Cat.Nr. Y203-EN2-02–DRIVES

GENERAL CATALOGUE 2006/2007

Motion & Drives



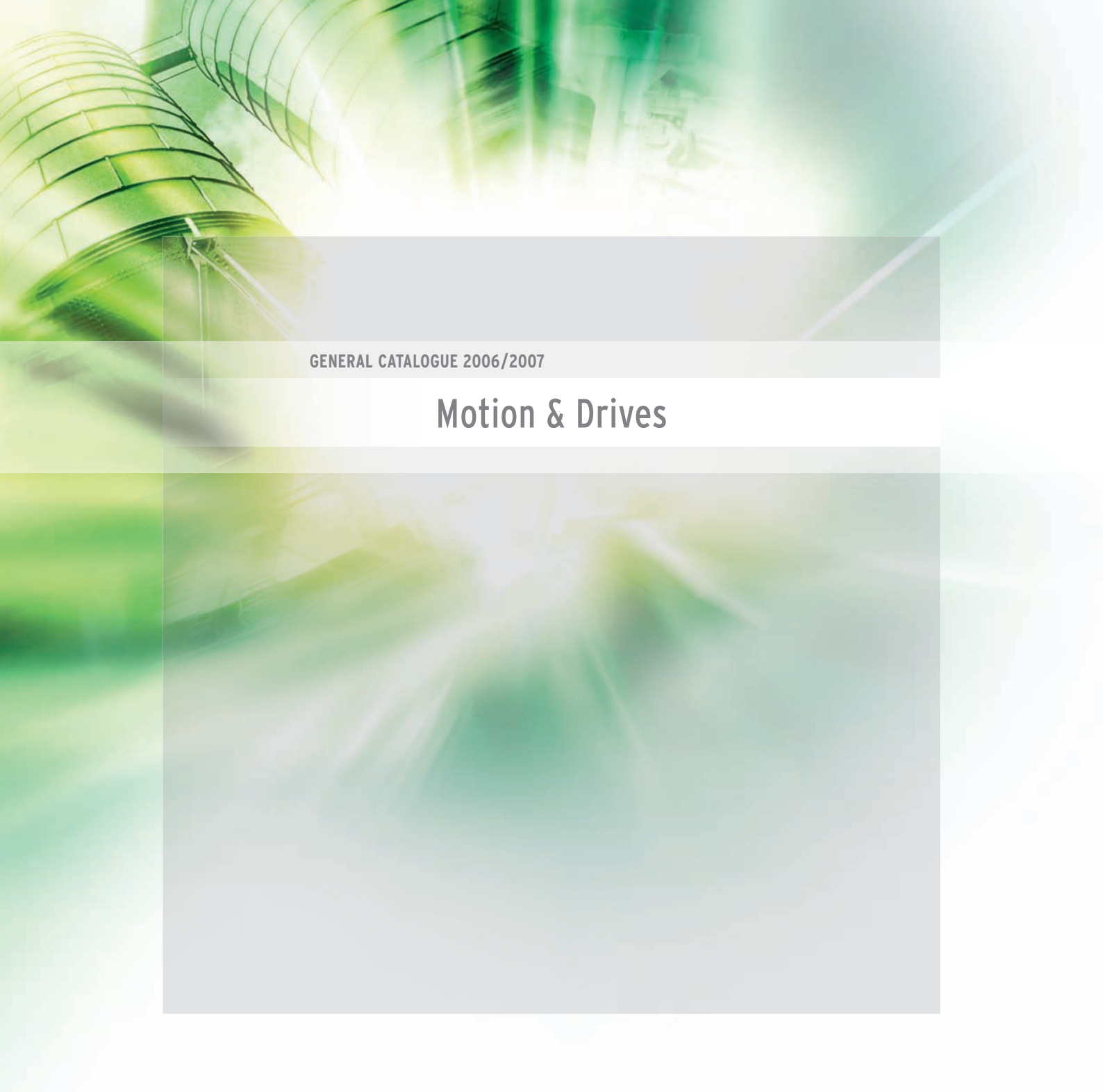




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Advanced Industrial Automation

OMRON



GENERAL CATALOGUE 2006/2007

Motion & Drives

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Motion & Drives

Never stop...

This catalogue features products that lead the field in motion technology by providing new control, motion, drive, servo and inverter solutions. What makes our products so special is that they are designed to deliver high performance and total reliability. With Omron Yaskawa's motion and drive products in your automation system, your systems never fail, and your production never stops.

The attached CD-ROM contains comprehensive information of our motion and drive product range. You can also find our latest innovations on www.omron-industrial.com or you can give us a call!



2 Omron – a global corporation

4 Omron product portfolio

6 Experts in Motion & Drives

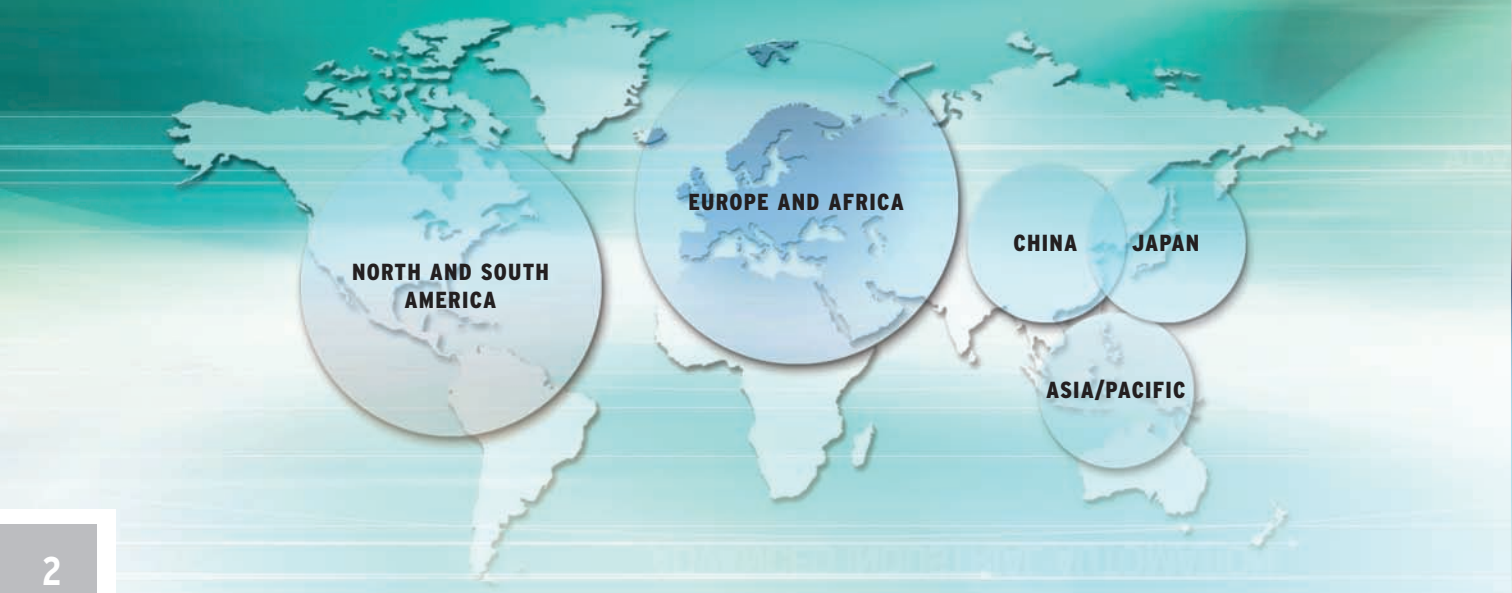
8 Product selection table

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17 Catalogue content

Omron – a global corporation

...with a local touch



Omron Industrial Automation

Omron Industrial Automation is a leading manufacturer of technologically advanced industrial automation products and a worldwide supplier of application expertise. You'll find our Industrial Automation technologies in factories and machines all over the world. Offering flexible and innovative solutions that support our guiding principle: never stop, never fail, just create!

Omron Industrial Automation Europe

In Europe we have maintained a leading position in machine and industrial automation for over 30 years. While offering global resources, our whole infrastructure is designed to act locally. So from sales and application knowledge through to R&D and customised production, we can support you wherever you're located, and through every step of your manufacturing process.

Omron Yaskawa Motion Control

For over a decade Yaskawa, a world leader in motion control, has worked with Omron in the marketing of machine automation products. This history of cooperation has now resulted in the formation of Omron Yaskawa Motion Control (OYMC) BV, a joint venture that handles our motion and drive products in Europe. OYMC provides customers with the best of all worlds – smart, innovating technologies combined with unrivalled reliability.

- 50 years in industrial automation
- Over 24,000 employees
- Over 1,800 employees in 18 European countries
- 8% of turnover invested in R&D
- More than 200,000 products
- 4,527 patents registered to date
- 6,235 patents pending

A solid history in customer service and support

As an Omron customer you have unprecedented support from our application engineers, who can advise you on-site anywhere in Europe.
The Omron Mechatronics Application Center (MAC) provides Omron engineers throughout Europe with up-to-date product knowledge and application support.



"From the moment you contact Omron, you get direct access to our application expertise, wherever and whenever you need it..."



European manufacturing on your doorstep

Yaskawa's Scottish facility in Cumbernauld manufactures AC Inverters and Servo Drives. Motion Control Products are manufactured in the Omron's manufacturing site in 's Hertogenbosch, the Netherlands. In addition to our standard product range, we can provide fast and flexible customised solutions using on-site R&D facilities and expertise. Both factories meet very strict quality and assurance standards, and are at the forefront in global enviromment protection.



European logistic centre – fast, reliable delivery

Lying at the heart of Europe, Omron's European Logistics Center (ELC) supports our National Sales Companies (NSCs). The ELC provides fast, reliable delivery of Omron products throughout Europe including the former Eastern European countries, and to the Middle East and Africa.



Repair services

While product reliability is vital, it's equally important for customers that repairs are completed quickly. Mean Time To Repair (MTTR) is the key service indicator here. In Europe, the Omron European Repair Centre and the Yaskawa Engineering Centre work closely together to guarantee a 5-day turnaround time. Omron-Yaskawa also offer a world-wide repair service that ensures a 24-hour site intervention.

Omron product portfolio

Smart Platform – one software, one connection, one minute



Why Smart Platform?

Smart Platform can help you increase the flexibility and efficiency of your machines or production lines. It provides:

- A single software environment for your machine covering sensing, regulation, control, motion, and visualisation.
- Easy drag & drop object-based programming and configuration of the complete system.
- Communications and architecture that is network independent.
- Distributed intelligent devices that are self-reporting and self-maintaining to reduce downtime and identify the source of production problems.



Motion & Drives

Motion controllers

Whether your interest is in stand-alone, PLC-based or servo-based motion controllers, Omron is the perfect choice. Omron motion controllers offer programming simplicity for control of up to 256 axes with no compromise on system performance. Functions like axis interpolation, master-slave, e-cam and multi-axis synchronisation over conventional I/Os or a robust digital servo-link are readily available.

New products
Page 10 »



Servo systems

Omron-Yaskawa's range of servo drives is unique in offering the highest dynamic performance in the most compact size. Add to that unparalleled reliability and you understand why our range of servos enjoys the largest installed base worldwide.

New products
Page 12 »



Inverters

Building on Yaskawa's world leading innovative design principles, the portfolio solution of inverter drives boasts everything from the micro J7, through application-dedicated drives such as the L7, up to the most advanced 3-level vector-control G7 frequency inverter. Also available the customised application software (CASE) that gives to a standard inverter the features of a dedicated solution.

New products
Page 14 »



Experts in Motion & Drives

Reliability matters!



Over 20 million drives installed worldwide, with a quarter in Europe alone, Omron-Yaskawa are a market reference in reliability. The latter is not some quantifiable parameter that one can just mention in the specification sheet. It is rather a rigorous process built in every stage of the product life cycle.

Defining reliability

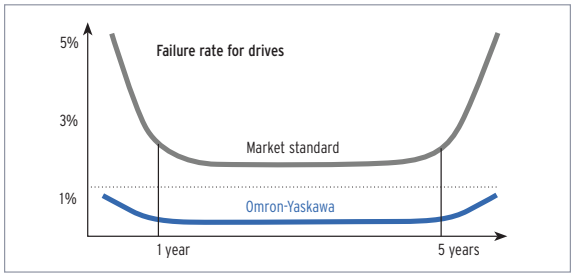
Reliability is technically termed as ‘able to satisfy the required functions during the specified time at specified conditions’. In Yaskawa‘s quality assurance book it is expanded to cover user environment and usage conditions. Therefore it is termed as ‘able to satisfy the required functions during the specified time under the customer usage environment and maintenance conditions’. Therefore reliability is not a mere “tick the box” exercise – it is a key element in total customer satisfaction.

Reliability built into the total product life cycle

Product reliability is a process that embraces the total product life cycle from new product planning to final service and repairs. Identifying strategic markets and understanding the environment in which they operate is key. For instance whereas a lift operates at typically 50,000 power cycles a year, an injection moulding machine would perform 500,000 cycles a year. Designing one standard inverter for both markets means that the IGBTs have to sustain 500,000 cycles a year. Meaning 10 times higher than their standard usage specification.

Development

Identifying critical parts in the unit such as power stages and establishing a stringent incoming inspection test plays a key role in subsequent reliability performance of the drive. New component validation is also an important aspect. Development time is now significantly reduced thanks to CAE/CAD and thermal modelling. Automatic regression test in firmware development allows testing of new versions by ensuring ZERO knock-on effect on the rest of the program. Typically firmware tests takes two thirds of the time it took to develop it.



▲ **Not all drives are born equal ...**

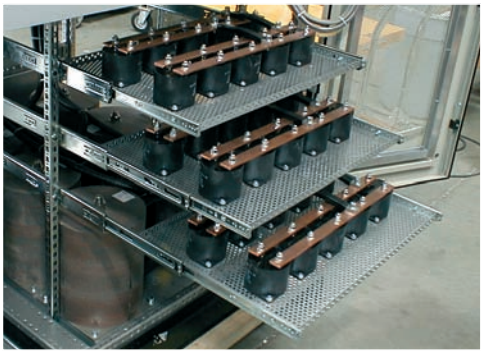
Zero failure at -40°

BHP Billiton, the world's leading Mining Corporation relies on Yaskawa frequency inverters in their EKATI Diamond Mine, located 200 km south of the Arctic Circle.











"We only have one chance to get it right first time."

Mark Leeson

Technical Director
Gainsborough Craftsmen Ltd.



"We cannot let luck position our discs."

Francis Laroche

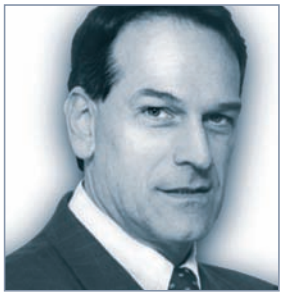
Managing Director
Esatec France



"Improving production yield is key, our machines contribute to that continuously."

Petri Väinölä

President and Chief Executive Officer
Cencorp Oyj



"Maximum reliability for total customar satisfaction."

Enrico Schmucker

Managing Director
Schmucker Italy



"We meet the demand for reliable plastic."

Glenn Dimmock

Managing Director
Oasys Technologies Ltd.



"My Machines never stop."

Herbert Herrman

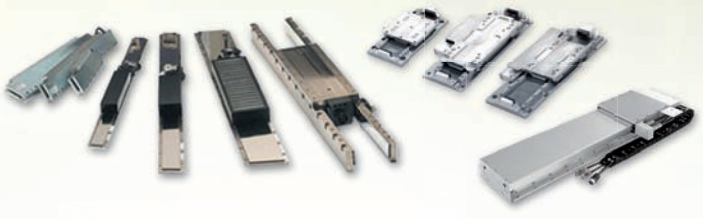
Manager
Mathias Bauerle GmbH

Motion & Drives – scalable, flexible,

Motion controllers

System architecture	Multi-axis			Single-axis
Drive control method	Pulse train control	Analogue output control	MECHATROLINK-II control	Direct Drive control
Continuous path control, Electronic CAMs, Advanced Motion control, Mutiaxes syncronisation		MCs 	MP2000  Trajexia  MCH71	MCW151  XtraDrive 
Point to Point Positioning Feed Equipment Indexers	NCs 		NCF71 	NS Units 

Servo systems

Drive control method	Pulse train control	Full control: Analogue Pulse, pulse train input and control option boards	Controller in the Drive
Servo drives	SmartStep 	Sigma-II 	XtraDive 
Servo motors		Linear motors 	Assembled Linear Axes
	SmartStep 	Sigma-II motors 	Direct Drives
	Precise positioning control	High dynamics, high accuracy, high motor range for continuous path control	

easy and above all, reliable

Frequency inverters

Very high performance, Heavy duty, Long cables	G7 				
Winders, Lifts, Cranes, Extruders	L7 Dedicated to lifts 	F7 			
Wide power range of pums, Fans	E7 				
Palletisers, Basic positioning, Textile winding, Door controllers	V7 				
Conveyors, Low Power Pumps & Fans	J7 				
		CASE – Customised Application Software			
	Basic speed control	Dynamic speed control	Energy saving	Precise torque control	3 level control

New products

Trajexia – the advanced motion controller that puts you in control

Datasheet page nr. 23





Main features and benefits

- 16 axes advanced motion coordination over a robust and fast motion link
- Each axis can run complex interpolation moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions
- Multi-tasking controller capable of running up to 14 tasks simultaneously
- Open – Ethernet built-in, PROFIBUS-DP and DeviceNet as options

TrajeXia is the new motion platform that offers you the performance of a dedicated motion system, the ease of use you get from an automation specialist and the peace of mind you have from a global player. TrajeXia puts you in full control to create the best machines today and tomorrow.

Perfect control of 16 axes

Controlling all 16 axes with a total system cycle time of 1 ms, Trajexia ensures fastest operation at highest accuracy.

Real multi-tasking

Trajexia is a real multi-tasking controller capable of running up to 14 tasks simultaneously.

Robust and stable motion bus

Specifically designed for motion control, MECHATROLINK-II offers the communication speed and time accuracy essential to guarantee perfect motion control of servos.

Best-in-class servo drives

Offering a wide variety of rotary and linear servomotors, Omron's Sigma II servo series is designed with NO compromise on quality, reliability and performance to guarantee best-in-class motion control.

Inverters and servos over the same bus

The inverters connected to the MECHATROLINK-II are driven at the same update cycle time as the servo drives.



trajexia
you decide

Freedom to communicate

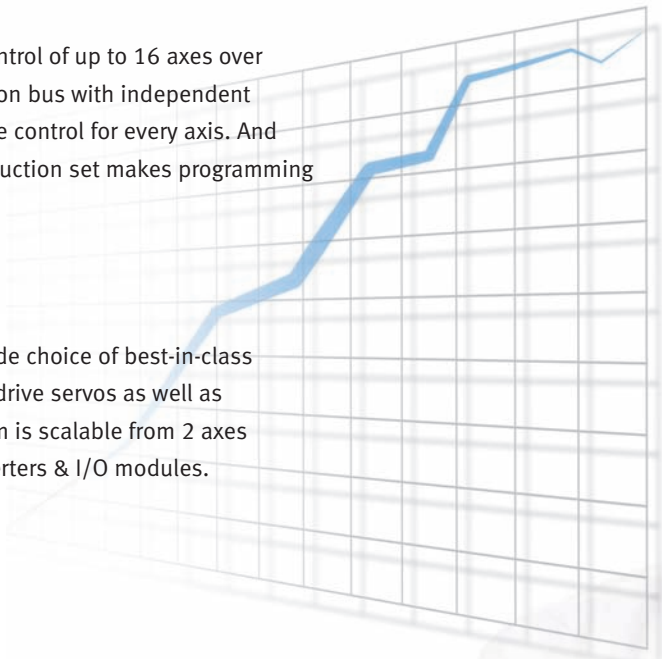
Besides a built-in Ethernet port that provides connectivity meeting today's and foreseeable future communication standards, Trajexia also includes interfaces to popular field buses such as Profibus-DP and DeviceNet.

Freedom to control

Trajexia offers perfect control of up to 16 axes over a MECHATROLINK-II motion bus with independent position, speed or torque control for every axis. And its powerful motion instruction set makes programming intuitive and easy.

Freedom to build

You can select from a wide choice of best-in-class rotary, linear and direct-drive servos as well as inverters. And the system is scalable from 2 axes up to 16 axes and 8 inverters & I/O modules.





New products

CJ1W-NCF71 – Point-to-point positioning in nano size

Datasheet page nr. 29



16-axis point-to-point positioning controller over MECHATROLINK-II motion bus

The CJ1W-NCF71combined with the CJ1 PLC and Omron Yaskawa servo drives offer the best performance/size ratio on the market. The motion commands can be set directly from the PLC ladder program making it simple and easy to use, it include functions like interrupt feeding and interpolation. The NCF controllers is ideal for all PTP applications such as pick & place, gantry robots, electronic assembly, labelling stations, etc.

Main features and benefits

- Simplified wiring to drives. Data routing to all servo drives (MECHATROLINK-II)
- Integration into Omron Smart Platform: Function Blocks, SAP, CX-One
- Servo drives' full control and parameter access via MECHATROLINK
- Easy, fast, reliable, optimised for positioning applications
- Advanced PTP: Interpolation of 8 axes (4 axes + 4 axes)
- PLCopen compliant function blocks

PLCopen motion control

NCT – a revolution in drive positioning algorithms

Datasheet page nr. 121



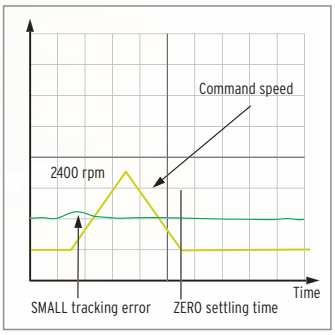
NCT main benefits

- Non-linear control, adaptive feed-forward algorithm and digital processing of encoder pulses, provide both small tracking error and zero settling time
- Increased throughput
- Reduced influence of external perturbations

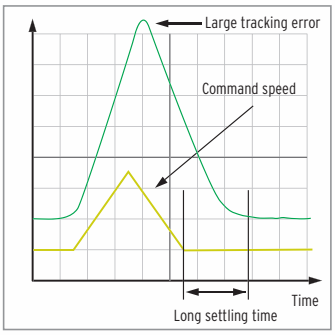
XtraDrive – All-in-one servo drive

If your application demands the highest positional accuracy combined with the shortest cycle times, the most compact size and an ability to connect to a Profibus network then look no further than XtraDrive. As a result of the revolutionary algorithms residing within the drive, XtraDrive offers the tightest control, providing near zero settling time, beneficial in a host of applications such as linear motor control.

Small tracking error, zero settling time



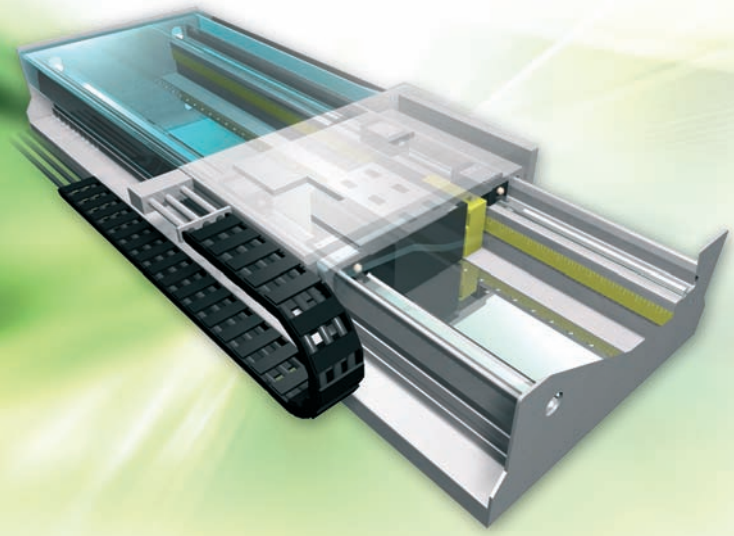
▲ **Drive with NCT**



▲ **Other Drive**

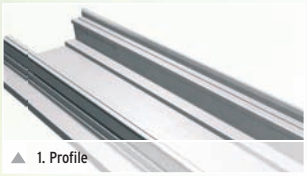
Assembled Linear axes – every single component counts

Datasheet page nr. 221

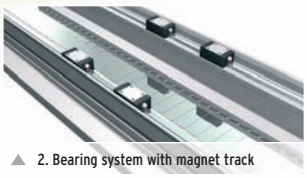


Main features and benefits

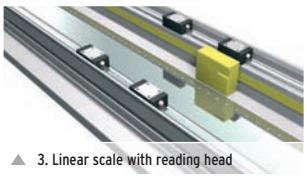
- Assembled axis ready to be assembled in the machine
- Plug & Drive – automatic motor recognition by servo drive
- Selection of the best components
- Robust construction for long durability and constant preformance
- Highly enclosed construction to protect the motor parts



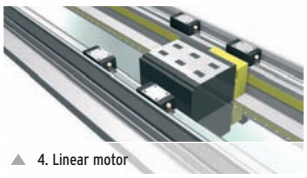
▲ 1. Profile



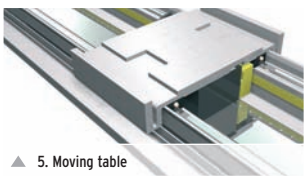
▲ 2. Bearing system with magnet track



▲ 3. Linear scale with reading head



▲ 4. Linear motor



▲ 5. Moving table



▲ 6. Cable chain and dust protection cover

An extremely high degree of flexibility, precision, speed and modularity is expected by customers in the plant engineering sector. Omron's product range of linear drive mechanisms offers the required characteristics and provides you with a decisive advantage over the competition.

Omron-Yaskawa's wide range of linear motor products has now been enhanced with the addition of a new series of complete linear axes. This series of plug & play axes offers not only excellent performance and a well-thought out design, but also the important advantages of modularity and a wide variety of versions. The modular system makes it possible to quickly configure the right solution for your tasks. Using 3D graphics, you are able to incorporate the selected system into your design, simply by clicking the mouse.

Regardless of the demands made on your system, Omron's wide product range of linear motors and linear axes provides you with the ideal linear drive solution at all times.

▶ The linear axis combines the best in class linear motors and components with an exclusive design providing a complete and reliable solution off-the-shelf.

New products

E7 IP54 inverter – built for the toughest conditions

Datasheet page nr. 309



Main features and benefits

- Robust chassis thanks to the metal box
- Built-in filter
- Lot of space inside for easy wiring
- Silent operation
- CASE (Customised application software) and PLC option board

The E7 is designed for variable torque applications such as fans and centrifugal pumps. It is supplied with V/f control and normal duty overload rating of 110% for one minute. A unique feature of the E7 is the energy-saving algorithm, which allows an extra saving of up to 20%.

E7 IP54 solution provides the inverter protection from non-conductive dust and splashed. These features make E7 IP54 the ideal solution for install it close to the motor saving space and money. E7 Series special features will allow you energy saving everywhere.

V7 IP65 – compact high protected inverter

Datasheet page nr. 329



Main features and benefits

- High inverter protection – IP65
- Built in filter
- Compact size
- High torque at low speed. 100% at 0,5 Hz
- CASE (Customised application software) and PLC option board

The Varispeed V7 is the perfect drive for standard industrial applications such as conveyor, cranes, grinders, etc. It delivers an amazing 100% torque at 0.5 Hz, ensuring a very stable motor speed.

V7 IP65 provides you high protection for compact sensorless vector control inverter, giving you the opportunity of decentralize your drives application without any extra cabinet cost and thanks to his features, being independent from main control panel.

Case – inverter application software

Datasheet page nr. 387

The CASE is special software that provides solutions for customised applications. It gives a standard inverter the performance of a custom-made solution, allowing huge savings in hardware equipment and increasing the overall system reliability. The inverter made for you.

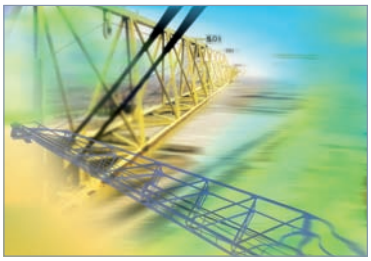
Case 1. ELS – Electronic Line Shaft software for F7 inverter

The Electronic Line Shaft Application Software is the Omron-Yaskawa dedicated software for position and speed follower applications, allowing a slave drive to precisely follow a master encoder. It is the ideal solution for dual-motor synchronised applications.



Case 2. Crane software into a standard F7 inverter

The Crane Application Software is the Omron-Yaskawa dedicated solution for Cranes applications. It customises the F7 inverter high-performance features to the specific software and hardware needs of Crane applications.



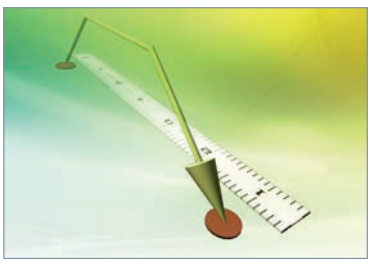
Case 3. Pump sequenzer software for E7 series

The Pump Sequencer Application Software is the Omron-Yaskawa dedicated solution for pump sequencer applications up to 2 auxiliary pumps. It is the ideal solution for water treatment installations, building HVAC and industrial pumping.



Case 4. Point to point position control software

The Point-to-Point Application Software is the Omron-Yaskawa dedicated solution for point-to-point positioning applications. Absolute or relative positioning is possible. It is the ideal solution for palletisers, transfer lines, positioning machines or cyclic feed rolls.









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		CS1W-NCF71	35
		CJ1W-MCH71	41
		CS1W-MCH71	49
		MP-2200	57
		MP-2300	67
		MP-2100	77
	Control via analogue output	C200HW-MC402-E	85
		CS1W-MC□	87
	Control via pulses	CJ1W-NC□□	89
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Single-axis controllers			
	Servo based controllers	R88A-MCW151-□	93
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Motion controllers

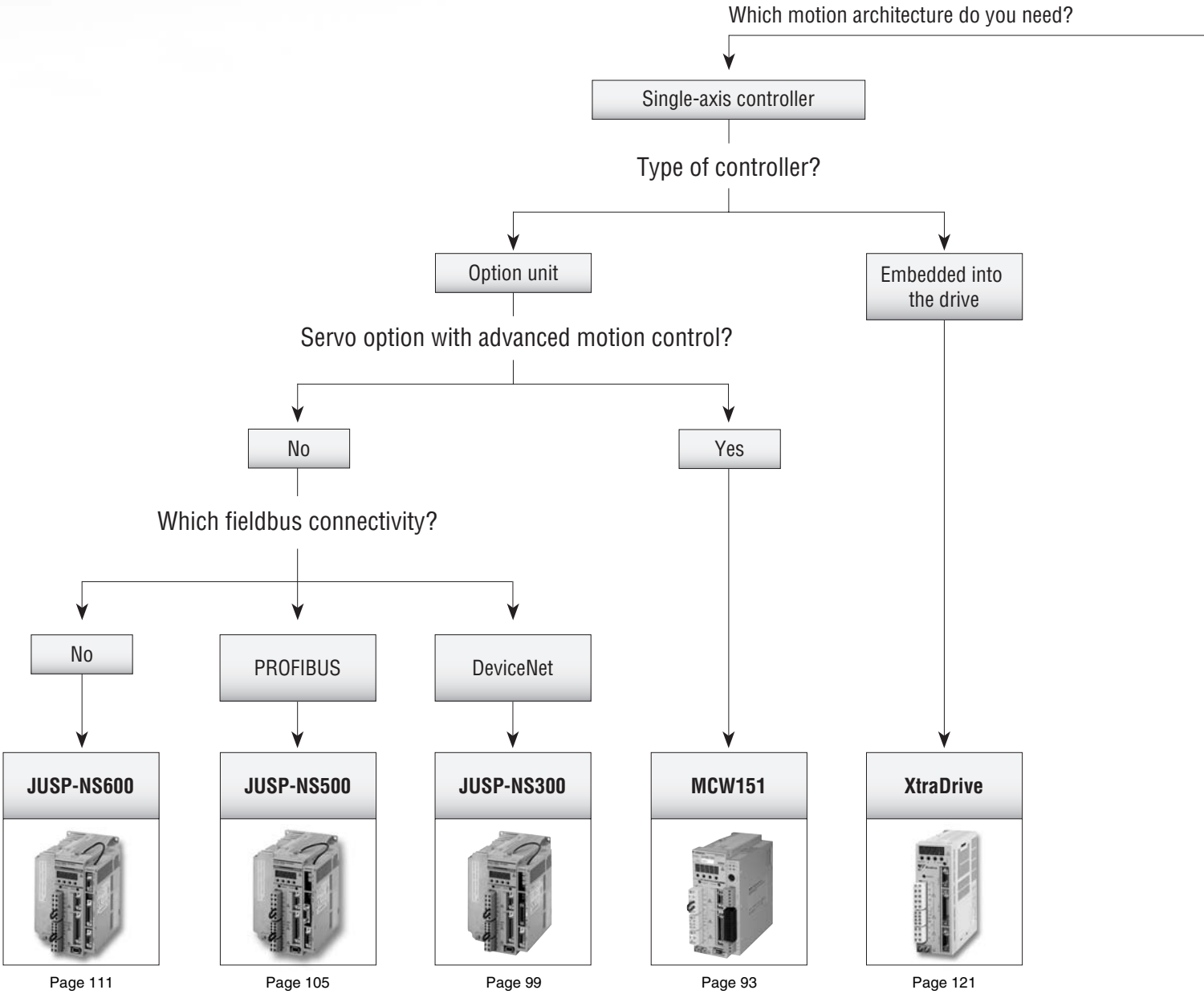
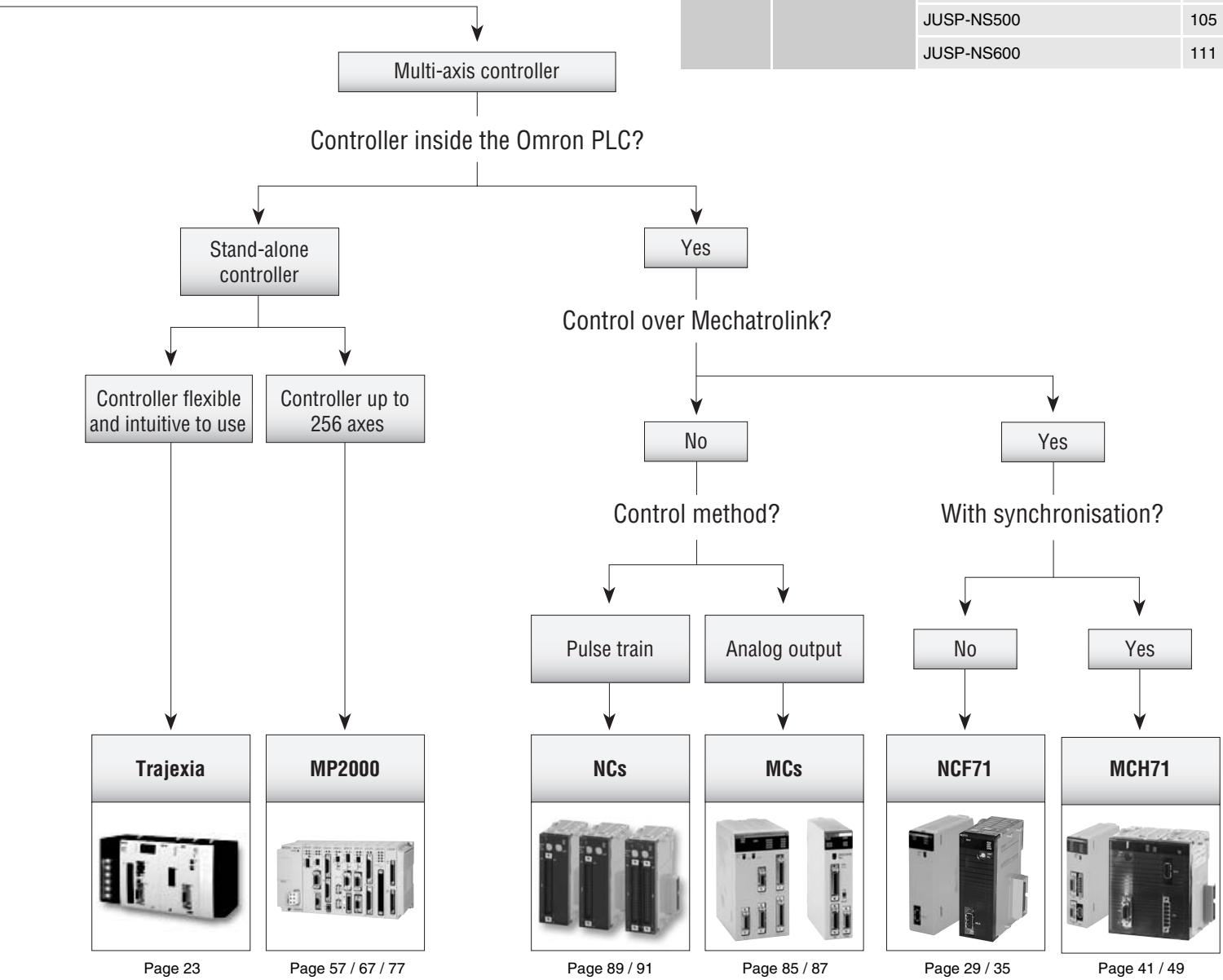


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		CS1W-NCF71	35
		CJ1W-MCH71	41
		CS1W-MCH71	49
		MP-2200	57
		MP-2300	67
		MP-2100	77
	Control via analogue output	C200HW-MC402-E	85
		CS1W-MC□	87
	Control via pulses	CJ1W-NC□□	89
		CS1W(C200HW)-NC□□	91
Single-axis controllers			
	Servo based controllers	R88A-MCW151-□	93
		JUSP-NS300	99
		JUSP-NS500	105
		JUSP-NS600	111



Selection table

Multi-axes motion controllers			
			
Model	**Trajexia**	**C□1W-MCH71**	**C□1W-NCF71**
	Flexible concept of advanced motion control over MECHATROLINK-II motion bus and traditional interfaces	Advanced motion controller over MECHATROLINK-II motion bus	Point-to-point positioning controller over MECHATROLINK-II motion bus
Axes control method	MECHATROLINK-II motion bus, analogue output and pulse-train	MECHATROLINK-II motion bus	MECHATROLINK-II motion bus
Number of axes	16 servos + 8 inverters	30 real and 2 virtual axes	16
Applicable servo drive	Sigma II	Sigma II	Sigma II
Application	Advanced motion, e-cam, e-gearbox, phase shift, registration	Advanced motion, e-cam, ELS, phase shift, registration	From simple PTP to multi axis PTP coordinated systems.
Servo control mode	Position, speed and torque	Position, speed and torque	Position, speed and torque
PLC series	Stand alone motion solution. Ethernet, PROFIBUS-DP and DeviceNet connectivity	Advanced motion controller over MECHATROLINK-II motion bus	CJ1 and CS1 PLCs
Page	23	41 / 49	29 / 35

Servo-based motion controllers		
		
Model	**MCW151**	**XtraDrive**
	Advanced motion in a compact package	All in one! Servo drive and motion controller integrated
Axes control method	Direct connection to servo drive	Integrated into the servo drive
Connectivity	DeviceNet, PROFIBUS, Hostlink	PROFIBUS
Digital I/O	8 DI, 6 DO, 2 registration inputs, 1 encoder IN 1 pulse OUT + Servo IOs	Servo inputs + expansion available
Application	Advanced motion, e-cam, e-gearbox, phase shift, registration	Advanced motion
Servo control mode	Position, speed and torque. Open loop pulse train for additional axis	Position, speed and torque.
Applicable servo drive	Sigma-II	XtraDrive
Page	93	121

Multi-axes motion controllers			
			
Model	**MCs**	**NCs**	**MP2000**
	CS1 solution for advanced motion control	Point-to-point positioning controller	High performance motion controller for a wide array of applications
Axes control method	Analogue output	Pulse train output	MECHATROLINK-II motion bus, analogue output, and pulse-train
Number of axes	4	1, 2, 4	up to 256
Applicable servo drive	Sigma II	SmartStep, Sigma II	Sigma-II
Application	Advanced motion, e-cam, ELS, phase shift, registration	Point-to-point applications	Advanced motion, e-cam, ELS, phase shift, registration
Servo control mode	Close loop position and speed	Open loop position with linear interpolation	Position, speed and torque
PLC series	CS1	CJ1 and CS1 PLCs	Stand-alone and PC-based controllers
Page	85 / 87	89 / 91	57 / 67 / 77

Servo-based motion controllers			
			
Model	**JUSP-NS300**	**JUSP-NS500**	**JUSP-NS600**
	Position controller over DeviceNet	Position controller over PROFIBUS-DP	Position controller over serial link
Axes control method	Direct connection to servo drive	Direct connection to servo drive	Direct connection to servo drive
Connectivity	DeviceNet	PRIFIBUS	RS-485/RS-422
Digital I/O	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 8 additional DI and 6 DO
Application	Point-to-point with registration capability	Poin- to-point with registration capability	Point-to-point with registration capability
Servo control mode	Position, speed	Position, speed	Position, speed
Applicable servo drive	Sigma-II	Sigma-II	Sigma-II
Page	99	105	111

TJ1-

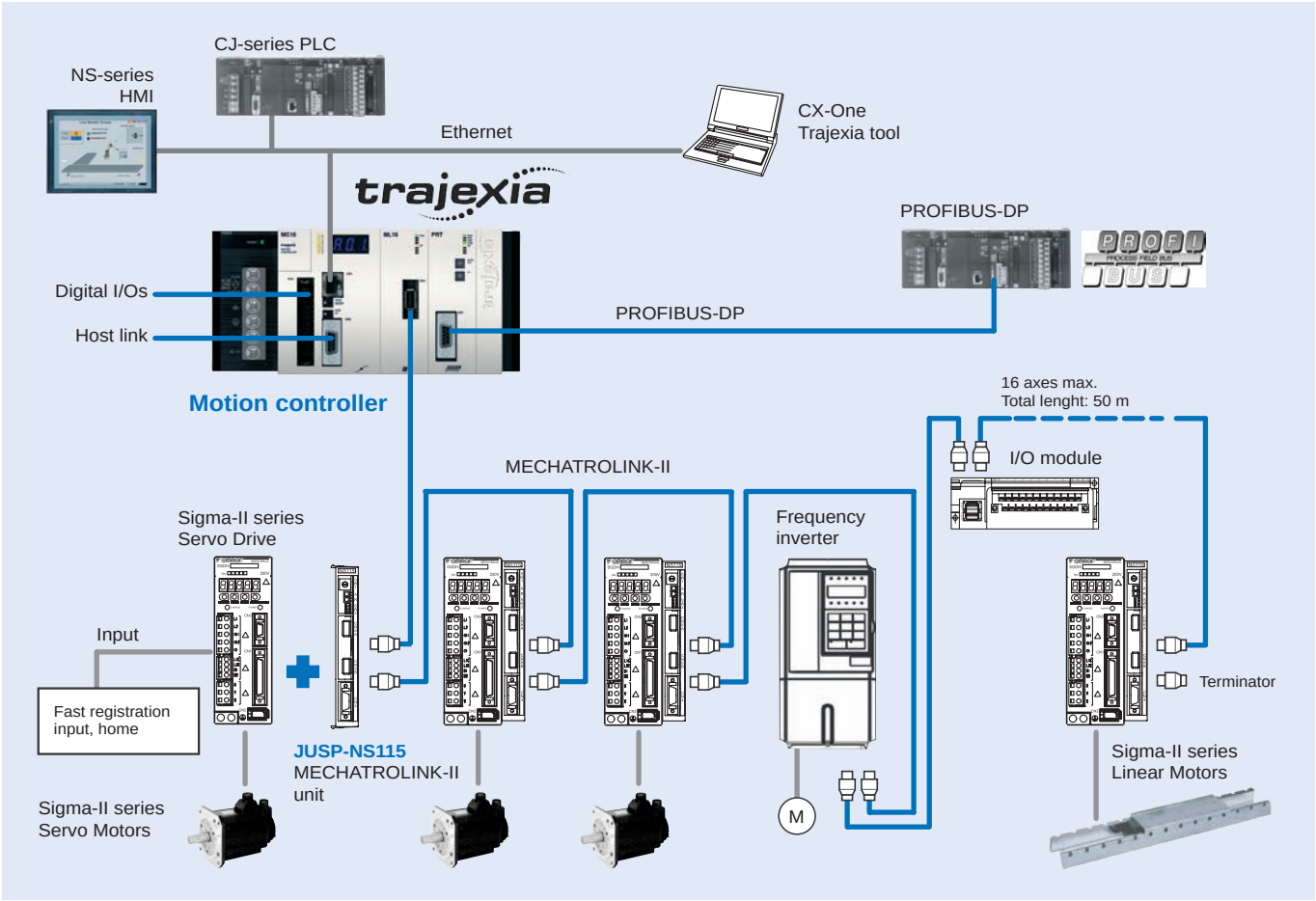
Trajexia motion controller



Stand-alone advanced motion controller using MECHATROLINK-II motion bus

- 16 axes advanced motion controller over a robust and fast motion link MECHATROLINK-II
- Supports position, speed and torque control
- Each axis can run complex interpolation moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions
- Hardware registration input for each servo axis
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 14 tasks simultaneously
- Open communication - ethernet built-in, PROFIBUS-DP and DeviceNet as options

System configuration



Specifications

General specifications

Item	Details
Model	TJ1-□
Ambient operating temperature	0 to 55 °C
Ambient operating humidity	10 to 90% RH
Ambient storage temperature	-20 to 70 °C
Ambient storage humidity	90% max. (with no condensation)
Atmosphere	No corrosive gases
Vibration resistance	10 to 57 Hz: (0.075 mm amplitude) 57 to 100 Hz acceleration: 9.8 m/s^2, in X, Y and Z directions for 80 minutes.
Shock resistance	143 m/s^2, 3 times each X, Y and Z directions.
Insulation resistance	20 MΩ
Dielectric strength	500 Volt
Protective structure	IP20
International standards	CE, EN 61131-2 and RO (approval pending for cULus and Lloyds)

Motion control unit

Item		Details	
Model		TJ1-MC16	
Number of axes		16	
Number of inverters and I/O modules		8 maximum	
Number of MECHATROLINK-II master units		Up to 4 MECHATROLINK-II master units (TJ1-ML16, see below) can be connected	
Cycle time		Selectable 0.5 ms, 1 ms or 2 ms	
Programming language		BASIC-like motion language	
Multi-tasking		Up to 14 tasks running simultaneously	
Digital I/O		16 inputs and 8 outputs freely configurable	
Measurement units		User definable	
Available memory for user programs		500 KB	
Data storage capacity		Up to 2 MB flash data storage	
Saving program data, motion controller		SRAM with battery backup and Flash-ROM	
Saving program data, personal computer		Trajexia motion perfect software manages a backup on the hard disk of the personal computer.	
Communication ports		1 ethernet port and 2 serial ports	
Firmware update		Via Trajexia tools software	
Ethernet port	Electrical characteristics	Conform to IEEE 802.3 (100BaseT)	
	Connector	RJ45 ethernet connector	
Serial port	Electrical characteristics	Conform 1 port to RS232C and 1 port to RS485/RS422A (selectable by switch)	
	Connector	SUB-D9 connector (counterpart included in the package)	
	Synchronization	Start-stop synchronization (asynchronous)	
	Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps	
	Transmission format	Databit length	7 or 8 bit
		Stop bit	1 or 2 bit
		Parity bit	Even/odd/none
	Transmission mode	Point-to-multipoint (1:N)	
	Transmission protocol	RS-232C (1:1)	Host link master protocol, Host link slave protocol, ASCII general-purpose
		RS-422A (1:N)	Host link master protocol, Host link slave protocol, ASCII general-purpose
		RS-485 (1:N)	Hostlink master protocol, Hostlink slave protocol, ASCII general-purpose
	Galvanic isolation	RS422A port	
	Communication buffers	254 bytes	
	Flow control	None	
	Terminator	Yes, selectable by switch	
	Cable length	15 m for RS232 and 500 meter for RS422/485	

MECHATROLINK-II master unit

Item	Specifications
Model	TJ1-ML16
Controlled devices with MECHATROLINK-II interface	Sigma-2 and Sigma-3 servo drives, various I/O units and V7, F7 and G7 frequency inverters
Electrical characteristics	Conform to MECHATROLINK standard
Communication ports	1 MECHATROLINK-II master
Transmission speed	10 Mbps
Communication cycle	0.5 ms, 1 ms or 2 ms
Stations slave types	Axes or servo drives
	Frequency inverters
	I/O modules
Number of stations per master/cycle time	Max.16 stations / 2 ms
	Max.8 stations / 1 ms
	Max. 4 stations / 0.5 ms (only Sigma-3 servo drives)
Transmission distance	Max. 50 meters without using repeater

PROFIBUS slave unit

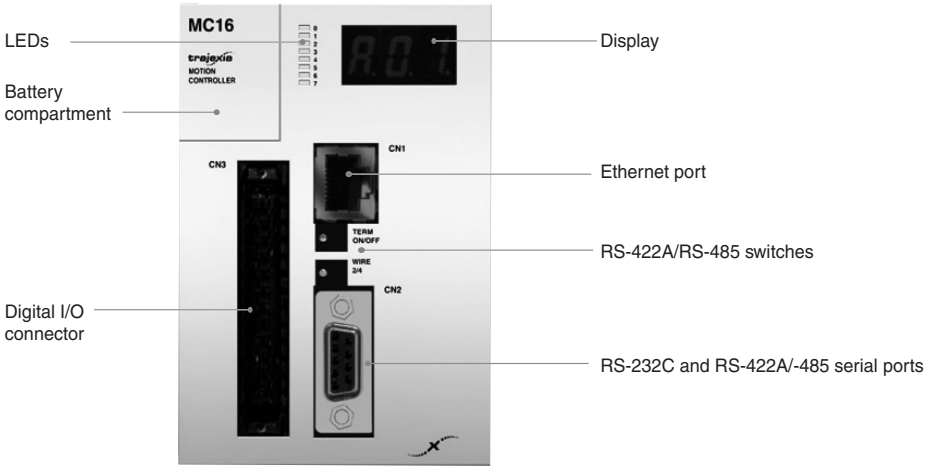
Items	Specifications
Model	TJ1-PRT
PROFIBUS standard	Conform to PROFIBUS-DP standard EN50170 (DP-V0)
Communication ports	1 PROFIBUS-DP slave
Transmission speed	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000 and 12000 kbits/s
Node numbers	0 to 99
I/O size	For both directions a configurable size of 0 to 122 words(16 bit)
Galvanic isolation	Yes

Flexible axis unit

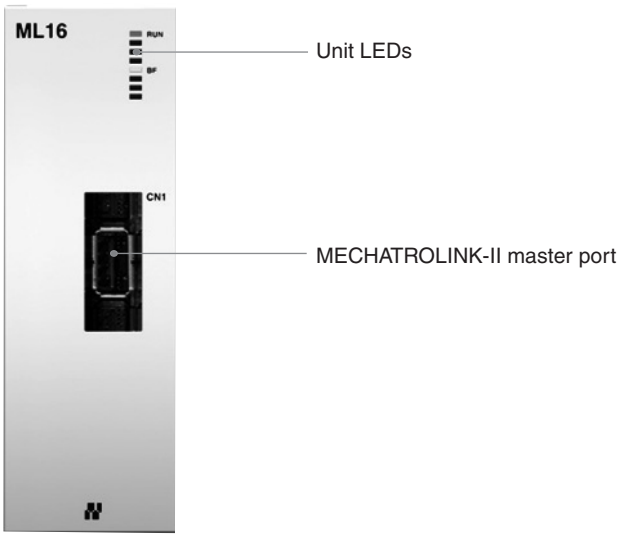
Items		Specifications
Model		TJ1-FL02
Number of axes		2
Control method		±10 V analogue output in closed loop or pulse train output in open loop
Encoder	Position/speed feedback	2 incremental and absolute encoders
	Absolute encoder standards supported	SSI, EnDat and Tamagawa
	Encoder input maximum frequency	6 MHz
	Encoder/pulse output max. frequency	2 MHz
Auxiliary I/Os		2 fast registration inputs per axis, 2 definable inputs, 1 enable output, 4 configurable outputs
Galvanic isolation		Yes

Nomenclature

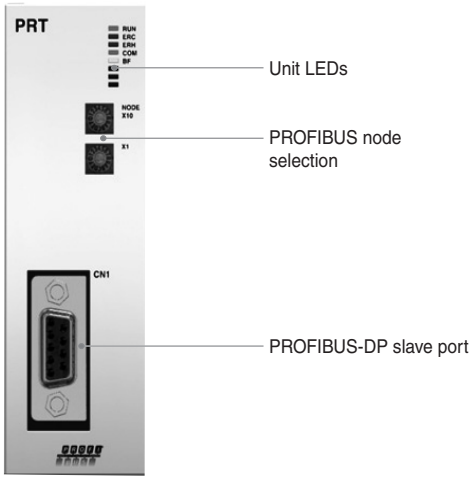
Trajexia motion controller unit - TJ1-MC16



Trajexia MECHATROLINK-II master unit - TJ1-ML16

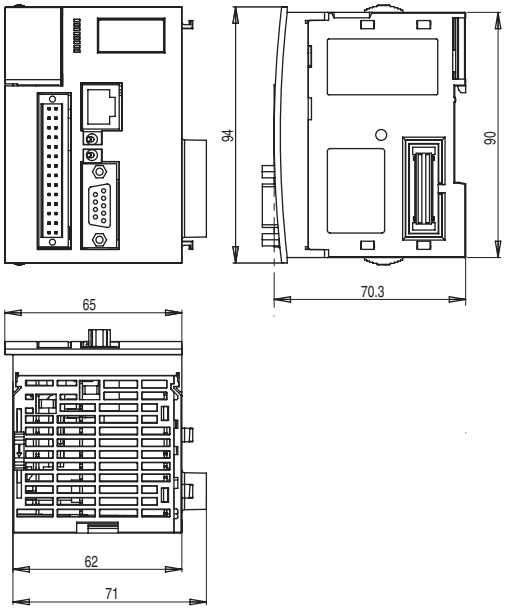


Trajexia PROFIBUS-DP slave unit - TJ1-PRT

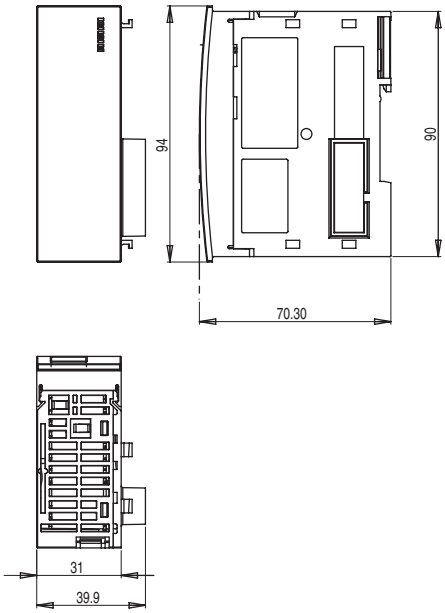


Dimensions

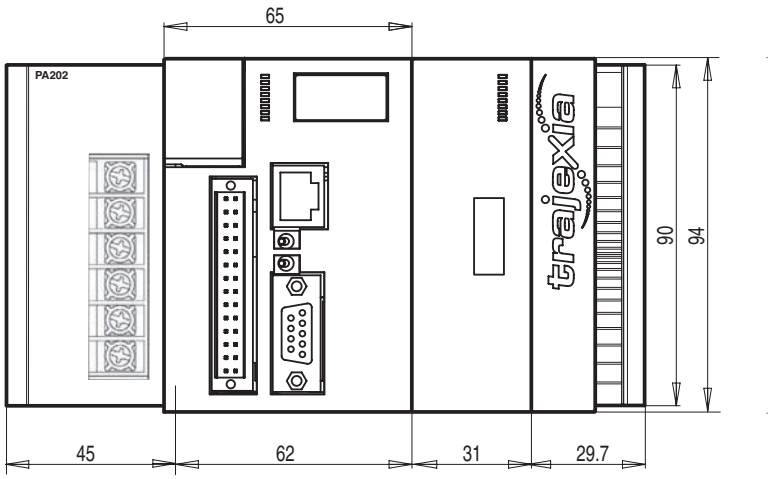
Trajexia motion controller - TJ1-MC16



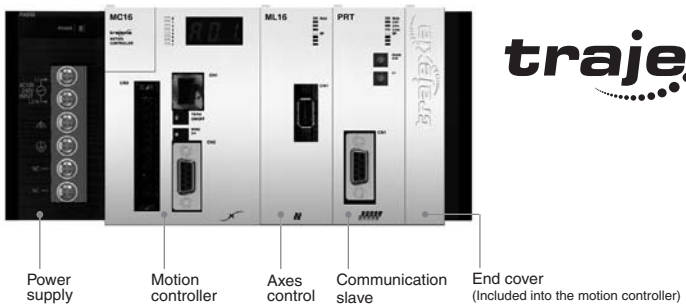
Trajexia modules - TJ1-ML16, TJ1-PRT, TJ1-FL02



Trajexia system - CJ1W-PA202 + TJ1-MC16 + one module + TJ1-TER



Ordering information



Trajexia motion controller

Name	Model
Trajexia motion controller unit. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC16
Power supply for Trajexia system, 100-240 VAC	CJ1W-PA202
Power supply for Trajexia system, 24 VDC	CJ1W-PD022

Trajexia - axes control modules

Name	Model
Trajexia MECHATROLINK-II master unit (up to 16 axes)	TJ1-ML16
Trajexia flexible axis unit (for 2 axes)	TJ1-FL02

Trajexia - communication modules

Name	Model
Trajexia PROFIBUS-DP slave unit	TJ1-PRT

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point digital input and 64-point digital output (24 VDC)	JEPMC-IO2310
	Analogue input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analogue output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 39 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T

I/O cables

	Remarks	Lenght m	Model
I/O cable for JEPMC-IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system & frequency inverters

Note: Refer to motion & drives catalogue for detailed specs and ordering information

Computer software

Specifications	Model
Trajexia motion perfect and CX-drive V1.2 or higher	TJ1-tools

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I53E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CJ1W-NCF71 - MECHATROLINK-II

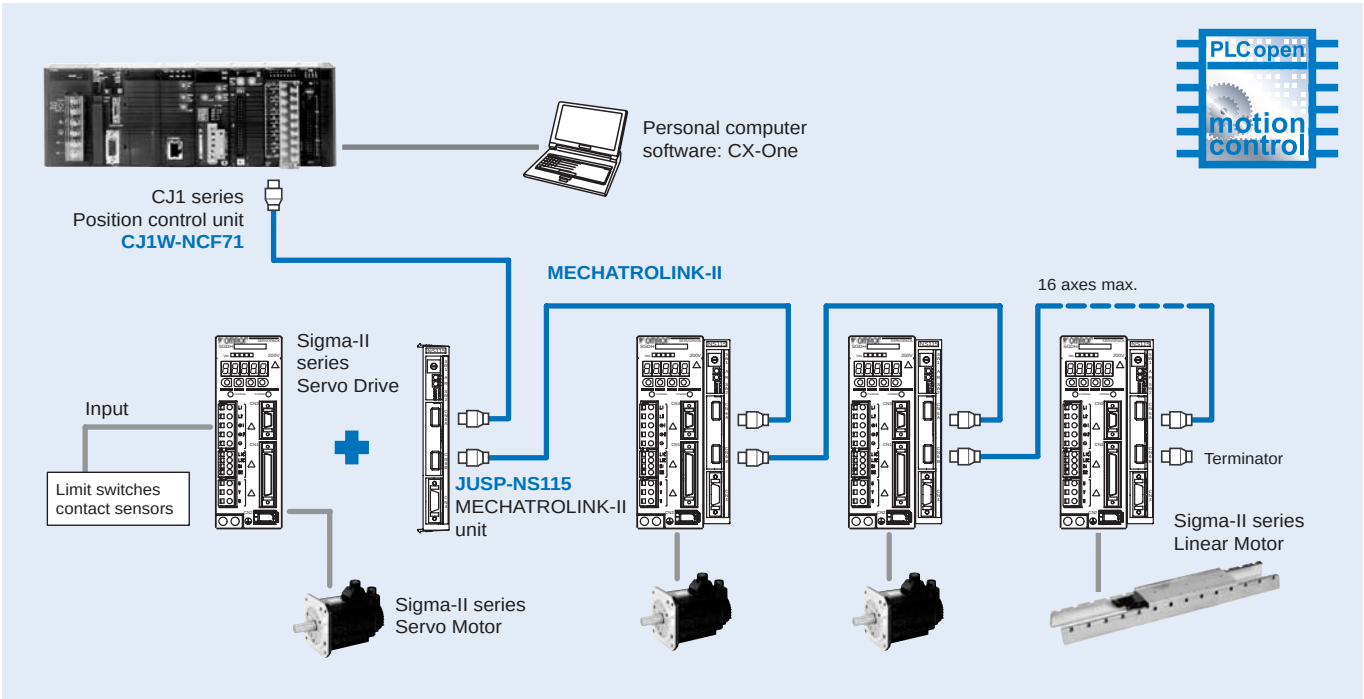
Position control unit



Multi-axes position controller via high-speed MECHATROLINK-II

- Up to 16 axes controlled with minimum wiring. Only one cable between devices is needed.
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control.
- Programming languages: ladder, function blocks.
- Smart active parts for OMRON HMIs terminals reduce engineering time.
- Access to the complete system from one point. Network setup, servo drives configuring and monitoring, and PLC programming.

System configuration



Specifications

Position control unit

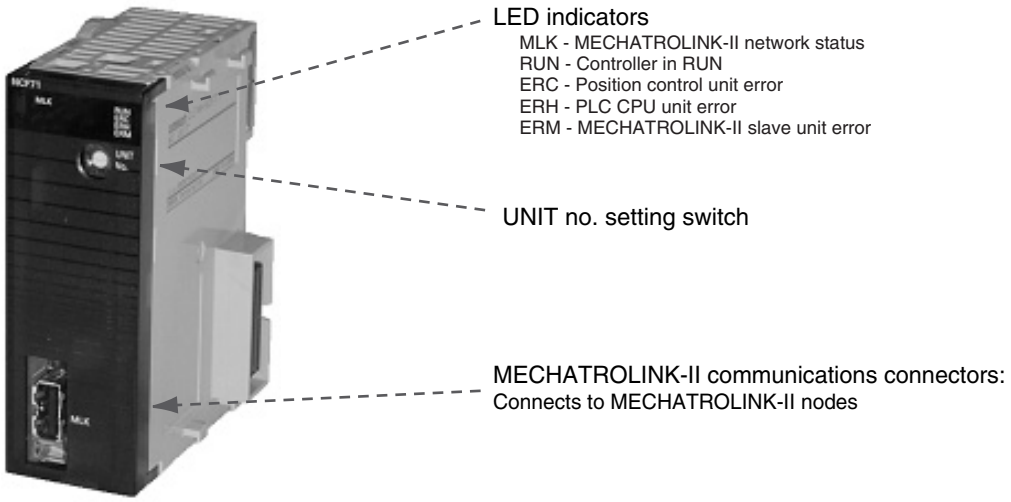
Model		CJ1W-NCF71
Classification		CJ-series CPU bus unit
Applicable PLCs		CJ-series
		CJ-series V. 3.0 or later in order to use function blocks (recomended CJ1G-CPU45 or CJ1H-CPU□)
Possible unit number settings		0 to F
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface
Controlled axes		16 maximum
I/O allocations	Common operating memory area	Words allocated in CPU bus unit area: 25 words (15 output words, 10 input words)
	Axis operating memory area	Allocated in one of the following areas (user-specified): CIO, work, auxiliary, holding, DM, or EM area. Number of words allocated: 50 words (25 output words, 25 input words) × highest axis No. used
Control units	Position command unit	Command unit: depends on the electronic gear setting in the servo parameters. Default setting: pulses
	Speed command unit for position control	Command units/s
	Acceleration/deceleration speeds for position control	10,000 command units/s^2
	Speed command unit for speed control	0.001% of the motor's maximum speed
	Torque command unit for torque control	0.001% of the motor's maximum torque
Control command range	Position command range	-2,147,483,648 to 2,147,483,647 (command units)
	Speed command range for position control	0 to 2,147,483,647 (command units/s)
	Acceleration/deceleration speeds for position control	1 to 65,535 (10,000 command units/s^2)
	Speed command range for speed control	-199.999% to 199.999% The upper limit is restricted by the maximum speed of the servo motor.
	Torque command range for torque control	-199.999% to 199.999% The upper limit is restricted by the maximum torque of the servo motor.
Control functions	Servo lock/unlock	Locks and unlocks the servo driver.
	Position control	Positions to an absolute position or relative position according to the specified target position and target speed specified from the ladder program.
	Origin determination	• Origin search: establishes the origin using the specified search method. • Present position preset: changes the present position to a specified position to establish the origin. • Origin return: returns the axis from any position to the established origin. • Absolute encoder origin: establishes the origin using a servo motor that has an absolute encoder, without having to use an origin search.
	Jogging	Outputs a fixed speed in the CW or CCW direction.
	Interrupt feeding	Performs positioning by moving the axis a fixed amount when an external interrupt input is received while the axis is moving.
	Speed control	Performs speed control by sending a command to the servo driver speed loop.
	Torque control	Performs torque control by sending a command to the servo driver current loop.
	Stop functions	• Deceleration stop: decelerates the moving axis to a stop. • Emergency stop: positions the moving axis for the number of pulses remaining in the deviation counter and then stops the axis.
	Linear interpolation	Up to 8 axes can be interpolated by using two interpolators (4 axes per interpolator) Available in unit version 1.1 or higher
Auxiliary functions	Acceleration/deceleration curves	Sets either a trapezoidal (linear) curve, an exponential curve, or an S-curve (moving average).
	Torque limit	Restricts the torque upper limit during position control.
	Override	Multiplies the axis command speed by a specified ratio. Override: 0.01% to 327.67%
	Servo parameter transfer	Reads and writes the servo driver parameters from the ladder program in the CPU unit.
	Monitoring function	Monitors the control status of the servo driver's command coordinate positions, feedback position, current speed, torque, etc.
	Software limits	Limits software operation for controlling positioning.
	Backlash compensation	Compensates for the amount of play in the mechanical system according to a set value.
External I/O	Position control unit	One MECHATROLINK-II interface port
	Servo driver I/O	CW/CCW limit inputs, origin proximity inputs, external interrupt inputs 1 to 3 (can be used as external origin inputs)
Programming methods	Standard ladder	Directly over NCF unit memory area
	Function blocks	Using standard PLC open function blocks
	Smart active parts	Use of OMRON HMIs smart active parts optimizes CPU usage and engineering time
Internal current consumption		360 mA or less for 5 VDC
Weight		95 g

JUSP-NS115 - MECHATROLINK-II interface unit

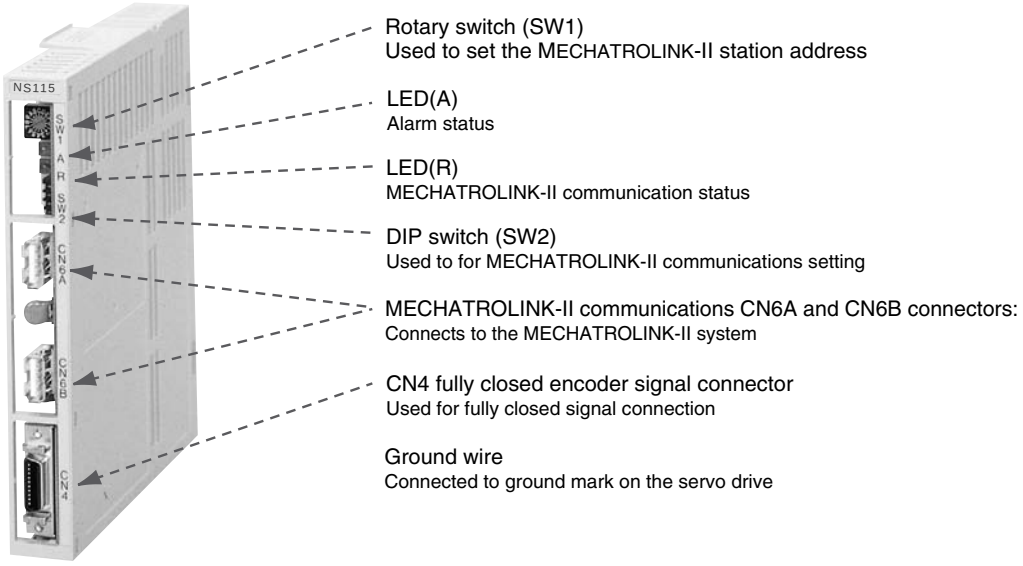
Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□E models (version 38 or later)
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK -II communications	Baud rate/transmission cycle	10 MHz / 0.5 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating

Nomenclature

CJ1W-NCF71 - position control unit

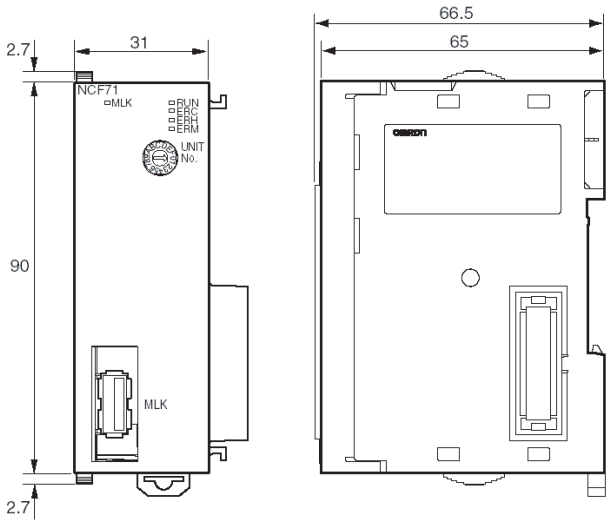


JUSP-NS115 - MECHATROLINK-II interface unit



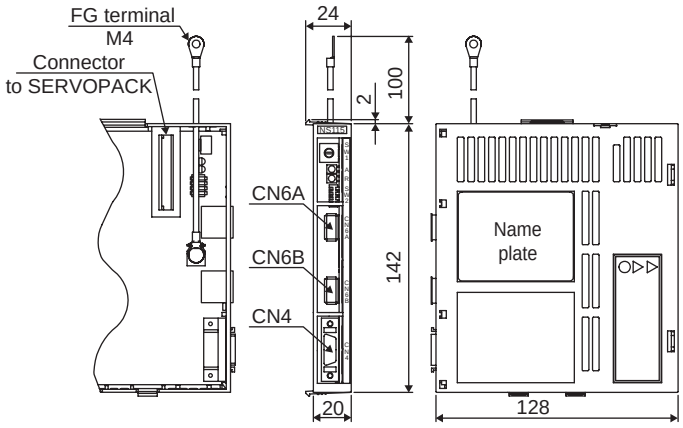
Dimensions

CJ1W-NCF71 - position control unit



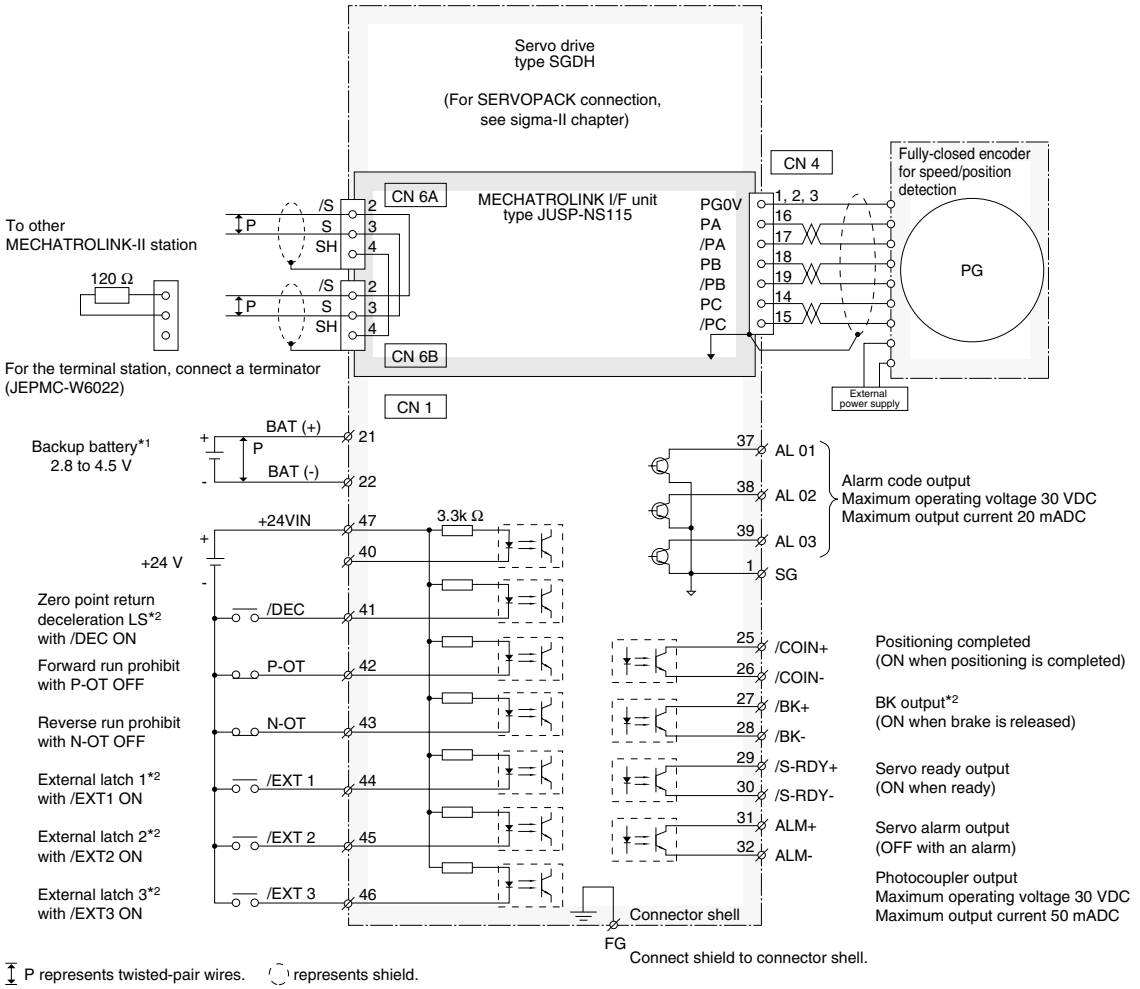
JUSP-NS115 - MECHATROLINK-II interface unit

Units: mm Approx. weight: 0.2 kg



Installation

MECHATROLINK-II interface connections



P represents twisted-pair wires. ◌ represents shield.

*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Ordering information

Position controller unit

Name	Model
MECHATROLINK-II position controller unit	CJ1W-NCF71

MECHATROLINK-II related devices

Name	Remarks	Model
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

Servo system

Note: Refer to servo systems section for more information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I09E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CS1W-NCF71 - MECHATROLINK-II

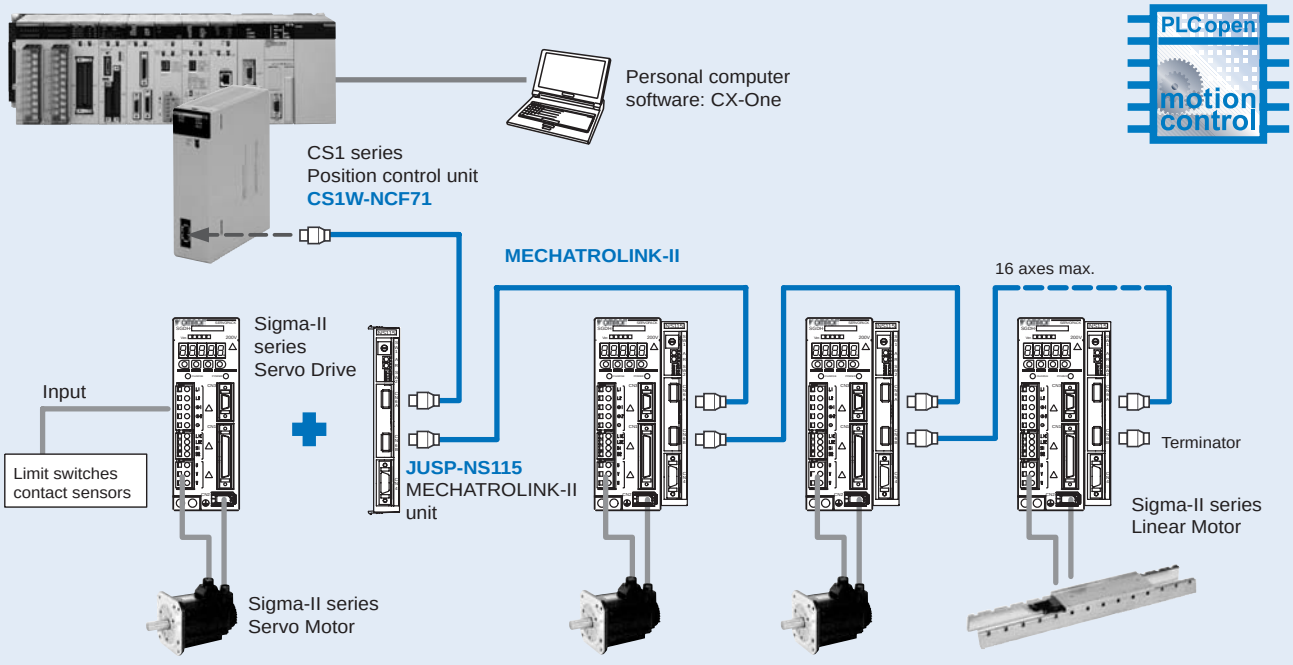
Position control unit



Multi-axes position controller over high-speed MECHATROLINK-II

- Up to 16 axes controlled with minimum wiring. Only one cable between devices is needed.
- High-speed bus MECHATROLINK-II is specially designed for motion control.
- Supports position, speed and torque control.
- Programming languages: ladder, function blocks.
- Smart active parts for OMRON HMIs terminals reduce engineering time.
- Access to the complete system from one point. Network setup, servo drives configuring and monitoring, and PLC programming.

System configuration



Specifications

Position control unit

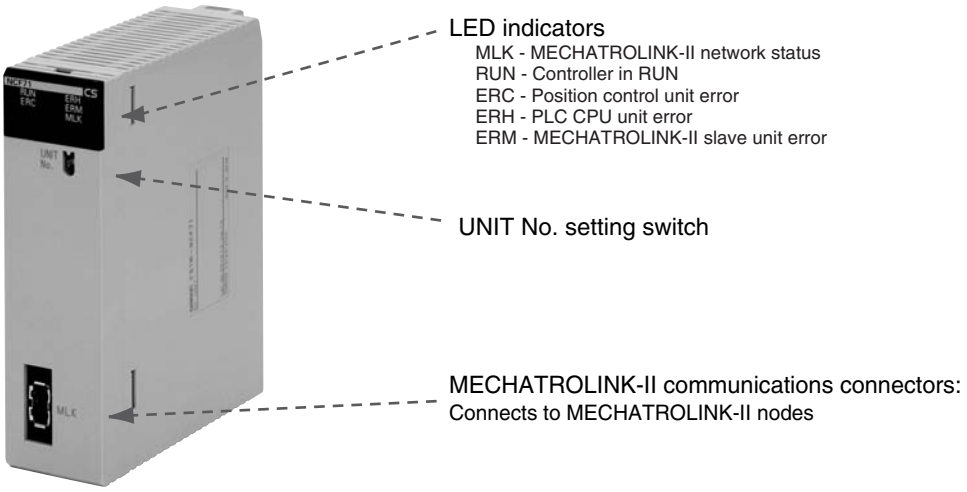
Model		CS1W-NCF71
Classification		CS-series CPU bus unit
Applicable PLCs		CS-series
		CS-series (V. 3.0 or later if use of function blocks is needed)
Possible unit number settings		0 to F
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface
Controlled axes		16 maximum
I/O allocations	Common operating memory area	Words allocated in CPU bus unit area: 25 words (15 output words, 10 input words)
	Axis operating memory area	Allocated in one of the following areas (user-specified): CIO, Work, Auxiliary, Holding, DM, or EM Area. Number of words allocated: 50 words (25 output words, 25 input words) × highest axis No. used
Control units	Position command unit	Command unit: Depends on the electronic gear setting in the servo parameters. Default setting: Pulses
	Speed command unit for position control	Command units/s
	Acceleration/deceleration speeds for position control	10,000 command units/s^2
	Speed command unit for speed control	0.001% of the motor's maximum speed
	Torque command unit for torque control	0.001% of the motor's maximum torque
Control command range	Position command range	-2,147,483,648 to 2,147,483,647 (command units)
	Speed command range for position control	0 to 2,147,483,647 (command units/s)
	Acceleration/deceleration speeds for position control	1 to 65,535 (10,000 command units/s^2)
	Speed command range for speed control	-199.999% to 199.999% The upper limit is restricted by the maximum speed of the servo motor.
	Torque command range for torque control	-199.999% to 199.999% The upper limit is restricted by the maximum torque of the servo motor.
Control functions	Servo lock/unlock	Locks and unlocks the servo driver.
	Position control	Positions to an absolute position or relative position according to the specified target position and target speed specified from the ladder program.
	Origin determination	• Origin search: Establishes the origin using the specified search method. • Present position preset: Changes the present position to a specified position to establish the origin. • Origin return: Returns the axis from any position to the established origin. • Absolute encoder origin: Establishes the origin using a Servomotor that has an absolute encoder, without having to use an origin search.
	Jogging	Outputs a fixed speed in the CW or CCW direction.
	Interrupt feeding	Performs positioning by moving the axis a fixed amount when an external interrupt input is received while the axis is moving.
	Speed control	Performs speed control by sending a command to the servo driver speed loop.
	Torque control	Performs torque control by sending a command to the servo driver current loop.
	Stop functions	• Deceleration stop: Decelerates the moving axis to a stop. • Emergency stop: Positions the moving axis for the number of pulses remaining in the deviation counter and then stops the axis.
	Linear interpolation	Up to 8 axes can be interpolated by using two interpolators (4 axes per interpolator) Available in unit version 1.1 or higher
Auxiliary functions	Acceleration/deceleration curves	Sets either a trapezoidal (linear) curve, an exponential curve, or an S-curve (moving average).
	Torque limit	Restricts the torque upper limit during position control.
	Override	Multiplies the axis command speed by a specified ratio. Override: 0.01% to 327.67%
	Servo parameter transfer	Reads and writes the servo driver parameters from the ladder program in the CPU unit.
	Monitoring function	Monitors the control status of the servo driver's command coordinate positions, feedback position, current speed, torque, etc.
	Software limits	Limits software operation for controlling positioning.
	Backlash compensation	Compensates for the amount of play in the mechanical system according to a set value.
External I/O	Position control unit	One MECHATROLINK-II interface port
	Servo driver I/O	CW/CCW limit inputs, origin proximity inputs, external interrupt inputs 1 to 3 (can be used as external origin inputs)
Programming methods	Standard ladder	Directly over NCF unit memory area
	Function blocks	Using standard PLC open function blocks
	Smart active parts	Use of OMRON HMIs smart active parts optimizes CPU usage and engineering time
Internal current consumption		360 mA or less for 5 VDC
Weight		188 g

JUSP-NS115 - MECHATROLINK-II interface unit

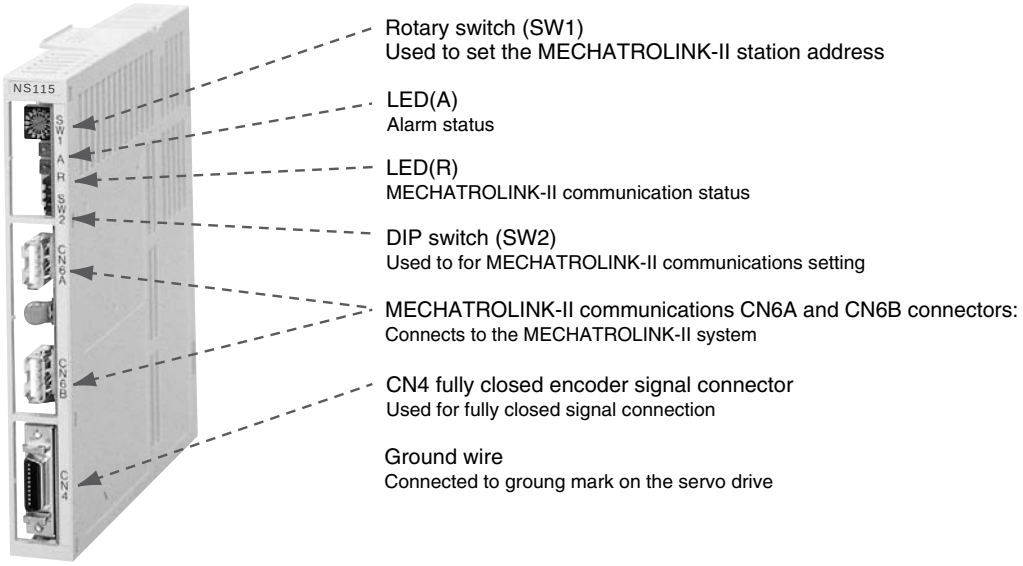
Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□E models (version 38 or later)
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate / transmission cycle	10 MHz / 0.5 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, Fully closed encoder detecting disconnection
	LED indicators	A: Alarm, R: MECHATROLINK-I/II communicating

Nomenclature

CJ1W-NCF71 - position control unit

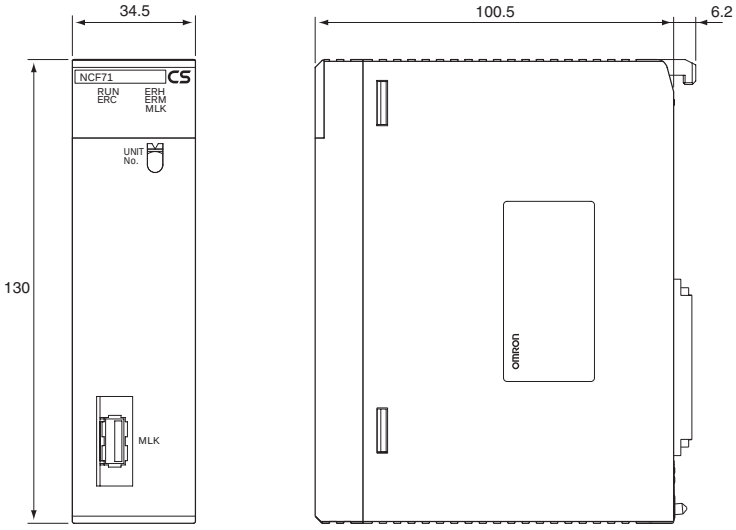


JUSP-NS115 - MECHATROLINK-II interface unit



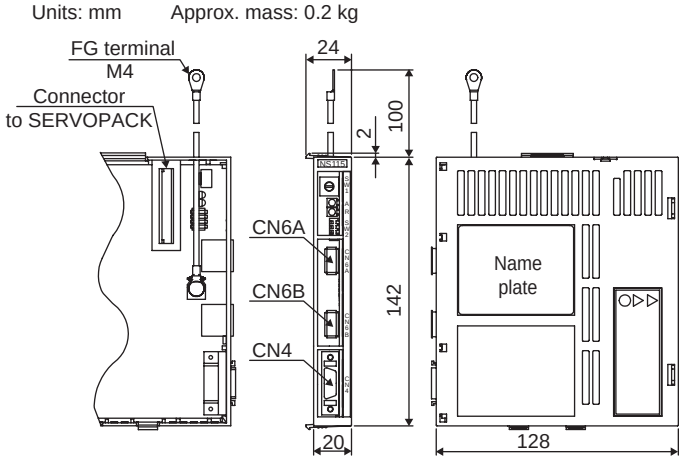
Dimensions

CS1W-NCF71 - position control unit



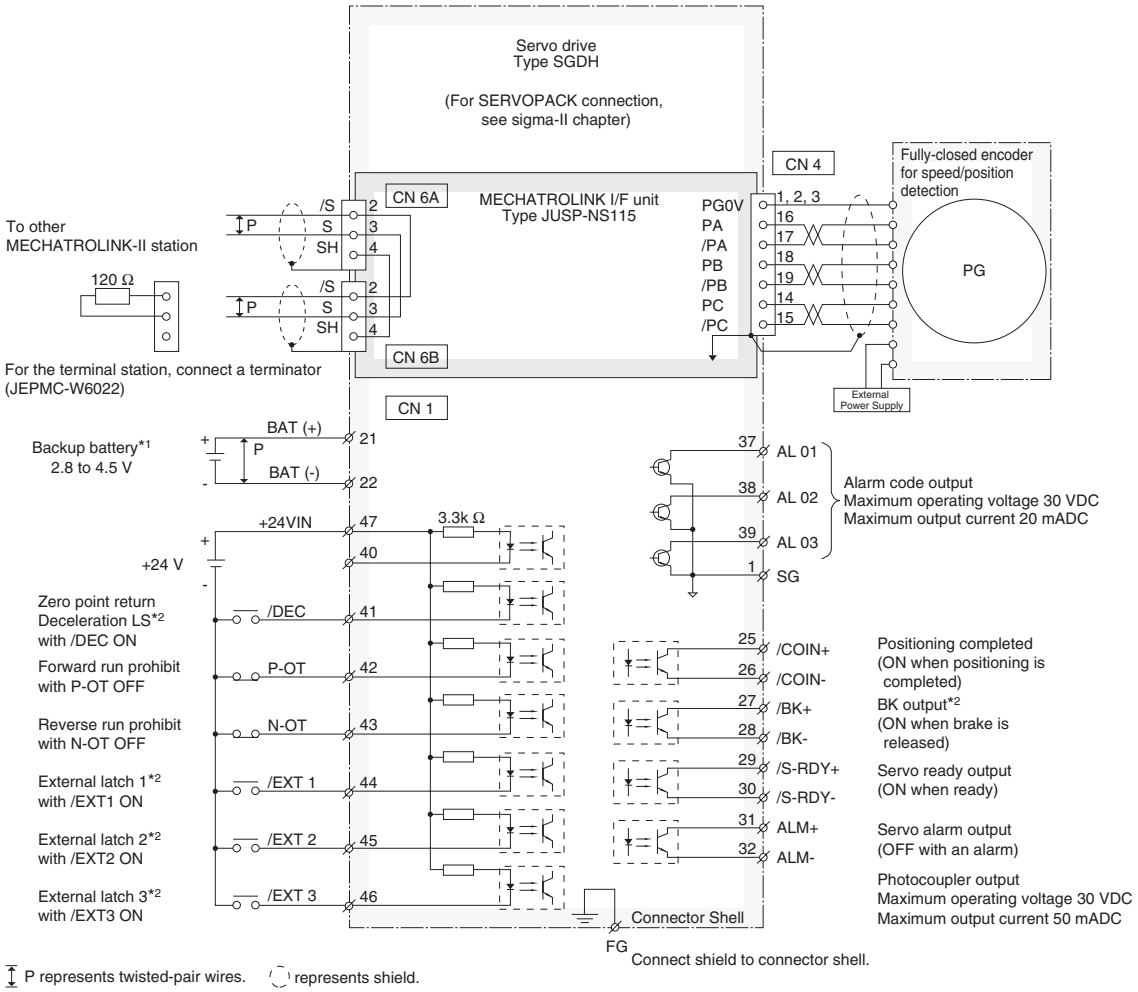
JUSP-NS115 - MECHATROLINK-II interface unit

Units: mm Approx. mass: 0.2 kg



Installation

MECHATROLINK-II interface connections



P represents twisted-pair wires. ◌ represents shield.

*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Ordering information

Position controller unit

Name	Model
MECHATROLINK-II position controller unit	CS1W-NCF71

MECHATROLINK-II related devices

Name	Remarks	Model
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

Servo system

Note: Refer to servo systems section for more information.

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-ONE

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I10E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CJ1W-MCH71 - MECHATROLINK-II

Motion control unit



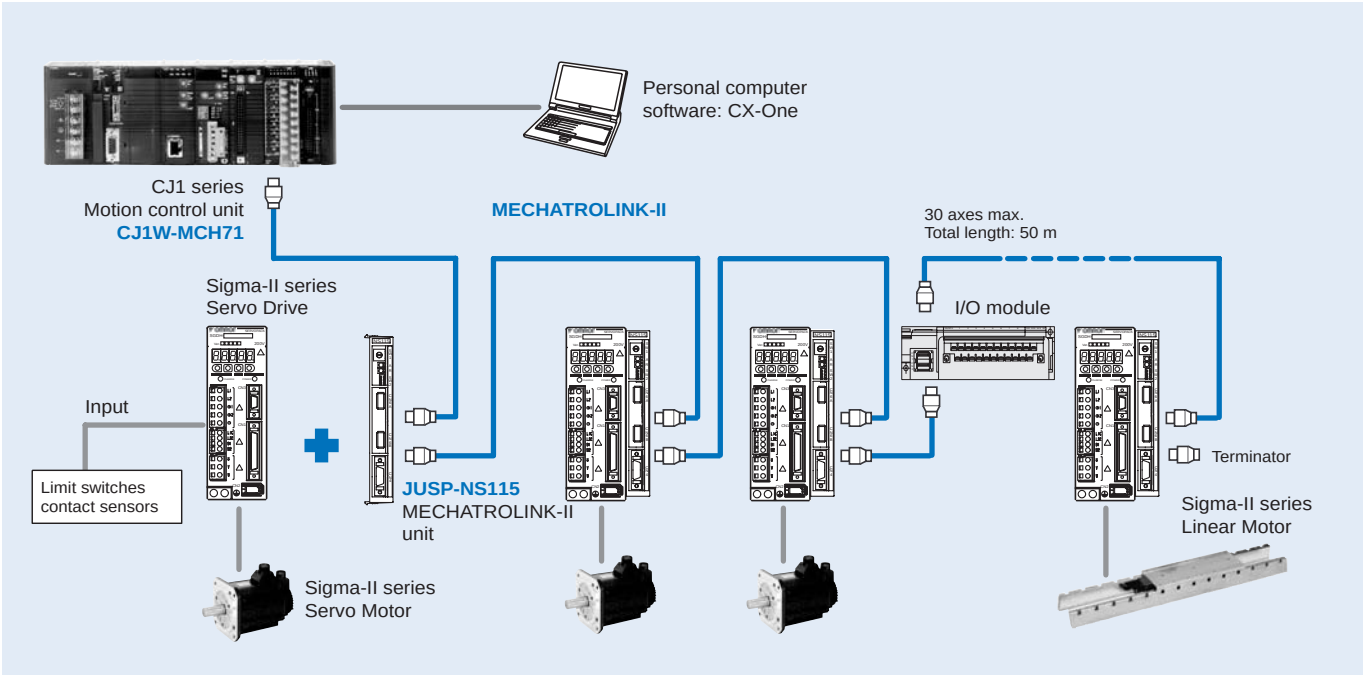
Multi-axes motion control via high-speed MECHATROLINK-II

- Up to 30 axes controlled with minimum wiring
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like multi-task, parallel programming and various arithmetic operations for maximum program efficiency
- Smart active parts for OMRON HMIs
- Access to the complete system from one point

Function

Multi-axes control is made easy by freely combining control axes. Up to 32 axes can be used, including 30 physical axes and two virtual axes, and each axis can be set individually. Position control, synchronized control (electronic gear, electronic cam, follow-up), speed control, and torque control are all supported, enabling a wide range of applications. By using the high-speed servo communications MECHATROLINK-II, motion programs, system parameters, system data, and servo drive parameters can be set and read from the software tool.

System configuration



Specifications

Motion control unit

Model		CJ1W-MCH71
Classification		CJ-series CPU bus unit
Applicable PLCs		CJ-series V. 2.0 or later
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface, various I/O units and inverters V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Programming language		BASIC type motion control language
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes
Automatic/manual mode		Automatic mode: mode for executing programs in the unit Manual Mode: mode for executing commands from the CPU unit (via allocated words)
Minimum setting unit		1, 0.1, 0.01, 0.001, 0.0001 (unit: mm, inch, degree, pulse)
Maximum command value		-2,147,483,648 to 2,147,483,647 pulses (32 bits with sign); infinite axis feed mode supported. Example: 16,384 pulses/rev after multiplication, a minimum setting unit of 0.001 mm and 1 mm/rev would result in -1,310,720,000 to 1,310,719,999 command units.
Control functions by command from CPU unit	Servo lock/unlock	Locks and unlocks the servo driver.
	Jogging	Executes continuous feeding for each axis independently at selectable speed.
	Origin search	Determines the machine origin in the direction set in the system parameters. Can be executed with an absolute encoder.
	Absolute origin setting	Sets the origin for when an absolute encoder is used. (Offset value: 32 bits [pulses] with sign)
	Machine lock	Stops the output of move commands to axes.
	Single block	Executes motion programs one block at a time.
Control functions by motion program	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/unit)
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/system)
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: two or three axes/block, simultaneous execution: up to 16 blocks/system)
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic CAM, synchronized electronic CAM, link operation, electronic gear, follow-up synchronization, speed reference, torque reference
Acceleration/deceleration curve, acceleration/deceleration time		Trapezoidal or S-curve, 60,000 ms max. (S-curve: constant 30,000 ms max.)
External I/O		One port for MECHATROLINK-II servo communications, one deceleration stop input, two general inputs, two general outputs
Feed rate		Rapid, interpolation feed rate: 1 to 2,147,483,647 (command units/min)
Override		0.00% to 327.67% (setting unit: 0.01%; Can be set for each axis or task.)
Motion programs	Number of tasks, number of programs	Up to 8 tasks and 256 programs/unit (8 parallel branches per task max.)
	Program numbers	0000 to 0499 for main program; 0500 to 0999 for subroutine
	Program capacity	In motion program conversion, 8,000 blocks/unit max. (2 Mbytes); number of blocks: 800 per program
	Data capacity	Position data: 10,240 points/unit; cam data: 32 max.; 16,000 points/unit
	Subroutine nesting	Five levels max.
	Start	Programs in other tasks can be started from a program or from the PLC
	Deceleration stop	Decelerates to a stop regardless of the block.
	Block stop	Decelerates to a stop after the block being executed is ended.
	Single block	Executes the program one block at a time.
Data exchange with CPU unit	Unit BIT area	Uses one unit number (25 words). Used for unit and tasks: 11 to 25 words (depending on the number of tasks)
	Unit data area	Uses one unit number (100 words). Used for unit and tasks: 32 to 74 words (depending on the number of tasks)
	Axes BIT area	Axes: 0 to 64 words (depending on the maximum axis number used). User configurable.
	Axes data area	Axes: 0 to 128 words (depending on the maximum axis number used). User configurable.
	General purpose	General I/O: 0 to 1,280 words (depending on the settings). User configurable.
Saving programs and data		Memory card backup (in CPU unit, 100,000 times max.)
Self-diagnostic functions		Watchdog, RAM check, etc.
Error detection functions		Deceleration stop inputs, unit number errors, CPU errors, software limit errors, etc.
Error log function		Read by IORD instruction from CPU unit.
Support software		Microsoft Windows 2000 or NT 4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB of memory)
External power supply voltage		24 VDC (21.6 to 26.4 VDC)
Internal current consumption		0.6 A or less for 5 VDC
Weight (not including connectors)		300 g max.

MECHATROLINK-II, Servo drive interface unit (JUSP-NS115)

Item		Details	
Type		JUSP-NS115	
Applicable servo drive		SGDH-□□□E models (version 38 or later)	
Installation Method		Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.	
	Power consumption	2 W	
MECHATROLINK -II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications	
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.	
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output	
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve	
	Fully closed control	Position control with fully closed feedback is possible.	
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)	
	Fully closed encoder pulse signal	A quad B line-driver	
	Maximum receivable frequency for servo drive	1 Mpps	
	Power supply for fully closed encoder	To be prepared by customer.	
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control	
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection	
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating	

MECHATROLINK-II, 64 Point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5mA, sink/source mode input Output: 64 points, 24 VDC, 50mA when all points ON,(the max. rating is 100mA per point) sink mode output (NPN) Signal connection method: connector (FCN360 series)	
Module power supply	24VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	

MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2 (1 can be used with MCH)	
Functions	Pulse counter, notch output	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (x 4 multiplier)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5VDC, 10mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II Repeater

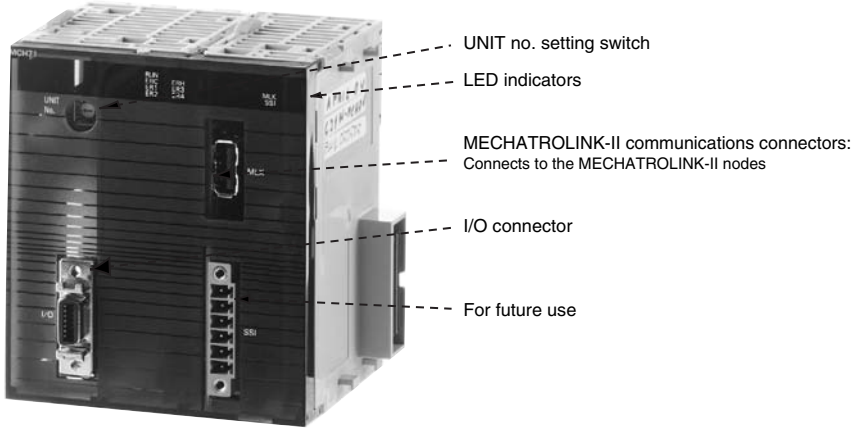
Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 30 stations for the CJ1W-MCH71))	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, frequency inverter interface units

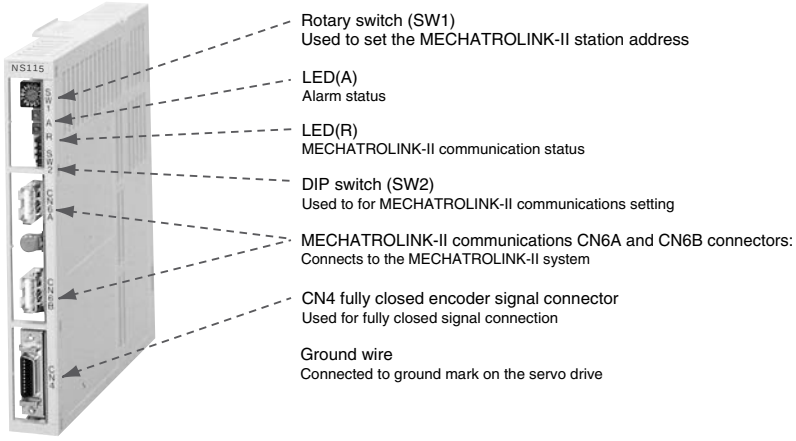
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Nomenclature

CJ1W-MCH71 - motion control unit

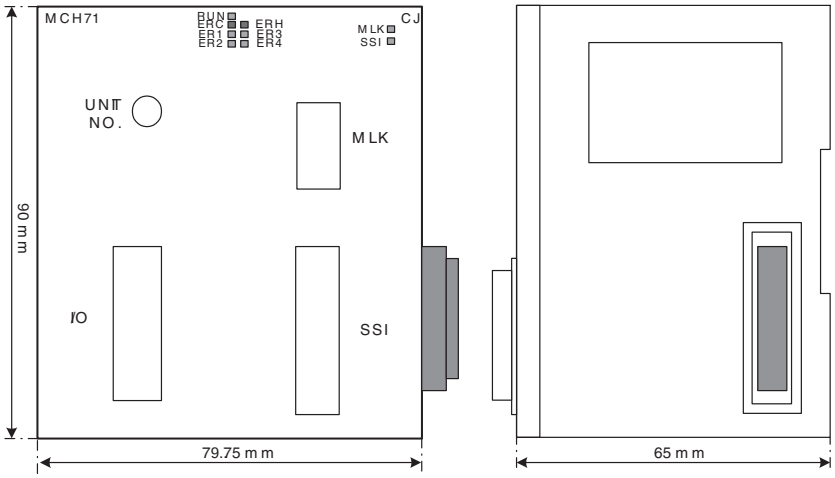


JUSP-NS115 - MECHATROLINK-II interface unit

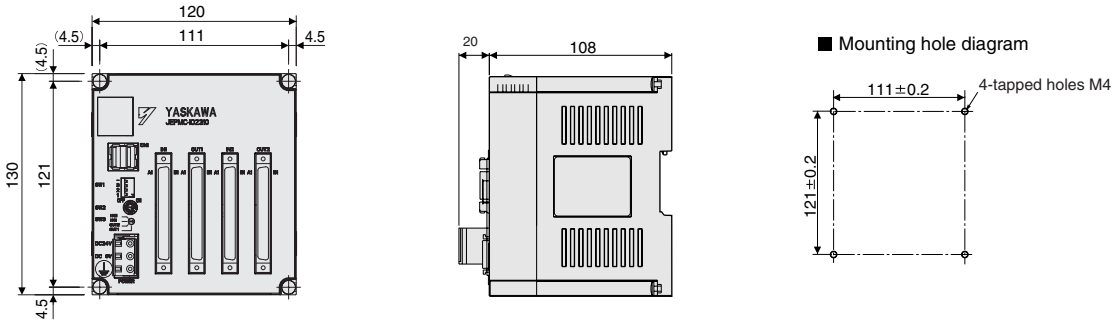


Dimensions

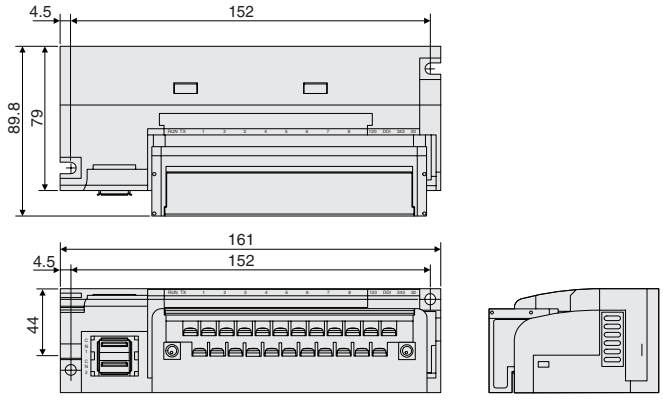
CJ1W-MCH71 - motion control unit



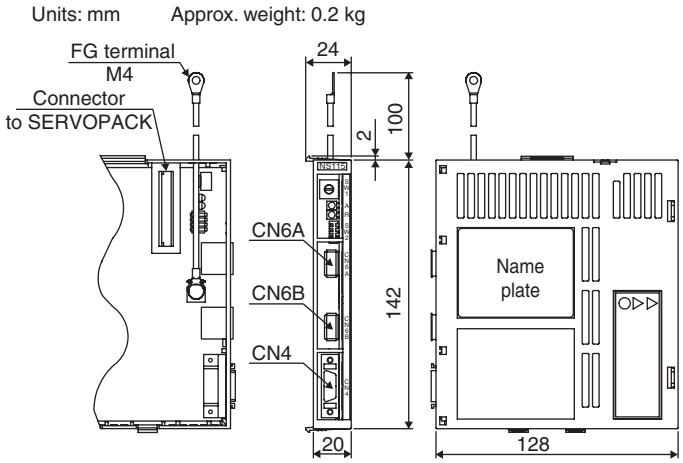
IO2310 I/O module



I/O modules PL2900, PL2910

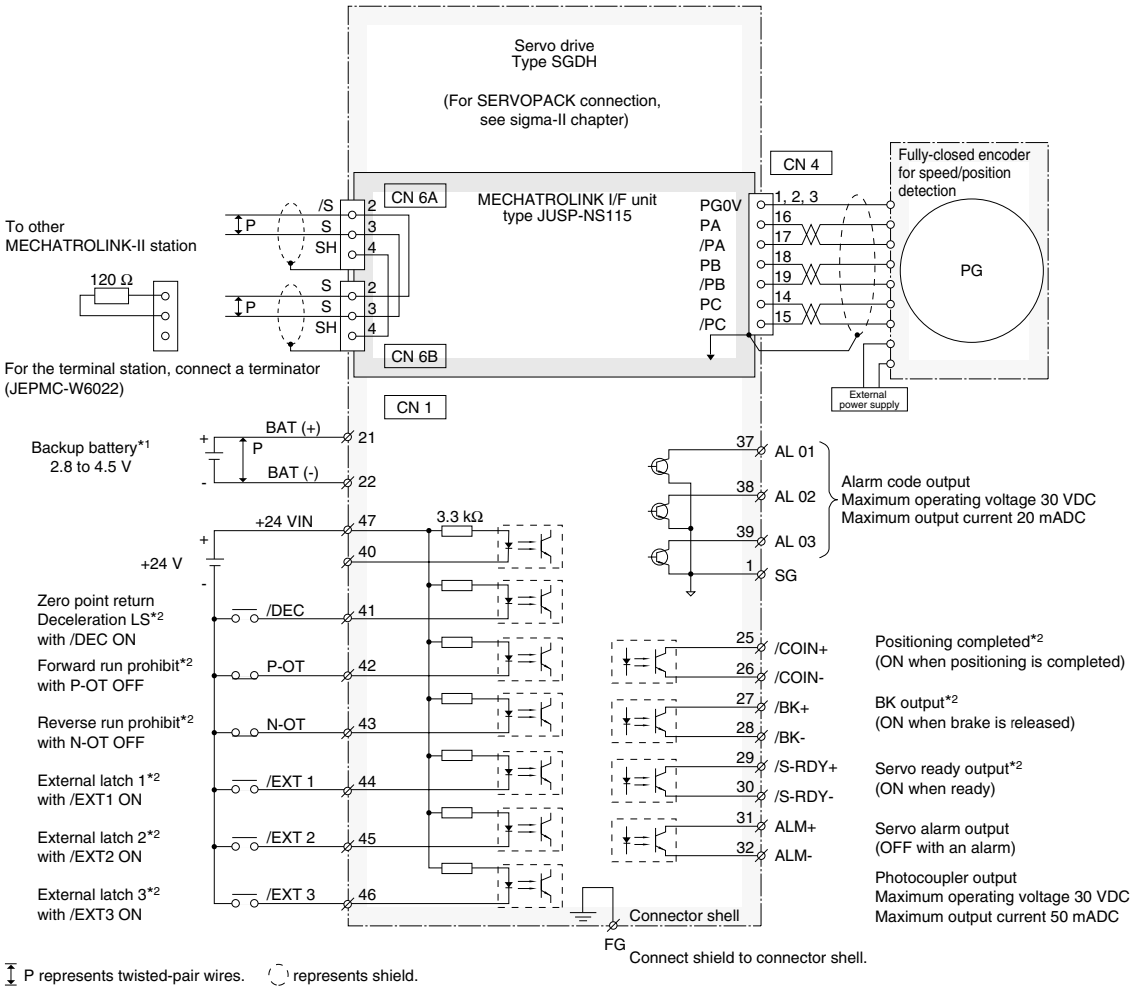


JUSP-NS115 - MECHATROLINK-II interface unit



Installation

MECHATROLINK-II interface connections



P represents twisted-pair wires. ◌ represents shield.

*1 Connect when using an absolute encoder and when the battery is not connected to CN8.

*2 Set the signal assignment with the user constants.

Ordering information

Motion controller

Name	Model
MECHATROLINK-II motion control unit	CJ1W-MCH71

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64 point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface units	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	When 17 or more axes are connected to the MECHATROLINK-II the repeater is required	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I33E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CS1W-MCH71 - MECHATROLINK-II

Motion control unit



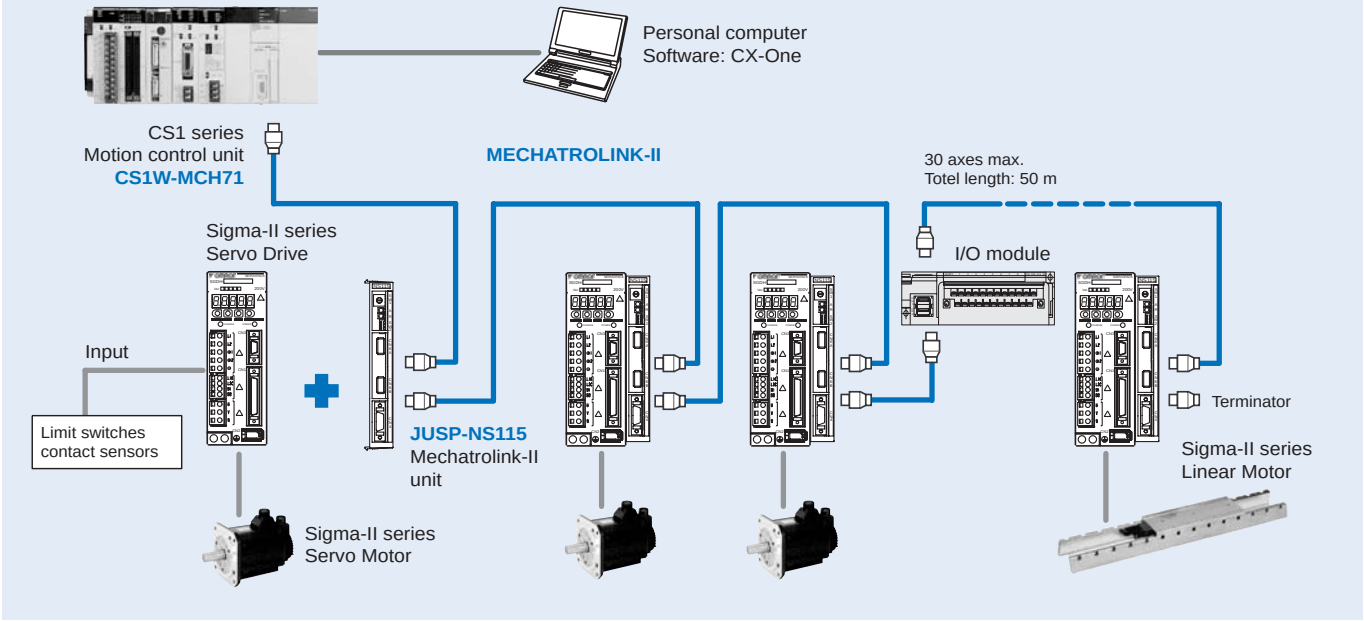
Multi-axes motion control via high-speed MECHATROLINK-II

- Up to 30 axes controlled with minimum wiring
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like multi-task, parallel programming and various arithmetic operations for maximum program efficiency
- Smart active parts for OMRON HMIs
- Access to the complete system from one point

Function

Multi-axes control is made easy by freely combining control axes. Up to 32 axes can be used, including 30 physical axes and two virtual axes, and each axis can be set individually. Position control, synchronized control (electronic gear, electronic cam, follow-up), speed control, and torque control are all supported, enabling a wide range of applications. By using the high-speed servo communications MECHATROLINK-II, motion programs, system parameters, system data, and servo drive parameters can be set and read from the software tool.

System configuration



Specifications

Motion control unit

Model		CS1W-MCH71
Classification		CS-series CPU bus unit
Applicable PLCs		CS-series, (CS1□-CPU□□H)
Backplanes on which MC unit can be mounted		CPU backplane or CS-series expansion I/O backplane
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II Interface, various I/O units and inverters V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Programming language		BASIC type motion control language
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes
Operating modes		RUN mode, CPU mode, Tool mode/system (depending on tool)
Automatic/manual mode		Automatic mode: mode for executing programs in the unit Manual mode: mode for executing commands from the CPU unit (via allocated words)
Minimum setting unit		1, 0.1, 0.01, 0.001, 0.0001 (unit: mm, inch, degree, pulse)
Maximum command value		-2,147,483,648 to 2,147,483,647 pulses (32 bits with sign); infinite axis feed mode supported. Example: 16,384 pulses/rev after multiplication, a minimum setting unit of 0.001 mm and 1 mm/rev would result in -1,310,720,000 to 1,310,719,999 command units.
Control functions by command from CPU unit	Servo lock/unlock	Locks and unlocks the servo driver.
	Jogging	Executes continuous feeding for each axis independently at selectable speed.
	Origin search	Determines the machine origin in the direction set in the system parameters. Can be executed with an absolute encoder.
	Absolute origin setting	Sets the origin for when an absolute encoder is used. (Offset value: 32 bits [pulses] with sign)
	Machine lock	Stops the output of move commands to axes.
	Single block	Executes motion programs one block at a time.
Control functions by motion program	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/unit)
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/system)
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: two or three axes/block, simultaneous execution: up to 16 blocks/system)
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic CAM, synchronized electronic CAM, link operation, electronic gear, follow-up synchronization, speed reference, torque reference
Acceleration/deceleration curve, acceleration/deceleration time		Trapezoidal or S-curve, 60,000 ms max. (S-curve: constant 30,000 ms max.)
External I/O		One port for MECHATROLINK-II servo communications, one deceleration stop input, two general inputs, two general outputs
Feed rate		Rapid, interpolation feed rate: 1 to 2,147,483,647 (command units/min)
Override		0.00% to 327.67% (setting unit: 0.01%; can be set for each axis or task.)
Motion programs	Number of tasks, number of programs	Up to 8 tasks and 256 programs/unit (8 parallel branches per task max.)
	Program numbers	0000 to 0499 for main program; 0500 to 0999 for subroutine
	Program capacity	In motion program conversion, 8,000 blocks/unit max. (2 Mbytes); number of blocks: 800 per program
	Data capacity	Position data: 10,240 points/unit; cam data: 32 max.; 16,000 points/unit
	Subroutine nesting	Five levels max.
	Start	Programs in other tasks can be started from a program or from the PLC
	Deceleration stop	Decelerates to a stop regardless of the block.
	Block stop	Decelerates to a stop after the block being executed is ended.
	Single block	Executes the program one block at a time.
Data exchange with CPU unit	Unit BIT area	Uses one unit number (25 words). Used for unit and tasks: 11 to 25 words (depending on the number of tasks)
	Unit data area	Uses one unit number (100 words). Used for unit and tasks: 32 to 74 words (depending on the number of tasks)
	Axes BIT area	Axes: 0 to 64 words (depending on the maximum axis number used). User configurable.
	Axes data area	Axes: 0 to 128 words (depending on the maximum axis number used). User configurable.
	General purpose	General I/O: 0 to 1,280 words (depending on the settings). User configurable.
Saving programs and data		Memory card backup (in CPU unit, 100,000 times max.)
Self-diagnostic functions		Watchdog, RAM check, etc.
Error detection functions		Deceleration stop inputs, unit number errors, CPU errors, software limit errors, etc.
Error log function		Read by IORD instruction from CPU unit.
Support software		Microsoft Windows 2000 or NT 4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB of memory)
External power supply voltage		24 VDC (21.6 to 26.4 VDC)
Internal current consumption		0.8 A or less for 5 VDC; 0.3 A or less for 24 VDC
Weight (not including connectors)		300 g max.

MECHATROLINK-II, servo drive interface unit (JUSP-NS115)

Item		Details	
Type		JUSP-NS115	
Applicable servo drive		SGDH-□□□E models (version 38 or later)	
Installation method		Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.	
	Power consumption	2 W	
MECHATROLINK -II communications	Baud rate / transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications	
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.	
	Reference input	MECHATROLINK-I/II communications Commands:position, speed, torque, parameter read/write, monitor output	
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve	
	Fully closed control	Position control with fully closed feedback is possible.	
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)	
	Fully Closed Encoder Pulse Signal	A quad B line-driver	
	Maximum Receivable Frequency for Servo Drive	1 Mpps	
	Power Supply for Fully Closed Encoder	To be prepared by customer.	
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control	
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection	
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating	

MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (the max. rating is 100 mA per point) sink mode output (NPN)) Signal connection method: connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	

MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2 (1 can be used with MCH)	
Functions	Pulse counter, notch output	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (x 4 multiplier)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II repeater

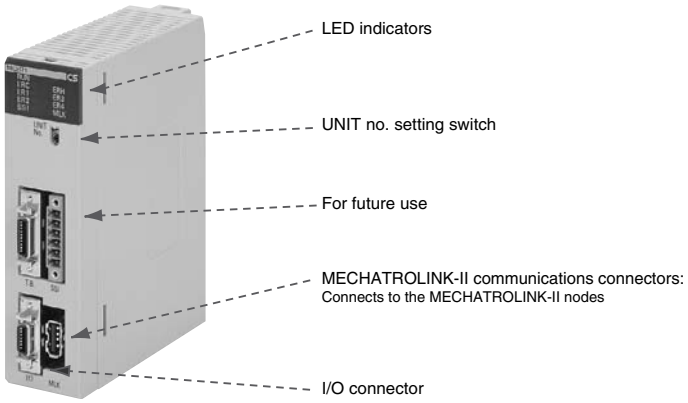
Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 30 stations for the CJ1W-MCH71)	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, frequency inverter interface units

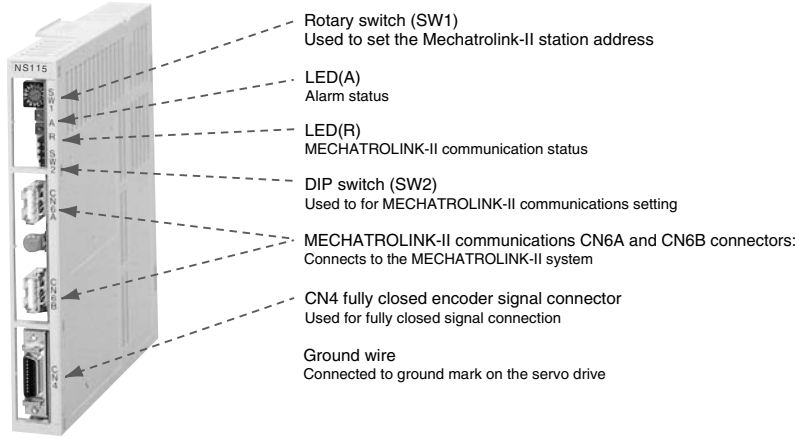
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10MHz, 0.5ms to 8ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Nomenclature

CS1W-MCH71 - motion control unit



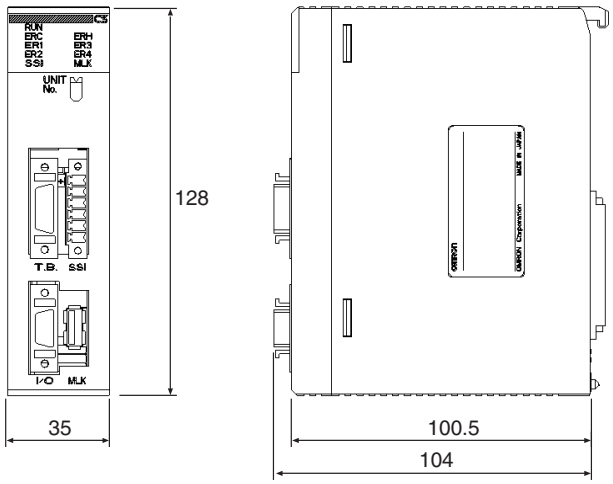
JUSP-NS115 - MECHATROLINK-II interface unit



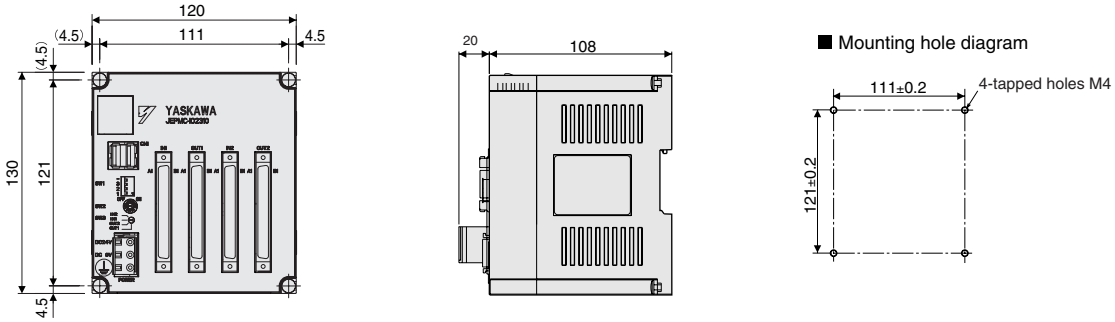
Dimensions

CS1W-MCH71 - motion control unit

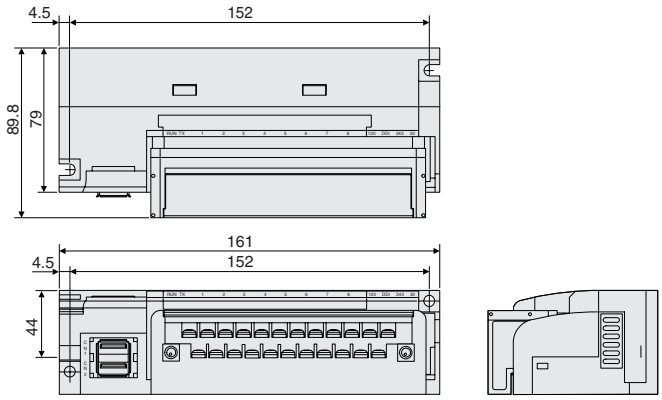
Units: mm Approx. weight: 0.3 kg



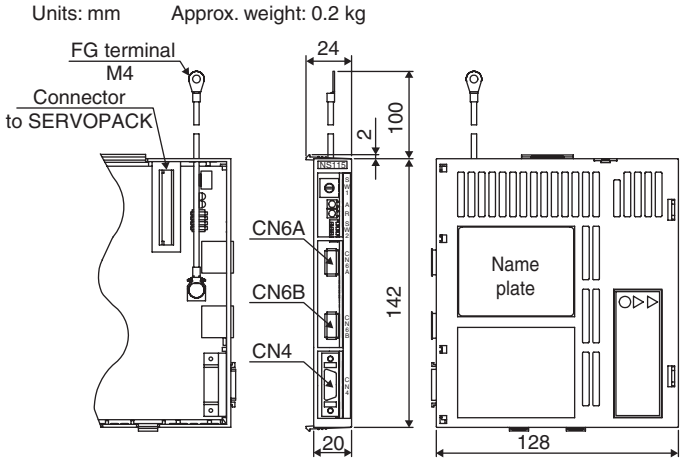
O2310 I/O module



I/O modules PL2900, PL2910

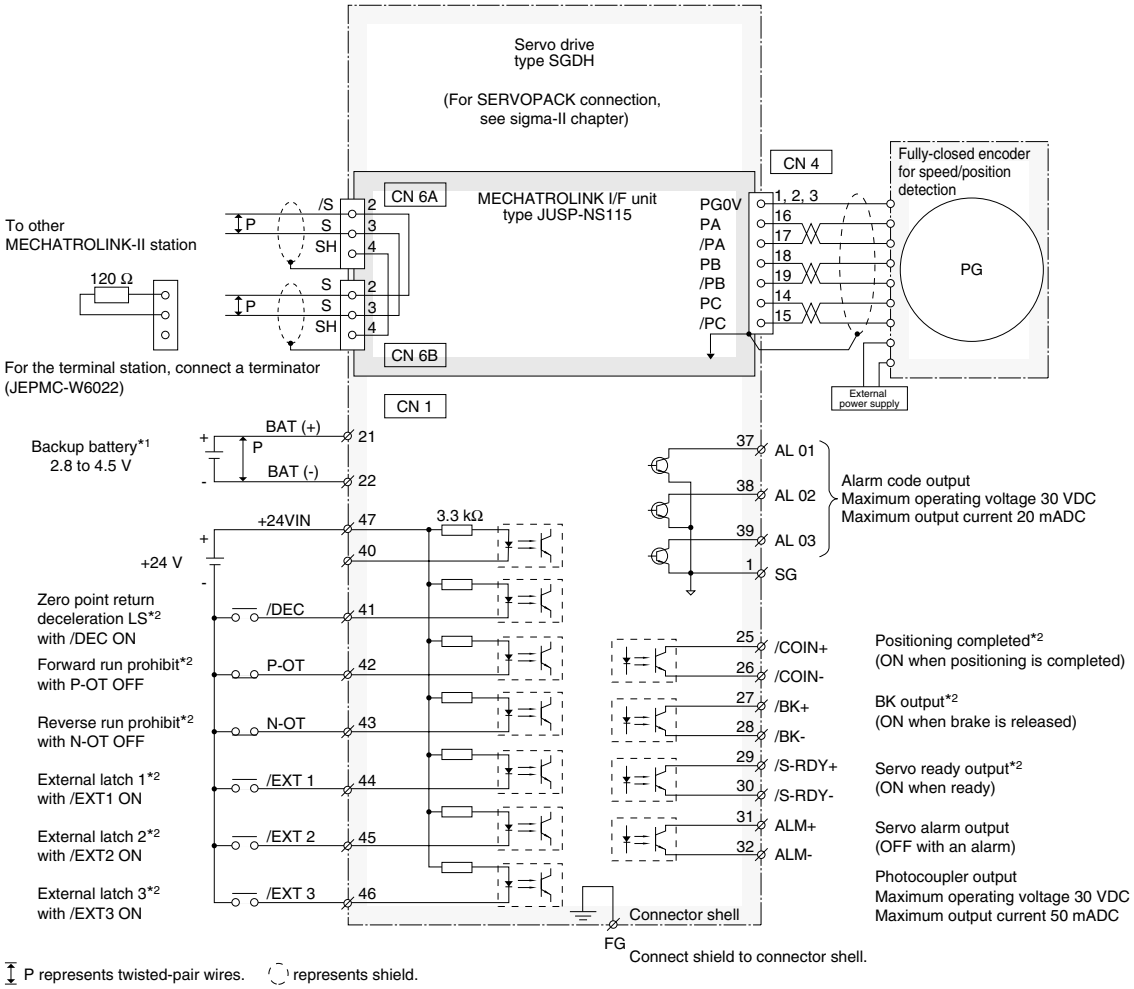


JUSP-NS115 - MECHATROLINK-II interface unit



Installation

MECHATROLINK-II interface connections



*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Ordering information

Motion controller

Name	Model
MECHATROLINK-II motion control unit	CS1W-MCH71

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64 point input and 64 point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface units	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	When 17 or more axes are connected to the MECHATROLINK-II the repeater is required	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

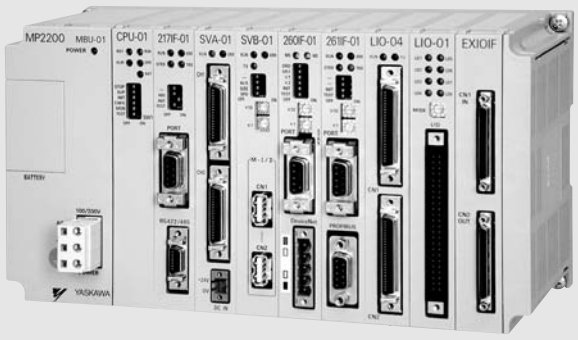
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I08E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

MP2200 - MECHATROLINK-II

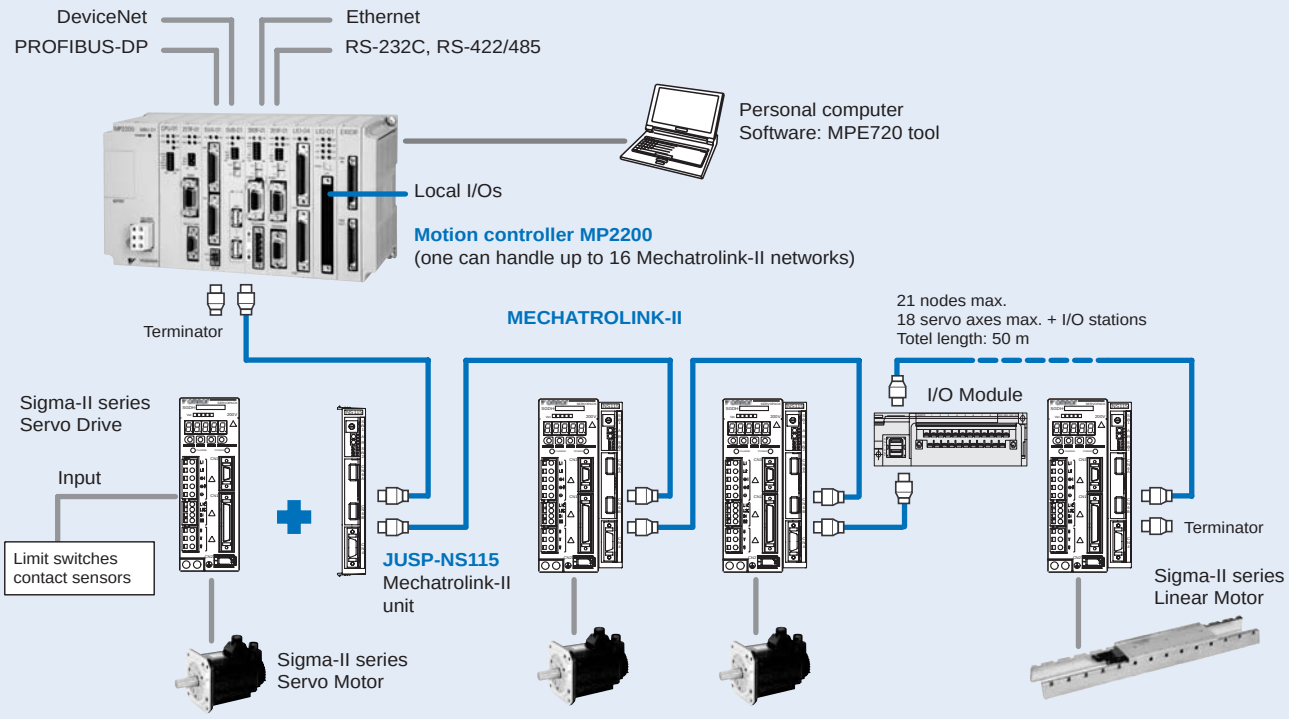
Motion controller



Stand-alone solution for advanced motion control

- Up to 256 axes controlled with minimum wiring
- Self configuration of nodes for an easy setup
- DeviceNet, PROFIBUS and ethernet network interfaces provide easy connectivity to any system
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os and pulse inputs locally and over the network
- Access to the complete system from one point.

System configuration



Specifications

General specifications

Hardware specifications

Items		Specifications
Environmental conditions	Ambient operating temperature	0 to 55 °C
	Ambient storage temperature	-25 to 85 °C
	Ambient operating humidity	30% to 95% (with no condensation)
	Ambient storage humidity	5% to 95% (with no condensation)
	Pollution level	Pollution level 1 (conforming to JIS B 3501)
	Corrosive gas	There must be no combustible or corrosive gas.
	Operating altitude	2,000 m above sea level or lower
Mechanical operating conditions	Vibration resistance	Conforming to JIS B 3502: 10 to 57 Hz with single-amplitude of 0.075 mm 57 to 150 Hz with fixed acceleration of 1 G 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min)
	Shock resistance	Conforming to JIS B 3502: Peak acceleration of 147 m/s^2 (15 G) twice for 11 ms each in the X, Y, and Z directions
Electrical operating conditions	Noise resistance	Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A)
Installation requirements	Ground	Ground to 100 Ω max.
	Cooling method	Natural cooling

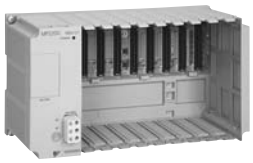
Sequential function specifications

Items	Specifications
Control method	Sequence: High-speed and low-speed scan methods
Programming language	Ladder diagram: Relay circuit Text-type language: Numeric operations, logic operations, etc.
Scanning	Two scan levels: High-speed scan and low-speed scan High-speed scan time setting: 0.5 to 32 ms (integral multiple of MECHATROLINK communication cycle) Low-speed scan time setting: 2 to 300 ms (integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A): 64 drawings max. up to three hierarchical drawing levels Interrupt processing drawings (DWG.I): 64 drawings max. up to three hierarchical drawing levels High-speed scan process drawings (DWG.H): 200 drawings max. up to three hierarchical drawing levels Low-speed scan process drawings (DWG.L): 500 drawings max. up to three hierarchical drawing levels Number of steps: Up to 1,000 steps per drawing User functions: Up to 500 functions Motion programs: Up to 256 Revision history of drawings and motion programs Security function for drawings and motion programs
Data memory	Common data (M) registers: 64 Kwords System (S) registers: 8 Kwords Drawing local (D) registers: Up to 16 Kwords per drawing Drawing constant (#) registers: Up to 16 Kwords per drawing Input (I) registers: 5 Kwords (including internal input registers) Output (O) registers: 5 Kwords (including internal output registers) Constant (C) registers: 16 Kwords
Trace memory	Data trace: 128 Kwords (32 Kwords, 4 groups), 16 points defined
Memory backup	Program memory: Flash memory: 8 MBytes (User area: 5.5 MBytes) definition files, ladder programs, motion programs, etc. Data memory: Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Data types	Bit (relay): ON/OFF Integer: -32768 to +32767 Double-length integer: -2147483648 to +2147483647 Real number: ± (1.175E-38 to 3.402E+38)
Register designation method	Register number: Direct designation of register number Symbolic designation: Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

Motion control function specifications

Item			Specifications
Interface			MECHATROLINK-I, MECHATROLINK-II
Number of controlled axes/module			Up to 16 axes
Control specifications	PTP control		Linear, rotary, and infinite-length
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes
	Speed reference output		Yes
	Torque reference output		Yes
	Phase control		Yes
	Position control	Positioning	Yes
		External positioning	Yes
		Zero point return	Yes
		Interpolation	Yes
		Interpolation with position detection function	Yes
		JOG operation	Yes
		STEP operation	Yes
		Parameter changes during motion command execution	Yes
Reference unit			mm, inch, deg, or pulse
Reference unit minimum setting			1, 0.1, 0.01, 0.001, 0.0001, 0.00001
Maximum programmable value			-2147483648 to +2147483647 (signed 32-bit value)
Speed reference unit			Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed
Acceleration/deceleration type			Linear, asymmetric, S-curve, exponent
Acceleration/deceleration reference unit			Reference unit/s^2 designation: mm/s^2, inch/s^2, deg/s^2, pulse/s^2 Acceleration/deceleration time constant: Time from 0 to rated speed (ms)
Override function			Positioning: 0.01% to 327.67% by axis
Coordinate system			Rectangular coordinates
Zero point return	DEC1+ phase-C pulse		Yes
	ZERO signal		Yes
	DEC1+ ZERO signal		Yes
	Phase-C pulse		Yes
	Only phase-C pulse		Yes
	POT and phase-C pulse		Yes
	POT		Yes
	Home limit switch and phase-C pulse		Yes
	HOME		Yes
	NOT and phase-C pulse		Yes
	NOT		Yes
	INPUT and phase-C pulse		Yes
	INPUT		Yes
Applicable servo drives			SGDH-□□□E-OY + NS115
Applicable frequency inverters			Varispeed V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Encoders			Incremental encoder Yaskawa absolute encoder

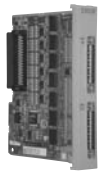
MP2200 base units

Items	Specifications		Appearance
Model	JEPMC-BU2200 (MBU-01)	JEPMC-BU2210 (MBU-02)	
Power supply	Input power voltage: 85 VAC to 276 VAC Current consumption: 1.5 A or less with I/O rating Inrush current: 10 A or less when completely discharged, 200 VAC input, output rating	Input power voltage: 24 VDC±20% Current consumption: 3.0 A or less with I/O rating Inrush current: 10 A or less when completely discharged, output rating	
Motion network	Not available for the base unit		
I/O signals	Not available for the base unit		
Slot for optional modules	9 slots		
Expansion configuration	Maximum of 4 base units can be connected using the EXIOIF.		
Dimensions (mm)	130x240x108 (HxWxD)		
Weight	665 g	640 g	

CPU module (CPU-01)

Items	Specifications	Appearance
Model	JAPMC-CP2200	
Max. number of controlled axes	256 axes	
High-speed scan	0.5 ms to 32 ms (in units of 0.5 ms)	
Low-speed scan	2.0 ms to 300.0 ms (in units of 0.5 ms)	
User memory capacity	8 MB	
Weight	80 g	

Connection module between racks (EXIOIF)

Items	Specifications	Appearance
Model	JAPMC-EX2200	
Number of expansion racks	4 racks max.	
Rack No.	Automatically identified	
Weight	70 g	

General-purpose serial communication module (217IF-01)

Items	Specifications		Appearance
Model	JAPMC-CM2310		
Port	For RS-232C communication	For RS-422/485 communication	
Interface	One port	One port (RS-422 or -485)	
Connector	D-sub 9 pins (female)	MDR 14 pins (female)	
Max. transmission distance	15 m	300 m	
Transmission speed	76.8 kbps	76.8 kbps	
Access mode	Asynchronous (start-stop synchronization)	Asynchronous (start-stop synchronization)	
Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Media access control method	1:1	1:1 (RS-422), 1:N (RS-485)	
Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	

Ethernet communication module (218IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2300			
Port	For ethernet communication	Port	For RS-232C communication	
Interface	One port (10BaseT) (RJ-45 modular jack)	Interface	One port	
Max. segment length	100m	Connector	D-sub 9 pins (female)	
Transmission speed	10 Mbps	Max. transmission distance	15 m	
Access mode	IEEE802.3	Transmission speed	76.8 kbps	
Flame format	Ethernet ver.2 (conforming to DIX)	Access mode	Asynchronous (Start-stop synchronization)	
Connections	TCP/UDP/IP/ARP	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Max. number of words in transmission	512 words (1024 bytes)	Media access control method	1:1	
Communication protocols	Extended MEMOBUS, MEMOBUS, MELSEC-A, non-protocol, or MODBUS/TCP	Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	
Max. number of connections	20 stations			

DeviceNet communication module (260IF-01)

Items		Specifications			Appearance
Model		JAPMC-CM2320			
Port		For DeviceNet communication	Port	For RS-232C communication	
Number of circuits		1	Interface	One Port	
Applicable communication		Conforms to DeviceNet master or slave - I/O transmission (polled I/O and bisstrobed I/O) - Explicit messaging	Connector	D-sub 9 pins (female)	
I/O communication	Max. number of slaves	63 Nodes	Max. transmission distance	15m	
	Max. I/O bytes	1024 bytes, 256 bytes per node			
Message Communication (only for master)	Max. number of nodes	63 Nodes (Synchronous communications possible: 8 nodes)	Transmission speed	76.8kbps	
	Max. message length	256 bytes			
	Executed functions	MSG-SND function	Access mode	Asynchronous (start-stop synchronization)	
Switches on the front		Two rotary switches: Node address settings DIP switch: Settings for transmission speed and switching master or slave	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Indicators		2 LEDs: MS or NS	Media access control method	1:1	
Power voltage for communication		24 VDC±10% (Using the specially designed cable)	Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	
Max. current consumption		Communication power: 45 mA (supplied by transmission connectors)			

PROFIBUS communication module (261IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2330			
Port	For PROFIBUS communication	**Port**	For RS-232C communication	
Functions	DP slave	**Interface**	One port	
	Cyclic communication (DP standard function)	**Connector**	D-sub 9 pins (female)	
Transmission speed	12M/6M/4M/3M/1.5M/750k/500k/ 187.5k/93.75k/19.2k/9.6kbps (automatic detection)	**Max. transmission distance**	15 m	
Configuration	By PROFIBUS master			
Slave address	1 to 64	**Transmission speed**	76.8 kbps	
I/O processing	Total capacity of IW/OW registers: 64 words Max. I/O allocation (IN and OUT each): 64 words	**Access mode**	Asynchronous (start-stop synchronization)	
		Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Diagnostic functions	Display for status and slave status using the EWS. I/O error display for SW registers	**Media access control method**	1:1	
		Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	

Analogue reference motion control module (SVA-01)

Items	Specifications	Appearance
Model	JAPMC-MC2300	
Number of axes	2 axes (CN1 & CN2) analogue output and encoder input.	
Digital inputs (per axis)	6 inputs, PNP or NPN (including alarm, ready, zero and latch)	
Digital outputs (per axis)	6 outputs, (including servo_on, alarm_reset, control_mode_select and SEN)	
Encoder input (per axis)	Differential line-driver (A,/A,B,/B,Z,/Z). 4 Mpps (before multiplication).	
Analog outputs (per axis)	2 outputs ±10 V 16 bits (typically speed and torque references)	
Analog inputs (per axis)	2 inputs ±10 V 16 bits	
External supply	24 VDC (in CN3)	
LED's	RUN (green) ERR(red)	

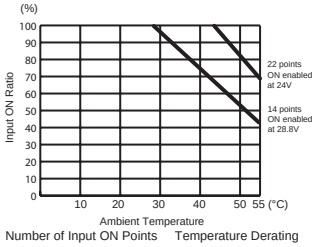
MECHATROLINK-II motion control module (SVB-01)

Items	Specifications	Appearance
Model	JAPMC-MC2310	
Communication circuits	1 circuit	
Communication ports	2 ports	
Terminator	External resistor (JEPMC-W6022 required)	
Transmission speed	10 Mbps	
Communication cycle	0.5 ms, 1 ms, 1.5 ms, 2 ms	
Number of connecting stations	21 stations (16 axes for servo drives and inverters) /2ms, 15 stations (15 axes for servo drives) /1.5 ms, 9 stations (9 axes for servo drives) /1 ms, 4 stations (4 axes for servo drives) /0.5 ms	
Retry function	Available with MECHATROLINK-II	
Slave function	Available with MECHATROLINK-II	
Transmission distance	See “MECHATROLINK-II repeater”	

I/O modules (LIO-01/-02)

Items	Specifications	Appearance
Models	JAPMC-IO2300 (NPN output), JAPMC-IO2301 (PNP output)	
Digital I/O		
Input signals	16 points (all connected) and 24 VDC±20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF➔ON 1 ms and ON➔OFF 1 ms Interruption (DI-00): DI-00 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00 is set to ON. Pulse latch (DI-01): DI-01 can be used for pulse latching. If pulse latching is enabled, the pulse counter is latched when DI-01 is set to ON.	
Output signals	16 points (all connected) and 24 VDC±20%, 100 mA max. Open collector: Sink mode output (LIO-01 module) Source mode output (LIO-02 module) Photocoupler isolation and max. OFF current: 0.1 mA Max. response time: OFF➔ON 1 ms and ON➔OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred) If circuit protection is required, provide a fuse for each output circuit.	
Pulse input		
Number of channels	1 (phase A, B, or Z input)	
Input circuit	Phase A/B: 5 V differential inputs, no insulation, and max. frequency 4 MHz Phase Z: 5 V/12 V photocoupler inputs and max. frequency 500 kHz	
Input method	A/B (1, 2, or 4 multipliers), sign (1 or 2 multipliers), UP/DOWN (1 or 2 multipliers)	
Latch input	Pulse latch with phase Z or DI-01 Min. response time: 5 µs when input with phase Z; 60 µs when input with DI-01	
Others	Coincident detection; preset and clear functions for counter values	

I/O modules (LIO-04)

Items	Specifications	Appearance
Model	JAPMC-IO2303	
Input signals	32 points (8 points common) and 24 VDC±20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF➔ON 0.5 ms and ON➔OFF 0.5 ms Interruption (DI-00, DI-01, DI-16, DI-17): DI-00, DI-01, DI-16, and DI-17 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00, DI-01, DI-16, or DI-17 is set to ON. Note: See right for the derating conditions  Number of Input ON Points Temperature Derating	
Output signals	32 points (8 points common) and 24 VDC±20%, 100 mA max. Open collector: Sink mode output (NPN) and photocoupler isolation Max. OFF current: 0.1 mA Max. response time: OFF➔ON 0.5 ms and ON➔OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short-circuit occurred) If circuit protection is required, provide a fuse for each output circuit.	

MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5mA, sink/source mode input Output: 64 points, 24 VDC, 50mA when all points ON,(The Max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	

MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 MΩ min.	
Data format	Binary, -32000 to +32000	
Input delay time	4ms max.	
Error	± 0.5% F.S. (at 25 °C), ± 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)

Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24VDC (20.4 VDC to 26.4 VDC), 120mA max.	
Weight	300 g	

MECHATROLINK-II repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series)	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24VDC, 100mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II servo drive interface unit

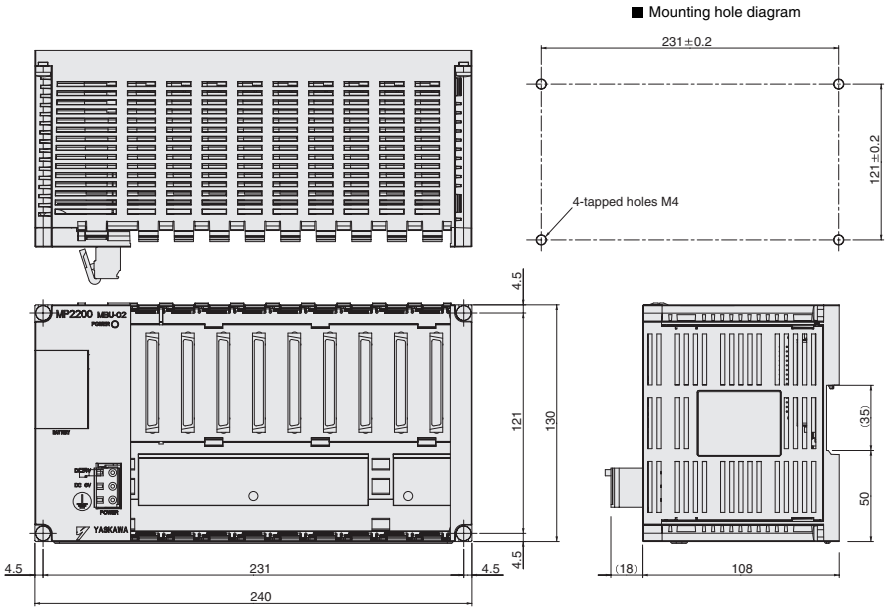
Item		Details	
Type		JUSP-NS115	
Applicable servo drive		SGDH-□□□E models (version 38 or later)	
Installation method		Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.	
	Power consumption	2 W	
MECHATROLINK -II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications	
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.	
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output	
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve	
	Fully closed control	Position control with fully closed feedback is possible.	
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)	
	Fully closed encoder pulse signal	A quad B line-driver	
	Maximum receivable frequency for servo drive	1 Mpps	
	Power supply for fully closed encoder	To be prepared by customer.	
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control	
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection	
	LED indicators	A: Alarm, R: MECHATROLINK-I/II communicating	

MECHATROLINK-II, frequency inverter interface units

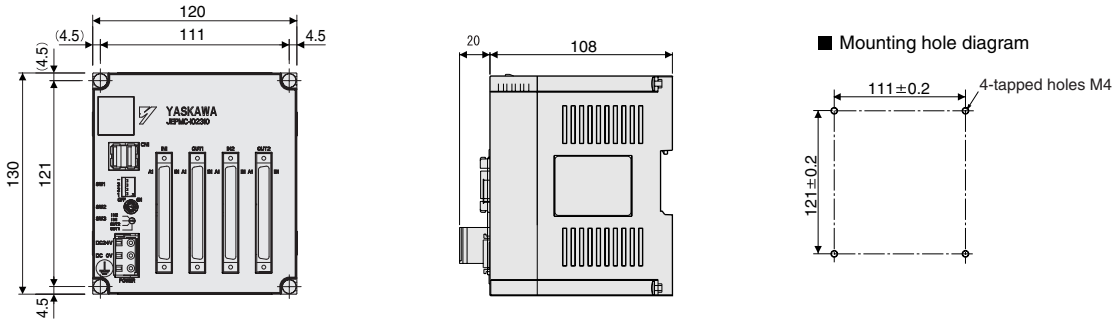
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Dimensions

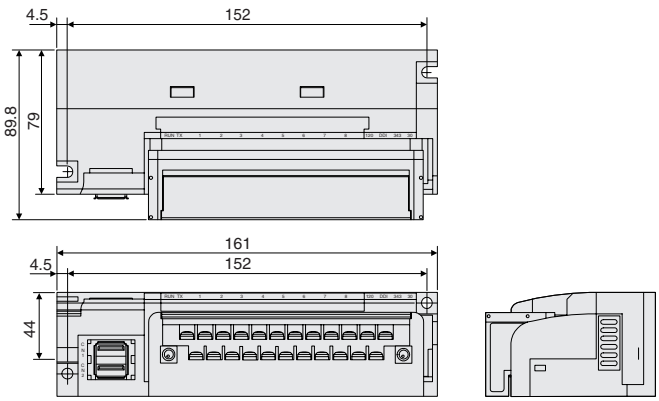
MP2200 basic unit



IO2310 I/O module

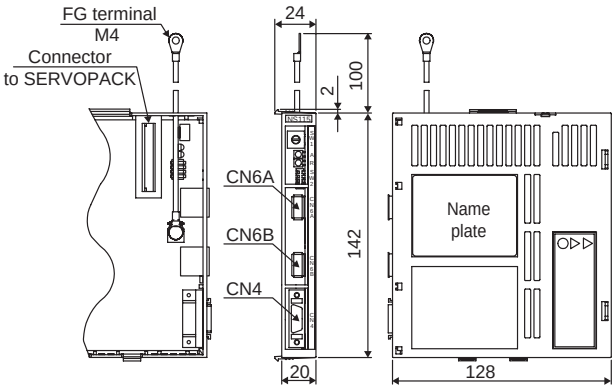


I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit

Units: mm Approx. weight: 0.2 kg



Ordering information

MP2200 - motion controller base unit

Name	Model name	Model
MP2200 base unit, 100 VAC/200 VAC input base unit	MBU-01	JEPMC-BU2200
MP2200 base unit, 24 VDC input base unit	MBU-02	JEPMC-BU2210

MP2200 - CPU module

Name	Model name	Model
CPU for MP2200	CPU-01	JAPMC-CP2200

MP2200 - motion control modules

Name	Model name	Model
Analogue reference motion control module (2 axes)	SVA-01	JAPMC-MC2300
1 channel for MECHATROLINK-II communication	SVB-01	JAPMC-MC2310

MP2200 - communication modules

Name	Model name	Model
General-purpose serial communication module (RS-232C / RS422 communication)	217IF-01	JAPMC-CM2310
Ethernet communication module (RS-232C / ethernet communication)	218IF-01	JAPMC-CM2300
DeviceNet communication module (RS-232C / DeviceNet communication)	260IF-01	JAPMC-CM2320
PROFIBUS communication module (RS-232C / PROFIBUS communication)	261IF-01	JAPMC-CM2330

MP2200 - I/O and expansion modules

Name	Model name	Model
16-point input, 16-point output (sink mode output / NPN), and 1-point pulse input	LIO-01	JAPMC-IO2300
16-point input, 16-point output (source mode output / PNP), and 1-point pulse input	LIO-02	JAPMC-IO2301
32-point input and 32-point output	LIO-04	JAPMC-IO2303
Expansion interface for MP2200	EXIOIF	JAPMC-EX2200

MECHATROLINK-II - elated devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives (firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for LIO-01, 02	With connector on the LIO-01, -02 side	0.5	JEPMC-W2061-A5
		1.0	JEPMC-W2061-01
		3.0	JEPMC-W2061-03
I/O cable for LIO-04	With connector on the LIO-04 side	0.5	JEPMC-W6060-05
		1.0	JEPMC-W6060-10
		3.0	JEPMC-W6060-30
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30
EXIOIF cable	With connector on both sides	0.5	JEPMC-W2091-A5
		1.0	JEPMC-W2091-01
		3.0	JEPMC-W2091-2A5

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Empty slot cover	JEPMC-OP2300
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation. Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I36E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

MP2300 - MECHATROLINK-II

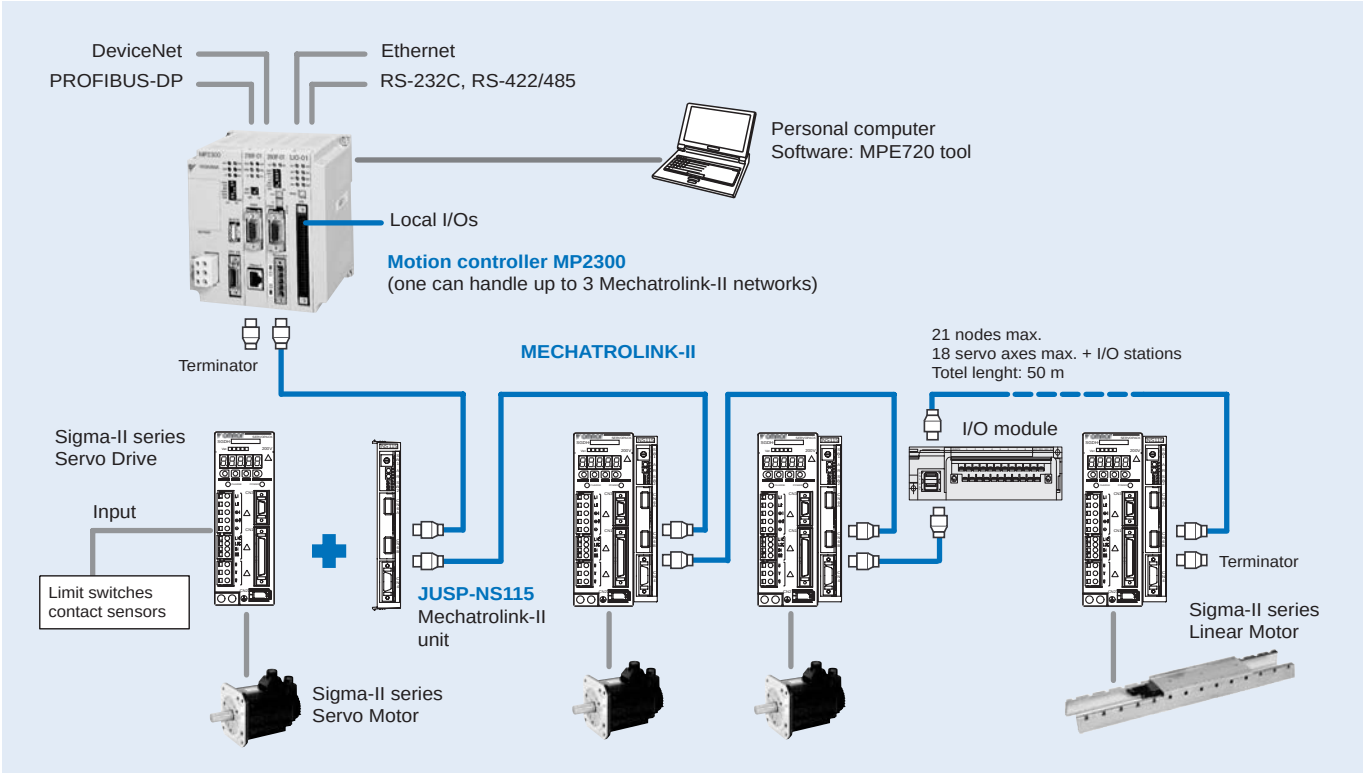
Motion controller



Stand-alone solution for advanced motion control

- Up to 48 axes controlled with minimum wiring
- Self configuration of nodes for an easy setup
- DeviceNet, PROFIBUS and ethernet network interfaces provide easy connectivity to any system
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os and pulse inputs locally and over the network
- Access to the complete system from one point.

System configuration



Specifications

General specifications

Hardware specifications

Items		Specifications
Environmental conditions	Ambient operating temperature	0 to 55 °C
	Ambient storage temperature	-25 to 85 °C
	Ambient operating humidity	30% to 95% (with no condensation)
	Ambient storage humidity	5% to 95% (with no condensation)
	Pollution level	Pollution level 1 (conforming to JIS B 3501)
	Corrosive gas	There must be no combustible or corrosive gas.
	Operating altitude	2,000 m above sea level or lower
Mechanical operating conditions	Vibration resistance	Conforming to JIS B 3502: 10 to 57 Hz with single-amplitude of 0.075 mm 57 to 150 Hz with acceleration of 1G 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min)
	Shock resistance	Conforming to JIS B 3502: Peak acceleration of 147 m/s^2 (15 G) twice for 11 ms each in the X, Y, and Z directions
Electrical operating conditions	Noise resistance	Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A)
Installation requirements	Ground	Ground to 100 Ω max.
	Cooling method	Natural cooling

Sequential function specifications

Items	Specifications
Control method	Sequence: High-speed and low-speed scan methods
Programming language	Ladder diagram: Relay circuit Text-type language: Numeric operations, logic operations, etc.
Scanning	Two scan levels: High-speed scan and low-speed scan High-speed scan time setting: 1 to 32 ms (Integral multiple of MECHATROLINK communication cycle) Low-speed scan time setting: 2 to 300 ms (Integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A): 64 drawings max. up to three hierarchical drawing levels Interrupt processing drawings (DWG.I): 64 drawings max. up to three hierarchical drawing levels High-speed scan process drawings (DWG.H): 200 drawings max. up to three hierarchical drawing levels Low-speed scan process drawings (DWG.L): 500 drawings max. up to three hierarchical drawing levels Number of steps: Up to 1,000 steps per drawing User functions: Up to 500 functions Motion programs: Up to 256 Revision history of drawings and motion programs Security function for drawings and motion programs
Data memory	Common data (M) registers: 64 Kwords System (S) registers: 8 Kwords Drawing local (D) registers: Up to 16 Kwords per drawing Drawing constant (#) registers: Up to 16 Kwords per drawing Input (I) registers: 5 Kwords (including internal input registers) Output (O) registers: 5 Kwords (including internal output registers) Constant (C) registers: 16 Kwords
Trace memory	Data trace: 128 Kwords (32 Kwords, 4 groups), 16 points defined
Memory backup	Program memory: Flash memory: 8 MBytes (user area: 5.5 MBytes) definition files,ladder programs, motion programs, etc. Data memory: Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Data types	Bit (relay): ON/OFF Integer: -32768 to +32767 Double-length integer: -2147483648 to +2147483647 Real number: ± (1.175E-38 to 3.402E+38)
Register designation method	Register number: Direct designation of register number Symbolic designation: Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

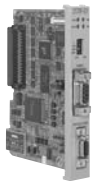
Motion control function specifications

Item			Specifications
Interface			MECHATROLINK-I, MECHATROLINK-II
Number of controlled axes/module			Up to 16 axes
Control specifications	PTP control		Linear, rotary, and infinite-length
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes
	Speed reference output		Yes
	Torque reference output		Yes
	Phase control		Yes
	Position control	Positioning	Yes
		External positioning	Yes
		Zero point return	Yes
		Interpolation	Yes
		Interpolation with position detection function	Yes
		JOG operation	Yes
		STEP operation	Yes
		Parameter changes during motion command execution	Yes
Reference unit			mm, inch, deg, or pulse
Reference unit minimum setting			1, 0.1, 0.01, 0.001, 0.0001, 0.00001
Maximum programmable value			-2147483648 to +2147483647 (signed 32-bit value)
Speed reference unit			Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed
Acceleration/deceleration type			Linear, asymmetric, S-curve, exponent
Acceleration/deceleration reference unit			Reference unit/s^2 designation: mm/s^2, inch/s^2, deg/s^2, pulse/s^2 Acceleration/deceleration time constant: Time from 0 to rated speed (ms)
Override function			Positioning: 0.01% to 327.67% by axis
Coordinate system			Rectangular coordinates
Zero point return	DEC1+ phase-C pulse		Yes
	ZERO signal		Yes
	DEC1+ ZERO signal		Yes
	Phase-C pulse		Yes
	Only phase-C pulse		Yes
	POT and phase-C pulse		Yes
	POT		Yes
	Home limit switch and phase-C pulse		Yes
	HOME		Yes
	NOT and phase-C pulse		Yes
	NOT		Yes
	INPUT and phase-C pulse		Yes
	INPUT		Yes
Applicable servo drives			SGDH-□□□E-OY + NS115
Applicable frequency inverters			Varispeed V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Encoders			Incremental encoder Yaskawa absolute encoder

MP2300 CPU (basic module)

Items	Specifications	Appearance
Model	JEPMC-MP2300	
Power supply	Input power voltage: 24 VDC±20% Current consumption:1 A Inrush current: 40 A or less	
Motion network	One channel for MECHATROLINK-II: Twenty-one stations, including servo drives and I/O equipment, can be connected. (16 axes for servo drives and inverters) Transmission speed: 10Mbps (MECHATROLINK-II) Transmission distance: See “MECHATROLINK-II repeater”	
I/O signals	Digital input: 8 points (one point can be used for interrupts), 24 VDC, 4 mA, and source mode or sink mode input Digital output: 4 points, 24 VDC, 100 mA, open collector, and sink mode output (NPN)	
Slot for optional modules	3 slots	
Dimensions (mm)	130x120x108 (HxWxD)	
Weight	500 g	

General-purpose serial communication module (217IF-01)

Items	Specifications		Appearance
Model	JAPMC-CM2310		
Port	For RS-232C communication	For RS-422/485 communication	
Interface	One port	One port (RS-422 or -485)	
Connector	D-sub 9 pins (female)	MDR 14 pins (female)	
Max. transmission distance	15 m	300 m	
Transmission speed	76.8 kbps	76.8 kbps	
Access mode	Asynchronous (start-stop synchronization)	Asynchronous (start-stop synchronization)	
Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Media access control method	1:1	1:1 (RS-422), 1:N (RS-485)	
Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	

Ethernet communication module (218IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2300			
Port	For ethernet communication	Port	For RS-232C communication	
Interface	One port (10BaseT) (RJ-45 modular jack)	Interface	One port	
Max. segment length	100 m	Connector	D-sub 9 pins (female)	
Transmission speed	10 Mbps	Max. transmission distance	15 m	
Access mode	IEEE802.3	Transmission speed	76.8 kbps	
Flame format	Ethernet ver.2 (conforming to DIX)	Access mode	Asynchronous (Start-stop synchronization)	
Connections	TCP/UDP/IP/ARP	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Max. number of words in transmission	512 words (1024 bytes)	Media access control method	1:1	
Communication protocols	Extended MEMOBUS, MEMOBUS, MELSEC-A, non-protocol, or MODBUS/TCP	Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	
Max. number of connections	20 stations			

DeviceNet communication module (260IF-01)

Items		Specifications			Appearance
Model		JAPMC-CM2320			
Port		For DeviceNet communication	Port	For RS-232C communication	
Number of circuits		1	Interface	One port	
Applicable communication		Conforms to DeviceNet master or slave - I/O transmission (polled I/O and bisstrobed I/O) - Explicit messaging	Connector	D-sub 9 pins (female)	
I/O communication	Max. number of slaves	63 nodes	Max. transmission distance	15 m	
	Max. I/O bytes	1024 bytes, 256 bytes per node			
Message communication (only for master)	Max. number of nodes	63 nodes (synchronous communications possible: 8 nodes)	Transmission speed	76.8 kbps	
	Max. message length	256 bytes			
	Executed functions	MSG-SND function	Access mode	Asynchronous (start-stop synchronization)	
Switches on the front		Two rotary switches: Node address settings DIP switch: Settings for transmission speed and switching master or slave	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Indicators		2 LEDs: MS or NS	Media access control method	1:1	
Power voltage for communication		24 VDC±10% (using the specially designed cable)	Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	
Max. current consumption		Communication power: 45 mA (supplied by transmission connectors)			

PROFIBUS communication module (261IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2330			
Port	For PROFIBUS communication	**Port**	For RS-232C communication	
Functions	DP slave	**Interface**	One port	
	Cyclic communication (DP standard function)	**Connector**	D-sub 9 pins (female)	
Transmission speed	12M/6M/4M/3M/1.5M/750k/500k/187.5k/93.75k/19.2k/9.6kbps (automatic detection)	**Max. transmission distance**	15 m	
Configuration	By PROFIBUS master			
Slave address	1 to 64	**Transmission speed**	76.8 kbps	
I/O processing	Total capacity of IW/OW registers: 64 words Max. I/O allocation (IN and OUT each): 64 words	**Access mode**	Asynchronous (start-stop synchronization)	
		Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Diagnostic functions	Display for status and slave status using the EWS. I/O error display for SW registers	**Media access control method**	1:1	
		Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	

Analogue reference motion control module (SVA-01)

Items	Specifications	Appearance
Model	JAPMC-MC2300	
Number of axes	2 axes (CN1 & CN2) analogue output and encoder input.	
Digital inputs (per axis)	6 inputs, PNP or NPN (including alarm, ready, zero and latch)	
Digital outputs (per axis)	6 outputs (including servo_on, alarm_reset, control_mode_select and SEN)	
Encoder input (per axis)	Differential line-driver (A,/A,B,/B,Z,/Z). 4 Mpps (before multiplication).	
Analog outputs (per axis)	2 outputs ±10 V 16 bits (typically speed and torque references)	
Analog inputs (per axis)	2 inputs ±10 V 16 bits	
External supply	24 VDC (in CN3)	
LED's	RUN (green) ERR(red)	

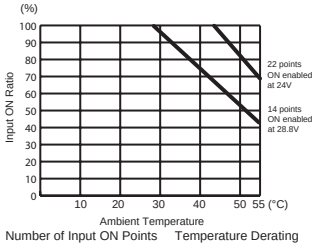
MECHATROLINK-II motion control module (SVB-01)

Items	Specifications	Appearance
Model	JAPMC-MC2310	
Communication circuits	1 circuit	
Communication ports	2 ports	
Terminator	External resistor (JEPMC-W6022 required)	
Transmission speed	10 Mbps	
Communication cycle	0.5ms, 1ms, 1.5ms, 2ms	
Number of connecting stations	21 stations (16 axes for servo drives and inverters) /2 ms, 15 stations (15 axes for servo drives) /1.5 ms, 9 stations (9 axes for servo drives) /1ms, 4 stations (4 axes for servo drives) /0.5 ms	
Retry function	Available with MECHATROLINK-II	
Slave function	Available with MECHATROLINK-II	
Transmission distance	See “MECHATROLINK-II repeater”	

I/O modules (LIO-01/-02)

Items	Specifications	Appearance
Models	JAPMC-IO2300 (NPN output), JAPMC-IO2301 (PNP output)	
Digital I/O		
Input signals	16 points (all connected) and 24 VDC±20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15V/1.6 mA Max. OFF voltage/current: 5V/1.0 mA Max. response time: OFF→ON 1 ms and ON→OFF 1 ms Interruption (DI-00): DI-00 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00 is set to ON. Pulse latch (DI-01): DI-01 can be used for pulse latching. If pulse latching is enabled, the pulse counter is latched when DI-01 is set to ON.	
Output signals	16 points (all connected) and 24 VDC±20%, 100 mA max. Open collector: Sink mode output (LIO-01 module) Source mode output (LIO-02 module) Photocoupler isolation and max. OFF current: 0.1 mA Max. response time: OFF→ON 1 ms and ON→OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred). If circuit protection is required, provide a fuse for each output circuit.	
Pulse input		
Number of channels	1 (Phase A, B, or Z input)	
Input circuit	Phase A/B: 5V differential inputs, no insulation, and max. frequency 4 MHz Phase Z: 5 V/12 V photocoupler inputs and max. frequency 500 kHz	
Input method	A/B (1, 2, or 4 multipliers), sign (1 or 2 multipliers), UP/DOWN (1 or 2 multipliers)	
Latch input	Pulse latch with phase Z or DI-01 Min. response time: 5 µs when input with phase Z; 60 µs when input with DI-01	
Others	Coincident detection; preset and clear functions for counter values.	

I/O modules (LIO-04)

Items	Specifications	Appearance
Model	JAPMC-IO2303	
Input signals	32 points (8 points common) and 24 VDC±20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF→ON 0.5 ms and ON→OFF 0.5 ms Interruption (DI-00, DI-01, DI-16, DI-17): DI-00, DI-01, DI-16, and DI-17 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00, DI-01, DI-16, or DI-17 is set to ON. Note: See right for the derating conditions  Number of Input ON Points Temperature Derating	
Output signals	32 points (8 points common) and 24 VDC±20%, 100 mA max. Open collector: Sink mode output (NPN) and photocoupler isolation Max. OFF current: 0.1 mA Max. response time: OFF→ON 0.5 ms and ON→OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred) If circuit protection is required, provide a fuse for each output circuit.	

MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (the max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	

MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	For input signal: 24 VDC, For dividing load: 24 VDC, For module: 24 VDC (20.4 V to 26.4 V), 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500kpps	
Pulse output voltage	5VDC	
Pulse interface circuit	Open collector output 5VDC, 10mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 MΩ min.	
Data format	Binary, -32000 to +32000	
Input delay time	4 ms max.	
Error	± 0.5% F.S. (at 25 °C), ± 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)

Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series))	
Restrictions	Between controller and repeater - Total cable length ≤ 30 m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30 m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, servo drive interface unit

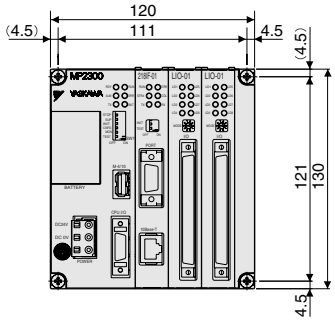
Item		Details	
Type		JUSP-NS115	
Applicable servo drive		SGDH-□□□E models (version 38 or later)	
Installation method		Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.	
	Power consumption	2 W	
MECHATROLINK -II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications	
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.	
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output	
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve	
	Fully closed control	Position control with fully closed feedback is possible.	
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)	
	Fully closed encoder pulse signal	A quad B line-driver	
	Maximum receivable frequency for servo drive	1 Mpps	
	Power supply for fully closed encoder	To be prepared by customer.	
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control	
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection	
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating	

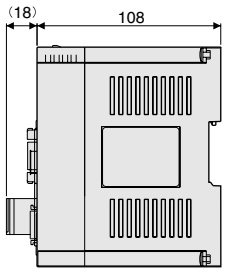
MECHATROLINK-II, frequency inverter interface units

Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

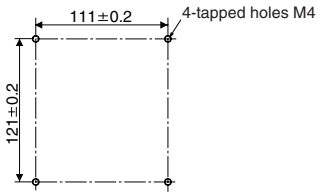
Dimensions

MP2300 basic module

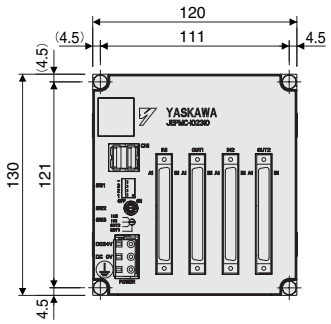


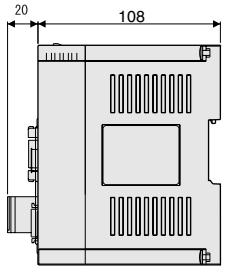


■ Mounting hole diagram

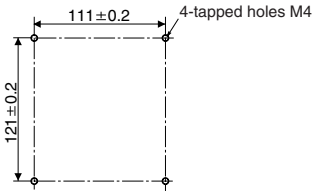


IO2310 I/O module

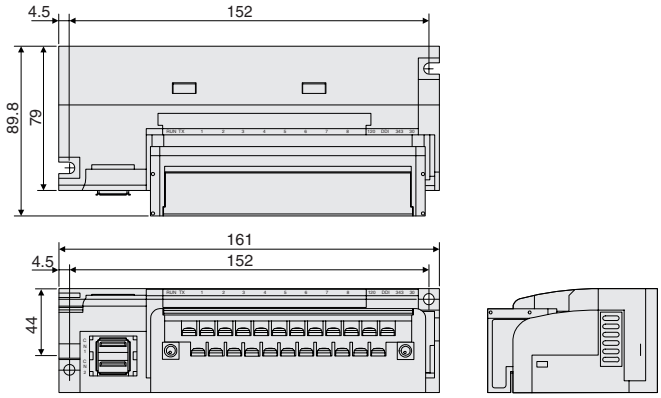




■ Mounting hole diagram

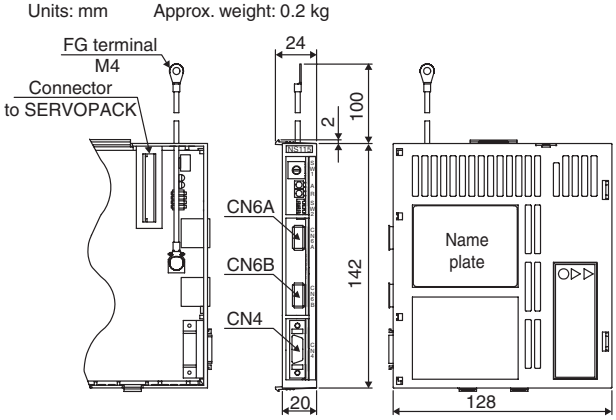


I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit

Units: mm Approx. weight: 0.2 kg



Ordering information

MP2300 - motion controller main unit

Name	Model name	Model
MP2300 basic module (CPU module included),1 channel for MECHATROLINK-II, I/O	MP2300	JEPMC-MP2300

MP2300 - motion control modules

Name	Model name	Model
Analogue reference motion control module (2 axes)	SVA-01	JAPMC-MC2300
1 additional MECHATROLINK-II communication channel	SVB-01	JAPMC-MC2310

MP2300 - communication modules

Name	Model name	Model
General-purpose serial communication module (RS-232C / RS422 communication)	217IF-01	JAPMC-CM2310
Ethernet communication module (RS-232C / ethernet communication)	218IF-01	JAPMC-CM2300
DeviceNet communication module (RS-232C / DeviceNet communication)	260IF-01	JAPMC-CM2320
PROFIBUS communication module (RS-232C / PROFIBUS communication)	261IF-01	JAPMC-CM2330

MP2300 - I/O modules

Name	Model name	Model
16-point input, 16-point output (sink mode output / NPN), and 1-point pulse input	LIO-01	JAPMC-IO2300
16-point input, 16-point output (source mode output / PNP), and 1-point pulse input	LIO-02	JAPMC-IO2301
32-point input and 32-point output	LIO-04	JAPMC-IO2303

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

	Remarks	Lenght m	Model
I/O cable for LIO-01, 02	With connector on the LIO-01, -02 side	0.5	JEPMC-W2061-A5
		1.0	JEPMC-W2061-01
		3.0	JEPMC-W2061-03
I/O cable for LIO-04	With connector on the LIO-04 side	0.5	JEPMC-W6060-05
		1.0	JEPMC-W6060-10
		3.0	JEPMC-W6060-30
I/O cable for MP2300	With connector on the MP2300 side	0.5	JEPMC-W2060-A5
		1.0	JEPMC-W2060-01
		3.0	JEPMC-W2060-03
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Empty slot cover	JEPMC-OP2300
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software to support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

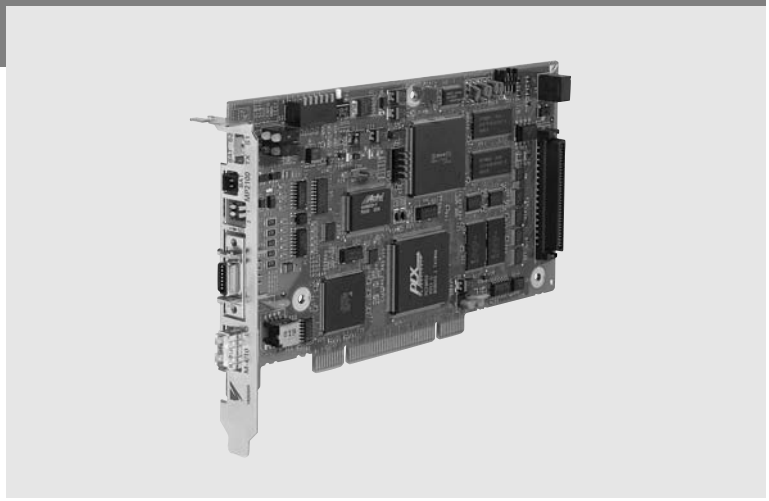
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I34E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

MP2100 - MECHATROLINK-II

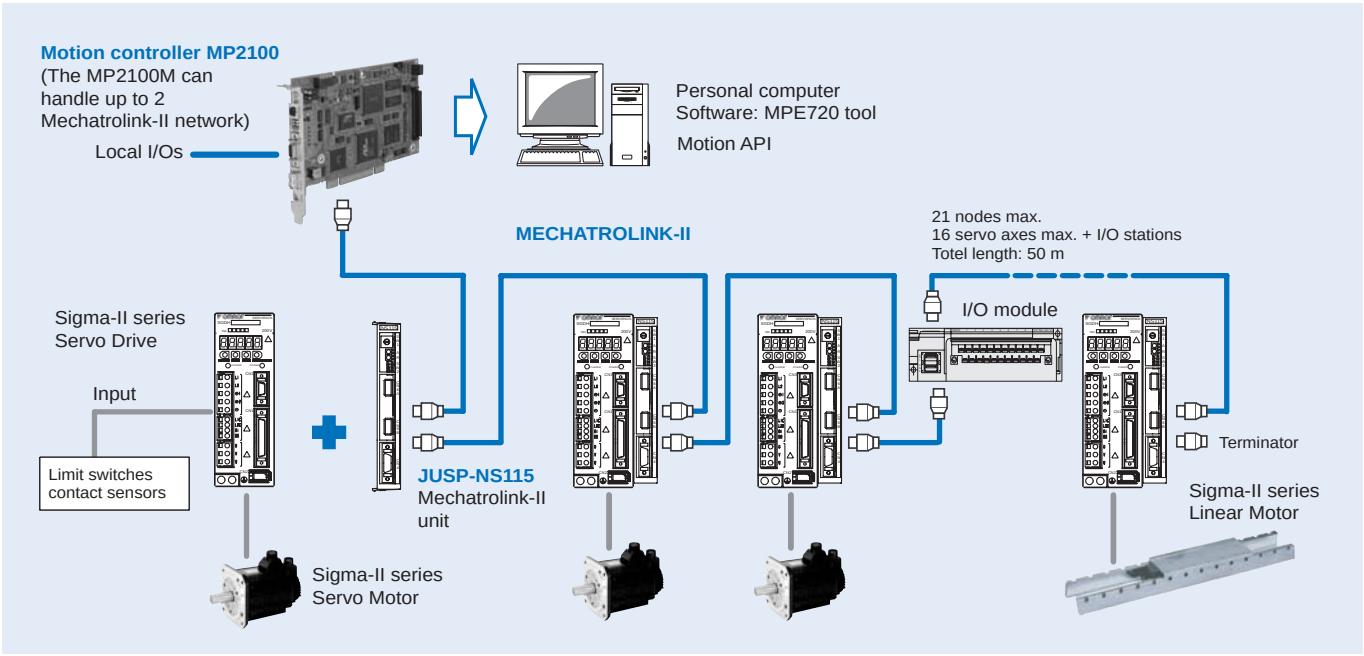
PC motion controller



PC based solution for advanced motion control

- Up to 32 axes controlled with minimum wiring
- Motion APIs are available for customised control aplications. Motion commands can be input from either the PC application or the MP2100 program
- Self configuration of nodes for an easy setup
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os locally and over the network
- Access to the complete system from one point

System configuration



Specifications

General specifications

Hardware specifications

Items		Specifications
Environmental conditions	**Ambient operating temperature**	0 to 55 °C
	Ambient storage temperature	-25 to 85 °C
	Ambient operating humidity	30% to 95% (with no condensation)
	Ambient storage humidity	5% to 95% (with no condensation)
	Pollution level	Pollution level 1 (conforming to JIS B 3501)
	Corrosive gas	There must be no combustible or corrosive gas.
	Operating altitude	2,000 m above sea level or lower
Mechanical operating conditions	**Vibration resistance**	Conforming to JIS B 3502: 10 to 57 Hz with single-amplitude of 0.075 mm 57 to 150 Hz with fixed acceleration of 1 G 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min)
	Shock resistance	Conforming to JIS B 3502: Peak acceleration of 147 m/s^2 (15 G) twice for 11 ms each in the X, Y, and Z directions
Electrical operating conditions	**Noise resistance**	Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A)
Installation requirements	**Ground**	Ground to 100 Ω max.
	Cooling method	Natural cooling

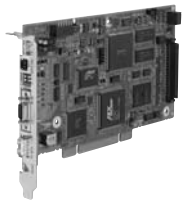
Sequential function specifications

Items	Specifications	
Control method	Sequence: High-speed and low-speed scan methods	
Programming language	Ladder diagram:	Relay circuit
	Text-type language:	Numeric operations, logic operations, etc.
Scanning	Two scan levels:	High-speed scan and low-speed scan
	High-speed scan time setting:	1 to 32 ms (Integral multiple of MECHATROLINK communication cycle)
	Low-speed scan time setting:	2 to 300 ms (Integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A):	64 drawings max. up to three hierarchical drawing levels
	Interrupt processing drawings (DWG.I):	64 drawings max. up to three hierarchical drawing levels
	High-speed scan process drawings (DWG.H):	200 drawings max. up to three hierarchical drawing levels
	Low-speed scan process drawings (DWG.L):	500 drawings max. up to three hierarchical drawing levels
	Number of steps:	Up to 1,000 steps per drawing
	User functions:	Up to 500 functions
	Motion programs:	Up to 256
	Revision history of drawings and motion programs	
	Security function for drawings and motion programs	
Data memory	Common data (M) registers:	64 Kwords
	System (S) registers:	8 Kwords
	Drawing local (D) registers:	Up to 16 Kwords per drawing
	Drawing constant (#) registers:	Up to 16 Kwords per drawing
	Input (I) registers:	5 Kwords (including internal input registers)
	Output (O) registers:	5 Kwords (including internal output registers)
	Constant (C) registers:	16 Kwords
Trace memory	Data trace: 128 Kwords (32 Kwords / 4 groups), 16 points defined	
Memory backup	Program memory:	Flash memory: 8 MBytes (User area: 5.5 MBytes) definition files, ladder programs, motion programs, etc.
	Data memory:	Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Data types	Bit (relay):	ON/OFF
	Integer:	-32768 to +32767
	Double-length integer:	-2147483648 to +2147483647
	Real number:	± (1.175E-38 to 3.402E+38)
Register designation method	Register number:	Direct designation of register number
	Symbolic designation:	Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

Motion control function specifications.

Item			Specifications
Interface			MECHATROLINK-I, MECHATROLINK-II
Number of controlled axes/module			Up to 16 axes
Control specifications	PTP control		Linear, rotary, and infinite-length
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes
	Speed reference output		Yes
	Torque reference output		Yes
	Phase control		Yes
	Position control	Positioning	Yes
		External positioning	Yes
		Zero point return	Yes
		Interpolation	Yes
		Interpolation with position detection function	Yes
		JOG operation	Yes
		STEP operation	Yes
		Parameter changes during motion command execution	Yes
Reference unit			mm, inch, deg, or pulse
Reference unit minimum setting			1, 0.1, 0.01, 0.001, 0.0001, 0.00001
Maximum programmable value			-2147483648 to +2147483647 (signed 32-bit value)
Speed reference unit			Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed
Acceleration/deceleration type			Linear, asymmetric, S-curve, exponent
Acceleration/deceleration reference unit			Reference unit/s^2 designation: mm/s^2, inch/s^2, deg/s^2, pulse/s^2 Acceleration/deceleration time constant: Time from 0 to rated speed (ms)
Override function			Positioning: 0.01% to 327.67% by axis
Coordinate system			Rectangular coordinates
Zero point return	DEC1+ phase-C pulse		Yes
	ZERO signal		Yes
	DEC1+ ZERO signal		Yes
	Phase-C pulse		Yes
	Only phase-C pulse		Yes
	POT and phase-C pulse		Yes
	POT		Yes
	Home limit switch and phase-C pulse		Yes
	HOME		Yes
	NOT and phase-C pulse		Yes
	NOT		Yes
	INPUT and phase-C pulse		Yes
	INPUT		Yes
Applicable servo drives			SGDH-□□□E-OY + NS115
Applicable frequency inverters			Varispeed V7, F7, G7 with MECHATROLINK-II Interface (for inverter's version supported contact your OMRON sales office)
Encoders			Incremental encoder Yaskawa absolute encoder

MP2100, MP2100M boards

Items		Specifications	Appearance
Model		JAPMC-MC2100, JAPMC-MC2140	
Power supply		Input supply voltage: 5 VDC±5%	
Dimensions		106.68x174.63 mm half the size of a standard PCI	
Motion network		MECHATROLINK-II: One channel with MP2100, two channels with MP2100M Twenty-one stations, including servo drives, inverters and I/O equipment, can be connected. (16 axes for servo drives and inverters) Transmission speed: 10Mbps (MECHATROLINK-II) Transmission distance: See "MECHATROLINK-II repeater"	
I/O signals		Digital input: 5 points (one point can be used for interrupts), 24 VDC, 4 mA, and source mode or sink mode input Digital output: 4 points, 24 VDC, 100 mA, open collector, and sink mode output	
Electrical operating conditions	Noise resistance	Radiation noise (FT noise): 1 kV or more for 1 min. Static noise (contact discharging method): 6 kV or more for 10 times	
		Other noise: Not specified	
Mechanical operating conditions	Vibration resistance	Not specified	
	Shock resistance	Not specified	
Installation requirements	Ground	Follows the personal computer's requirements	
Environmental conditions		Same as the general specifications	

Host computer specifications

Items		Specifications
Hardware	**Model**	PC/AT compatible
	CPU	Pentium 200 MHz or more (Pentium 400 MHz or more recommended)
	Memory capacity	64 MB or more
	Hard disk drive capacity	Free space 500 MB or more
	Display resolution	800x600 or more (1024x768 recommended)
	Expansion slot[1]	Half the size of a standard PCI slot
	Interrupts[1]	First-level use (IRQ sharing is possible)
	I/O memory[1]	32 kB shared memory used
Software	**OS**	Windows NT 4.0 Workstation SP5 or later Windows 2000 Professional SP1 or later Windows XP
	Web browser	Microsoft IE 5.5 SP2 or later
	Language	Microsoft Visual C/C++ 6.0 SP5 or later

1. These specifications are applicable if using one MP2100s board. If using two or more boards in the same host personal computer, expanasion slots, interrupts and I/O memory resources needs to be increased per each board.

MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (The max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	

MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	For input signal: 24 VDC, for dividing load: 24 VDC, for module: 24 VDC (20.4 V to 26.4 V), 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 MΩ min.	
Data format	Binary, -32000 to +32000	
Input delay time	4 ms max.	
Error	± 0.5% F.S. (at 25 °C), ± 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)

Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m, after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series)	
Restrictions	Between controller and repeater - Total cable length ≤ 30 m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30 m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II servo drive interface unit

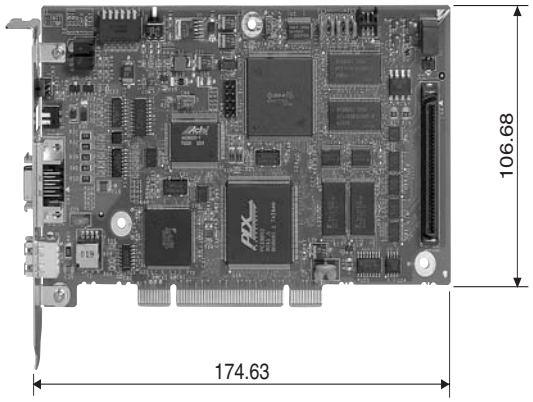
Item		Details	
Type		JUSP-NS115	
Applicable servo drive		SGDH-□□□E models (version 38 or later)	
Installation method		Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.	
	Power consumption	2 W	
MECHATROLINK -II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications	
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.	
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output	
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve	
	Fully closed control	Position control with fully closed feedback is possible.	
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)	
	Fully closed encoder pulse signal	A quad B line-driver	
	Maximum receivable frequency for servo drive	1 Mpps	
	Power supply for fully closed encoder	To be prepared by customer.	
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control	
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection	
	LED indicators	A: Alarm, R: MECHATROLINK-I/II communicating	

MECHATROLINK-II, frequency inverter interface units

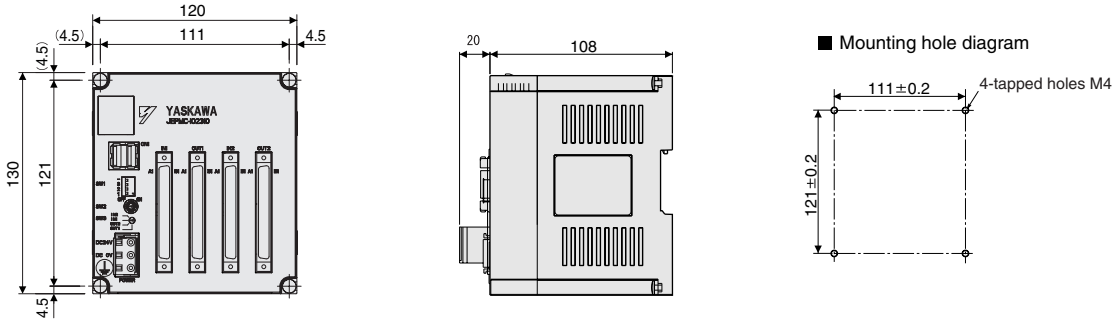
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Dimensions

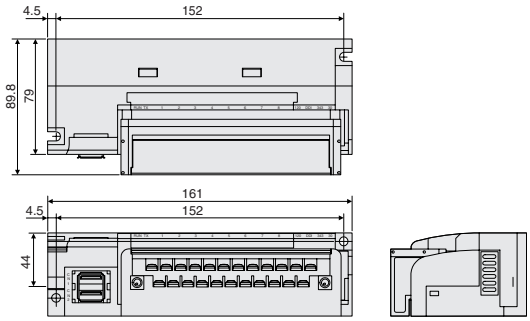
MP2100, MP2100M boards



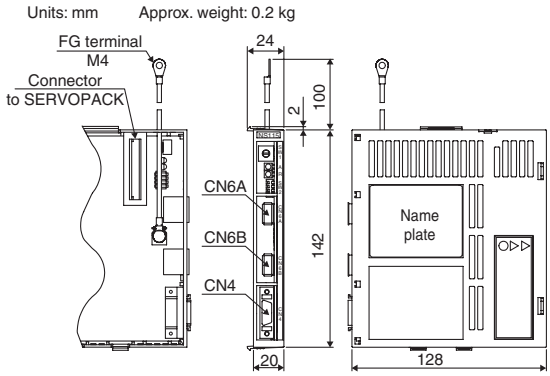
IO2310 I/O module



I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit



Ordering information

MP2100 - motion controller main units

Name	Model name	Model
MP2100 board, 1 channel for MECHATROLINK-II communication, 5-point input and 4-point output	MP2100	JAPMC-MC2100
MP2100M board, 2 channels for MECHATROLINK-II communication, 5-point input and 4-point output	MP2100M	JAPMC-MC2140

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

Name	Remarks	Lenght m	Model
I/O cable for MP2100	With connector on the MP2100 side	0.5	JEPMC-W2062-A5
		1.0	JEPMC-W2062-01
		3.0	JEPMC-W2062-03
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Extended cable for battery with connectors on both sides	JEPMC-W2090-01
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software to support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720
Motion API. Header file, library, DLL, driver, and manual	CPMC-MPA70

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I35E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

C200HW-MC402-E

Motion control unit



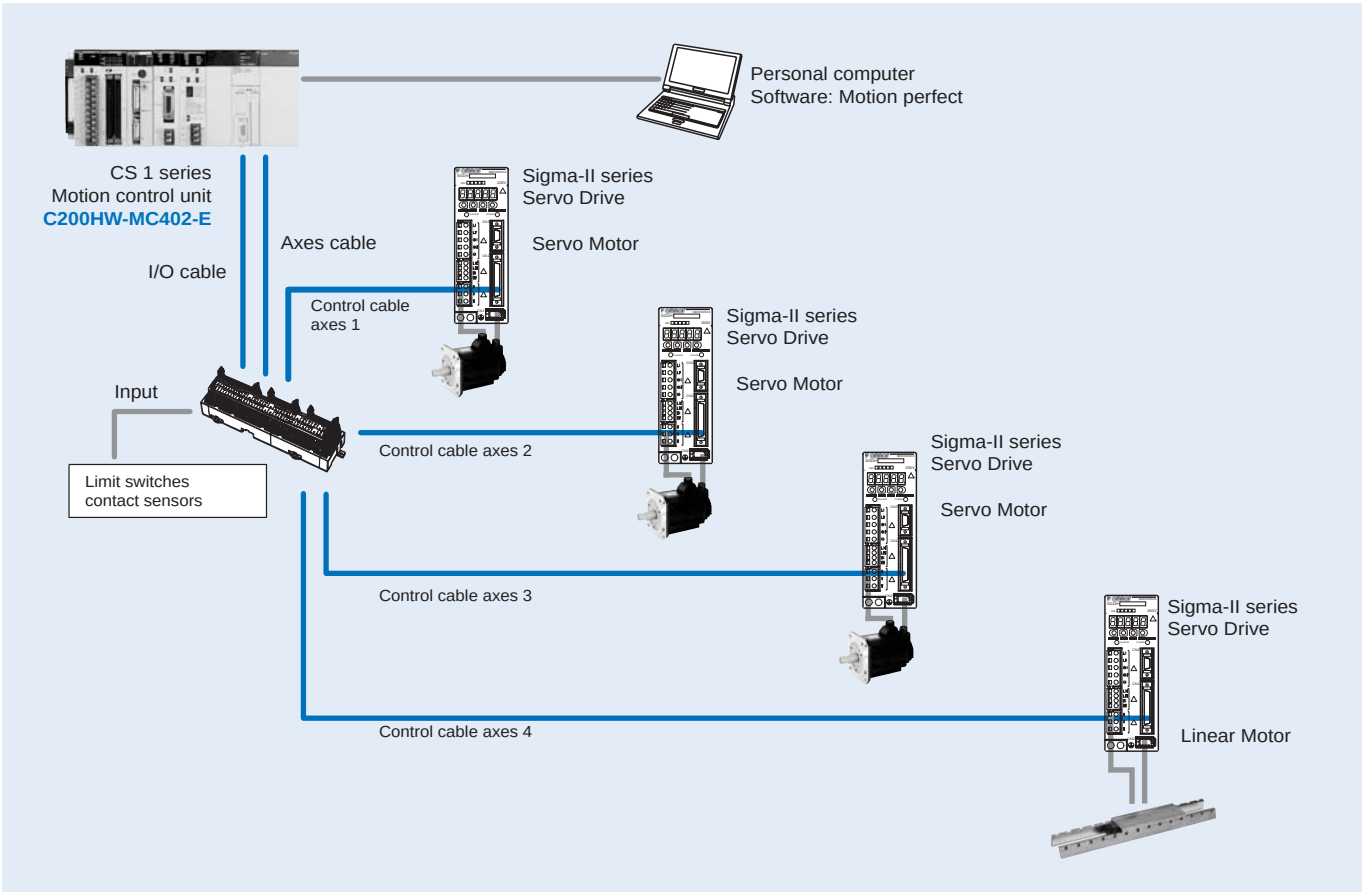
Advanced multi-axes motion control made perfectly intuitive

- Advanced motion control of 4 real axes and 4 virtual axes per unit. Up to 16 modules can be installed in one PLC
- Analogue outputs for close loop position and speed control
- Simple to develop and modify using BASIC
- Multi-tasking programing
- Hardware registration input for every axis
- Electronic CAM profiles and axes synchronization
- Friendly motion perfect Windows-based programming and debugging software. Provides versatile test and monitoring functions including a 4-channel software oscilloscope.

Function

The advanced motion control unit provides closed-loop control of up to 4 axes, it is programmed in a multi-task BASIC type language and supported by the powerful software tool. The unit provides a complete command set, allowing applications such as flying saws, rotaring knives, any synchronization and electronic CAM profile to be easily programmed.

System configuration



Specifications

Model		C200HW-MC402-E
Classification		C200H special I/O unit
Control output signals		Analogue
Programming language		BASIC type motion control language
Basic specifications	Power supply voltage	5 VDC (supplied from backplane).
		24 VDC (supplied from external power supply)
	Approx. mass	500 g
	External dimensions	130x34.5x100.5 mm (HxWxD)
Functional specifications	Controlled axes	4 real axes 4 virtual axes
	Control method	Closed loop with incremental encoder and with PID and speed command outputs
	Servo loop cycle	1.0 ms
	Speed control	Speed control of up to 4 axes. Up to 1 MHz pulse input frequency after quadrature
	Measurement units	User definable
Motion control	Linear interpolation	4 axes
	Circular interpolation	For any 2 axes
	Helical interpolation	For any 3 axes
	Axes synchronization	For any 2 axes
	Axes linked CAM profile	For any 2 axes
	Hardware registration interrupt	4 axes
	Acceleration/deceleration curves	Trapezoidal or S-curve
Task programming capacity	Number of tasks	Up 5 tasks simultaneous plus interface task
	Number of programs	14
	Data storage capacity	251 (VR) + 16000 (table) max.
External I/O	Encoder input	Line driver receiver inputs for 4 axes (1 MHz after quadrature)
	Servo drive relationships	The following signals are provided per axis Inputs: Drive alarm signal Outputs: Drive enable (RUN or SERVO ON) Drive alarm reset SPEED command
	Digital inputs	Up to 16 digital inputs can be wired to control MC unit funtions. These include limit switches, rapid stop switches and proximity inputs.
	Digital outputs	Total of 8 digital outputs can be wired and used for position dependent switching or other general purposes.
	Registration inputs	Each axis has a registration input that can be used to record the current position of the encoder feedback signals in hardware for use within the software enviroment
Serial communications	RS-232C	Connection to PC (motion perfect software)

Motion perfect software

Model	Motion perfect
Supported MC units	C200HW-MC402-E, R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable computer	Windows 95/98/2000/NT4.0
Functions	Programming and debugging software tool. Test and moitoring functions including a 4-channel software oscilloscope.

Ordering information

Motion controller unit

Name	Model
4 axes advanced motion controller	C200HW-MC402-E

Serial cable

Name		Model
Programing cable	2 m	R88A-CCM002P4-E

Terminal block and cables to motion controller unit

Description		Model
Terminal block for MC402 unit	-	R88A-TC04-E
PLC unit control cable (I/O signals)	1 m	R88A-CMX001S-E
PLC unit control cable (axes control)	1 m	R88A-CMX001J1-E

Sigma-II series servo drive cables

Description		Model
Servo drive connecting cable, 1 axis. (It is required 1 cable for each servo drive)	1 m	R88A-CMUK001J3-E2

Computer software

Specifications	Model
Motion perfect software	MOTION TOOLS CD

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To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I07E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CS1W-MC421/-MC221

Motion control units



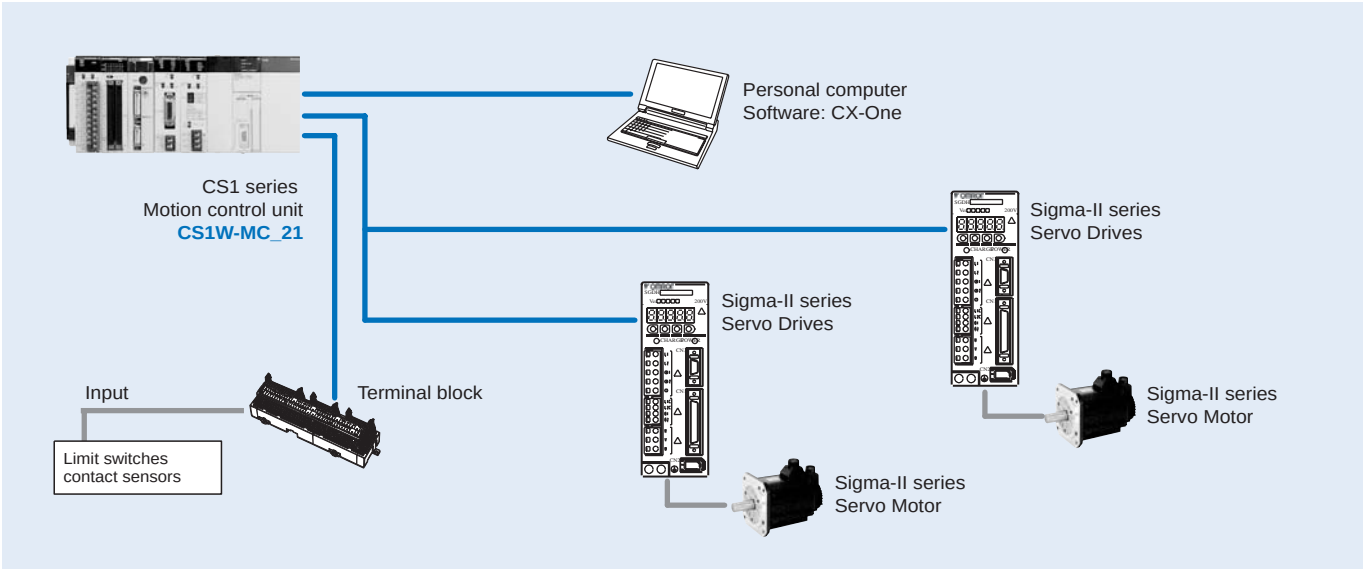
High-precision, motion controller with multi-tasking G-language programming

- High-speed control of up to 4 axes with one unit and up to 76 axes with one PLC (19 units x 4 axes) (assumes that power supply unit capacity is not exceeded).
- Winding operations easily controlled at high-speed using traverse positioning control.
- High-speed response to commands from CPU unit (8 ms for 2 axes, 13 ms for 4 axes).
- Encoder response of 2 Mpps possible with 4x frequency multiplication for applications with high-speed, high-precision servo motors.
- D interrupt code outputs to CPU unit at end of positioning or at specified positions (D code output time: 3.3 ms max.).
- CX-motion Windows-based support software define user mnemonics to use in place of G codes to simplify MC program development and analysis.
- Servo trace function from CX-motion to trace error counter changes or motor speeds.
- Automatic loading function
  MC programs and positioning data can be automatically downloaded from computer memory when required by the MC unit.

Function

The motion controller provides closed-loop motion control via analog outputs for up to 4 axes, and supports the G language for advanced, high-speed, high-precision position control. Multi-tasking allows you to run the axes independently for a wider range of application.

System configuration



Specifications

General

Model		CS1W-MC421-V1	CS1W-MC221-V1
Classification		CS1 Special I/O unit	
Control method		Closed loop with automatic trapezoid or S-curve acceleration/deceleration	
Control output signals		Analog	
Internal programming language		G language (program started by command sent from CPU unit's ladder program.)	
Controlled axes		4 axes max.	2 axes max.
Maximum position value		–39,999,999 to 39,999,999 (for minimum setting unit of 1)	
Synchronous axis control		4 axes max.	2 axes max.
Positioning	Linear interpolation	4 axes max.	2 axes max.
	Arc interpolation	2 axes max. in a plane	
	Helical interpolation	2-axis arc interpolation in a plane + feed axis	---
	Traverse	2-axis traverse feeding	
	Infinite feed	Infinite feeding of one or more axes	
	Interrupt feed	Interrupt feeding for specified axes (positioning can be specified for when there is no interrupt.)	
Task programming capacity	Number of tasks	4 tasks max.	2 tasks max.
	Number of programs	25 programs when using 4 tasks	50 programs when using 2 tasks
	Program capacity	500 blocks per task when using 4 tasks	1,000 blocks per task when using 2 tasks

CX-Motion: Windows-based support software

Model	WS02-MCTC1-EV□
Supported MC units	CS1W-MC221/421, C200H-MC221, and CV500-MC221/421
Applicable computer	DOS, OS: Windows 95/98 or Windows NT Version 4.0
Functions	Functions required for MC unit control: creating/editing/saving/printing system parameters, positioning data, and MC programs; monitoring MC unit operation

Ordering information

Motion control unit

Name	Model
2 axes motion control unit.	CS1W-MC221-V1
4 axes motion control unit.	CS1W-MC421-V1

Sigma-II series servo drive cables

Description	Connect to		Model
Axis control cable (1 axis)	Motion control units CS1W-MC221 (1 cable needed) CS1W-MC421 (2 cables needed)	1 m	R88A-CPW001M1
		2 m	R88A-CPW002M1
		3 m	R88A-CPW003M1
		5 m	R88A-CPW005M1
Axes control cable (2 axis)	Motion control units CS1W-MC221 (1 cable needed) CS1W-MC421 (2 cables needed)	1 m	R88A-CPW001M2
		2 m	R88A-CPW002M2
		3 m	R88A-CPW003M2
		5 m	R88A-CPW005M2

I/O terminal block and cables

Description	Connect to motion control unit		Model
Terminal block	CS1W-MC221	-	XW2B-20J6-6
	CS1W-MC421	-	XW2B-40J6-7
Cable form PLC unit to terminal block.	CS1W-MC221 CS1W-MC421	1 m	XW2Z-100J-F1

Computer software

Specifications	Model
CX-One	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I06E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

CJ1W-NC□□

Position control units



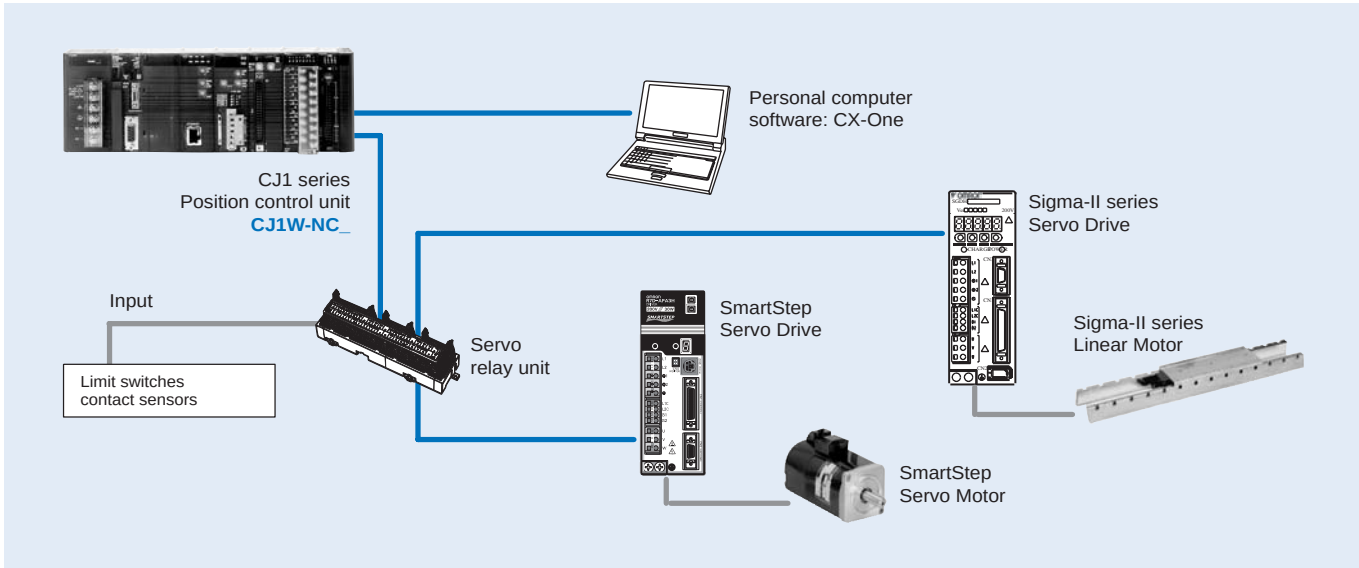
High-speed, High-precision positioning with 1, 2, or 4 axes

- Positioning can done by direct ladder commands
- Position and speed control
- Linear interpolation
- Interrupt feeding function
- Positioning of 100 points done from memory
- S-curve acceleration/deceleration, origin search, backlash compensation, and other features are also supported.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based support software (CX-position) to easily create positioning data and store data and parameters in files.

Function

These position control units support positioning control via pulse-train outputs. Positioning is performed using trapezoid al or S-curve acceleration and deceleration. Models are available with 1, 2, or 4 axes control, and can be used in combination with servo drives or stepping motors what accept pulse-train control.

System configuration



Specifications

Model	CJ1W-NC113 CJ1W-NC133	CJ1W-NC213 CJ1W-NC233	CJ1W-NC413 CJ1W-NC433
Unit name	Position control unit		
Classification	Special I/O unit		
Unit numbers	0 to 95		0 to 94
Control method	Open-loop control by pulse train output		
Control output interface	CJ1W-NC□13: Open-collector output CJ1W-NC□33: Line-driver output		
Controlled axes	1	2	4
Operating modes	Direct operation or memory operation		
Data format	Binary (hexadecimal)		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions		
Startup time	2 ms max. (refer to operation manual for conditions)		
Position data	-1,073,741,823 to +1,073,741,823 pulses		
No. of positions	100 per axis		
Speed data	1 to 500 kpps (in 1 pps units)		
No. of speeds	100 per axis		
Acceleration/deceleration times	0 t 250 s (time to max. speed)		
Acceleration/deceleration curves	Trapezoidal or S-curve		
Saving data in CPU	Flash memory		
Windows-based support software	CX-position (WS02-NCTC1-E)		
Ambient operating temperature	0 to 55 °C		0 to 50 °C
External power supply	24 VDC ±10%, 5 VDC ±5% (line driver only)		24 VDC ±5%, 5 VDC ±5% (line driver only)

Ordering information

Position control unit

Name	Model
1 axis position control unit. Open-collector output.	CJ1W-NC113
2 axes position control unit. Open-collector output.	CJ1W-NC213
4 axes position control unit. Open-collector output.	CJ1W-NC413
1 axis position control unit. Line-driver output.	CJ1W-NC133
2 axes position control unit. Line-driver output.	CJ1W-NC233
4 axes position control unit. Line-driver output.	CJ1W-NC433

Servo drive cables

Note: Refer the selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I04E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

CS1W-NC□□□, C200HW-NC□□□

Position control units



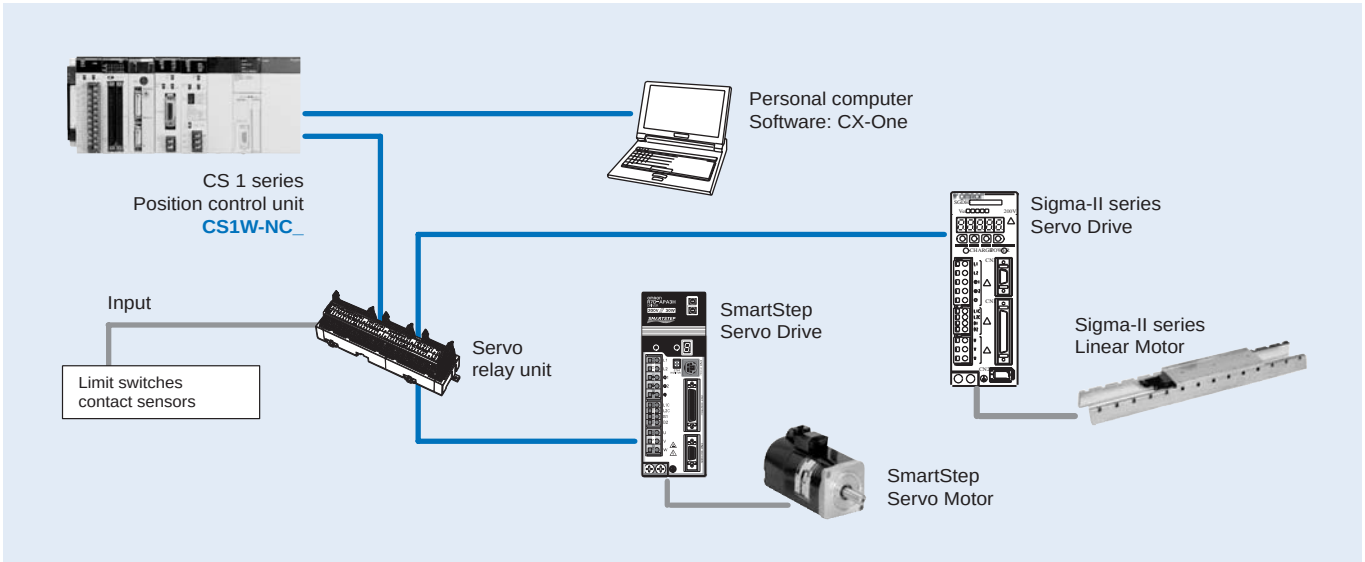
High-speed, high-precision positioning with 1, 2, or 4 axes

- Positioning can done by direct ladder commands
- Position and speed control
- Linear interpolation
- Interrupt feeding function
- Positioning of 100 points done from memory
- S-curve acceleration/deceleration, origin search, backlash compensation, and other features are also supported.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based support software to easily create positioning data and store data and parameters in files.

Function

These position control units support positioning control via pulse-train outputs. Positioning is performed using trapezoid al or S-curve acceleration and deceleration. Models are available with 1, 2, or 4 axes control, and can be used in combination with servo drives or stepping motors what accept pulse-train control.

System configuration



Specifications

Model	CS1W-NC113 CS1W-NC133	CS1W-NC213 CS1W-NC233	CS1W-NC413 CS1W-NC433	C200HW-NC113	C200HW-NC213	C200HW-NC413
Unit name	Position control unit					
Classification	CS1 special I/O units			C200H special I/O units		
Unit numbers	0 to 95			0 to 15 (0 to F)		
Control method	Open-loop, automatic trapezoid acceleration/deceleration					
Control output signals	CS1W-NC□13: Open-collector outputs CS1W-NC□33: Line-driver outputs			Open-collector		
Controlled axes	1	2	4	1	2	4
Operating modes	Direct operation or memory operation					
Data format	Binary (hexadecimal)			BCD		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit			2.6 to 4.5 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions			2.6 to 5.5 ms max./instructions		
Startup time	2 ms min. (Refer to operation manual for conditions.)			7.51 ms min. (Refer to operation manual for conditions.)		
Position data	-1,073,741,823 to +1,073,741,823 pulses			-9,999,999 to +9,999,999 pulses		
No. of positions	100 per axis					
Speed data	1 to 500 kpps (in 1 pps units)			1 to 500 kpps (specified as factor)		
No. of speeds	100 per axis					
Acceleration/deceleration times	0 to 250 s (time to max. speed)					
Acceleration/deceleration curves	Trapezoidal or S-curve					
Saving data in CPU	Flash memory					
Windows-based support software	CX-position			SYSMAC-NCT (WS01-NCTF1-E)		

Ordering information

Position control unit

Name	Model
1 axis position control unit. Open-collector output.	CS1W-NC113
2 axes position control unit. Open-collector output.	CS1W-NC213
4 axes position control unit. Open-collector output.	CS1W-NC413
1 axis position control unit. Line-driver output.	CS1W-NC133
2 axes position control unit. Line-driver output.	CS1W-NC233
4 axes position control unit. Line-driver output.	CS1W-NC433
1 axis position control unit. Open-collector output.	C200HW-NC113
2 axes position control unit. Open-collector output.	C200HW-NC213
4 axes position control unit. Open-collector output.	C200HW-NC413

Servo drive cables

Note: Refer to selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I05E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

R88A-MCW151-□

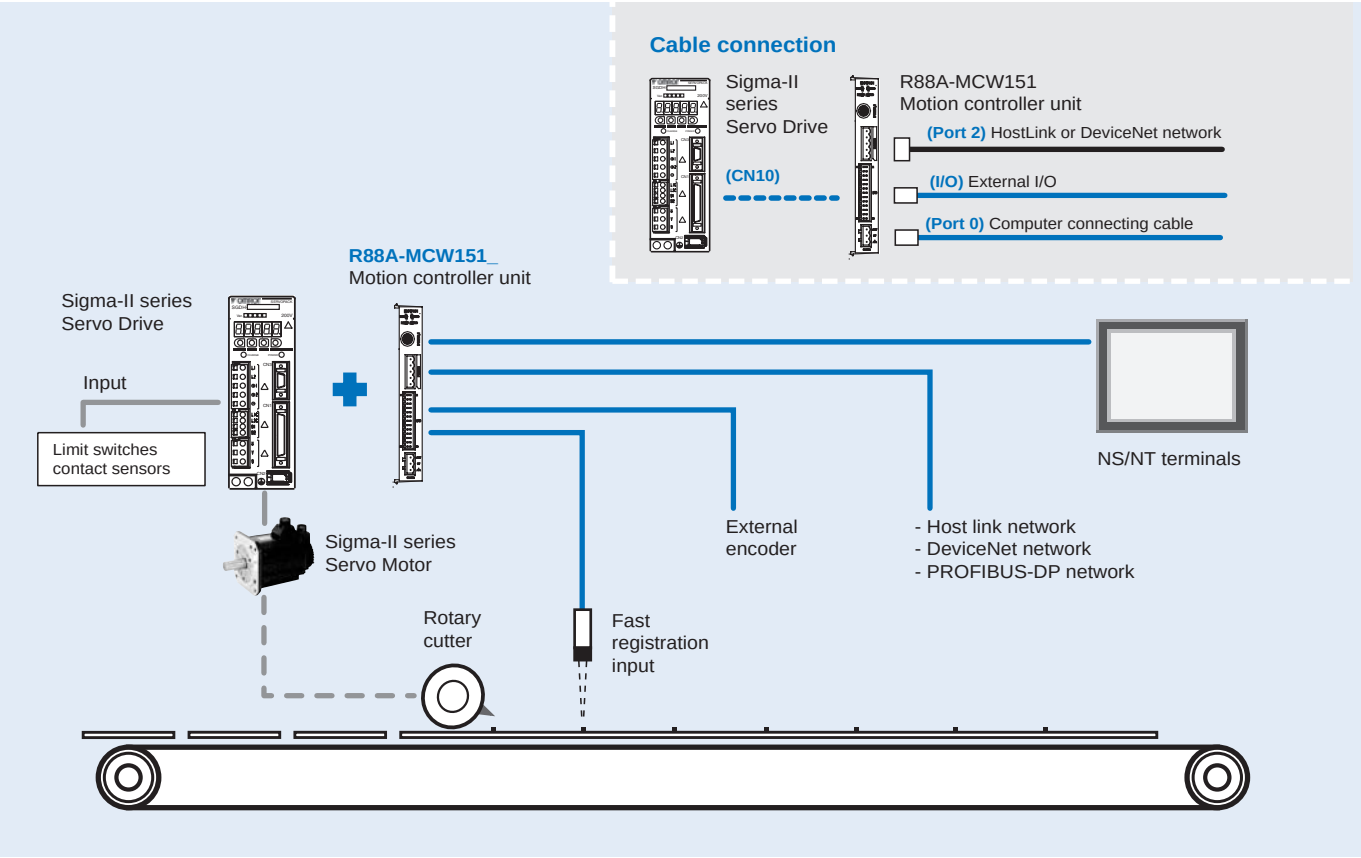
1.5 axis motion controller



Advanced motion made perfectly intuitive

- Connects directly to the Sigma-II series drive
- Controls 1 real axis, 1 virtual axis and a configurable third axis
- Provides an additional encoder input/output to the servo drive
- Simple to develop and modify using BASIC
- Built-in local I/O for easy operation
- Provides two additional hardware registration inputs to the drive
- Electronic CAM profiles and axes synchronization
- Multi-tasking functionality
- Friendly and powerful Windows-based software
- Network connectivity via HostLink or DeviceNet
- Supports HMI connection without the need of a PLC

System configuration



Specifications

General specifications

Item		Details
Type		R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable servo drive		SGDH-□□□E models (software version 14 or later)
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	24 VDC (supplied from external power supply)
		5 VDC (supplied from the servo drive control power supply)
	Power consumption	4.0 W
	External dimensions	20x142x128 mm (HxWxD)
	Approx. mass	200 g
	Current consumption	170 mA for 24 VDC
	Output power supply	5 VDC, maximum 160 mA (to external encoder)
Environment	Operating temperature	0 … +55 °C
	Storage temperature	-20 … +75 °C
	Operating and storage humidity	90% RH max. (no condensation)
	Vibration resistance	0.5 G (4.9 m/s^2)
	Shock resistance	2 G (19.6 m/s^2)
Functional specifications	Number of axes	- 1 controlled servo drive axis - 1 master axis, encoder output axis or virtual axis - 1 virtual axis
	Servo loop cycle	Selectable to 0.5 ms or 1.0 ms.
	Registration inputs	2x MCW151 unit for encoder input axis 1x Sigma-II servo drive axis
	Measurement units	User definable
Programming	Programming language	BASIC
	Number of tasks	Up to 3 tasks running simultaneously plus the command line task
	Max. number of programs	14
	Available memory for user programs	128 KB
	Data storage capacity	251 (VR) + 8000 (table)
	Saving program data, motion controller	Random access memory (RAM) and flash memory backup.
	Saving program data, personal computer	Motion perfect software manages a backup on the hard disk of the personal computer.
Motion control	Speed control	Inferred closed loop with PID, output speed and speed feed forward gains Speed reference (open loop) Possible torque limit operation
	Torque control	Torque reference (open loop) Possible speed limit operation
	Control switch	Speed / torque control switching during operation
	Positioning operations	Linear interpolation Circular interpolation CAM profile movement Electronic gearbox link Linked CAM profile movement Linked move for any two axes Adding axes
	Acceleration/deceleration curves	Trapezoidal or S-curve
Servo drive access	Motion control	Speed control Torque control Position feedback Driver enable Driver print registration
	Monitoring	Driver alarm and warning status General driver status Driver digital input Driver analogue input Driver limit switches
	General control	Driver alarm reset Driver reset
	Parameter access	Read and write Pn parameters Read Un parameters
External I/O	Encoder input	Line receiver input; maximum response frequency: 1500 kHz pulses (before multiplication) Pulse multiplication: x4
	Encoder output	Line receive output; maximum frequency: 500 kHz pulses Internal counts to output pulse ratio: 64:1
	Digital inputs	Total of 8 digital inputs can be wired and used for instance for limit switches, emergency stop and proximity inputs. Two inputs can be used for registration of the encoder input/output axis.
	Digital outputs	Total of 6 digital outputs can be wired and used for position dependent switching or other general purposes.
	Registration inputs	Two registration inputs can be used (simultaneously) to capture the position in hardware.
Serial communications	RS-232C	Port 0: Connection to PC (motion perfect software) Port 1: Host link master protocol Host link slave protocol General-purpose

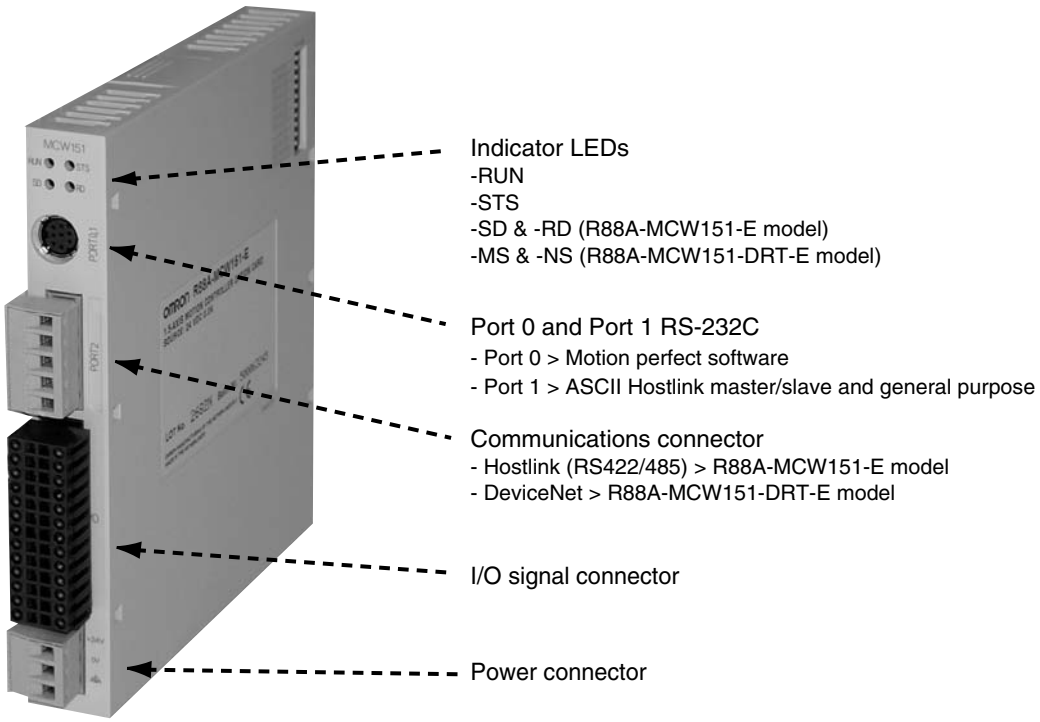
RS-422A/485 interface specifications (R88A-MCW151-E only)

Item	Details	
Electrical characteristics	Conform to EIA RS-422A/485	
Synchronization	Start-stop synchronization (asynchronous)	
Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps	
Transmission format	Databit length	7 or 8 bit
	Stop bit	1 or 2 bit
	Parity bit	Even/odd/none
Transmission mode	Point-to-multipoint (1:N)	
Transmission protocol	RS-422A	Host link master protocol, Host link slave protocol, ASCII general-purpose
	RS-485	ASCII general-purpose
Galvanic isolation	Yes	
Connector type	Phoenix MSTB 2.5/5-ST-5.08 (included in package).	
Communication buffers	254 bytes	
Flow control	None	
Terminator	Yes, internal 220 Ω selectable by DIP-switch SW2	
Cable length	500 m max.	

DeviceNet specifications (R88A-MCW151-DRT-E only)

Item	Details
Communications protocol	DeviceNet
Supported connections (communications)	Remote I/O polling messages Explicit messages Both conform to DeviceNet specifications
Baud rate	500 kbps, 250 kbps, 125 kbps (switchable)
Communications media	Special 5-wire cables (2 signal lines, 2 power lines, 1 shield line)
Communications distances	
500 kbps	Network length: 100 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 39 m max.
250 kbps	Network length: 250 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 78 m max.
125 kbps	Network length: 500 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 156 m max.

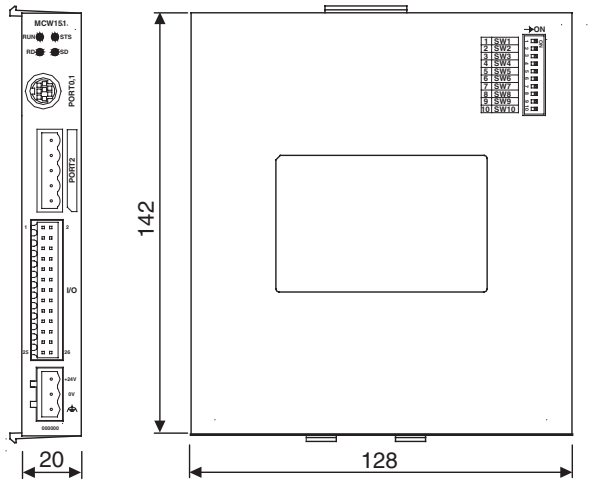
Nomenclature



Dimensions

R88A-MCW151-(DRT)-E - 1.5 axes motion controller unit

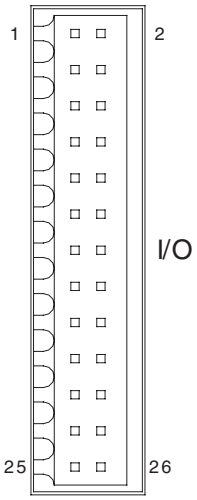
Units: mm Approx. weight: 0.2 kg



Installation

I/O connector

Connector pin arrangement



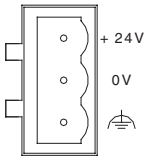
A+	1	2	A-
B+	3	4	B-
Z+	5	6	Z-
0V_ENC	7	8	5V_ENC
I0 / R0	9	10	FG
I2	11	12	I1 / R1
I4	13	14	I3
I6	15	16	I5
0V_IN	17	18	I7
O8	19	20	O9
O10	21	22	O11
O12	23	24	O13
0V_OP	25	26	24V_OP

I/O connector pin functions

Pin	Signal	
	Name	Function
1	A+	Encoder phase A+ (input / output)
2	A-	Encoder phase A- (input / output)
3	B+	Encoder phase B+ (input / output)
4	B-	Encoder phase B- (input / output)
5	Z+	Encoder phase Z+ (input / output)
6	Z-	Encoder phase Z- (input / output)
7	0V_ENC	Encoder 0V common
8	5V_ENC	Encoder 5 V power supply output
9	I0 / R0	(Registration) Input 0
10	FG	Frame ground
11	I2	Input 2
12	I1 / R1	(Registration) Input 1
13	I4	Input 4
14	I3	Input 3
15	I6	Input 6
16	I5	Input 5
17	0V_IN	Inputs 0 V common
18	I7	Input 7
19	O8	Output 8
20	O9	Output 9
21	O10	Output 10
22	O11	Output 11
23	O12	Output 12
24	O13	Output 13
25	0V_OP	Outputs 0 V common
26	24V_OP	Outputs 24 V power supply input

Power connector

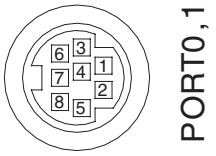
The power connector is used to connect the 24 V power supply to the controller unit



Pin	Name	Function
1	+24 V	Power supply 24 V
2	0 V	Power supply 0 V
3	FG	Frame ground

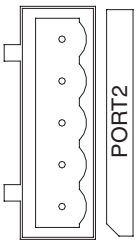
RS-232C connections (port 0 and port 1)

The controller unit has two serial RS-232C ports for communication with external devices.



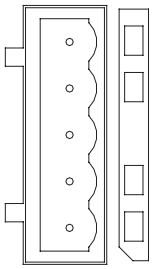
Pin	Symbol	Name	Port	Direction
1	-	Not used	-	
2	RS-1	Request to send	1	Output
3	SD-0	Send data	0	Output
4	SG-0	Signal ground	0	-
5	RD-0	Receive data	0	Input
6	SD-1	Send data	1	Output
7	SG-1	Signal ground	1	-
8	RD-1	Receive data	1	Input

RS-422A/485 connections (R88A-MCW151-E only)



Pin	Symbol	Name	Port	Direction
1	RD-	Receive data (-)	2	Input
2	RD+	Receive data (+)	2	Input
3	FG	Frame ground	2	-
4	SD-	Send data (-)	2	Output
5	SD+	Send data (+)	2	Output

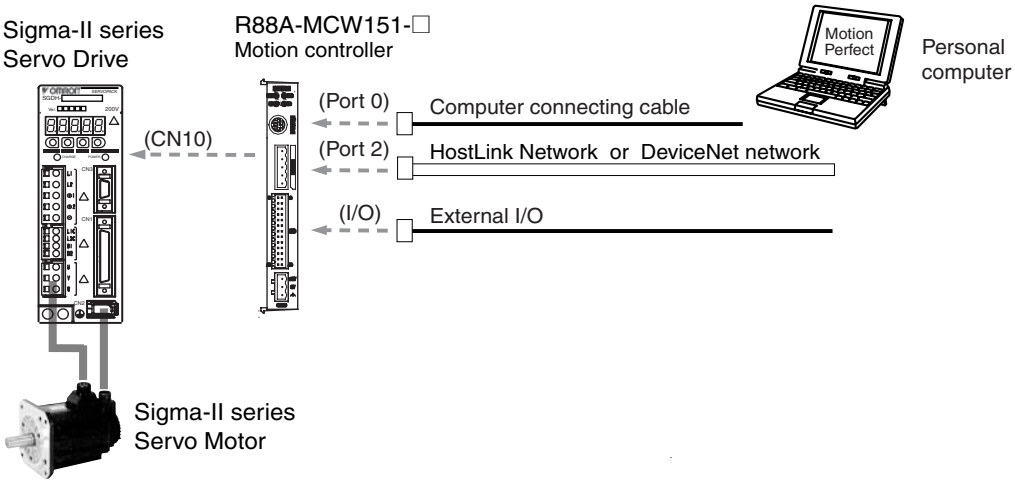
DeviceNet connections (R88A-MCW151-DRT-E only)



Pin	Symbol	Signal	Color of cable
1	V+	Power line, positive voltage	Red
2	CAN-H	Communications line, high	White
3	Shield	Shield	-
4	CAN-L	Communications line, low	Blue
5	V-	Power line, negative voltage	Black

Ordering information

System configuration



Motion controller unit

Name	Model
1.5 axis advanced motion controller with Host Link interface	R88A-MCW151-E
1.5 axis advanced motion controller with DeviceNet interface	R88A-MCW151-DRT-E

PROFIBUS connectivity

Name	Model
PROFIBUS-DP module interface for R88A-MCW151-E motion controllers	PRT1-SCU11

Serial cables (for port 0, 1)

Name	Model
Programing cable, 2 m. (Port 0)	R88A-CCM002P4-E
Spliter cable, 1 m (Port 0 & 1). Combined with R88A-CCM002P4-E cable allows using motion perfect and a general purpose application.(e.g. terminal)	R88A-CCM001P5-E

Connectors

Specification	Model
I/O connector (Included in package)	B2L 3.5/26 SN SW (Weidmüler)
Power connector (Included in package)	MSTB 2.5/3-ST-5.08 (Phoenix)
Port 2 connector (Included in package)	MSTB 2.5/5-ST-5.08 (Phoenix)

Note: For a complete view of DeviceNet network accessories, refer to automation systems catalogue or contact your OMRON representative.

Computer software

Specifications	Model
Motion perfect	MOTION TOOLS CD
EDS file	

Servo system

Note: Refer to the servo systems section for more information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I14E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

JUSP-NS300

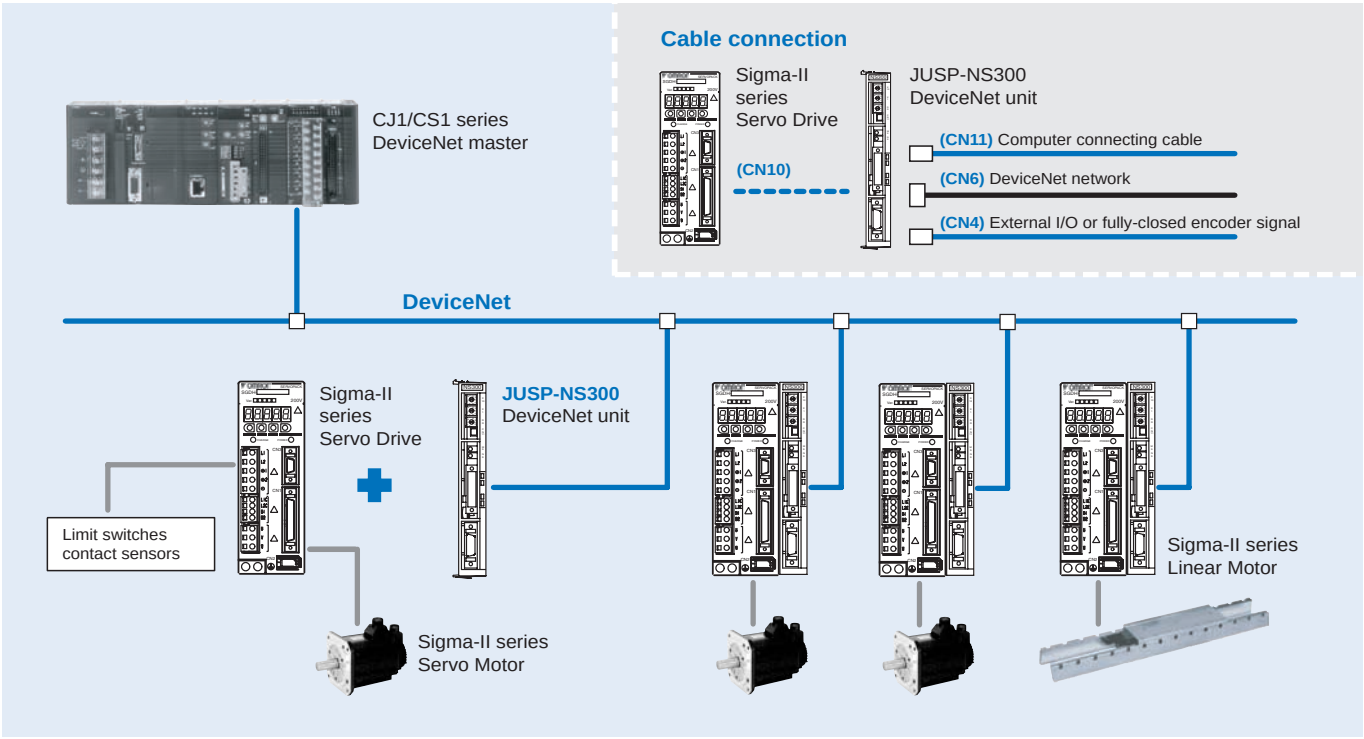
DeviceNet unit



DeviceNet connectivity with positioning functionality.

- Connects directly to the Sigma-II series drive
- Simplifies distributed control and information management
- No programming languages are required.
- Various positioning functions including point-to-point mode (with multi-step speed positioning available) and station number mode (indexing function)
- All parameters are set and maintained by a PLC or PC.
- Up to 63 servos can be connected to the DeviceNet network
- Supports polling I/O and explicit messages

System configuration



Specifications

JUSP-NS300 - DeviceNet interface unit

Item		Details
Type		JUSP-NS300
Applicable servo drive		All SGDH-□□□E models
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	1.3 W
DeviceNet communications	Baud rate setting	Select from 125 kbps, 250 kbps, or 500 kbps using a rotary switch.
	Node address setting	Select the address from 0 to 63 using the rotary switches.
Command format	Operation specifications	Positioning using DeviceNet communications.
	Reference input	DeviceNet communications Commands: motion commands (position, speed), and parameter read/write
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully-closed control	Possible
Input signals	Fixed allocation to servo drive CN1 connector	Forward/reverse run prohibited, zero point return deceleration LS, zero point signal, external positioning signal
	NS300 unit	Emergency stop signal
Output signals	Servo drive CN1 connector*	Servo alarm, brake interlock, servo ready, positioning completion
	NS300 unit	P1, P2 (area signals)
Internal functions	Position data latch function	Position data latching is possible using phase C, zero point signals, and external signals.
	Protection	Parameters damage, parameter setting errors, communications errors, etc.
	LED indicators	MS: Module status NS: Network status

Note: *The allocation of the output signals for brake interlock, servo ready, or positioning completion can be changed using parameter settings.

Transmission specifications

Item	Specifications			
Communication format	Multi-drop, T-branch (1:N)			
Transmission speed (kbps)	500, 250, 125 kbps			
Transmission media	5-wire cables			
Transmission distance	**Speed**	**Max. network length**	**Branch length**	**Total branch length**
	500 kbps	100 m or less	6 m or less	39 m or less
	250 kbps	250 m or less		78 m or less
	125 kbps	500 m or less		156 m or less
Number of nodes	Up to 64 units			
Error control	SRS error, node address double checking			

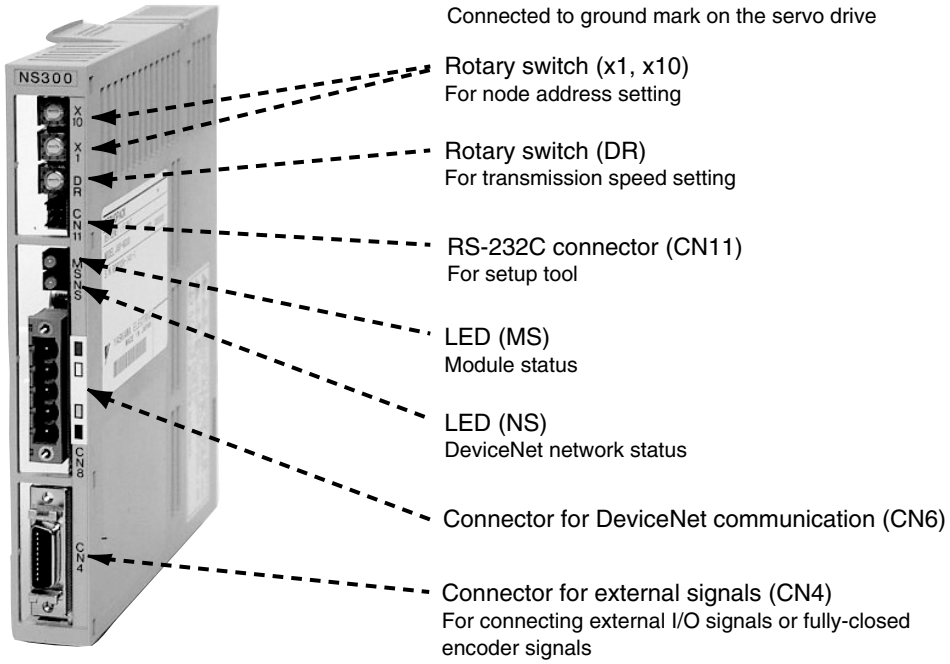
Cable

Item	Cable	
	Thick	Thin
Loss of signal	Little	Much
Transmission distance	Long	Short
Advantage/disadvantage	Hard (not easy to bend)	Soft (easy to bend)

The maximum network lengths differ in accordance with the cable type as shown below.

Transmission speed (kbps)	Max. network length (m)	
	Thick cable	Thin cable
500	100	100
250	250	100
125	500	100

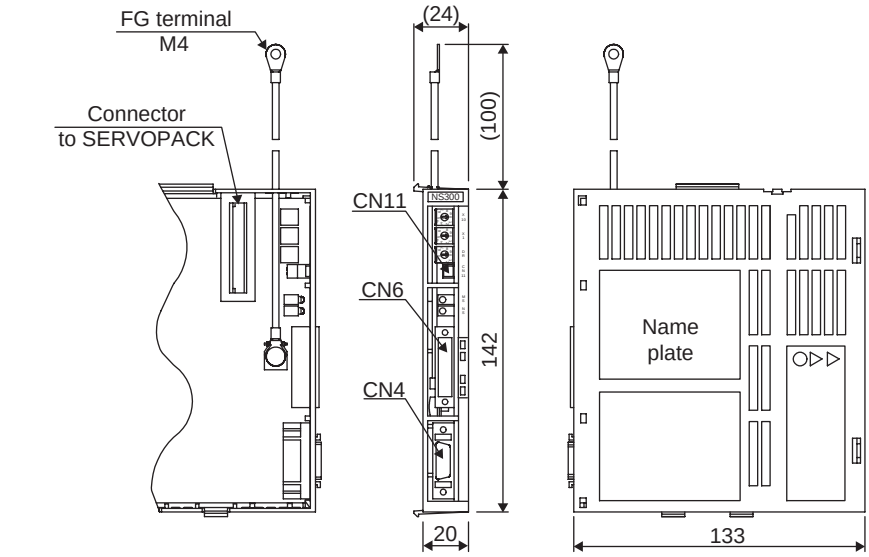
Nomenclature



Dimensions

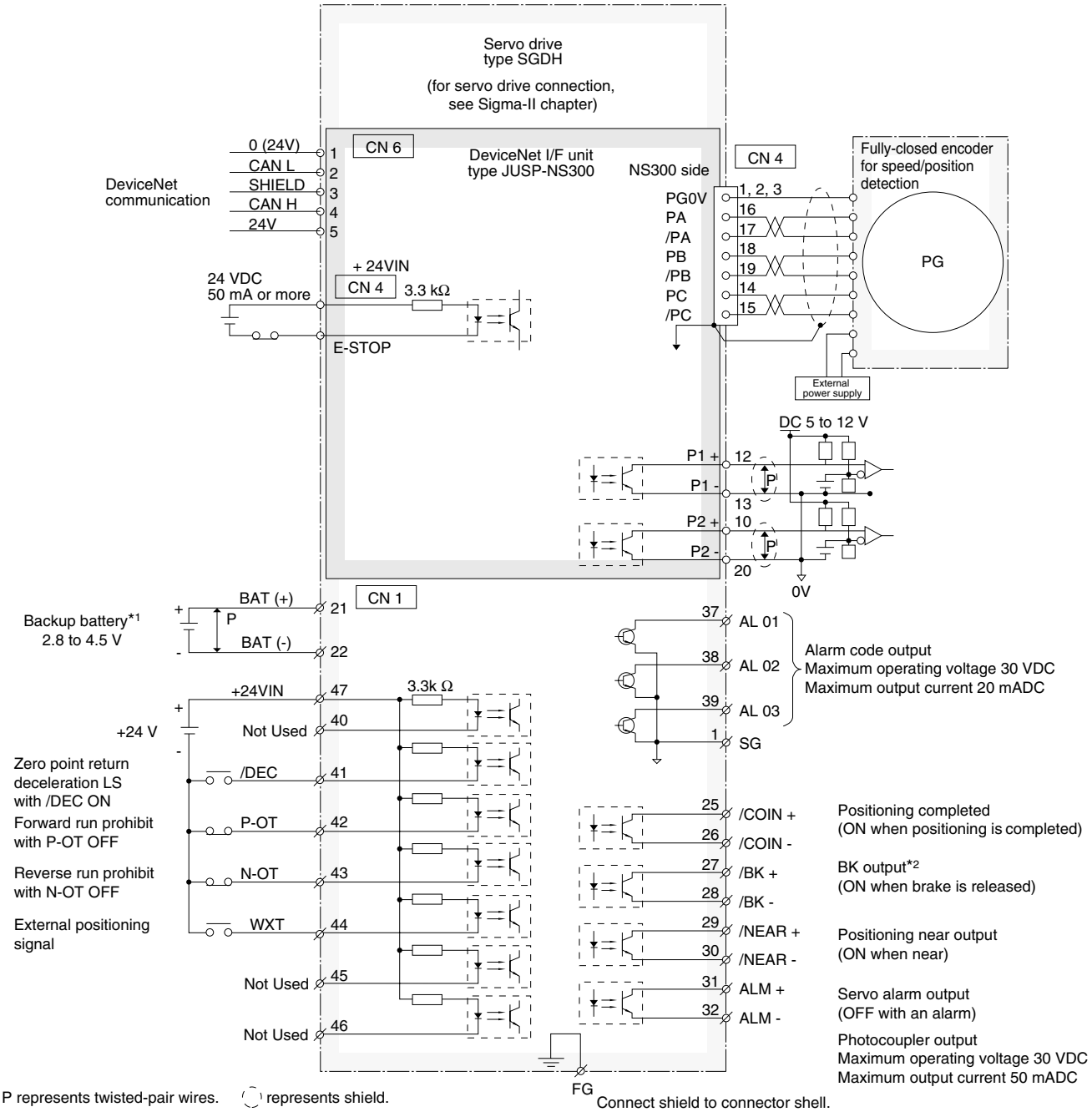
JUSP-NS300 - DeviceNet interface unit

Units: mm Approx. weight: 0.2 kg



Installation

Standard connections

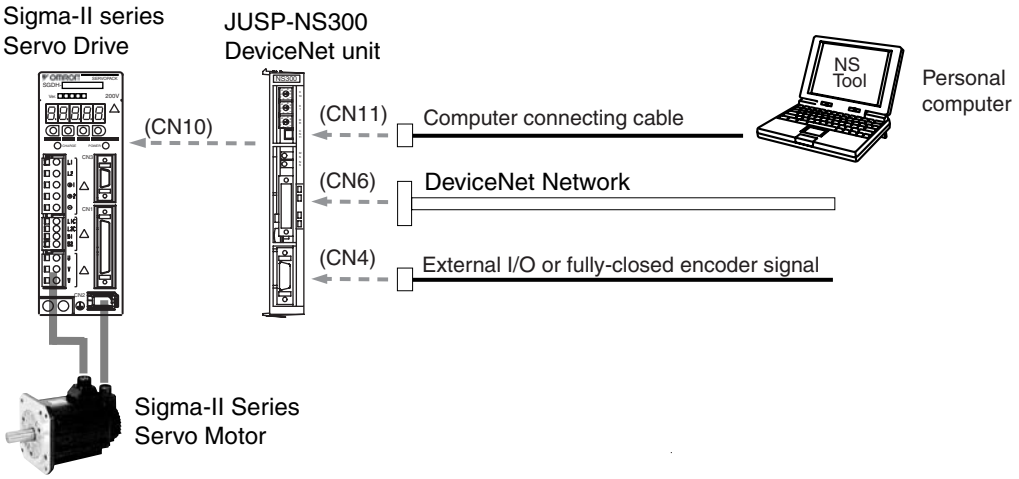


*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Note: Connect the ground cable of the field bus I/F unit to the ground connector of the servo drive.

Ordering information

System configuration



DeviceNet interface unit

Name	Model
DeviceNet interface unit with point-to-point positioning functionality	JUSP-NS300

Serial cable (for CN11)

Name		Model
Computer connecting cable	2m	R88A-CCW002P4

Connectors

Name	Model
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973
Connector for CN6. DeviceNet connector with retaining screws	XW4B-05C1-H1-D
Connector for CN6. DeviceNet multi-branching Connector with retaining screws	XW4B-05C4-TF-D
Connector for CN6. DeviceNet multi-branching Connector (without retaining screws)	XW4B-05C4-T-D

Note: For a complete view of DeviceNet network accessories, refer to automation systems catalogue or contact your OMRON representative.

Computer software

Name	Model
NS tool	MOTION TOOLS CD
ESD file	

Servo system

Note: Refer to the servo systems section for more information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I11E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

JUSP-NS500

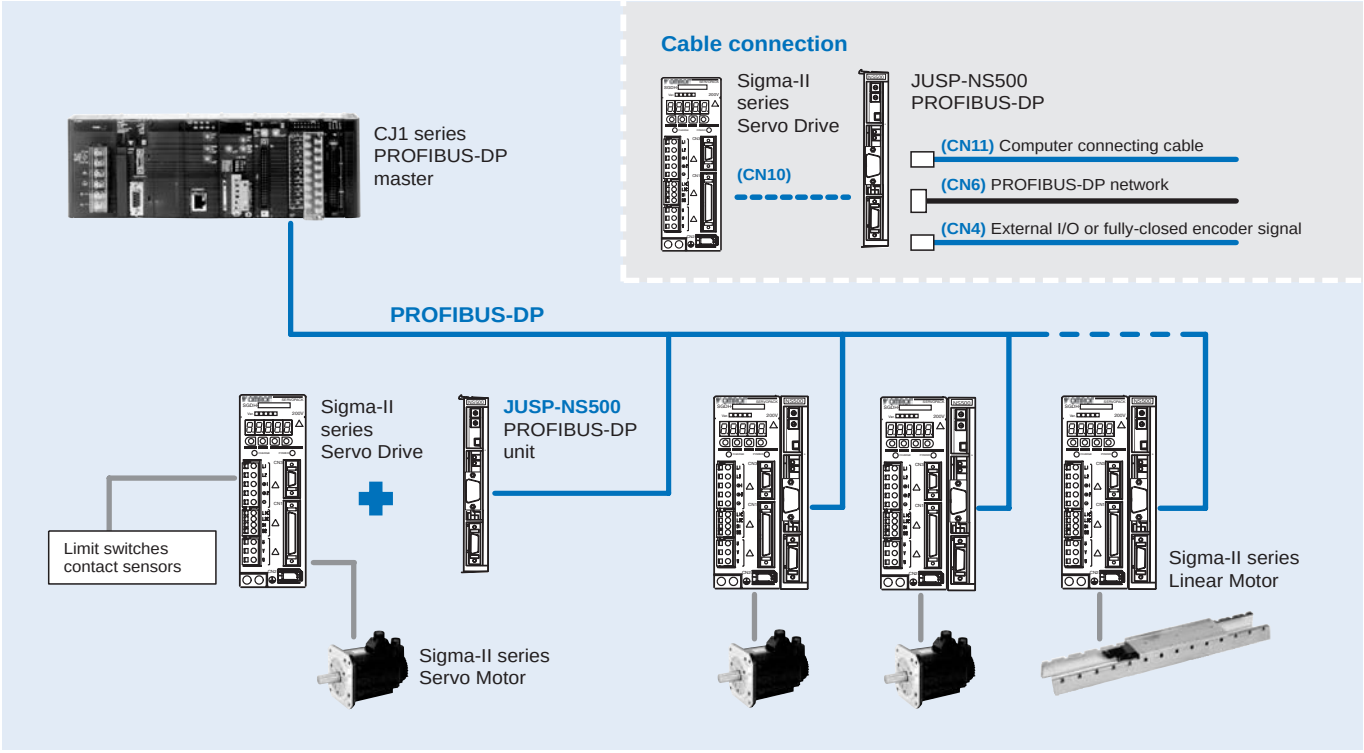
PROFIBUS-DP unit



PROFIBUS-DP connectivity with positioning functionality.

- Connects directly to the Sigma-II series drive
- Simplifies distributed control and information management
- No programming languages are required.
- Various positioning functions including point-to-point mode (with multi-step speed positioning available) and station number mode (indexing function)
- All parameters are set and maintained by a PLC or PC.
- Up to 126 servos can be connected to the PROFIBUS-DP network

System configuration



Specifications

JUSP-NS500 - PROFIBUS-DP interface unit

Item		Details
Type		JUSP-NS500
Applicable servo drive		All SGDH-□□□E models
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	1.3 W
PROFIBUS-DP communications	Baud rate setting	The baud rate is automatically set by the master between 9.6 kbps and 12 Mbps.
	Station address setting	Select the address from 0 to 7D (0 to 125) using the rotary switches.
Command format	Operation specifications	Positioning using PROFIBUS-DP communications
	Reference input	PROFIBUS-DP communications Commands: motion commands (position, speed), parameter read/write
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully-closed control	Possible
Input signals	Fixed allocation to SERVOPACK CN1 connector	Forward/reverse run prohibited, zero point return deceleration LS, zero point signal, external positioning signal
	NS500 unit	Emergency stop signal
Output signals	Servo drive CN1 connector*	Servo alarm, brake interlock, servo ready, positioning completion
	NS500 unit	P1, P2 (area signals)
Internal functions	Position data latch function	Position data latching is possible using phase C, zero point signals, and external signals.
	Protection	Parameters damage, parameter setting errors, communications errors, etc.
	LED indicators	ERR: Module error COMM: Communications status

Note: *The allocation of the output signals for brake interlock, servo ready, or positioning completion can be changed using parameter settings.

Transmission specifications

Item	Specifications						
Communication format	Conforms to PROFIBUS-DP						
Transmission speed (kbps)	9.6	19.2	93.75	187.5	500	1500	12000
Transmission distance (m)	1200			1000	400	200	100
Transmission media	STP cable						
Number of stations	32 stations (can be extended to 126 stations using repeater.)						

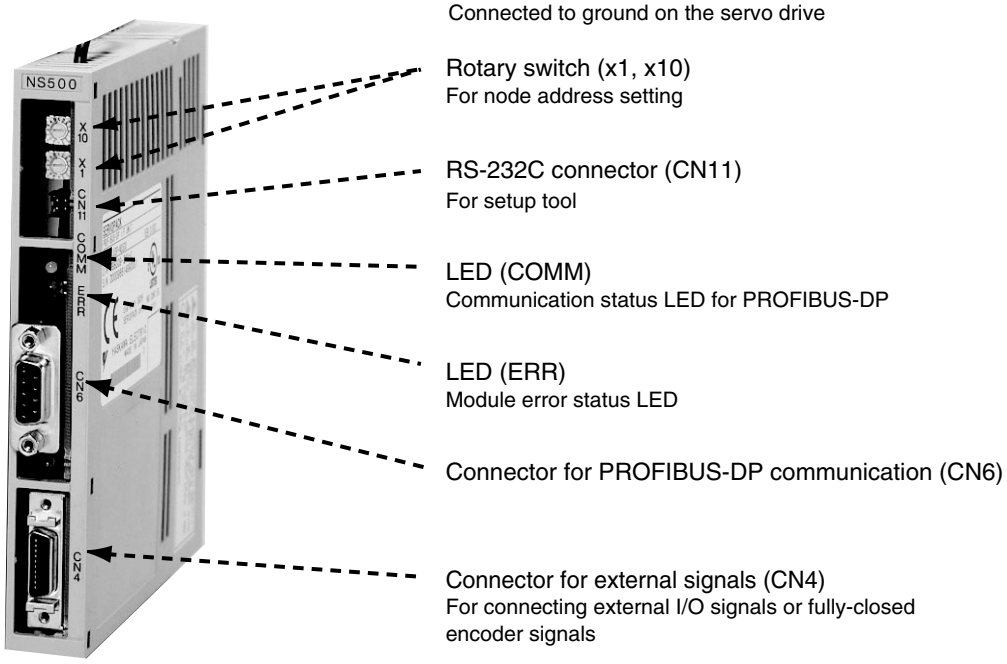
Cable

Item	Specifications
Cable type impedance	Shielded twisted-pair wire type A 135 to 165 Ω
Capacity	< 30 pf/m
Loop resistance	110 Ω/km
Wire gage	0.64 mm
Conductor area	> 0.34 mm^2

Connector

9-pin D-sub connectors are used.

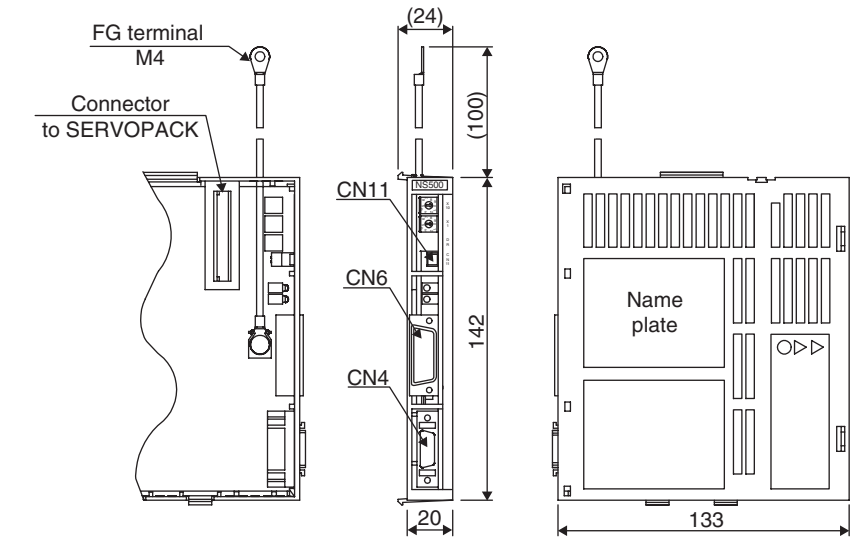
Nomenclature



Dimensions

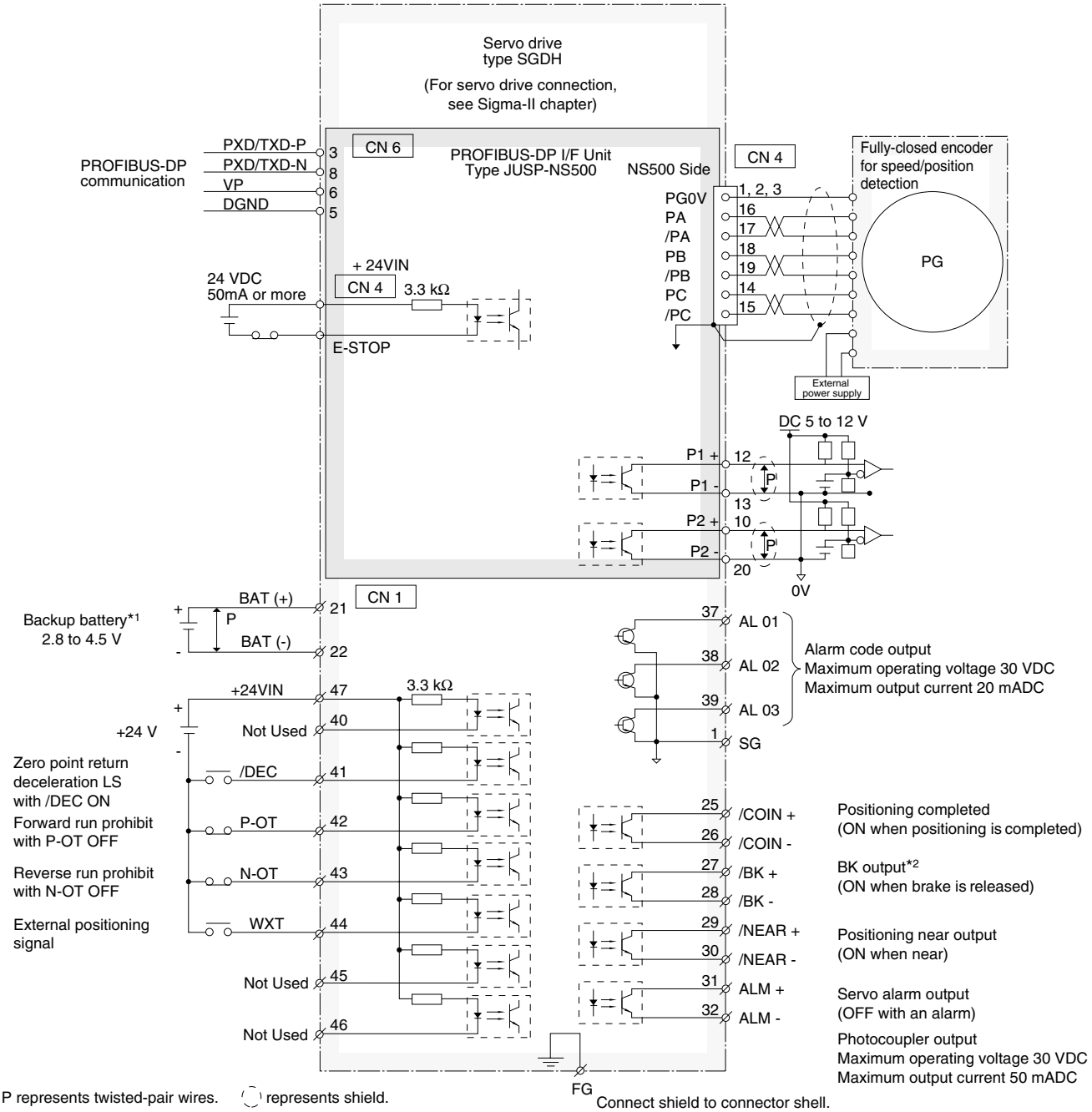
JUSP-NS500 - PROFIBUS-DP interface unit

Units: mm Approx. weight: 0.2 kg



Installation

Standard connections

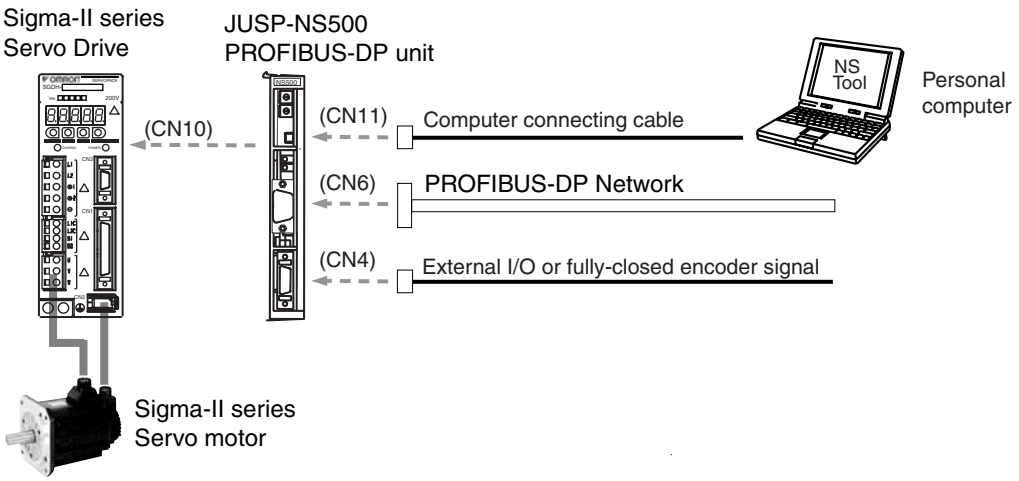


*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Note: Connect the ground cable of the field bus I/F unit to the ground connector of the servo drive.

Ordering information

System configuration



PROFIBUS-DP interface unit

Name	Model
PROFIBUS_DP interface unit with point-to-point positioning functionality	JUSP-NS500

Serial cable (for CN11)

Name		Model
Computer connecting cable	2 m	R88A-CCW002P4

Connectors

Name	Model
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973

Computer software

Name	Model
NS tool	MOTION TOOLS CD
GSD file	

Servo system

Note: Refer to the servo systems section for more information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I12E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

JUSP-NS600

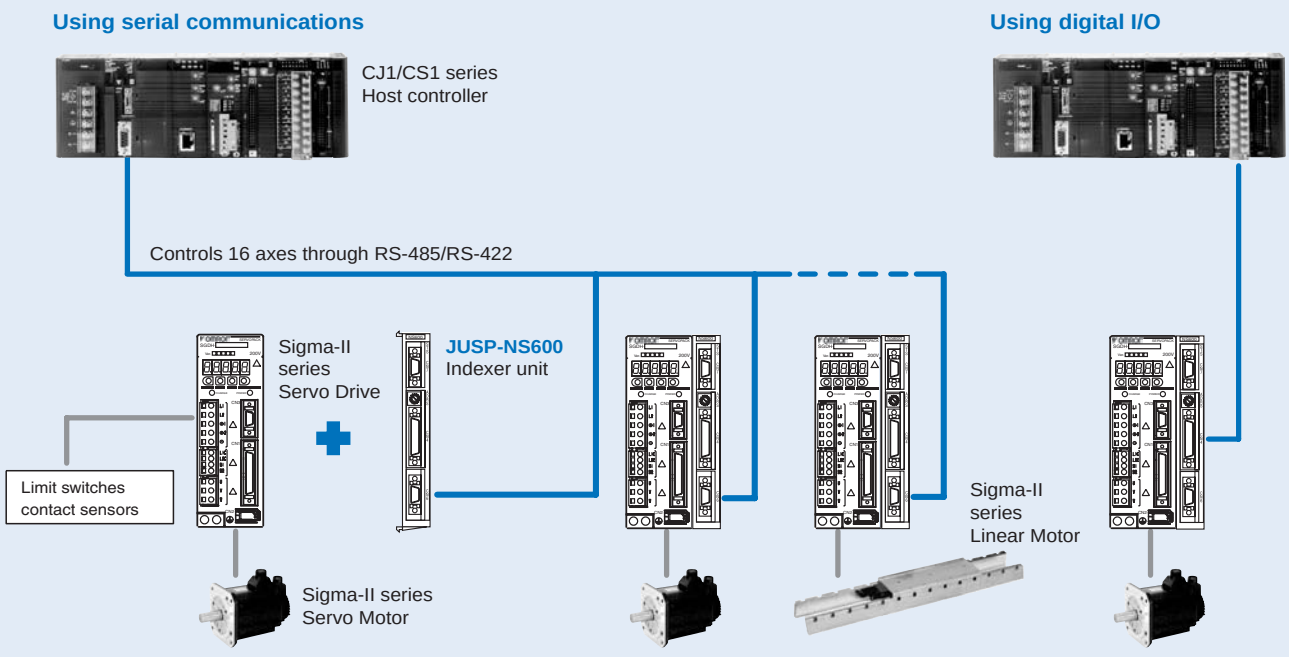
Indexer unit



Smart and simple positioning solution.

- No programming languages are required. Connects directly to the Sigma-II series drive
- Allows serial network control and discrete I/O control
- Servo axis set-up, actuation and monitoring
- 128 indexing programmed moves
- Refined methods and functions for smart control like program tables or position and speed tables
- Up to 16 servos can be connected via serial network
- With SigmaWin+ the system can be easily configured

System configuration

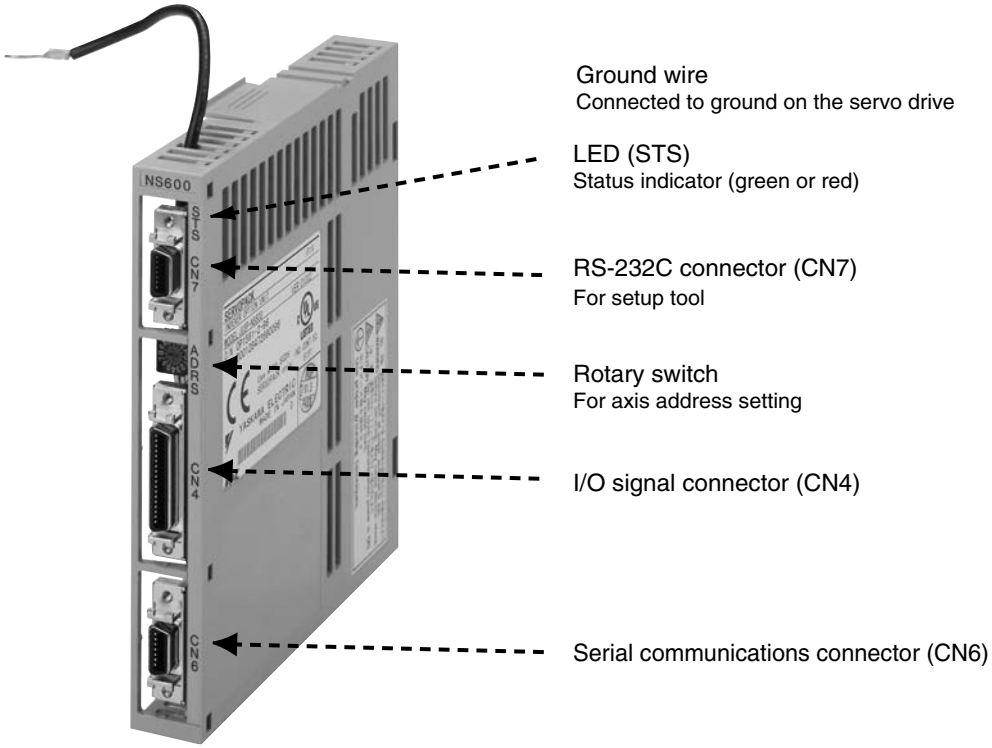


Specifications

JUSP-NS600 - indexer unit

Item			Details
Type			JUSP-NS600
Applicable servo drive			All SGDH-□□□E SERVOPACKs
Installation method			Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method		Supplied from the servo drive control power supply
	Power consumption		2.6 W
Control specifications	Program table		Program table positioning by designating the starting step by the contact input (maximum 128 steps)
	Serial communications		Serial commands in ASCII codes Communications specifications: RS422 / RS485 (maximum 50 m (164.0 ft)) RS232C (maximum 3 m (9.84 ft)) Connection: Multi-drop method (maximum 16 axes) Baud rate: 9600, 19200, 38400bps
	Command table		Positioning by designating the command table by the contact input (maximum 128 points)
	Zero-point return		3 types
Other functions			External positioning, JOG speed table operation (maximum 16 speeds)
I/O signals	Input	Servo drive	S-ON (Servo ON) P-OT (forward run prohibited), N-OT (reverse run prohibited) DEC (zero-point return deceleration LS) RTRG (external positioning signal)
		INDEXER module	MODE0/1 (mode signal) START/HOME (start signal / zero-point return execution) PGMRES/JOGP (program reset / motor forward rotation) SEL0/JOGN (program starting step designation / motor reverse rotation) SEL1 to SEL4 / JOG0 to JOG3 (program starting table selection / JOG speed table selection)
	Output	Servo drive	ALM (servo alarm) WARN (warning) BK (brake interlock) S-RDY (servo ready) ALO1, ALO2, ALO3 (alarm codes)
		INDEXER module	INPOSITION (positioning completed) POUT0 to POUT4 (programable outputs)

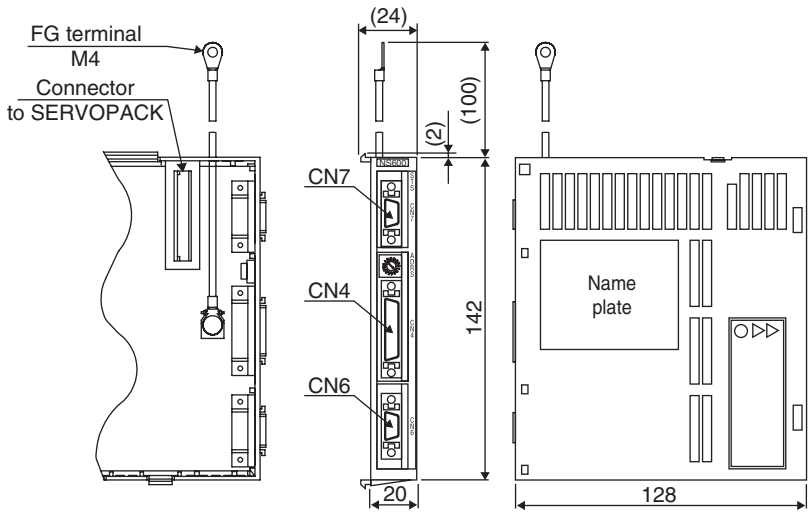
Nomenclature



Dimensions

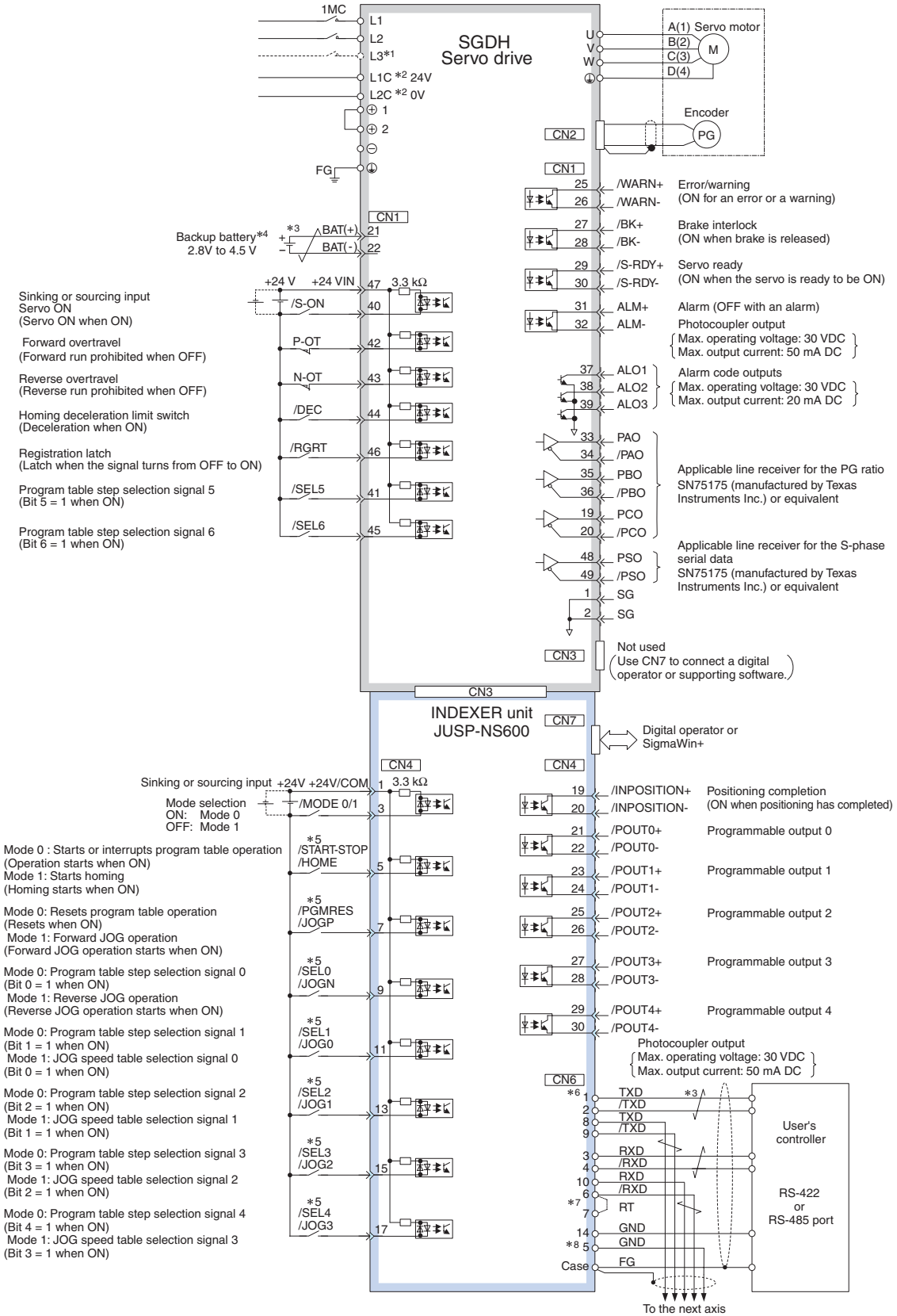
JUSP-NS600 - indexer unit

Units: mm Approx. weight: 0.2 kg



Installation

Standard connections

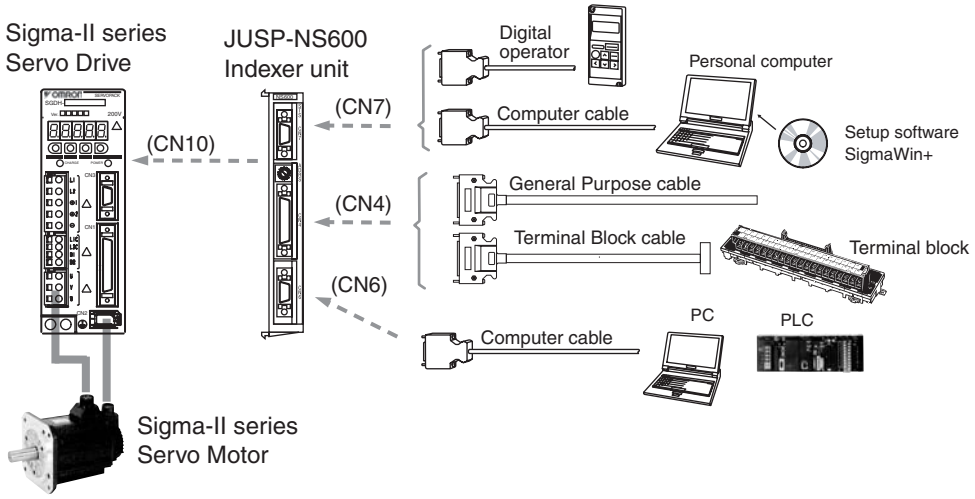


*1: The L3 terminal is for specifications requiring a three-phase power supply.
*2: The control power supply for 400 V-class servo drive is 24 VDC.
*3: ⏥ represents a twisted-pair cable.
*4: Connect a backup battery when an absolute encoder is used and no battery is connected to CN8.
*5: The signal on the first line is in mode 0, and the signal on the second line is in mode 1.
*6: The wiring for CN6 shown here is full-duplex wiring for RS-422 or RS-485 communications.
*7: Short-circuit RT and /RXD at the last axis.
*8: Grounding for pin No.5 is available for hardware version 04 or later.The grounding for pin No.14 is shared with the other pins for hardware version 03 or earlier.The hardware version is shown in the VER. column of the nameplate located on the side of the device (VER.□□□□□).

Note: Connect the ground cable of indexer unit to the ground connector of the servo drive.

Ordering information

System configuration



Indexer option unit

Name	Model
Indexer unit. Versatile point-to-point positioning	JUSP-NS600

Serial options (for CN7)

Name		Model
Computer connecting cable	2 m	R88A-CCW002P2 or JZSP-CMS02
Parameter unit with 1 m cable	2 m	JUSP-OP02A-2 or R88A-PR02W

Control cables (for CN4)

Name		Model
Relay terminal block		XW2B-40F5-P
Relay terminal block cables	1 m	R88A-CTU001N
	2 m	R88A-CTU002N
General purpose I/O cable (with open end)	1 m	FND-CCX001S
	2 m	FND-CCX002S

Serial cables (for CN6)

Name		Model
Computer connecting cable	2 m	R88A-CCW002P2 or JZSP-CMS02

Connectors

Specification	Model
Connector for CN4	R88A-CNU01C
Connector for CN6 and CN7	R7A-CNA01R

Computer software

Specifications	Model
SigmaWin+	MOTION TOOLS CD

Servo system

Note: Refer to the servo systems section for more information.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I13E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

AC Servo systems

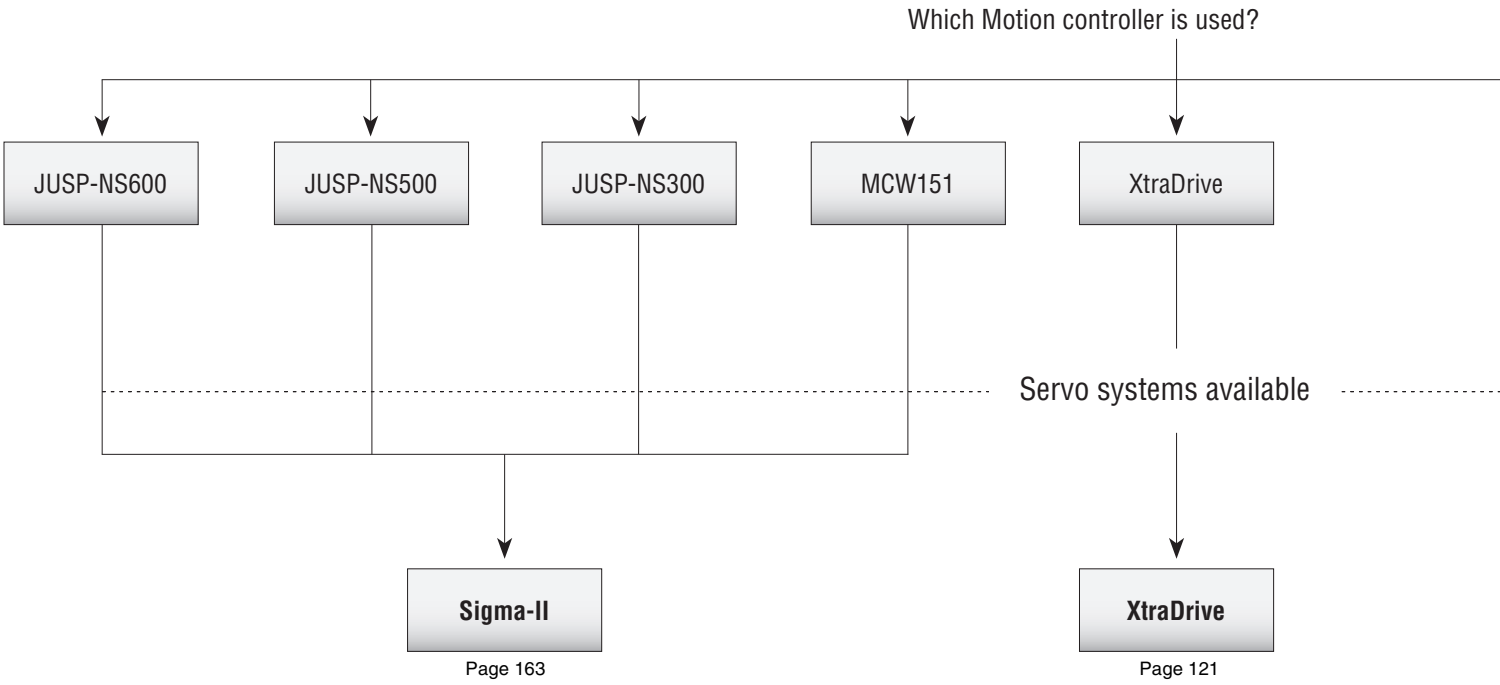
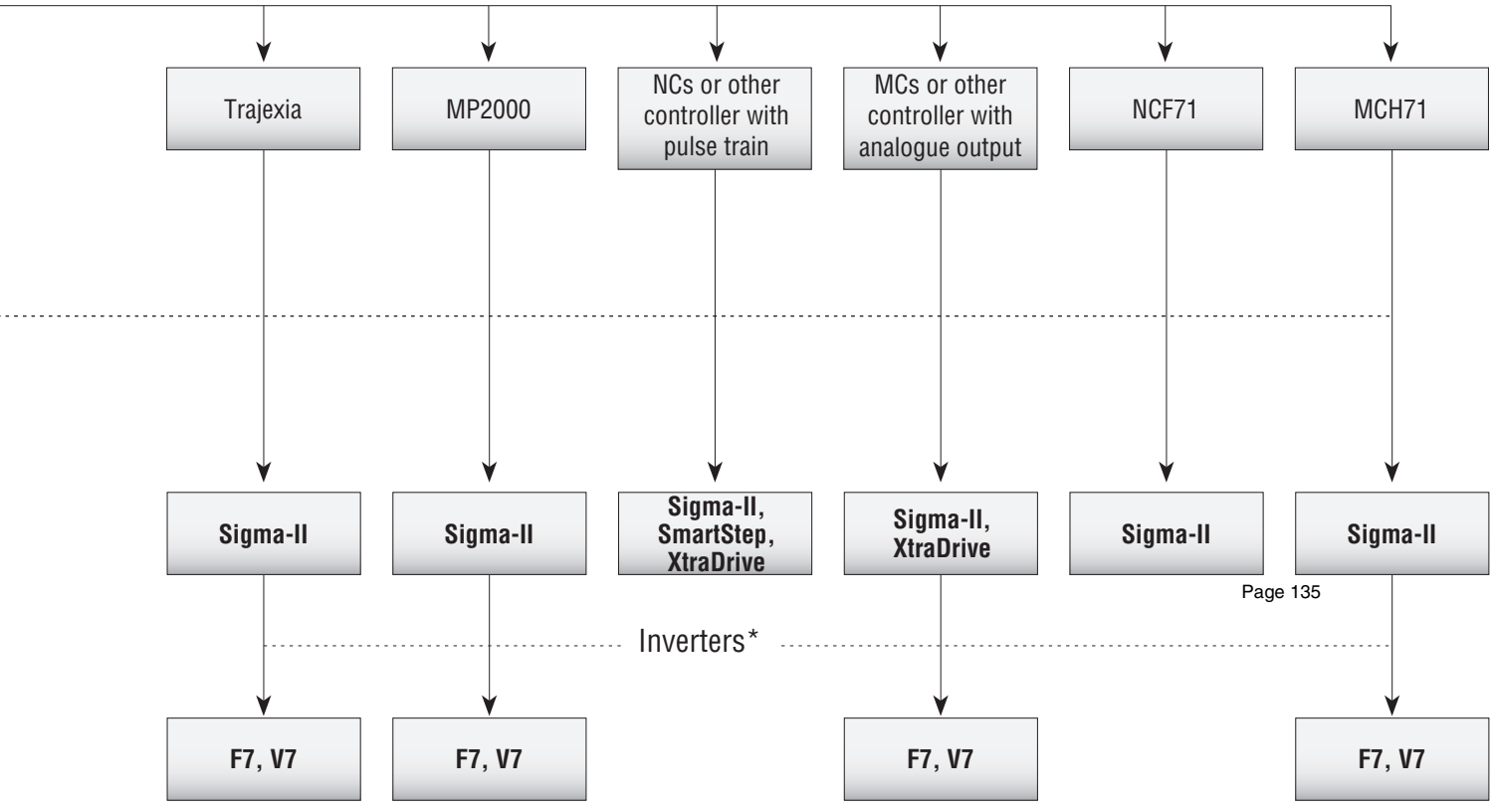


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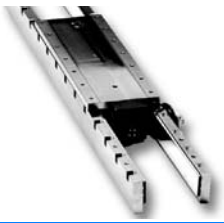
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	SmartStep servo drive	153
Rotary servo motors	Sigma-II rotary servo motors	163
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	Sigma linear axis	221
	Sigma linear trac-micro	235

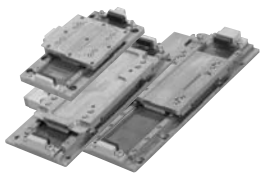


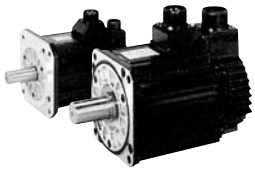
*see Inverter chapter

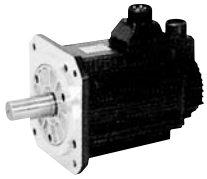
Selection table

Servo drives			
			
	XtraDrive	**Sigma-II**	**SmartStep**
	All in one! servo drive and motion controller integrated	Designed with ZERO compromise	Servo capability with stepper simplicity
Ratings 230 V single-phase	30 W to 1,500 W	30 W to 1,500 W	30 W to 800 W
Ratings 400 V single-phase	0.5 kW to 5 kW	0.5 kW to 55 kW	N/A
Motors applicable	Sigma linear motors, rotary Sigma-II and SmartStep motors	Rotary Sigma-II, rotary direct drives and Sigma linear motors	SmartStep motors
Positioning control	Internal program, pulse train input or via PROFIBUS	Pulse train input or via option unit	Pulse train input
Speed control	Internal program, analogue ±10 V or via PROFIBUS	Analogue ±10 V or via option unit	N/A
Torque control	Internal program, analogue ±10 V or via PROFIBUS	Analogue ±10 V or via option unit	N/A
Page	121	135	153

Sigma linear servo motors			
			
	SGLFW	**SGLGW**	**SGLTW**
	Iron-core Sigma linear motor, making the difference	Coreless GW linear motor construction results in zero attraction force	Iron-core TW linear motor with magnetic attraction cancellation
Rated force range	25 N to 2250 N	12.5 N to 325 N	300 N to 2000 N
Peak force range	86 N to 5400 N	40 N to 1300 N	600 N to 7500 N
Maximum speed	5 m/sec	5 m/sec	5 m/sec
Design type	Iron-core coil	Coreless coil	Iron-core coil
Magnetic attraction	314 N to 14600 N	zero	zero
Drives applicable	Sigma-II and XtraDrive	Sigma-II and XtraDrive	Sigma-II and XtraDrive
Page	195		

Sigma linear servo motors		
		
	LETLA	**SGTMM**
	Linear axes ready to use	Flat construction for mounting at narrow spaces
Rated force range	80 N to 1120 N	3.5 N to 7 N
Peak force range	220 N to 2400 N	10 N to 25 N
Maximum speed	5 m/sec	1.5 m/sec
Design type	Iron-core coil	Moving magnet
Magnetic attraction	810 N to 6520 N	zero
Drives applicable	Sigma-II and XtraDrive	Sigma-II
Page	221	235

Sigma linear servo motors			
			
	SGMAH	**SGMPH**	**SGMGH**
	Sigma-II rotary motors (6 different motor families to cover all application needs)		
	Low-inertia design for high dynamics	Medium inertia design with flat profile	High torque servo motors
Rated speed	3000 rpm	3000 rpm	1500 rpm
Maximum speed	5000 rpm	5000 rpm	3000 rpm
Rated torque	0.095 Nm to 2.39 Nm	0.318 Nm to 4.77 Nm	2.84 Nm to 95.4 Nm
Sizes	30 to 750 W	100 to 1500 W	0.45 to 15 kW
Drives applicable	Sigma-II and XtraDrive	Sigma-II and XtraDrive	Sigma-II and XtraDrive
Encoder resolution	13 bits-incremental / 16 bits-absolute	13 bits-incremental / 16 bits-absolute	17 bits-incremental and absolute
IP rating	IP55	IP55 (optional IP67)	IP67
Page	163		

Sigma linear servo motors			
			
	SGMSH	**SGMUH**	**SGMBH**
	Sigma-II rotary motors (6 different motor families to cover all application needs)		
	Low-inertia motors for high dynamics	High speed servo motors	High power applications
Rated speed	3000 rpm	6000 rpm	1500 rpm
Maximum speed	5000 rpm	6000 rpm	2000 rpm
Rated torque	3.18 Nm to 15.8 Nm	1.59 Nm to 6.3 Nm	140 Nm to 350 Nm
Sizes	1 to 5 kW	1 to 5 kW	22 kW to 55 kW
Drives applicable	Sigma-II and XtraDrive	Sigma-II and XtraDrive	Sigma-II
Encoder resolution	17 bits-incremental and absolute	17 bits-incremental	17 bits-incremental and absolute
IP rating	IP67	IP67	IP44
Page	163		

Sigma linear servo motors		
		
	SmartStep	**SGMCS**
	SmartStep motors	Direct drive
	Ultra compact motor	Gearless high torque rotary motors
Rated speed	3000 rpm	150 / 200 rpm
Maximum speed	4500 rpm	500 rpm
Rated torque	0.095 Nm to 2.39 Nm	2 Nm to 80 Nm
Sizes	30 to 800 W	42 to 1.5 kW
Drives applicable	SmartStep and XtraDrive	Sigma-II
Encoder resolution	2000 pulses/revolution	20 bits-absolute
IP rating	IP55	IP42
Page	181	189

XD-□, XD-□-E

XtraDrive



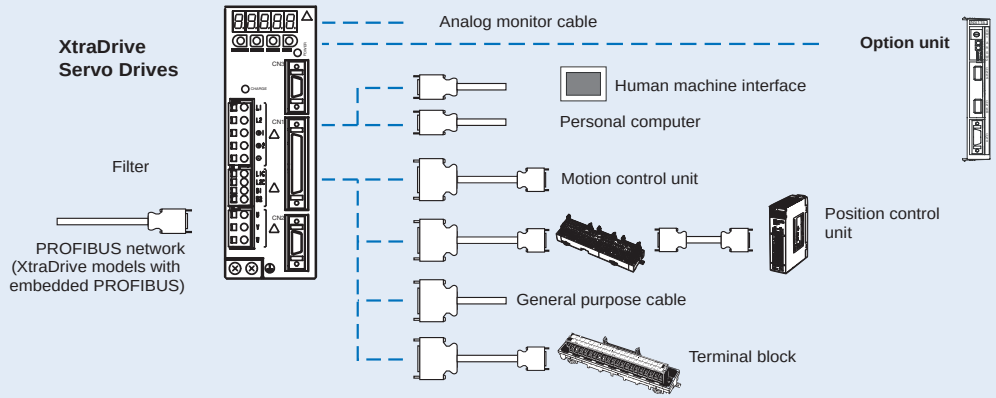
Intelligent servo drive. Integrated controller and network connectivity.

- NCT. Patented non-linear algorithm for tight control
- Very low tracking error with no overshoot and zero settling time
- Supports different servo motor encoder types
- PROFIBUS embedded in the drive available
- XtraDive model available with electronic CAM
- The ideal drive for linear motor control
- Fast hardware registration input
- Intuitive text programming language
- Automatic tuning of servo parameters for optimal settling time
- Oscilloscope available via XtraWare software tool
- CompoWay/F is supported, it allows remote access to the drives through the PLC

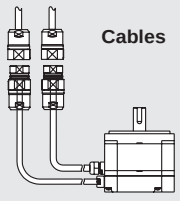
Ratings

- 230 VAC single-phase 30 W to 1.5 kW (4.77 Nm)
- 400 VAC three-phase 0.5 kW to 5.0 kW (28.4 Nm)

System configuration

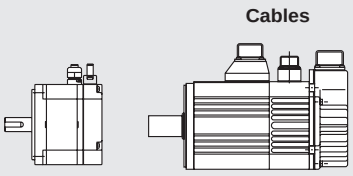


(Refer to chapter SmartStep servo motors)



R7M Servo Motor

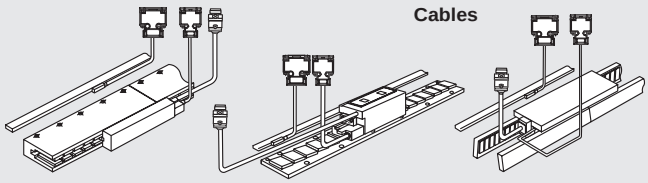
(Refer to chapter Sigma-II rotary motors)



SGMAH, SGMPH Servo Motor

SGMGH, SGMUH, SGMSH, SGMBH Servo Motor

(Refer to chapter Sigma-II linear motors)



SGLG_ linear Servo Motor

SGLF_ linear Servo Motor

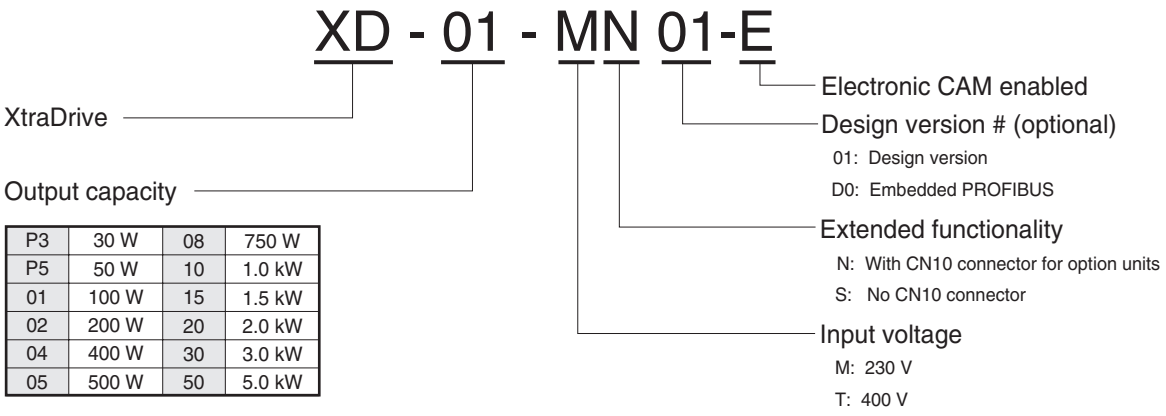
SGLT_ linear Servo Motor

Servo motor / servo drive combination

Servo motor				Servo drive			
	Voltage	Rated torque	Capacity	230 V (1-phase)	230 V (1-phase) w PROFIBUS	400 V (3-phase)	400 V (3-phase) w PROFIBUS
Sigma-II series motors (refer to the Sigma-II rotary motors chapter for details)							
SGMAH (3000 min^{-1}) 	230 V	0.0955 N.m	30 W	XD-P3-MN01-□	XD-P3-MSD0-□	-	-
		0.159 N.m	50 W	XD-P5-MN01-□	XD-P5-MSD0-□	-	-
		0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
	400 V	0.955 N.m	300 W	-	-	XD-05-TN□	XD-05-TSD0-□
		2.07 N.m	650 W	-	-	XD-10-TN□	XD-10-TSD0-□
SGMPH (3000 min^{-1}) 	230 V	0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□-□	XD-08-MSD0-□	-	-
		4.77 N.m	1500 W	XD-15-MN□-□	-	-	-
	400 V	0.637 N.m	200 W	-	-	XD-05-TN□	XD-05-TSD0-□
		1.27 N.m	400 W	-	-	XD-05-TN□	XD-05-TSD0-□
		2.39 N.m	750 W	-	-	XD-10-TN□	XD-10-TSD0-□
		4.77 N.m	1500 W	-	-	XD-15-TN□	XD-15-TSD0-□
SGMGH (1500 min^{-1}) 	400 V	2.84 N.m	0.45 kW	-	-	XD-05-TN□	XD-05-TSD0-□
		5.39 N.m	0.85 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		8.34 N.m	1.3 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		11.5 N.m	1.8 kW	-	-	XD-20-TN□	XD-20-TSD0-□
		18.6 N.m	2.9 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		28.4 N.m	4.4 kW	-	-	XD-50-TN□	-
SGMSH (3000 min^{-1}) 	400 V	3.18 N.m	1.0 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		4.90 N.m	1.5 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		6.36 N.m	2.0 kW	-	-	XD-20-TN□	XD-20-TSD0-□
		9.80 N.m	3.0 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		12.6 N.m	4.0 kW	-	-	XD-50-TN□	-
		15.8 N.m	5.0 kW	-	-	XD-50-TN□	-
SGMUH (6000 min^{-1}) 	400 V	1.59 N.m	1.0 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		2.45 N.m	1.5 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		4.9 N.m	3.0 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		6.3 N.m	4.0 kW	-	-	XD-50-TN□	-
SmartStep series motors (refer to the SmartStep servo motors chapter for details)							
R7M-A (3000 min^{-1}) 	230 V	0.0955 N.m	30 W	XD-P3-MN01-□	-	-	-
		0.159 N.m	50 W	XD-P5-MN01-□	-	-	-
		0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
R7M-AP (3000 min^{-1}) 	230 V	0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
Sigma linear motors (refer to the Sigma linear motors chapter for details)							
SGLGW Linear motors 	230 V	Refer to the linear motors chapter for details					
SGLFW Linear motors 	230 V, 400 V	Refer to the linear motors chapter for details					
SGLTW Linear motors 	400 V	Refer to the linear motors chapter for details					

Type designation

Drive



P3	30 W	08	750 W
P5	50 W	10	1.0 kW
01	100 W	15	1.5 kW
02	200 W	20	2.0 kW
04	400 W	30	3.0 kW
05	500 W	50	5.0 kW

Servo drive specifications

Single-phase, 230 V

Servo drive type			XD-P3-M□	XD-P5-M□	XD-01-M□	XD-02-M□	XD-04-M□	XD-08-M□	XD-15-M□
Applicable servo motor		SGMAH-□	A3A□	A5A□	01A□	02A□	04A□	08A□	15A□
		SGMPH-□	-	-	01A□	02A□	04A□	08A□	-
		R7M-□	A03030-□	A05030-□	A10030-□	A20030-□	A40030-□	A75030-□	-
		R7M-□	-	-	AP10030-□	AP20030-□	AP40030-□	AP75030-□	-
Basic specifications	Max. applicable motor capacity	W	30	50	100	200	400	750	1500
	Continuous output current	Arms	0.44	0.64	0.91	2.1	2.8	5.7	11.6
	Max. output current	Arms	1.3	2.0	2.8	6.5	8.5	13.9	28
	Input power	Main circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
	Supply	Control circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
	Control method		Single phase full-wave rectification / IGBT / PWM / sine-wave current drive method						
	Feedback		Serial encoder (incremental/absolute value)						
	Conditions: Usage/storage temperature		0 to +55 °C / -20 to 85 °C						
	Conditions: Usage/storage humidity		90%RH or less (non-condensing)						
	Conditions: Altitude		1000 m or less above sea level						
	Conditions: Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2						
	Configuration		Base mounted						
	Approx. weight	Kg	0.8				1.1	1.7	3.8

Three-phase, 400 V

Servo drive type			XD-05-T□	XD-10-T□	XD-15-T□	XD-20-T□	XD-30-T□	XD-50-T□
Applicable servo motor		SGMAH-□	03D□	07D□	-	-	-	-
		SGMPH-□	02D□, 04D□	08D□	15D□	-	-	-
		SGMGH-□	05D□	09D□	13D□	20D□	30D□	44D□
		SGMSH-□	-	10D□	15D□	20D□	30D□	40D□/50D□
		SGMUH-□	-	10D□	15D□	-	30D□	40D□
Basic specifications	Max. applicable motor capacity	kW	0.45	1.0	1.5	2.0	3.0	5.0
	Continuous output current	Arms	1.9	3.5	5.4	8.4	11.9	16.5
	Max. output current	Arms	5.5	8.5	14	20	28	40.5
	Input power	Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60 Hz)					
	Supply	Control circuit	24 VDC+15%					
	Control method		Three phase full-wave rectification / IGBT / PWM / sine-wave current drive method					
	Feedback		Serial encoder (incremental/absolute value)					
	Conditions: Usage/storage temperature		0 to +55 °C / -20 to +85 °C					
	Conditions: Usage/storage humidity		90%RH or less (non condensing)					
	Conditions: Altitude		1000 m or less above sea level					
	Conditions: Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2					
	Configuration		Base mounted					
	Approx. weight	Kg	2.8			3.8		5.5

General specifications

Speed/torque control mode	Performance	Speed control range		1:5000
		Speed variance	Load variance	During 0 to 100% load ±0.01% max. (at rated speed)
			Voltage variance	Rated voltage ±10%: 0% (at rated speed)
			Temperature variance	25 ±25 °C: ±0.1 % max (at rated speed)
		Frequency characteristics		400Hz (at $J_L = J_M$)
		Torque control accuracy (reproducibility)		±2%
		Soft start time setting		0 to 10s (acceleration, deceleration can each be set.)
	Input signal	Speed reference input	Reference voltage	±6VDC (forward motor rotation if positive reference) at rated speed: Set at delivery Variable setting range: ±2 to ±10 VDC at rated speed/ max. input voltage: ±12 V
			Input empedance	Approx. 14 kΩ
			Circuit time constant	-
		Torque reference input	Reference voltage	±3 VDC (forward rotation if positive reference) at rated speed: Set at delivery Variable setting range ±1 to ±10 VDC at rated torque reference
			Imput impedance	Approx. 14 KΩ
			Circuit time constant	Approx. 47 µs
		Contact speed reference	Rotation direction selection	With P control signal
			Speed selection	With forward/reverse current limit signal (speed 1 to 3 selection), servo motor stops or another control method is used when both are OFF.
Position control mode	Performance	Bias Setting		0 to 450 min^{-1} (setting resolution: 1 min^{-1})
		Feed forward compensation		0 to 100 % (setting resolution: 1%)
		Position completed width setting		0 to 250 command units (setting resolution: 1 command unit)
	Input signal	Command pulse	Input pulse type	Sign + pulse train, 90° phase displacement 2-phase pulse (A-phase+ B-phase) or CCW/CW pulse train
			Input pulse form	Line driver (+5 V level) , open collector (+5 V or +12 level)
			Input pulse frequency	0 to 500 Kpps (200 Kpps max. at open collector)
		Control signal		Clear signal (input pulse is same as reference pulse)
I/O signal		Position signal output		A-phase, B.phase, C-phase, (S-phase): line driver output S-phase is for absolute encoder only.
		Sequence input signal		Servo ON, P control (or control mode switching, zero clamp, command pulse inhibit), forward/reverse run prohibit, alarm reset, forward/ reverse current limit (or internal speed switching)
		Sequence output signal		Servo alarm, alarm codes (3-bit output): CN1 output terminal is fixed
				It is possible to output three types of signals form among: positioning complete (speed agree), motor rotation, servo ready, current limit, speed limit, brake release, warning, NEAR, and zero point pulse signal
Integrated functions		Communications	Interface	Digital operator (hand- held type), RS-422 port for PCs, etc. (RS-232C ports under some conditions)
			1:N communications	N may equal up to 14 when an RS-422A port is used. CompoWay/F protocol is supported on firmware version "3.20C" and higher
			Axis address setting	Set by user setting
			Functions	Status display, user constant setting monitor display, alarm traceback display, JOG run /autotuning operations, and graphing functions for speed/torque command signal, etc
			PROFIBUS	(Only models with PROFIBUS) PROFIBUS DP slave, node address 0-125 set by rotary switches, baud rate from 9.6 kbps to 12 Mbps. LED Indicators: Bus failure and system failure
		Auto tuning function		Position speed loop gain and integral time constant can be automatically set.
		Dynamic brake (DB)		Operates during main power OFF, servo alarm, servo OFF or overtravel
		Regenerative processing		Regenerative resistor externally mounted (option)
		Overtravel (OT) prevention function		DB stop, deceleration stop or coast to stop during P-OT, N-OT operation
		Encoder divider function		Optional division possible
		Electronic gearing		0,01< A/B<100
		Internal speed setting function		3 speeds may be set internally
		Protective functions		Overcurrent, overvoltage, insufficient voltage, overload, main circuit sensor error, heatsink overheat, power phase loss, overflow, overspeed, encoder error, runaway, CPU error, parameter error, etc.
		Analog monitor functions for supervision		Integrates analog monitor connectors for supervision of the speed and torque reference signals, etc.
		Display functions		CHARGE, POWER, 7-segments LEDx5 (Integrated digital operator function, not available in models with PROFIBUS)
		Others		Reverse connection, zero search, automatic motor discrimination function, and DC reactor connection terminal for high frequency power suppression function (except: 6 to 15 kW)

I/O specifications

Terminal specifications

Symbol	Name	Function	
L1, L2 or L1, L2, L3	Main circuit AC input terminal	AC power input terminals for the main circuit	
U	Servo motor connection terminal	Red	Terminals for outputs to the servo motor.
V		White	
W		Blue	
L1C, L2C	Control power input terminal	AC power input terminals for the control circuit.	
⏚	Frame ground	Ground terminal. Ground to a maximum of 100 Ω. (class 3)	
B1, B2 or B1, B2, B3	Main circuit DC output terminal	5 kW or less: Connect an external regenerative resistor if regenerative energy is high. 5.5 kW: There is no internal regenerative resistor. Be sure to connect an external regenerative resistor unit.	
⊕1, ⊕2	DC reactor connection terminal for suppressing power supply harmonic waves	Normally, short ⊕1 and ⊕2. If a countermeasure against power supply harmonic waves is needed, connect a DC reactor between ⊕1 and ⊕2.	
⊕	Main circuit DC output terminal (+)	Normally, not connected. This terminal exists on the servo drives with a capacity opf 6.0 kW or higher only.	
⊖	Main circuit DC output terminal (n-)	Normally, not connected.	

Encoder connector (CN2)

Pin	Symbol	Function
1, 2, 3	PPG0V	Encoder power supply GND
4, 5, 6	PPG5V	Encoder power supply +5 V
7	-	-
8	PS+	Encoder serial signal input
9	PS–	Encoder serial signal input
10	SePG5V	Serial encoder power supply +5 V (Sigma-II)
11	SePG0V	Serial encoder power supply GND (Sigma-II)
12	BAT+	Battery + (used only with absolute encoder)
13	BAT-	Battery - (used only with absolute encoder)
14	PC+	Encoder + C-phase input
15	PC–	Encoder – C-phase input
16	A+	Encoder + A-phase input
17	A–	Encoder – A-phase input
18	B+	Encoder + B-phase input
19	B–	Encoder – B-phase input
20	-	-
Shell	FG	Cable shield ground

I/O signals (CN1) - input signals

Pin No.	Signal Name		Function	
40	Common	/S-ON	Servo ON: Turns ON the servo motor when the gate block in the inverter is released.	
41		/P-CON	Function selected by parameter.	
			Proportional control reference	Switches the speed control loop from PI (proportional/ integral) to P (proportional) control when ON.
			Direction reference	With the internal set speed selected: switch the rotation direction.
			Control mode switching	Position ↔ speed Position ↔ torque Torque ↔ speed } Enables control mode switching.
			Zero-clamp reference	Speed control with zero-clamp function: referencevspeed is zero when ON.
			Reference pulse block	Position control with reference pulse stop: stops reference pulse input when ON.
42 43		P-OT N-OT	Forward run prohibited Reverse run prohibited	Overtravel prohibited: stops servo motor when movable part travels beyond the allowable range of motion.
45 46		/P-CL /N-CL	Function selected by parameter.	
			Forward external torque limit ON Reverse external torque limit ON	Current limit function enabled when ON.
			Internal speed switching	With the internal set speed selected: switches the internal speed settings.
44		/ALM-RST	Alarm reset: releases the servo alarm state.	
47		+24VIN	Control power supply input for sequence signals: users must provide the +24 V power supply. Allowable voltage fluctuation range: 11 to 25 V	
4 (2)		SEN	Initial data request signal when using an absolute encoder.	
21 22		BAT (+) BAT (-)	Connecting pin for the absolute encoder backup battery. Do not connect when a battery is connected to the host controller.	
5 (6)	Speed	V-REF	Speed reference speed input: ±2 to ±10 V/rated motor speed (input gain can be modified using a parameter.)	
9 (10)	Torque	T-REF	Torque reference input: ±1 to ±10 V/rated motor torque (input gain can be modified using a parameter.)	
7 8 11 12	Position	PULS /PULS SIGN /SIGN	Reference pulse input for line driver only	Input mode is set from the following pulses. Sign + pulse string CCW/CW pulse Two-phase pulse (90° phase differential)
15 14		CLR /CLR	Positional error pulse clear input: clears the positional error pulse during position control.	
3 13 18		PL1 PL2 PL3	+12 V pull-up power is supplied when PULS, SIGN, and CLR reference signals are open-collector outputs (+12 V power supply is built into the SERVOPACK).	

Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /S-ON, /P-CON. P-OT, N-OT, /ALM-RST, /P-CL, and /N-CL input signals can be changed by using the parameters.

3. The voltage input range for speed and torque references is a maximum of ±12 V.

I/O signals (CN1) - output signals

Pin No.	Signal name		Function	
31 32	Common	ALM+ ALM-	Servo alarm: Turns OFF when an error is detected.	
27 28		/TGON+ /TGON-	Detection during servo motor rotation: detects when the servo motor is rotating at a speed higher than the motor speed setting. Detection speed can be set by using the parameters.	
29 30		/S-RDY+ /S-RDY-	Servo ready: ON if there is no servo alarm when the control/main circuit power supply is turned ON.	
33 (1) 34		PAO /PAO	Phase-A signal	Converted two-phase pulse (phases A and B) encoder output signal and zero-point pulse (phase C) signal: RS-422 or the equivalent (proper line receiver is SN75175 manufactured by Texas Instruments or the equivalent corresponding to MC3486.)
35 36		PBO /PBO	Phase-B signal	
19 20		PCO /PCO	Phase-C signal	
48 49		PSO /PSO	Phase-S signal	With an absolute encoder: Outputs serial data corresponding to the number of revolutions (RS-422 or the equivalent)
37 38 39 (1)		ALO1 ALO2 ALO3	Alarm code output: Outputs 3-bit alarm codes. Open-collector: 30 V and 20 mA rating maximum	
16		TMON	Analog monitor signal	
17		VTG	Analog monitor signal	
Shell		FG	Connected to frame ground if the shield wire of the I/O signal cable is connected to the connector shell.	
25 26	Speed	/V-CMP+ /V-CMP-	Speed coincidence (output in speed control mode): Detects whether the motor speed is within the setting range and if it matches the reference speed value.	
25 26	Position	/COIN+ /COIN-	Positioning completed (output in position control mode): Turns ON when the number of positional error pulses reaches the value set. The setting is the number of positional error pulses set in reference units (input pulse units defined by the electronic gear).	
-	Reserved	/CLT /VLT /BK /WARN /NEAR	Reserved terminals The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.	
23 24 50		-	Terminals not used Do not connect relays to these terminals.	

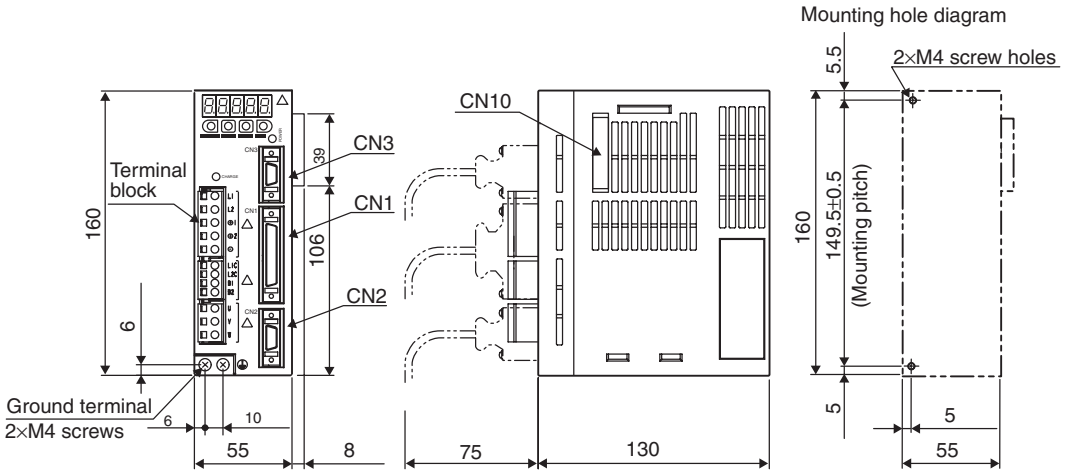
Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.

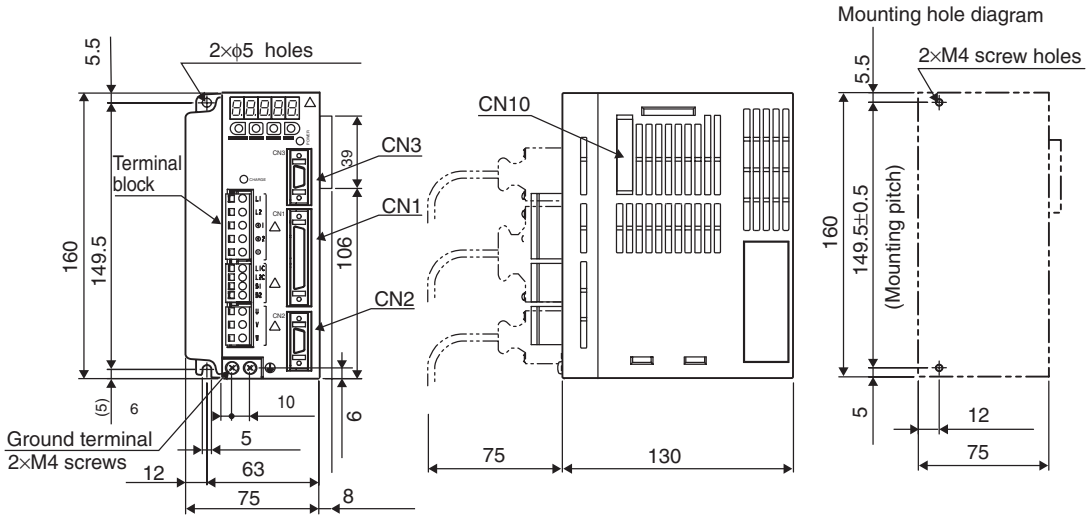
Dimensions

Servo drives

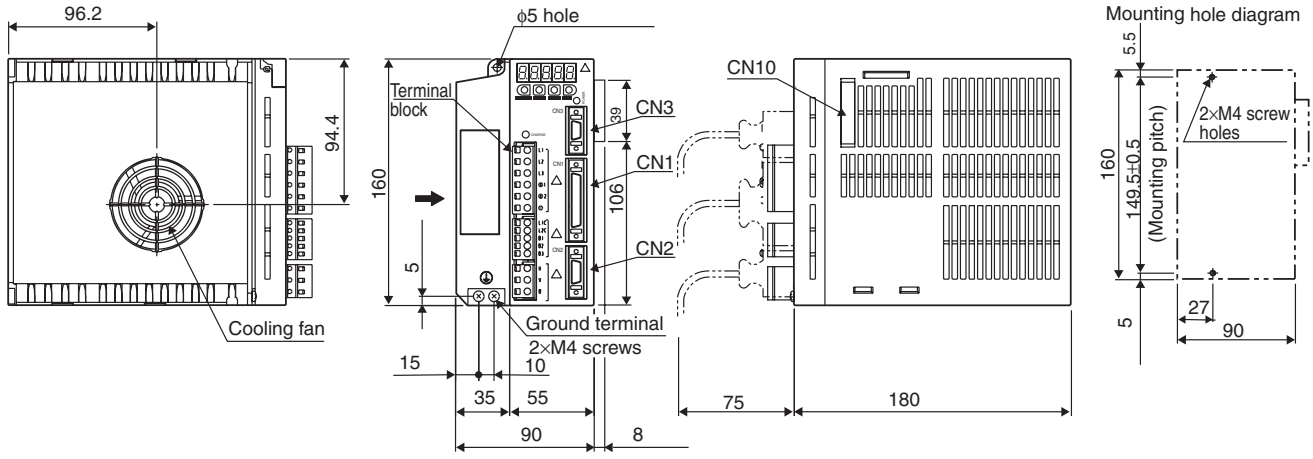
XD-P3-M□ to XD-02-M□ (230V, 30 to 200W)



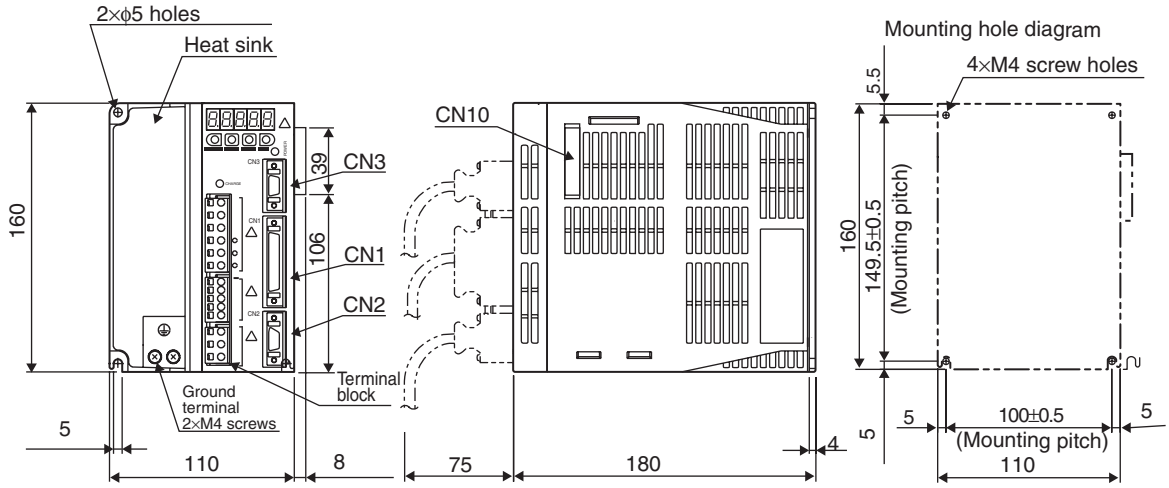
XD-04-M□ (230V, 400W)



XD-08-M□ (230V, 750W)

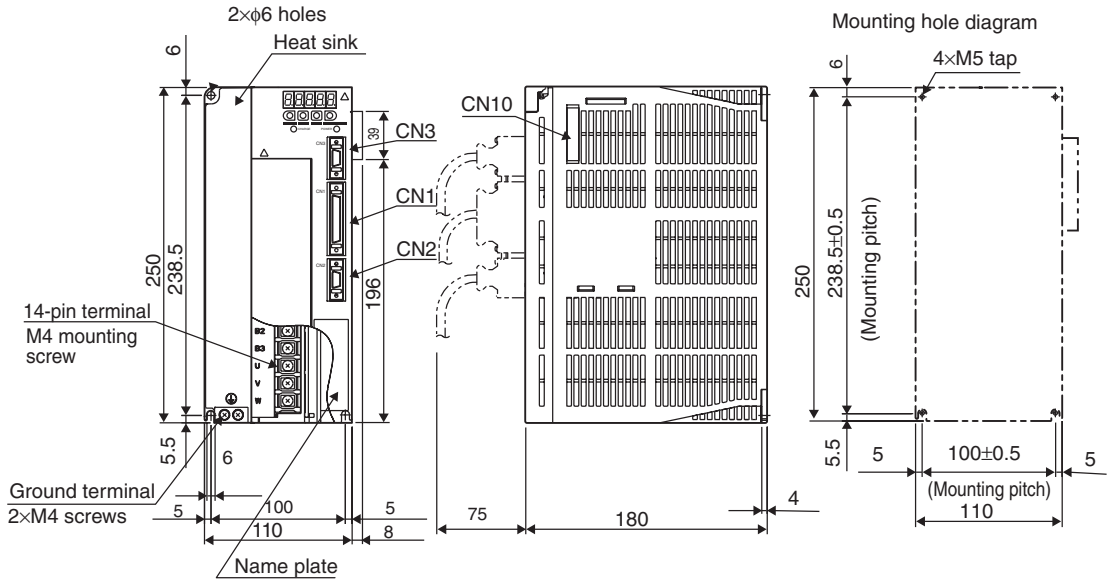


XD-05-T□ to -15-T□ (400V, 0.5 to 1.5kW)

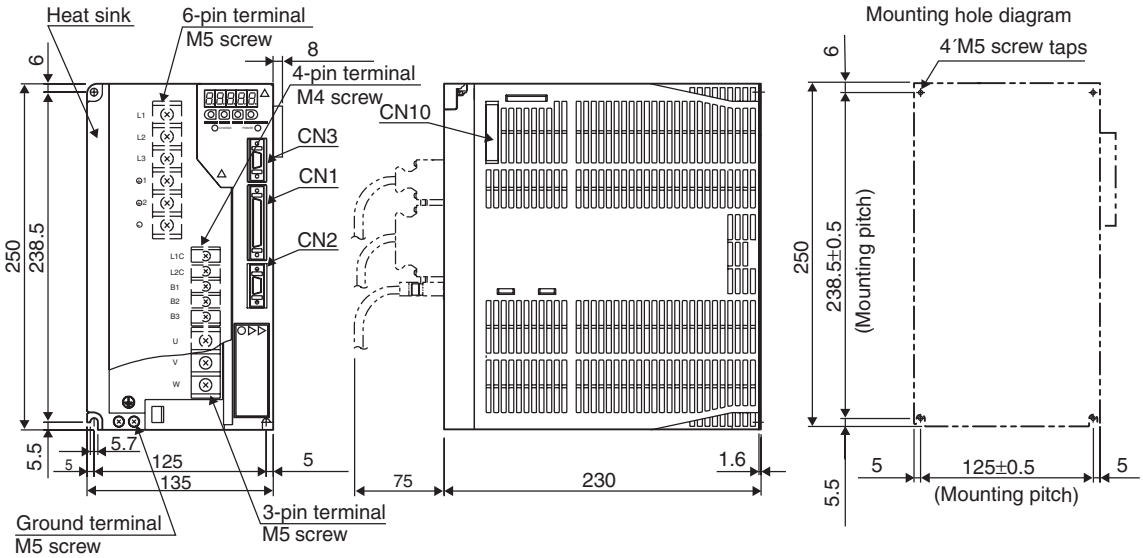


XD-15-M□ (230V, 1.5kW)

XD-20-T□, XD-30-T□ (400V, 2/3kW)

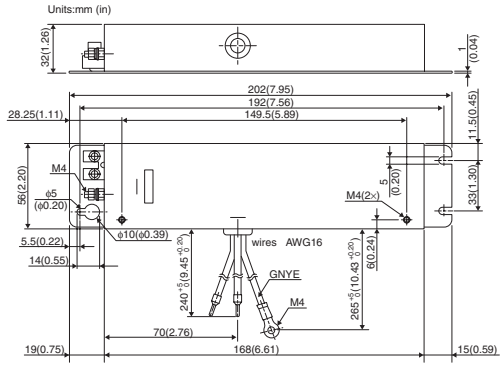


XD-50-T□ (400V, 5kW)



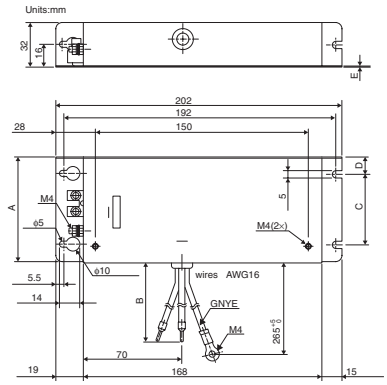
Filters

R88A-FIW104-SE

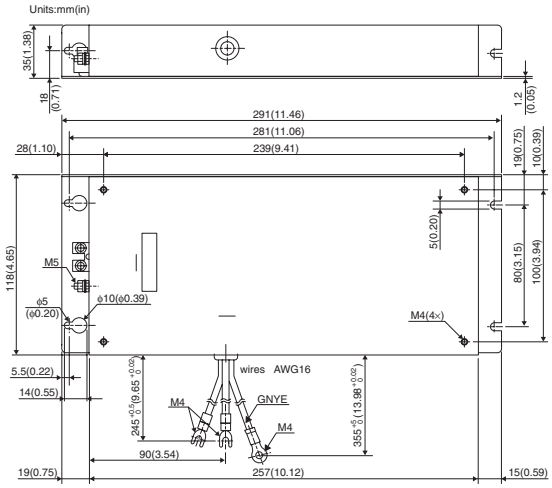


R88A-FIW107-SE, R88A-FIW115-SE

Model		R88A-FIW107-SE	R88A-FIW115-SE
Dimensions in mm	A	75	90
	B	240^{+5}	300^{+5}
	C	50	60
	D	12	15
	E	1	1.2

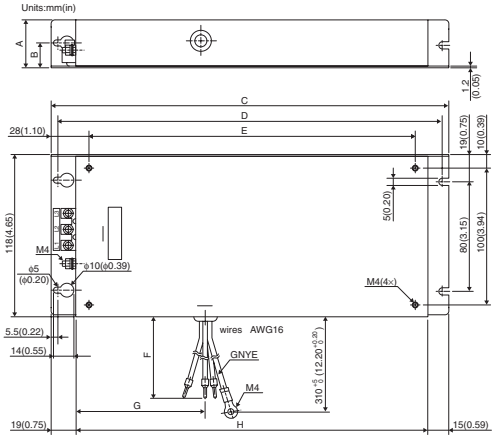


R88A-FIW125-SE

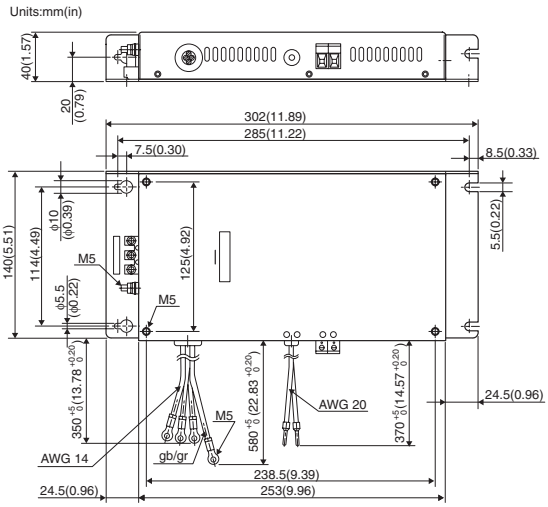


R88A-FIW4006-SE, R88A-FIW4010-SE

Model		R88A-FIW4006-SE	R88A-FIW4010-SE
Dimensions in mm (in)	A	32 (1.26)	35 (1.38)
	B	16 (0.63)	18 (0.71)
	C	202 (7.95)	291 (11.46)
	D	192 (7.56)	281 (11.06)
	E	150 (5.91)	239 (9.41)
	F	300 (11.81)	270 (10.63)
	G	70 (2.76)	90 (3.54)
	H	168 (6.61)	257 (10.12)

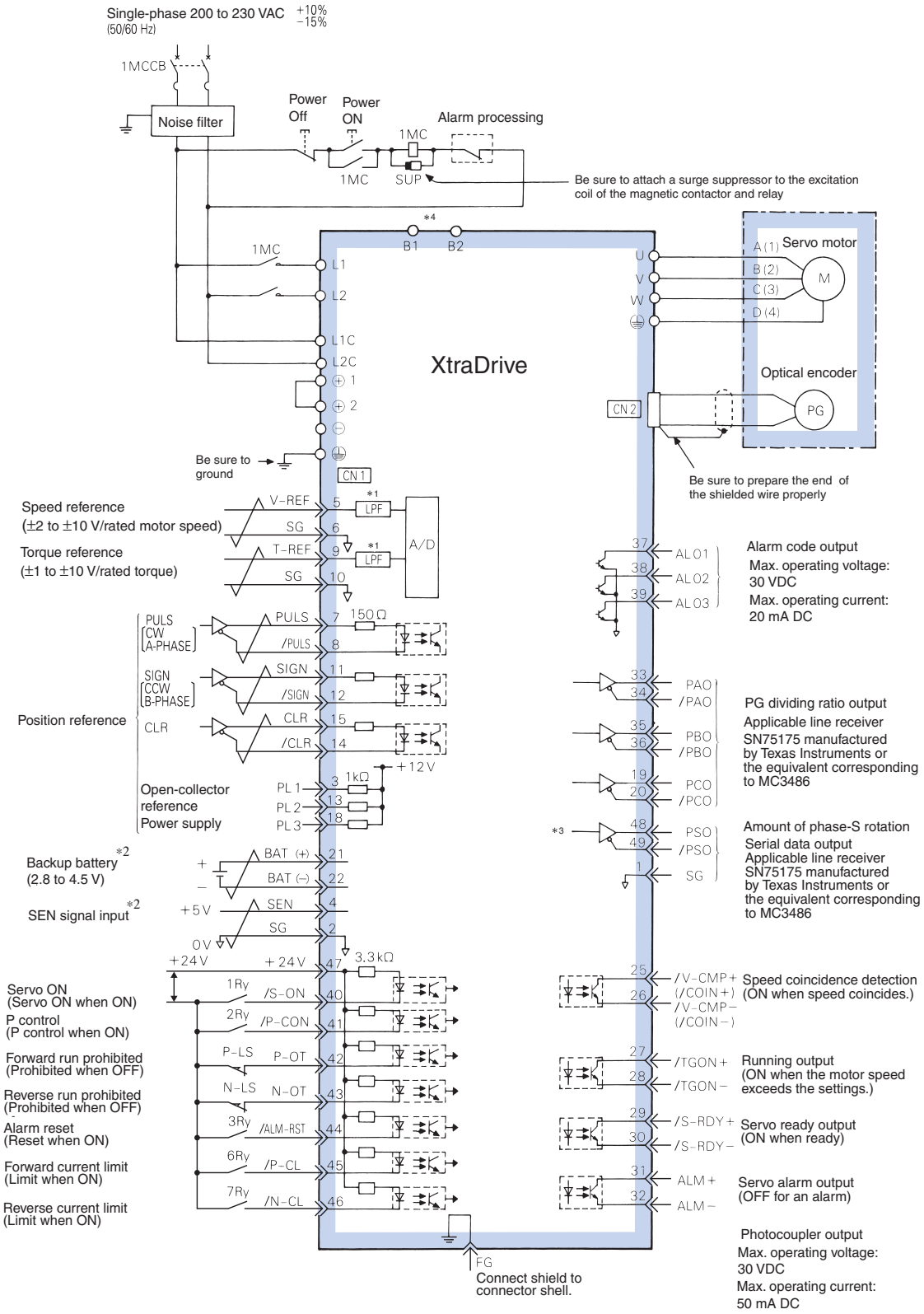


R88A-FIW4020-SE



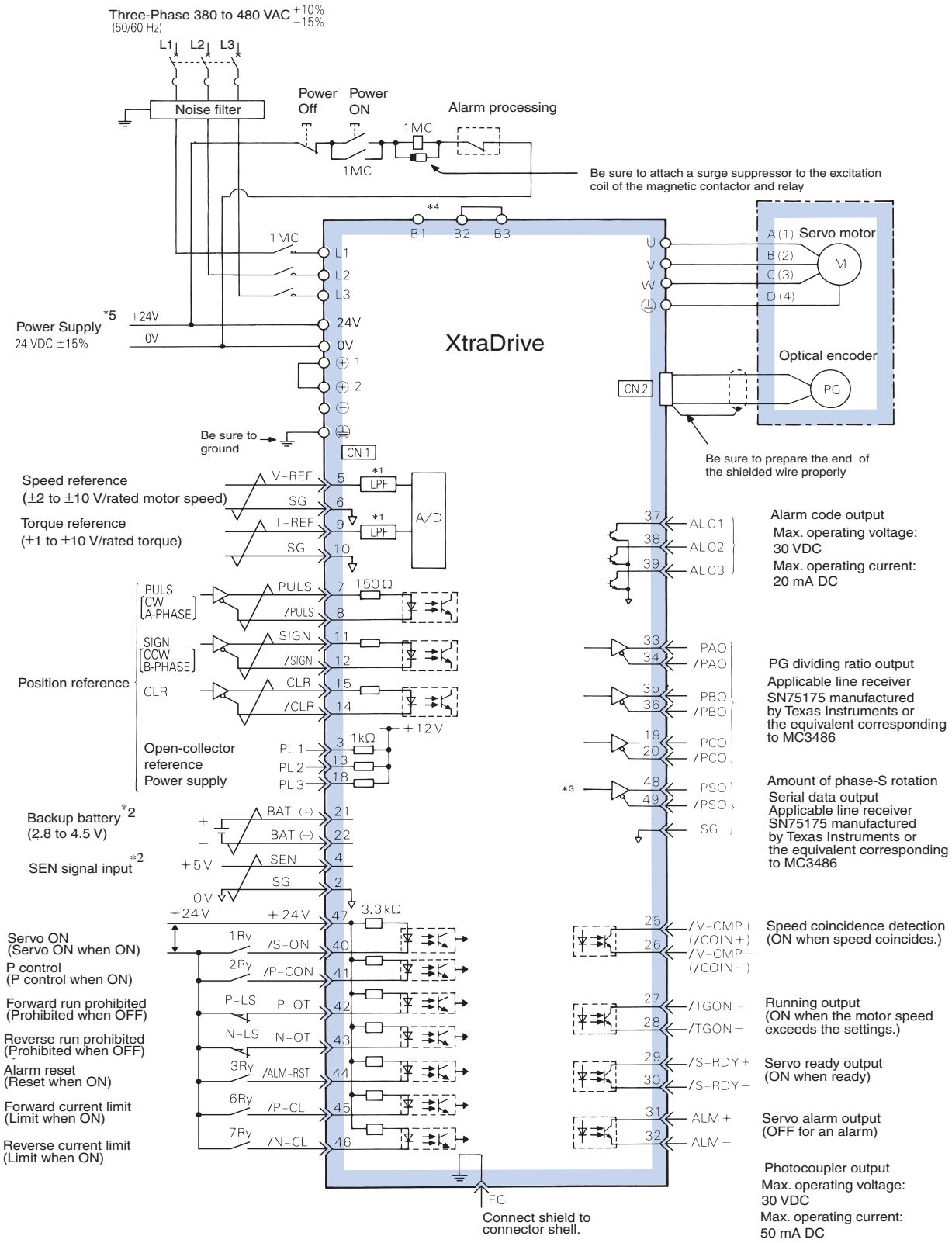
Installation

Single-phase, 230 VAC



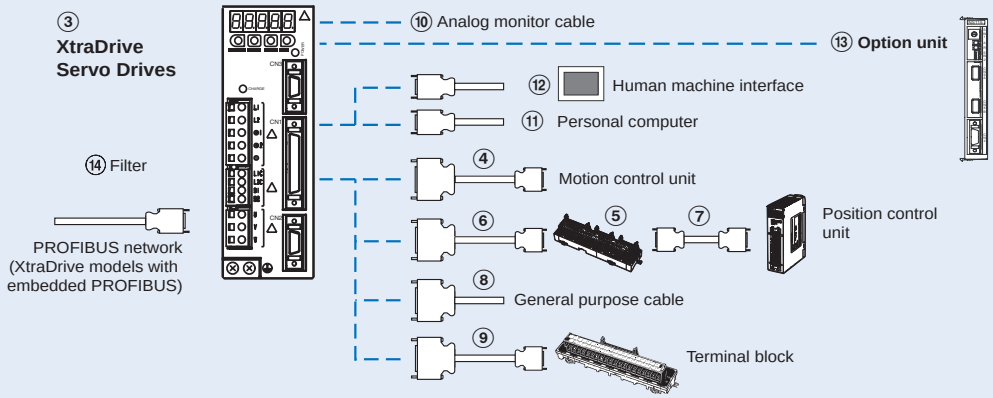
*1 The time constant for the primary filter is 47 μs.
*2 Connect when using an absolute encoder.
*3 Used only with an absolute encoder.
*4 Regenerative resistor can be connected between B1 and B2.
*6 TI stands for Texas Instruments Inc.

Three-phase, 400 VAC

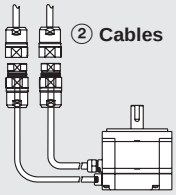


*1 The time constant for the primary filter is 47 μs.
*2 Connect when using an absolute encoder.
*3 Used only with an absolute encoder.
*4 For using an external regenerative resistor, connect it between B1 and B2.
*5 The 24VDC power is supplyed by the user.
*6 TI stands for Texas Instruments Inc.

Ordering information

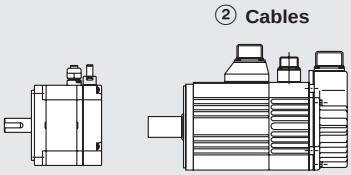


(Refer to chapter SmartStep servo motors)



① R7M Servo Motor

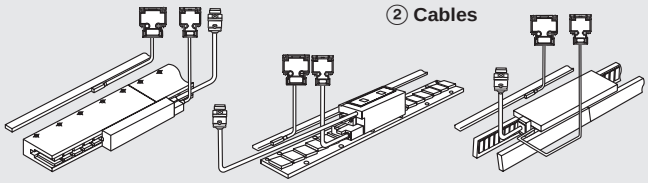
(Refer to chapter Sigma-II rotary motors)



① SGMAH, SGMPH Servo Motor

① SGMGH, SGMUH, SGMSH, SGMBH Servo Motor

(Refer to chapter Sigma-II linear motors)



① SGLG_ linear Servo Motor

① SGLF_ linear Servo Motor

① SGLT_ linear Servo Motor

Note: The symbols ①②③④⑤... show the recommended sequence to select the components for a servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo Drives

Symol	Specifications		XtraDrive	XtraDrive-E with electronic CAM	XtraDrive-DP with PROFIBUS	XtraDrive-DP-E with PROFIBUS and electronic CAM	Compatible servo motors ①		
							Sigma-II rotary	SmartStep	Sigma linear motors
③	1 phase 200 VAC	30 W	XD-P3-MN01	XD-P3-MN01-E	XD-P3-MSD0	XD-P3-MSD0-E	SGMAH-A3A□	R7M-A03030-□	-
		50 W	XD-P5-MN01	XD-P5-MN01-E	XD-P5-MSD0	XD-P5-MSD0-E	SGMAH-A5D□	R7M-A05030-□	SGLGW-30A050□
		100 W	XD-01-MN01	XD-01-MN01-E	XD-01-MSD0	XD-01-MSD0-E	SGMAH-01A□, SGMPH-01A□	R7M-A10030-□, R7M-AP10030-□	SGLGW-30A080□, SGLGW-40A140□
		200 W	XD-02-MN01	XD-02-MN01-E	XD-02-MSD0	XD-02-MSD0-E	SGMAH-02A□, SGMPH-02A□	R7M-A20030-□, R7M-AP20030-□	SGLFW-20A□, SGLFW-35A120□, SGLGW-40A253A□, SGLGW-60A140□
		400 W	XD-04-MN01	XD-04-MN01-E	XD-04-MSD0	XD-04-MSD0-E	SGMAH-04A□, SGMPH-04A□	R7M-A40030-□, R7M-AP40030-□	SGLGW-40A365A□, SGLGW-60A253A□
		750 W	XD-08-MN	XD-08-MN00-E	XD-08-MSD0	XD-08-MSD0-E	SGMAH-08A□, SGMPH-08A□	R7M-A75030-□, R7M-AP75030-□	SGLFW-35A230□, SGLFW-50A200□, SGLGW-60A365A□
		1.5 kW	XD-15-MN	XD-15-MN00-E	-	-	SGMPH-15A□	-	SGLFW-50A380□, SGLFW-1ZA200□, SGLGW-90A200A□
	3 Phase 400 VAC	0.5 kW	XD-05-TN	XD-05-TN00-E	XD-05-TSD0	XD-05-TSD0-E	SGMGH-05D□, SGMAH-03D□, SGMPH-02D□/04D□	-	SGLFW-35D□
		1.0 kW	XD-10-TN	XD-10-TN00-E	XD-10-TSD0	XD-10-TSD0-E	SGMGH-09D□, SGMSH/UH-10D□, SGMAH-07D□, SGMPH-08D□	-	SGLFW-50D200□, SGLTW-35D170□, SGLTW-50D170□
		1.5 kW	XD-15-TN	XD-15-TN00-E	XD-15-TSD0	XD-15-TSD0-E	SGMGH-13D□, SGMSH/UH-15D□, SGMPH-15D□	-	SGLFW-50D380□, SGLFW-1ZD200□
		2.0 kW	XD-20-TN	XD-20-TN00-E	XD-20-TSD0	XD-20-TSD0-E	SGMGH-20D□, SGMSH-20D□	-	SGLFW-1ED380□, SGLTW-35D320□, SGLTW-50D320□
		3.0 kW	XD-30-TN	XD-30-TN00-E	XD-30-TSD0	XD-30-TSD0-E	SGMGH-30D□, SGMSH/UH-30D□	-	SGLFW-1ZD380□, SGLFW-1ED560□, SGLTW-40D400□
		5.0 kW	XD-50-TN	XD-50-TN00-E	-	-	SGMGH-44D□, SGMSH/UH-40D□, SGMSH-50D□	-	SGLTW-40D600□, SGLTW-80D400□

Note: SGLGW-□ linear motor combination is made considering the use of standard magnets. Refer to the linear motors chapter for details

Control cables (for CN1)

Symbol	Description	Connect to	Len	Model
④	Control cable (1 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M1
			2 m	R88A-CPW002M1
			3 m	R88A-CPW003M1
			5 m	R88A-CPW005M1
	Control cable (2 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M2
			2 m	R88A-CPW002M2
			3 m	R88A-CPW003M2
			5 m	R88A-CPW005M2
	Terminal block (4 axes)	Motion control unit C200HW-MC402-E	-	R88A-TC04-E
	Servo drive connecting cable (1 axis)		1 m	R88A-CMUK001J3-E2
	PLC unit control cables (4 axes)		1 m	R88A-CMX001S-E
			1 m	R88A-CMX001J1-E
⑤	Servo relay unit	CS1W-NC1□3, CJ1W-NC1□3, or C200HW-NC113 Position control unit		XW2B-20J6-1B (1 axis)
		CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3, or C200HW-NC213/413 Position control unit		XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 CQM1-CPU43		XW2B-20J6-3B (1 axis)
		CJ1M-CPU22/23		XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
⑥	Cable to servo drive	Servo relay units XW2B-□0J6-□B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4
⑦	Position control unit connecting cable	C200H-NC112	0.5 m	XW2Z-050J-A1
			1 m	XW2Z-100J-A1
		C200H-NC211	0.5 m	XW2Z-050J-A2
			1 m	XW2Z-100J-A2
		CQM1-CPU43-V1 and CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑧	Control cable	For general purpose controllers	1 m	R88A-CPW001S or JZSP-CKI01-1
			2 m	R88A-CPW002S or JZSP-CKI01-2
⑨	Relay terminal block cable	General purpose controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay terminal block		-	XW2B-50G5

Cable (for CN5)

Symbol	Name	Model
⑩	Analog monitor cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Model
⑪	Computer connecting cable	R88A-CCW002P2 or JZSP-CMS02

Human machine interface

Symbol	Name	Model
⑫	4.1“ HMI monochrome	NT3S-ST126B-E

Option units (for CN10)

Symbol	Name	Model
⑬	IO card, 8 inputs / 8 outputs	XDIO-08

Filters

Symbol	Applicable servo drive	Filter model	Rated current	Rated voltage
⑭	XD-P3-M□, XD-P5-M□, XD-01-M□, XD-02-M□	R88A-FIW104-SE	4 A	250 VAC single-phase
	XD-04-M□	R88A-FIW107-SE	7A	
	XD-08-M□	R88A-FIW115-SE	15 A	
	XD-15-M□	R88A-FIW125-SE	25 A	
	XD-05-T□, XD-10-T□, XD-15-T□	R88A-FIW4006-SE	6 A	400 VAC three-phase
	XD-20-T□, XD-30-T□	R88A-FIW4010-SE	10 A	
	XD-50-T□	R88A-FIW4020-SE	20 A	

Battery backup for absolute encoder

Name	Model
Battery (required for servo motors with absolute encoder)	JZSP-BA01 ER6VC3 (3.6V)

Connectors

Specification		Model
Control I/O connector (for CN1)		R88A-CNU11C or JZSP-CKI9
XtraDrive 200 V connector kit (for 200 V motors SGMAH/PH-□□A□□□D-OY and R7M-A□-D)	Connectors included	XD-CN200K-DE
	DE9406973 SPOC-17H-FRON169 SPOC-06K-FSDN169	
XtraDrive 400 V connector kit. (for 400 V motors SGMAH/PH-□□D□□□D-OY)	Connectors included	XD-CN400K-DE
	DE9406973 SPOC-17H-FRON169 LPRA-06B-FRBN170	
Sigma-II drive encoder connector (For CN2)		DE9406973 or R88A-CNU01R
Hypertac encoder connector IP67 (for motors SGMAH/PH-□□□□□□□D-OY and R7M-A□-D)		SPOC-17H-FRON169
Hypertac power connector IP67, 200 V. (for 200 V motors SGMAH/PH-□□A□□□□D-OY and R7M-A□-D)		SPOC-06K-FSDN169
Hypertac power connector IP67, 400 V. (for 400 V Motors SGMAH/PH-□□D□□□□D-OY)		LPRA-06B-FRBN170
Military encoder connector IP67 (for Motors SGMGH-□, SGMSH-□, SGMUH-□)		MS3108E20-29S
Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D□, SGMSH-(10/15/20)D□ , SGMUH-(10/15)D□)		MS3108E18-10S
Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D□, SGMSH-(30/40/50)D□, SGMUH-(30/40)D□)		MS3108E22-22S
Military brake connector IP67 (for 400 V servo motors SGMGH-□, SGMSH-□, SGMUH-□)		MS3108E10SL-3S

Computer software

Specifications	Model
XtraWare	MOTION TOOLS

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I18E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

SGDH-□

Sigma-II servo drive



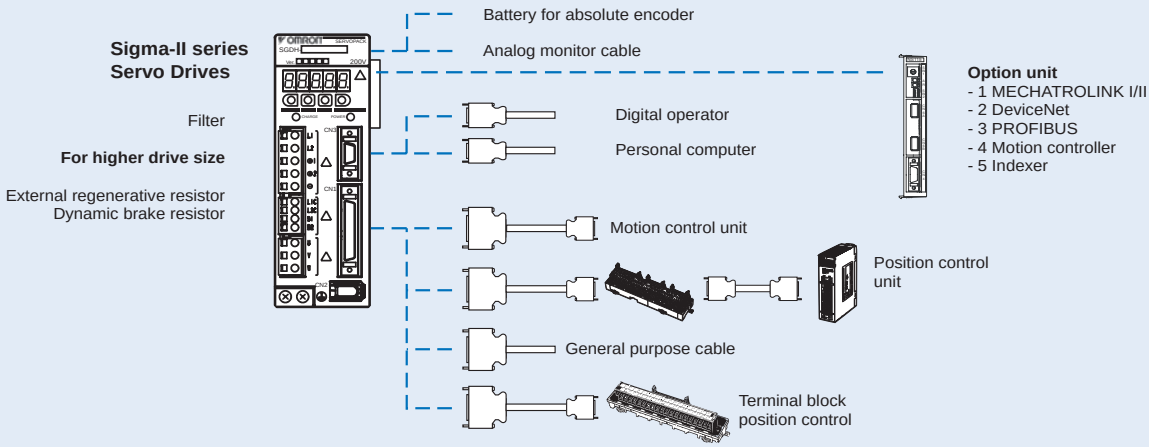
The ideal servo family for motion control. Fast response, high speed, and high accuracy.

- Online autotuning with 10 levels of rigidity
- Peak torque 300% of nominal during 3 seconds
- Automatic motor recognition
- Analogue control for speed and torque
- Pulse train control for positioning
- Optional units offer network connectivity and flexible system architecture
- Smooth operation
- Oscilloscope available via software tool
- Windows based configuration and commissioning software

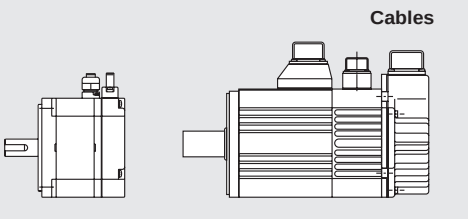
Ratings

- 230 VAC Single-phase 30 W to 1.5 kW (4.77 Nm)
- 400 VAC Three-phase 450 W to 55 kW (350 Nm)

System configuration



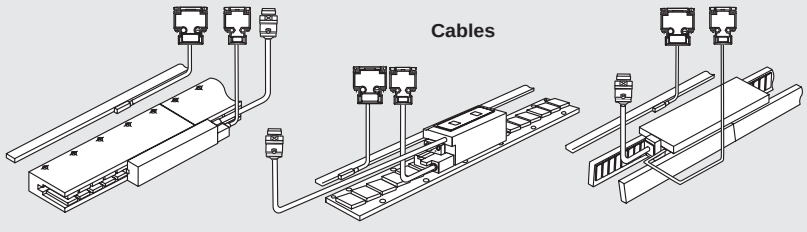
(Refer to chapter Sigma-II rotary motors)



SGMAH, SGMPH Servo Motor

SGMGH, SGMUH, SGMSH, SGMBH Servo Motor

(Refer to chapter Sigma-II linear motors)

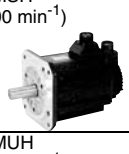


SGLG_ linear Servo Motor

SGLF_ linear Servo Motor

SGLT_ linear Servo Motor

Servo motor supported

Servo motor			
Family	**Voltage**	**Models rated torque**	**Remarks**
SGMAH (3000 min^{-1}) 	230 V	0.0955 Nm to 2.39 Nm	Refer to the Sigma-II rotary motors chapter for details
	400 V	0.955 Nm to 2.07 Nm	
SGMPH (3000 min^{-1}) 	230 V	0.318 Nm to 4.77 Nm	Refer to the Sigma-II rotary motors chapter for details
	400 V	0.637 Nm to 4.77 Nm	
SGMGH (1500 min^{-1}) 	400 V	2.84 Nm to 95.4 Nm	Refer to the Sigma-II Rrotary motors chapter for details
SGMSH (3000 min^{-1}) 	400 V	3.18 Nm to 15.8 Nm	Refer to the Sigma-II Rrotary motors chapter for details
SGMUH (6000 min^{-1}) 	400 V	1.59 Nm to 6.3 Nm	Refer to the Sigma-II rotary motors chapter for details
SGMBH (1500 min^{-1}) 	400 V	140 Nm to 350 Nm	Refer to the Sigma-II rotary motors chapter for details
SGLGW Linear motors 	230 V	12.5 N to 325 N	Refer to the Sigma linear motors chapter for details
SGLFW Linear motors 	230 V	25 N to 560 N	Refer to the Sigma linear motors chapter for details
	400 V	80 N to 2250 N	
SGLTW Linear motors 	400 V	300 N to 2000 N	Refer to the Sigma linear motors chapter for details

Type designation

Servo drive

SGDH - 04 A E - S - OY

Sigma-II servo drive

Capacity

A3	30 W	15	1.5 kW	2B	22 kW
A5	50 W	20	2.0 kW	3Z	30 kW
01	100 W	30	3.0 kW	3G	37 kW
02	200 W	50	5.0 kW	4E	45 kW
04	400 W	60	6.0 kW	5E	55 kW
05	500 W	75	7.5 kW		
08	750 W	1A	11 kW		
10	1.0 kW	1E	15 kW		

Source voltage
- A: 230 V
- D: 400 V

Model
- E: speed, torque, position

Phase

Blank	Three-phase (0.5 to 55kW) Single-phase (30 to 400W)
S	Single-phase (750W/1.5kW)

Servo drive specifications

Single-phase, 230 V

Servo drive type			SGDH-□	A3AE-OY	A5AE-OY	01AE-OY	02AE-OY	04AE-OY	08AE-S-OY	15AE-S-OY
Applicable servo motor			SGMAH-□	A3A□	A5A□	01A□	02A□	04A□	08A□	-
			SGMPH-□	-	-	01A□	02A□	04A□	08A□	15A□
Basic specifications	Max. applicable motor capacity		W	30	50	100	200	400	750	1500
	Continuous output current		Arms	0.44	0.64	0.91	2.1	2.8	5.7	11.6
	Max. output current		Arms	1.3	2.0	2.8	6.5	8.5	13.9	28
	Input power		Main circuit	For single-phase, 200 to 230 VAC + 10 to -15%					220 to 230 VAC +10 to -15% (50/60 Hz)	
	Supply		Control circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
	Control method			Single phase full-wave rectification / IGBT / PWM / sine-wave current drive method						
	Feedback			Serial encoder (incremental/absolute value)						
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to 85 °C						
		Usage/storage humidity		90%RH or less (non-condensing)						
		Altitude		1000m or less above sea level						
		Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2						
	Configuration			Base mounted						
	Approx. weight		Kg	0.8				1.1	1.7	3.8

Three-phase, 400 V (up to 15 kW)

Servo drive type			SGDH-□	05DE-OY	10DE-OY	15DE-OY	20DE-OY	30DE-OY	50DE-OY	60DE-OY	75DE-OY	1ADE-OY	1EDE-OY
Applicable servo motor			SGMGH-□	05D□	09D□	13D□	20D□	30D□	44D□	55D□	75D□	1AD□	1ED□
			SGMSH-□	-	10D□	15D□	20D□	30D□	40D□/50D□	-	-	-	-
			SGMUH-□	-	10D□	15D□	-	30D□	40D□	-	-	-	-
Basic specifications	Max. applicable motor capacity		kW	0.45	1.0	1.5	2.0	3.0	5.0	6.0	7.5	11	15
	Continuous output current		Arms	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
	Max. output current		Arms	5.5	8.5	14	20	28	40.5	55	65	70	85
	Input power		Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60Hz)									
	Supply		Control circuit	24 VDC+ 15%									
	Control method			Three phase full-wave rectification / IGBT / PWM / sine-wave current drive method									
	Feedback			Serial encoder (incremental/absolute)									
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to +85 °C									
		Usage/storage humidity		90%RH or less (non-condensing)									
		Altitude		1000 m or less above sea level									
		Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2									
	Configuration			Base mounted									
	Approx. weight		Kg	2.8			3.8		5.5	13.5		22	

Three-phase, 400 V (from 22 kW to 55 kW)

Servo drive type			SGDH-□	2BDE	3ZDE	3GDE	4EDE	5EDE
Applicable servo motor			SGMBH-□	2BD□A	3ZD□A	3GD□A	4ED□A	5ED□A
Basic specifications	Max. applicable motor capacity		kW	22	30	37	45	55
	Continuous output current		Arms	58	80	100	127	150
	Max. output current		Arms	120	170	210	260	310
	Input power		Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60 Hz)				
	Supply		Control circuit	24 VDC+ 15%				
	Control method			Three phase full-wave rectification / IGBT / PWM / sine-wave current drive method				
	Feedback			Serial encoder (incremental/absolute)				
	Conditions	Usage/storage temperature		0 to +55 °C / -20 to +85 °C				
		Usage/storage humidity		90%RH or less (non-condensing)				
		Altitude		1000 m or less above sea level				
		Vibration/shock resistance		4.9 m/s^2 / 19.6 m/s^2				
	Configuration			Base mounted				
	Approx. weight		Kg	40		60	65	

General specifications

Speed/torque control mode	Performance	Speed control range	1:5000
		Speed variance — Load variance	During 0 to 100% load ±0.01% max. (at rated speed)
		Speed variance — Voltage variance	Rated voltage ±10%:0% (at rated speed)
		Speed variance — Temperature variance	25 ±25 °C: ±0.1 % max (at rated speed)
		Frequency characteristics	400 Hz (at $J_L = J_M$ up to 15 kW drives), 100 Hz (at $J_L = J_M$ from 22 kW to 55 kW drives)
		Torque control accuracy (reproducibility)	±2%
		Soft start time setting	0 to 10 s (acceleration, deceleration can each be set.)
	Input signal	Speed reference input — Reference voltage	±6 VDC (forward motor rotation if positive reference) at rated speed: set at delivery Variable setting range: ±2 to ±10 VDC at rated speed/ max. input voltage: ±12 V
		Speed reference input — Input impedance	Approx. 14 kΩ
		Speed reference input — Circuit time constant	Approx. 47 µs
		Torque reference input — Reference voltage	±3 VDC (forward rotation if positive reference) at rated speed: set at delivery Variable setting range ±1 to ±10 VDC at rated torque reference
		Torque reference input — Input impedance	Approx. 14 KΩ
		Torque reference input — Circuit time constant	Approx. 47 µs

Position control mode	performance	Bias setting		0 to 450 min^{-1} (setting resolution: 1 min^{-1})
		Feed forward compensation		0 to 100% (setting resolution: 1%)
		Position completed width setting		0 to 250 command units (setting resolution: 1 command unit)
	Input signal	Command pulse	Input pulse type	Sign + pulse train, 90° phase displacement 2-phase pulse (A-phase+ B-phase) or CCW/CW pulse train
			Input pulse form	Line driver (+5 V level) , open collector (+5 V or +12 level)
			Input pulse frequency	0 to 500 Kpps (200 Kpps max. at open collector)
		Control signal		Clear signal (input pulse is same as reference pulse)
I/O signal	Position signal output			A-phase, B.phase, C-phase, (S-phase): line driver output S-phase is for absolute encoder only.
	Sequence input signal			Servo ON, P control (or control mode switching, zero clamp, command pulse inhibit), forward/reverse run prohibit, alarm reset, forward/reverse current limit (or internal speed switching)
	Sequence output signal			Servo alarm, alarm codes (3-bit output): CN1 output terminal is fixed
				It is possible to output three types of signal form incl.: positioning complete (speed agree), motor rotation, servo ready, current limit, speed limit, brake release, warning, NEAR, and zero point pulse signal
Integrated functions	Communications		Interface	Digital operator (hand- held type), RS-422 port for PCs, etc. (RS-232C ports under some conditions)
			1:N communications	N may equal up to 14 when an RS-422A port is used
			Axis address setting	Set by user setting
			Functions	Status display, user constant setting monitor display, alarm traceback display, JOG run/autotuning operations, and graphing functions for speed/torque command signal, etc
	Automatic load inertia detection			Automatic motor parameter setting. One parameter rigidity setting.
	Dynamic brake (DB)			Operates during main power OFF, servo alarm, servo OFF or overtravel
	Regenerative processing			Internal resistor included in models from 500 W to 5 kW. Regenerative resistor externally mounted (option).
	Overtravel (OT) prevention function			DB stop, deceleration stop or coast to stop during P-OT, N-OT operation
	Encoder divider function			Optional division possible
	Electronic gearing			0,01< A/B<100
	Internal speed setting function			3 speeds may be set internally
	Protective functions			Overcurrent, overvoltage, insufficient voltage, overload, main circuit sensor error, heatsink overheat, power phase loss, overflow, overspeed, encoder error, runaway, CPU error, parameter error, etc.
	Analog monitor functions for supervision			Integrates analog monitor connectors for supervision of the speed and torque reference signals, etc.
	Display functions			CHARGE, POWER, 7-segments LEDx5 (integrated digital operator function)
	Others			Reverse connection, zero search, automatic motor discrimination function, and DC reactor connection terminal for high frequency power suppression function (except: 6 to 15 kW)

I/O specifications

I/O signals (CN1) - input signals

Pin No.	Signal name		Function	
40	Common	/S-ON	Servo ON: Turns ON the servo motor when the gate block in the inverter is released.	
41		/P-CON	Function selected by parameter.	
			Proportional control reference	Switches the speed control loop from PI (proportional/integral) to P (proportional) control when ON.
			Direction reference	With the internal set speed selected: switch the rotation direction.
			Control mode switching	Position ↔ speed Position ↔ torque Torque ↔ speed } Enables control mode switching
			Zero-clamp reference	Speed control with zero-clamp function: reference speed is zero when ON.
			Reference pulse block	Position control with reference pulse stop: stops reference pulse input when ON.
42 43		P-OT N-OT	Forward run prohibited Reverse run prohibited	Overtravel prohibited: Stops servo motor when movable part travels beyond the allowable range of motion.
45 46		/P-CL /N-CL	Function selected by parameter.	
			Forward external torque limit ON Reverse external torque limit ON	Current limit function enabled when ON.
			Internal speed switching	With the internal set speed selected: switches the internal speed settings.
44		/ALM-RST	Alarm reset: releases the servo alarm state.	
47		+24VIN	Control power supply input for sequence signals: users must provide the +24 V power supply. Allowable voltage fluctuation range: 11 to 25 V	
4 (2)		SEN	Initial data request signal when using an absolute encoder.	
21 22		BAT (+) BAT (-)	Connecting pin for the absolute encoder backup battery. Do not connect when a battery is connected to the host controller.	
5 (6)	Speed	V-REF	Speed reference input: ±2 to ±10 V/rated motor speed (input gain can be modified using a parameter.)	
9 (10)	Torque	T-REF	Torque reference input: ±1 to ±10 V/rated motor torque (input gain can be modified using a parameter.)	
7 8 11 12	Position	PULS /PULS SIGN /SIGN	Reference pulse input for line driver only	Input mode is set from the following pulses. Sign + pulse string CCW/CW pulse Two-phase pulse (90° phase differential)
15 14		CLR /CLR	Positional error pulse clear input: clears the positional error pulse during position control.	
3 13 18		PL1 PL2 PL3	+12 V pull-up power is supplied when PULS, SIGN, and CLR reference signals are open-collector outputs (+12 V power supply is built into the SERVOPACK).	

Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /S-ON, /P-CON. P-OT, N-OT, /ALM-RST, /P-CL, and /N-CL input signals can be changed by using the parameters.

3. The voltage input range for speed and torque references is a maximum of ±12 V.

I/O signals (CN1) - output signals

Pin No.	Signal Name		Function	
31 32	Common	ALM+ ALM-	Servo alarm: Turns OFF when an error is detected.	
27 28		/TGON+ /TGON-	Detection during servo motor rotation: detects when the servo motor is rotating at a speed higher than the motor speed setting. Detection speed can be set by using the parameters.	
29 30		/S-RDY+ /S-RDY-	Servo ready: ON if there is no servo alarm when the control/main circuit power supply is turned ON.	
33 (1) 34		PAO /PAO	Phase-A signal	Converted two-phase pulse (phases A and B) encoder output Signal and zero-point pulse (phase C) signal: RS-422 or the equivalent (proper line receiver is SN75175 manufactured by Texas Instruments or the equivalent corresponding to MC3486.)
35 36		PBO /PBO	Phase-B signal	
19 20		PCO /PCO	Phase-C signal	
48 49		PSO /PSO	Phase-S signal	With an absolute encoder: outputs serial data corresponding to the number of revolutions (RS-422 or the equivalent)
37 38 39 (1)		ALO1 ALO2 ALO3	Alarm code output: Outputs 3-bit alarm codes. Open-collector: 30 V and 20 mA rating maximum	
Shell		FG	Connected to frame ground if the shield wire of the I/O signal cable is connected to the connector shell.	
25 26	Speed	/V-CMP+ /V-CMP-	Speed coincidence (output in speed control mode): detects whether the motor speed is within the setting range and if it matches the reference speed value.	
25 26	Position	/COIN+ /COIN-	Positioning completed (output in position control mode): turns ON when the number of positional error pulses reaches the value set. The setting is the number of positional error pulses set in reference units (input pulse units defined by the electronic gear).	
-	Reserved	/CLT /VLT /BK /WARN /NEAR	Reserved terminals The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.	
16 17 23 24 50		-	Terminals not used Do not connect relays to these terminals.	

Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.

Terminal specifications (all drives)

Symbol	Name	Function	
L1, L2 or L1, L2, L3 or L1/R, L2/S, L3/T	Main circuit AC input terminal	AC power input terminals for the main circuit	
U	Servo motor connection terminal	Red	Terminals for outputs to the servo motor.
V		White	
W		Blue	
L1C, L2C	Control power input terminal	AC power input terminals for the control circuit.	
⏚	Frame ground	Ground terminal. Ground to a maximum of 100 Ω. (class 3)	
B1, B2 or B1, B2, B3	Main circuit DC output terminal	Up to 5 kW: Connect an external regenerative resistor if regenerative energy is high. From 5.5 kW to 55 kW: There is no internal regenerative resistor. Be sure to connect an external regenerative resistor unit.	
⊕1, ⊕2	DC reactor connection terminal for suppressing power supply harmonic waves	Normally, short ⊕1 and ⊕2. If a countermeasure against power supply harmonic waves is needed, connect a DC reactor between ⊕1 and ⊕2.	
⊕	Main circuit DC output terminal (positive)	Normally, not connected. This terminal exists on the servo drives with a capacity of 6.0 kW or higher only.	
⊖	Main circuit DC output terminal (negative)	Normally, not connected.	

Terminal specifications (from 22 kW to 55 kW)

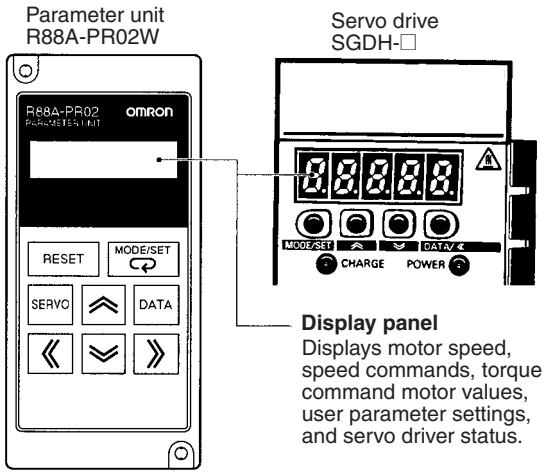
Symbol	Name	Function	
DC24P,DC24N	Control power supply input terminal	24 VDC	
DU, DV, DW	DB resistor unit, DB contactor connection terminal	Connects DB resistor unit or DB contactor.	
DBON, DB24	DB resistor unit connection terminal	For 37 to 55 kW, connects to DBON and DB24 terminals or DB resistor unit.	
480 V, 460 V, 440 V, 400 V, 380 V, 0 V	Control power Supply input Terminal	Connect to the terminal whose voltage is close to the power supply voltage.	

Encoder connector (CN2)

Pin No.	Signal Name	Function
1	E5V	Encoder power supply + 5 V
2	E0V	Encoder power supply ground
3	BAT+	Battery + (used only with absolute encoder)
4	BAT–	Battery – (used only with absolute encoder)
5	S+	Encoder serial signal input
6	S–	Encoder serial signal input

Operation

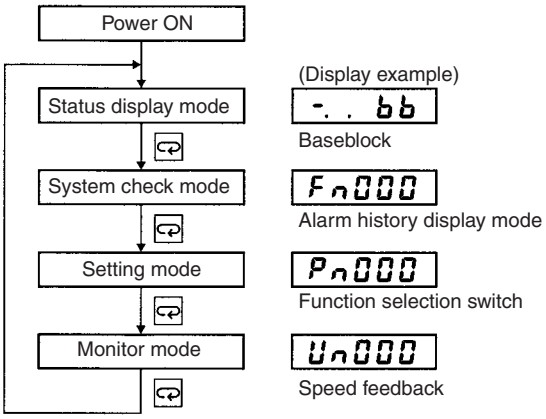
Operating functions



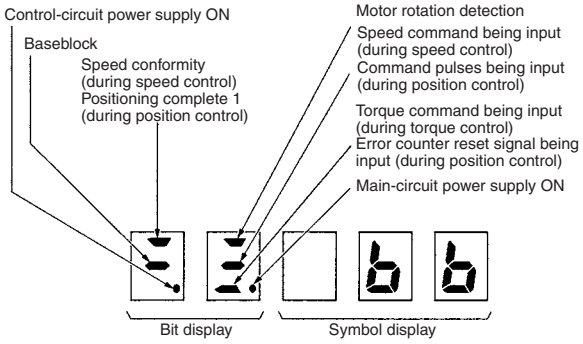
Display panel
Displays motor speed, speed commands, torque command motor values, user parameter settings, and servo driver status.

Changing modes

To change modes, press the MODE/SET key.



Status display mode

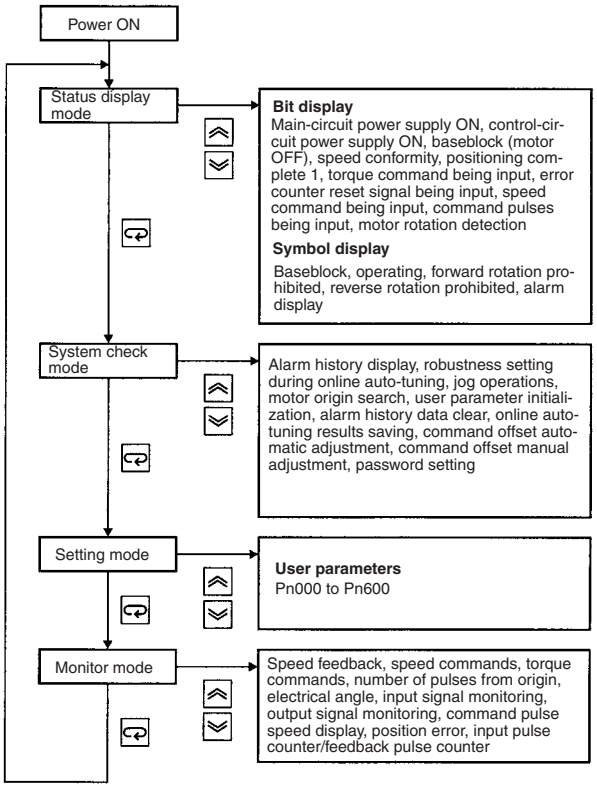


Symbol	Status
bb	Baseblock (motor OFF)
run	Operating
Pot	Forward rotation prohibited (forward overtravel)
not	Reverse rotation prohibited (reverse overtravel)
A.02	Alarm display

Unit keys

R88A-PR02W	SGDH-□	Function
RESET	+	Resets an alarm.
MODE/SET	MODE/SET	Switches between status display mode, system check mode, setting mode, and monitor mode. Used as a data setting key while in setting mode.
SERVO	MODE/SET	Turns the servo ON or OFF while jog operations are being performed.
DATA	DATA/	Switches between parameter display and data display, and records data.
		Increments parameter settings. Used as a forward rotation start key during jog operation.
		Decrements parameter settings. Used as a reverse rotation start key during jog operation.
	DATA/	Selects the digit whose setting is to be changed. When selected, the digit flashes.

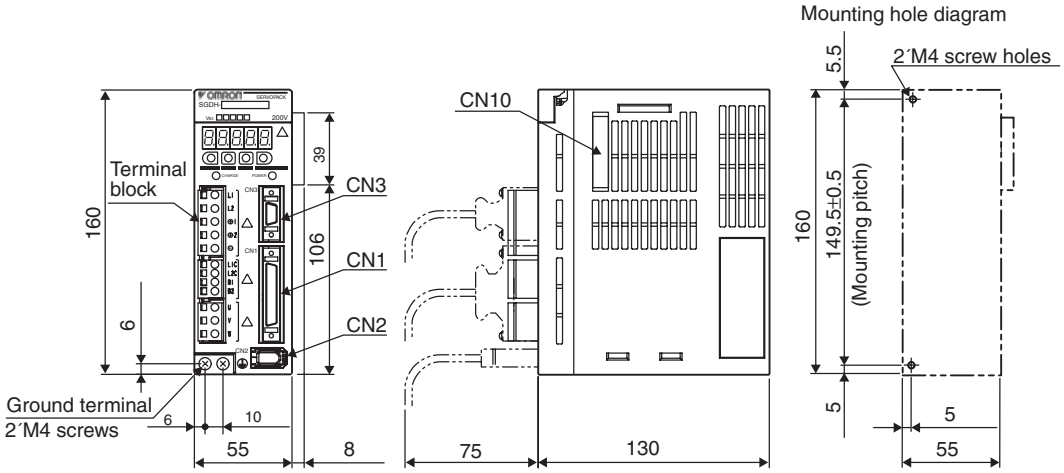
Mode details



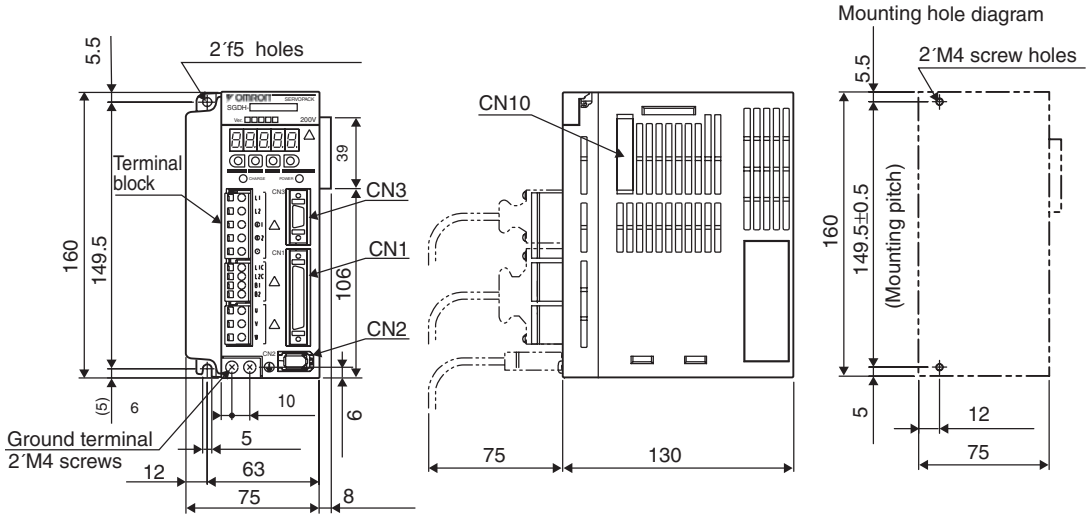
Dimensions

Servo drives

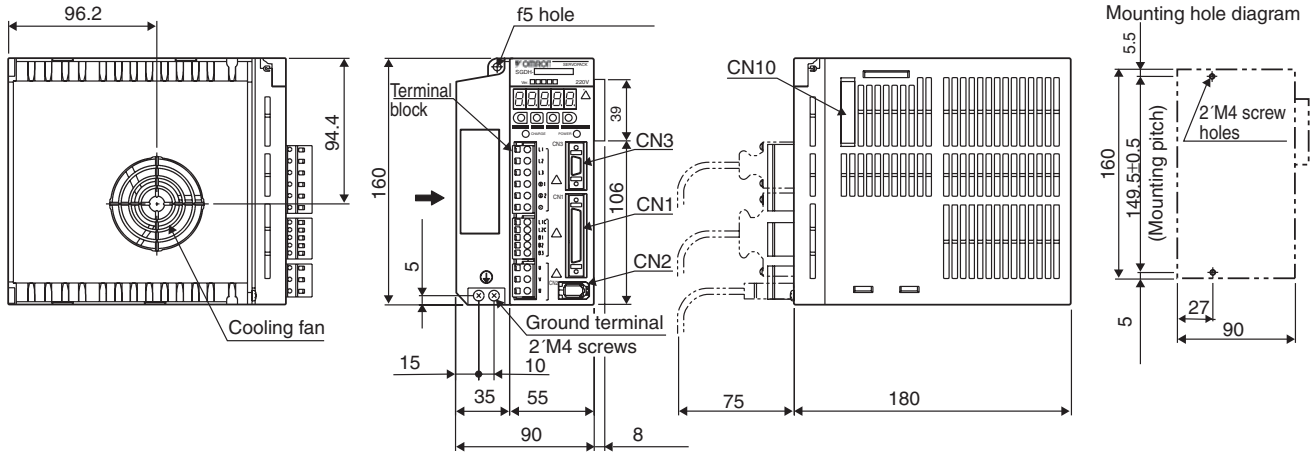
SGDH-A3AE-OY to -02AE-OY (230 V, 30 to 200 W)



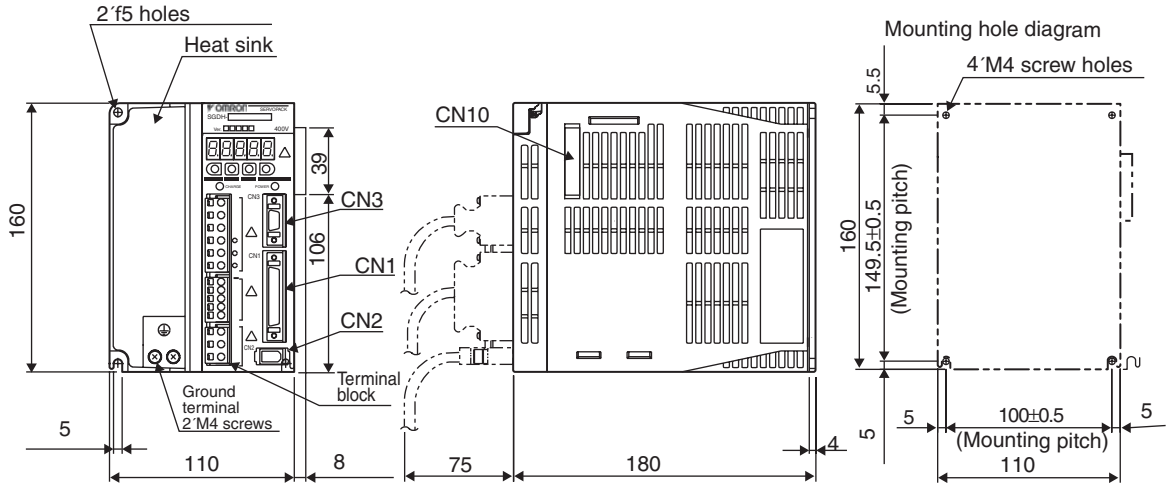
SGDH-04AE-OY (230 V, 400 W)



SGDH-08AE-S-OY (230 V, 750 W)

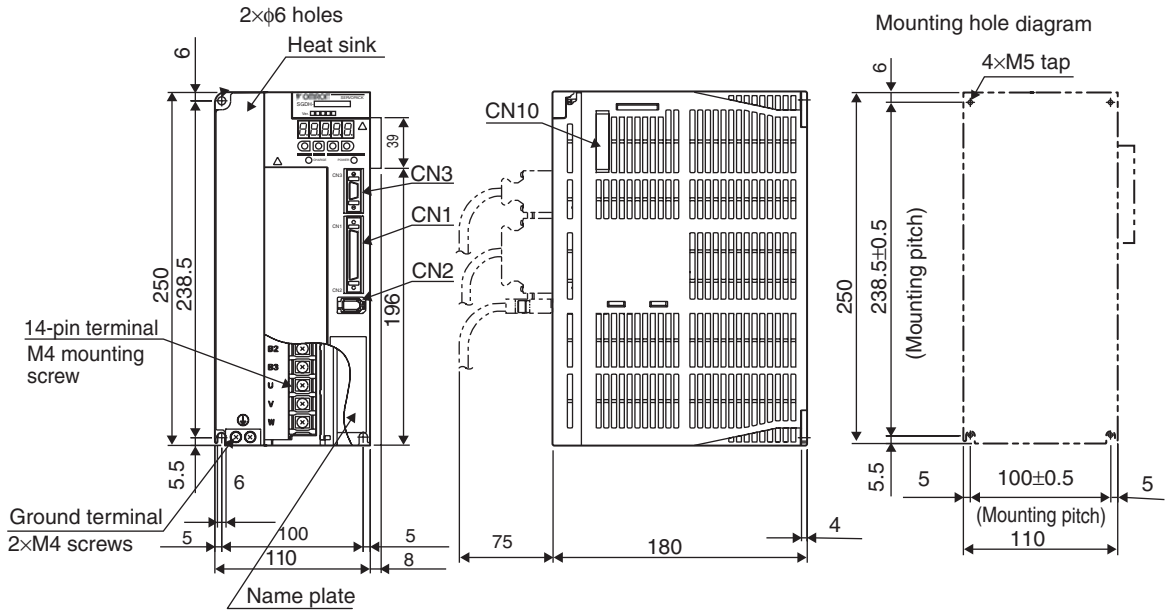


SGDH-05DE-OY to -15DE-OY (400 V, 0.5 to 1.5 kW)

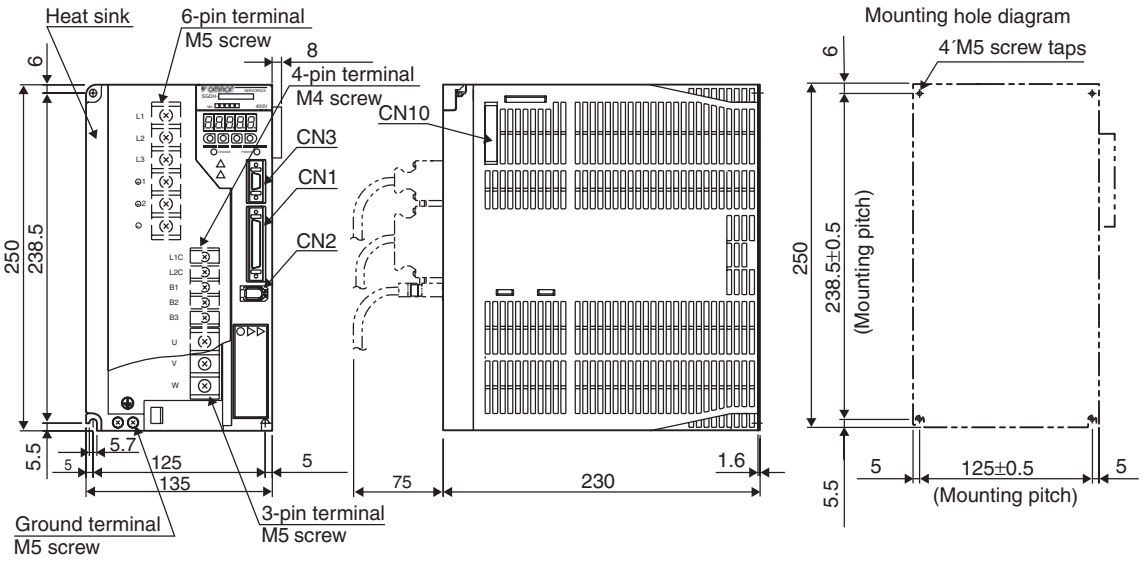


SGDH-15AE-S (230 V, 1.5 kW)

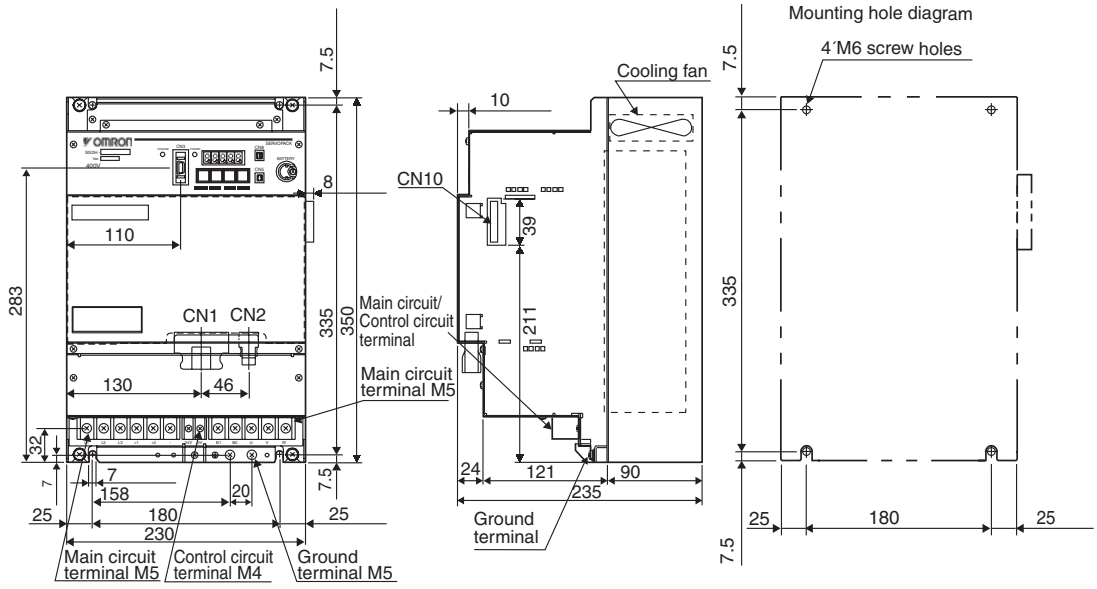
SGDH-20/30DE-OY (400 V, 2/3 kW)



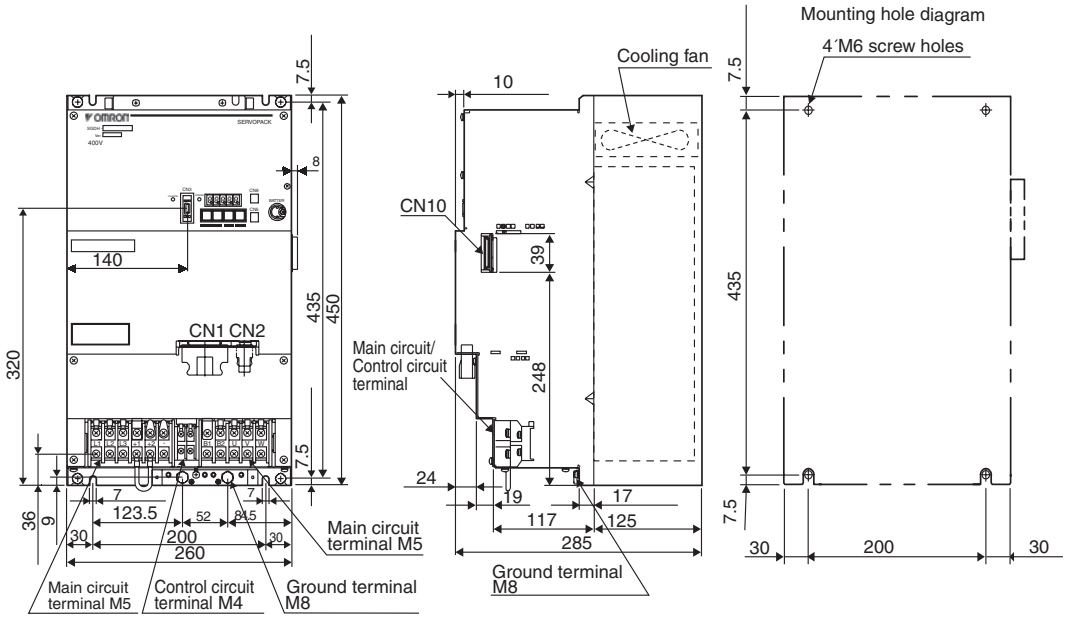
SGDH-50DE-OY (400 V, 5 kW)



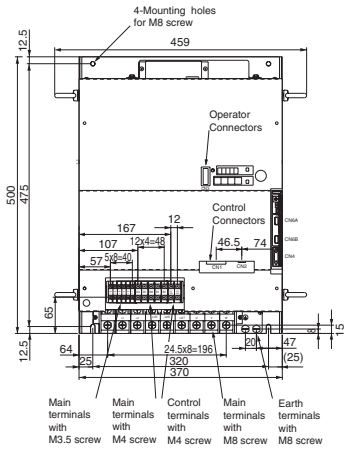
SGDH-60/75DE-OY (400 V, 6/7.5 kW)

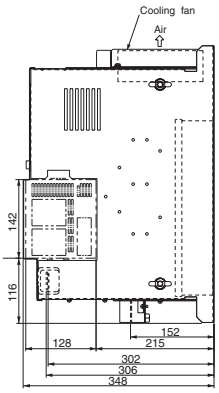


SGDH-1A/1EDE-OY (400 V, 11/15 kW)



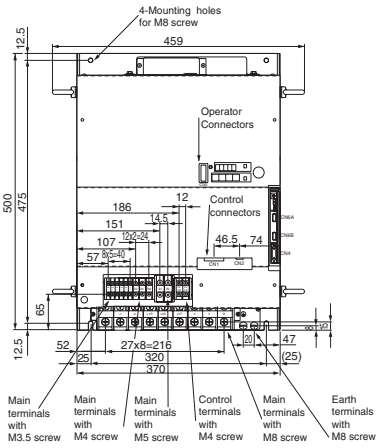
SGDH-2BDE (400 V, 22 kW)

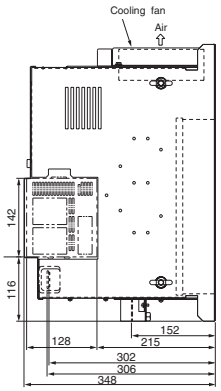




Approx. weight: 40 kg

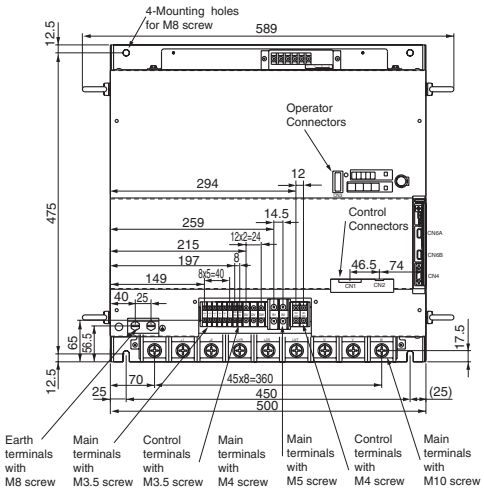
SGDH-3ZDE (400 V, 30 kW)

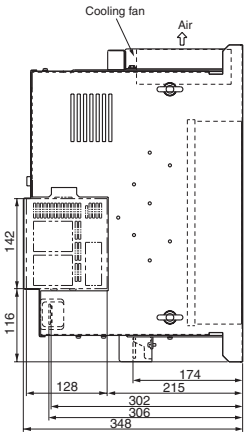




Approx. weight: 40 kg

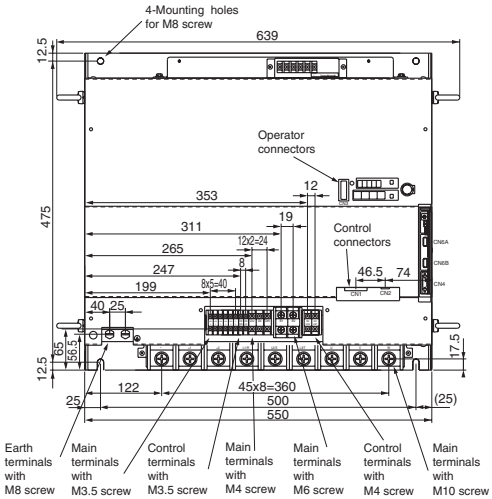
SGDH-3GDE (400 V, 37 kW)

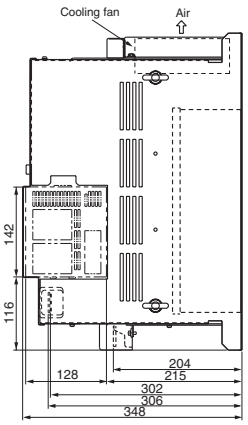




Approx. weight: 60 kg

SGDH-4EDE / -5EDE (400 V, 45/55 kW)

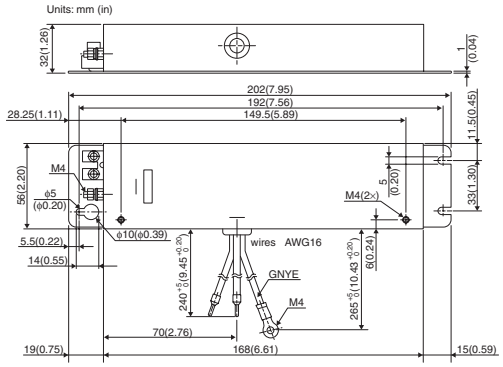




Approx. weight: 65 kg

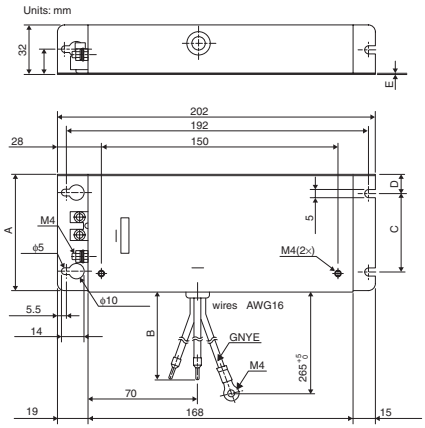
Filters

R88A-FIW104-SE

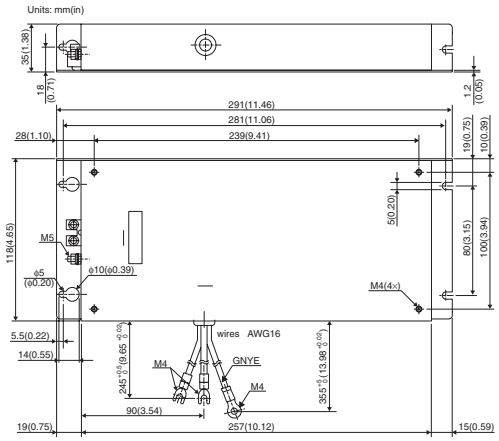


R88A-FIW107-SE, R88A-FIW115-SE

Model		R88A-FIW107-SE	R88A-FIW115-SE
Dimensions in mm	A	75	90
	B	240^{+5}	300^{+5}
	C	50	60
	D	12	15
	E	1	1.2

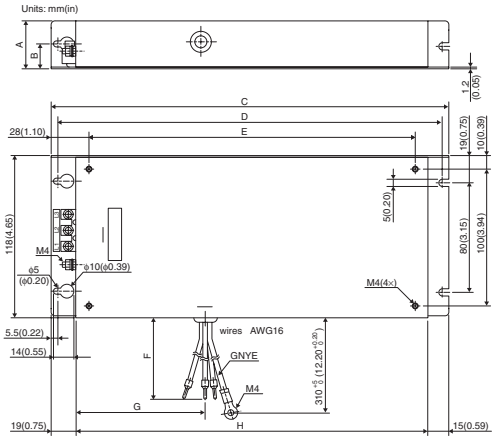


R88A-FIW125-SE

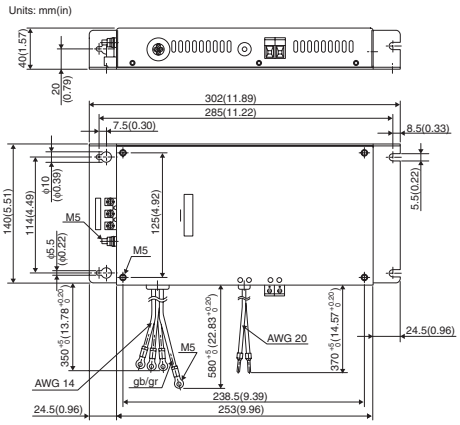


R88A-FIW4006-SE, R88A-FIW4010-SE

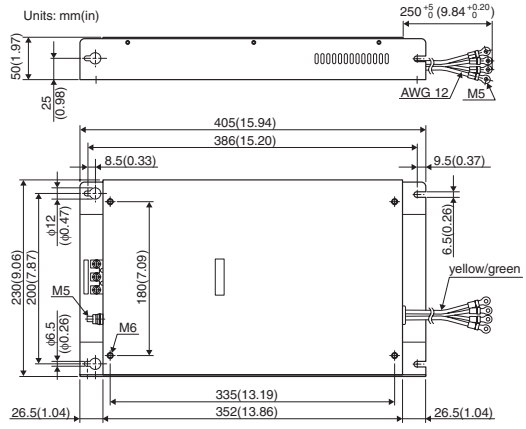
Model		R88A-FIW4006-SE	R88A-FIW4010-SE
Dimensions in mm (in)	A	32 (1.26)	35 (1.38)
	B	16 (0.63)	18 (0.71)
	C	202 (7.95)	291 (11.46)
	D	192 (7.56)	281 (11.06)
	E	150 (5.91)	239 (9.41)
	F	300 (11.81)	270 (10.63)
	G	70 (2.76)	90 (3.54)
	H	168 (6.61)	257 (10.12)



R88A-FIW4020-SE

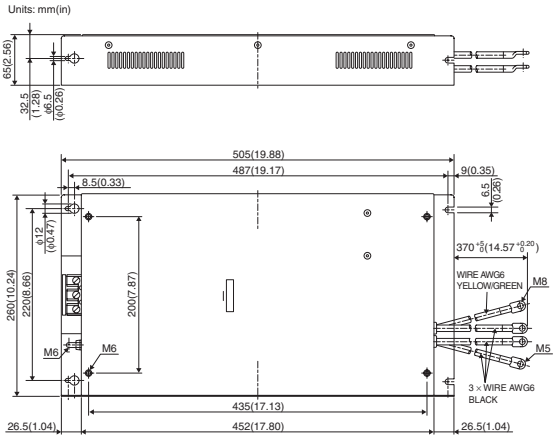


R88A-FIW4030-SE

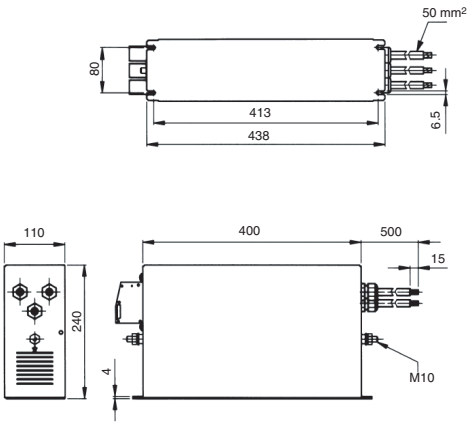


Filters

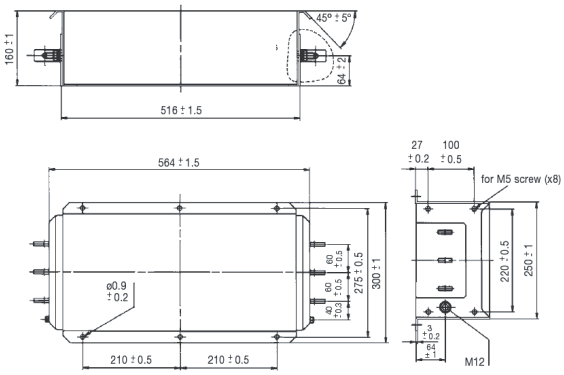
R88A-FIW4055-SE



FN258-180-07

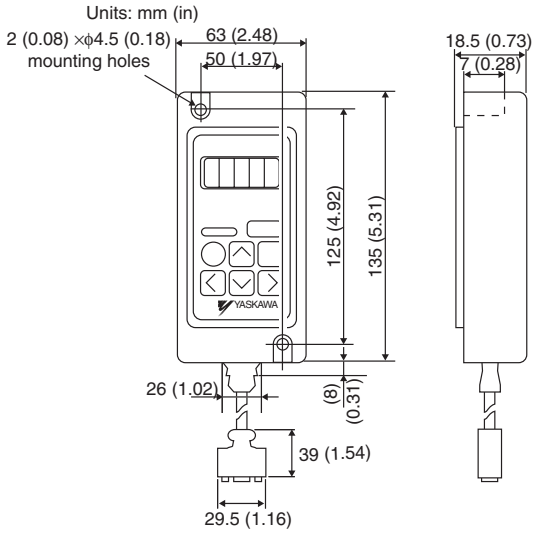


FN359-250-99



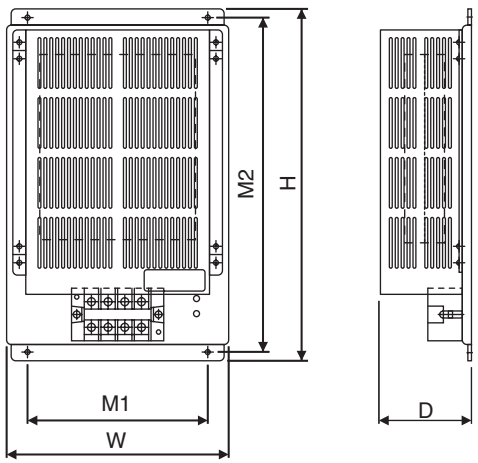
Digital operator

JUSP-OP02A-2



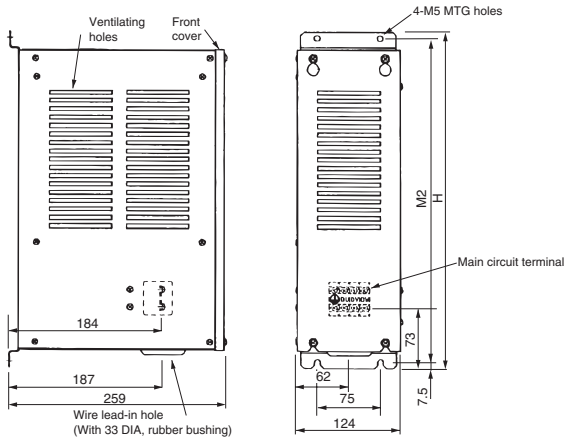
Regenerative resistor units

Model	W	H	D	M1	M2	Approx. weight kg
JUSP-RA18	220	350	92	180	335	4
JUSP-RA19	300	350	95	250	335	7
JUSP-RA12	259	500	348	200	485	14
JUSP-RA13	259	500	348	200	485	14
JUSP-RA14	484	500	348	425	485	20
JUSP-RA15	484	500	348	425	485	21.5
JUSP-RA16	484	500	348	425	485	23.5



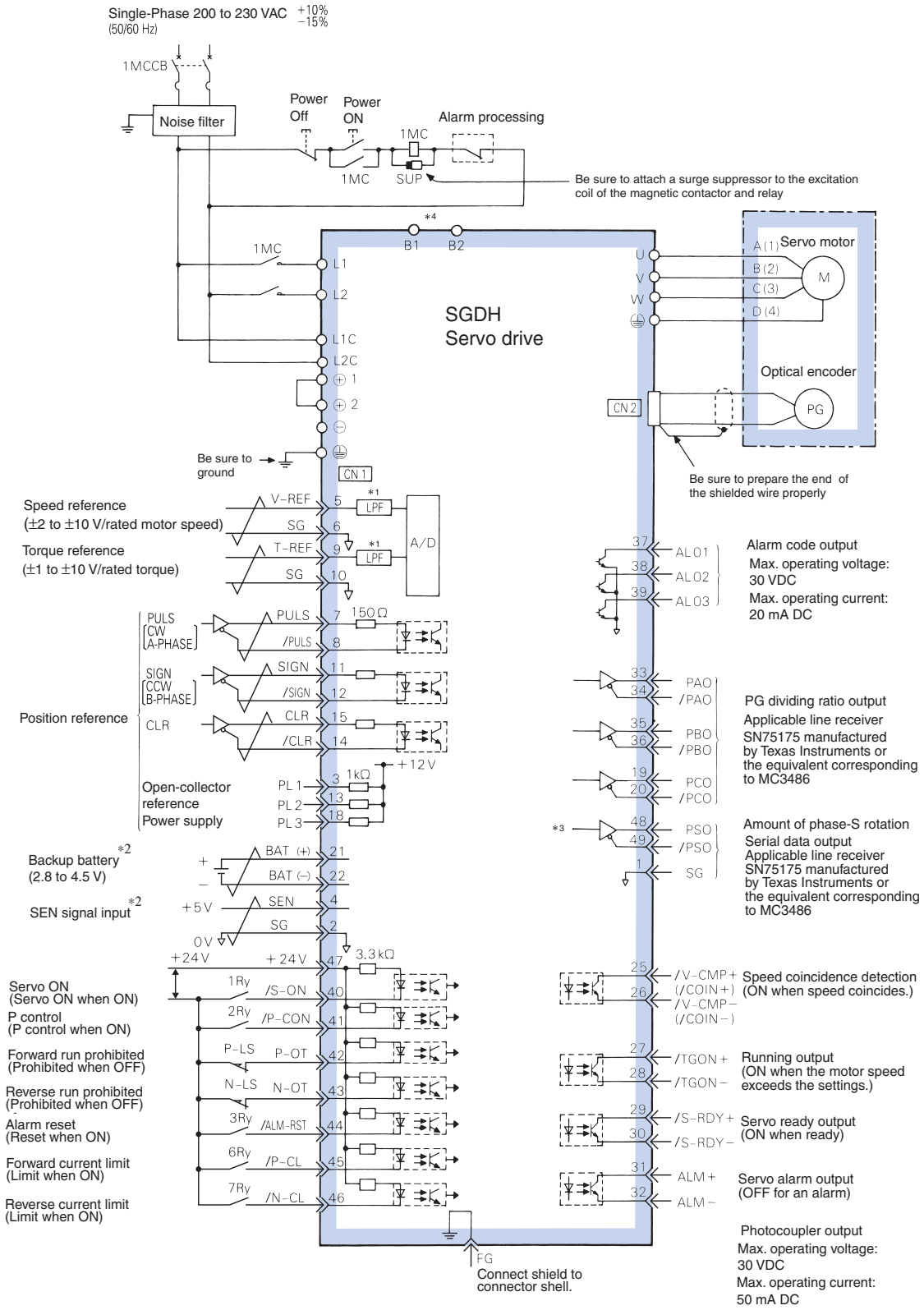
DB resistor units

Model	H	M2	Approx. weight kg
JUSP-DB03	400	385	5
JUSP-DB04	400	385	6
JUSP-DB05	400	385	6
JUSP-DB06	490	475	7



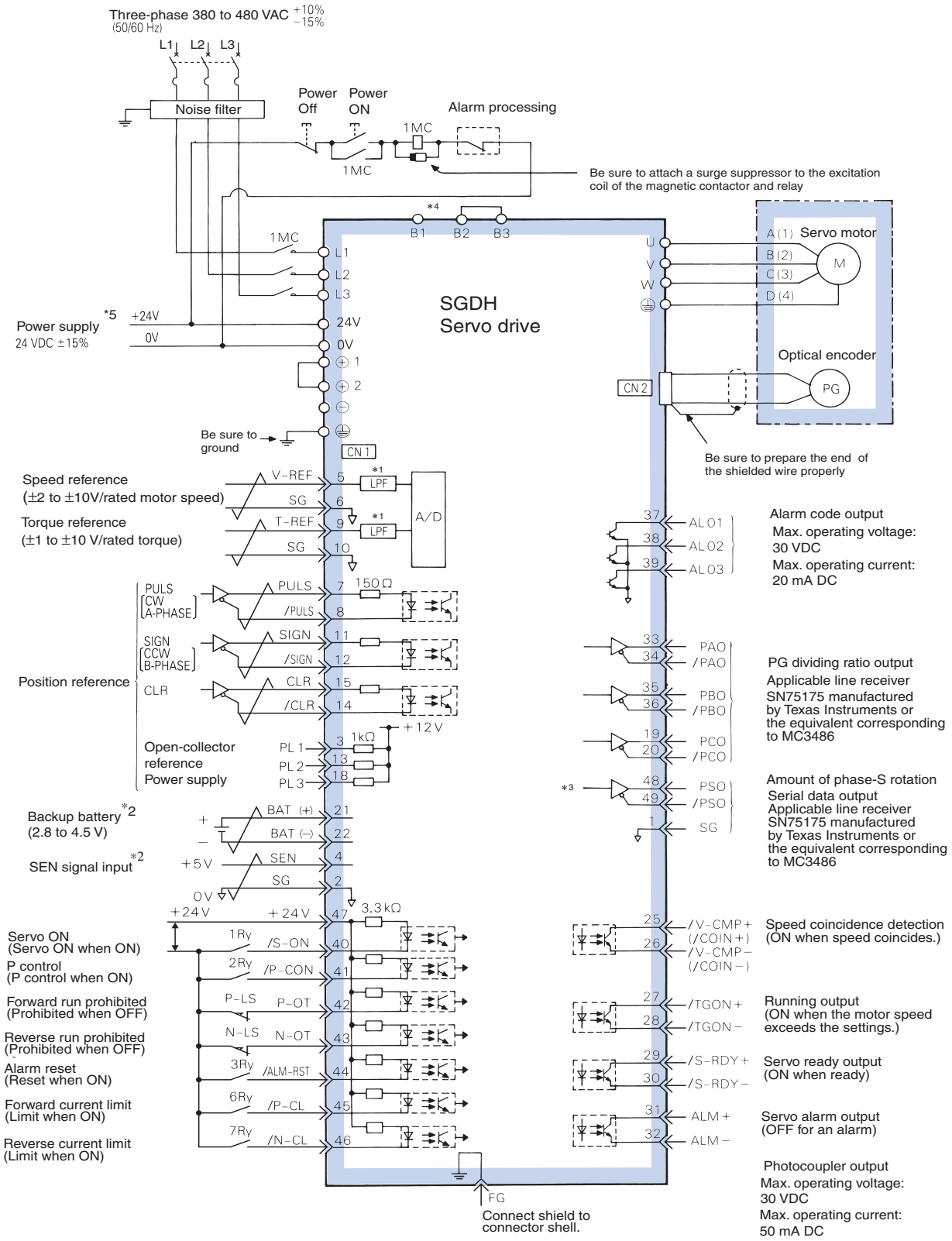
Installation

Single-phase, 230 VAC



*1 The time constant for the primary filter is 47 μs.
*2 Connect when using an absolute encoder.
*3 Used only with an absolute encoder.
*4 Regenerative resistor can be connected between B1 and B2.
*5 For types SGDH-08AE-S-OY and SGDH-15AE-S-OY, voltage is 220 to 230 VAC (+10% -15%).
*6 TI stands for Texas Instruments Inc.

Three-phase, 400 VAC (up to 15 kW)



*1 The time constant for the primary filter is 47 µs.

*2 Connect when using an absolute encoder.

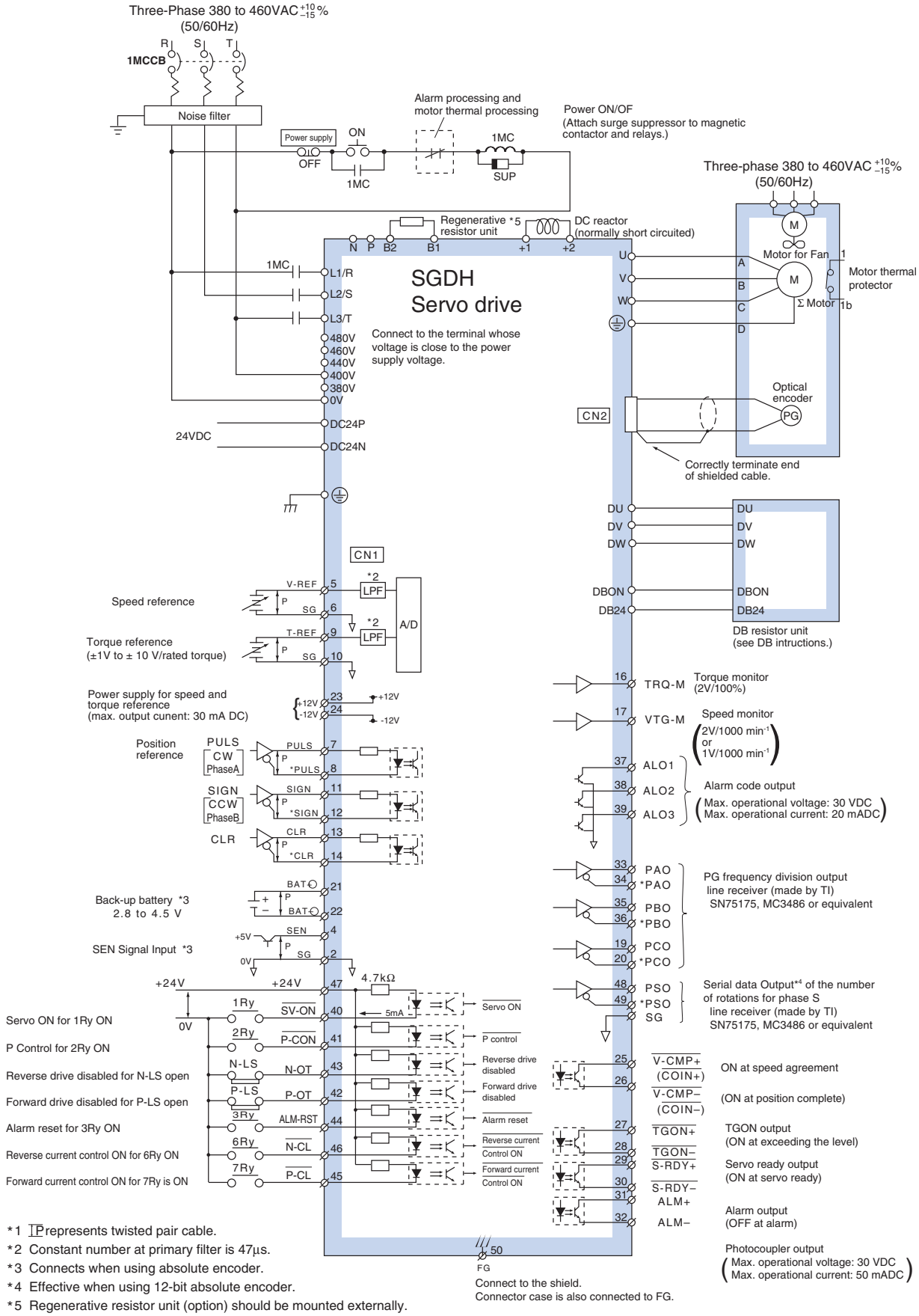
*3 Used only with an absolute encoder.

*4 For using an external regenerative resistor, connect it between B1 and B2.
(Be sure to connect a regenerative resistor unit to Servo Drive of 6/7.5/11/15 kW)

*5 It is the user's responsibility to obtain 24 VDC power supply.

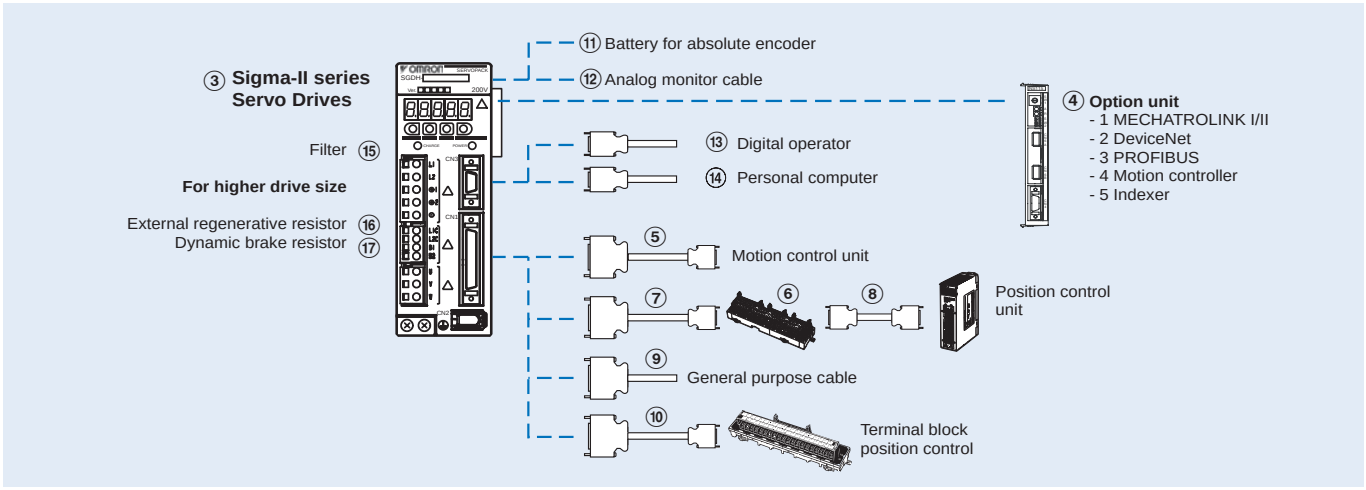
*6 TI stands for Texas Instruments Inc.

Three-phase, 400 VAC (from 22 kW to 55 kW)

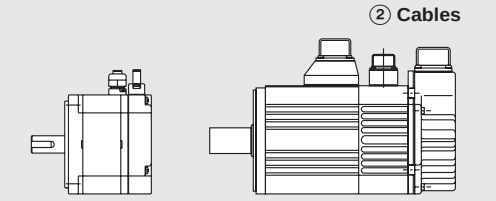


*1 TP represents twisted pair cable.
*2 Constant number at primary filter is 47µs.
*3 Connects when using absolute encoder.
*4 Effective when using 12-bit absolute encoder.
*5 Regenerative resistor unit (option) should be mounted externally.
*6 TI stands for Texas Instruments Inc.

Ordering information

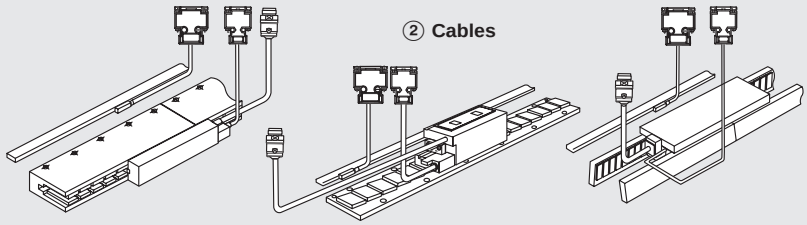


(Refer to chapter Sigma-II rotary motors)



① SGMAH, SGMPH Servo Motor ① SGMGH, SGMUH, SGMSH, SGMBH Servo Motor

(Refer to chapter Sigma-II linear motors)



① SGLG_ linear Servo Motor ① SGLF_ linear Servo Motor ① SGLT_ linear Servo Motor

Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a Sigma-II servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo drives

Symbol	Specifications		Model	Compatible rotary servo motors ①	Compatible linear motors ①
③	1 phase 200 VAC	30 W	SGDH-A3AE-OY	SGMAH-A3A□	-
		50 W	SGDH-A5AE-OY	SGMAH-A5D□	SGLGW-30A050□
		100 W	SGDH-01AE-OY	SGMAH-01A□, SGMPH-01A□	SGLGW-30A080□, SGLGW-40A140□
		200 W	SGDH-02AE-OY	SGMAH-02A□, SGMPH-02A□	SGLFW-20A□, SGLFW-35A120□, SGLGW-40A253A□,SGLGW-60A140□
		400 W	SGDH-04AE-OY	SGMAH-04A□, SGMPH-04A□	SGLGW-40A365A□, SGLGW-60A253A□
		750 W	SGDH-08AE-S-OY	SGMAH-08A□, SGMPH-08A□	SGLFW-35A230□, SGLFW-50A200□, SGLGW-60A365A□
		1500 W	SGDH-15AE-S-OY	SGMPH-15A□	SGLFW-50A380□, SGLFW-1ZA200□, SGLGW-90A200A□
	3 phase 400 VAC	0.5 kW	SGDH-05DE-OY	SGMGH-05D□, SGMAH-03D□, SGMPH-02D□/04D□	SGLFW-35D□
		1.0 kW	SGDH-10DE-OY	SGMGH-09D□, SGMSH/UH-10D□, SGMAH-07D□, SGMPH-08D□	SGLFW-50D200□, SGLTW-35D170□, SGLTW-50D170□
		1.5 kW	SGDH-15DE-OY	SGMGH-13D□, SGMSH/UH-15D□, SGMPH-15D□	SGLFW-50D380□, SGLFW-1ZD200□
		2 kW	SGDH-20DE-OY	SGMGH-20D□, SGMSH-20D□	SGLFW-1ED380□,SGLTW-35D320□, SGLTW-50D320□
		3 kW	SGDH-30DE-OY	SGMGH-30D□, SGMSH/UH-30D□	SGLFW-1ZD380□, SGLFW-1ED560□, SGLTW-40D400□
		5 kW	SGDH-50DE-OY	SGMGH-44D□, SGMSH/UH-40D□, SGMSH-50D□	SGLTW-40D60□, SGLTW-80D400□
		6 kW	SGDH-60DE-OY	SGMGH-55D□	-
		7.5 kW	SGDH-75DE-OY	SGMGH-75D□	SGLTW-80D600□
		11 kW	SGDH-1ADE-OY	SGMGH-1AD□	-
		15 kW	SGDH-1EDE-OY	SGMGH-1ED□	-
		22 kW	SGDH-2BDE	SGMBH-2BD□	-
		30 kW	SGDH-3ZDE	SGMBH-3ZD□	-
		37 kW	SGDH-3GDE	SGMBH-3GD□	-
		45 kW	SGDH-4EDE	SGMBH-4ED□	-
		55 kW	SGDH-5EDE	SGMBH-5ED□	-

Option units (for CN10)

Symbol	Name	Model
④	1.5 axis advanced motion controller with host link interface	R88A-MCW151-E
	1.5 axis advanced motion controller with DeviceNet interface	R88A-MCW151-DRT-E
	MECHATROLINK-I interface unit	JUSP-NS100
	MECHATROLINK-II interface unit	JUSP-NS115
	DeviceNet interface unit with positioning fuctionality	JUSP-NS300
	PROFIBUS-DP interface unit with positioning fuctionality	JUSP-NS500
	Indexer unit. Versatile point-to-point positioning	JUSP-NS600

Note: ④ Refer to the servo drive option unit chapter for detailed specifications and selection

Control cables (for CN1)

Symbol	Description	Connect to		Model
⑤	Control cable (1 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M1
			2 m	R88A-CPW002M1
			3 m	R88A-CPW003M1
			5 m	R88A-CPW005M1
	Control cable (2 axis)	Motion control units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M2
			2 m	R88A-CPW002M2
			3 m	R88A-CPW003M2
			5 m	R88A-CPW005M2
	Terminal block (4 axes)	Motion control unit C200HW-MC402-E	-	R88A-TC04-E
	Servo drive connecting cable (1 axis)		1 m	R88A-CMUK001J3-E2
	PLC unit control cables (4 axes)		1 m	R88A-CMX001S-E
			1 m	R88A-CMX001J1-E
⑥	Servo relay unit	CS1W-NC1□3, CJ1W-NC1□3, or C200HW-NC113 Position control unit		XW2B-20J6-1B (1 axis)
		CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3, or C200HW-NC213/413 position control unit		XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 CQM1-CPU43		XW2B-20J6-3B (1 axis)
		CJ1M-CPU22/23		XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
⑦	Cable to servo drive	Servo relay units XW2B-□0J6-□B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4
⑧	Position control unit connecting cable	C200H-NC112	0.5 m	XW2Z-050J-A1
			1 m	XW2Z-100J-A1
		C200H-NC211	0.5 m	XW2Z-050J-A2
			1 m	XW2Z-100J-A2
		CQM1-CPU43-V1 and CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑨	Control cable	For general purpose controllers	1 m	R88A-CPW001S or JZSP-CKI01-1
			2 m	R88A-CPW002S or JZSP-CKI01-1
⑩	Relay terminal block cable	General purpose controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay terminal block		-	XW2B-50G5

Battery backup for absolute encoder (for CN8)

Symbol	Name	Model
⑪	Battery for 30 W to 5 kW drives	JZSP-BA01
	Battery for 6 kW to 15 kW drives	JZSP-BA01-1

Cable (for CN5)

Symbol	Name	Model
⑫	Analog monitor cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Model
⑬	Parameter unit with cable	JUSP-OP02A-2 or R88A-PR02W
⑭	Computer connecting cable	R88A-CCW002P2 or JZSP-CMS02

Filters

Symbol	Applicable servo drive	Filter model	Rated current	Rated voltage
⑮	SGDH-A3AE-OY,SGDH-A5AE-OY, SGDH-01AE-OY, SGDH-02AE-OY	R88A-FIW104-SE	4 A	250 VAC single-phase
	SGDH-04AE-OY	R88A-FIW107-SE	7A	
	SGDH-08AE-S-OY	R88A-FIW115-SE	15 A	
	SGDH-15AE-S-OY	R88A-FIW125-SE	25 A	
	SGDH-05DE-OY, SGDH-10DE-OY, SGDH-15DE-OY	R88A-FIW4006-SE	6 A	400 VAC three-phase
	SGDH-20DE-OY, SGDH-30DE-OY	R88A-FIW4010-SE	10 A	
	SGDH-50DE-OY	R88A-FIW4020-SE	20 A	
	SGDH-60DE-OY, SGDH-75DE-OY	R88A-FIW4030-SE	30 A	
	SGDH-1ADE-OY, SGDH-1EDE-OY	R88A-FIW4055-SE	55 A	
	SGDH-2BDE, SGDH-3ZDE, SGDH-3GDE	FN258-180-07	180 A	
	SGDH-4EDE, SGDH-5EDE	FN359-250-99	250 A	

External regenerative resistor

Symbol	Applicable servo drive	Regenerative resistor unit model	Specifications
⑯	SGDH-60DE-OY to -75DE-OY	JUSP-RA18	18 Ω , 880 W
	SGDH-1ADE-OY to -1EDE-OY	JUSP-RA19	14.25 Ω , 1760 W
	SGDH-2BDE	JUSP-RA12	9 Ω, 3600 W
	SGDH-3ZDE	JUSP-RA13	6.7 Ω, 3600 W
	SGDH-3GDE	JUSP-RA14	5 Ω, 4800 W
	SGDH-4EDE	JUSP-RA15	4 Ω, 6000 W
	SGDH-5EDE	JUSP-RA16	3.8 Ω, 7200 W

DB resitor units

Symbol	Servo drive model	Regenerative resistor unit model	Specifications. Star wiring
⑰	SGDH-2BDE, SGDH-3ZDE	JUSP-DB03	180 W, 0.8 Ω
	SGDH-3GDE	JUSP-DB04	180 W, 0.8 Ω
	SGDH-4EDE	JUSP-DB05	180 W, 0.8 Ω
	SGDH-5EDE	JUSP-DB06	300 W, 0.8 Ω

Connectors

Specification	Model
Control I/O connector (for CN1)	R88A-CNU11C or JZSP-CKI9
Sigma-II drive encoder connector (for CN2)	JZSP-CMP9-1
Communications connector (for CN3)	R7A-CNA01R
Hypertac power connector IP67 (for 200 V motors SGMAH/PH-□□A□□□□D-OY)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400 V motors SGMAH/PH-□□D□□□□D-OY)	LPRA-06B-FRBN170
Hypertac encoder connector IP67 (for motors SGMAH/PH-□□□□□□□D-OY)	SPOC-17H-FRON169
Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D□, SGMSH-(10/15/20)D□ , SGMUH-(10/15)D□)) (for SGMBH-□ fan)	MS3108E18-10S
Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D□, SGMSH-(30/40/50)D□, SGMUH-(30/40)D□)	MS3108E22-22S
Military power connector IP67 (for 400 V motors SGMGH-(55/75/1A/1E)D□)	MS3108E32-17S
Military brake connector IP67 (for 400 V servo motors SGMGH-□, SGMSH-□, SGMUH-□)	MS3108E10SL-3S
Military encoder connector IP67 (for motors SGMGH-□, SGMSH-□, SGMUH-□, SGMBH-□)	MS3108E20-29S

Computer software

Specifications	Model
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.11 or higher)	CX-drive
Complete OMRON software package including CX-drive. (CX-One version 1.1 or higher)	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I48E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

R7D-AP□

SmartStep servo drive



A new concept in servo systems the smart alternative to stepper motors

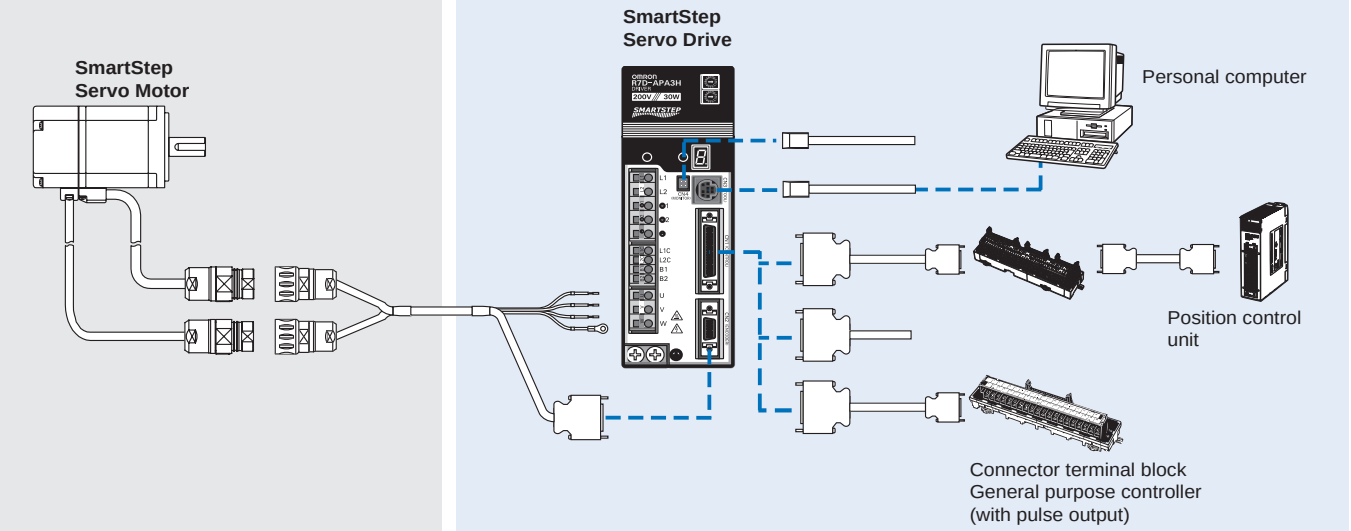
- Easy to setup, easy to operate. SmartStep is as easy to use as a stepper motor
- Front-panel switches make settings easy and eliminate the need for time-consuming parameter settings
- Auto-tuning on-line mode, dynamic brake setting, alarm display, high torque performance
- Easy to wire with prebuilt cables
- Oscilloscope available via CX-Drive software (CX-One)
- Windows based configuration and commissioning software

Ratings

- 230 VAC single-phase 30 W to 750 W (2.39 Nm)

System configuration

(Refer to chapter SmartStep servo motors)



Servo motor supported

Servo motor			
Family	**Voltage**	**Models rated torque**	**Remarks**
R7M-A (3000 min^{-1}) 	230 V	0.095 Nm to 2.39 Nm	Refer to the SmartStep servo motors chapter for details
R7M-AP(3000 min^{-1}) 	230 V	0.318 Nm to 2.39 Nm	Refer to the SmartStep servo motors chapter for details

Servo drive specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 55 °C
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	-20 to 85 °C
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1 mm double amplitude or acceleration of 4.9 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 19.6 m/s^2 max., in X, Y, and Z directions, three times
Insulation resistance	Between power line terminals and case: 0.5 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and case: 1,500 VAC for 1 min at 50/60 Hz Between each control signal and case: 500 VAC for 1 min
Protective structure	Built into panel (IP10).
International standards	Approval obtained for UL, cUL, and EN (EMC directiveand low-voltage directive)

Performance specifications

Item	200 VAC input type					
	30 W	**50 W**	**100 W**	**200 W**	**400 W**	**750 W**
	R7D-APA3H	**R7D-APA5H**	**R7D-AP01H**	**R7D-AP02H**	**R7D-AP04H**	**R7D-AP08H**
Continuous output current (rms)	0.42	0.6	0.89	2.0	2.6	4.4
Momentary maximum output current (rms)	1.3	1.9	2.8	6.0	8.0	13.9
Control power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz					
Main-circuit power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz (three-phase 200/230 VAC can be used with the 750 W model.)					
Control method	All-digital servo					
Speed feedback	2,000 pulses/revolution incremental encoder					
Inverter method	PWM method based on IGBT					
PWM frequency	11.7 kHz					
Weight	0.8	0.8	0.8	0.8	1.1	1.7
Compatible motor voltage	200 V					
Compatible motor capacity	30 W	50 W	100 W	200 W	400 W	750 W
Command pulse response	250 kHz					
Applicable servo motor (R7M-)	A03030	A05030	A10030 AP10030	A20030 AP20030	A40030 AP40030	A75030 AP75030

I/O specifications

Terminal specifications

Symbol	Name	Function	
L1 and L2 or L1, L2, and L3	Main-circuit power supply terminals	These are the input terminals for the main-circuit power supply.	
⊕1	DC reactor terminals	Normally short-circuit between +1 and +2. If harmonic control measures are required, connect a DC reactor between +1 and +2.	
⊕2			
⊖	Main-circuit DC output	Do not connect anything to this terminal.	
L1C	Control circuit power supply terminals	These are the input terminals for the control power supply.	
L2C			
B1 and B2 or B1, B2, and B3	External regeneration resistance terminals	Connect an external regeneration resistor to these terminals if the regenerative capacity of the internal capacitor is exceeded. (An external regeneration resistor cannot be connected to the 30 to 200 W models.)	
U	Servo motor terminals	Red	These are the terminals for outputs to the servo motor.
V		White	
W		Blue	
⏚	Frame ground	This is the ground terminal.	

Control I/O (CN1) specifications

Pin	Symbol	Name	Function
1	+PULS/CW/A	Feed pulses, reverse pulses, or 90° phase difference pulses (A phase)	Line-driver input: 7 mA at 3 V Open-collector input Input impedance: 200 Ω Maximum response frequency: 250 kpps Position control is performed based on the pulses that have been input.
2	–PULS/CW/A		
3	+SIGN/CCW/B	Direction signal, forward pulses, or 90° phase difference pulses (B phase)	
4	–SIGN/CCW/B		
5	+ECRST	Deviation counter reset	Line-driver input: 7 mA at 3 V Open-collector input: 16 mA at 5 V Input impedance: 200 Ω ON: resets deviation counter.
6	–ECRST		
7	BKIR	Brake interlock output	Outputs holding brake timing signals.
8	INP	Positioning completed output	ON when the position error is within the positioning completed range.
10	OGND	Output ground common	Ground common for output signals (pins 7 and 8).
13	+24V	+24 VDC power input for control	Power supply input (+24 VDC) for pins 14 and 18.
14	RUN	RUN command input	ON: servo ON (starts power to servo motor)
18	RESET	Alarm reset input	ON: servo alarm status is reset.
19	GND	RS-422A ground	Ground for RS-422A
20	RXD+	RS-422A reception data	Interface for RS-422A data transfers
21	RXD–		
22	TXD+	RS-422A transmission data	
23	TXD–		
24	RT	Termination resistance terminal	Connect to RXD- (pin 21) in the unit at the end of the line.
32	Z	Encoder phase-Z open-collector output	Output goes ON when the encoder's phase-Z signal (1 pulse/revolution) is detected. Open-collector output: 20 mA max. at 30 VDC
33	ZCOM		
34	ALM	Alarm output	Output goes OFF when alarm is detected. Open-collector output: 50 mA max. at 30 VDC
35	ALMCOM		
Shell	FG	Cable shield ground	Ground for cable's shield wire.

Encoder connector (CN2) specifications

Pin	Symbol	Name	Function
1, 2, 3	E0V	Encoder power supply GND	Power supply output for encoder
4, 5, 6	E5V	Encoder power supply +5 V	
8	S+	Encoder + phase-S input	Line driver input (conforms to EIA-RS422A) (Input impedance: 220 Ω ± 5%)
9	S–	Encoder – phase-S input	
10	A+	Encoder + phase-A input	Line driver input (conforms to EIA-RS422A) (Input impedance: 220 Ω ± 5%)
11	A–	Encoder – phase-A input	
12	B+	Encoder + phase-B input	Line driver input (conforms to EIA-RS422A) (Input impedance: 220 Ω ± 5%)
13	B–	Encoder – phase-B input	
Shell	FG	Cable shield ground	Ground for cable's shield wire.

Communications connector (CN3) specifications

Pin	Symbol	Name	Function
1	/TXD	Transmission data	Transmission data: RS-232C output Reception data: RS-232C input
2	/RXD	Reception data	
3	PRMU	Unit switching	Switching terminal for a parameter unit
7	+5V	+5 V output	This is the +5 V power supply output to the parameter unit.
8	GND	Ground	
Shell	FG	Cable shield ground	Ground for cable's shield wire.

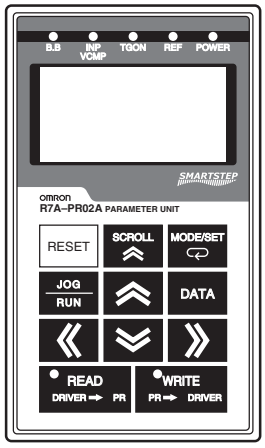
Monitor output (CN4) specifications

Pin	Symbol	Name	Function
1	NM	Speed monitor	Speed monitor output: 1 V per 1,000 r/min
2	AM	Current monitor	Current monitor: 1 V / rated torque
3	GND	Ground	Grounds for monitor output
4	GND	Ground	

Digital operator specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 55 °C
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	-20 to 85 °C
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1 mm double amplitude or acceleration of 9.8 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 19.6 m/s^2 max., in X, Y, and Z directions, three times



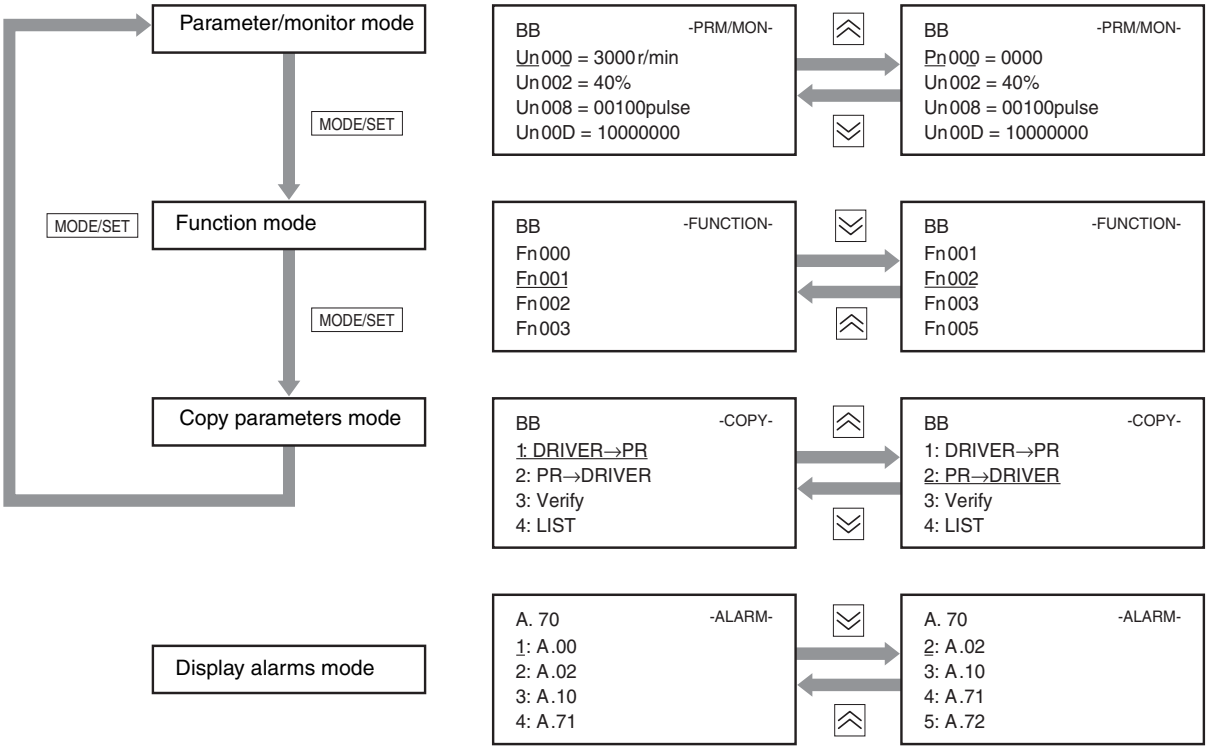
R7A-PR02A

Function specifications

Item	Function
Setting mode	Display or change parameter settings.
Monitor mode	Display monitor values.
Execute function mode	Execute each function mode.
Display alarms	Display alarms that have occurred.
Copy parameters	Read or save parameters from the servo drive. Write parameters to the servo drive. Compare parameters in the servo drive with parameters in the parameter unit.

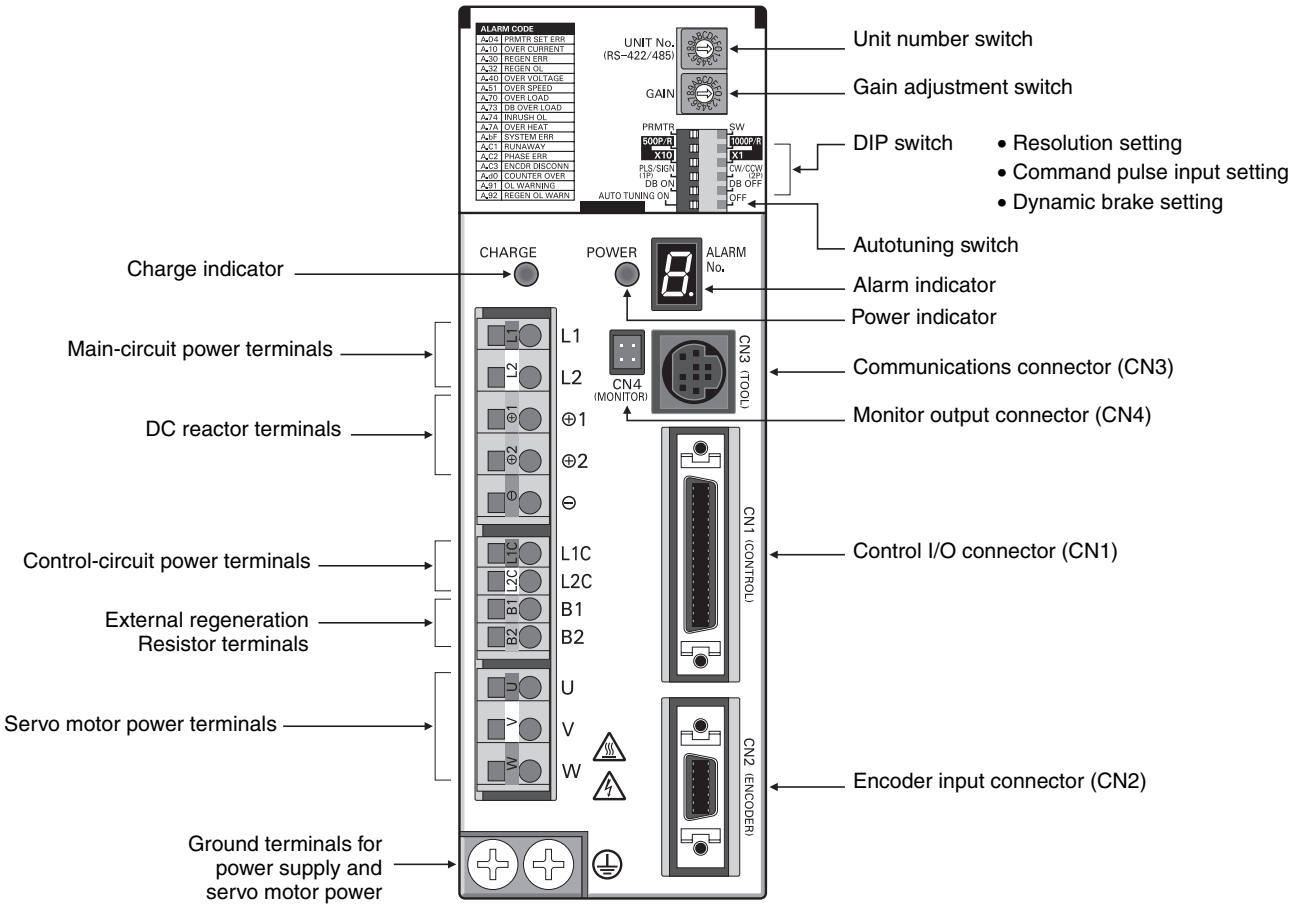
Mode change specifications

Power ON



Operation

Components



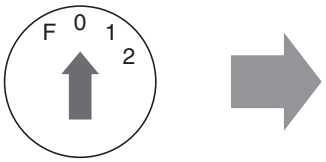
Switch operations

Gain adjustment switch

Adjusts the motor's responsiveness.

When this switch is set to 0, the unit will operate according to the settings in the internal parameters (Pn100, Pn101, Pn102, and Pn401).

When this switch is set to 1 through F, the unit will operate according to the rotary switch's setting.

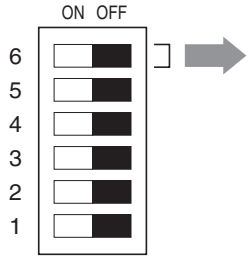


Decrease the switch setting to lower the motor's responsiveness (i.e., so that it moves more smoothly).
Increase the switch setting to raise the motor's responsiveness (i.e., so that it moves faster).

Setting	Position loop gain	Speed loop gain	Speed loop integral constant	Torque command filter time constant
0	Enables parameter settings (including settings other than gain settings).			
1	15	15	4,000	250
2	20	20	3,500	200
3	30	30	3,000	150
4	40	40	2,000	100
5	60	60	1,500	70
6	85	85	1,000	50
7	120	120	800	30
8	160	160	600	20
9	200	200	500	15
A	250	250	400	10
B	250	250	400	10
C	250	250	400	10
D	250	250	400	10
E	250	250	400	10
F	250	250	400	10

Enable switch/parameter setting

Pin 6 of the DIP switch selects whether the servo drive operates according to the DIP switch settings or parameter settings.

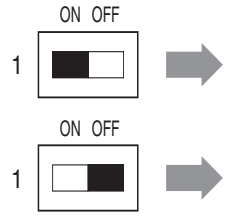


(Default setting)

Pin 6	Function
OFF	Enables the DIP switch settings.
ON	Enables the parameter settings.

Online autotuning setting

The autotuning switch selects whether the gain will be adjusted automatically during operation.

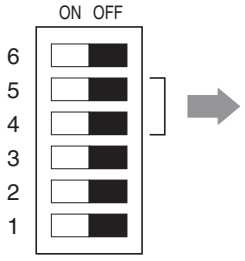


Perform online autotuning.

Complete online autotuning.
The result is stored in the inertia ratio parameter (Pn103) and the servo drive runs.

Resolution setting

Pins 4 and 5 select the positioning resolution.
If the resolution is set to 1,000 (the default setting), the motor makes one revolution for every 1,000 pulses input.

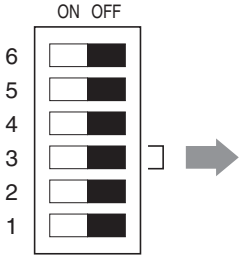


(Default setting)

Pins		Resolution
5	4	
OFF	OFF	1,000 pulses/revolution (0.36°/step)
OFF	ON	10,000 pulses/revolution (0.036°/step)
ON	OFF	500 pulses/revolution (0.72°/step)
ON	ON	5,000 pulses/revolution (0.072°/step)

Command pulse input setting

Pin 3 selects the command pulse mode. Select “Forward pulse/reverse pulse: positive logic” or “feed pulses/direction signal: positive logic.”

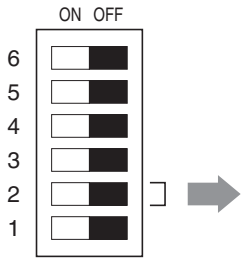


(Default setting)

Pin 3	Command pulse mode
OFF	Forward pulse/reverse pulse: positive logic
ON	Feed pulses/direction signal: positive logic

Dynamic brake setting

Pin 2 enables or disables dynamic brake operation. If the dynamic brake is enabled, the motor can be brought to an emergency stop when the RUN command goes OFF or an alarm occurs.



(Default setting)

Pin 2	Dynamic brake mode
OFF	Dynamic brake disabled.
ON	Dynamic brake enabled.

Alarm Table

Display	ALM output	Error detection function
A.04*	OFF	Parameter setting error
A.10*	OFF	Overcurrent
A.30	OFF	Regeneration error
A.32	OFF	Regeneration overload
A.40	OFF	Overvoltage/undervoltage
A.51	OFF	Overspeed
A.70	OFF	Overload
A.73	OFF	Dynamic brake overload
A.74	OFF	Inrush resistance overload

Display	ALM output	Error detection function
A.7A	OFF	Overheat
A.bF*	OFF	System error
A.C1	OFF	Runaway detected
A.C2*	OFF	Phase not detected
A.C3*	OFF	Encoder disconnect detected
A.d0	OFF	Deviation counter overflow
CPF00	---	Parameter unit transmission error 1
CPF01	---	Parameter unit transmission error 2
A.91	---	Overload warning
A.92	---	Regeneration overload warning

Note: **1.** These parameters are read when the power is turned ON. Parameter Pn110.2 is valid when online.

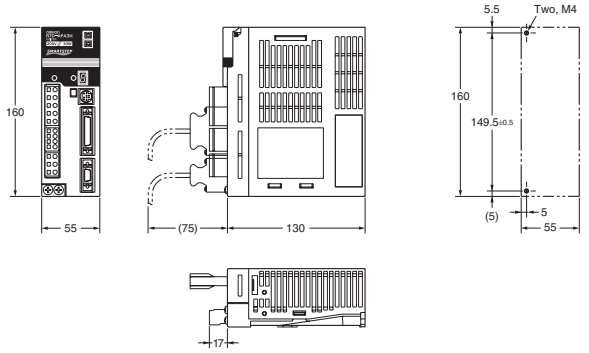
2. When using a regeneration resistor, set the resistor’s capacity when the temperature has risen to 120 °C. Set this parameter to 0 if a regeneration resistor is not being used.

Dimensions

Servo drives

R7D-APA3H/APA5H/AP01H/AP02H (230 V, 30 to 200 W)

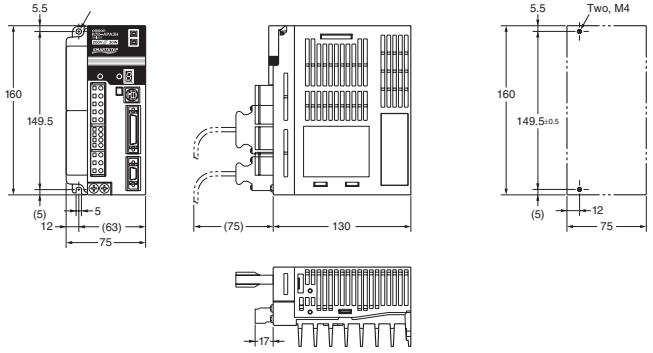
Mounting dimensions



R7D-AP04H (230 V, 400 W)

5 dia. hole

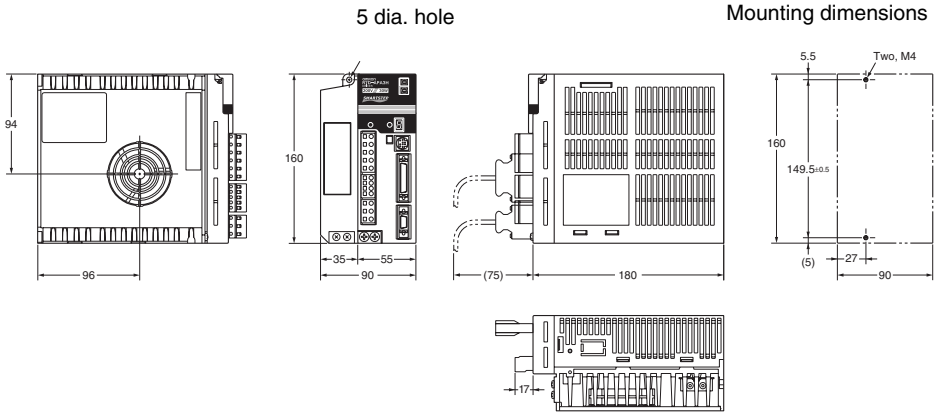
Mounting dimensions



R7D-AP08H (230 V, 750 W)

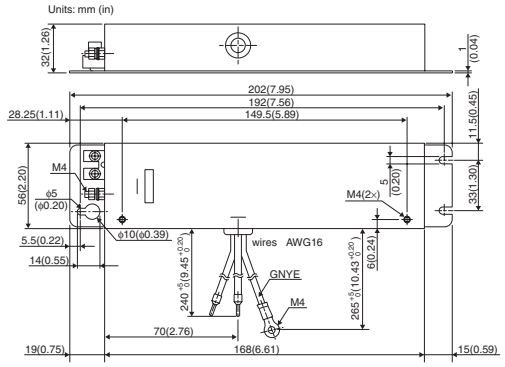
5 dia. hole

Mounting dimensions



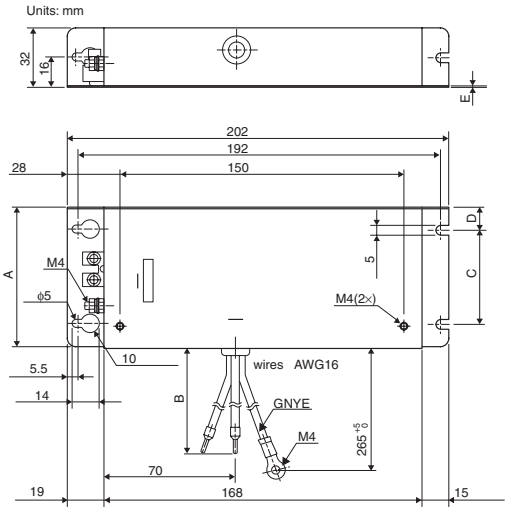
Filters

R88A-FIW104-SE



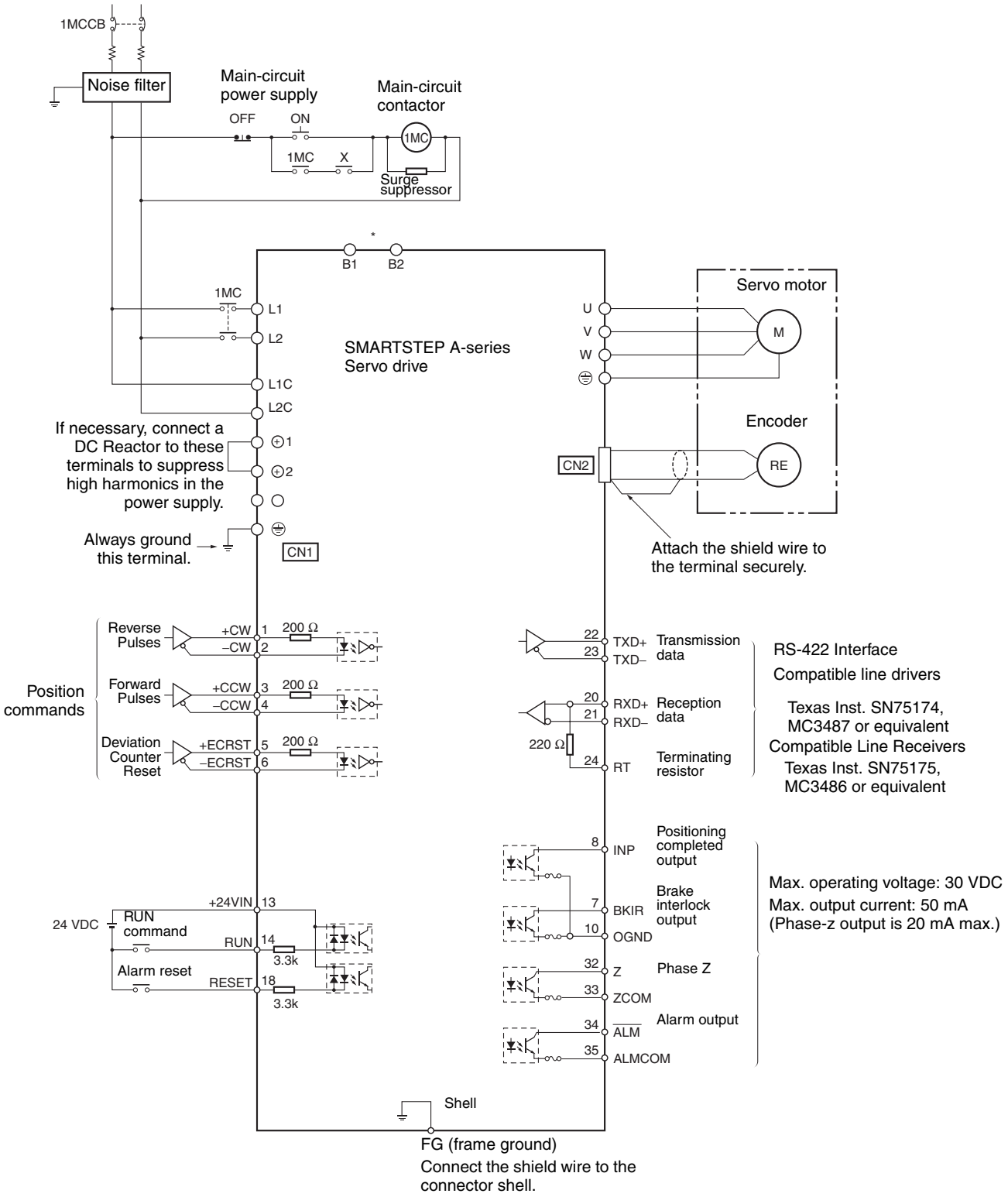
R88A-FIW107-SE, R88A-FIW115-SE

Model		R88A-FIW107-SE	R88A-FIW115-SE
Dimensions in mm	A	75	90
	B	240^{+5}	300^{+5}
	C	50	60
	D	12	15
	E	1	1.2



Installation

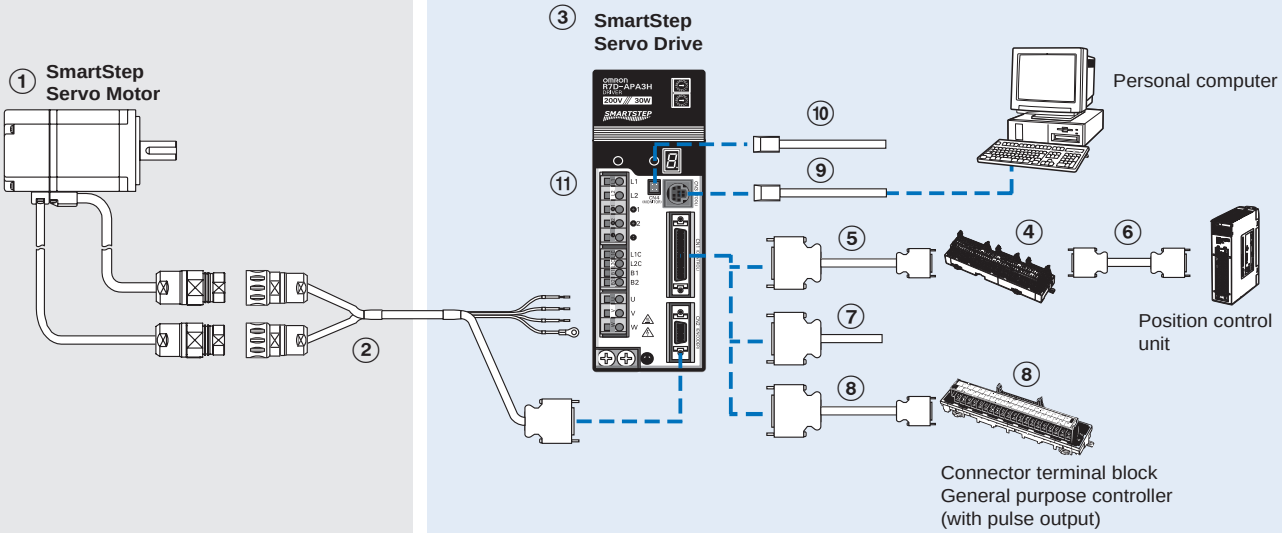
Single-phase 200 to 230 VAC +10%/-15% (50/60 Hz)
(the 750 W servo drives can input three-phase 200 to 230 VAC.)



Note: * A regeneration resistor can be connected across the B1 and B2 terminals with 400 W and 750 W servo drives.
When using an external regeneration resistor with a 400 W servo drive, just connect it across the B1 and B2 terminals.
When using an external regeneration resistor with a 750 W servo drive, remove the jumper bar from the B2 and B3 terminals and then connect the regeneration resistor across the B1 and B2 terminals.

Ordering information

(Refer to chapter SmartStep servo motors)



Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a SmartStep servo system

Servo motors

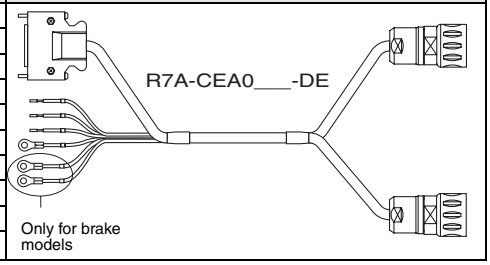
Note: ① Refer to the SmartStep servo motor chapter for detailed motor specifications and selection

Servo drives

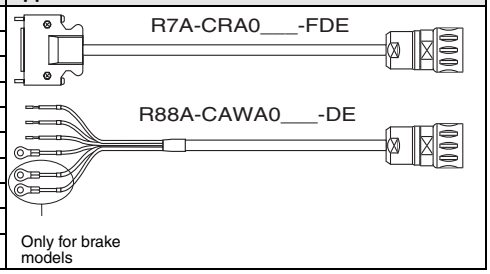
Symbol	Specifications		SmartStep drive model	Compatible servo motors ①	
				Cylindrical type	Flat type
③	200 VAC	30 W	R7D-APA3H	R7M-A03030-□	-
		50 W	R7D-APA5H	R7M-A05030-□	-
		100 W	R7D-AP01H	R7M-A10030-□	R7M-AP10030-□
		200 W	R7D-AP02H	R7M-A20030-□	R7M-AP20030-□
		400 W	R7D-AP04H	R7M-A40030-□	R7M-AP40030-□
		750 W	R7D-AP08H	R7M-A75030-□	R7M-AP75030-□

Servo motor cables (for CN2)

Standard cable (power + encoder)

Symbol	Drive	Specifications		Power cable model	Encoder cable model	Appearance
②	SmartStep	For servo motors without brake R7M-A(P)□□□30-S1-D	3 m	R7A-CEA003S-DE		
			5 m	R7A-CEA005S-DE		
			10 m	R7A-CEA010S-DE		
			15 m	R7A-CEA015S-DE		
			20 m	R7A-CEA020S-DE		
		For servo motors with brake R7M-A(P)□□□30-BS1-D	3 m	R7A-CEA003B-DE		
			5 m	R7A-CEA005B-DE		
			10 m	R7A-CEA010B-DE		
			15 m	R7A-CEA015B-DE		
			20 m	R7A-CEA020B-DE		

Flexible cables (power + encoder)

Symbol	Drive	Specifications		Power cable model	Encoder cable model	Appearance
②	SmartStep	For servo motors without brake R7M-A(P)□□□30-S1-D	3 m	R88A-CAWA003S-DE	R7A-CRA003-FDE	
			5 m	R88A-CAWA005S-DE	R7A-CRA005-FDE	
			10 m	R88A-CAWA010S-DE	R7A-CRA010-FDE	
			15 m	R88A-CAWA015S-DE	R7A-CRA015-FDE	
			20 m	R88A-CAWA020S-DE	R7A-CRA020-FDE	
		For servo motors with brake R7M-A(P)□□□30-BS1-D	3 m	R88A-CAWA003B-DE	R7A-CRA003-FDE	
			5 m	R88A-CAWA005B-DE	R7A-CRA005-FDE	
			10 m	R88A-CAWA010B-DE	R7A-CRA010-FDE	
			15 m	R88A-CAWA015B-DE	R7A-CRA015-FDE	
			20 m	R88A-CAWA020B-DE	R7A-CRA020-FDE	

Control cables (for CN1)

Symbol	Name	Compatible units	Model	Available lengths
④	Servo relay unit	Use with position control units (doesn't support communications functions.) Units: CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113, and C200H-NC112	XW2B-20J6-1B (1 axis)	---
		Use with position control units (doesn't support communications functions.) Units: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413, C500-NC113/211, and C200H-NC211	XW2B-40J6-2B (2 axes)	
		Use with position control units (doesn't support communications functions.) Units: CQM1H-PLB21, and CQM1-CPU43-V1	XW2B-20J6-3B (1 axis)	
		Use with position control units (supports communications functions.) Units: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433	XW2B-40J6-4A (2 axes)	
		Use with CJ1M-CPU22/23 (doesn't support communications functions.)	XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)	
⑤	Cable to servo drive	Doesn't support communications functions. (For the XW2B-□□J6-□B)	XW2Z-□□□J-B5	1 m or 2 m (the cable length goes in the empty boxes.)
		Supports communications functions. (For the XW2B-□□J6-4B)	XW2Z-□□□J-B7	
⑥	Cable to position control unit	CQM1H-PLB21 and CQM1-CPU43-V1	XW2Z-□□□J-A3	0.5 m or 1 m (the cable length goes in the empty boxes.)
		C200H-NC112	XW2Z-□□□J-A4	
		C200H-NC211 and C500-NC113/211	XW2Z-□□□J-A5	
		CS1W-NC113 and C200HW-NC113	XW2Z-□□□J-A8	
		CS1W-NC213/413 and C200HW-NC213/413	XW2Z-□□□J-A9	
		CS1W-NC133	XW2Z-□□□J-A12	
		CS1W-NC233/433	XW2Z-□□□J-A13	
		CJ1W-NC113	XW2Z-□□□J-A16	
		CJ1W-NC213/413	XW2Z-□□□J-A17	
		CJ1W-NC133	XW2Z-□□□J-A20	
		CS1W-NC233/433	XW2Z-□□□J-A21	
		CJ1M-CPU22/23	XW2Z-□□□J-A26	
⑦	Control cable	For general-purpose controllers	R88A-CPU□□□S	1 m or 2 m (the cable length goes in the empty boxes.)
⑧	Connector terminal block cable	For general-purpose controllers	R88A-CTU□□□N	
	Connector terminal block		XW2B-40F5-P	---

Cable for CN3

Symbol	Name	Model
⑨	Computer monitor cable	R7A-CCA002P2

Cable for CN4

Symbol	Name	Model
⑩	Analog monitor cable	R88A-CMW001S

Filters

Symbol	Applicable servo drive	Filter model	Rated current	Rated voltage
⑪	R7D-APA3H, R7D-APA5H, R7D-AP01H, R7D-AP02H	R88A-FIW104-E	4A	250 VAC single phase
	R7D-AP04H	R88A-FIW107-E	7A	
	R7D-AP08H	R88A-FIW115-E	15A	

Connectors

Specifications		Model
Control I/O connector (for CN1)		R88A-CNU01C
SmartStep connectors kit.	Models included in kit	R7A-CNA00K-DE
SmartStep encoder connector (for CN2)	R7A-CNA01R	
Hypertac power connector female	SPOC-06K-FSDN169	
Hypertac encoder connector female	SPOC-17H-FRON169	
Hypertac power connector male (used in the motor)		SRUC-06J-MSCN236
Hypertac encoder connector male (used in the motor)		SRUC-17G-MRWN087

External regeneration resistor

Specification	Model
220 W, 47 Ω	R88A-RR22047S

Parameter unit & computer software

Specifications	Model
Parameter copy unit (with cable)	R7A-PR02A
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.11 or higher)	CX-drive
Complete OMRON software package including CX-drive. (CX-One version 1.1 or higher)	CX-One

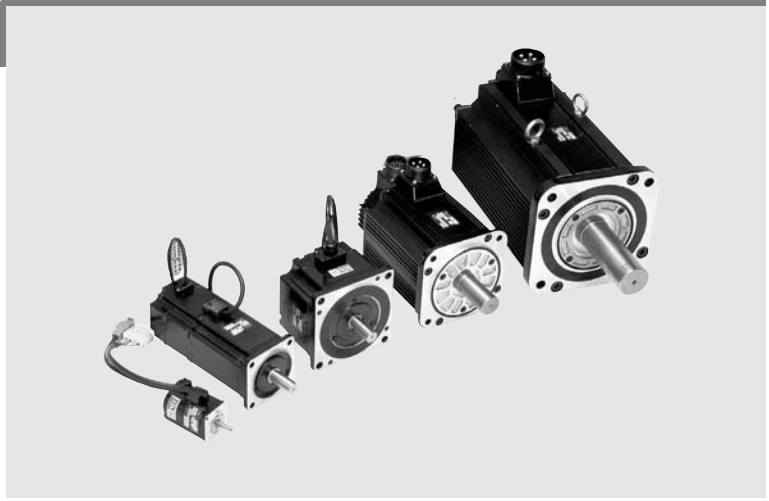
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I46E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

SGMAH-□, SGMPH-□, SGMGH-□,SGMSH-□,SGMUH-□,SGMBH-□

Sigma-II rotary servo motors



The ideal servo family for motion control. Fast response, high speed, and high accuracy.

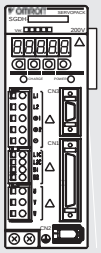
- 6 different designs provide a complete range of servo motors to meet the power, speed and performance required per each application.
- Peak torque 300% of nominal during 3 seconds
- Automatic motor recognition by servo drive
- IP67 and shaft oil seal available
- High resolution encoders
- Absolute multiturn encoder solution
- Compact design and robust construction

Ratings

- 230 VAC from 30 W to 1.5k W (rated torque from 0.09 to 4.77 Nm)
- 400 VAC from 300 W to 55 kW (rated torque from 0.95 Nm to 350 Nm)

System configuration

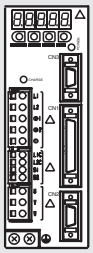
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

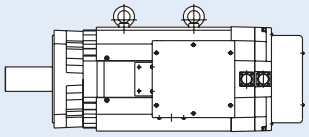
Sigma-II Servo Drive

Drive options

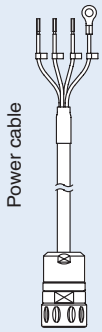


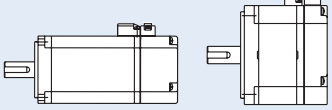
Intelligent Servo Drive

XtraDrive



SGMBH Servo Motor 1500 rpm (22 kW-55 kW)

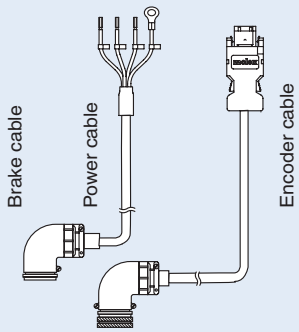


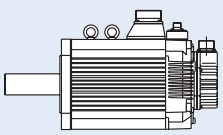


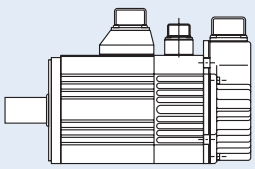
SGMAH Servo Motor 3000 rpm (30-750 W)

SGMPH Servo Motor 3000 rpm (100-1500 W)

Power and encoder cables







SGMGH Servo Motor 1500 rpm (450W-15 kW)

SGMUH Servo Motor 3000 rpm (1-5 kW)

SGMSH Servo Motor 6000 rpm (1-4 kW)

Servo motor / servo drive combination

Sigma-II rotary servo motor					Sigma-II servo drive		XtraDrive servo drive	
	Voltage	Rated torque	Capacity	Model	230 V (1-phase)	400 V (3-phase)	230 V (1-phase)	400 V (3-phase)
SGMAH ($3000\ min^{-1}$) 	230 V	0.0955 N.m	30 W	SGMAH-A3A□	SGDH-A3AE-OY	-	XD-P3-MN01	-
		0.159 N.m	50 W	SGMAH-A5A□	SGDH-A5AE-OY	-	XD-P5-MN01	-
		0.318 N.m	100 W	SGMAH-01A□	SGDH-01AE-OY	-	XD-01-MN01	-
		0.637 N.m	200 W	SGMAH-02A□	SGDH-02AE-OY	-	XD-02-MN01	-
		1.27 N.m	400 W	SGMAH-04A□	SGDH-04AE-OY	-	XD-04-MN01	-
		2.39 N.m	750 W	SGMAH-08A□	SGDH-08AE-S-OY	-	XD-08-MN	-
	400 V	0.955 N.m	300 W	SGMAH-03D□	-	SGDH-05DE-OY	-	XD-05-TN
		2.07 N.m	650 W	SGMAH-07D□	-	SGDH-10DE-OY	-	XD-10-TN
SGMPH ($3000\ min^{-1}$) 	230 V	0.318 N.m	100 W	SGMPH-01A□	SGDH-01AE-OY	-	XD-01-MN01	-
		0.637 N.m	200 W	SGMPH-02A□	SGDH-02AE-OY	-	XD-02-MN01	-
		1.27 N.m	400 W	SGMPH-04A□	SGDH-04AE-OY	-	XD-04-MN01	-
		2.39 N.m	750 W	SGMPH-08A□	SGDH-08AE-S-OY	-	XD-08-MN	-
		4.77 N.m	1500 W	SGMPH-15A□	SGDH-15AE-S-OY	-	XD-15-MN	-
	400 V	0.637 N.m	200 W	SGMPH-02D□	-	SGDH-05DE-OY	-	XD-05-TN
		1.27 N.m	400 W	SGMPH-04D□	-	SGDH-05DE-OY	-	XD-05-TN
		2.39 N.m	750 W	SGMPH-08D□	-	SGDH-10DE-OY	-	XD-10-TN
		4.77 N.m	1500 W	SGMPH-15D□	-	SGDH-15DE-OY	-	XD-15-TN
SGMGH ($1500\ min^{-1}$) 	400 V	2.84 N.m	0.45 kW	SGMGH-05D□	-	SGDH-05DE-OY	-	XD-05-TN
		5.39 N.m	0.85 kW	SGMGH-09D□	-	SGDH-1ODE-OY	-	XD-10-TN
		8.34 N.m	1.3 kW	SGMGH-13D□	-	SGDH-15DE-OY	-	XD-15-TN
		11.5 N.m	1.8 kW	SGMGH-20D□	-	SGDH-20DE-OY	-	XD-20-TN
		18.6 N.m	2.9 kW	SGMGH-30D□	-	SGDH-30DE-OY	-	XD-30-TN
		28.4 N.m	4.4 kW	SGMGH-44D□	-	SGDH-50DE-OY	-	XD-50-TN
		35.0 N.m	5.5 kW	SGMGH-55D□	-	SGDH-60DE-OY	-	-
		48.0 N.m	7.5 kW	SGMGH-75D□	-	SGDH-75DE-OY	-	-
		70.0 N.m	11 kW	SGMGH-1AD□	-	SGDH-1ADE-OY	-	-
		95.4 N.m	15 kW	SGMGH-1ED□	-	SGDH-1EDE-OY	-	-
SGMSH ($3000\ min^{-1}$) 	400 V	3.18 N.m	1.0 kW	SGMSH-10D□	-	SGDH-10DE-OY	-	XD-10-TN
		4.90 N.m	1.5 kW	SGMSH-15D□	-	SGDH-15DE-OY	-	XD-15-TN
		6.36 N.m	2.0 kW	SGMSH-20D□	-	SGDH-20DE-OY	-	XD-20-TN
		9.80 N.m	3.0 kW	SGMSH-30D□	-	SGDH-30DE-OY	-	XD-30-TN
		12.6 N.m	4.0 kW	SGMSH-40D□	-	SGDH-50DE-OY	-	XD-50-TN
		15.8 N.m	5.0 kW	SGMSH-50D□	-	SGDH-50DE-OY	-	XD-50-TN
SGMUH ($6000\ min^{-1}$) 	400 V	1.59 N.m	1.0 kW	SGMUH-10D□	-	SGDH-10DE-OY	-	XD-10-TN
		2.45 N.m	1.5 kW	SGMUH-15D□	-	SGDH-15DE-OY	-	XD-15-TN
		4.9 N.m	3.0 kW	SGMUH-30D□	-	SGDH-30DE-OY	-	XD-30-TN
		6.3 N.m	4.0 kW	SGMUH-40D□	-	SGDH-50DE-OY	-	XD-50-TN
SGMBH ($1500\ min^{-1}$) 	400 V	140 Nm	22 kW	SGMBH-2BD□	-	SGDH-2BDE	-	-
		191 Nm	30 kW	SGMBH-3ZD□	-	SGDH-3ZDE	-	-
		236 Nm	37 kW	SGMBH-3GD□	-	SGDH-3GDE	-	-
		286 Nm	45 kW	SGMBH-4ED□	-	SGDH-4EDE	-	-
		350 Nm	55 kW	SGMBH-5ED□	-	SGDH-5EDE	-	-

Note: 1. For servo motor and cables part numbers refer to ordering information at the end of this chapter

2. Refer to the servo drive chapter for drive options selection and detailed specifications

Type designation

Servo motor

SGMAH - 01 A 1 A 6 S D - OY

Sigma-II servo motor type
- SGMAH: Super high power rate type
- SGMPH: Cube type
- SGMGH: High-speed feed type
- SGMSH: Super high power rate type
- SGMUH: High speed type

Capacity (kW)

Code	SGMAH 3000 min⁻¹	SGMPH 3000 min⁻¹	SGMGH 1500 min⁻¹	SGMSH 3000 min⁻¹	SGMUH 6000 min⁻¹
A3	0.03				
A5	0.05				
01	0.1	0.1			
02	0.2	0.2			
03	0.3				
04	0.4	0.4			
05			0.45		
06					
07	0.65				
08	0.75	0.75			
09			0.85		
10				1.0	1.0
12					
13			1.3		
15		1.5		1.5	1.5
20			1.8	2.0	
22					
30			2.9	3.0	3.0
32					
40				4.0	4.0
44			4.4		
50				5.0	
55			5.5		
60					
75			7.5		
1A			11		
1E			15		

Voltage
- A: 230 V
- D: 400 V

Connector specifications

Blank	No option
D	Hypertac connector (SGMAH,SGMPH)

Brake, oil seal specifications

1	No brake, no oil/dust seal
S	Oil seal
B	90 V brake
C	24 V brake
D	Oil seal + 90 DC brake
E	Oil seal + 24 VDC brake
F	Dust seal
G	Dust seal + 90 VDC brake
H	Dust seal + 24 VDC brake

Shaft end specifications

Code	Shaft end	Type				
		SGMAH	SGMPH	SGMGH	SGMSH	SGMUH
2	Straight, no key	○	○	○	○	
4	Straight, key	○	○			
6	Straight, key, tapped	◎	◎	◎	◎	◎
8	Straight, tapped	○	○			

◎: Standard ○: Option

Design procedure:
- A: Standard
- E: SGMPH (IP67)
- F: SGMAH (prepared for oil seal mounting)

Serial encoder specifications

Code	Encoder	Type				
		SGMAH	SGMPH	SGMGH	SGMSH	SGMUH
1	16-bit absolute	○	○			
2	17-bit absolute			○	○	
A	13-bit incremental	◎	◎			
B	16-bit incremental	○	○			
C	17-bit incremental			◎	◎	◎

◎: Standard ○: Option

SGMBH - 2 B D 2 A □ □

Sigma-II series large
Type : SGMBH

Motor output
2B: 22 kW 4E: 45 kW
3Z: 30 kW 5E: 55 kW
3G: 37 kW

Voltage
D:400 V

Encoder specifications
2:17-bit absolute (standard)
C:17-bit incremental (standard)
3: 20-bit absolute (option)

Design revision
A: Max. torque 200%

Motor specifications
2 : Flange, straight shaft
6 : Flange, straight shaft (with key and tap)
} For 45 kW or less
K : Foot mount, straight shaft
L : Foot mount, straight shaft (with key and tap)
} For 37 kW or more

Option
1: Oil seal (V type)
B: Oil seal (V type) and holding brake (90 VDC)
C: Oil seal (V type) and holding brake (24 VDC)
S: Oil seal (S type)
D: Oil seal (S type) and holding brake (90 VDC)
E: Oil seal (S type) and holding brake (24 VDC)
Note : Options are not available for 55 kW motors.

Servo motor specifications

Type SGMAH, 230 V/400 V

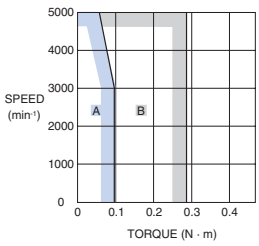
Ratings and specifications

Applied voltage		230 V						400 V	
Servo motor model SGMAH- □		A3A□	A5A□	01A□	02A□	04A□	08A□	03D□	07D□
Rated output	W	30	50	100	200	400	750	300	650
Rated torque	N·m	0.096	0.159	0.318	0.637	1.27	2.39	0.955	2.07
Instantaneous peak torque	N·m	0.286	0.477	0.955	1.91	3.82	7.16	3.82	7.16
Rated current	A (rms)	0.44	0.64	0.91	2.1	2.8	4.4	1.3	2.2
Instantaneous max. current	A (rms)	1.3	2.0	2.8	6.5	8.5	13.4	5.1	7.7
Rated speed	min^{-1}	3000							
Max. speed	min^{-1}	5000							
Torque constant	N·m/A (rms)	0.238	0.268	0.378	0.327	0.498	0.590	0.837	1.02
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$	0.017	0.022	0.036	0.106	0.173	0.672	0.173	0.672
Allowable load moment of inertia (JL)	Multiple of (JM)	30				20			
Rated power rate	kW/s	5.49	11.5	27.8	38.2	93.7	84.8	52.9	63.8
Rated angular acceleration	rad/s^2	57500	72300	87400	60100	73600	35500	55300	30800
Applicable encoder	Standard	Incremental encoder (13 bits)							
	Option	Incremental/absolute encoder (16 bits)							
Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.0085			0.058		0.14	0.058	0.14
Basic specifications: Time rating		Continuous							
Basic specifications: Insulation class		Class B							
Basic specifications: Ambient temperature		0 to +40 °C							
Basic specifications: Ambient humidity		20 to 80% (non-condensing)							
Basic specifications: Vibration class		15 µm or below							
Basic specifications: Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening)							
Basic specifications: Vibration resistance		Vibration acceleration 49 m/s2							
Basic specifications: Mounting		Flange-mounted							

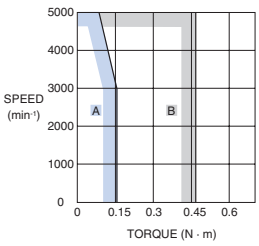
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

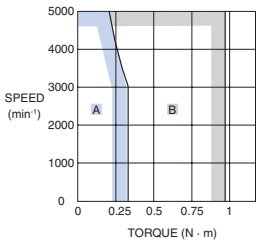
SGMAH-A3A



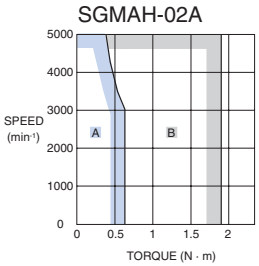
SGMAH-A5A



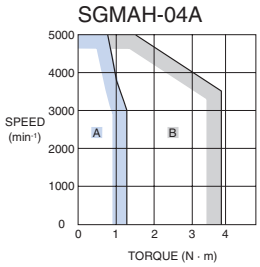
SGMAH-01A



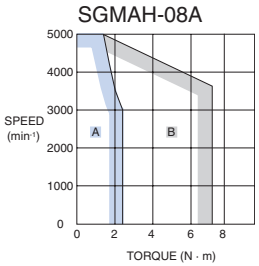
SGMAH-02A



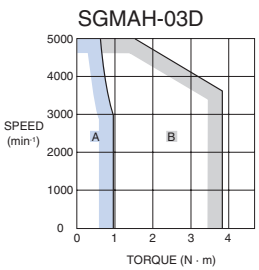
SGMAH-04A



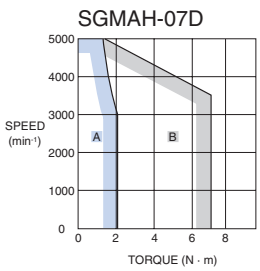
SGMAH-08A



SGMAH-03D



SGMAH-07D



Type SGMPH, 230 V/400 V

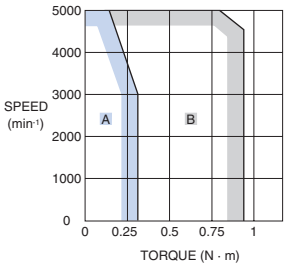
Ratings and specifications

Applied voltage			230 V					400 V			
Servo motor model SGMPH-□			01A□	02A□	04A□	08A□	15A□	02D□	04D□	08D□	15D□
Rated output		W	100	200	400	750	1500	200	400	750	1500
Rated torque		N·m	0.318	0.637	1.27	2.39	4.77	0.637	1.27	2.39	4.77
Instantaneous peak torque		N·m	0.955	1.91	3.82	7.16	14.3	1.91	3.82	7.16	14.3
Rated current		A (rms)	0.89	2.0	2.6	4.1	7.5	1.4	1.4	2.6	4.5
Instantaneous max. current		A (rms)	2.8	6.0	8.0	13.9	23.0	4.6	4.4	7.8	13.7
Rated speed		min^{-1}	3000								
Max. speed		min^{-1}	5000								
Torque constant		N·m/A (rms)	0.392	0.349	0.535	0.641	0.687	0.481	0.963	0.994	1.14
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	0.0491	0.193	0.331	2.10	4.02	0.193	0.331	2.10	4.02
Allowable load moment of inertia (JL)		Multiple of (JM)	25	15	7	5		15	7	5	
Rated power rate		kW/s	20.6	21.0	49.0	27.1	56.7	21.0	49.0	27.1	56.7
Rated angular acceleration		rad/s^2	64800	33000	38500	11400	11900	33000	38500	11400	11900
Applicable encoder		Standard	Incremental encoder (13 bits)								
		Option	Incremental/absolute encoder (16 bits)								
Holding brake moment of inertia J		$kg·m^2x10^{-4}$	0.029	0.109		0.875		0.109		0.875	
Basic specifications	Time rating		Continuous								
	Insulation class		Class B								
	Ambient temperature		0 to +40 °C								
	Ambient humidity		20 to 80% (non-condensing)								
	Vibration class		15 µm or below								
	Enclosure		Totally-enclosed, self-cooled, IP55 (excluding shaft opening)								
	Vibration resistance		Vibration acceleration 49 m/s2								
	Mounting		Flange-mounted								

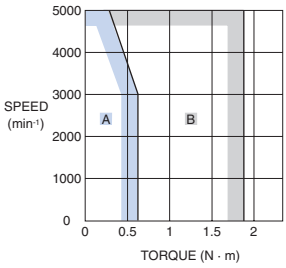
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

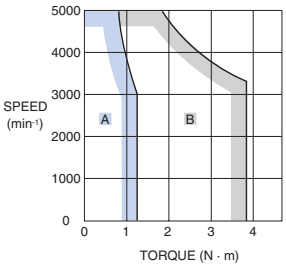
SGMPH-01A



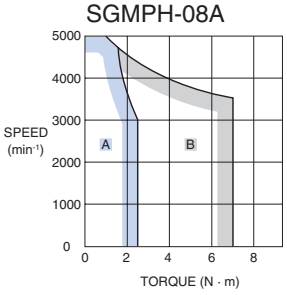
SGMPH-02A



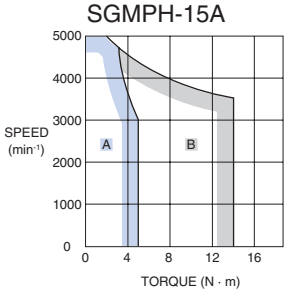
SGMPH-04A



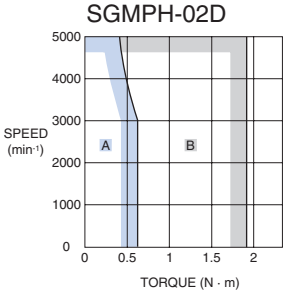
SGMPH-08A



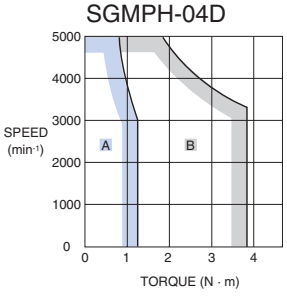
SGMPH-15A



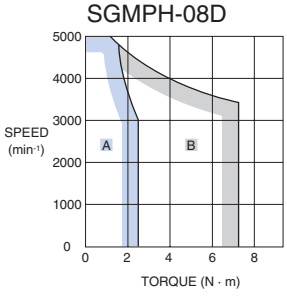
SGMPH-02D



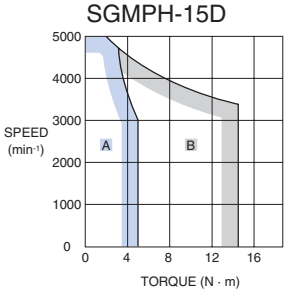
SGMPH-04D



SGMPH-08D



SGMPH-15D



Type SGMGH, 400 V

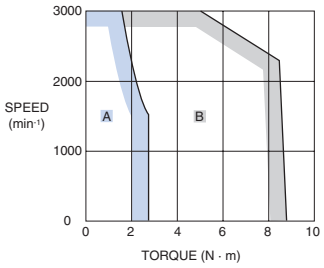
Ratings and specifications

Applied voltage		400 V									
Servo motor model SGMGH- □		05D□	09D□	13D□	20D□	30D□	44D□	55D□	75D□	1AD□	1ED□
Rated output	kW	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15
Rated torque	N·m	2.84	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4
Instantaneous peak torque	N·m	8.92	13.8	23.3	28.7	45.1	71.1	90.7	123	175	221
Rated current	A (rms)	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
Instantaneous max. current	A (rms)	5.5	8.5	14	20	28	40.5	55	65	70	85
Rated speed	min^{-1}	1500									
Max. speed	min^{-1}	3000								2000	
Torque constant	N·m/A (rms)	1.64	1.65	1.68	1.46	1.66	1.82	1.74	2.0	2.56	2.64
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$	7.24	13.9	20.5	31.7	46.0	67.5	89.0	125	281	315
Allowable load moment of inertia (JL)	Multiple of (JM)	5									
Rated power rate	kW/s	11.2	20.9	33.8	41.5	75.3	120	137	184	174	289
Rated angular acceleration	rad/s^2	3930	3880	4060	3620	4050	4210	3930	3850	2490	3030
Applicable encoder	Standard	Incremental encoder (17 bits)									
	Option	Absolute encoder (17 bits)									
Holding brake moment of inertia J	$kg·m^2x10^{-4}$	2.10			8.50					18.8	37.5
Basic specifications: Time rating		Continuous									
Basic specifications: Insulation class		Class F									
Basic specifications: Ambient temperature		0 to +40 °C									
Basic specifications: Ambient humidity		20 to 80% (non-condensing)									
Basic specifications: Vibration class		15 µm or below									
Basic specifications: Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)									
Basic specifications: Vibration resistance		Vibration acceleration 24.5 m/s2									
Basic specifications: Mounting		Flange-mounted									

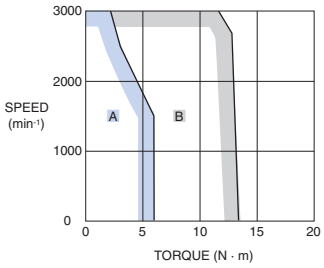
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

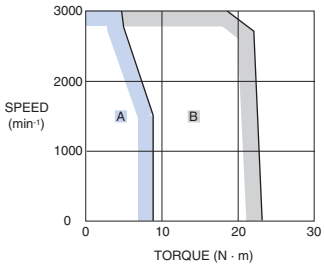
SGMGH-05D



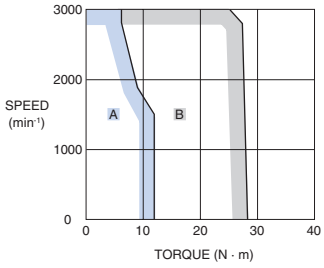
SGMGH-09D



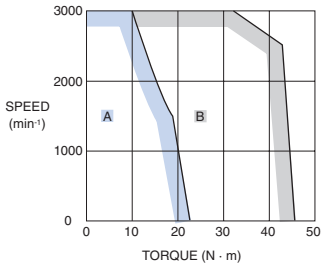
SGMGH-13D



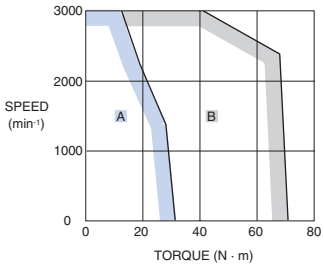
SGMGH-20D



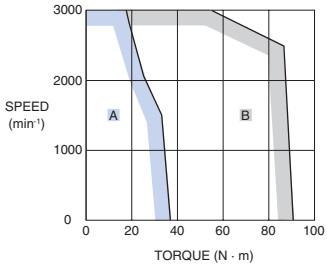
SGMGH-30D



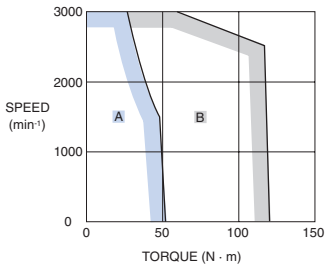
SGMGH-44D



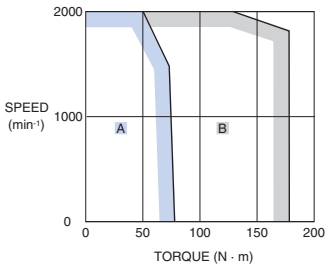
SGMGH-55D



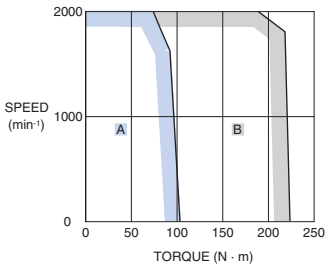
SGMGH-75D



SGMGH-1AD



SGMGH-1ED



Type SGMSH, 400 V

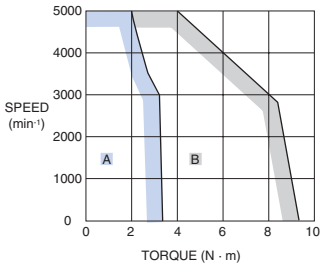
Ratings and specifications

Applied voltage			400 V					
Servo motor model SGMSH- □			10D□	15D□	20D□	30D□	40D□	50D□
Rated output		kW	1.0	1.5	2.0	3.0	4.0	5.0
Rated torque		N·m	3.18	4.9	6.36	9.8	12.6	15.8
Instantaneous peak torque		N·m	9.54	14.7	19.1	29.4	37.8	47.6
Rated current		A (rms)	2.8	4.7	6.2	8.9	12.5	13.8
Instantaneous max. current		A (rms)	8.5	14	19.5	28	38	42
Rated speed		min^{-1}	3000					
Max. speed		min^{-1}	5000					
Torque constant		N·m/A (rms)	1.27	1.15	1.12	1.19	1.07	1.24
Rotor moment of inertia (JM)		$kg·m^2x10^{-4}$	1.74	2.47	3.19	7.0	9.60	12.3
Allowable load moment of inertia (JL)		Multiple of (JM)	5					
Rated power rate		kW/s	57.9	97.2	127	137	166	202
Rated angular acceleration		rad/s^2	18250	19840	19970	14000	13160	12780
Applicable encoder		Standard	Incremental encoder (17 bits)					
		Option	Absolute encoder (17 bits)					
Holding brake moment of inertia J		$kg·m^2x10^{-4}$	0.325			2.10		
Basic specifications	Time rating		Continuous					
	Insulation class		Class F					
	Ambient temperature		0 to +40 °C					
	Ambient humidity		20 to 80% (non-condensing)					
	Vibration class		15 µm or below					
	Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)					
	Vibration resistance		Vibration acceleration 24.5 m/s2					
	Mounting		Flange-mounted					

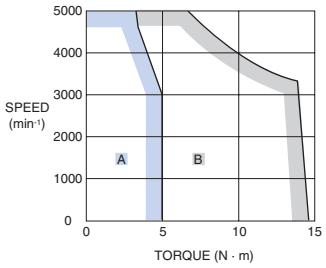
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

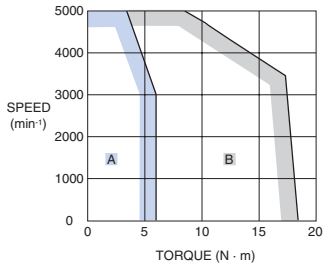
SGMSH-10D



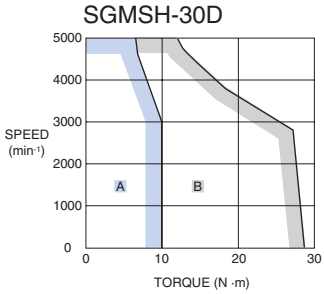
SGMSH-15D



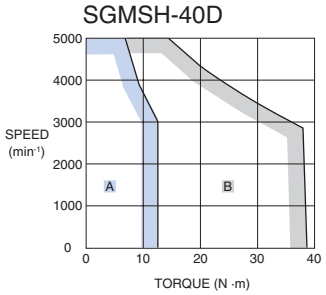
SGMSH-20D



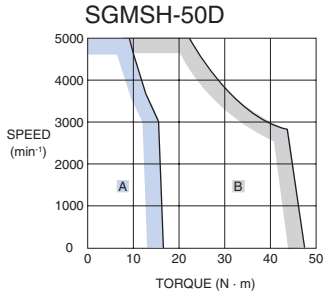
SGMSH-30D



SGMSH-40D



SGMSH-50D



Type SGMUH, 400V

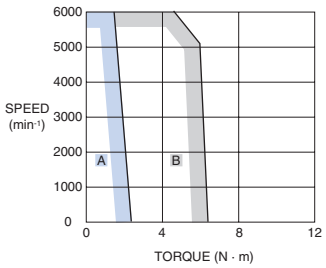
Ratings and specifications

Applied voltage		400 V			
Servo motor model SGMUH- □		10D□	15D□	30D□	40D□
Rated output	kW	1.0	1.5	3.0	4.0
Rated torque	N·m	1.59	2.45	4.9	6.3
Instantaneous peak torque	N·m	6.5	11	21.5	29
Rated current	A (rms)	2.7	4.1	8.1	9.6
Instantaneous max. current	A (rms)	8.5	14	28	38.5
Rated speed	min^{-1}	6000			
Max. speed	min^{-1}	6000			
Torque constant	N·m/A (rms)	0.81	0.83	0.81	0.80
Rotor moment of inertia (JM)	$kg·m^2x10^{-4}$	1.74	2.47	7.0	9.6
Allowable load moment of inertia (JL)	Multiple of (JM)	5			
Rated power rate	kW/s	14.5	24.3	34.3	41.3
Rated angular acceleration	rad/s^2	9130	9910	7000	6550
Applicable encoder	Standard	Incremental encoder (17 bits)			
	Option	-			
Holding brake moment of inertia J	$kg·m^2x10^{-4}$	0.25		2.10	
Basic specifications: Time rating		Continuous			
Basic specifications: Insulation class		Class F			
Basic specifications: Ambient temperature		0 to +40 °C			
Basic specifications: Ambient humidity		20 to 80% (non-condensing)			
Basic specifications: Vibration class		15 µm or below			
Basic specifications: Enclosure		Totally-enclosed, self-cooled, IP67 (excluding shaft opening)			
Basic specifications: Vibration resistance		Vibration acceleration 24.5 m/s2			
Basic specifications: Mounting		Flange-mounted			

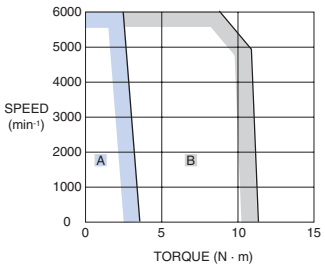
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

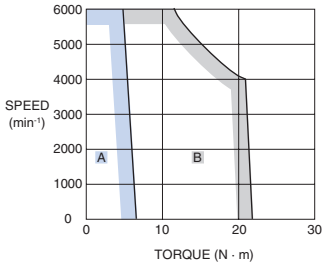
SGMUH-10D



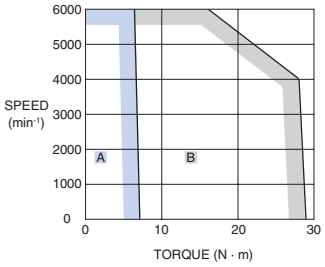
SGMUH-15D



SGMUH-30D



SGMUH-40D



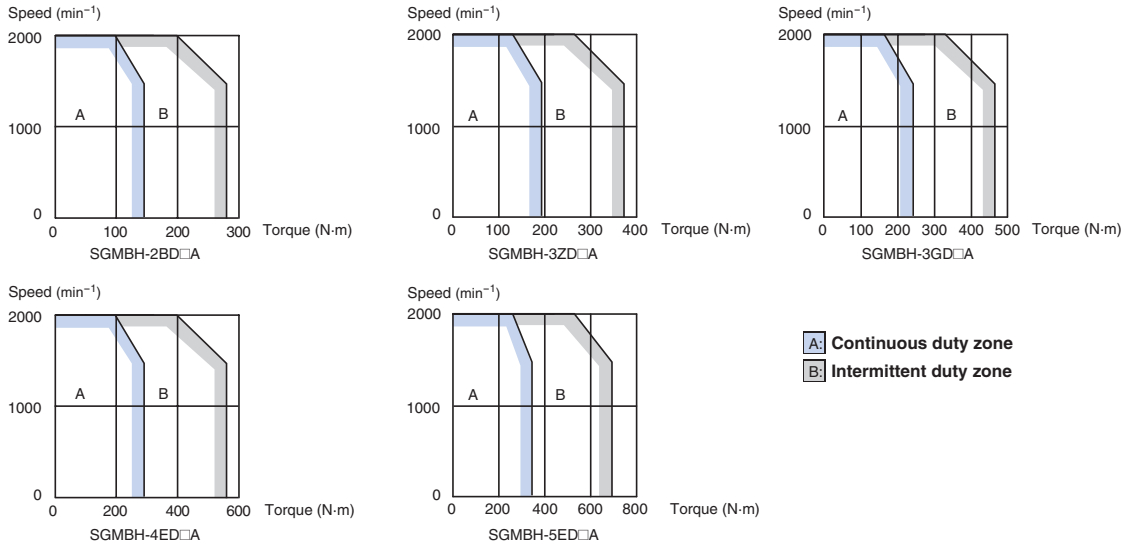
Type SGMBH, 400 V

Ratings and specifications

Type	SGMBH-□		2BD□A	3ZD□A	3GD□A	4ED□A	5ED□A
Performance	Rated output	kW	22	30	37	45	55
	Rated torque	N·m	140	191	236	286	350
	Stalling torque	N·m	140	191	236	286	350
	Instantaneous peak torque	N·m	280	382	471	572	700
	Rated current	A(rms)	58	80	100	127	150
	Innstantaneous max. current	A(rms)	120	170	210	260	310
	Rated/max. speed	min^{-1}	1500/2000				
	Rotor inertia	$kg·m^2$	0.0592	0.0773	0.139	0.151	0.197
Structure	Protective enclosure		IP44				
	Mounting method		Flange		Flange foot mount [1]		Foot mount
Encoder		Standard	Incremental, absolute: 17 bits				
		Option	Absolute: 20 bits				
Usage temperature			0 to 40 °C				
Usage humidity			20 to 80% (non-condensing)				

Note: 1. 37 kW and 45 kW motors with brakes are foot mount type.

Torque-speed charecteristics

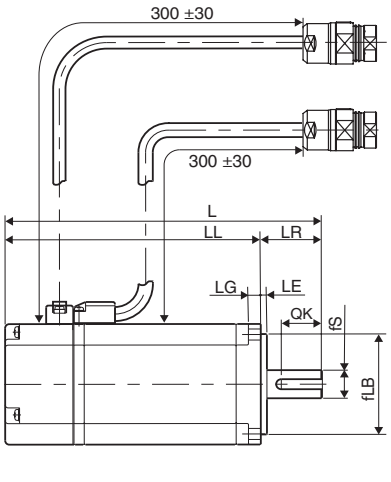


Dimensions

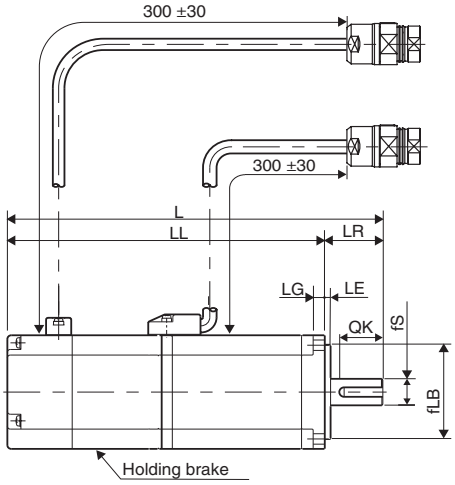
Servo motors

Type SGMAH (230/400 V)

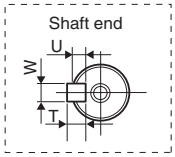
Dimensions (mm)	Without brake		With brake		LR	Flange surface						Shaft end						Aprox. Mass (Kg)	
Model	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap × depth	Without brake	With brake
SGMAH-A3A□A6□D-OY	94.5	69.5	126	101	25	46	30^{h7}	40	2.5	5	4.3	6^{h6}	14	2	2	1.2	M2.5 x 5L	0.3	0.6
SGMAH-A5A□A6□D-OY	102.0	77	133.5	108.5														0.4	0.7
SGMAH-01A□A6□D-OY	119.5	94.5	160	135								8^{h6}		3	3	1.8	M3 x 6L	0.5	0.8
SGMAH-02A□A6□D-OY	126.5	96.5	166	136	30	70	50^{h7}	60	3	6	5.5	14^{h6}	20	5	5	3	M5 x8L	1.1	1.6
SGMAH-03D□A6□D-OY	154.5	124.5	194	164														1.7	2.2
SGMAH-04A□A6□D-OY																		1.7	2.2
SGMAH-07D□A6□D-OY	185	145	229.5	189.5	40	90	70^{h7}	80	3	8	7	16^{h6}	30					3.4	4.3
SGMAH-08A□A6□D-OY																		3.4	4.3

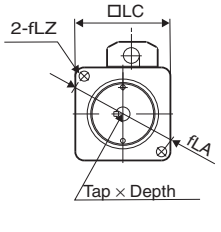


Models without brake

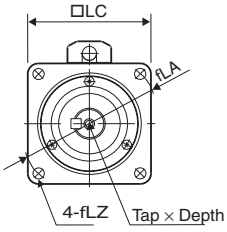


Models with brake





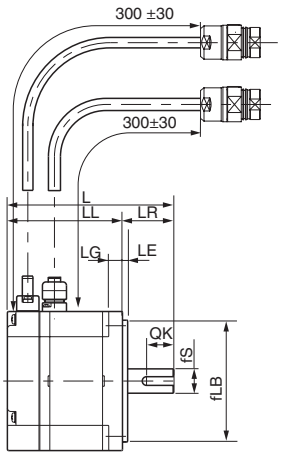
SGMAH-A3,-A5,-01



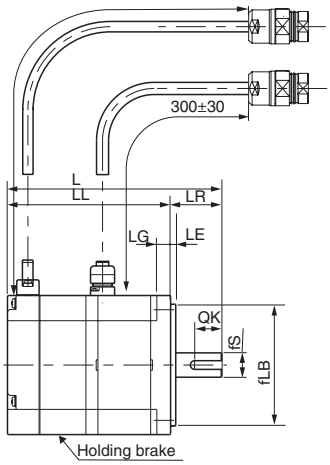
SGMAH-02 to -08

Type SGMPH (230/400 V)

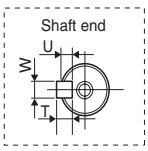
Dimensions (mm)	Without brake		With brake		LR	Flange surface						Shaft end						Aprox. Mass (Kg)	
Model	L	LL	L	LL		LA	LB	LC	LE	LG	LZ	S	QK	W	T	U	Tap × depth	Without brake	With brake
SGMPH-01□□□6□D-OY	87	62	116	91	25	70	50^{h7}	60	3	6	5.5	8^{h6}	14	3	3	1.8	M3x6L	0.7	0.9
SGMPH-02□□□6□D-OY	97	67	128.5	98.5	30	90	70^{h7}	80	3	8	7	14^{h6}	16	5	5	3	M5x8L	1.4	1.9
SGMPH-04□□□6□D-OY	117	87	148.5	118.5														2.1	2.6
SGMPH-08□□□6□D-OY	126.5	86.5	160	120	40	145	110^{h}_{7}	120	3.5	10	10	16^{h6}	22					4.2	5.7
SGMPH-15□□□6□D-OY	154.5	114.5	188	148								19^{h6}		6	6	3.5	M6x10L	6.6	8.1

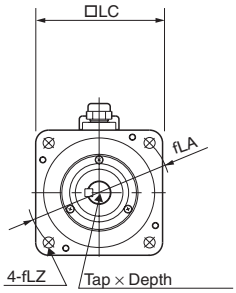


Models without brake



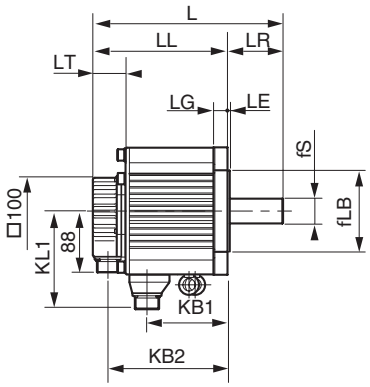
Models with brake



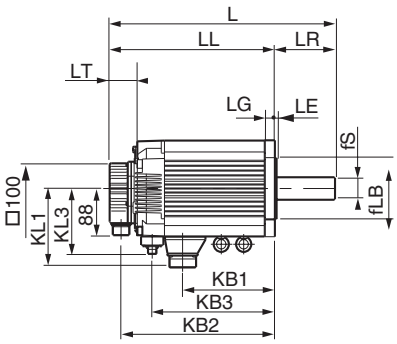


Type SGMGH (400 V)

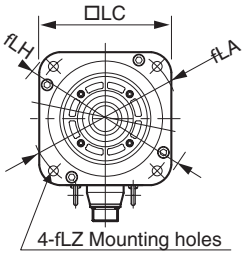
Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end							Aprox. Mass (Kg)	
Model	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P	Without brake	With brake
SGMGH-05D□A6□-OY	196	138	117	234	176	154	109	98	58	46	65	109	145	110	130	6	12	165	9	19	40	25	5	5	3	M5 x 12L	5.5	7.5
SGMGH-09D□A6□-OY	219	161	140	257	199	177	132				88																7.6	9.6
SGMGH-13D□A6□-OY	243	185	164	281	223	201	156				112									22			6	6	3.5		9.6	12
SGMGH-20D□A6□-OY	245	166	144	296	217	195	137	123	79	47	89	140	200	114.3	180	3.2	18	230	13.5	35	76	60	10	8	5	M12 x 25L	14	19
SGMGH-30D□A6□-OY	271	192	170	322	243	221	163				115																18	23.5
SGMGH-44D□A6□-OY	305	226	204	356	277	255	197				149																23	28.5
SGMGH-55D□A6□-OY	373	260	238	424	311	289	231		113		174	150								42	110	90	12			M16 x 32L	30	35
SGMGH-75D□A6□-OY	447	334	312	498	385	363	305				248																40	45.5
SGMGH-1AD□A6□-OY	454	338	316	499	383	362	315	142	116	47	251	168	235	200	220	4	18	270	13.5	42	110	90	12	8	5	M16 x 32L	57.5	65
SGMGH-1ED□A6□-OY	573	457	435	635	519	497	415			48	343						20			55			16	10	6	M20 x 40L	86	100

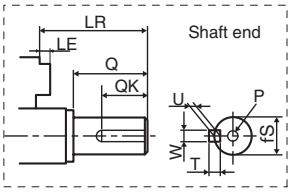


Models without brake



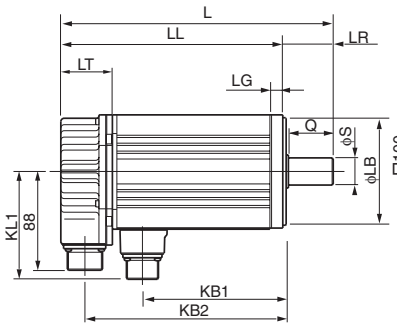
Models with brake



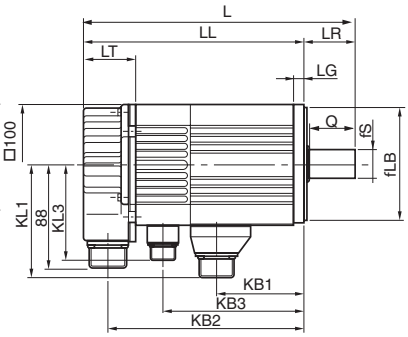


Type SGMSH (400 V)

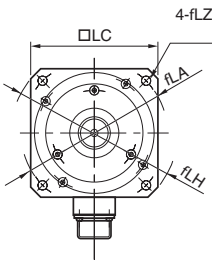
Dimensions (mm)	Without brake			With brake					LR	LT	KB 1	KL 1	Flange surface							Shaft end							Aprox. Mass (Kg)	
Model	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P	Without brake	With brake
SGMSH-10D□A6□-OY	194	149	128	238	193	171	120	85	45	46	76	96	115	95^{h}_{7}	100	3	10	130	7	24^{h6}	40	32	8	7	4	M8 x 16L	4.6	6.0
SGMSH-15D□A6□-OY	220	175	154	264	219	197	146				102																5.8	7.5
SGMSH-20D□A6□-OY	243	198	177	287	242	220	169				125																7.0	8.5
SGMSH-30D□A6□-OY	262	199	178	300	237	216	170	98	63		124	114	145	$110^{}_{h7}$	130	6	12	165	9	28^{h6}	55	50					11	14
SGMSH-40D□A6□-OY	299	236	215	337	274	253	207				161																14	17
SGMSH-50D□A6□-OY	339	276	255	377	314	293	247				201																17	20

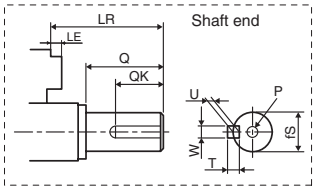


Models without brake



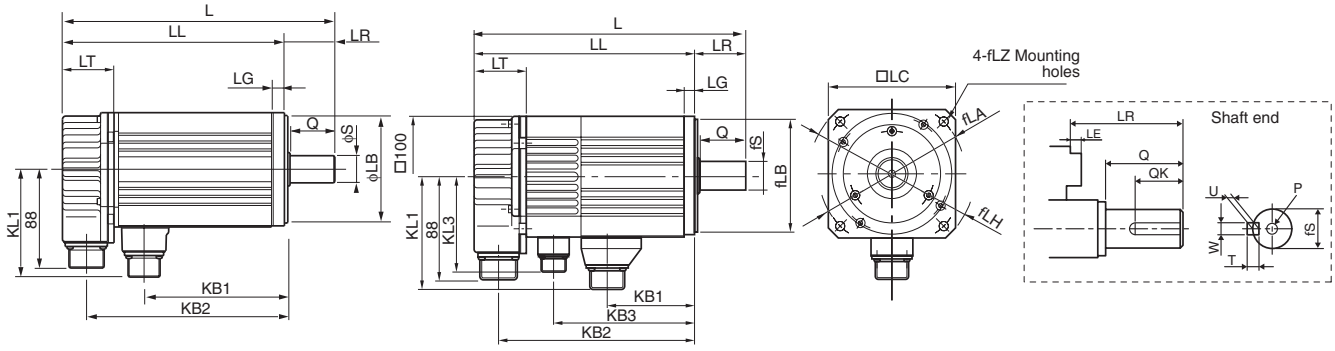
Models with brake





Type SGMUH (400 V)

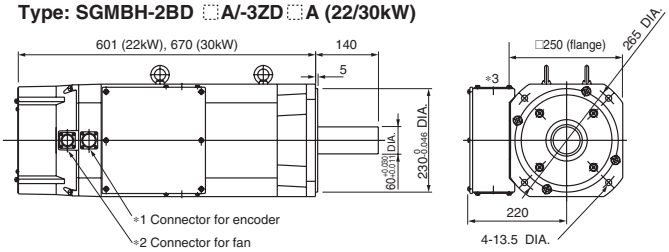
Dimensions (mm)	Without brake			With brake					LR	LT	KB1	KL1	Flange surface							Shaft end							Aprox. Mass (Kg)	
Model	L	LL	KB2	L	LL	KB2	KB3	KL3					LA	LB	LC	LE	LG	LH	LZ	S	Q	QK	W	T	U	P	With-out brake	With brake
SGMUH-10D□A6□-OY	194	149	128	238	193	171	120	85	45	46	76	96	130	110	116	3.5	10	150	9	24^{h6}	40	32	8	7	4	M8 x 16L	4.8	6.2
SGMUH-15D□A6□-OY	220	175	154	264	219	197	146				102																6.0	7.7
SGMUH-30D□A6□-OY	262	202	181	300	237	219	173	98	60		127	114	165	130	155		12	190	11	28^{h6}	55	50					11.5	14.5
SGMUH-40D□A6□-OY	327	269	245	362	302	281	210			71	164																15	18



Models without brake　　Models with brake

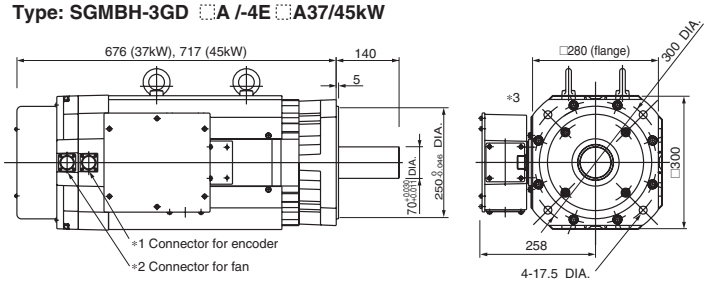
Type SGMBH (400 V)

Type: SGMBH-2BD □A/-3ZD□A (22/30kW)



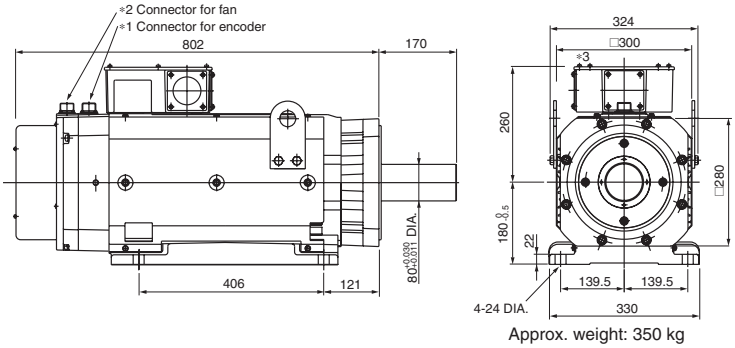
Approx. weight: 120 kg (22 kW)
140 kg (30 kW)

Type: SGMBH-3GD □A /-4E□A37/45kW



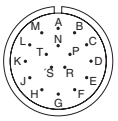
Approx. weight: 230 kg (37 kW)
250 kg (45 kW)

Type: SGMBH-5ED □A (55kW)



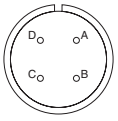
Approx. weight: 350 kg

∗1 Connector for encoder



Receptacle:	97F-3102E20-29P
Plug IP67 (L-shape):	MS3108E20-29S

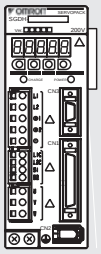
∗2 Connector for fan



Receptacle:	CE05-2A18-10PD-B
Plug IP67 (L-shape):	MS3108E18-10S

Ordering information

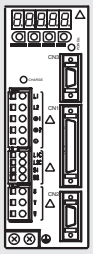
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

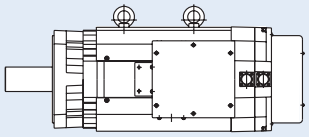
② **Sigma-II Servo Drive**

Drive options

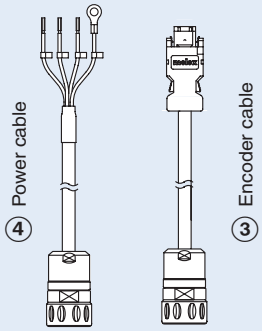


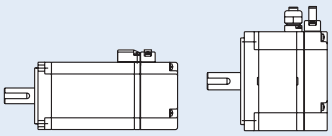
Intelligent servo drive

② **XtraDrive**



① **SGMBH Servo Motor 1500 rpm (22 kW-55 kW)**

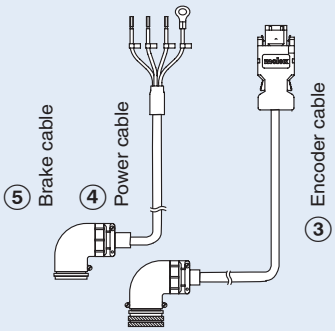


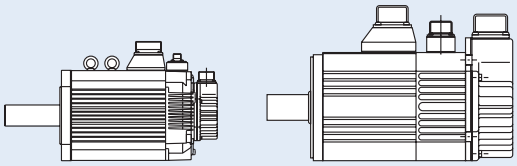


① **SGMAH Servo Motor 3000 rpm (30-750 W)**

① **SGMPH Servo Motor 3000 rpm (100-1500 W)**

Power and encoder cables





① **SGMGH Servo Motor 1500 rpm (450W-15 kW)**

① **SGMUH Servo Motor 3000 rpm (1-5 kW)**

① **SGMSH Servo Motor 6000 rpm (1-4 kW)**

Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables

Servo motor

① Select motor from families SGMAH, SGMPH, SGMGH, SGMUH, SGMSH, SGMBH using motor tables in next pages.

Servo drive

Note: Choosing Sigma-II drive or XtraDrive affects to the encoder cable needed.

② Refer to Sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

SGMAH - cylindrical servo motors 3000 r/min (30 - 750 W)

Symbol	Specifications					Servo motor model	Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	230 V	**Incremental encoder (13 bit)** Straight shaft with key & tap	Without brake	0.096 Nm	30 W	SGMAH-A3AAA61D-OY	SGDH-A3AE-OY	XD-P3-MN01
				0.159 Nm	50 W	SGMAH-A5AAA61D-OY	SGDH-A5AE-OY	XD-P5-MN01
				0.318 Nm	100 W	SGMAH-01AAA61D-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMAH-02AAA61D-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMAH-04AAA61D-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMAH-08AAA61D-OY	SGDH-08AE-S-OY	XD-08-MN
			With brake	0.096 Nm	30 W	SGMAH-A3AAA6CD-OY	SGDH-A3AE-OY	XD-P3-MN01
				0.159 Nm	50 W	SGMAH-A5AAA6CD-OY	SGDH-A5AE-OY	XD-P5-MN01
				0.318 Nm	100 W	SGMAH-01AAA6CD-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMAH-02AAA6CD-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMAH-04AAA6CD-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMAH-08AAA6CD-OY	SGDH-08AE-S-OY	XD-08-MN
		Absolute encoder (16 bit) Straight shaft with key & tap	Without brake	0.096 Nm	30 W	SGMAH-A3A1A61D-OY	SGDH-A3AE-OY	XD-P3-MN01
				0.159 Nm	50 W	SGMAH-A5A1A61D-OY	SGDH-A5AE-OY	XD-P5-MN01
				0.318 Nm	100 W	SGMAH-01A1A61D-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMAH-02A1A61D-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMAH-04A1A61D-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMAH-08A1A61D-OY	SGDH-08AE-S-OY	XD-08-MN
			With brake	0.096 Nm	30 W	SGMAH-A3A1A6CD-OY	SGDH-A3AE-OY	XD-P3-MN01
				0.159 Nm	50 W	SGMAH-A5A1A6CD-OY	SGDH-A5AE-OY	XD-P5-MN01
				0.318 Nm	100 W	SGMAH-01A1A6CD-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMAH-02A1A6CD-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMAH-04A1A6CD-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMAH-08A1A6CD-OY	SGDH-08AE-S-OY	XD-08-MN
	400 V	**Incremental encoder (13 bit)** Straight shaft with key	Without brake	0.955 Nm	300 W	SGMAH-03DAA61D-OY	SGDH-05DE-OY	XD-05-TN
				2.07 Nm	650 W	SGMAH-07DAA61D-OY	SGDH-10DE-OY	XD-10-TN
			With brake	0.955 Nm	300 W	SGMAH-03DAA6CD-OY	SGDH-05DE-OY	XD-05-TN
				2.07 Nm	650 W	SGMAH-07DAA6CD-OY	SGDH-10DE-OY	XD-10-TN
		Absolute encoder (16 bit) Straight shaft with key	Without brake	0.955 Nm	300 W	SGMAH-03D1A61D-OY	SGDH-05DE-OY	XD-05-TN
				2.07 Nm	650 W	SGMAH-07D1A61D-OY	SGDH-10DE-OY	XD-10-TN
			With brake	0.955 Nm	300 W	SGMAH-03D1A6CD-OY	SGDH-05DE-OY	XD-05-TN
				2.07 Nm	650 W	SGMAH-07D1A6CD-OY	SGDH-10DE-OY	XD-10-TN

SGMPH - flat type servo motors 3000 r/min (100 - 1500 W)

Symbol	Specifications					Servo motor model	Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	230 V	**Incremental encoder (13 bit)** Straight shaft with key & tap	Without brake	0.318 Nm	100 W	SGMPH-01AAA61D-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMPH-02AAA61D-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMPH-04AAA61D-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMPH-08AAA61D-OY	SGDH-08AE-S-OY	XD-08-MN
				4.77 Nm	1500 W	SGMPH-15AAA61D-OY	SGDH-15AE-S-OY	XD-15-MN
			With brake	0.318 Nm	100 W	SGMPH-01AAA6CD-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMPH-02AAA6CD-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMPH-04AAA6CD-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMPH-08AAA6CD-OY	SGDH-08AE-S-OY	XD-08-MN
				4.77 Nm	1500 W	SGMPH-15AAA6CD-OY	SGDH-15AE-S-OY	XD-15-MN
		Absolute encoder (16 bit) Straight shaft with key & tap	Without brake	0.318 Nm	100 W	SGMPH-01A1A61D-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMPH-02A1A61D-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMPH-04A1A61D-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMPH-08A1A61D-OY	SGDH-08AE-S-OY	XD-08-MN
				4.77 Nm	1500 W	SGMPH-15A1A61D-OY	SGDH-15AE-S-OY	XD-15-MN
			With brake	0.318 Nm	100 W	SGMPH-01A1A6CD-OY	SGDH-01AE-OY	XD-01-MN01
				0.637 Nm	200 W	SGMPH-02A1A6CD-OY	SGDH-02AE-OY	XD-02-MN01
				1.27 Nm	400 W	SGMPH-04A1A6CD-OY	SGDH-04AE-OY	XD-04-MN01
				2.39 Nm	750 W	SGMPH-08A1A6CD-OY	SGDH-08AE-S-OY	XD-08-MN
				4.77 Nm	1500 W	SGMPH-15A1A6CD-OY	SGDH-15AE-S-OY	XD-15-MN
	400 V	**Incremental encoder (13 bit)** Straight shaft with key	Without brake	0.637 Nm	200 W	SGMPH-02DAA61D-OY	SGDH-05DE-OY	XD-05-TN
				1.27 Nm	400 W	SGMPH-04DAA61D-OY	SGDH-05DE-OY	XD-05-TN
				2.39 Nm	750 W	SGMPH-08DAA61D-OY	SGDH-10DE-OY	XD-10-TN
				4.77 Nm	1500 W	SGMPH-15DAA61D-OY	SGDH-15DE-OY	XD-15-TN
			With brake	0.637 Nm	200 W	SGMPH-02DAA6CD-OY	SGDH-05DE-OY	XD-05-TN
				1.27 Nm	400 W	SGMPH-04DAA6CD-OY	SGDH-05DE-OY	XD-05-TN
				2.39 Nm	750 W	SGMPH-08DAA6CD-OY	SGDH-10DE-OY	XD-10-TN
				4.77 Nm	1500 W	SGMPH-15DAA6CD-OY	SGDH-15DE-OY	XD-15-TN
		Absolute encoder (16 bit) Straight shaft with key	Without brake	0.637 Nm	200 W	SGMPH-02D1A61D-OY	SGDH-05DE-OY	XD-05-TN
				1.27 Nm	400 W	SGMPH-04D1A61D-OY	SGDH-05DE-OY	XD-05-TN
				2.39 Nm	750 W	SGMPH-08D1A61D-OY	SGDH-10DE-OY	XD-10-TN
				4.77 Nm	1500 W	SGMPH-15D1A61D-OY	SGDH-15DE-OY	XD-15-TN
			With brake	0.637 Nm	200 W	SGMPH-02D1A6CD-OY	SGDH-05DE-OY	XD-05-TN
				1.27 Nm	400 W	SGMPH-04D1A6CD-OY	SGDH-05DE-OY	XD-05-TN
				2.39 Nm	750 W	SGMPH-08D1A6CD-OY	SGDH-10DE-OY	XD-10-TN
				4.77 Nm	1500 W	SGMPH-15D1A6CD-OY	SGDH-15DE-OY	XD-15-TN

SGMGH - servo motors 1500 r/min (0.45 - 15 kW)

Symbol	Specifications					Servo motor model	Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	400 V	**Incremental encoder (17 bit)** Straight shaft with key & tap	Without brake	2.84 Nm	0.45 kW	SGMGH-05DCA6F-OY	SGDH-05DE-OY	XD-05-TN
				5.39 Nm	0.85 kW	SGMGH-09DCA6F-OY	SGDH-10DE-OY	XD-10-TN
				8.34 Nm	1.3 kW	SGMGH-13DCA6F-OY	SGDH-15DE-OY	XD-15-TN
				11.5 Nm	1.8 kW	SGMGH-20DCA6F-OY	SGDH-20DE-OY	XD-20-TN
				18.6 Nm	2.9 kW	SGMGH-30DCA6F-OY	SGDH-30DE-OY	XD-30-TN
				28.4 Nm	4.4 kW	SGMGH-44DCA6F-OY	SGDH-50DE-OY	XD-50-TN
				35.0 Nm	5.5 kW	SGMGH-55DCA6F-OY	SGDH-60DE-OY	-
				48.0 Nm	7.5 kW	SGMGH-75DCA6F-OY	SGDH-75DE-OY	-
				70.0 Nm	11.5 kW	SGMGH-1ADCA6F-OY	SGDH-1ADE-OY	-
				95.4 Nm	15.0 kW	SGMGH-1EDCA6F-OY	SGDH-1EDE-OY	-
			With brake	2.84 Nm	0.45 kW	SGMGH-05DCA6H-OY	SGDH-05DE-OY	XD-05-TN
				5.39 Nm	0.85 kW	SGMGH-09DCA6H-OY	SGDH-10DE-OY	XD-10-TN
				8.34 Nm	1.3 kW	SGMGH-13DCA6H-OY	SGDH-15DE-OY	XD-15-TN
				11.5 Nm	1.8 kW	SGMGH-20DCA6H-OY	SGDH-20DE-OY	XD-20-TN
				18.6 Nm	2.9 kW	SGMGH-30DCA6H-OY	SGDH-30DE-OY	XD-30-TN
				28.4 Nm	4.4 kW	SGMGH-44DCA6H-OY	SGDH-50DE-OY	XD-50-TN
				35.0 Nm	5.5 kW	SGMGH-55DCA6H-OY	SGDH-60DE-OY	-
				48.0 Nm	7.5 kW	SGMGH-75DCA6H-OY	SGDH-75DE-OY	-
				70.0 Nm	11.5 kW	SGMGH-1ADCA6H-OY	SGDH-1ADE-OY	-
				95.4 Nm	15.0 kW	SGMGH-1EDCA6H-OY	SGDH-1EDE-OY	-
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake	2.84 Nm	0.45 kW	SGMGH-05D2A6F-OY	SGDH-05DE-OY	XD-05-TN
				5.39 Nm	0.85 kW	SGMGH-09D2A6F-OY	SGDH-10DE-OY	XD-10-TN
				8.34 Nm	1.3 kW	SGMGH-13D2A6F-OY	SGDH-15DE-OY	XD-15-TN
				11.5 Nm	1.8 kW	SGMGH-20D2A6F-OY	SGDH-20DE-OY	XD-20-TN
				18.6 Nm	2.9 kW	SGMGH-30D2A6F-OY	SGDH-30DE-OY	XD-30-TN
				28.4 Nm	4.4 kW	SGMGH-44D2A6F-OY	SGDH-50DE-OY	XD-50-TN
				35.0 Nm	5.5 kW	SGMGH-55D2A6F-OY	SGDH-60DE-OY	-
				48.0 Nm	7.5 kW	SGMGH-75D2A6F-OY	SGDH-75DE-OY	-
				70.0 Nm	11.5 kW	SGMGH-1AD2A6F-OY	SGDH-1ADE-OY	-
				95.4 Nm	15.0 kW	SGMGH-1ED2A6F-OY	SGDH-1EDE-OY	-
			With brake	2.84 Nm	0.45 kW	SGMGH-05D2A6H-OY	SGDH-05DE-OY	XD-05-TN
				5.39 Nm	0.85 kW	SGMGH-09D2A6H-OY	SGDH-10DE-OY	XD-10-TN
				8.34 Nm	1.3 kW	SGMGH-13D2A6H-OY	SGDH-15DE-OY	XD-15-TN
				11.5 Nm	1.8 kW	SGMGH-20D2A6H-OY	SGDH-20DE-OY	XD-20-TN
				18.6 Nm	2.9 kW	SGMGH-30D2A6H-OY	SGDH-30DE-OY	XD-30-TN
				28.4 Nm	4.4 kW	SGMGH-44D2A6H-OY	SGDH-50DE-OY	XD-50-TN
				35.0 Nm	5.5 kW	SGMGH-55D2A6H-OY	SGDH-60DE-OY	-
				48.0 Nm	7.5 kW	SGMGH-75D2A6H-OY	SGDH-75DE-OY	-
				70.0 Nm	11.5 kW	SGMGH-1AD2A6H-OY	SGDH-1ADE-OY	-
				95.4 Nm	15.0 kW	SGMGH-1ED2A6H-OY	SGDH-1EDE-OY	-

SGMSH - servo motors 3000 r/min (1 - 5 kW)

Symbol	Specifications					Servo motor model	Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	400 V	**Incremental encoder (17 bit)** Straight shaft with key & tap	Without brake	3.18 Nm	1.0 kW	SGMSH-10DCA6F-OY	SGDH-10DE-OY	XD-10-TN
				4.9 Nm	1.5 kW	SGMSH-15DCA6F-OY	SGDH-15DE-OY	XD-15-TN
				6.36 Nm	2.0 kW	SGMSH-20DCA6F-OY	SGDH-20DE-OY	XD-20-TN
				9.8 Nm	3.0 kW	SGMSH-30DCA6F-OY	SGDH-30DE-OY	XD-30-TN
				12.6 Nm	4.0 kW	SGMSH-40DCA6F-OY	SGDH-50DE-OY	XD-50-TN
				15.8 Nm	5.0 kW	SGMSH-50DCA6F-OY	SGDH-50DE-OY	XD-50-TN
			With brake	3.18 Nm	1.0 kW	SGMSH-10DCA6H-OY	SGDH-10DE-OY	XD-10-TN
				4.9 Nm	1.5 kW	SGMSH-15DCA6H-OY	SGDH-15DE-OY	XD-15-TN
				6.36 Nm	2.0 kW	SGMSH-20DCA6H-OY	SGDH-20DE-OY	XD-20-TN
				9.8 Nm	3.0 kW	SGMSH-30DCA6H-OY	SGDH-30DE-OY	XD-30-TN
				12.6 Nm	4.0 kW	SGMSH-40DCA6H-OY	SGDH-50DE-OY	XD-50-TN
				15.8 Nm	5.0 kW	SGMSH-50DCA6H-OY	SGDH-50DE-OY	XD-50-TN
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake	3.18 Nm	1.0 kW	SGMSH-10D2A6F-OY	SGDH-10DE-OY	XD-10-TN
				4.9 Nm	1.5 kW	SGMSH-15D2A6F-OY	SGDH-15DE-OY	XD-15-TN
				6.36 Nm	2.0 kW	SGMSH-20D2A6F-OY	SGDH-20DE-OY	XD-20-TN
				9.8 Nm	3.0 kW	SGMSH-30D2A6F-OY	SGDH-30DE-OY	XD-30-TN
				12.6 Nm	4.0 kW	SGMSH-40D2A6F-OY	SGDH-50DE-OY	XD-50-TN
				15.8 Nm	5.0 kW	SGMSH-50D2A6F-OY	SGDH-50DE-OY	XD-50-TN
			With brake	3.18 Nm	1.0 kW	SGMSH-10D2A6H-OY	SGDH-10DE-OY	XD-10-TN
				4.9 Nm	1.5 kW	SGMSH-15D2A6H-OY	SGDH-15DE-OY	XD-15-TN
				6.36 Nm	2.0 kW	SGMSH-20D2A6H-OY	SGDH-20DE-OY	XD-20-TN
				9.8 Nm	3.0 kW	SGMSH-30D2A6H-OY	SGDH-30DE-OY	XD-30-TN
				12.6 Nm	4.0 kW	SGMSH-40D2A6H-OY	SGDH-50DE-OY	XD-50-TN
				15.8 Nm	5.0 kW	SGMSH-50D2A6H-OY	SGDH-50DE-OY	XD-50-TN

SGMUH - servo motors 6000 r/min (1 - 4 kW)

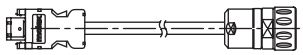
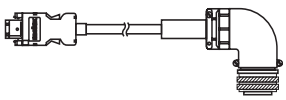
Symbol	Specifications					Servo motor model	Compatible servo drives ②	
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II	XtraDrive
① 	400 V	**Incremental encoder (17 bit)** Straight shaft with key	Without brake	1.59 Nm	1.0 kW	SGMUH-10DCA61-OY	SGDH-10DE-OY	XD-10-TN
				2.45 Nm	1.5 kW	SGMUH-15DCA61-OY	SGDH-15DE-OY	XD-15-TN
				4.9 Nm	3.0 kW	SGMUH-30DCA61OY	SGDH-30DE-OY	XD-30-TN
				6.3 Nm	4.0 kW	SGMUH-40DCA61-OY	SGDH-50DE-OY	XD-50-TN
			With brake	1.59 Nm	1.0 kW	SGMUH-10DCA6C-OY	SGDH-10DE-OY	XD-10-TN
				2.45 Nm	1.5 kW	SGMUH-15DCA6C-OY	SGDH-15DE-OY	XD-15-TN
				4.9 Nm	3.0 kW	SGMUH-30DCA6C-OY	SGDH-30DE-OY	XD-30-TN
				6.3 Nm	4.0 kW	SGMUH-40DCA6C-OY	SGDH-50DE-OY	XD-50-TN

SGMBH - servo motors 1500 r/min (22 - 55 kW)

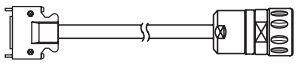
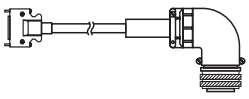
Symbol	Specifications					Servo motor model	Compatible drives ②
	Voltage	Encoder and design		Rated torque	Capacity		Sigma-II
① 	400 V	**Incremental encoder (17 bit)** Straight shaft with key & tap	Without brake Flange mount	140 Nm	22 kW	SGMBH-2BDCA61	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZDCA61	SGDH-3ZDE
				236 Nm	37 kW	SGMBH-3GDCA61	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCA61	SGDH-4EDE
			Without brake Foot mount	236 Nm	37 kW	SGMBH-3GDCAL1	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCAL1	SGDH-4EDE
				350 Nm	55 kW	SGMBH-5EDCAL1	SGDH-5EDE
			With brake Flange mount	140 Nm	22 kW	SGMBH-2BDCA6C	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZDCA6C	SGDH-3ZDE
			With brake Foot mount	236 Nm	37 kW	SGMBH-3GDCALC	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4EDCALC	SGDH-4EDE
		Absolute encoder (17 bit) Straight shaft with key & tap	Without brake Flange mount	140 Nm	22 kW	SGMBH-2BD2A61	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZD2A61	SGDH-3ZDE
				236 Nm	37 kW	SGMBH-3GD2A61	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2A61	SGDH-4EDE
			Without brake Foot mount	236 Nm	37 kW	SGMBH-3GD2AL1	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2AL1	SGDH-4EDE
				350 Nm	55 kW	SGMBH-5ED2AL1	SGDH-5EDE
			With brake Flange mount	140 Nm	22 kW	SGMBH-2BD2A6C	SGDH-2BDE
				191 Nm	30 kW	SGMBH-3ZD2A6C	SGDH-3ZDE
			With brake Foot mount	236 Nm	37 kW	SGMBH-3GD2ALC	SGDH-3GDE
				286 Nm	45 kW	SGMBH-4ED2ALC	SGDH-4EDE

Encoder Cables

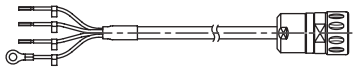
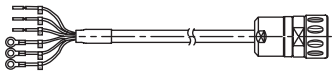
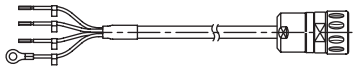
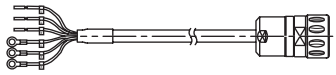
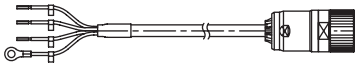
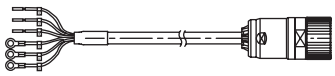
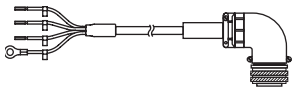
for sigma-II servo drive

Symbol	Specifications		Model	Appearance
③	Sigma-II encoder cable for SGMAH/PH Servo motors SGMAH-□□□□□□□D-OY SGMPH-□□□□□□□D-OY	3 m	R88A-CRWA003C-DE	
		5 m	R88A-CRWA005C-DE	
		10 m	R88A-CRWA010C-DE	
		15 m	R88A-CRWA015C-DE	
		20 m	R88A-CRWA020C-DE	
	Sigma-II encoder cable for SGMGH/SH/UH Servo motors SGMGH-□ SGMSH-□ SGMUH-□, SGMBH-□	3 m	R88A-CRWB003N-E	
		5 m	R88A-CRWB005N-E	
		10 m	R88A-CRWB010N-E	
		15 m	R88A-CRWB015N-E	
		20 m	R88A-CRWB020N-E	

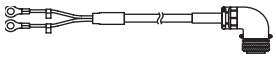
for XtraDrive servo drive

Symbol	Specifications		Model	Appearance
③	XtraDrive encoder cable for Sigma-II (SGMAH/PH) Servo motors SGMAH-□□□□□□□D-OY SGMPH-□□□□□□□D-OY	3 m	XD-CRWA003-DE	
		5 m	XD-CRWA005-DE	
		10 m	XD-CRWA010-DE	
		15 m	XD-CRWA015-DE	
		20 m	XD-CRWA020-DE	
	XtraDrive encoder cable for Sigma-II (SGMGH/SH/UH/BH) Servo motors SGMGH-□ SGMSH-□ SGMUH-□	3 m	XD-CRWB003N-E	
		5 m	XD-CRWB005N-E	
		10 m	XD-CRWB010N-E	
		15 m	XD-CRWB015N-E	
		20 m	XD-CRWB020N-E	

Power cables

Symbol	Specifications		Model	Appearance
④	For 200 V servo motors without brake SGMAH-□□A□□□1D-OY SGMPH-(01/02/04/08)A□□41D-OY	3 m	R88A-CAWA003S-DE	
		5 m	R88A-CAWA005S-DE	
		10 m	R88A-CAWA010S-DE	
		15 m	R88A-CAWA015S-DE	
		20 m	R88A-CAWA020S-DE	
	For 200 V servo motors with brake SGMAH-□□A□□□CD-OY SGMPH-(01/02/04/08)A□□4CD-OY	3 m	R88A-CAWA003B-DE	
		5 m	R88A-CAWA005B-DE	
		10 m	R88A-CAWA010B-DE	
		15 m	R88A-CAWA015B-DE	
		20 m	R88A-CAWA020B-DE	
	For 200 V servo motors without brake SGMPH-15A□□□1D-OY	3 m	R88A-CAWB003S-DE	
		5 m	R88A-CAWB005S-DE	
		10 m	R88A-CAWB010S-DE	
		15 m	R88A-CAWB015S-DE	
		20 m	R88A-CAWB020S-DE	
	For 200 V servo motors with brake SGMPH-15A□□□CD-OY	3 m	R88A-CAWB003B-DE	
		5 m	R88A-CAWB005B-DE	
		10 m	R88A-CAWB010B-DE	
		15 m	R88A-CAWB015B-DE	
		20 m	R88A-CAWB020B-DE	
	For 400 V servo motors without brake SGMAH-□□D□□□1D-OY SGMPH-□□D□□□1D-OY	3 m	R88A-CAWK003S-DE	
		5 m	R88A-CAWK005S-DE	
		10 m	R88A-CAWK010S-DE	
		15 m	R88A-CAWK015S-DE	
		20 m	R88A-CAWK020S-DE	
	For 400 V servo motors with brake SGMAH-□□D□□□CD-OY SGMPH-□□D□□□CD-OY	3 m	R88A-CAWK003B-DE	
		5 m	R88A-CAWK005B-DE	
		10 m	R88A-CAWK010B-DE	
		15 m	R88A-CAWK015B-DE	
		20 m	R88A-CAWK020B-DE	
	For 400 V servo motors SGMGH-(05/09/13)D□ SGMSH-(10/15/20)D□ SGMUH-(10/15)D□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWC003S-E	
		5 m	R88A-CAWC005S-E	
		10 m	R88A-CAWC010S-E	
		15 m	R88A-CAWC015S-E	
		20 m	R88A-CAWC020S-E	
	For 400 V servo motors SGMGH-(20/30)D□ SGMSH-(30/40/50)D□ SGMUH-(30/40)D□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWD003S-E	
		5 m	R88A-CAWD005S-E	
		10 m	R88A-CAWD010S-E	
		15 m	R88A-CAWD015S-E	
		20 m	R88A-CAWD020S-E	
	For 400 V servo motors SGMGH-44D□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWG003S-E	
		5 m	R88A-CAWG005S-E	
		10 m	R88A-CAWG010S-E	
		15 m	R88A-CAWG015S-E	
		20 m	R88A-CAWG020S-E	
	For 400 V servo motors SGMGH-55D□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWF003S-E	
		5 m	R88A-CAWF005S-E	
		10 m	R88A-CAWF010S-E	
		15 m	R88A-CAWF015S-E	
		20 m	R88A-CAWF020S-E	
	For 400 V servo motors SGMGH-(75/1A)D□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWH003S-E	
		5 m	R88A-CAWH005S-E	
		10 m	R88A-CAWH010S-E	
		15 m	R88A-CAWH015S-E	
		20 m	R88A-CAWH020S-E	
	For 400 V servo motors SGMGH-1ED□ For servomotors with brake, a separate cable (R88A-CAWC0□□B-E) is needed	3 m	R88A-CAWJ003S-E	
		5 m	R88A-CAWJ005S-E	
		10 m	R88A-CAWJ010S-E	
		15 m	R88A-CAWJ015S-E	
		20 m	R88A-CAWJ020S-E	

Brake cable (for SGMGH/SH/UH Motors)

Symbol	Specifications		Model	Appearance
⑤	Brake cable only. For 400 V servo motors with brake SGMGH-□□D□ SGMSH-□□D□ SGMUH-□□D□	3 m	R88A-CAWC003B-E	
		5 m	R88A-CAWC005B-E	
		10 m	R88A-CAWC010B-E	
		15 m	R88A-CAWC015B-E	
		20 m	R88A-CAWC020B-E	

Connectors

Specification	Model
Hypertac power connector IP67 (for 200 V motors SGMAH/PH-□□A□□□□D-OY)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400 V motors SGMAH/PH-□□D□□□□D-OY)	LPRA-06B-FRBN170
Hypertac encoder connector IP67 (for motors SGMAH/PH-□□□□□□□D-OY)	SPOC-17H-FRON169
Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D□, SGMSH-(10/15/20)D□ , SGMUH-(10/15)D□)) (for SGMBH-□ fan)	MS3108E18-10S
Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D□, SGMSH-(30/40/50)D□, SGMUH-(30/40)D□)	MS3108E22-22S
Military power connector IP67 (for 400 V motors SGMGH-(55/75/1A/1E)D□)	MS3108E32-17S
Military brake connector IP67 (for 400 V servo motors SGMGH-□, SGMSH-□, SGMUH-□)	MS3108E10SL-3S
Military encoder connector IP67 (for motors SGMGH-□, SGMSH-□, SGMUH-□, SGMBH-□)	MS3108E20-29S
Spare part, hypertac power connector male (connector included with the motor for 200 V models SGMAH/PH-□□A□□□□D-OY)	SRUC-06J-MSCN236
Spare part, hypertac power connector male (connector included with the motor for 400 V motors SGMAH/PH-□□D□□□□D-OY)	LRRA-06A-MRPN182
Spare part, hypertac encoder connector male (connector included with the motor for motors SGMAH/PH-□□□□□□□D-OY)	SRUC-17G-MRWN087

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I47E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

R7M-A□, R7M-AP□

SmartStep servo motors



The smart alternative to stepper motors

- SmartStep motors can be controlled by SmartStep drive and XtraDrive
- Cylindrical and flat servo motor types are available
- Easy to setup, easy to operate. SmartStep is as easy to use as a stepper motor
- Front-panel switches in the SmartStep drive make settings easy and eliminate the need for time-consuming parameter settings
- Extended features and embedded in drive control can be provided using intelligent XtraDrive
- Models with brake available
- Easy to connect to the drive using prebuilt cables

Ratings

- 230 VAC from 30 W to 750 W (0.095 Nm to 2.39 Nm)

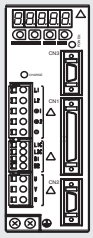
System configuration

(Refer to servo drive chapter)



Servo Drive controlled by pulses

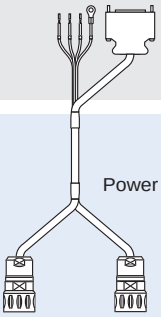
SmartStep Servo Drive



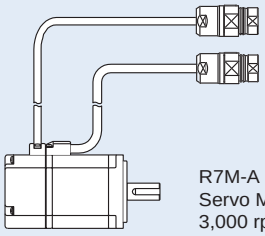
Intelligent Servo Drive

XtraDrive

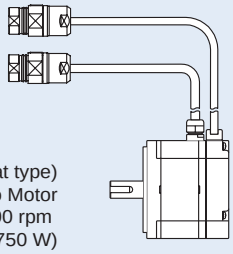
Drive options



Power and encoder cables



R7M-A (cylindrical type)
Servo Motor
3,000 rpm
(30-750 W)



R7M-AP (flat type)
Servo Motor
3,000 rpm
(100-750 W)

Servo motor / servo drive combination

SmarStep servo motor					SmartStep servo drive	XtraDrive servo drive
	Voltage	Rated torque	Capacity	Model	230 V (1-phase)	230 V (1-phase)
R7M-A (3000 min^{-1}) 	230 V	0.095 Nm	30 W	R7M-A03030-□	R7D-APA3H	XD-P3-MN01
		0.159 Nm	50 W	R7M-A05030-□	R7D-APA5H	XD-P5-MN01
		0.318 Nm	100 W	R7M-A10030-□	R7D-AP01H	XD-01-MN01
		0.637 Nm	200 W	R7M-A20030-□	R7D-AP02H	XD-02-MN01
		1.27 Nm	400 W	R7M-A40030-□	R7D-AP04H	XD-04-MN01
		2.39 Nm	750 W	R7M-A75030-□	R7D-AP08H	XD-08-MN
R7M-AP(3000 min^{-1}) 	230 V	0.318 Nm	100 W	R7M-AP10030-□	R7D-AP01H	XD-01-MN01
		0.637 Nm	200 W	R7M-AP20030-□	R7D-AP02H	XD-02-MN01
		1.27 Nm	400 W	R7M-AP40030-□	R7D-AP04H	XD-04-MN01
		2.39 Nm	750 W	R7M-AP75030-□	R7D-AP08H	XD-08-MN

Note: 1. For servo motor and cable part numbers, refer to ordering information at the end of this chapter.

2. Refer to the servo drive chapter for drive options selection and detailed specifications.

Servo motor specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 40 °C
Ambient operating humidity	20% to 80% (with no condensation)
Ambient storage temperature	-20 to 60 °C
Ambient storage humidity	20% to 80% (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 2,500 Hz in X, Y, and Z directions with 0.2 mm double amplitude or acceleration of 24.5 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 98 m/s^2 max., in a vertical direction, two times
Insulation resistance	Between power line terminals and FG: 10 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and FG: 1,500 VAC for 1 min at 50/60 Hz
Run position	Any direction
Insulation grade	Type B
Structure	Totally-enclosed self-cooling
Protective structure	IP55 for both the cylindrical and flat servo motors
Vibration grade	V-15
Mounting method	Flange-mounting
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Performance specifications

Flat servo motors

Item		R7M-AP10030-□	R7M-AP20030-□	R7M-AP40030-□	R7M-AP75030-□
Rated output		100 W	200 W	400 W	750 W
Rated torque		0.318 N·m	0.637 N·m	1.27 N·m	2.39 N·m
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min
Momentary maximum rotation speed		4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min
Momentary maximum torque		0.96 N·m	1.91 N·m	3.82 N·m	7.1 N·m
Rated current		0.89 A (rms)	2.0 A (rms)	2.6 A (rms)	4.1 A (rms)
Momentary maximum current		2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia		6.5×10^{-6} kg·m^2	2.09×10^{-5} kg·m^2	3.47×10^{-5} kg·m^2	2.11×10^{-4} kg·m^2
Power rate		15.7 kW/s	19.4 kW/s	46.8 kW/s	26.9 kW/s
Allowable radial load		78 N	245 N	245 N	392 N
Allowable thrust load		49 N	68 N	68 N	147 N
Weight	Without brake	0.7 kg	1.4 kg	2.1 kg	4.2 kg
	With brake	0.9 kg	1.9 kg	2.6 kg	5.7 kg
Encoder resolution		2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z			
Radiation shield dimensions		t6 × 250 mm square			t12 × 300 mm square
Brake specifications	Brake inertia	3.1×10^{-6} kg·m^2	1.52×10^{-5} kg·m^2	1.52×10^{-5} kg·m^2	8.75×10^{-5} kg·m^2
	Excitation voltage	24 VDC ±10%			
	Power consumption (at 20 °C)	7.5 W	7.6 W	8.2 W	7.5 W
	Current consumption (at 20 °C)	0.31 A	0.32 A	0.34 A	0.31 A
	Static friction torque	0.4 N·m min.	0.9 N·m min.	1.9 N·m min.	3.5 N·m min.
	Attraction time	60 ms max.	40 ms max.	60 ms max.	20 ms max.
	Release time	20 ms max.	20 ms max.	20 ms max.	40 ms max.
	Backlash	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous
	Insulation grade	Type F	Type F	Type F	Type F
Applicable servo driver (R7D-)		AP01H	AP02H	AP04H	AP08H

Cylindrical servo motors

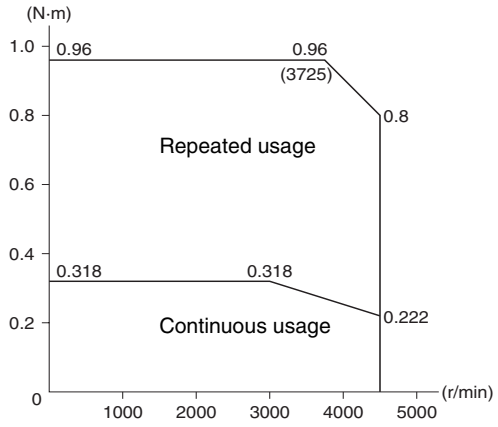
Item		R7M-A03030-□	R7M-A05030-□	R7M-A10030-□	R7M-A20030-□	R7M-A40030-□	R7M-A75030-□
Rated output		30 W	50 W	100 W	200 W	400 W	750 W
Rated torque		0.095 N·m	0.159 N·m	0.318 N·m	0.637 N·m	1.27 N·m	2.39 N·m
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min
Momentary maximum rotation speed		4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min
Momentary maximum torque		0.29 N·m	0.48 N·m	0.96 N·m	1.91 N·m	3.82 N·m	7.1 N·m
Rated current		0.42 A (rms)	0.6 A (rms)	0.87 A (rms)	2.0 A (rms)	2.6 A (rms)	4.4 A (rms)
Momentary maximum current		1.3 A (rms)	1.9 A (rms)	2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia		1.7×10^{-6} kg·m^2	2.2×10^{-6} kg·m^2	3.6×10^{-6} kg·m^2	1.19×10^{-5} kg·m^2	1.87×10^{-5} kg·m^2	6.67×10^{-5} kg·m^2
Power rate		5.31 kW/s	11.5 kW/s	28.1 kW/s	34.1 kW/s	86.3 kW/s	85.6 kW/s
Allowable radial load		68 N	68 N	78 N	245 N	245 N	392 N
Allowable thrust load		54 N	54 N	54 N	74 N	74 N	147 N
Weight	Without brake	0.3 kg	0.4 kg	0.5 kg	1.1 kg	1.7 kg	3.4 kg
	With brake	0.6 kg	0.7 kg	0.8 kg	1.6 kg	2.2 kg	4.3 kg
Encoder resolution		2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z					
Radiation shield dimensions		t6 × 250 mm square					
Brake specifications	Brake inertia	0.85×10^{-6} kg·m^2	0.85×10^{-6} kg·m^2	0.85×10^{-6} kg·m^2	6.4×10^{-6} kg·m^2	6.4×10^{-6} kg·m^2	1.7×10^{-5} kg·m^2
	Excitation voltage	24 VDC ±10% V					
	Power consumption (at 20 °C)	6 W	6 W	6 W	7 W	7 W	7.7 W
	Current consumption (at 20 °C)	0.25 A	0.25 A	0.25 A	0.29 A	0.29 A	0.32 A
	Static friction torque	0.2 N·m min.	0.2 N·m min.	0.34 N·m min.	1.47 N·m min.	1.47 N·m min.	2.45 N·m min.
	Attraction time	30 ms max.	30 ms max.	30 ms max.	60 ms max.	60 ms max.	60 ms max.
	Release time	60 ms max.	60 ms max.	60 ms max.	20 ms max.	20 ms max.	20 ms max.
	Backlash	1°	1°	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
	Insulation grade	Type F	Type F	Type F	Type F	Type F	Type F
Applicable servo driver (R7D-)		APA3H	APA5H	AP01H	AP02H	AP04H	AP08H

Torque and rotation speed characteristics

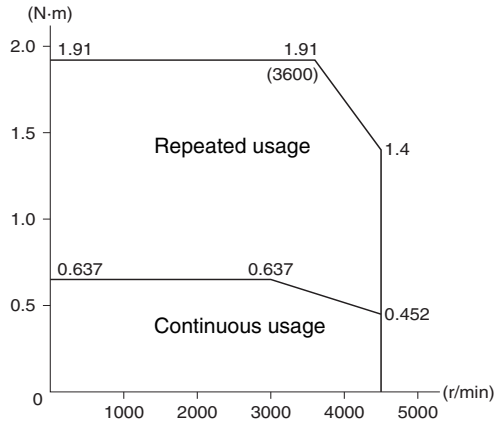
Flat servo motors

The following graphs show the characteristics with a 3 m standard cable and R7D-AP□H servo driver (200 VAC input)

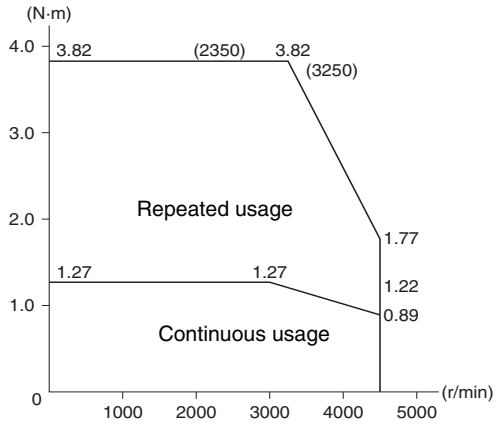
R7M-AP10030 (100 W)



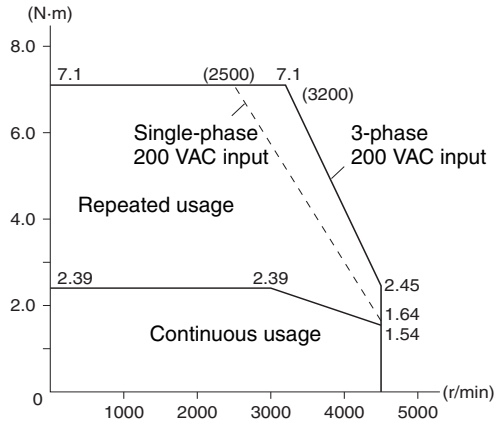
R7M-AP20030 (200 W)



R7M-AP40030 (400 W)



R7M-AP75030 (750 W)

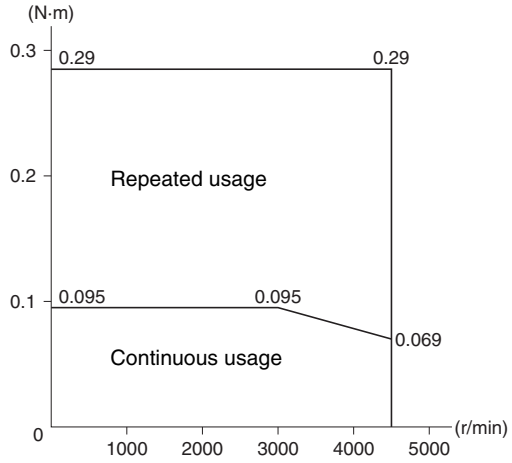


Torque and rotation speed characteristics

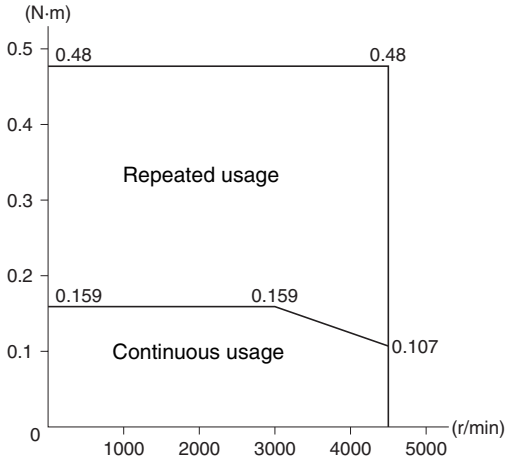
Cylindrical servo motors

The following graphs show the characteristics with a 3 m standard cable and an R7D-AP□H servo driver (200 VAC input.)

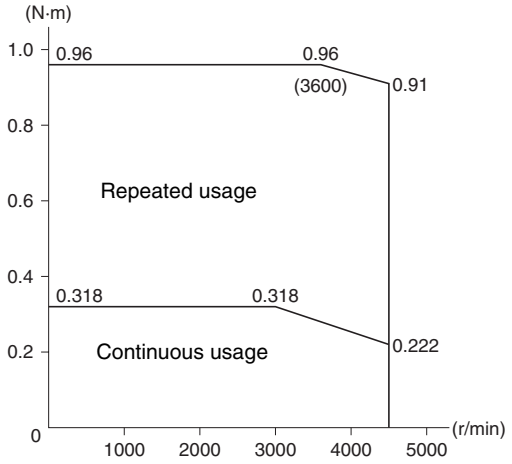
R7M-A03030 (30 W)



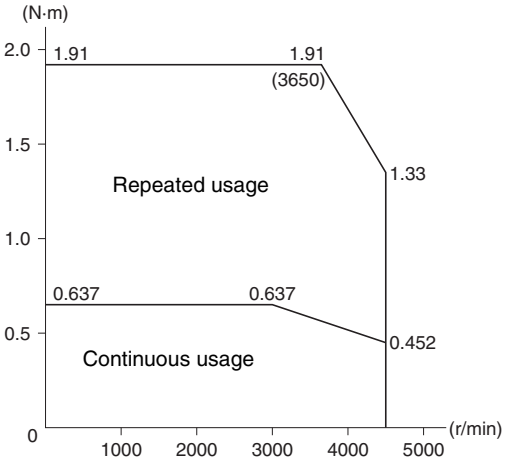
R7M-A05030 (50 W)



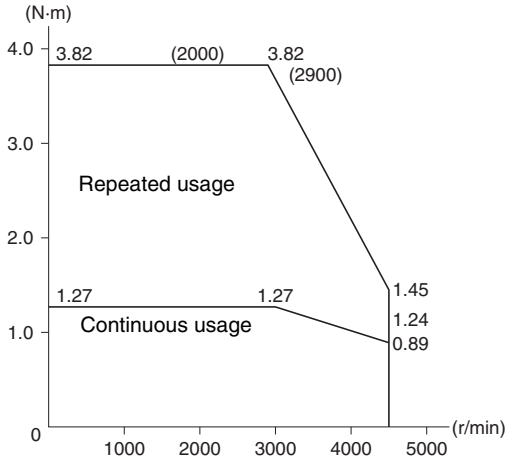
R7M-A10030 (100 W)



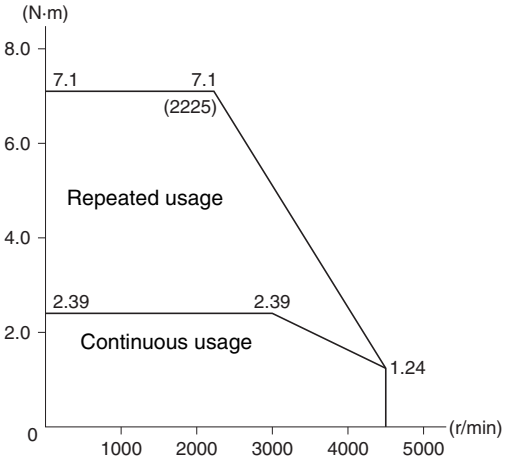
R7M-A20030 (200 W)



R7M-A40030 (400 W)



R7M-A75030 (750 W)



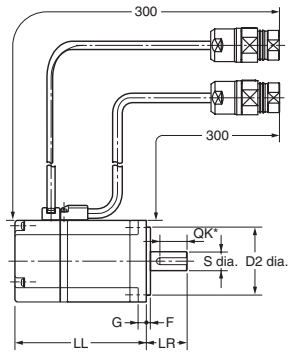
Dimensions

Cylindrical servo motors (3,000 r/min)
200 VAC: 30W/50W/100W/200W/400W/750W

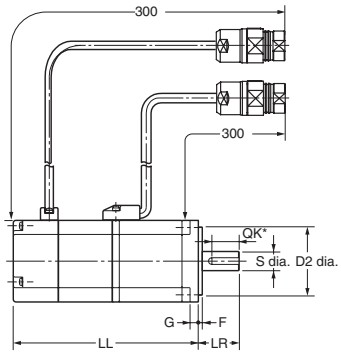
Without brake: R7M-A03030-S1-D/A05030-S1-D/A10030-S1-D/A20030-S1-D/A40030-S1-D/A75030-S1-D
With brake: R7M-A03030-BS1-D/A05030-BS1-D/A10030-BS1-D/A20030-BS1-D/A40030-BS1-D/A75030-BS1-D

Model	Dimensions (mm)													
	LL		LR	Flange surface						Axis end				
	Without brake	With brake		C	D1	D2	F	G	Z	S	QK	b	h	t1
R7M-A03030□	69.5	101	25	40	46	30h7	2.5	5	Two, 4.3 dia.	6h6	14	2	2	1.2
R7M-A05030□	77	108.5												
R7M-A10030□	94.5	135								8h6		3	3	1.8
R7M-A20030□	96.5	136	30	60	70	50h7	3	6	Four, 5.5 dia.	14h6	20	5	5	3
R7M-A40030□	124.5	164												
R7M-A75030□	145	189.5	40	80	90	70h7	3	8	Four, 7 dia.	16h6	30			

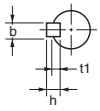
R7M-A□□□30-S1-D (Without brake)



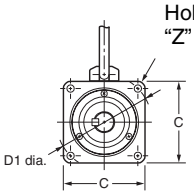
R7M-A□□□30-BS1-D (With brake)



Axis end dimensions



Hole with "Z" mark

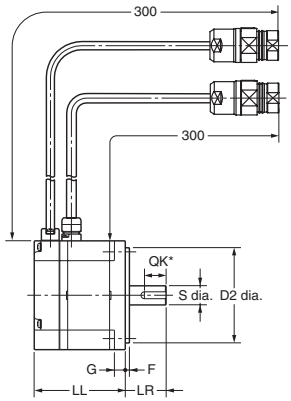


Flat servo motors (3,000 r/min)
200 VAC: 100W/200W/400W/750W

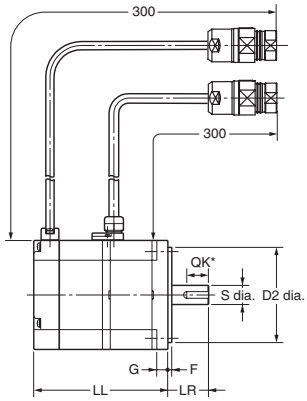
Without brake: R7M-AP10030-S1-D/AP20030-S1-D/AP40030-S1-D/AP75030-S1-D
With brake: R7M-AP10030-BS1-D/AP20030-BS1-D/AP40030-BS1-D/AP75030-BS1-D

Model	Dimensions (mm)													
	LL		LR	Flange surface						Axis End				
	Without brake	With brake		C	D1	D2	F	G	Z	S	QK	b	h	t1
R7M-AP10030□	62	91	25	60	70	50h7	3	6	5.5	8h6	14	3	3	1.8
R7M-AP20030□	67	98.5	30	80	90	70h7	3	8	7	14h6	16	5	5	3
R7M-AP40030□	87	118.5												
R7M-AP75030□	86.5	120	40	120	145	110h7	3.5	10	10	16h6	22			

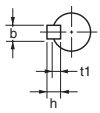
R7M-AP□□□30-S1-D (Without brake)



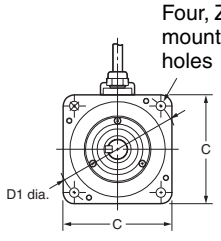
R7M-AP□□□30-BS1-D (With brake)



Axis end dimensions



Four, Z-dia. mounting holes



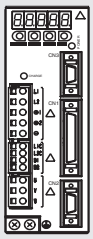
Ordering information

(Refer to servo drive chapter)



Servo Drive controlled by pulses

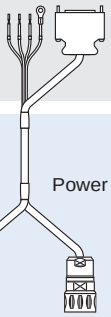
② **SmartStep Servo Drive**



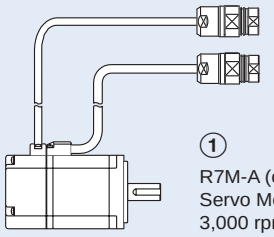
Intelligent Servo Drive

② **XtraDrive**

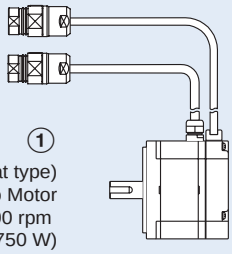
Drive options



③ Power and encoder cables



① R7M-A (cylindrical type) Servo Motor 3,000 rpm (30-750 W)



① R7M-AP (flat type) Servo Motor 3,000 rpm (100-750 W)

Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables.

Servo motor

Cylindrical servo motors (3,000-r/min)

Symbol	Specifications				Servo motor model	Compatible servo drives ②	
	Design		Rated torque	Capacity		SmartStep	XtraDrive
①	**Cylindrical servo motors (3,000-r/min)** Straight shaft with key	Without brake	0.095 Nm	30 W	R7M-A03030-S1-D	R7D-APA3H	XD-P3-MN01
			0.159 Nm	50 W	R7M-A05030-S1-D	R7D-APA5H	XD-P5-MN01
			0.318 Nm	100 W	R7M-A10030-S1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-A20030-S1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-A40030-S1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-A75030-S1-D	R7D-AP08H	XD-08-MN
		With brake	0.095 Nm	30 W	R7M-A03030-BS1-D	R7D-APA3H	XD-P3-MN01
			0.159 Nm	50 W	R7M-A05030-BS1-D	R7D-APA5H	XD-P5-MN01
			0.318 Nm	100 W	R7M-A10030-BS1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-A20030-BS1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-A40030-BS1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-A75030-BS1-D	R7D-AP08H	XD-08-MN

Flat servo motors (3,000-r/min)

Symbol	Specifications				Servo motor model	Compatible servo drives ②	
	Design		Rated torque	Capacity		SmartStep	XtraDrive
①	**Flat servo motors (3,000-r/min)** Straight shaft with key	Without brake	0.318 Nm	100 W	R7M-AP10030-S1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-AP20030-S1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-AP40030-S1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-AP75030-S1-D	R7D-AP08H	XD-08-MN
		With brake	0.318 Nm	100 W	R7M-AP10030-BS1-D	R7D-AP01H	XD-01-MN01
			0.637 Nm	200 W	R7M-AP20030-BS1-D	R7D-AP02H	XD-02-MN01
			1.27 Nm	400 W	R7M-AP40030-BS1-D	R7D-AP04H	XD-04-MN01
			2.39 Nm	750 W	R7M-AP75030-BS1-D	R7D-AP08H	XD-08-MN

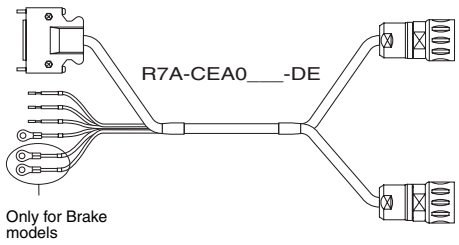
Servo drive

Note: Choosing SmartStep drive or XtraDrive affects to the encoder cable needed.

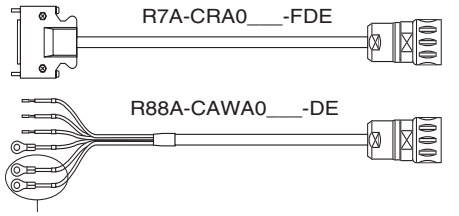
② Refer to SmartStep servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

Servo motor cables for SmartStep drive

Standard cable (power + encoder)

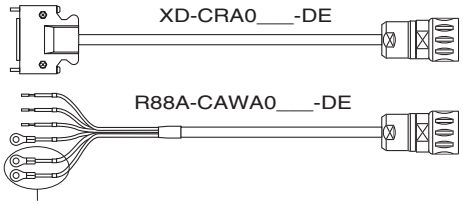
Symbol	Drive	Specifications		Power cable model	Encoder cable model	Appearance
③	SmartStep	For servo motors without brake R7M-A(P)□□□30-S1-D	3 m	R7A-CEA003S-DE		
			5 m	R7A-CEA005S-DE		
			10 m	R7A-CEA010S-DE		
			15 m	R7A-CEA015S-DE		
			20 m	R7A-CEA020S-DE		
		For servo motors with brake R7M-A(P)□□□30-BS1-D	3 m	R7A-CEA003B-DE		
			5 m	R7A-CEA005B-DE		
			10 m	R7A-CEA010B-DE		
			15 m	R7A-CEA015B-DE		
			20 m	R7A-CEA020B-DE		

Flexible cables (power + encoder)

Symbol	Drive	Specifications		Power cable model	Encoder cable model	Appearance
③	SmartStep	For servo motors without brake R7M-A(P)□□□30-S1-D	3 m	R88A-CAWA003S-DE	R7A-CRA003-FDE	
			5 m	R88A-CAWA005S-DE	R7A-CRA005-FDE	
			10 m	R88A-CAWA010S-DE	R7A-CRA010-FDE	
			15 m	R88A-CAWA015S-DE	R7A-CRA015-FDE	
			20 m	R88A-CAWA020S-DE	R7A-CRA020-FDE	
		For servo motors with brake R7M-A(P)□□□30-BS1-D	3 m	R88A-CAWA003B-DE	R7A-CRA003-FDE	
			5 m	R88A-CAWA005B-DE	R7A-CRA005-FDE	
			10 m	R88A-CAWA010B-DE	R7A-CRA010-FDE	
			15 m	R88A-CAWA015B-DE	R7A-CRA015-FDE	
			20 m	R88A-CAWA020B-DE	R7A-CRA020-FDE	

Servo motor cables for XtraDrive Drive

Flexible cables (power + encoder)

Symbol	Drive	Specifications		Power cable model	Encoder cable model	Appearance
③	XtraDrive	For servo motors without brake R7M-A(P)□□□30-S1-D	3 m	R88A-CAWA003S-DE	XD-CRA003-DE	
			5 m	R88A-CAWA005S-DE	XD-CRA005-DE	
			10 m	R88A-CAWA010S-DE	XD-CRA010-DE	
			15 m	R88A-CAWA015S-DE	XD-CRA015-DE	
			20 m	R88A-CAWA020S-DE	XD-CRA020-DE	
		For servo motors with brake R7M-A(P)□□□30-BS1-D	3 m	R88A-CAWA003B-DE	XD-CRA003-DE	
			5 m	R88A-CAWA005B-DE	XD-CRA005-DE	
			10 m	R88A-CAWA010B-DE	XD-CRA010-DE	
			15 m	R88A-CAWA015B-DE	XD-CRA015-DE	
			20 m	R88A-CAWA020B-DE	XD-CRA020-DE	

Connectors

Specifications		Model
SmartStep connectors kit	Models included in kit	R7A-CNA00K-DE
SmartStep encoder connector (for CN2)	R7A-CNA01R	
Hypertac power connector female	SPOC-06K-FSDN169	
Hypertac encoder connector female	SPOC-17H-FRON169	
Hypertac power connector male (used in the motor)		SRUC-06J-MSCN236
Hypertac encoder connector male (used in the motor)		SRUC-17G-MRWN087

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I45E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

SGMCS-□

Sigma direct drive motors

High torque motor for direct coupling to load

- High dynamic performance
- Gearless. Reduction of mechanic components
- Improved positioning accuracy
- No maintenance for lubrication
- Backlash free operation
- Automatic motor recognition by servo drive
- Peak torque 300% of nominal during 3 seconds
- Hollow structure construction
- High-presicion. Resolution of 1,000,000 points per revolution
- Absolute encoder as standard

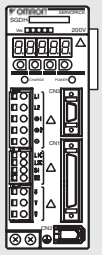


Ratings

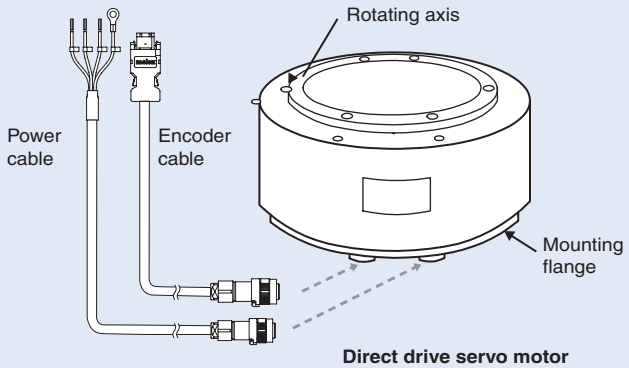
- 230 VAC from 42 W to 1260 W
  (Rated torque from 2.00 to 80 Nm)

System configuration

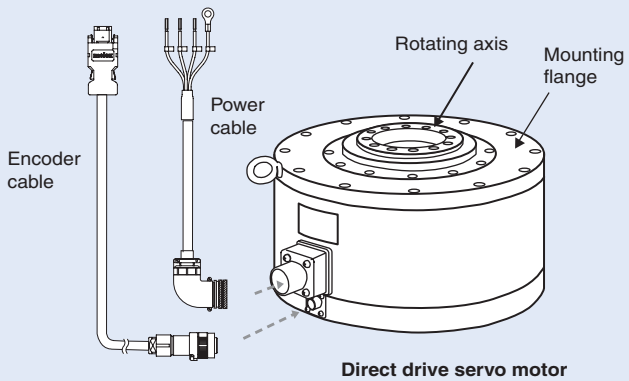
(Refer to Servo Drive chapter)



Sigma-II Servo Drive

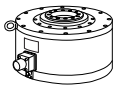


Direct drive servo motor
SGMCS-□-□B, C, D, E



Direct drive servo motor
SGMCS-□-□M, N

Servomotor / servo drive combination

Sigma-II rotary servo motor					Sigma-II servo drive
	Voltage	Rated torque	Capacity	Model	230 V (1-phase)
	230 V	2.00 Nm	42 W	SGMCS-02B□	SGDH-02AE-OY
		5.00 Nm	105 W	SGMCS-05B□	SGDH-02AE-OY
		7.00 Nm	147 W	SGMCS-07B□	SGDH-02AE-OY
		4.00 Nm	84 W	SGMCS-04C□	SGDH-04AE-OY
		10.0 Nm	209 W	SGMCS-10C□	SGDH-04AE-OY
		14.0 Nm	293 W	SGMCS-14C□	SGDH-04AE-OY
		8.00 Nm	168 W	SGMCS-08D□	SGDH-04AE-OY
		17.0 Nm	356 W	SGMCS-17D□	SGDH-04AE-OY
		25.0 Nm	393 W	SGMCS-25D□	SGDH-04AE-OY
		16.0 Nm	335 W	SGMCS-16E□	SGDH-08AE-S-OY
		35.0 Nm	550 W	SGMCS-35E□	SGDH-08AE-S-OY
		45.0 Nm	707 W	SGMCS-45M□	SGDH-15AE-S-OY
		80.0 Nm	1260 W	SGMCS-80M□	SGDH-15AE-S-OY
		80.0 Nm	1260 W	SGMCS-80N□	SGDH-15AE-S-OY

Type designation

Servo motor

SGMCS—02 B 3 B 1 1

Σ Series SGMCS servo motor

Rated torque (N·m)		Motor outer diameter (mm)					
Code	Specifications	B (ϕ135)	C (ϕ175)	D (ϕ230)	E (ϕ290)	M (ϕ280)	N (ϕ360)
02	2.0	○					
04	4.0		○				
05	5.0	○					
07	7.0	○					
08	8.0			○			
10	10.0		○				
14	14.0		○				
16	16.0				○		
17	17.0			○			
25	25.0			○			
35	35.0				○		
45	45.0					○	
80	80.0					○	○

Brake specifications	
Code	Specifications
1	Without brake

Flange specifications	
Code	Specifications
1	C face

Design revision order	
Code	Specifications
A	45 to 80 N·m
B	2 to 35 N·m

Serial encoder specifications		
Code	Specifications	Remarks
3	20-bit absolute (without multiturn data)	Standard
D	20-bit incremental	Option

Specifications

Ratings and specifications

Applied voltage			230 V												
Servomotor model SGMCS-□			02B□B	05B□B	07B□B	04C□B	10C□B	14C□B	08D□B	17D□B	25D□B	16E□B	35E□B	45M□A	80M□A	80N□A
Rated output*1		W	42	105	147	84	209	293	168	356	393	335	550	707	1260	1260
Rated torque*1, *2		N·m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0	45	80	80
Instantaneous peak torque *1		N·m	6.00	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105	135	240	240
Stall torque*1		N·m	2.05	5.15	7.32	4.15	10.4	14.9	8.64	19.2	27.2	17.6	38.3	45	80	80
Rated current*1		A_{rms}	1.8	1.8	1.4	2.1	2.0	2.0	2.0	2.3	2.7	3.3	3.5	5.80	9.74	9.35
Instantaneous max. current *1		A_{rms}	5.1	5.1	4.1	6.0	5.8	5.9	5.9	6.6	7.9	9.4	10.0	17	28	28
Rated speed*1		min^{-1}	200			200			200		150	200	150	150		
Max. speed*1		min^{-1}	500			500	400	300	500	350	250	500	250	300		
Torque constant		$N·m/A_{rms}$	1.28	3.12	5.51	2.16	5.56	7.60	4.46	8.28	10.3	5.58	11.1	8.39	8.91	9.08
Rotor moment of inertia		$kg·m^2×10^{-4}$	25.0	51.0	77.0	77.0	140	220	285	510	750	930	1430	388	627	1360
Rated power rate*1		KW/s	1.60	4.90	6.36	2.08	7.14	8.91	2.25	5.67	8.33	2.75	8.57	52.2	102	47.1
Rated angular acceleration*1		rad/s^2	800	980	910	520	710	640	280	330	330	170	240	1160	1280	588
Absolute accuracy		second	±15			±15			±15			±15		±15		
Repeatability		second	±1.3			±1.3			±1.3			±1.3		±1.3		
Aplicable encoder		Standard	Absolute encoder (20 bits)													
		Option	Incremental encoder (20 bits)													
Basic specifications	Time rating		Continuous													
	Thermal class		Class A											Class F		
	Ambient temperature		0 to +40 °C													
	Ambient humidity		20 to 80% (non-condensing)													
	Vibration class		15μm or below													
	Enclosure		Totally-enclosed, self-cooled													
			IP42											IP44		
	Mounting		Flange-mounted													

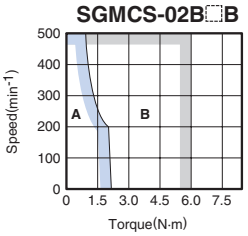
Note: 1. The items marked with an *1 and the torque/speed characteristics listed here are representative of the values obtained when the motor is driven from the servo drive and the coil temperature is at 100 °C(20 °C for servo motors SGMCS-45M to 80 N). All others are for a coil temperature of 20 °C.

2. The values marked with an *2 for rated torques are continuous allowable torque with the following heatsinks at an ambient temperature of 40 °C.
Heatsink dimensions : 350x350x12 mm : SGMCS-□□B 450x450x12 mm : SGMCS-□□C 550x550x12 mm : SGMCS-□□D
650x650x12 mm : SGMCS-□□E 750x750x45 mm : SGMCS-□□M/N

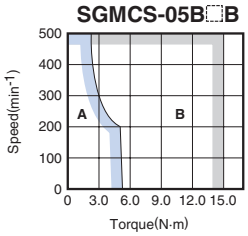
Torque-speed charecteristics

(A : Continuous duty zone B : Intermittent duty zone)

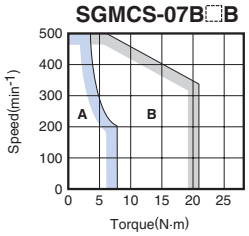
SGMCS-02B□B



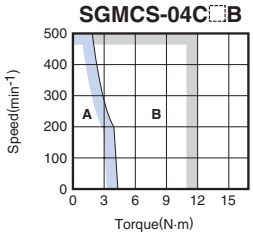
SGMCS-05B□B



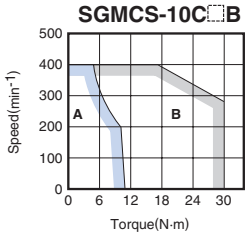
SGMCS-07B□B



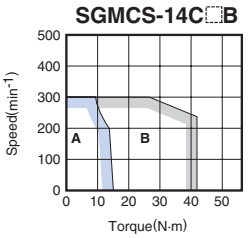
SGMCS-04C□B



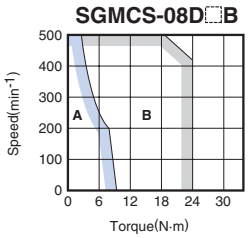
SGMCS-10C□B



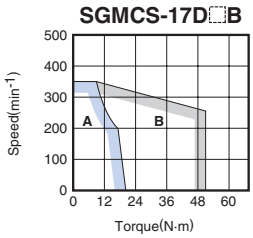
SGMCS-14C□B



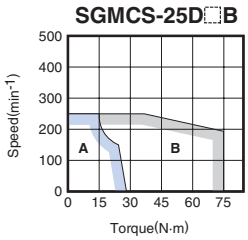
SGMCS-08D□B



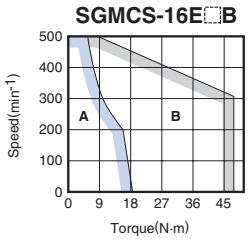
SGMCS-17D□B



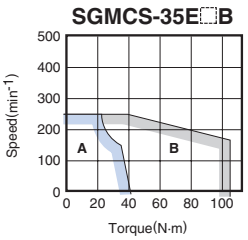
SGMCS-25D□B



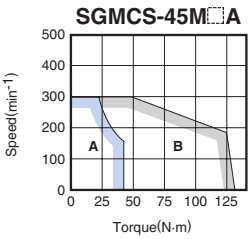
SGMCS-16E□B



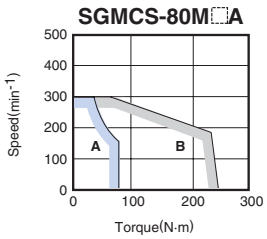
SGMCS-35E□B



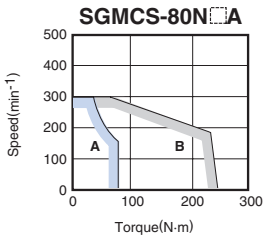
SGMCS-45M□A



SGMCS-80M□A



SGMCS-80N□A

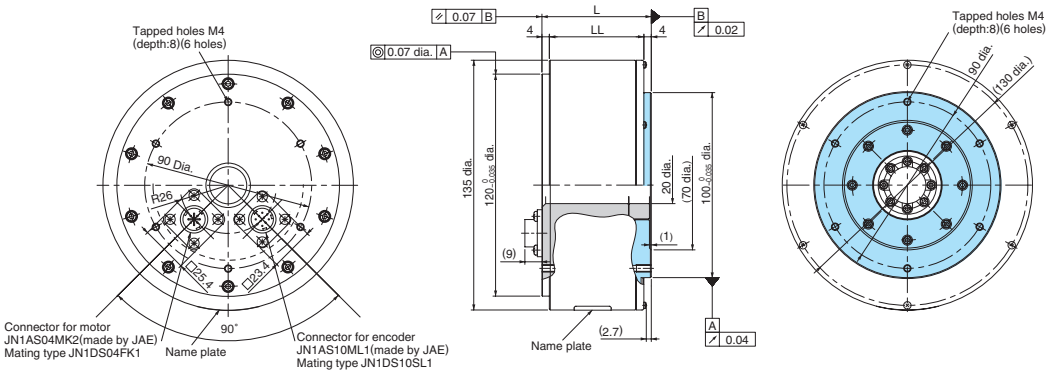


Dimensions

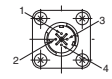
SGMCS-02/05/07B□B11 (Ø135 models)

Model	Dimensions (mm)		Approx. mass (kg)
	L	LL	
SGMCS-02B□B11	59	51	5.0
SGMCS-05B□B11	88	80	6.2
SGMCS-07B□B11	128	120	8.6

Rotating part: Non rotating part:

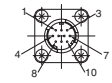


Motor connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green/yellow

Encoder connector

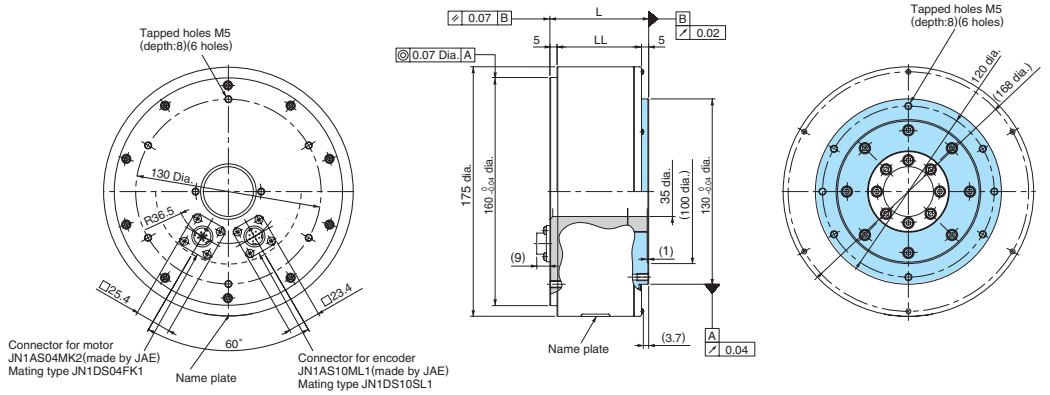


1	PS	Light blue
2	*PS	Light blue/white
3	–	–
4	PG5V	Red
5	–	–
6	–	–
7	FG (Frame Ground)	Shield
8	–	–
9	PG0V	Black
10	–	–

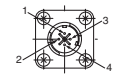
SGMCS-04/10/14C□B11 (Ø175 models)

Model	Dimensions (mm)		Approx. mass (kg)
	L	LL	
SGMCS-04C□B11	69	59	7.2
SGMCS-10C□B11	90	80	10.2
SGMCS-14C□B11	130	120	14.2

Rotating part: Non rotating part:

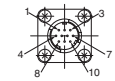


Motor connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green/yellow

Encoder connector

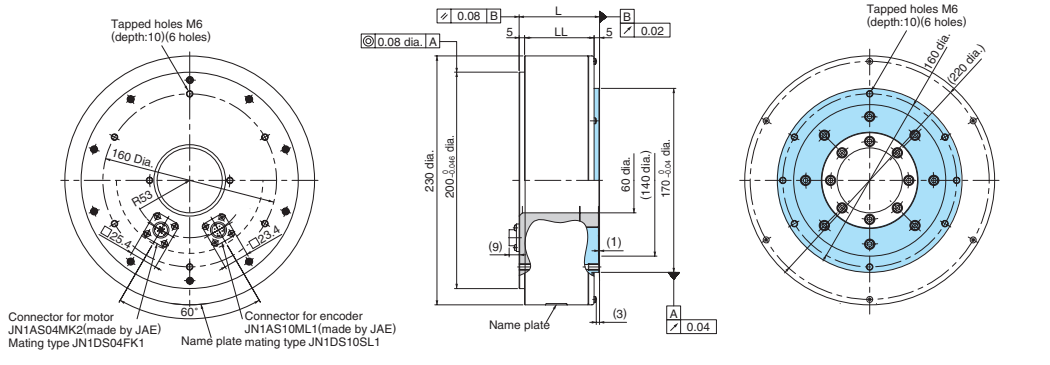


1	PS	Light blue
2	*PS	Light blue/white
3	–	–
4	PG5V	Red
5	–	–
6	–	–
7	FG (Frame Ground)	Shield
8	–	–
9	PG0V	Black
10	–	–

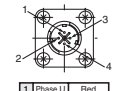
SGMCS-08/17/25D□B11 (Ø230 models)

Model	Dimensions (mm)		Approx. mass (kg)
	L	LL	
SGMCS-08D□B11	74	64	14.0
SGMCS-17D□B11	110	100	22.0
SGMCS-25D□B11	160	150	29.7

Rotating part: Non rotating part:

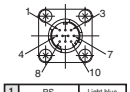


Motor connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green/yellow

Encoder connector

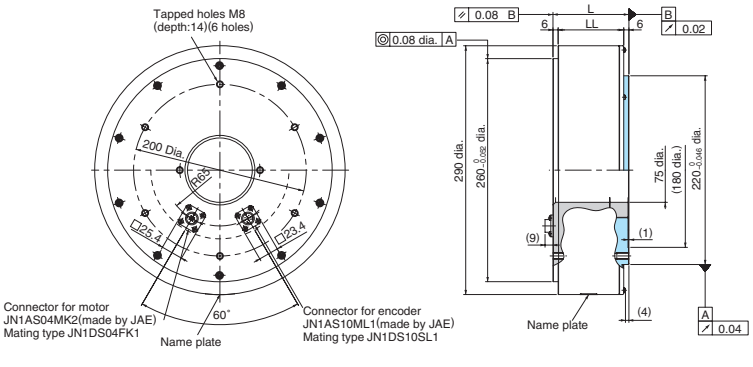


1	PS	Light blue
2	*PS	Light blue/white
3	–	–
4	PG5V	Red
5	–	–
6	–	–
7	FG (Frame Ground)	Shield
8	–	–
9	PG0V	Black
10	–	–

SGMCS-16/35E□B11 (Ø290 models)

Model	Dimensions (mm)		Approx. mass (kg)
	L	LL	
SGMCS-16E□B11	88	76	26.0
SGMCS-35E□B11	112	100	34.0

Rotating part: Non rotating part:

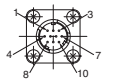


Motor connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green/yellow

Encoder connector



1	PS	Light Blue
2	*PS	Light blue/white
3	–	–
4	PG5V	Red
5	–	–
6	–	–
7	FG (Frame Ground)	Shield
8	–	–
9	PG0V	Black
10	–	–

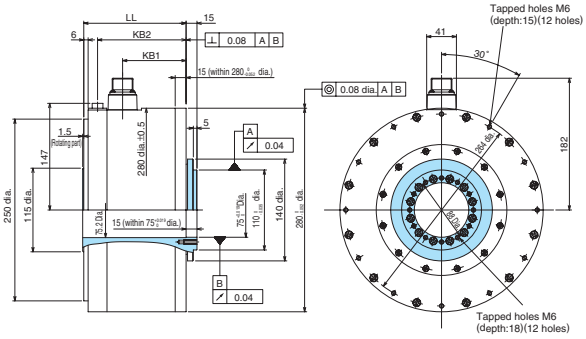
SGMCS-45/80M□A11 (Ø280 models)

Model	Dimensions (mm)			Approx. mass (kg)
	L	KB1	KB2	
SGMCS-45M□A11	141	87.5	122	38
SGMCS-80M□A11	191	137.5	172	45

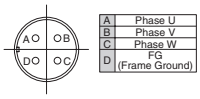
SGMCS-80N□A11 (Ø360 models)

Model	Dimensions (mm)			Approx. mass (kg)
	L	KB1	KB2	
SGMCS-80N□A11	151	98	132	50

Rotating part:

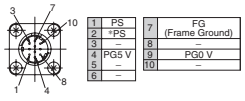


Motor connector
Model: CE05-2A18-10PD
(made by DDK Electronics, Inc.)



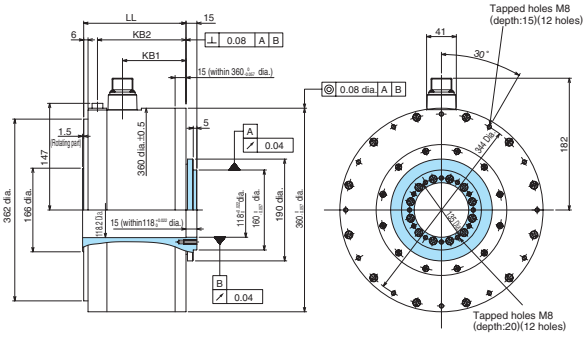
A	Phase U
B	Phase V
C	Phase W
D	FG (Frame Ground)

Encoder connector
Model: JN1AS10ML1
(made by Japan Aviation Electronics Industry, Ltd.)

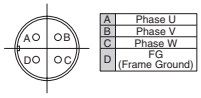


1	PS	7	FG (Frame Ground)
2	*PS	8	–
3	–	9	PG0 V
4	PG5 V	10	–
5	–		
6	–		

Rotating part:

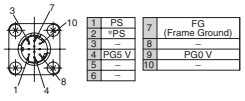


Motor connector
Model: CE05-2A18-10PD
(made by DDK Electronics, Inc.)



A	Phase U
B	Phase V
C	Phase W
D	FG (Frame Ground)

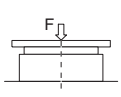
Encoder connector
Model: JN1AS10ML1
(made by Japan Aviation Electronics Industry, Ltd.)



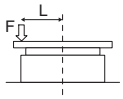
1	PS	7	FG (Frame Ground)
2	*PS	8	–
3	–	9	PG0 V
4	PG5 V	10	–
5	–		
6	–		

Load capacity

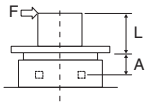
The following figures show the load capacity during motor operation.
Design motors so as not to exceed the values in the table for thrust and moment loading.



Force: F
Thrust loading: Fa = F + Load's mass
Moment loading: M = 0



Force: F
Thrust loading: Fa = F + Load's mass
Moment loading: M = F × L



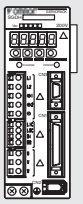
Force: F
Thrust moading: Fa = Load's mass
Moment moading: M = F × (L+A)

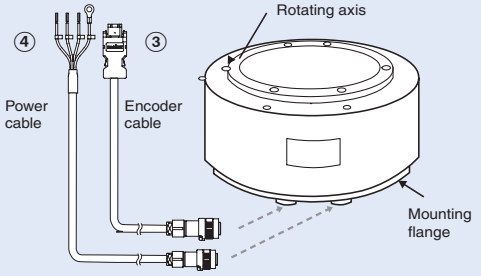
Servomotor model SGMCS- □		02B□B	05B□B	07B□B	04C□B	10C□B	14C□B	08D□B	17D□B	25D□B	16E□B	35E□B	45M□A	80M□A	80N□A
Dimension of "A"	mm	0	0	0	0	0	0	0	0	0	0	0	33	33	37.5
Allowable moment load Fa	N	1500			3300			4000			11000		9000		16000
Allowable thrust load M	N·m	40	50	64	70	75	90	93	103	135	250	320	180		350

Ordering information

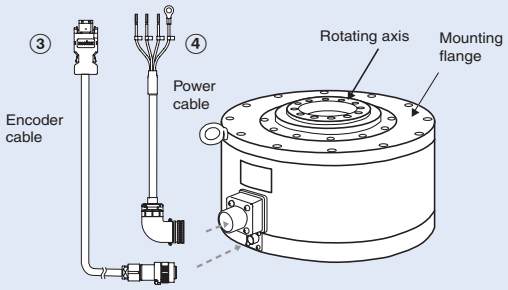
(Refer to Servo Drive chapter)

② Sigma-II Servo Drive

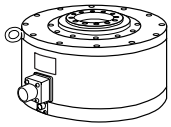




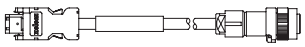
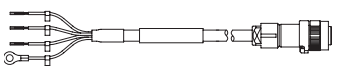
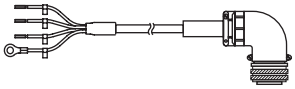
① Direct drive servo motor SGMCS-□-□B C, D, E



① Direct drive servo motor SGMCS-□-□M, N

Symbol	Specifications				Servo motor model	Compatible servo drive ②
	Voltage	Encoder and design	Rated torque	Capacity		Sigma-II
① 	230 V	Absolute encoder (20 bit)	2.00 Nm	42 W	SGMCS-02B3B11	SGDH-02AE-OY
			5.00 Nm	105 W	SGMCS-05B3B11	SGDH-02AE-OY
			7.00 Nm	147 W	SGMCS-07B3B11	SGDH-02AE-OY
			4.00 Nm	84 W	SGMCS-04C3B11	SGDH-04AE-OY
			10.0 Nm	209 W	SGMCS-10C3B11	SGDH-04AE-OY
			14.0 Nm	293 W	SGMCS-14C3B11	SGDH-04AE-OY
			8.00 Nm	168 W	SGMCS-08D3B11	SGDH-04AE-OY
			17.0 Nm	356 W	SGMCS-17D3B11	SGDH-04AE-OY
			25.0 Nm	393 W	SGMCS-25D3B11	SGDH-04AE-OY
			16.0 Nm	335 W	SGMCS-16E3B11	SGDH-08AE-S-OY
			35.0 Nm	550 W	SGMCS-35E3B11	SGDH-08AE-S-OY
		Incremental encoder (20 bit)	2.00 Nm	42 W	SGMCS-02BDB11	SGDH-02AE-OY
			5.00 Nm	105 W	SGMCS-05BDB11	SGDH-02AE-OY
			7.00 Nm	147 W	SGMCS-07BDB11	SGDH-02AE-OY
			4.00 Nm	84 W	SGMCS-04CDB11	SGDH-04AE-OY
			10.0 Nm	209 W	SGMCS-10CDB11	SGDH-04AE-OY
			14.0 Nm	293 W	SGMCS-14CDB11	SGDH-04AE-OY
			8.00 Nm	168 W	SGMCS-08DDB11	SGDH-04AE-OY
			17.0 Nm	356 W	SGMCS-17DDB11	SGDH-04AE-OY
			25.0 Nm	393 W	SGMCS-25DDB11	SGDH-04AE-OY
			16.0 Nm	335 W	SGMCS-16EDB11	SGDH-08AE-S-OY
			35.0 Nm	550 W	SGMCS-35EDB11	SGDH-08AE-S-OY
		Absolute encoder (20 bit)	45.0 Nm	707 W	SGMCS-45M3A11	SGDH-15AE-S-OY
			80.0 Nm	1260 W	SGMCS-80M3A11	SGDH-15AE-S-OY
			80.0 Nm	1260 W	SGMCS-80N3A11	SGDH-15AE-S-OY
		Incremental encoder (20 bit)	45.0 Nm	707 W	SGMCS-45MDA11	SGDH-15AE-S-OY
			80.0 Nm	1260 W	SGMCS-80MDA11	SGDH-15AE-S-OY
			80.0 Nm	1260 W	SGMCS-80NDA11	SGDH-15AE-S-OY

Encoder cables

Symbol	Specifications		Model	Appearance
③	Encoder cable for SGMCS- direct drive servo motors	3 m	JZSP-CMP60-03	
		5 m	JZSP-CMP60-05	
		10 m	JZSP-CMP60-10	
		15 m	JZSP-CMP60-15	
		20 m	JZSP-CMP60-20	
④	Power cable for servo motors SGMCS-□□B/-□□C/-□□D/-□□E	3 m	JZSP-CMM60-03	
		5 m	JZSP-CMM60-05	
		10 m	JZSP-CMM60-10	
		15 m	JZSP-CMM60-15	
		20 m	JZSP-CMM60-20	
	Power cable for servo motors SGMCS-□□M/-□□N	3 m	R88A-CAWC003S-E	
		5 m	R88A-CAWC005S-E	
		10 m	R88A-CAWC010S-E	
		15 m	R88A-CAWC015S-E	
		20 m	R88A-CAWC020S-E	

Servo drive

② Refer to Sigma-II servo drive chapter for detailed drive specifications and selection of drive accessories.

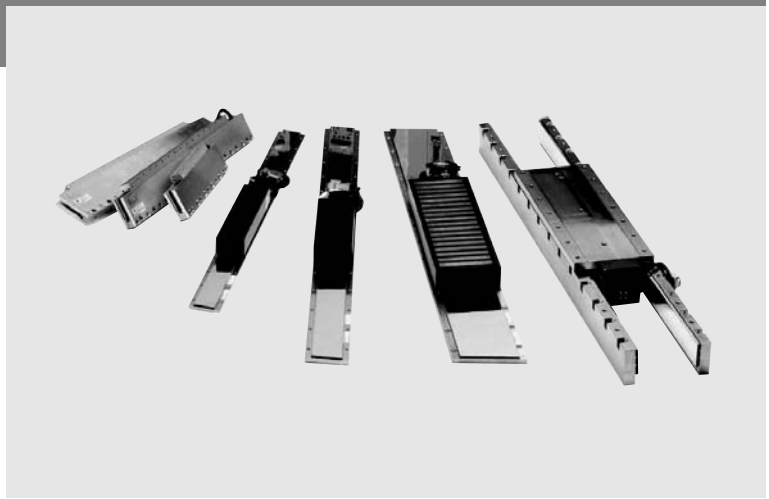
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I41E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

SGLG□, SGLF□, SGLT□

Sigma linear motors



Direct drive linear servo motors for faster machine cycles

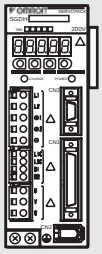
- Direct control of the motors using XtraDrive and Sigma-II drives
- Improved machine performance
- Easy of operation & high reliability
- Designed for high force density in compact packages
- Exhibit exceptional force linearity even at near peak force regions
- Extremely energy efficient, due to its optimized magnetic circuitry design and high-density windings
- Can reach speeds as high as 5 meters per second.
- Coreless and iron core types available

Ratings

- 230 VAC Single-phase 12.5 to 560 N (1200 N Peak)
- 400 VAC Three-phase 80 to 2250 N (7500 N Peak)

System configuration

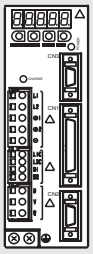
(Refer to servo drive chapter)



Servo Drive with option boards for flexible system configuration

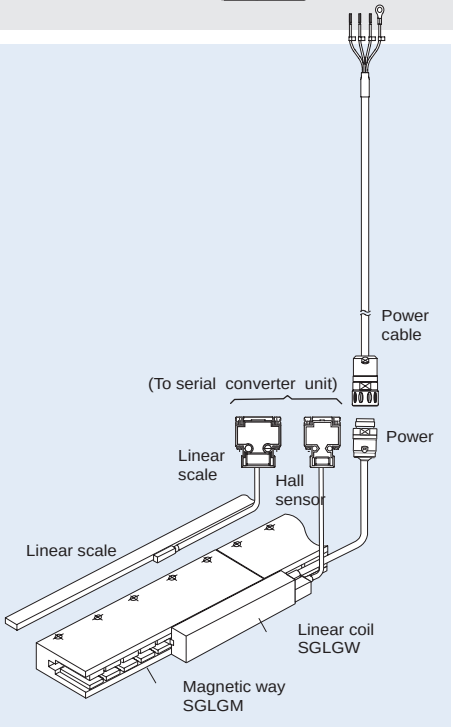
Sigma-II Servo Drive

Drive options

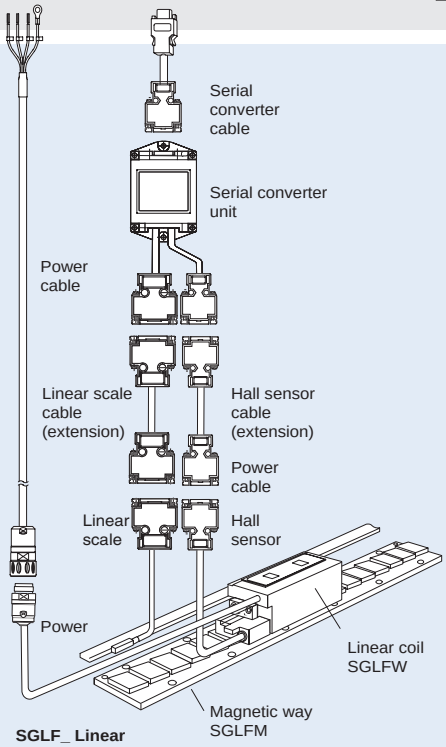


Intelligent Servo Drive

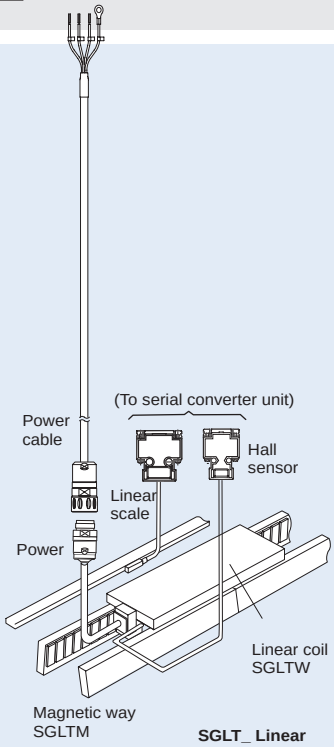
XtraDrive



SGLG_ Linear Servo Motor



SGLF_ Linear Servo Motor

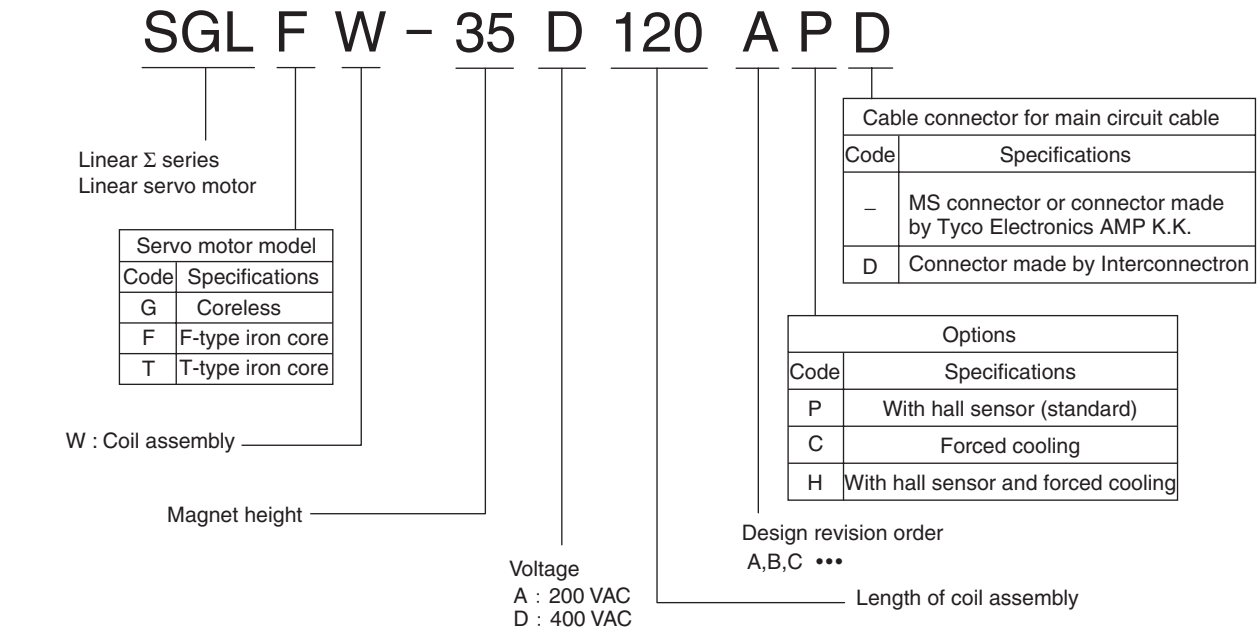


SGLT_ Linear Servo Motor

Servo Motor / Servo Drive Combination

Sigma series linear servo motor					Serial converter		Servo drive			
					JZDP-□008-[code]		Sigma-II series		XtraDrive	
Type	Voltage	Rated force	Peak force	Model	code for Rev A, B	code for Rev C	230 V (1-phase)	400 V (3-phase)	230 V (1-phase)	400 V (3-phase)
SGLGW coreless standard-force magnetic ways 	230 V	12.5 N	40 N	30A050 [B / C]	158	250	SGDH-A5AE-OY	-	XD-P5-MN01	-
		25 N	80 N	30A080 [B / C]	156	251	SGDH-01AE-OY	-	XD-01-MN01	-
		47 N	140 N	40A140 [B / C]	001	252	SGDH-01AE-OY	-	XD-01-MN01	-
		70 N	220 N	60A140 [B / C]	004	258	SGDH-02AE-OY	-	XD-02-MN01	-
		93 N	280 N	40A253 [B / C]	002	253	SGDH-02AE-OY	-	XD-02-MN01	-
		140 N	420 N	40A365 [B / C]	003	254	SGDH-04AE-OY	-	XD-04-MN01	-
		140 N	440 N	60A253 [B / C]	005	259	SGDH-04AE-OY	-	XD-04-MN01	-
		210 N	660 N	60A365 [B / C]	006	260	SGDH-08AE-S-OY	-	XD-08-MN	-
		325 N	1300 N	90A200 [A / C]	101	264	SGDH-15AE-S-OY	-	XD-15-MN	-
SGLGW coreless high-force magnetic ways 	230 V	57 N	230 N	40A140 [B / C]	059	255	SGDH-02AE-OY	-	XD-02-MN01	-
		114 N	460N	40A253 [B / C]	060	256	SGDH-04AE-OY	-	XD-04-MN01	-
		171 N	690 N	40A365 [B / C]	061	257	SGDH-08AE-S-OY	-	XD-08-MN	-
		85 N	360N	60A140 [B / C]	062	261	SGDH-02AE-OY	-	XD-02-MN01	-
		170 N	720 N	60A253 [B / C]	063	262	SGDH-08AE-S-OY	-	XD-08-MN	-
		255 N	1080 N	60A365 [B / C]	047	263	SGDH-15AE-S-OY	-	XD-15-MN	-
Type	Voltage	Rated force	Peak force	Model	code		230 V (1-phase)	400 V (3-phase)	230 V (1-phase)	400 V (3-phase)
SGLFW linear motors 	230 V	25 N	86 N	20A090A	017		SGDH-02AE-OY	-	XD-02-MN01	
		40 N	125 N	20A120A	018		SGDH-02AE-OY	-	XD-02-MN01	
		80 N	220 N	35A120A	019		SGDH-02AE-OY	-	XD-02-MN01	
		160 N	440 N	35A230A	020		SGDH-08AE-S-OY	-	XD-08-MN01	
		280 N	600 N	50A200B	181		SGDH-08AE-S-OY	-	XD-08-MN	
		560 N	1200 N	50A380B	182		SGDH-15AE-S-OY	-	XD-15-MN	
		560 N	1200 N	1ZA200B	183		SGDH-15AE-S-OY		XD-15-MN	
	400 V	80 N	220 N	35D120A	211		-	SGDH-05DE-OY	-	XD-05-TN
		160 N	440 N	35D230A	212		-	SGDH-05DE-OY	-	XD-05-TN
		280 N	600 N	50D200B	189		-	SGDH-10DE-OY	-	XD-10-TN
		560 N	1200 N	50D380B	190		-	SGDH-15DE-OY	-	XD-15-TN
		560 N	1200 N	1ZD200B	191		-	SGDH-15DE-OY	-	XD-15-TN
		1120 N	2400 N	1ZD380B	192		-	SGDH-30DE-OY	-	XD-30-TN
		1500 N	3600 N	1ED380B	333		-	SGDH-20DE-OY	-	XD-20-TN
		2250 N	5400 N	1ED560B	334		-	SGDH-30DE-OY	-	XD-30-TN
SGLTW linear motors 	400 V	300 N	600 N	35D170H	193		-	SGDH-10DE-OY	-	XD-10-TN
		600 N	1200 N	35D320H	194		-	SGDH-20DE-OY	-	XD-20-TN
		450 N	900 N	50D170H	195		-	SGDH-10DE-OY	-	XD-10-TN
		900 N	1800 N	50D320H	196		-	SGDH-20DE-OY	-	XD-20-TN
		670 N	2600 N	40D400B	197		-	SGDH-30DE-OY	-	XD-30-TN
		1000 N	4000 N	40D600B	198		-	SGDH-50DE-OY	-	XD-50-TN
		1300 N	5000 N	80D400B	199		-	SGDH-50DE-OY	-	XD-50-TN
		2000 N	7500 N	80D600B	200		-	SGDH-75DE-OY	-	-

Motor coil



Magnetic way

SGL F M – 35 324 A C

Linear Σ series
Linear servo motor

Model	
Code	Specifications
G	Coreless
F	F-type iron core
T	T-type iron core

M : Magnetic way

Magnet width

Length of magnetic way

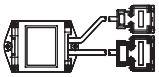
Design revision order
A,B,C •••

Options		
Code	Specifications	Remarks
C	With magnet cover	For iron-core types - SGLFM - SGLTM
-Y	With base and magnet cover	For SGLTM type
	Mounting type 1	For SGLGM type
-M	Mounting type 1 & high thrust force	
T-	Mounting type 2	
T-M	Mounting type 2 & high thrust force	

Serial converter unit

JZDP – D008 – 001

Design revision order
A,B,C •••

Serial converter unit model			
Symbol	Appearance	Applicable linear scale	Hall sensor
A008 D008		Made by Renishaw or (Heidenhain *)	Yes

Note: * When using a linear scale made by Heidenhain an extension cable is required

Applicable linear servo motor							
Servo motor model		Symbol	Model	Symbol	Servo motor model		Symbol
SGLGW- (coreless) When a standard-force magnetic way is used.	30A050B	158	30A050C	250	SGLTW- (Iron core, T-type)	20A170A	011
	30A080B	156	30A080C	251		20A320A	012
	40A140B	001	40A140C	252		20A460A	013
	40A253B	002	40A253C	253		35A170A	014
	40A365B	003	40A365C	254		35A320A	015
	60A140B	004	60A140C	258		35A460A	016
	60A253B	005	60A253C	259		35A170H	105
	60A365B	006	60A365C	260		35A320H	106
	90A200A	101	90A200C	264		50A170H	108
	90A370A	102	90A370C	265		50A320H	109
	90A535A	103	90A535C	266		40A400B	185
SGLGW- + SGLGM- □ -M (coreless) When a high-force magnetic way is used.	40A140B	059	40A140C	255		40A600B	186
	40A253B	060	40A253C	256		80A400B	187
	40A365B	061	40A365C	257		80A600B	188
	60A140B	062	60A140C	261		35D170H	193
	60A253B	063	60A253C	262		35D320H	194
	60A365B	047	60A365C	263		50D170H	195
SGLFW- (Iron core, F-type)	20A090A	017				50D320H	196
	20A120A	018				40D400B	197
	35A120A	019				40D600B	198
	35A230A	020				80D400B	199
	50A200B	181				80D600B	200
	50A380B	182					
	1ZA200B	183					
	1ZA380B	184					
	35D120A	211					
	35D230A	212					
	50D200B	189					
	50D380B	190					
	1ZD200B	191					
	1ZD380B	192					
	1ED380B	333					
	1ED560B	334					

Servo motor specifications

Coreless SGLGW/SGLGM - (with standard-force magnetic ways)

Voltage		230 V								
Linear servo motor model SGLGW-		30A		40A			60A			90A
		050C	080C	140C	253C	365C	140C	253C	365C	200C
Rated force*	N	12.5	25	47	93	140	70	140	210	325
Rated current*	Arms	0,51	0,79	0.8	1.6	2.4	1,16	2,2	3,3	4.4
Instantaneous peak force*	N	40	80	140	280	420	220	440	660	1300
Instantaneous peak current*	Arms	1.62	2.53	2.4	4.9	7.3	3.5	7.0	10.5	17.6
Coil assembly weight	kg	0.14	0.19	0.40	0.66	0.93	0.48	0.82	1.16	2.2
Force constant	N / Arms	26.4	33.9	61.5	61.5	61.5	66.6	66.6	66.6	78
BEMF constant	V /(m / s)	8.8	11.3	20.5	20.5	20.5	22.2	22.2	22.2	26.0
Motor constant	$N/\sqrt{W}$	3.7	5.6	7.8	11.0	13.5	11.1	15.7	19.2	26.0
Electrical time constant	ms	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	1.4
Mechanical time constant	ms	7.30	4.78	5.59	4.96	4.77	3.41	3.08	2.98	3.18
Thermal resistance (with heat sink)	K / W	5,19	3,11	1,67	0,87	0,58	1,56	0,77	0,51	0,39
Thermal resistance (without heat sink)	K / W	-	-	3,02	1,80	1,23	2,59	1,48	1,15	1.09
Magnetic attraction	N	0	0	0	0	0	0	0	0	0
Heat sink size	mm	200 x 300 x 12			300 x 400 x 12	400 x 500 x 12	200 x 300 x 12	300 x 400 x 12	400 x 500 x 12	800 x 900 x 12
Basic specifications	Time rating	Continuous								
	Insulation class	Class B								
	Ambient temperature	0 to +40 °C								
	Ambient humidity	20 to 80% (non-condensing)								
	Insulation resistance	500 VDC, 10 MΩ min.								
	Excitation	Permanent magnet								
	Dielectric strength	1500 VAC for 1 minute								
	Protection methods	Self-cooled, air-cooling								
	Allowable winding temperature	130 °C								

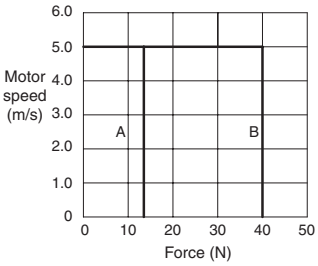
Note: 1. The items marked with an * and “force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).

2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

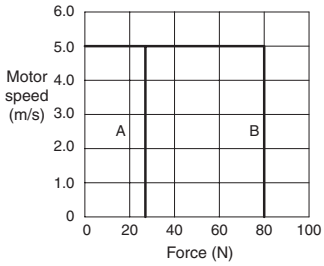
Force-speed characteristics - (with standard-force magnetic ways)

A: Continuous duty zone
B: Intermittent duty zone

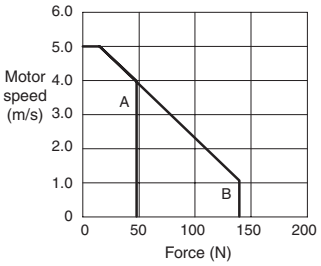
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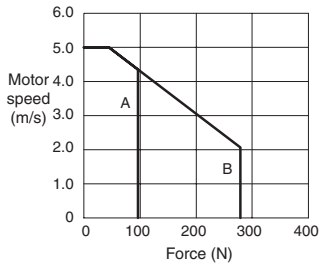
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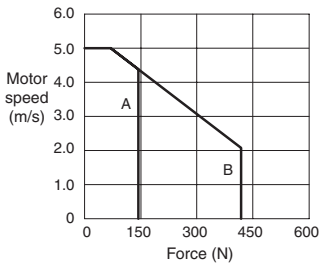
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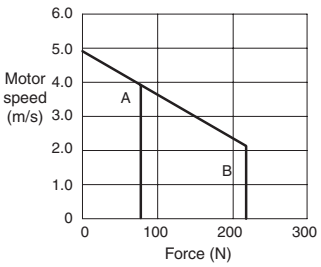
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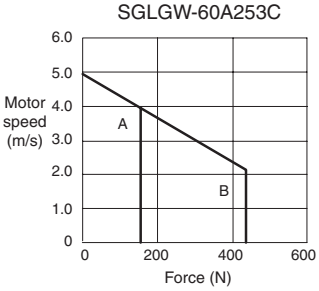
SGLGW-40A365C



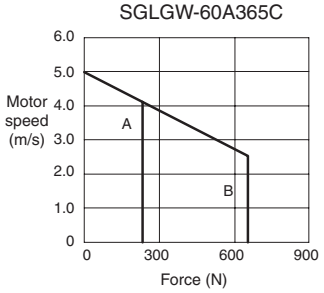
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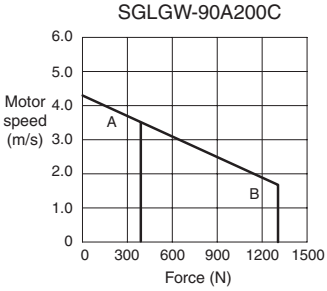
SGLGW-60A253C



SGLGW-60A365C



SGLGW-90A200C



Coreless SGLGW/SGLGM - (with high-force magnetic ways)

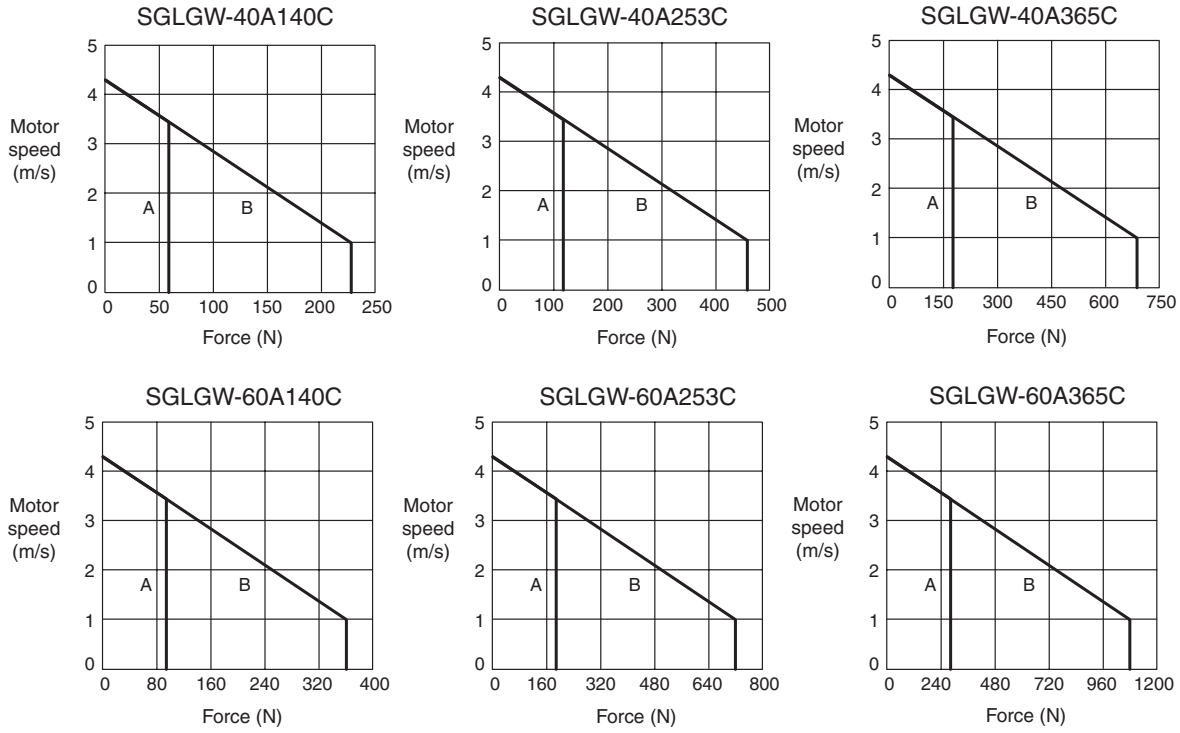
Voltage			230 V					
Linear servo motor model SGLGW-			40A			60A		
			140C	253C	365C	140C	253C	365C
Rated force*		N	57	114	171	85	170	255
Rated current*		Arms	0.8	1.6	2.4	1.2	2.2	3.3
Instantaneous peak force*		N	230	460	690	360	720	1080
Instantaneous peak current*		Arms	3.2	6.5	9.7	5.0	10.0	14.9
Coil assembly weight		kg	0.40	0.66	0.93	0.48	0.82	1.16
Force constant		N / Arms	76.0	76.0	76.0	77.4	77.4	77.4
BEMF constant		V /(m / s)	25.3	25.3	25.3	25.8	25.8	25.8
Motor constant		$N/\sqrt{W}$	9.6	13.6	16.7	12.9	18.2	22.3
Electrical time constant		ms	0.4	0.4	0.4	0.5	0.5	0.5
Mechanical time constant		ms	3.69	3.24	3.12	2.52	2.29	2.21
Thermal resistance (with heat sink)		K / W	1.67	0.87	0.58	1.56	0.77	0.51
Thermal resistance (without heat sink)		K / W	3.02	1.80	1.23	2.59	1.48	1.15
Magnetic attraction		N	0	0	0	0	0	0
Heat sink size		mm	200 x 300 x 12	300 x 400 x 12	400 x 500 x 12	200 x 300 x 12	300 x 400 x 12	400 x 500 x 12
Basic specifications	Time rating		Continuous					
	Insulation class		Class B					
	Ambient temperature		0 to +40 °C					
	Ambient humidity		20 to 80% (non-condensing)					
	Insulation resistance		500 VDC, 10 MΩ min.					
	Excitation		Permanent magnet					
	Dielectric strength		1500 VAC for 1 minute					
	Protection methods		Self-cooled, air-cooling					
	Allowable winding temperature		130 °C					

Note: 1. The items marked with an * and “force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).

2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

Force-speed characteristics - (with high-force magnetic ways)

A: Continuous duty zone
B: Intermittent duty zone



Iron-core SGLFW/SGLFM (200 V)

Voltage		230 V						
Linear servo motor model SGLFW-		20A		35A		50A		1ZA
		090A	120A	120A	230A	200B	380B	200B
Rated force*	N	25	40	80	160	280	560	560
Rated current*	Arms	0.7	0.8	1.4	2.8	5.0	10.0	8.7
Instantaneous peak force*	N	86	125	220	440	600	1200	1200
Instantaneous peak current*	Arms	3.0	2.9	4.4	8.8	12.4	25.0	21.6
Coil assembly weight	kg	0.7	0.9	1.3	2.3	3.5	6.9	6.4
Force constant	N / Arms	36.0	54.0	62.4	62.4	60.2	60.2	69.0
BEMF constant	V /(m / s)	12.0	18.0	20.8	20.8	20.1	20.1	23.0
Motor constant	$N/\sqrt{W}$	7.9	9.8	14.4	20.4	34.3	48.5	52.4
Electrical time constant	ms	3.2	3.3	3.6	3.6	15.9	15.8	18.3
Mechanical time constant	ms	11.0	9.3	6.2	5.5	3.0	2.9	2.3
Thermal resistance (with heat sink)	K / W	4.35	3.19	1.57	0.96	0.82	0.32	0.6
Thermal resistance (without heat sink)	K / W	7.69	5.02	4.10	1.94	1.48	0.74	0.92
Magnetic attraction	N	314	462	809	1586	1650	3260	3300
Heat sink size	mm	125 x 125 x 13		254 x 254 x 25			400 x 500 x 40	254 x 254 x 25
Basic specifications	Time rating	Continuous						
	Insulation class	Class B						
	Ambient temperature	0 to +40 °C						
	Ambient humidity	20 to 80% (non-condensing)						
	Insulation resistance	500 VDC, 10 MΩ min.						
	Excitation	Permanent magnet						
	Dielectric strength	1500 VAC for 1 minute						
	Protection methods	Self-cooled						
	Allowable winding temperature	130 °C						

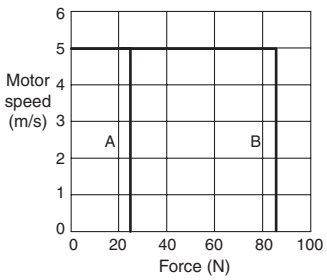
Note: 1. The items marked with an * and “force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).

2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

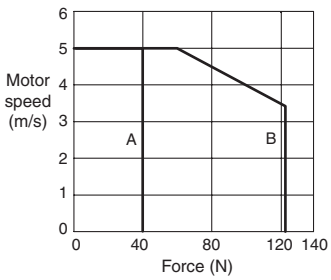
Force-speed characteristics (200 V)

A: Continuous duty zone
B: Intermittent duty zone

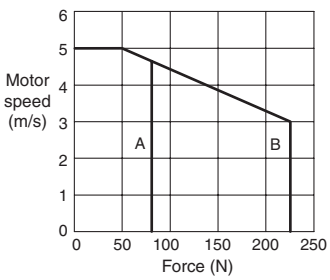
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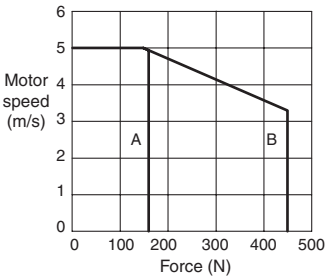
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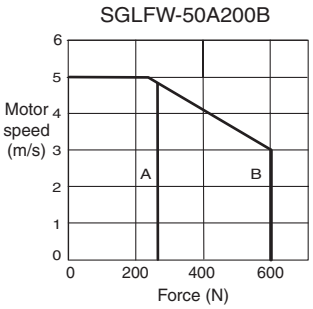
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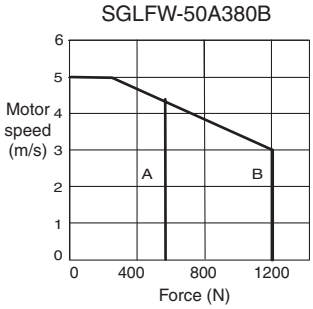
SGLFW-35A230A



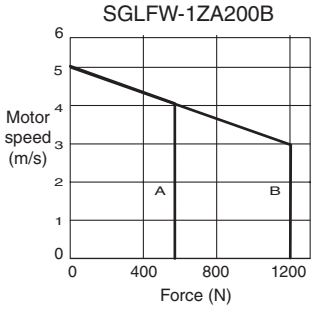
SGLFW-50A200B



SGLFW-50A380B



SGLFW-1ZA200B



Iron-core SGLFW/SGLFM (400 V)

Voltage		400 V							
Linear servo motor model SGLFW-		35D		50D		1ZD		1ED	
		120A	230A	200B	380B	200B	380B	380B	560B
Rated force*	N	80	160	280	560	560	1120	1500	2250
Rated current*	Arms	0.7	1.4	2.3	4.5	4.9	9.8	6.4	9.6
Instantaneous peak force*	N	220	440	600	1200	1200	2400	3600	5400
Instantaneous peak current*	Arms	2.3	4.6	5.6	11.0	12.3	24.6	18.1	27.2
Coil assembly weight	kg	1.3	2.3	3.5	6.9	6.4	11.5	22	33
Force constant	N / Arms	120.2	120.2	134.7	134.7	122.6	122.6	250	250
BEMF constant	V /(m / s)	40.1	40.1	44.9	44.9	40.9	40.9	83.2	83.2
Motor constant	$N/\sqrt{W}$	13.8	19.5	33.4	47.2	51.0	72.1	95.4	117
Electrical time constant	ms	3.5	3.5	15.0	15.0	17.4	17.2	19.7	19.6
Mechanical time constant	ms	5.5	5.5	3.2	3.2	2.5	2.2	1.8	1.8
Thermal resistance (with heat sink)	K / W	1.57	0.96	0.82	0.32	0.6	0.28	0.21	0.13
Thermal resistance (without heat sink)	K / W	4.1	1.94	1.48	0.74	0.92	0.55	0.50	0.35
Magnetic attraction	N	810	1590	1650	3260	3300	6520	9780	14600
Heat sink size	mm	254 x 254 x 25			400 x 500 x 40	254 x 254 x 25	400 x 500 x 40	609 x 762 x 50	762 x 1270 x 64
Basic specifications	Time rating	Continuous							
	Insulation class	Class B							
	Ambient temperature	0 to +40 °C							
	Ambient humidity	20 to 80% (non-condensing)							
	Insulation resistance	500 VDC, 10 MΩ min.							
	Excitation	Permanent magnet							
	Dielectric strength	1500 VAC for 1 minute							
	Protection methods	Self-cooled							
	Allowable winding temperature	130 °C							

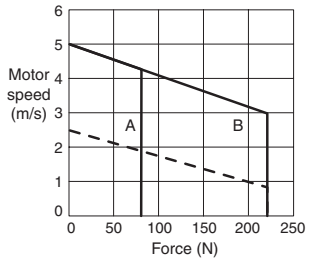
Note: 1. The items marked with an * and "force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).

2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

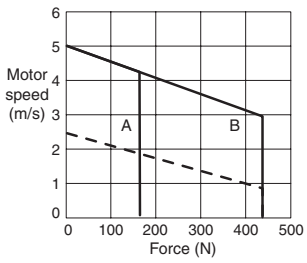
Force-speed characteristics (400 V)

A: Continuous duty zone
B: Intermittent duty zone

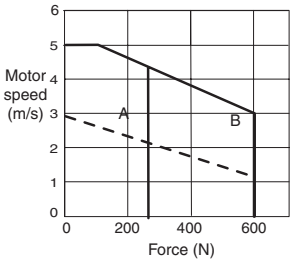
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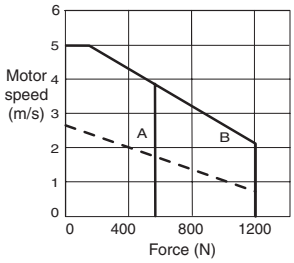
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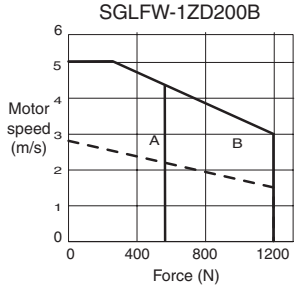
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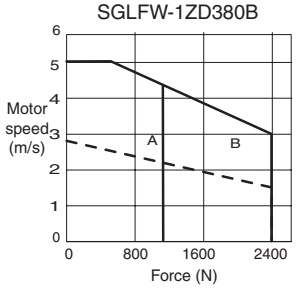
SGLFW-50D380B



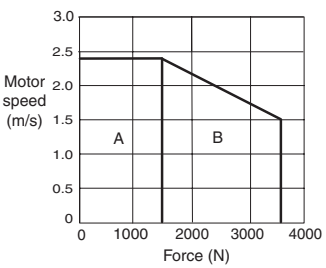
SGLFW-1ZD200B



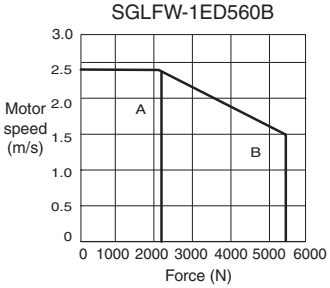
SGLFW-1ZD380B



SGLFW-1ED380B



SGLFW-1ED560B



Note: The dotted line indicates characteristics when the linear servo motor for 400 VAC is used with an input power supply for 200 VAC. In this case, the serial converter should be changed. Contact your OMRON Yaskawa representatives.

Iron-core SGLTW/SGLTM (400 V)

Voltage		400 V							
Linear servo motor model SGLTW-		35D		50D		40D		80D	
		170H	320H	170H	320H	400B	600B	400B	600B
Rated force*	N	300	600	450	900	670	1000	1300	2000
Rated current*	Arms	3.2	6.5	3.2	6.3	3.7	5.5	7.2	11.1
Instantaneous peak force*	N	600	1200	900	1800	2600	4000	5000	7500
Instantaneous peak current*	Arms	7.5	15.1	7.3	14.6	20.7	30.6	37.6	56.4
Coil assembly weight	kg	4.7	8.8	6	11	15	23	25	36
Force constant	N / Arms	99.6	99.6	153.3	153.3	196.1	196.1	194.4	194.4
BEMF constant	V /(m / s)	33.2	33.2	51.1	51.1	65.4	65.4	64.8	64.8
Motor constant	$N/\sqrt{W}$	36.3	51.4	48.9	69.1	59.6	73	85.9	105.2
Electrical time constant	ms	14.3	14.3	15.6	15.6	14.4	14.4	15.4	15.4
Mechanical time constant	ms	3.5	3.5	2.5	2.5	4.2	4.2	3.2	3.2
Thermal resistance (with heat sink)	K / W	0.76	0.4	0.61	0.3	0.24	0.2	0.22	0.18
Thermal resistance (without heat sink)	K / W	1.26	0.83	0.97	0.8	0.57	0.4	0.47	0.33
Magnetic attraction*1	N	0	0	0	0	0	0	0	0
Magnetic attraction*2	N	1400	2780	2000	3980	3950	5890	7650	11400
Heat sink size	mm	400 x 500 x 40				609 x 762 x 50			
Basic specifications	Time rating	Continuous							
	Insulation class	Class B							
	Ambient temperature	0 to +40 °C							
	Ambient humidity	20 to 80% (non-condensing)							
	Insulation resistance	500 VDC, 10 MW min.							
	Excitation	Permanent magnet							
	Dielectric strength	1500 VAC for 1 minute							
	Protection methods	Self-cooled							
	Allowable winding temperature	130 °C							

*1. The unbalanced magnetic gap resulting from the coil assembly installation condition causes a magnetic attraction on the coil assembly.

*2. The value indicates the magnetic attraction generated on one side of the magnetic way.

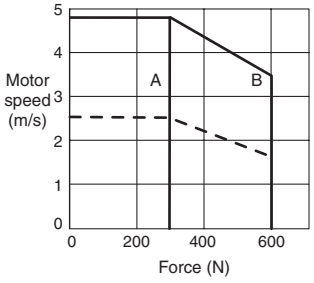
Note: 1. The items marked with an * and "force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68 °F).

2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

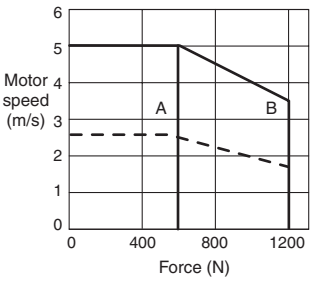
Force-speed characteristics (400 V)

A: Continuous duty zone
B: Intermittent duty zone

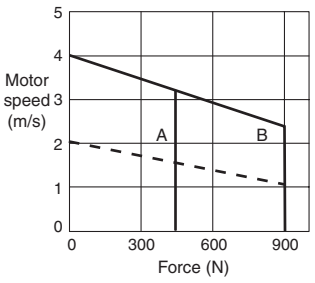
SGLTW-35D170H



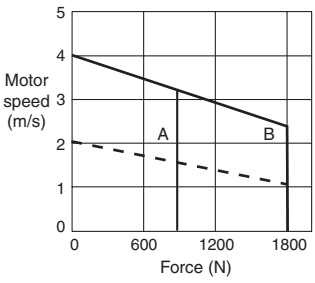
SGLTW-35D320H



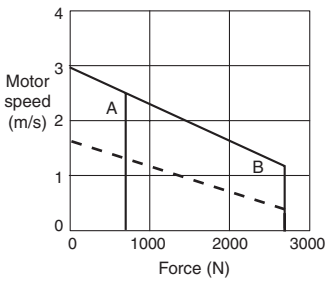
SGLTW-50D170H



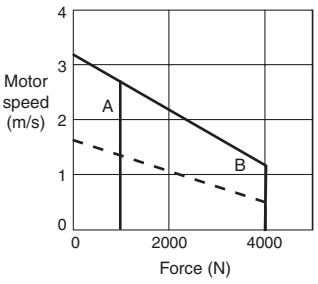
SGLTW-50D320H



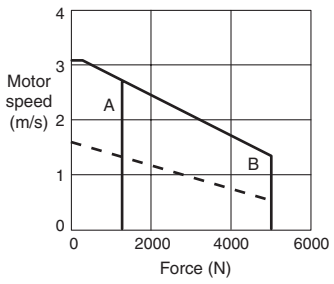
SGLTW-40D400B



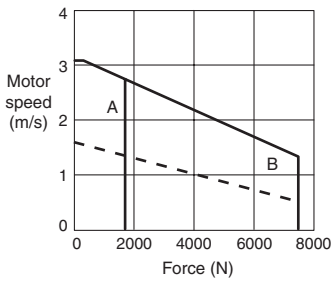
SGLTW-40D600B



SGLTW-80D400B



SGLTW-80D600B



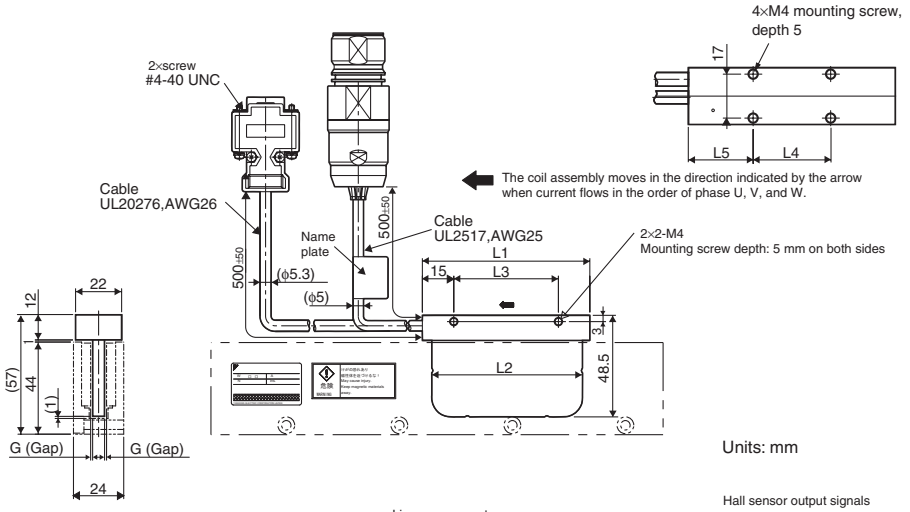
Note: The dotted line indicates characteristics when the linear servo motor for 400 VAC is used with an input power supply for 200 VAC. In this case, the serial converter should be changed. Contact your OMRON Yaskawa representatives.

Dimensions

Coreless SGLG□-30

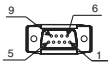
Coil assembly: SGLGW-30A□□□□□D

Coil assembly model SGLGW-	L1	L2	L3	L4	L5	G(Gap)	Approx. weight* kg	
30A050□□D	50	48	30	20	20	0.85	0.14	*The value indicates the weight of coil assembly with a hall sensor unit.
30A080□□D	80	72	50	30	25	0.95	0.19	



Units: mm

Hall sensor connector specifications



Pin connector type: 17JE-23090-02 (D8C) made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02 (D8C)
Stud type:17L-002C or 17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor Connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020 made by Interconnectron

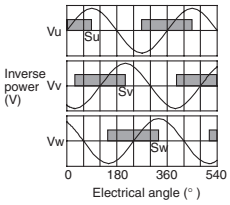
The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name	Lead color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green/yellow
7	Not used	–

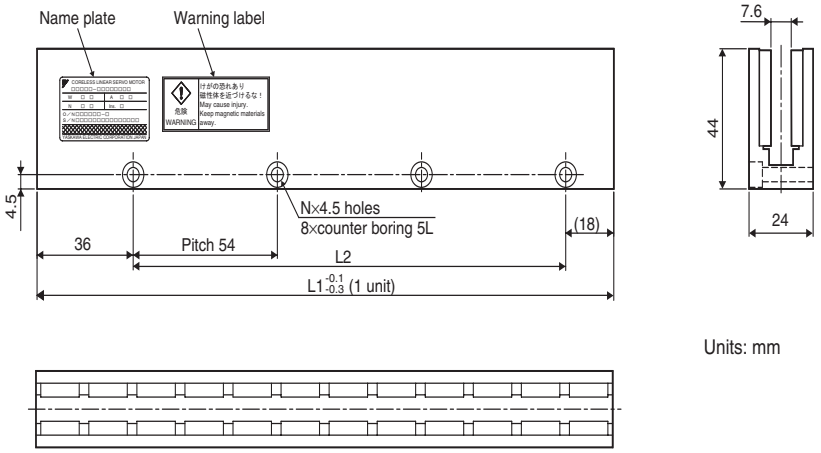
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the following figure.



Magnetic way: SGLGM-30□□□A

Magnetic way model SGLGM-	L1 mm	L2 mm	N	Approx. weight kg
30108A	108	54	2	0.6
30216A	216	162	4	1.1
30432A	432	378	8	2.3

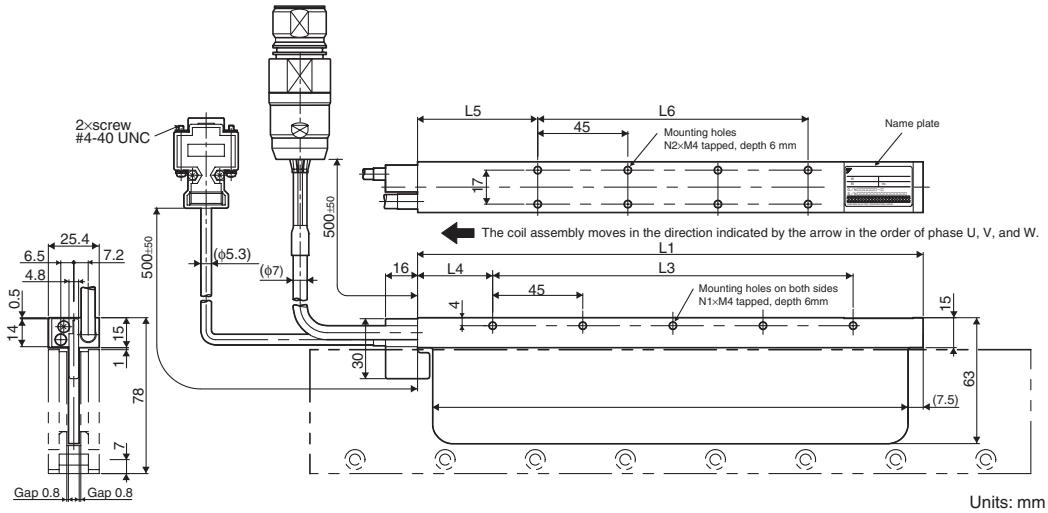


Units: mm

Coreless SGLG□-40

Coil assembly: SGLGW-40A□□□□□D

Coil assembly model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. weight* kg	
40A140□□D	140	125	90	30	52.5	45	3	4	0.40	*The value indicates the weight of coil assembly with a hall sensor unit.
40A253□□D	252.5	237.5	180	37.5	60	135	5	8	0.66	
40A365□□D	365	350	315	30	52.5	270	8	14	0.93	



Hall sensor connector specifications



Pin connector type:
17JE-23090-02 (D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02 (D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

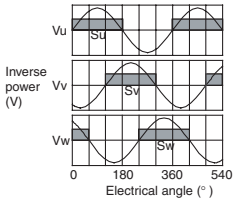
The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name	Lead color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green/yellow
7	Not used	–

Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

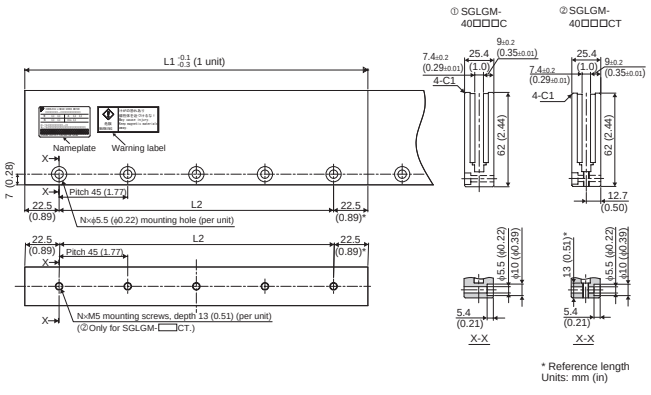


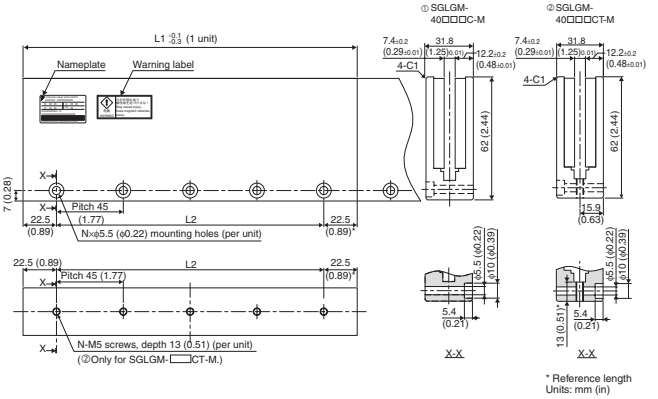
Standard-force magnetic way: SGLGM-40□□□C□

Standard-force magnetic way model SGLGM-		L1 mm	L2 mm	N	Approx. weight kg
Mounting type 1	Mounting type 2				
40090C	40090CT	90	45	2	0.8
40225C	40225CT	225	180	5	2.0
40360C	40360CT	360	315	8	3.1
40405C	40405CT	405	360	9	3.5
40450C	40450CT	450	405	10	3.9

High-force magnetic way: SGLGM-40□□□C□-M

High-force magnetic way model SGLGM-		L1 mm	L2 mm	N	Approx. weight kg
Mounting type 1	Mounting type 2				
40090C-M	40090CT-M	90	45	2	1.0
40225C-M	40225CT-M	225	180	5	2.6
40360C-M	40360CT-M	360	315	8	4.1
40405C-M	40405CT-M	405	360	9	4.6
40450C-M	40450CT-M	450	405	10	5.1

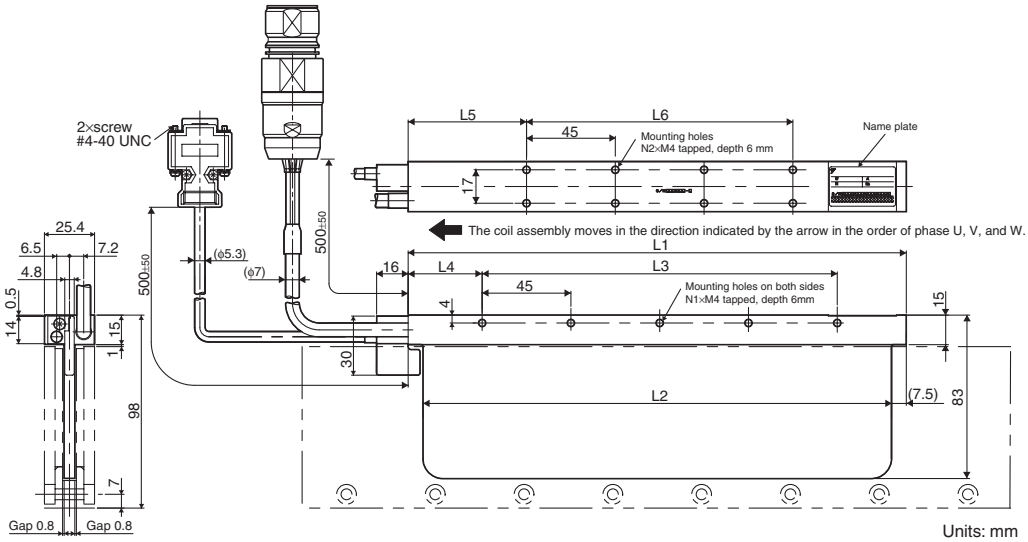




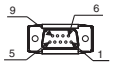
Note: Mounting dimensions of magnets revision B are equivalent to magnets revision C mounting type 2

Coreless SGLG□-60

Coil assembly: SGLGW-60A□□□□□D



Hall sensor
Connector Specifications



Pin connector type:
17JE-23090-02 (D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02 (D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

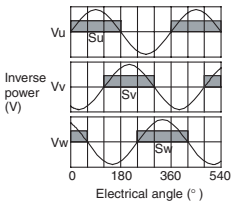
The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green/yellow
7	Not used	–

Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



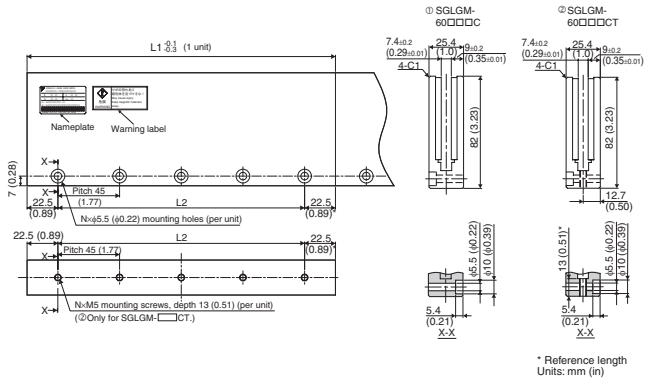
Coil assembly model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. weight* kg	
60A140□□D	140	125	90	30	52.5	45	3	4	0.48	*The value indicates the weight of coil assembly with a hall sensor unit.
60A253□□D	252.5	237.5	180	37.5	60	135	5	8	0.82	
60A365□□D	365	350	315	30	52.5	270	8	14	1.16	

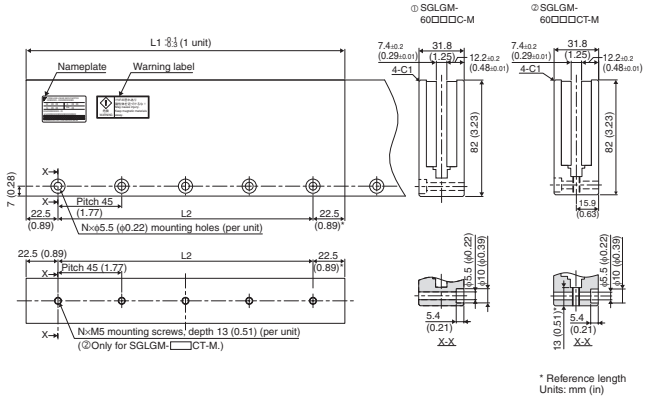
Standard-force magnetic way: SGLGM-60□□□C□

Standard-force magnetic way model SGLGM-		L1 mm	L2 mm	N	Approx. weight kg
Mounting type 1	Mounting type 2				
60090C	60090CT	90	45	2	1.1
60225C	60225CT	225	180	5	2.6
60360C	60360CT	360	315	8	4.1
60405C	60405CT	405	360	9	4.6
60450C	60450CT	450	405	10	5.1

High-force magnetic way: SGLGM-60□□□C□-M

High-force magnetic way model SGLGM-		L1 mm	L2 mm	N	Approx. weight kg
Mounting type 1	Mounting type 2				
60090C-M	60090CT-M	90	45	2	1.3
60225C-M	60225CT-M	225	180	5	3.3
60360C-M	60360CT-M	360	315	8	5.2
60405C-M	60405CT-M	405	360	9	5.9
60450C-M	60450CT-M	450	405	10	6.6



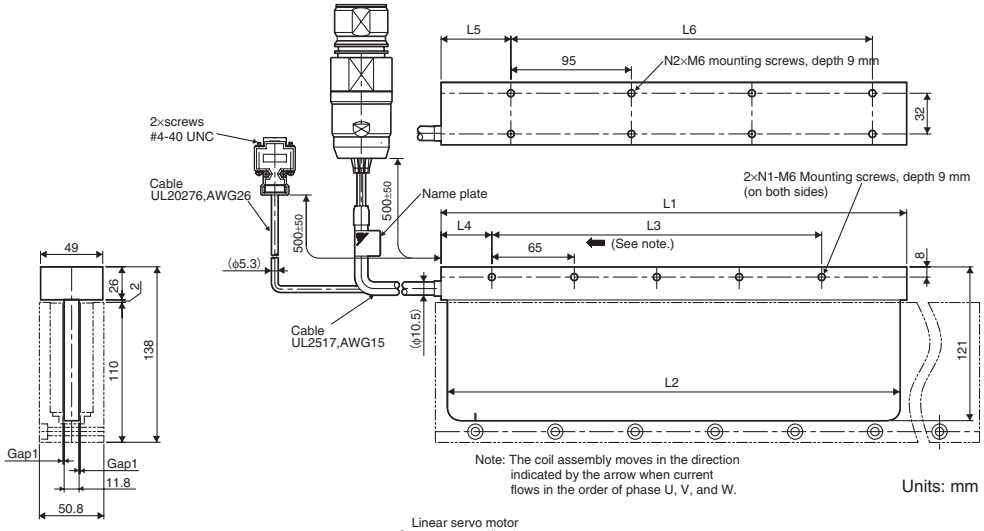


Note: Mounting dimensions of magnets revision B are equivalent to magnets revision C mounting type 2.

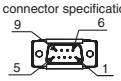
Coreless SGLG□-90

Coil assembly: SGLGW-90A200□□D

Coil assembly model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. weight* kg	
90A200□□D	199	189	130	40	60	95	3	4	2.2	*The value indicates the weight of coil assembly with a hall sensor unit.



Hall sensor connector specifications



Pin connector type:
17JE-23090-02(D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02(D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

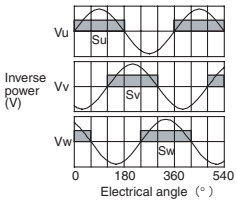
The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name	Lead color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green/yellow
7	Not used	–

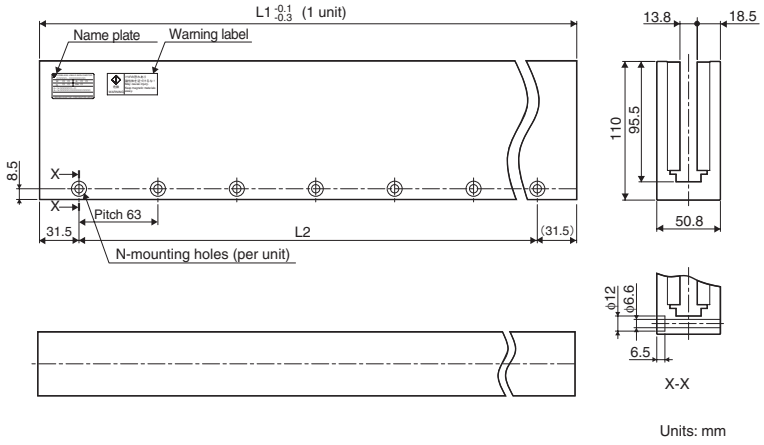
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLGM-90□□□A

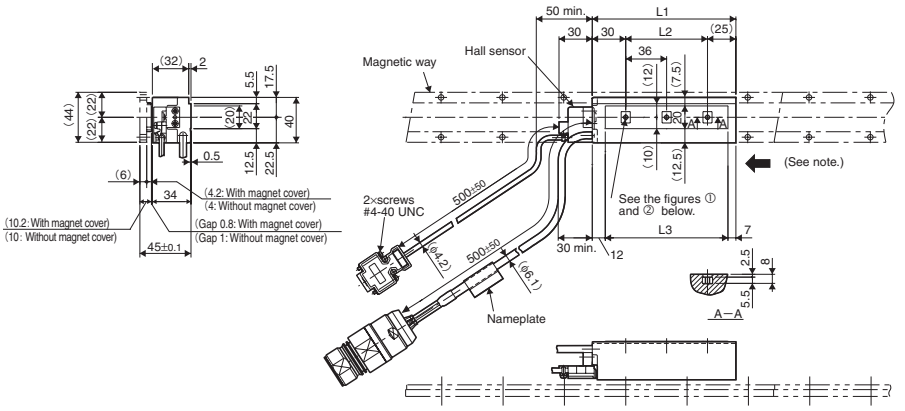
Magnetic way model SGLGM-	L1 mm	L2 mm	N	Approx. weight kg
90252A	252	189	4	7.3
90504A	504	441	8	14.7



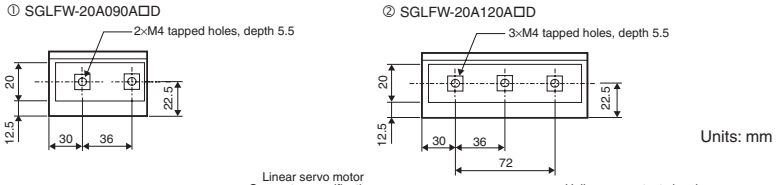
Iron-core SGLF□-20

Coil assembly: SGLFW-20A□□□A□D

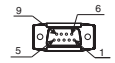
Coil assembly model SGLFW-	L1	L2	L3	N	Approx. weight kg
20A090A□	91	36	72	2	0.7
20A120A□	127	72	108	3	0.9



Note: The coil assembly moves in the direction indicated by the arrow, when current flows in the order of phase U, V, and W.



Hall sensor
Connector specifications



Pin connector type:
17JE-23090-02(D8C)
made by DDK Ltd.

The mating connector

Socket connectoro type:
17JE-13090-02(D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

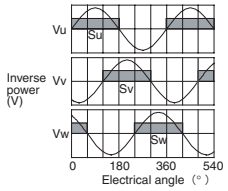
The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name	Lead color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green/yellow
7	Not used	–

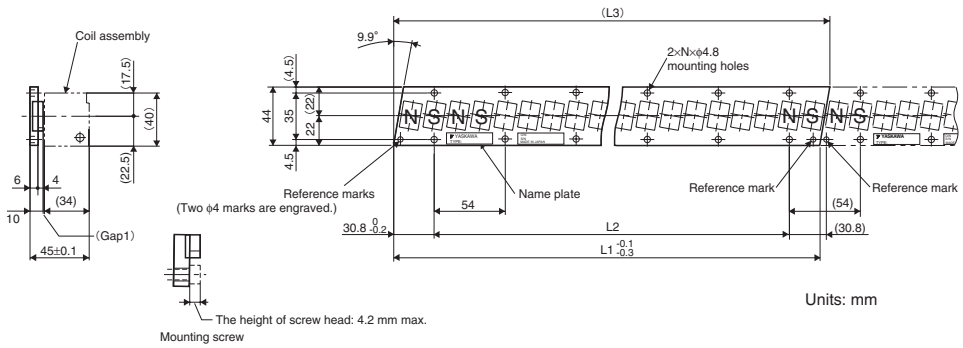
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLFM-20□□□A□

Magnetic way model SGLFM-	L1 $^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. weight kg
20324A□	324	270 (54 × 5)	(331.6)	6	0.9
20540A□	540	486 (54 × 9)	(547.6)	10	1.4
20756A□	756	702 (54 × 13)	(763.6)	14	2



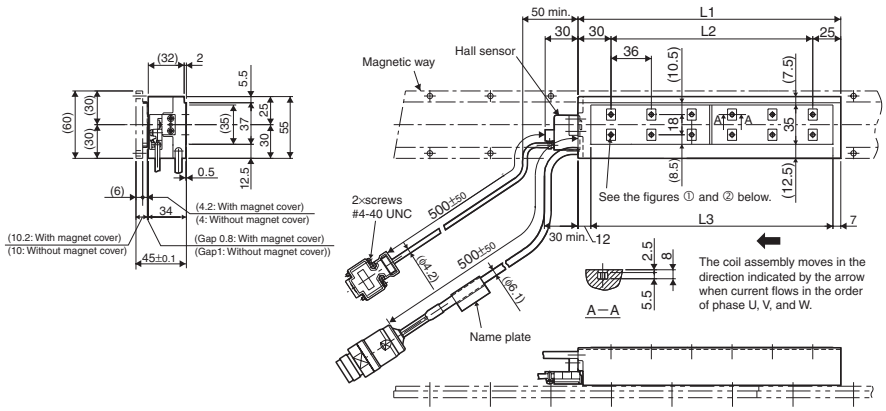
Note: 1. Multiple SGLFM-20□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

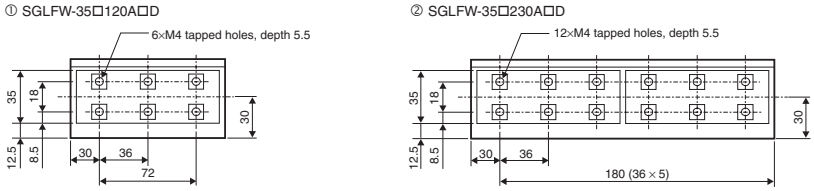
2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way

Iron-core SGLF□-35

Coil assembly: SGLFW-35□□□□A□D

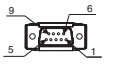
Coil assembly model SGLFW-	L1	L2	L3	N	Approx. weight kg
35□120A□D	127	72	108	6	1.3
35□230A□D	235	180	216	12	2.3





Units: mm

Hall sensor
Connector specifications



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02 (D8C) Stud type: 17L-002C or 17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

SGLFW-35A□□□A□D
Linear servo motor 200 V
Connector specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

SGLFW-35D□□□A□D
Linear servo motor 400 V
Connector specifications



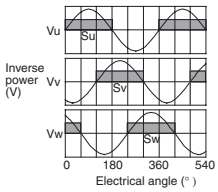
Extension: LRRA06AMRPN182
Pin type: 021.279.1020
made by Interconnectron

The mating connector
Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

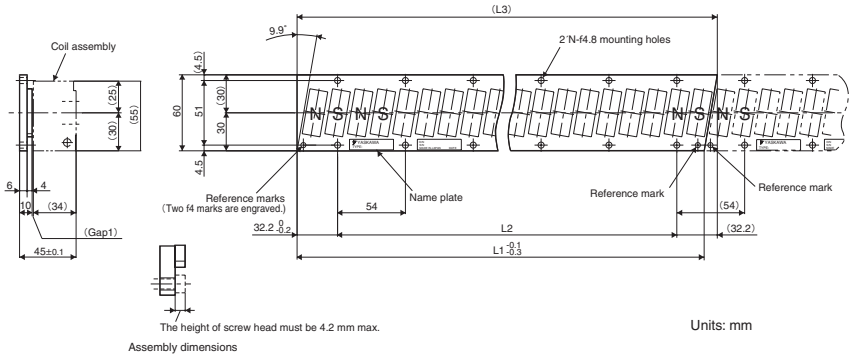
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLFM-35□□□A□

Magnetic way model SGLFM-	L1 $^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. weight kg
35324A□	324	270 (54 × 5)	(334.4)	6	1.2
35540A□	540	486 (54 × 9)	(550.4)	10	2
35756A□	756	702 (54 × 13)	(766.4)	14	2.9



Units: mm

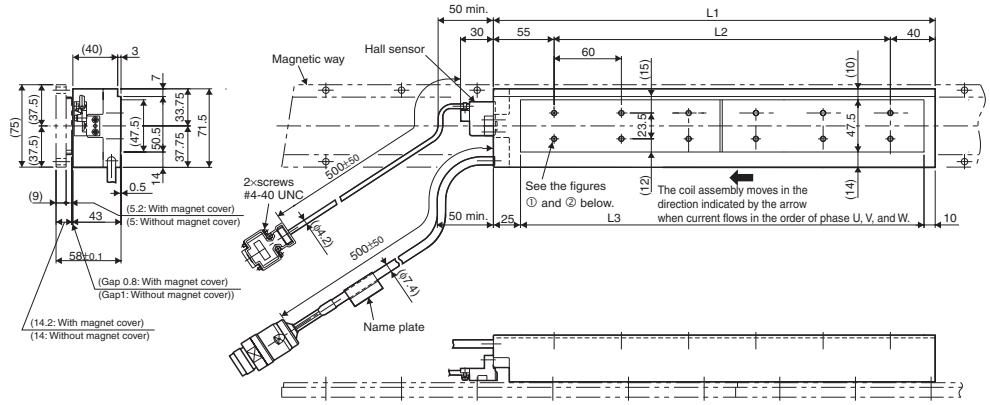
Note: 1. Multiple SGLFM-35□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.

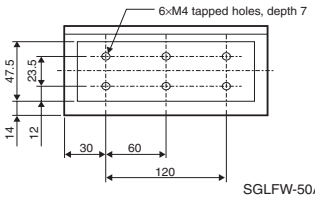
Iron-core SGLF□-50

Coil assembly: SGLFW-50□□□□B□D

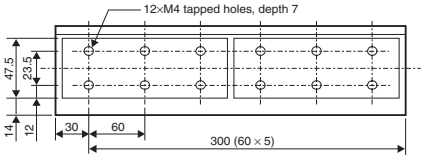
Coil assembly model SGLFW-	L1	L2	L3	N	Approx. weight kg
50□200B□D	215	120	180	6	3.5
50□380B□D	395	300	360	12	6.9



① SGLFW-50□200B□D

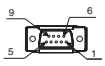


② SGLFW-50□380B□D



Units: mm

Hall sensor
Connector specifications



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02 (D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

SGLFW-50A□□□A□D
Linear servo motor 200 V
Connector Specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

SGLFW-50D□□□A□D
Linear servo motor 400 V
Connector Specifications



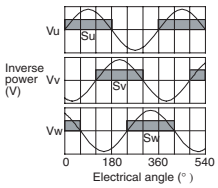
Extension: LRRA06AMRPN182
Pin type: 021.279.1020
made by Interconnectron

The mating connector
Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

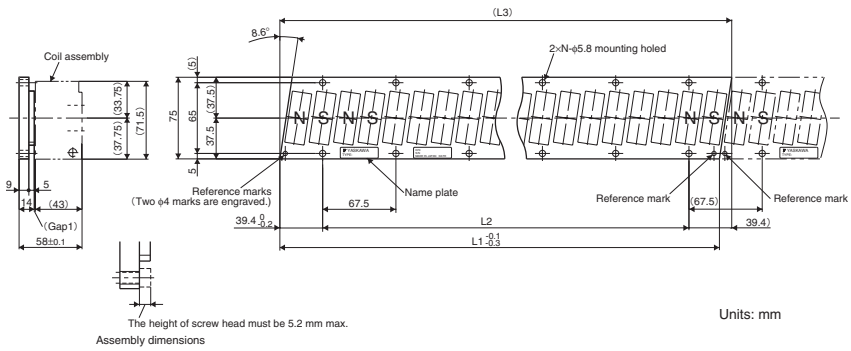
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLFM-50□□□A□

Magnetic way model SGLFM-	L1 $^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. weight kg
50135A□	135	67.5 (67.5 × 1)	(146.3)	2	1.0
50405A□	405	337.5 (67.5 × 5)	(416.3)	6	2.8
50675A□	675	607.5 (67.5 × 9)	(686.3)	10	4.6
50945A□	945	877.5 (67.5 × 13)	(956.3)	14	6.5



Units: mm

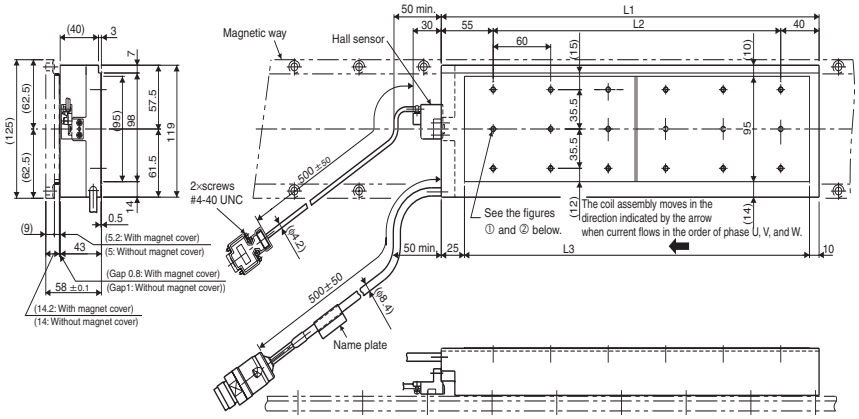
Note: 1. Multiple SGLFM-50□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way

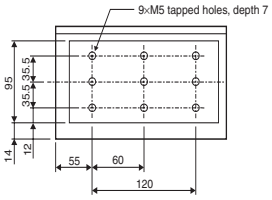
Iron-core SGLF□-1Z

Coil assembly: SGLFW-1Z□□□□B□D

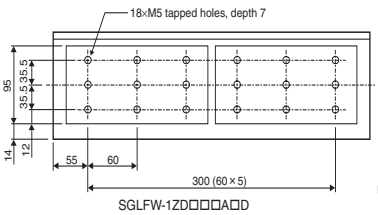
Coil assembly model SGLFW-	L1	L2	L3	N	Approx. weight kg
1Z□200B□D	215	120	180	8	6.4
1ZD380B□D	395	300	360	18	11.5



① SGLFW-1Z□200B□D



② SGLFW-1ZD380B□D



Units: mm

Hall sensor
Connector specifications



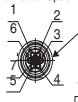
Pin connector type: 17JE-23090-02 (D8C) made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02 (D8C)
Stud type: 17L-002C or 17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

SGLFW-1ZA200A□D
Linear servo motor 200 V
Connector Specifications



Extension: SROC06JMSCN169
Pin type: 021.423.1020
made by Interconnectron

The mating connector

Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

SGLFW-1ZD□□□A□D
Linear servo motor 400 V
Connector specifications



Extension: LRRA06AMRPN182
Pin type: 021.279.1020
made by Interconnectron

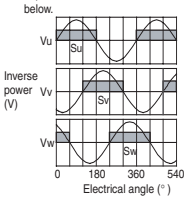
The mating connector

Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

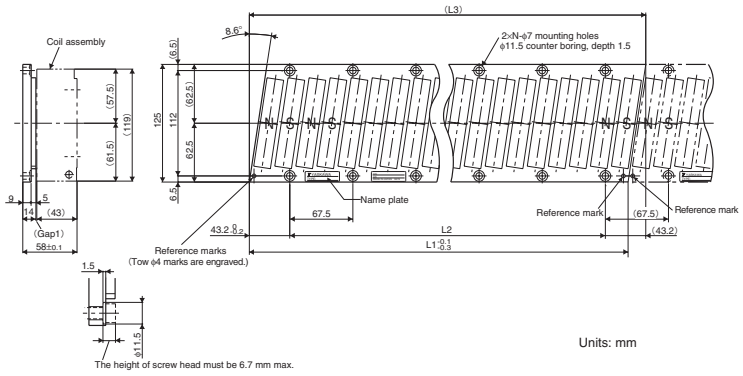
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLFM-1Z□□□A□

Magnetic way model SGLFM-	L1 $^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. weight kg
1Z135A□	135	67.5 (67.5 × 1)	(153.9)	2	1.7
1Z405A□	405	337.5 (67.5 × 5)	(423.9)	6	5
1Z675A□	675	607.5 (67.5 × 9)	(693.9)	10	8.3
1Z945A□	945	877.5 (67.5 × 13)	(963.9)	14	12



Units: mm

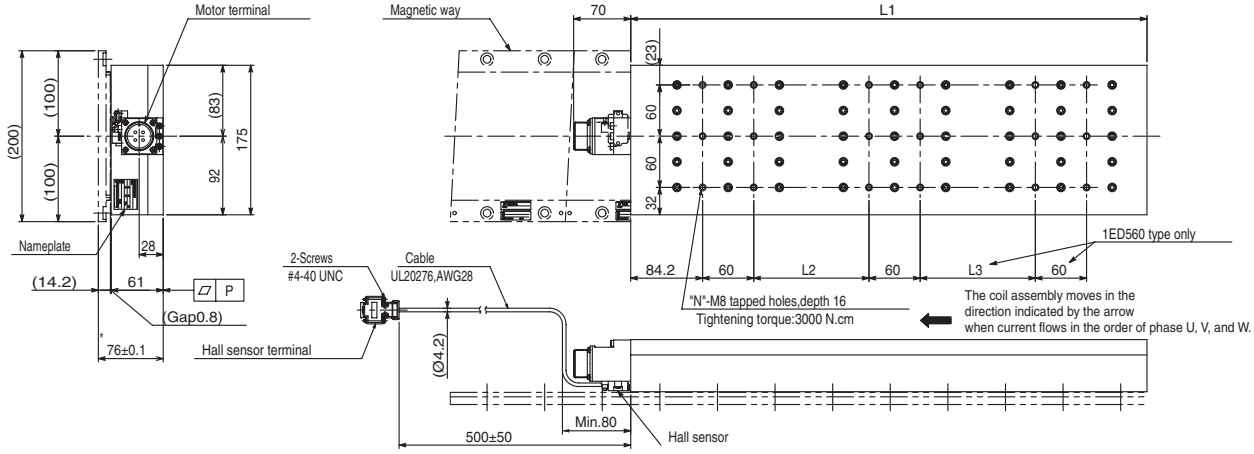
Note: 1. Multiple SGLFM-1Z□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way

Iron-core SGLF□-1E

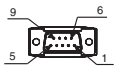
Coil assembly: SGLFW-1ED□□□B□

Coil assembly model SGLFW-	L1	L2	L3	N	P	Approx. weight kg
1ED380B□	395	120	-	12	0.3	22
1ED560B□	605	135	135	18	0.5	33



Units: mm

Hall sensor
Connector specifications



Pin connector type:
17JE-23090-02 (D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02 (D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector Specifications



Receptacle type: MS3102A-22-22P
made by DDK Ltd.

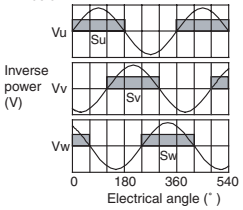
The mating connector

L-shaped plug type: MS3108E22-22S

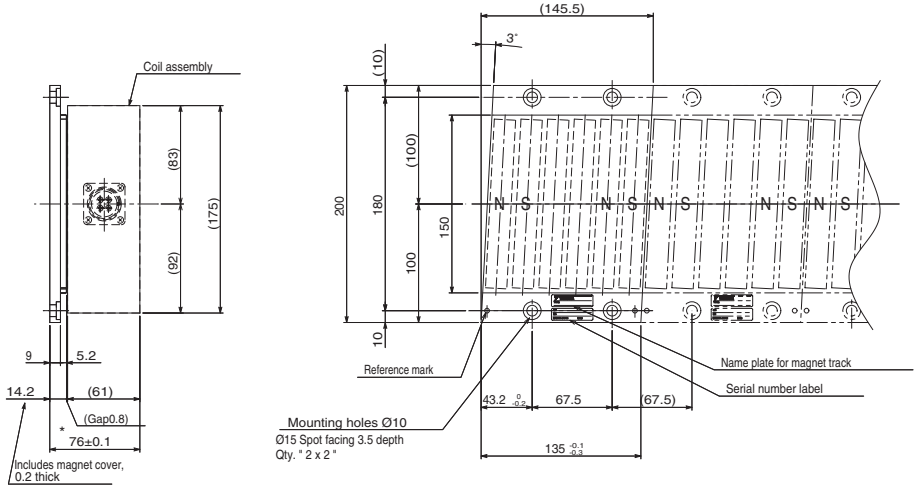
Pin No.	Name
A	Phase U
B	Phase V
C	Phase W
D	Ground

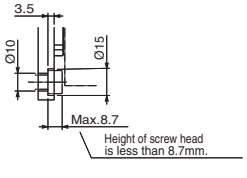
Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLFM-1E135A□





Detail drawing of mounting

Units: mm

Approx. weight: 2.5 kg

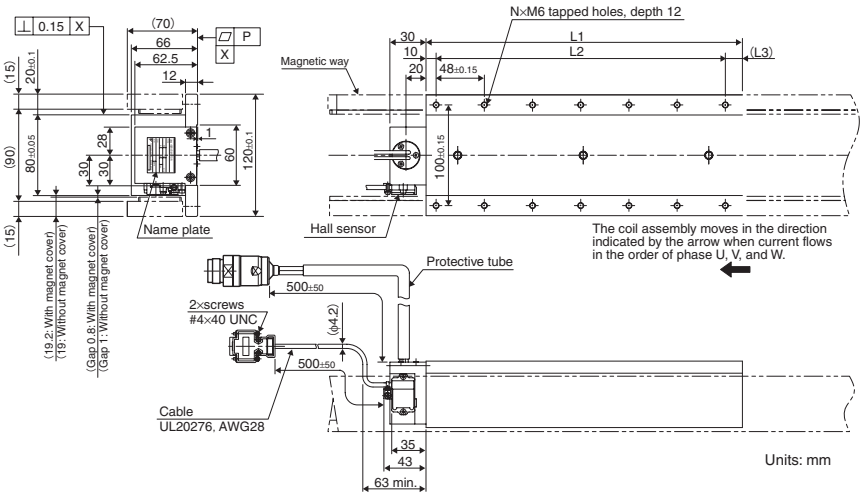
Note: 1. Multiple SGLFM-1E□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way

Iron-core SGLT□-35

Coil assembly: SGLTW-35D□□□H□D

Coil assembly model SGLTW-	L1	L2	(L3)	N	Approx. weight kg
35D320H□D	315	288 (48 × 6)	(17)	14	8.8



Wiring specification of hall sensor cable



Pin connector type: 17JE-23090-02(D8C) made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02(D8C) Stud type: 17L-002C or 17L-002C1

Pin No.	Name
1	+5VDC
2	Phase U
3	Phase V
4	Phase W
5	0V
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor Connector specifications



Extension: LRRA06AMRPN182
Pin type: 021.279.1020 made by Interconnectron

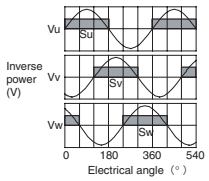
The mating connector

Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

Hall sensor output signals

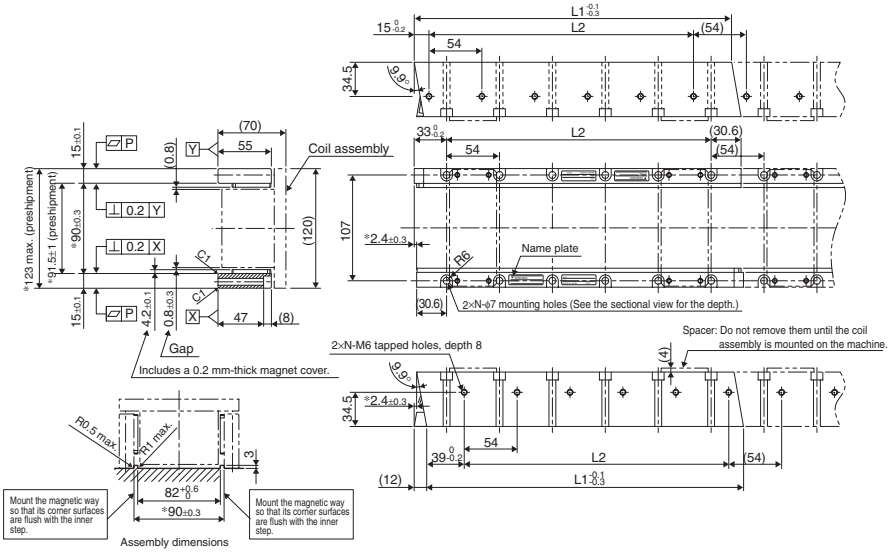
When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below



Magnetic way: SGLTM-35□□□H

Magnetic way model SGLTM-	L1 $^{-0.1}_{-0.3}$	L2	N	Approx. weight kg
35324H	324	270 (54 × 5)	6	4.8
35540H	540	486 (54 × 9)	10	8
35756H	756	702 (54 × 13)	14	11

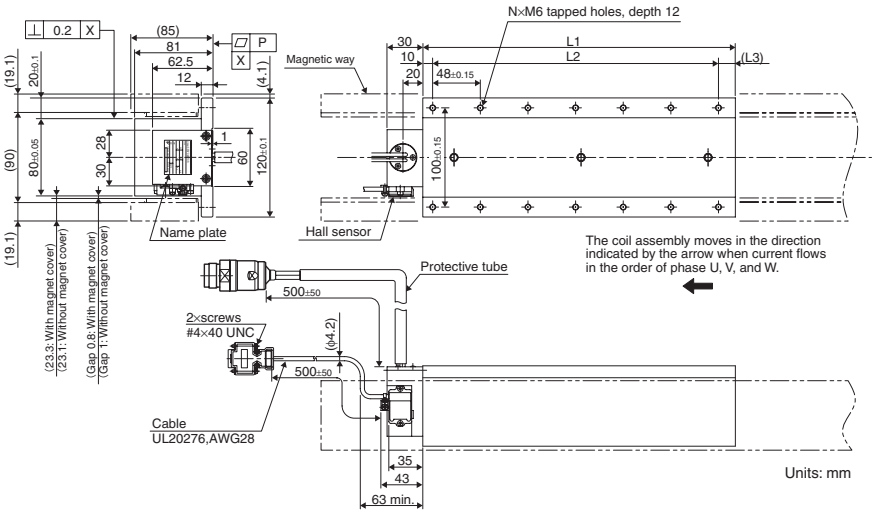
Note: 1. Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.
2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.
3. Two magnetic ways in a set can be connected to each other.
4. The dimensions marked with an * are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an * are the dimensions at preshipment.
5. Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.



Iron-core SGLT□-50

Coil assembly: SGLTW-50D□□□H□D

Coil assembly model SGLTW-	L1	L2	(L3)	N	Approx. weight kg
50D170H□D	170	144 (48 × 3)	(16)	8	6
50D320H□D	315	288 (48 × 6)	(17)	14	11



Wiring specification of hall sensor cable



Pin connector type: 17JE-23090-02(D8C) made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02(D8C) Stud type: 17L-002C or 17L-002C1

Pin No.	Name
1	+5VDC
2	Phase U
3	Phase V
4	Phase W
5	0V
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor Connector specifications



Extension: LRRA06AMRPN182
Pin type: 021.279.1020
made by Interconnectron

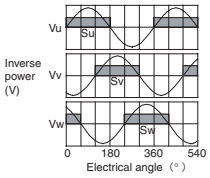
The mating connector

Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below



Magnetic way: SGLTM-50□□□H

Magnetic way model SGLTM-	L1 $^{-0.1}_{-0.3}$	L2	N	Approx. weight kg
50324H	324	270 (54 × 5)	6	8
50540H	540	486 (54 × 9)	10	13
50756H	756	702 (54 × 13)	14	18

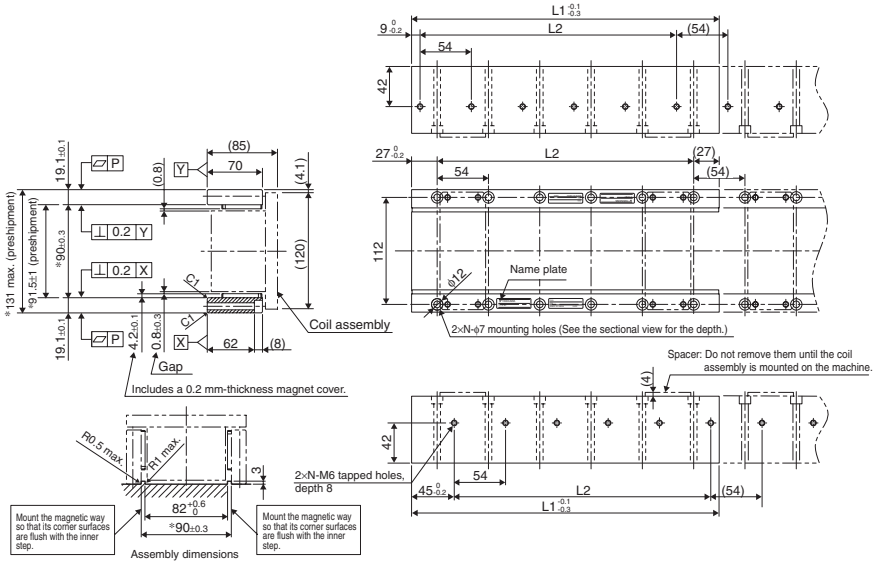
Note: 1. Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.

3. Two magnetic ways in a set can be connected to each other.

4. The dimensions marked with an * are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an * are the dimensions at preshipment.

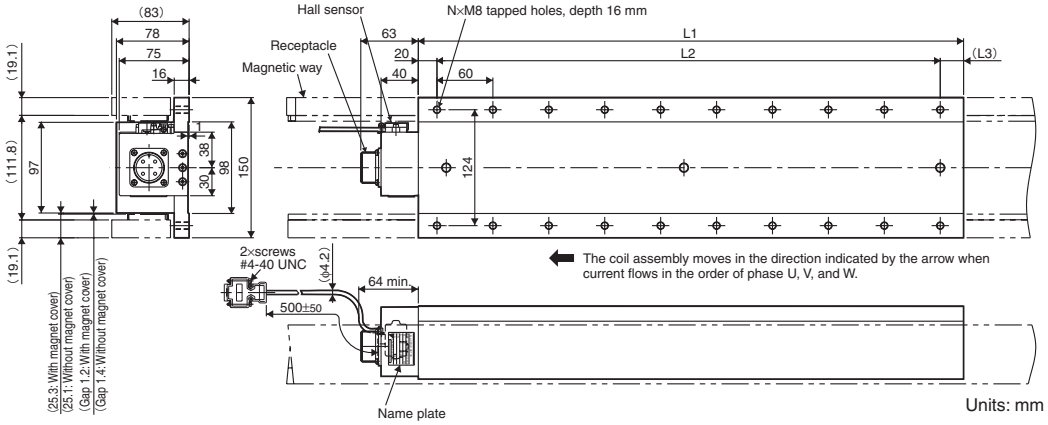
5. Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.



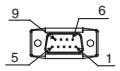
Iron-core SGLT□-40

Coil assembly: SGLTW-40D□□□B□

Coil assembly model SGLTW-	L1	L2	(L3)	N	Approx. weight kg
40D400B□	395	360 (60 × 6)	(15)	14	15
40D600B□	585	540 (60 × 9)	(25)	20	23



Hall sensor
Connector specifications



Pin connector type:
17JE-23090-02(D8C)
made by DDK Ltd.

The mating connector

Socket connector type:
17JE-13090-02(D8C)
Stud type: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector specifications



Receptacle type: MS3102A-22-22P
made by DDK Ltd.

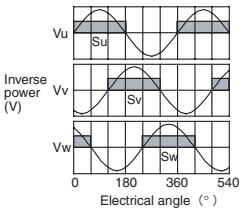
The mating connector

L-shaped plug type: MS3108E22-22S

Pin No.	Name
A	Phase U
B	Phase V
C	Phase W
D	Ground

Hall sensor output signals

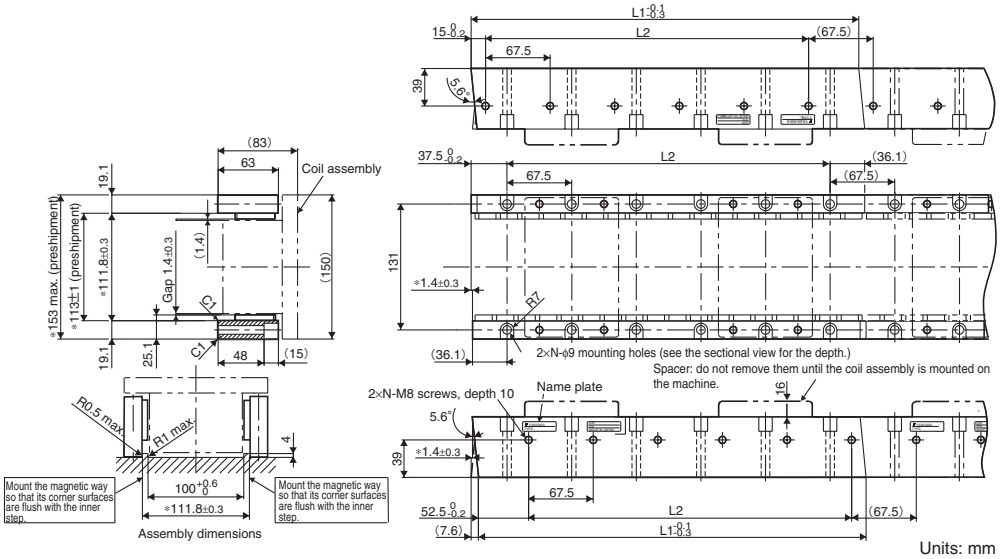
When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw, and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Magnetic way: SGLTM-40□□□A

Magnetic way model SGLTM-	L1 $^{-0.1}_{-0.3}$	L2	N	Approx. weight kg
40405A	405	337.5 (67.5 × 5)	6	9
40675A	675	607.5 (67.5 × 9)	10	15
40945A	945	877.5 (67.5 × 13)	14	21

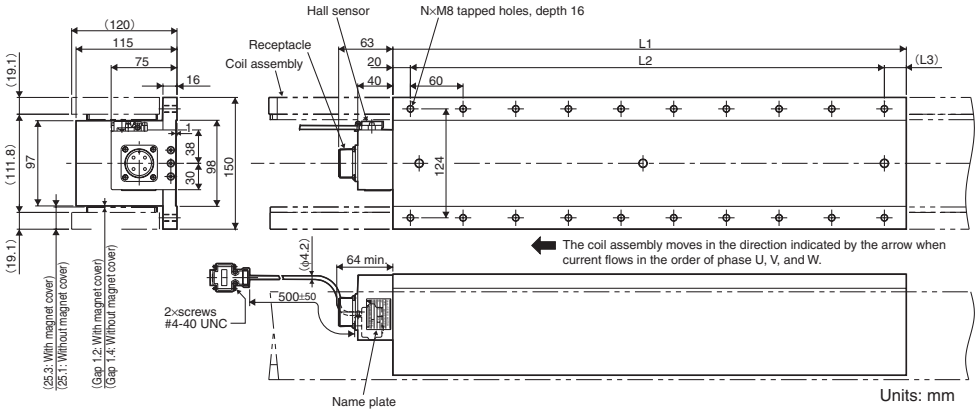
Note: 1. Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.
2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.
3. Two magnetic ways in a set can be connected to each other.
4. The dimensions marked with an * are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an * are the dimensions at preshipment.
5. Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.



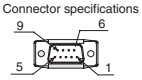
Iron-core SGLT□-80

Coil assembly: SGLTW-80D□□□B□

Coil assembly model SGLTW-	L1	L2	(L3)	N	Approx. weight kg
80D400B□	395	360 (60 × 6)	(15)	14	25
80D600B□	585	540 (60 × 9)	(25)	20	36



Hall sensor
Connector specifications



Pin connector type:
17JE-23090-02(D8C)
made by DDK Ltd.

The mating connector

Socket connector type: 17JE-13090-02(D8C) Stud type: 17L-002C or 17L-002C1

Pin No.	Name
1	+5VDC
2	Phase U
3	Phase V
4	Phase W
5	0V
6	Not used
7	Not used
8	Not used
9	Not used

Linear servo motor
Connector specifications



Receptacle type: MS3102A-22-22P
made by DDK Ltd.

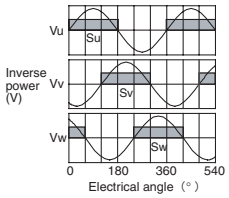
The mating connector

L-shaped plug type: MS3108E22-22S

Pin No.	Name
A	Phase U
B	Phase V
C	Phase W
D	Ground

Hall sensor output signals

When the coil assembly moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv,Vw becomes as shown in the figiure below



Magnetic way: SGLTM-80□□□A

Magnetic way model SGLTM-	L1 $^{-0.1}_{-0.3}$	L2	L3	N1	N2	Approx. weight kg
80405A	405	337.5 (67.5 × 5)	337.5 (33.75 × 10)	6	11	14
80675A	675	607.5 (67.5 × 9)	607.5 (33.75 × 18)	10	19	24
80945A	945	877.5 (67.5 × 13)	887.5 (33.75 × 26)	14	27	34

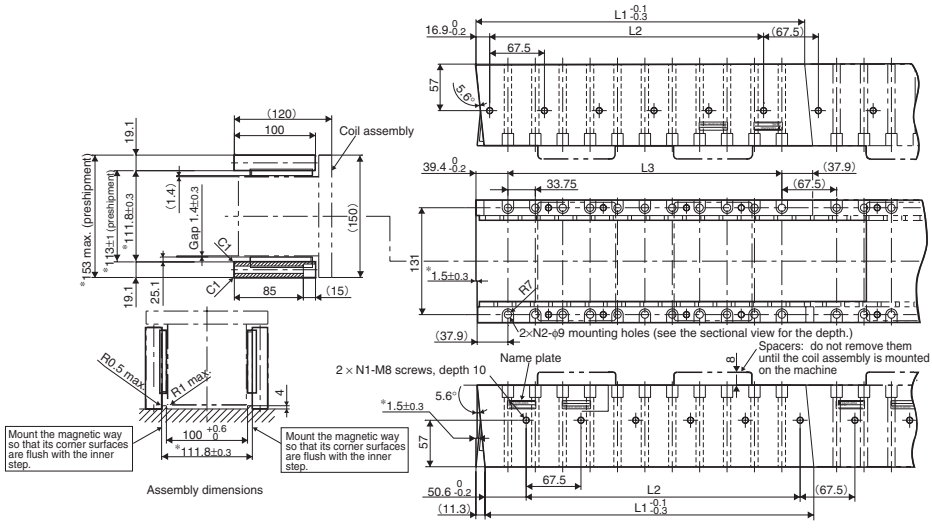
Note: 1. Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.

2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.

3. Two magnetic ways in a set can be connected to each other.

4. The dimensions marked with an * are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in assembly dimensions. The values with an * are the dimensions at preshipment.

5. Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

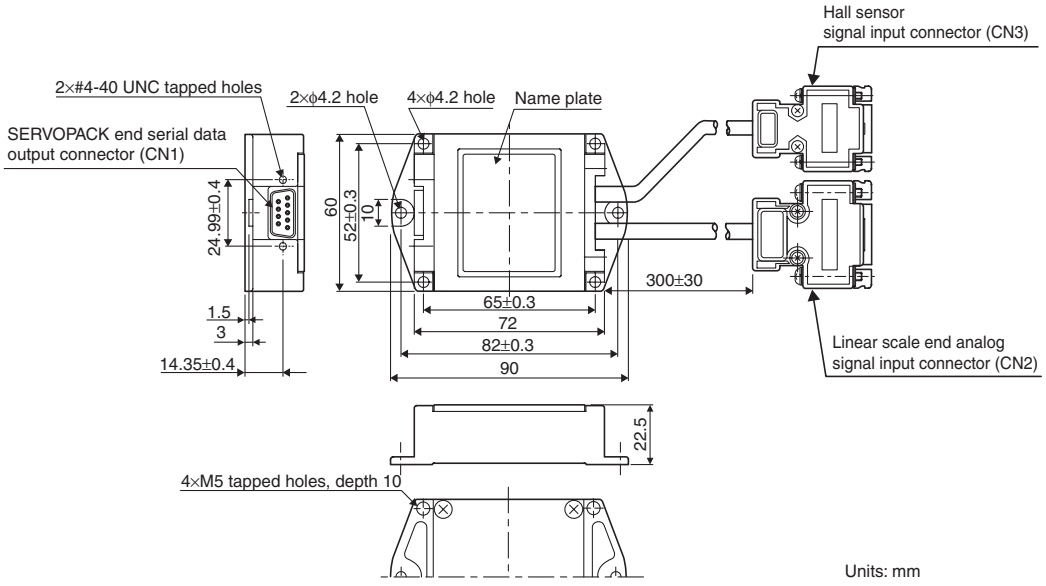


Units: mm

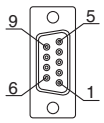
Serial converter unit

JZDP-[A/D]008-□□□

Items		Specifications
Electrical characteristics	Power supply voltage	+5.0 V ±5%, ripple content 5% max.
	Current consumption	120 mA Typ. 350 mA max.
	Signal resolution	Input 2-phase sine wave: 1/256 pitch
	Max. response frequency	250 kHz
	Analog input signals (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V input signal level: 1.5 V to 3.5 V
	Pole sensor input signal	CMOS level
	Output signals	Position data, hall sensor information, and alarms
	Output method	Serial data transmission (HDLC (High-level Data Link Control) protocol format with Manchester codes)
	Transmission cycle	62.5 µs
	Output circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120 Ω
Mechanical characteristics	Approx. weight	150 g
	Vibration resistance	98 m/s^2 max. (1 to 2500 Hz) in three directions
	Shock resistance	980 m/s^2, (11 ms) two times in three directions
Environmental conditions	Operating temperature	0 °C to 55 °C (32 to 131 °F)
	Storage temperature	-20 °C to +80 °C (-4 to +176 °F)
	Humidity	20 % to 90 %RH (without condensation)

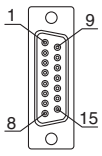


CN1
SERVOPACK end serial data output



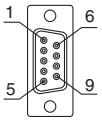
Pin No.	Signal
1	+5V
2	S-phase output
3	Empty
4	Empty
5	0V
6	/S-phase output
7	Empty
8	Empty
9	Empty
Case	Shield

CN2
Linear scale end analog signal input



Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5V
5	5Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0V
13	0Vs
14	Empty
15	Inner shield
Case	Shield

CN3
Hall sensor signal input



Pin No.	Signal
1	+5V
2	U-phase input
3	V-phase input
4	W-phase input
5	0V
6	Empty
7	Empty
8	Empty
9	Empty
Case	Shield

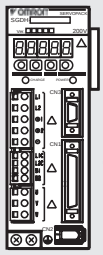
Note: 1. Do not use empty pins.

2. The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by Renishaw Inc. can be directly connected. However, the BID and DIR signals are not connected.

3. Use the linear scale end connector to change the zero point specifications of the linear scale.

Ordering information

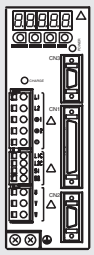
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

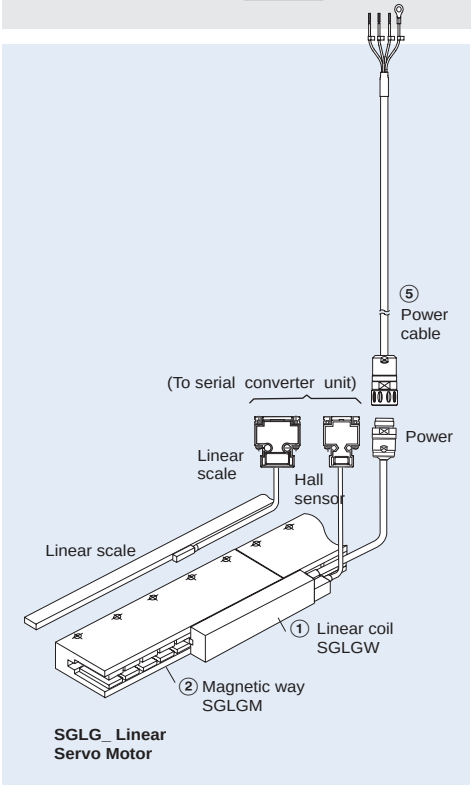
④ **Sigma-II Servo Drive**

Drive options

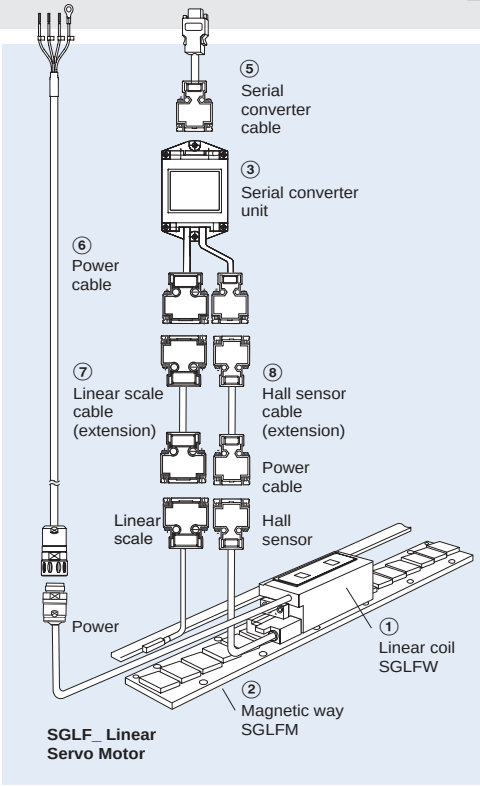


Intelligent Servo Drive

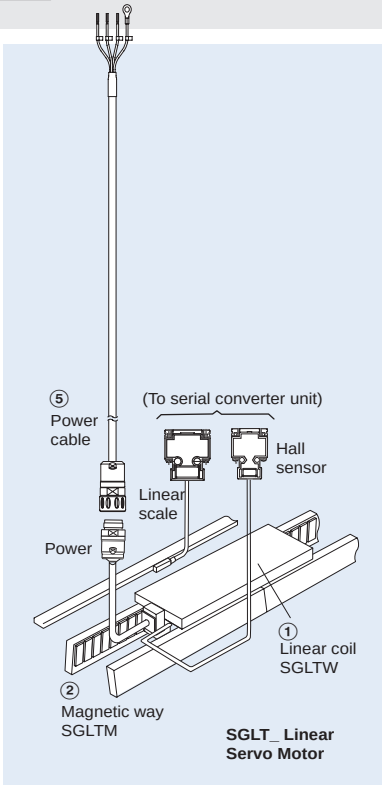
④ **XtraDrive**



SGLG_ Linear Servo Motor



SGLF_ Linear Servo Motor



SGLT_ Linear Servo Motor

Note: The symbols ①②③... show the recommended sequence to select the servo motor, cables and serial converter for a linear motor system

Servo motor

SGLGW / SGLGM coreless type (200 V)

With standard-force magnetic ways - 230 VAC single phase

Symbol	Specifications		Model				
	Rated force	Peak force	① Linear coil	②Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④	12.5 N	40 N	SGLGW-30A050CPD	SGLGM-30108A SGLGM-30216A SGLGM-30432A	JZDP-D008-250	SGDH-A5AE-OY	XD-P5-MN01
	25 N	80 N	SGLGW-30A080CPD		JZDP-D008-251	SGDH-01AE-OY	XD-01-MN01
	47 N	140 N	SGLGW-40A140CPD	SGLGM-40090CT SGLGM-40225CT SGLGM-40360CT SGLGM-40405CT SGLGM-40450CT	JZDP-D008-252	SGDH-01AE-OY	XD-01-MN01
	93 N	280 N	SGLGW-40A253CPD		JZDP-D008-253	SGDH-02AE-OY	XD-02-MN01
	140 N	420 N	SGLGW-40A365CPD		JZDP-D008-254	SGDH-04AE-OY	XD-04-MN01
	70 N	220 N	SGLGW-60A140CPD	SGLGM-60090CT SGLGM-60225CT SGLGM-60360CT SGLGM-60405CT SGLGM-60450CT	JZDP-D008-258	SGDH-02AE-OY	XD-02-MN01
	140 N	440 N	SGLGW-60A253CPD		JZDP-D008-259	SGDH-04AE-OY	XD-04-MN01
	210 N	660 N	SGLGW-60A365CPD		JZDP-D008-260	SGDH-08AE-S-OY	XD-08-MN
	325 N	1300 N	SGLGW-90A200CPD	SGLGM-90252A SGLGM-90504A	JZDP-D008-264	SGDH-15AE-S-OY	XD-15-MN

Note: 1. Linear coils with design revision C replace the previous versions A and B. The serial converter required for revision C coil has changed from previous version, select it according to the table above

2. Magnetic ways with design revision CT and revision B can be combined

With high-force magnetic ways - 230 VAC single phase

Symbol	Specifications		Model				
	Rated force	Peak force	① Linear coil	②Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	57 N	230 N	SGLGW-40A140CPD	SGLGM-40090CT-M SGLGM-40225CT-M SGLGM-40360CT-M SGLGM-40405CT-M SGLGM-40450CT-M	JZDP-D008-255	SGDH-02AE-OY	XD-02-MN01
	114 N	460N	SGLGW-40A253CPD		JZDP-D008-256	SGDH-04AE-OY	XD-04-MN01
	171 N	690 N	SGLGW-40A365CPD		JZDP-D008-257	SGDH-08AE-S-OY	XD-08-MN
	85 N	360N	SGLGW-60A140CPD	SGLGM-60090CT-M SGLGM-60225CT-M SGLGM-60360CT-M SGLGM-60405CT-M SGLGM-60450CT-M	JZDP-D008-261	SGDH-02AE-OY	XD-02-MN01
	170 N	720 N	SGLGW-60A253CPD		JZDP-D008-262	SGDH-08AE-S-OY	XD-08-MN
	255 N	1080 N	SGLGW-60A365CPD		JZDP-D008-263	SGDH-15AE-S-OY	XD-15-MN

Note: 1. Linear coils with design revision C replace the previous versions A and B. The serial converter required for revision C coil has changed from previous version, select it according to the table above
2. Magnetic ways with design revision CT and revision B can be combined

SGLFW / SGLFM iron-core type

230 VAC single phase

Symbol	Specifications		Model				
	Rated force	Peak force	① Linear coil	②Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	25 N	86 N	SGLFW-20A090APD	SGLFM-20324AC SGLFM-20540AC SGLFM-20756AC	JZDP-A008-017	SGDH-02AE-OY	XD-02-MN01
	40 N	125 N	SGLFW-20A120APD		JZDP-A008-018	SGDH-02AE-OY	XD-02-MN01
	80 N	220 N	SGLFW-35A120APD	SGLFM-35324AC SGLFM-35540AC SGLFM-35756AC	JZDP-A008-019	SGDH-02AE-OY	XD-02-MN01
	160 N	440 N	SGLFW-35A230APD		JZDP-A008-020	SGDH-08AE-S-OY	XD-08-MN01
	280 N	600 N	SGLFW-50A200BPD	SGLFM-50135AC SGLFM-50405AC SGLFM-50675AC SGLFM-50945AC	JZDP-A008-181	SGDH-08AE-S-OY	XD-08-MN
	560 N	1200 N	SGLFW-50A380BPD		JZDP-A008-182	SGDH-15AE-S-OY	XD-15-MN
	560 N	1200 N	SGLFW-1ZA200BPD	SGLFM-1Z135AC SGLFM-1Z405AC SGLFM-1Z675AC SGLFM-1Z945AC	JZDP-A008-183	SGDH-15AE-S-OY	XD-15-MN

Note: Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible

400 VAC three phase

Symbol	Specifications		Model				
	Rated force	Peak force	① Linear coil	② Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	80 N	220 N	SGLFW-35D120APD	SGLFM-35324AC SGLFM-35540AC SGLFM-35756AC	JZDP-A008-211	SGDH-05DE-OY	XD-05-TN
	160 N	440 N	SGLFW-35D230APD		JZDP-A008-212	SGDH-05DE-OY	XD-05-TN
	280 N	600 N	SGLFW-50D200BPD	SGLFM-50135AC SGLFM-50405AC SGLFM-50675AC SGLFM-50945AC	JZDP-A008-189	SGDH-10DE-OY	XD-10-TN
	560 N	1200 N	SGLFW-50D380BPD		JZDP-A008-190	SGDH-15DE-OY	XD-15-TN
	560 N	1200 N	SGLFW-1ZD200BPD	SGLFM-1Z135AC SGLFM-1Z405AC SGLFM-1Z675AC SGLFM-1Z945AC	JZDP-A008-191	SGDH-15DE-OY	XD-15-TN
	1120 N	2400 N	SGLFW-1ZD380BPD		JZDP-A008-192	SGDH-30DE-OY	XD-30-TN
	1500 N	3600 N	SGLFW-1ED380BP	SGLFM-1E135AC	JZDP-D008-333	SGDH-20DE-OY	XD-20-TN
	2250 N	5400 N	SGLFW-1ED560BP		JZDP-D008-334	SGDH-30DE-OY	XD-30-TN

Note: Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible

SGLTW / SGLTM iron-core type

400 VAC three phase

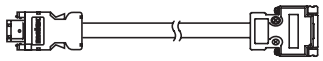
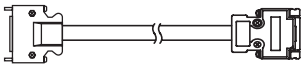
Symbol	Specifications		Model				
	Rated force	Peak force	① Linear coil	②Magnetic way	③ Serial converter	④ Servo drive	
						Sigma-II series	XtraDrive
①②③④ 	300 N	600 N	SGLTW-35D170HPD	SGLTM-35324HC SGLTM-35540HC SGLTM-35756HC	JZDP-D008-193	SGDH-10DE-OY	XD-10-TN
	600 N	1200 N	SGLTW-35D320HPD		JZDP-D008-194	SGDH-20DE-OY	XD-20-TN
	450 N	900 N	SGLTW-50D170HPD	SGLTM-50324HC SGLTM-50540HC SGLTM-50756HC	JZDP-D008-195	SGDH-10DE-OY	XD-10-TN
	900 N	1800 N	SGLTW-50D320HPD		JZDP-D008-196	SGDH-20DE-OY	XD-20-TN
	670 N	2600 N	SGLTW-40D400BP	SGLTM-40405AC SGLTM-40675AC SGLTM-40945AC	JZDP-D008-197	SGDH-30DE-OY	XD-30-TN
	1000 N	4000 N	SGLTW-40D600BP		JZDP-D008-198	SGDH-50DE-OY	XD-50-TN
	1300 N	5000 N	SGLTW-80D400BP	SGLTM-80405AC SGLTM-80675AC SGLTM-80945AC	JZDP-D008-199	SGDH-50DE-OY	XD-50-TN
	2000 N	7500 N	SGLTW-80D600BP		JZDP-D008-200	SGDH-75DE-OY	-

Servo drive

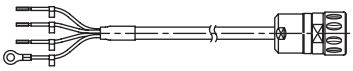
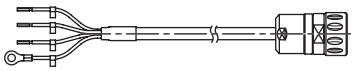
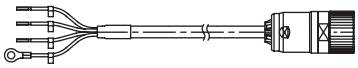
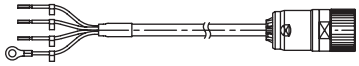
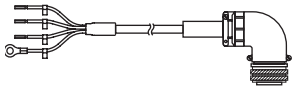
Note: Choosing Sigma-II drive or XtraDrive affects to the serial converter cable needed.

④ Refer to Sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

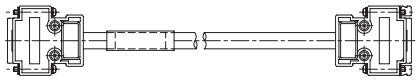
Serial converter cable to servo drive

Symbol	Specifications		Model	Appearance
⑤	Sigma-II drive to serial converter cable	3 m	JZSP-CLP70-03-E	
		5 m	JZSP-CLP70-05-E	
		10 m	JZSP-CLP70-10-E	
		15 m	JZSP-CLP70-15-E	
		20 m	JZSP-CLP70-20-E	
	XtraDrive drive to serial converter cable	3 m	XD-CLP70-03-E	
		5 m	XD-CLP70-05-E	
		10 m	XD-CLP70-10-E	
		15 m	XD-CLP70-15-E	
		20 m	XD-CLP70-20-E	

Power cables

Symbol	Specifications		Model	Appearance
⑥	For 200 V servo motors SGLGW-30A□□□□□D SGLGW-40A□□□□□D SGLGW-60A□□□□□D SGLFW-20A□□□A□D SGLFW-35A□□□A□D	3 m	R88A-CAWA003S-DE	
		5 m	R88A-CAWA005S-DE	
		10 m	R88A-CAWA010S-DE	
		15 m	R88A-CAWA015S-DE	
		20 m	R88A-CAWA020S-DE	
	For 200 V servo motors SGLGW-90A200□□D SGLFW-50A□□□B□D SGLFW-1ZA200B□D	3 m	R88A-CAWB003S-DE	
		5 m	R88A-CAWB005S-DE	
		10 m	R88A-CAWB010S-DE	
		15 m	R88A-CAWB015S-DE	
		20 m	R88A-CAWB020S-DE	
	For 400 V servo motors SGLFW-35D□□□A□D SGLFW-50D200□D SGLTW-35D170H□D SGLTW-50D170H□D	3 m	R88A-CAWK003S-DE	
		5 m	R88A-CAWK005S-DE	
		10 m	R88A-CAWK010S-DE	
		15 m	R88A-CAWK015S-DE	
		20 m	R88A-CAWK020S-DE	
	For 400 V servo motors SGLFW-50D380□D SGLFW-1ZD□□□B□D SGLTW-35D320H□D SGLTW-50D320H□D	3 m	R88A-CAWL003S-DE	
		5 m	R88A-CAWL005S-DE	
		10 m	R88A-CAWL010S-DE	
		15 m	R88A-CAWL015S-DE	
		20 m	R88A-CAWL020S-DE	
	For 400 V servo motors SGLFW-1ED□□□B□ SGLTW-40D□□□B□ SGLTW-80D□□□B□	3 m	R88A-CAWD003S-E	
		5 m	R88A-CAWD005S-E	
		10 m	R88A-CAWD010S-E	
		15 m	R88A-CAWD015S-E	
		20 m	R88A-CAWD020S-E	

Linear scale cable to serial converter

Symbol	Specifications		Model	Appearance
⑦	Extension cable for **Renishaw** linear scale to serial converter. (Connector DB-15) (the extension cable is optional)	1 m	JZSP-CLL00-01-E	
		3 m	JZSP-CLL00-03-E	
		5 m	JZSP-CLL00-05-E	
		10 m	JZSP-CLL00-10-E	
		15 m	JZSP-CLL00-15-E	
	Extension cable for **Heidenhain** linear scale to serial converter (Connector DB-15) (when a Heidenhain scale is used the extension cable is required)	1 m	JZSP-CLL20-01-E	
		3 m	JZSP-CLL20-03-E	
		5 m	JZSP-CLL20-05-E	
		10 m	JZSP-CLL20-10-E	
		15 m	JZSP-CLL20-15-E	

Hall sensor cable to serial converter

Symbol	Specifications		Model	Appearance
⑧	Extension cable for linear scale to serial converter (The extension cable is optional)	1 m	JZSP-CLL10-01-E	
		3 m	JZSP-CLL10-03-E	
		5 m	JZSP-CLL10-05-E	
		10 m	JZSP-CLL10-10-E	
		15 m	JZSP-CLL10-15-E	

Connectors

Specification	Model
Hypertac power connector IP67 (for 200 V motor coils SGL□W-□□A□□□□□D)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400 V motor coils SGL□W-□□D□□□□□D)	LPRA-06B-FRBN170
Military power connector IP67 (for motor coils SGLTW-40□/80□ and SGLFW-1ED□)	MS3108E22-22S

Dimensioning software

Specifications	Model
SigmaSize	MOTION TOOLS CD

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I17E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

LETLA-□-F□

Sigma linear axis



Linear servo axis ready to use

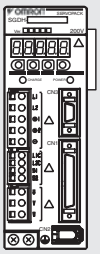
- Highly enclosed construction avoids falling parts into the magnets and bearings area
- Plug and drive, shorten start-up time
- Long durability, reliable and constant performance after years of use
- Designed for an easy servicing
- Direct control of the axis using XtraDrive and Sigma-II drives
- Extremely energy efficient, due to its optimised magnetic circuitry design and high-density winding
- For special lenghts, special specifications and XY systems contact your OMRON sales office

Ratings

- 230 VAC Single-phase 80 to 560 N (1200 N peak)
- 400 VAC Three-phase 80 to 1200 N (2400 N peak)

System configuration

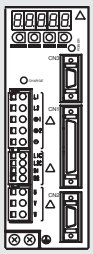
(Refer to Servo Drive chapter)



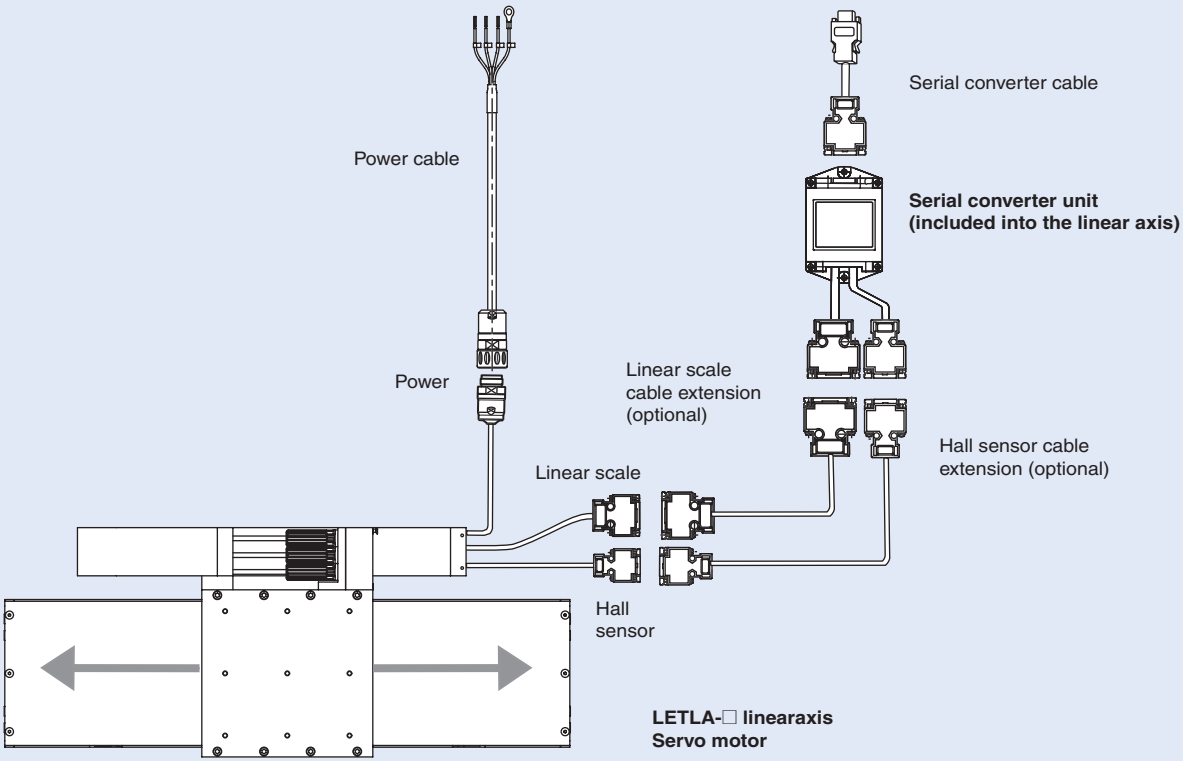
Servo Drive with option boards for flexible system configuration

Sigma-II Servo Drive

Drive options



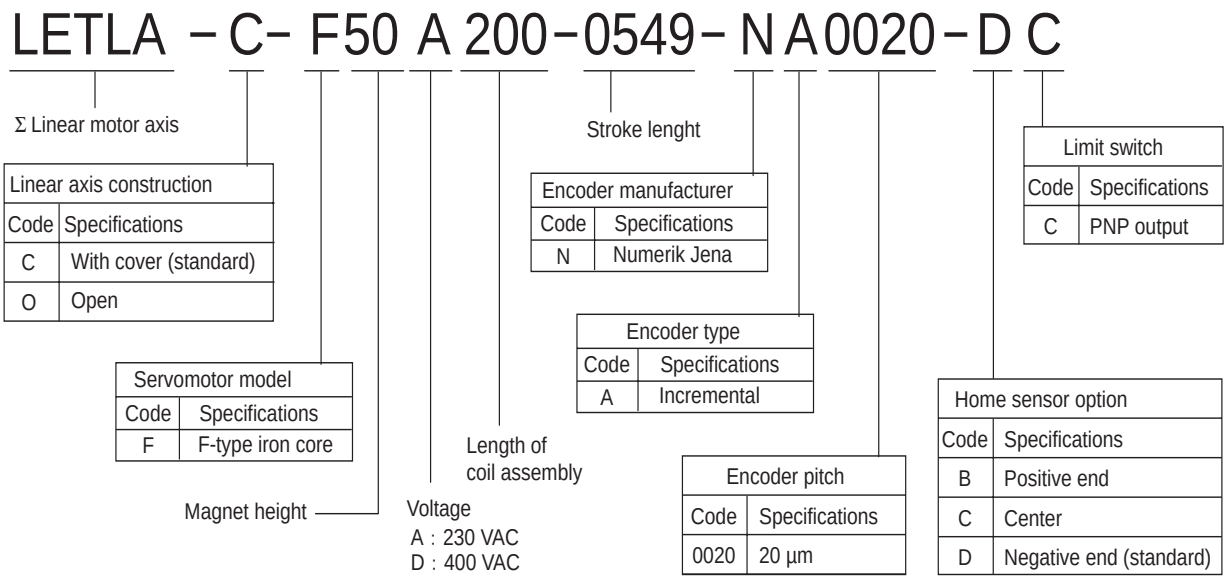
Intelligent Servo Drive



Sigma series linear axis					Serial converter (included in LETLA)	Servo drive			
						Sigma-II series		XtraDrive	
Type	Voltage	Rated force	Peak force	Model	Model JZDP-□008-	230 V (1-phase)	400 V (3-phase)	230 V (1-phase)	400 V (3-phase)
LETLA-□- Linear motor axes	230 V	80 N	220 N	LETLA-□-F35A120-□	019	SGDH-02AE-OY	-	XD-02-MN01	-
		160 N	440 N	LETLA-□-F35A230-□	020	SGDH-08AE-S-OY	-	XD-08-MN	-
		280 N	600 N	LETLA-□-F50A200-□	181	SGDH-08AE-S-OY	-	XD-08-MN	-
		560 N	1200 N	LETLA-□-F50A380-□	182	SGDH-15AE-S-OY	-	XD-15-MN	-
		560 N	1200 N	LETLA-□-F1ZA200-□	183	SGDH-15AE-S-OY	-	XD-15-MN	-
	400 V	80 N	220 N	LETLA-□-F35D120-□	211	-	SGDH-05DE-OY	-	XD-05-TN
		160 N	440 N	LETLA-□-F35D230-□	212	-	SGDH-05DE-OY	-	XD-05-TN
		280 N	600 N	LETLA-□-F50D200-□	189	-	SGDH-10DE-OY	-	XD-10-TN
		560 N	1200 N	LETLA-□-F50D380-□	190	-	SGDH-15DE-OY	-	XD-15-TN
		560 N	1200 N	LETLA-□-F1ZD200-□	191	-	SGDH-15DE-OY	-	XD-15-TN
		1120 N	2400 N	LETLA-□-F1ZD380-□	192	-	SGDH-30DE-OY	-	XD-30-TN

Type designation

Linear axis



Servomotor specifications

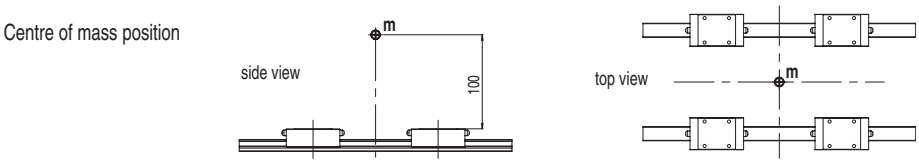
Linear axis LETLA-□-F□□A (200 V)

Voltage			230V				
Linear axis model		LETLA-□-	F35A120-□-NA0020	F35A230-□-NA0020	F50A200□-NA0020	F50A380□-NA0020	F1ZA200□-NA0020
Motor coil specifications	Linear servo motor coil used	SGLFW-	35A120A	35A230A	50A200B	50A380B	1ZA200B
	Rated force*1	N	80	160	280	560	560
	Instantaneous peak force*1	N	220	440	600	1200	1200
	Rated current*1	Arms	1.4	2.8	5.0	10.0	8.7
	Instantaneous peak current*1	Arms	4.4	8.8	12.4	25.0	21.6
	Force constant	N / A_{rms}	62.4	62.4	60.2	60.2	69.0
	BEMF constant	V /(m / s)	20.8	20.8	20.1	20.1	23.0
	Motor constant	N /√W	14.4	20.4	34.3	48.5	52.4
	Electrical time constant	ms	3.6	3.6	15.9	15.8	18.3
	Mechanical time constant	ms	6.2	5.5	3.0	2.9	2.3
Axis specifications	Position accuracy repetibility*2	µm	+/-1				
	Absolute position accuracy*2	µm/100mm	+/-5				
	Linear encoder resolution	µm	0.078µm = 20µm / 256 (8bit)				
	Static friction of the axis*3	N	20	25	30	35	50
	Maximum load*3	kg	60	60	80	80	150
	Bearings model used	THK	SSR 15	SSR 15	SSR 15	SSR 15	SSR 25
	Linear measuring head used	Numerik Jena	LIA20-C001-KZ				
	Linear measuring scale used		MV5340□□□□				
	Available lengths	m	Standard lenght up to 2.5 m(see dimensions section) / for lengths up to 5 m contact your OMRON sales office				
Basic specifications	Time rating		Continuous				
	Insulation class		Class B				
	Ambient temperature		0 to +40 °C				
	Ambient humidity		20 to 80% (non-condensing)				
	Insulation resistance		500 VDC, 10 MΩ min.				
	Excitation		Permanent magnet				
	Dielectric strength		1500 VAC for 1 minute				
	Protection methods		Self-cooled				
	Allowable winding temperature		130 °C				

Note: *1. The items marked with an *1 and “Force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).

***2.** With stable environmental conditions and motor temperature unchanged.

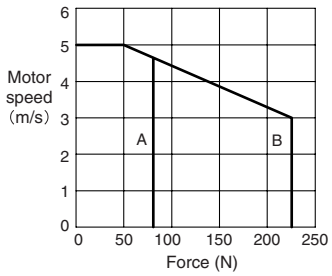
***3.** Items calculated with load position like in figure below.



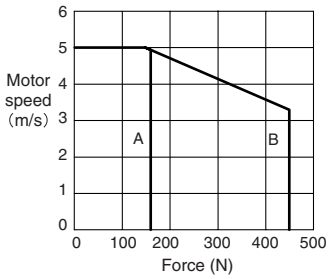
Force-speed characteristics (200 V)

A: Continuous duty zone B: Intermittent duty zone

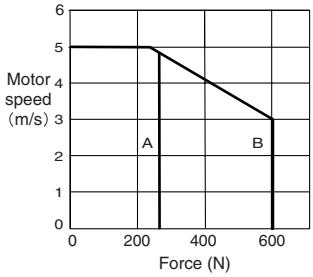
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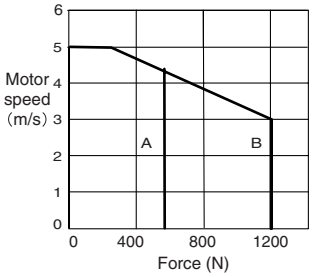
SGLFW-35A230A



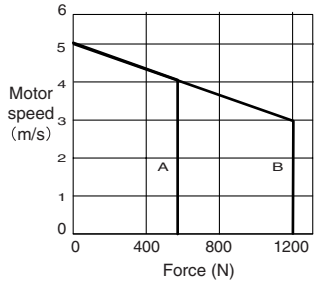
SGLFW-50A200B



SGLFW-50A380B



SGLFW-1ZA200B



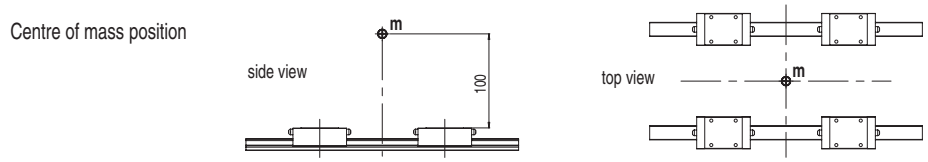
Linear axis LETLA-□-F□□D(400V)

Voltage			400V					
Linear axis model		LETLA-□-	F35D120-□-NA0020	F35D230-□-NA0020	F50D20□-NA0020	F50D380□-NA0020	F1ZD200□-NA0020	F1ZD380□-NA0020
Motor coil specifications	Linear Servomotor coil used	SGLFW-	35D120A	35D230A	50D200B	50D380B	1ZD200B	1ZD380B
	Rated force*1	N	80	160	280	560	560	1120
	Instantaneous peak force*1	N	220	440	600	1200	1200	2400
	Rated current*1	A_{rms}	0.7	1.4	2.3	4.5	4.9	9.8
	Instantaneous peak current*1	A_{rms}	2.3	4.6	5.6	11.0	12.3	24.6
	Force constant	N / A_{rms}	120.2	120.2	134.7	134.7	122.6	122.6
	BEMF constant	V /(m / s)	40.1	40.1	44.9	44.9	40.9	40.9
	Motor constant	$N/\sqrt{W}$	13.8	19.5	33.4	47.2	51.0	72.1
	Electrical time constant	ms	3.5	3.5	15.0	15.0	17.4	17.2
	Mechanical time constant	ms	5.5	5.5	3.2	3.2	2.5	2.2
Axis specifications	Position accuracy repetibility*2	µm	+/-1					
	Absolute position accuracy*2	µm/100mm	+/-5					
	Linear encoder resolution	µm	0.078 µm = 20 µm / 256 (8 bit)					
	Static friction of the axis*3	N	20	25	30	35	50	60
	Maximum load*3	kg	60	60	80	80	150	150
	Bearings model used	THK	SSR 15	SSR 15	SSR 15	SSR 15	SSR 25	SSR 25
	Linear measuring head used	Numerik Jena	LIA20-C001-KZ					
	Linear measuring scale used		MV5340□□□□					
	Available lengths	m	Standard lenght up to 2.5 m (see dimensions section) / for lengths up to 5m contact you OMRON sales office					
Basic specifications	Time rating		Continuous					
	Insulation class		Class B					
	Ambient temperature		0 to +40° C					
	Ambient humidity		20 to 80% (non-condensing)					
	Insulation resistance		500 VDC, 10 MΩ min.					
	Excitation		Permanent magnet					
	Dielectric strength		1500 VAC for 1 minute					
	Protection methods		Self-cooled					
	Allowable winding temperature		130 °C					

Note: *1. The items marked with an *1 and "Force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F)

***2.** With stable environmental conditions and motor temperature unchanged

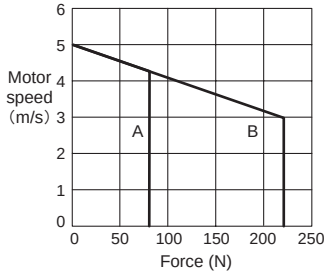
***3.** Items calculated with load position like in figure below



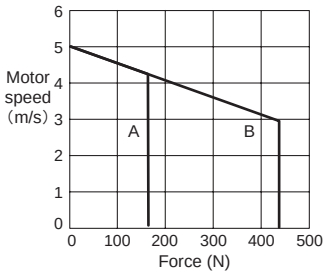
Force-speed characteristics (400 V)

A: Continuous duty zone B: Intermittent duty zone

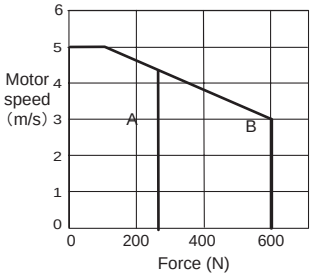
SGLFW-35D120A



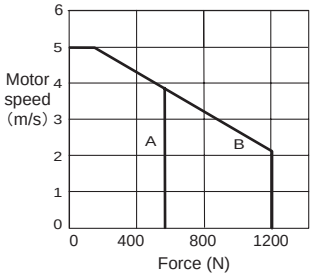
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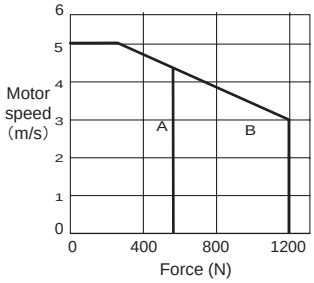
SGLFW-50D200B



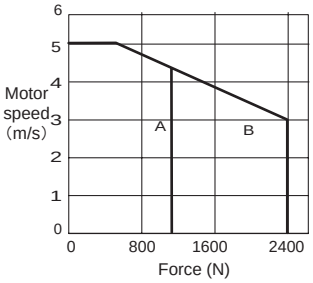
SGLFW-50D380B



SGLFW-1ZD200B



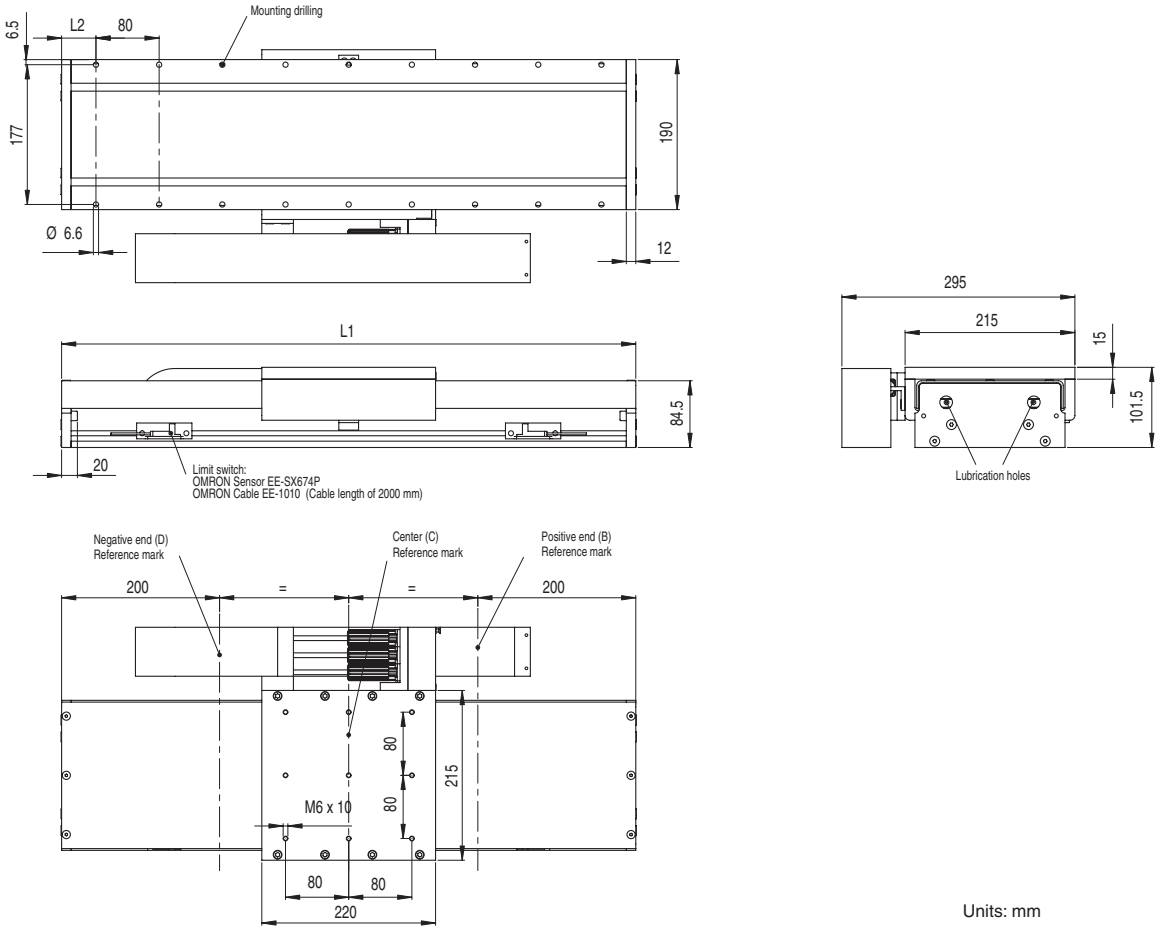
SGLFW-1ZD380B



Dimensions

LETLA-C-F35□120-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F35□120-0103-NA0020-□C	103	403	29.5	7.6	16
LETLA-C-F35□120-0319-NA0020-□C	319	619	17.5	7.6	19
LETLA-C-F35□120-0427-NA0020-□C	427	727	31.5	7.6	21
LETLA-C-F35□120-0535-NA0020-□C	535	835	45.5	7.6	23
LETLA-C-F35□120-0643-NA0020-□C	643	943	19.5	7.6	25
LETLA-C-F35□120-0751-NA0020-□C	751	1051	33.5	7.6	27
LETLA-C-F35□120-0859-NA0020-□C	859	1159	47.5	7.6	29
LETLA-C-F35□120-0967-NA0020-□C	967	1267	21.5	7.6	31
LETLA-C-F35□120-1075-NA0020-□C	1075	1375	35.5	7.6	33
LETLA-C-F35□120-1183-NA0020-□C	1183	1483	49.5	7.6	35
LETLA-C-F35□120-1291-NA0020-□C	1291	1591	23.5	7.6	36
LETLA-C-F35□120-1399-NA0020-□C	1399	1699	37.5	7.6	38
LETLA-C-F35□120-1507-NA0020-□C	1507	1807	13.5	7.6	40
LETLA-C-F35□120-1615-NA0020-□C	1615	1915	25.5	7.6	42
LETLA-C-F35□120-1723-NA0020-□C	1723	2023	41.5	7.6	44
LETLA-C-F35□120-1831-NA0020-□C	1831	2131	13.5	7.6	46
LETLA-C-F35□120-1939-NA0020-□C	1939	2239	29.5	7.6	48
LETLA-C-F35□120-2047-NA0020-□C	2047	2347	41.5	7.6	50
LETLA-C-F35□120-2155-NA0020-□C	2155	2455	17.5	7.6	52



Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector

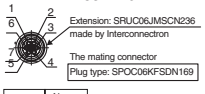


LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 200V
Connector specifications

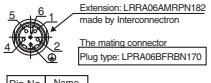
LETLA-□-F35A120□



Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

Linear servo motor 400V
Connector specifications

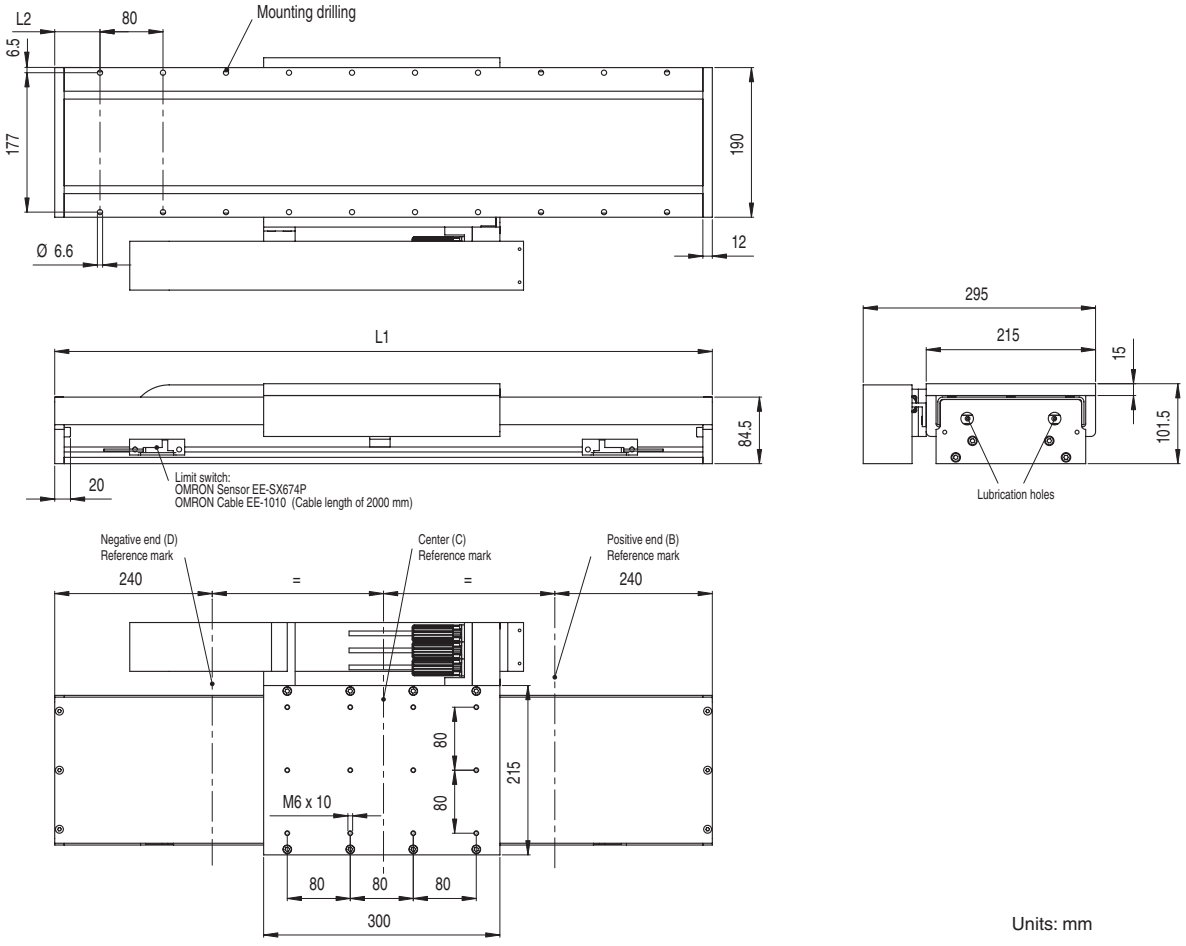
LETLA-□-F35D120□



Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

LETLA-C-F35□230-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F35□230-0239-NA0020-□C	239	619	17.5	11.5	23
LETLA-C-F35□230-0347-NA0020-□C	347	727	31.5	11.5	25
LETLA-C-F35□230-0455-NA0020-□C	455	835	45.5	11.5	27
LETLA-C-F35□230-0563-NA0020-□C	563	943	19.5	11.5	28
LETLA-C-F35□230-0671-NA0020-□C	671	1051	33.5	11.5	30
LETLA-C-F35□230-0779-NA0020-□C	779	1159	47.5	11.5	32
LETLA-C-F35□230-0887-NA0020-□C	887	1267	21.5	11.5	34
LETLA-C-F35□230-0995-NA0020-□C	995	1375	35.5	11.5	36
LETLA-C-F35□230-1103-NA0020-□C	1103	1483	49.5	11.5	38
LETLA-C-F35□230-1211-NA0020-□C	1211	1591	23.5	11.5	40
LETLA-C-F35□230-1319-NA0020-□C	1319	1699	37.5	11.5	42
LETLA-C-F35□230-1427-NA0020-□C	1427	1807	13.5	11.5	44
LETLA-C-F35□230-1535-NA0020-□C	1535	1915	25.5	11.5	45
LETLA-C-F35□230-1643-NA0020-□C	1643	2023	41.5	11.5	47
LETLA-C-F35□230-1751-NA0020-□C	1751	2131	13.5	11.5	49
LETLA-C-F35□230-1859-NA0020-□C	1859	2239	29.5	11.5	51
LETLA-C-F35□230-1967-NA0020-□C	1967	2347	41.5	11.5	53
LETLA-C-F35□230-2075-NA0020-□C	2075	2455	17.5	11.5	55
LETLA-C-F35□230-2183-NA0020-□C	2183	2563	29.5	11.5	57



Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector



LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 200 V
Connector specifications

LETLA-□-F35A230□



Extension: SRUC06JMSCN236
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

Linear servo motor 400 V
Connector specifications

LETLA-□-F35D230□



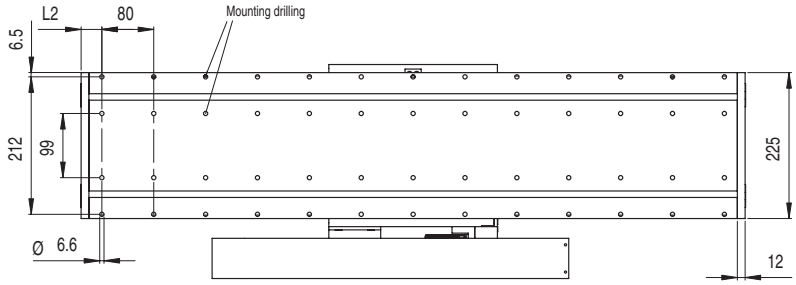
Extension: LRRA06AMRPN182
made by Interconnectron

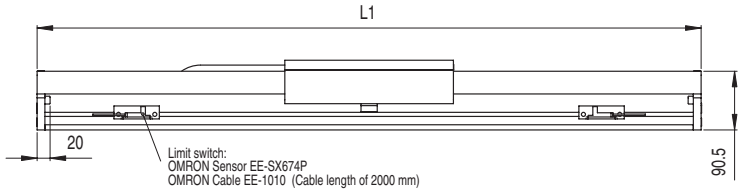
The mating connector
Plug type: LPRA06BFRBN170

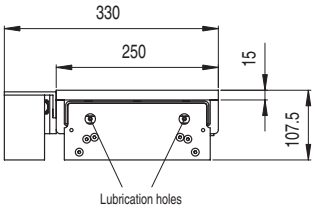
Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

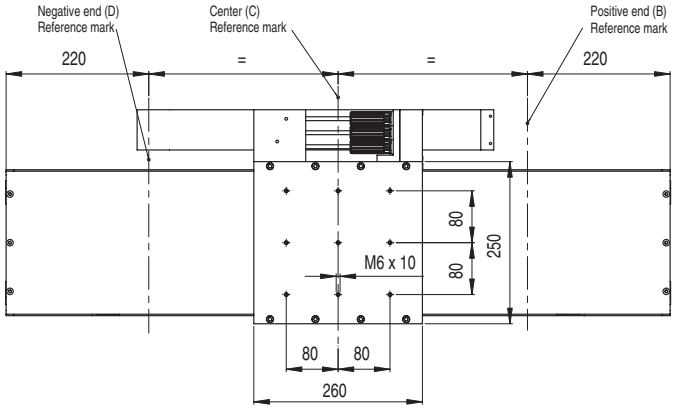
LETLA-C-F50□200-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F50□200-0144-NA0020-□C	144	484	30.0	11.2	25
LETLA-C-F50□200-0414-NA0020-□C	414	754	45.0	11.2	31
LETLA-C-F50□200-0549-NA0020-□C	549	889	32.5	11.2	34
LETLA-C-F50□200-0684-NA0020-□C	684	1024	20.0	11.2	37
LETLA-C-F50□200-0819-NA0020-□C	819	1159	47.5	11.2	40
LETLA-C-F50□200-0954-NA0020-□C	954	1294	35.0	11.2	43
LETLA-C-F50□200-1089-NA0020-□C	1089	1429	22.5	11.2	46
LETLA-C-F50□200-1224-NA0020-□C	1224	1564	50.0	11.2	49
LETLA-C-F50□200-1359-NA0020-□C	1359	1699	37.5	11.2	52
LETLA-C-F50□200-1494-NA0020-□C	1494	1834	25.0	11.2	55
LETLA-C-F50□200-1629-NA0020-□C	1629	1969	12.5	11.2	58
LETLA-C-F50□200-1764-NA0020-□C	1764	2104	40.0	11.2	61
LETLA-C-F50□200-1899-NA0020-□C	1899	2239	27.5	11.2	64
LETLA-C-F50□200-2034-NA0020-□C	2034	2374	15.0	11.2	67
LETLA-C-F50□200-2169-NA0020-□C	2169	2509	42.5	11.2	70









Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector

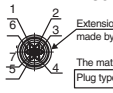


LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 200 V
Connector specifications

LETLA-□-F50A200□



Extension: SRUC06JMSCN236
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

Linear servo motor 400 V
Connector specifications

LETLA-□-F50D200□



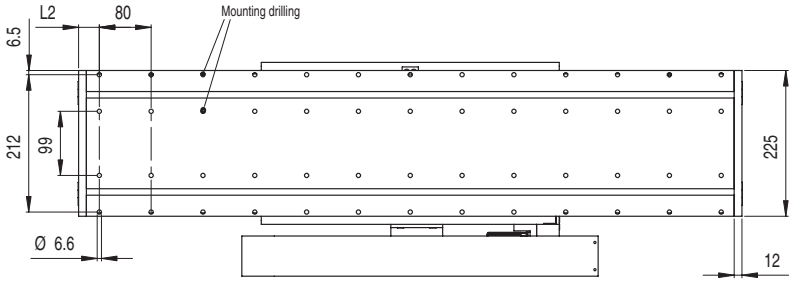
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made by Interconnectron

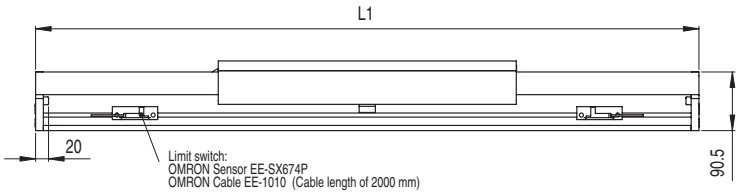
The mating connector
Plug type: LPRA06BFRBN170

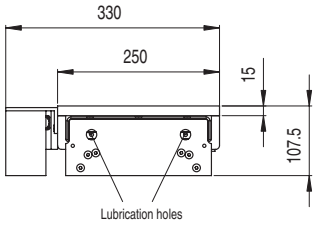
Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

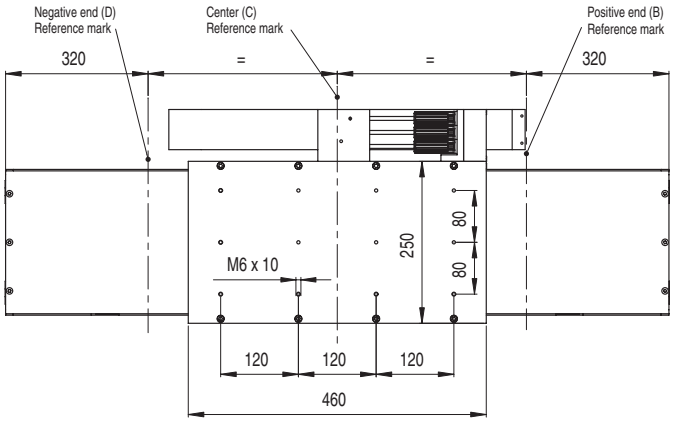
LETLA-C-F50□380-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F50□380-0214-NA0020-□C	214	754	45.0	22.5	40
LETLA-C-F50□380-0349-NA0020-□C	349	889	32.5	22.5	43
LETLA-C-F50□380-0484-NA0020-□C	484	1024	20.0	22.5	46
LETLA-C-F50□380-0619-NA0020-□C	619	1159	47.5	22.5	49
LETLA-C-F50□380-0754-NA0020-□C	754	1294	35.0	22.5	52
LETLA-C-F50□380-0889-NA0020-□C	889	1429	22.5	22.5	55
LETLA-C-F50□380-1024-NA0020-□C	1024	1564	50.0	22.5	58
LETLA-C-F50□380-1159-NA0020-□C	1159	1699	37.5	22.5	61
LETLA-C-F50□380-1294-NA0020-□C	1294	1834	25.0	22.5	64
LETLA-C-F50□380-1429-NA0020-□C	1429	1969	12.5	22.5	67
LETLA-C-F50□380-1564-NA0020-□C	1564	2104	40.0	22.5	70
LETLA-C-F50□380-1699-NA0020-□C	1699	2239	27.5	22.5	74
LETLA-C-F50□380-1834-NA0020-□C	1834	2374	15.0	22.5	77
LETLA-C-F50□380-1969-NA0020-□C	1969	2509	42.5	22.5	80
LETLA-C-F50□380-2104-NA0020-□C	2104	2644	30.0	22.5	83









Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector



LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 200 V
Connector specifications

LETLA-□-F50A380□



Extension: SRUC06JMSCN236
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

Linear servo motor 400 V
Connector specifications

LETLA-□-F50D380□



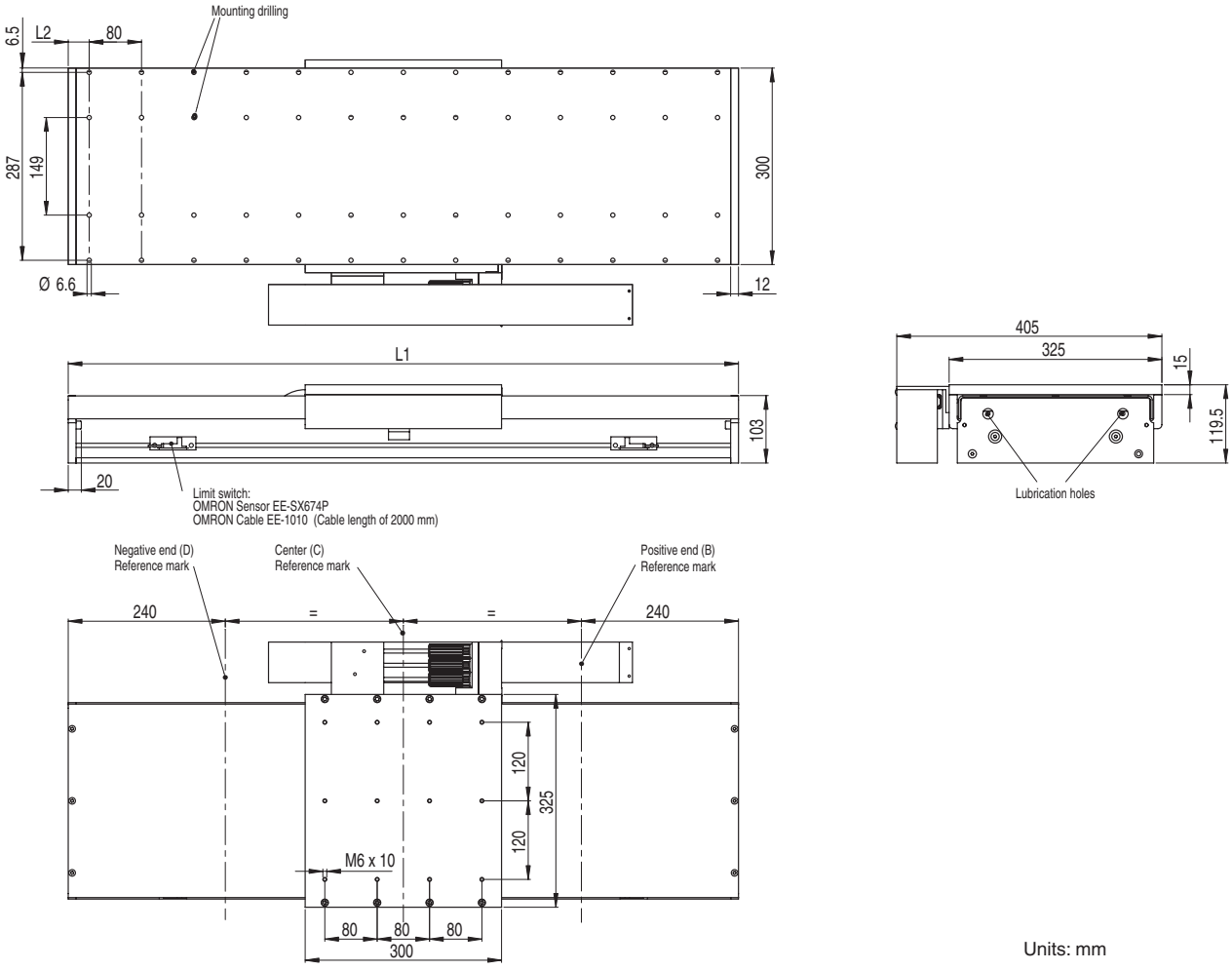
Extension: LRRA06AMRPN182
made by Interconnectron

The mating connector
Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

LETLA-C-F1Z□200-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F1Z□200-0104-NA0020-□C	104	484	30.0	18	37
LETLA-C-F1Z□200-0374-NA0020-□C	374	754	45.0	18	47
LETLA-C-F1Z□200-0509-NA0020-□C	509	889	32.5	18	52
LETLA-C-F1Z□200-0644-NA0020-□C	644	1024	20.0	18	57
LETLA-C-F1Z□200-0779-NA0020-□C	779	1159	47.5	18	62
LETLA-C-F1Z□200-0914-NA0020-□C	914	1294	35.0	18	67
LETLA-C-F1Z□200-1049-NA0020-□C	1049	1429	22.5	18	72
LETLA-C-F1Z□200-1184-NA0020-□C	1184	1564	50.0	18	77
LETLA-C-F1Z□200-1319-NA0020-□C	1319	1699	37.5	18	82
LETLA-C-F1Z□200-1454-NA0020-□C	1454	1834	25.0	18	87
LETLA-C-F1Z□200-1589-NA0020-□C	1589	1969	12.5	18	92
LETLA-C-F1Z□200-1724-NA0020-□C	1724	2104	40.0	18	97
LETLA-C-F1Z□200-1859-NA0020-□C	1859	2239	27.5	18	102
LETLA-C-F1Z□200-1994-NA0020-□C	1994	2374	15.0	18	107
LETLA-C-F1Z□200-2129-NA0020-□C	2129	2509	42.5	18	111



Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector



LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 200 V
Connector specifications

LETLA-□-F1ZA200□



Extension: SRUC06JMSCN236
made by Interconnectron

The mating connector
Plug type: SPOC06KFSDN169

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	Not used
5	Not used
6	FG
7	Not used

Linear servo motor 400 V
Connector specifications

LETLA-□-F1ZD200□



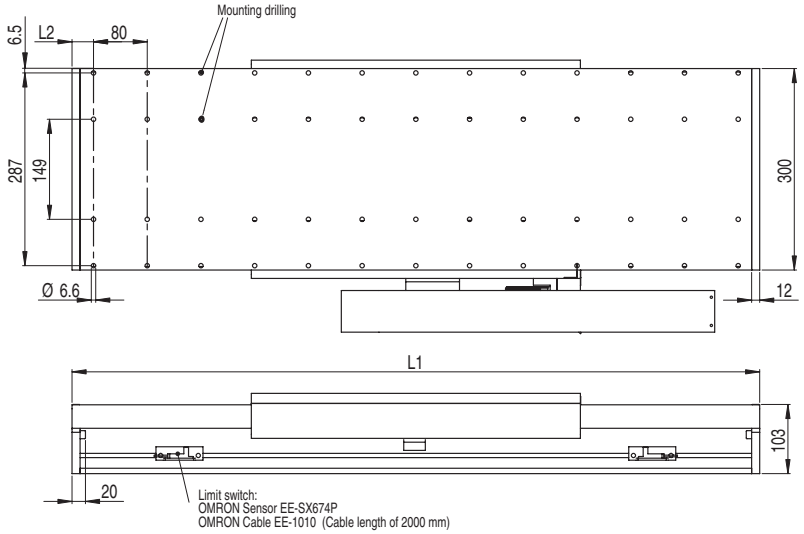
Extension: LRRA06AMRPN182
made by Interconnectron

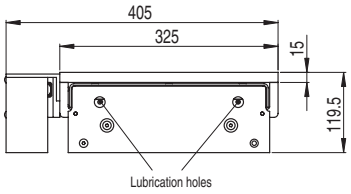
The mating connector
Plug type: LPRA06BFRBN170

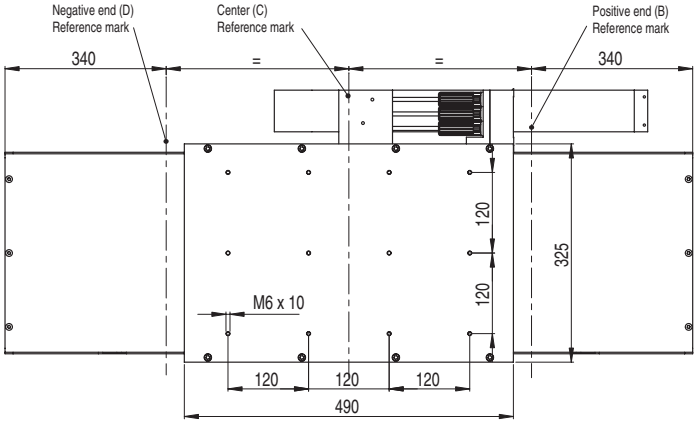
Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

LETLA-C-F1ZD380-□

Linear axis model	Effective stroke in mm	L1 in mm	L2 in mm	Weigth of moving table including motor coil (kg)	Weigth of the complete axis (kg)
LETLA-C-F1ZD380-0184-NA0020-□C	184	754	45.0	31	60
LETLA-C-F1ZD380-0319-NA0020-□C	319	889	32.5	31	65
LETLA-C-F1ZD380-0454-NA0020-□C	454	1024	20.0	31	70
LETLA-C-F1ZD380-0589-NA0020-□C	589	1159	47.5	31	75
LETLA-C-F1ZD380-0724-NA0020-□C	724	1294	35.0	31	80
LETLA-C-F1ZD380-0859-NA0020-□C	859	1429	22.5	31	84
LETLA-C-F1ZD380-0994-NA0020-□C	994	1564	50.0	31	89
LETLA-C-F1ZD380-1129-NA0020-□C	1129	1699	37.5	31	94
LETLA-C-F1ZD380-1264-NA0020-□C	1264	1834	25.0	31	99
LETLA-C-F1ZD380-1399-NA0020-□C	1399	1969	12.5	31	104
LETLA-C-F1ZD380-1534-NA0020-□C	1534	2104	40.0	31	109
LETLA-C-F1ZD380-1669-NA0020-□C	1669	2239	27.5	31	114
LETLA-C-F1ZD380-1804-NA0020-□C	1804	2374	15.0	31	119
LETLA-C-F1ZD380-1939-NA0020-□C	1939	2509	42.5	31	124
LETLA-C-F1ZD380-2074-NA0020-□C	2074	2644	30.0	31	129







Units: mm

Hall sensor connector



Pin connector type:
7JE-23090-02 (D8C)
made by DDK Ltd.

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear scale connector



LET adapter type:
MA-15BL-15SL

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner
Case	Shield

Linear servo motor 400 V
Connector specifications

LETLA-□-F1ZD380□



Extension: LRRA06AMRPN182
made by Interconnectron

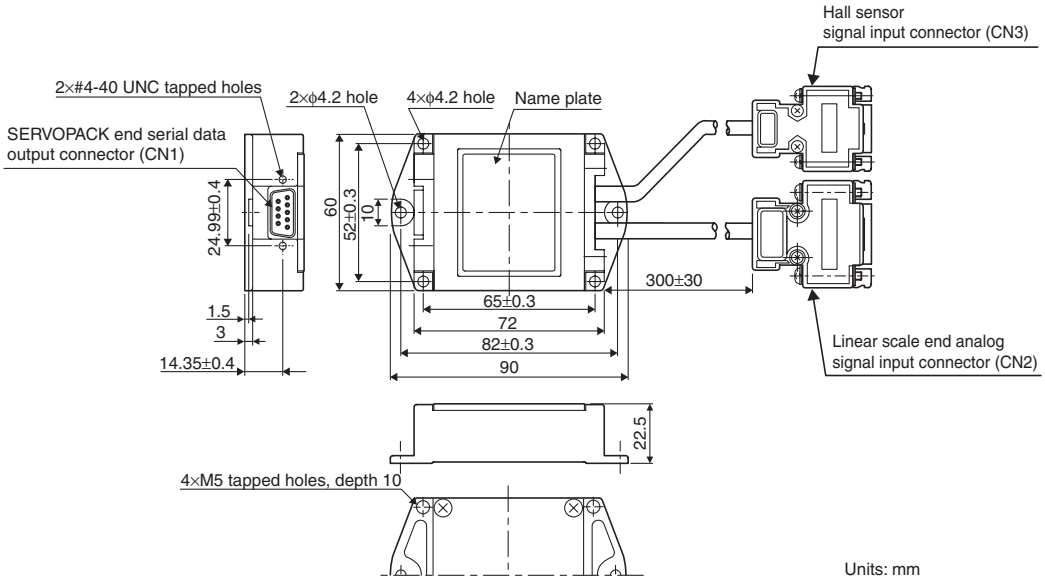
The mating connector
Plug type: LPRA06BFRBN170

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

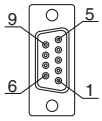
Serial converter unit

JZDP-[A/D]008-□□□

Items		Specifications
Electrical characteristics	Power supply voltage	+5.0 V ±5%, ripple content 5% max.
	Current consumption	120 mA Typ. 350 mA Max.
	Signal resolution	Input 2-phase sine wave: 1/256 pitch
	Max. response frequency	250 kHz
	Analog input signals (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Pole sensor input signal	CMOS level
	Output signals	Position data, hall sensor information, and alarms
	Output method	Serial data transmission (HDLC (High-level data link control) protocol format with Manchester codes)
	Transmission cycle	62.5 µs
	Output circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120 Ω
Mechanical characteristics	Approx. mass	150 g
	Vibration resistance	98 m/s^2 max. (1 to 2500 Hz) in three directions
	Shock resistance	980 m/s^2, (11 ms) two times in three directions
Environmental conditions	Operating temperature	0 °C to 55 °C (32 to 131 °F)
	Storage temperature	-20 °C to +80 °C (-4 to +176 °F)
	Humidity	20% to 90%RH (without condensation)

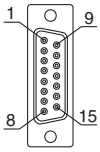


CN1
SERVOPACK end serial data output



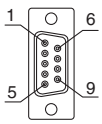
Pin No.	Signal
1	+5 V
2	S-phase output
3	Empty
4	Empty
5	0 V
6	/S-phase output
7	Empty
8	Empty
9	Empty
Case	Shield

CN2
Linear scale end Analog signal input



Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Empty
7	Empty
8	Empty
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Empty
15	Inner shield
Case	Shield

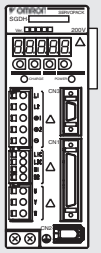
CN3
Hall sensor signal input



Pin No.	Signal
1	+5 V
2	U-phase input
3	V-phase input
4	W-phase input
5	0 V
6	Empty
7	Empty
8	Empty
9	Empty
Case	Shield

Ordering information

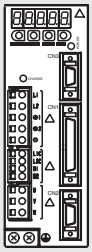
(Refer to Servo Drive chapter)

② 

Servo Drive with option boards for flexible system configuration

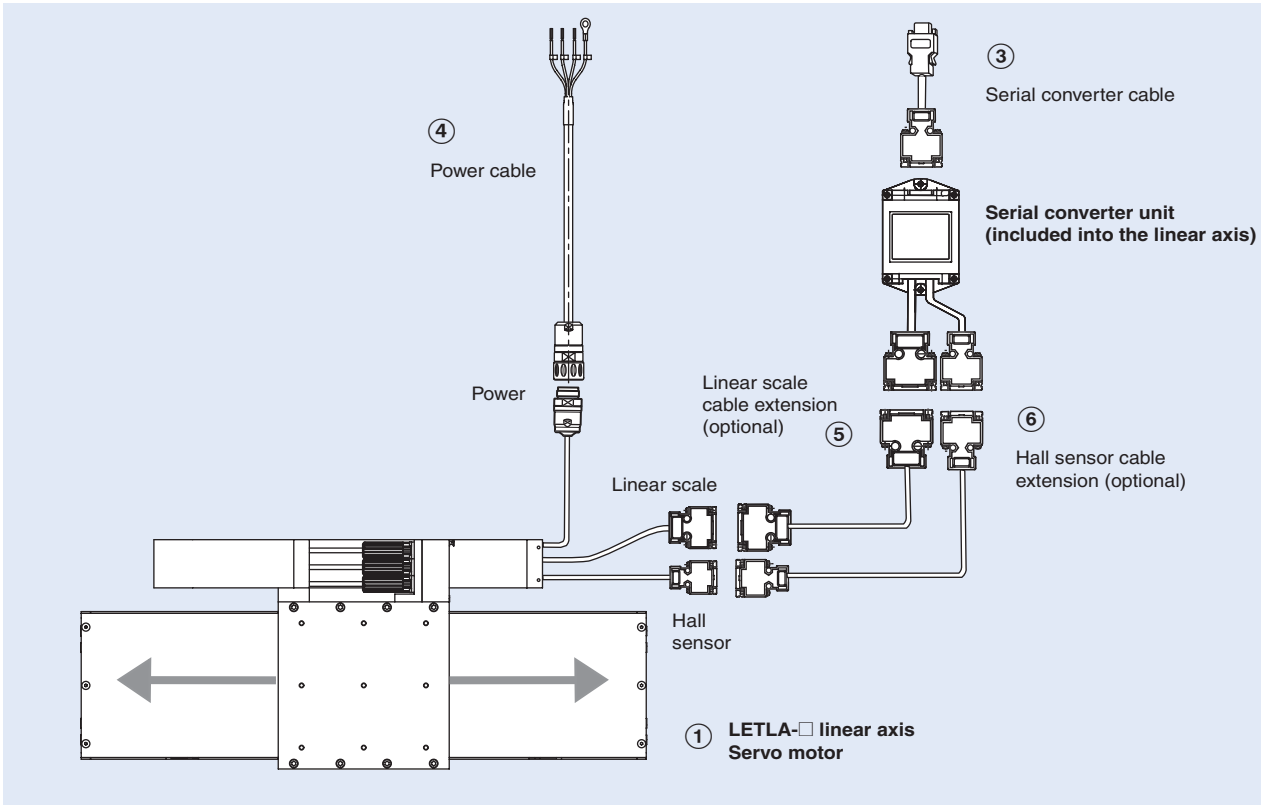
Sigma-II Servo Drive

Drive options

② 

Intelligent Servo Drive

XtraDrive



Note: The symbols ①②③... show the recommended sequence to select the servomotor, cables and serial converter for a linear motors system.

Linear motor axis

LETLA-C-F□

230 VAC single phase

Symbol	Specifications		Model		
	Rated force	Peak force	① Linear axis model	② Servo drive	
				Sigma-II series	XtraDrive
①②	80 N	220 N	LETLA-C-F35A120-[stroke]-NA0020-DC	SGDH-02AE-OY	XD-02-MN01
	160 N	440 N	LET-A-C-F35A230-[stroke]-NA0020-DC	SGDH-08AE-S-OY	XD-08-MN
	280 N	600 N	LETLA-C-F50A200-[stroke]-NA0020-DC	SGDH-08AE-S-OY	XD-08-MN
	560 N	1200 N	LETLA-C-F50A380-[stroke]-NA0020-DC	SGDH-15AE-S-OY	XD-15-MN
	560 N	1200 N	LETLA-C-F1ZA200-[stroke]-NA0020-DC	SGDH-15AE-S-OY	XD-15-MN

Note: For effective stroke distances available see dimensions section.

400 VAC three phase

Symbol	Specifications		Model		
	Rated force	Peak force	① Linear axis model	② Servo drive	
				Sigma-II series	XtraDrive
①②	80 N	220 N	LETLA-C-F35D120-[stroke]-NA0020-DC	SGDH-05DE-OY	XD-05-TN
	160 N	440 N	LETLA-C-F35D230-[stroke]-NA0020-DC	SGDH-05DE-OY	XD-05-TN
	280 N	600 N	LETLA-C-F50D200-[stroke]-NA0020-DC	SGDH-10DE-OY	XD-10-TN
	560 N	1200 N	LETLA-C-F50D380-[stroke]-NA0020-DC	SGDH-15DE-OY	XD-15-TN
	560 N	1200 N	LETLA-C-F1ZD200-[stroke]-NA0020-DC	SGDH-15DE-OY	XD-15-TN
	1120 N	2400 N	LETLA-C-F1ZD380-[stroke]-NA0020-DC	SGDH-30DE-OY	XD-30-TN

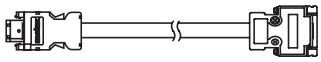
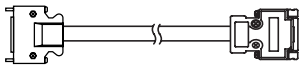
Note: For effective stroke distances available see dimensions section.

Servo drive

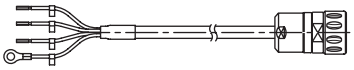
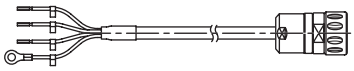
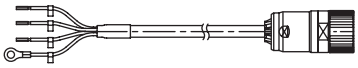
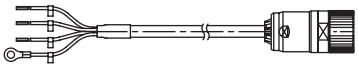
Note: Choosing sigma-II drive or XtraDrive affects to the serial converter cable needed.

② Refer to sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

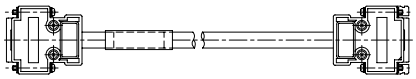
Serial converter cable to servo drive

Symbol	Specifications		Model	Appearance
③	Sigma-II drive to serial converter cable	3 m	JZSP-CLP70-03-E	
		5 m	JZSP-CLP70-05-E	
		10 m	JZSP-CLP70-10-E	
		15 m	JZSP-CLP70-15-E	
		20 m	JZSP-CLP70-20-E	
	XtraDrive drive to serial converter cable	3 m	XD-CLP70-03-E	
		5 m	XD-CLP70-05-E	
		10 m	XD-CLP70-10-E	
		15 m	XD-CLP70-15-E	
		20 m	XD-CLP70-20-E	

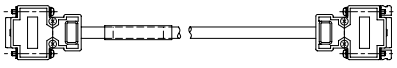
Power cables

Symbol	Specifications		Model	Appearance
④	For 200 V servo motors LETLA-□-F35A□	3 m	R88A-CAWA003S-DE	
		5 m	R88A-CAWA005S-DE	
		10 m	R88A-CAWA010S-DE	
		15 m	R88A-CAWA015S-DE	
		20 m	R88A-CAWA020S-DE	
	For 200 V servo motors LETLA-□-F50A□ LETLA-□-F1ZA200□	3 m	R88A-CAWB003S-DE	
		5 m	R88A-CAWB005S-DE	
		10 m	R88A-CAWB010S-DE	
		15 m	R88A-CAWB015S-DE	
		20 m	R88A-CAWB020S-DE	
	For 400 V servo motors LETLA-□-F35D□ LETLA-□-F50D200D□	3 m	R88A-CAWK003S-DE	
		5 m	R88A-CAWK005S-DE	
		10 m	R88A-CAWK010S-DE	
		15 m	R88A-CAWK015S-DE	
		20 m	R88A-CAWK020S-DE	
	For 400 V servo motors LETLA-□-F50D380□ LETLA-□-F1ZD□	3 m	R88A-CAWL003S-DE	
		5 m	R88A-CAWL005S-DE	
		10 m	R88A-CAWL010S-DE	
		15 m	R88A-CAWL015S-DE	
		20 m	R88A-CAWL020S-DE	

Linear scale cable to serial converter

Symbol	Specifications		Model	Appearance
⑤	Extension cable linear scale to serial converter. (Connector DB-15) (The extension cable is optional)	1 m	JZSP-CLL00-01-E	
		3 m	JZSP-CLL00-03-E	
		5 m	JZSP-CLL00-05-E	
		10 m	JZSP-CLL00-10-E	
		15 m	JZSP-CLL00-15-E	

Hall sensor cable to serial converter

Symbol	Specifications		Model	Appearance
⑥	Extension cable for linear scale to serial converter. (The extension cable is optional)	1 m	JZSP-CLL10-01-E	
		3 m	JZSP-CLL10-03-E	
		5 m	JZSP-CLL10-05-E	
		10 m	JZSP-CLL10-10-E	
		15 m	JZSP-CLL10-15-E	

Connectors

Specification	Model
Hypertac power connector IP67 (for 200 V motors)	SPOC-06K-FSDN169
Hypertac power connector IP67 (for 400 V motors)	LPRA-06B-FRBN170

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I42E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

SGTMM01-□, SGTMM03-□

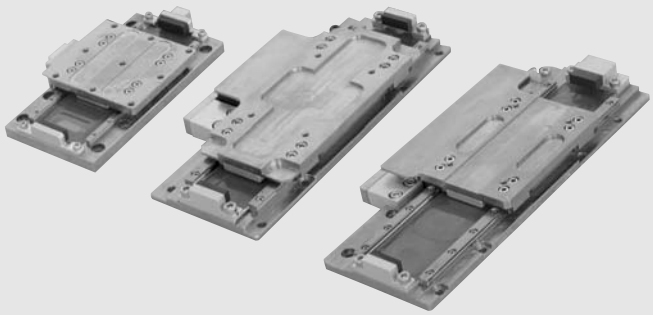
Linear sigma trac-micro

Direct drive linear servomotor axis for mounting at narrow spaces

- Compact, high-thrust and high-speed movement
- Flat construction for mounting at narrow spaces
- Plug and drive, shorten start-up time
- Easy operation and high reliability
- Moving magnet construction avoids moving cables
- Resolution of 78 nm
- Direct control of the axis using XtraDrive and Sigma-II drives

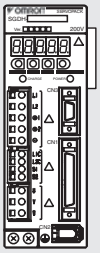
Ratings

- 230 VAC single-phase 3.5 N and 7 N (25 N peak)



System configuration

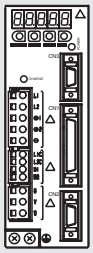
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

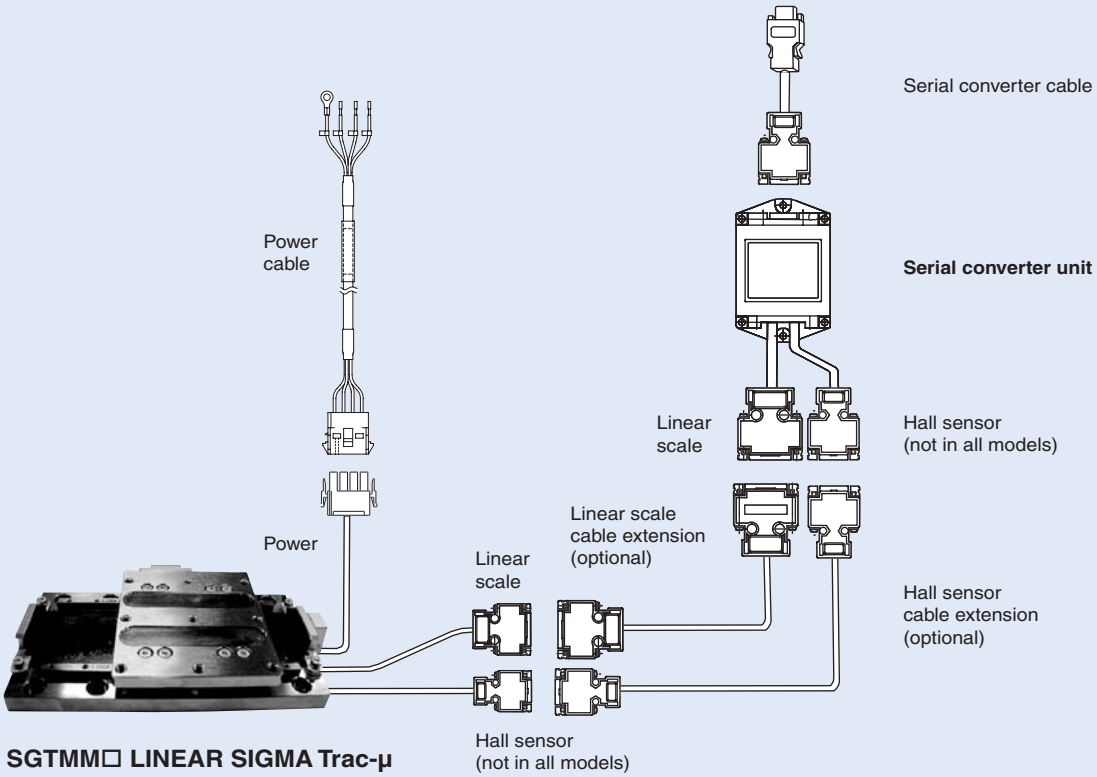
Sigma-II servo drive

Drive options



Intelligent servo drive

XtraDrive



SGTMM□ LINEAR SIGMA Trac-μ

Servo motor / servo drive combination

Sigma trac-µ

SGTMM 03 − 065 A H 20 A P

Σ Trac linear axis

Maximum thrust	
Code	Specifications
01	10 N
03	25 N

Effective stroke length	
Code	Specifications
010	10 mm
025	25 mm
030	30 mm
065	65 mm

Output from linear scale	
Code	Specifications
A	Analogue (1 Vp-p)

Linear scale manufacturer	
Code	Specifications
H	Heidenhain
M	MicronE

Linear scale pitch	
Code	Specifications
20	20 µm

Design revision

Hall sensor	
Code	Specifications
-	None
P	Provided

Servomotor specifications

Sigma trac-μ

Voltage		230V			
Linear axis model		**SGTMM01-010AM20A**	**SGTMM01-030AM20A**	**SGTMM03-025AH20AP**	**SGTMM03-065AH20AP**
Rated force	**N**	3.5	3.5	7.5	7.5
Instantaneous peak force	**N**	10	10	25	25
Force constant	**N / A_{rms}**	9	9	13.2	12.3
Motor constant	N /$\sqrt{W}$	1.2	1.2	2.29	1.58
Maximum load *1	**kg**	1	1	3	3
Effective stroke lenght	**mm**	10	30	25	65
Linear scale resolution	**μm**	0.078μm = 20μm / 256 (8bit)			
Linear scale model number		M1020 (MicroE)		LIDA487/LIF181 (Heidenhain)	
Hall sensor		None	None	Yes	Yes
Weigth of moving part	**kg**	0.1	0.1	0.215	0.24
Total weigth of micro trac	**kg**	0.31	0.35	0.62	0.71
Position accuracy repetibility *2	**μm**	+/- 0.5	+/- 0.5	+/- 0.5	+/- 0.5
Basic specifications	**Time rating**	Continuous			
	Insulation class	Class B			
	Ambient temperature	0 to +40 °C			
	Ambient humidity	20 to 80% (non-condensing)			
	Insulation resistance	500 VDC, 10 MΩ min.			
	Excitation	Permanent magnet			
	Dielectric strength	1500 VAC for 1 minute			
	Protection methods	Self-cooled			
	Allowable winding temperature	130 °C			

Note: ***1** The maximum load is calculated for an acceleration of 4.9 m/s^2.
***2** With stable environmental conditions and motor temperature unchanged.

Characteristics

Force-speed

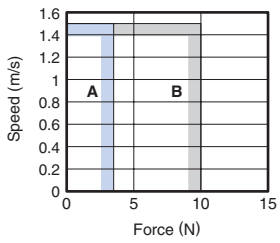
A : Continuous duty zone
B : Intermittent duty zone

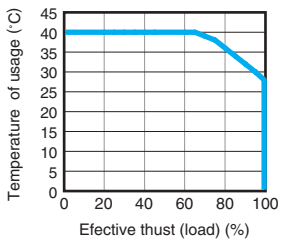
Efective thust-ambient temperature

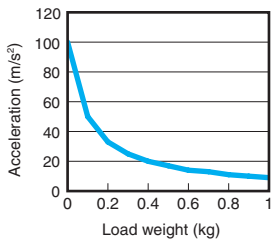
Sensor head temperature is bellow 50 °C
Ambient temperature

Load-acceleration

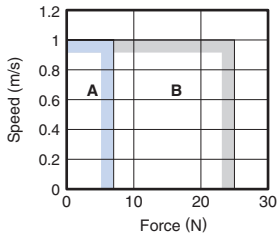
SGTMM01-□

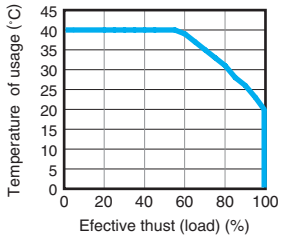


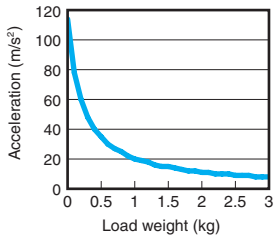




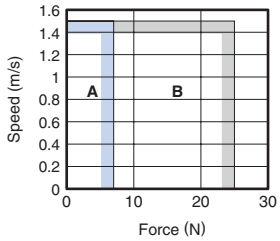
SGTMM03-025□

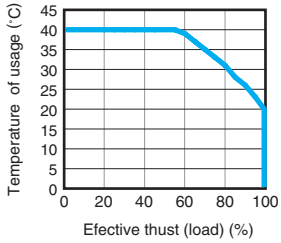


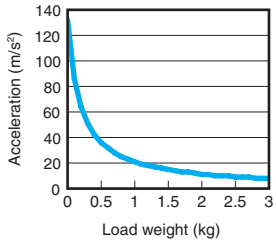




SGTMM03-065□



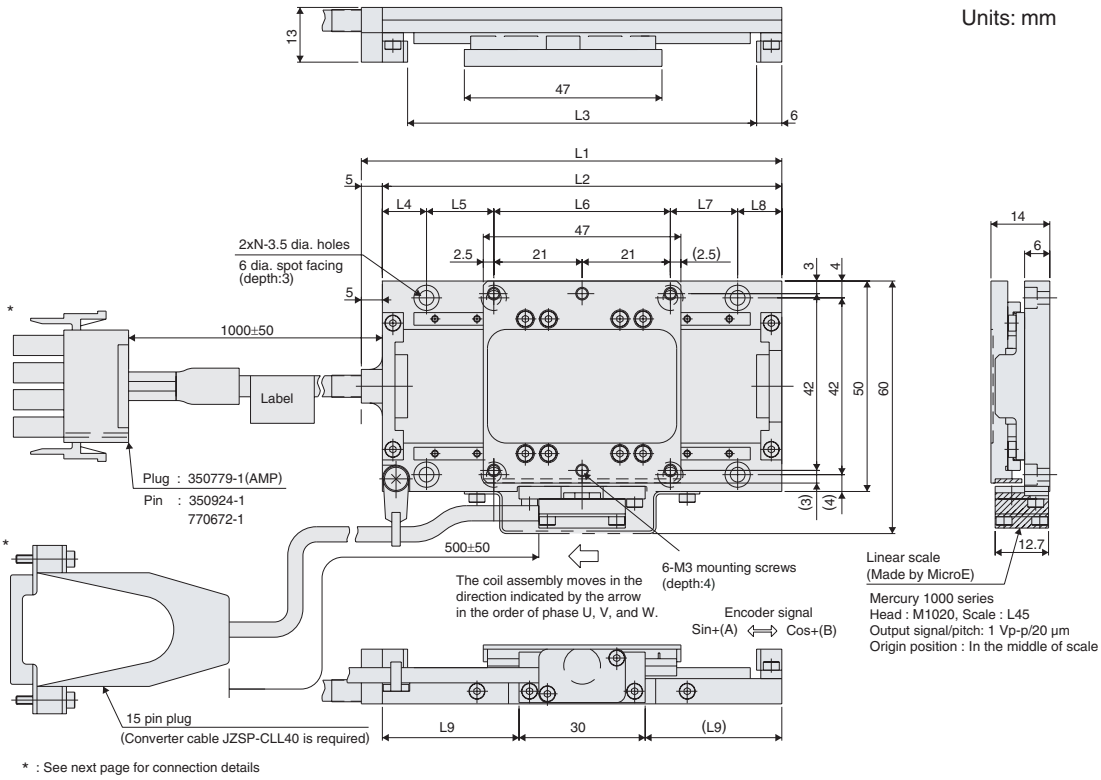




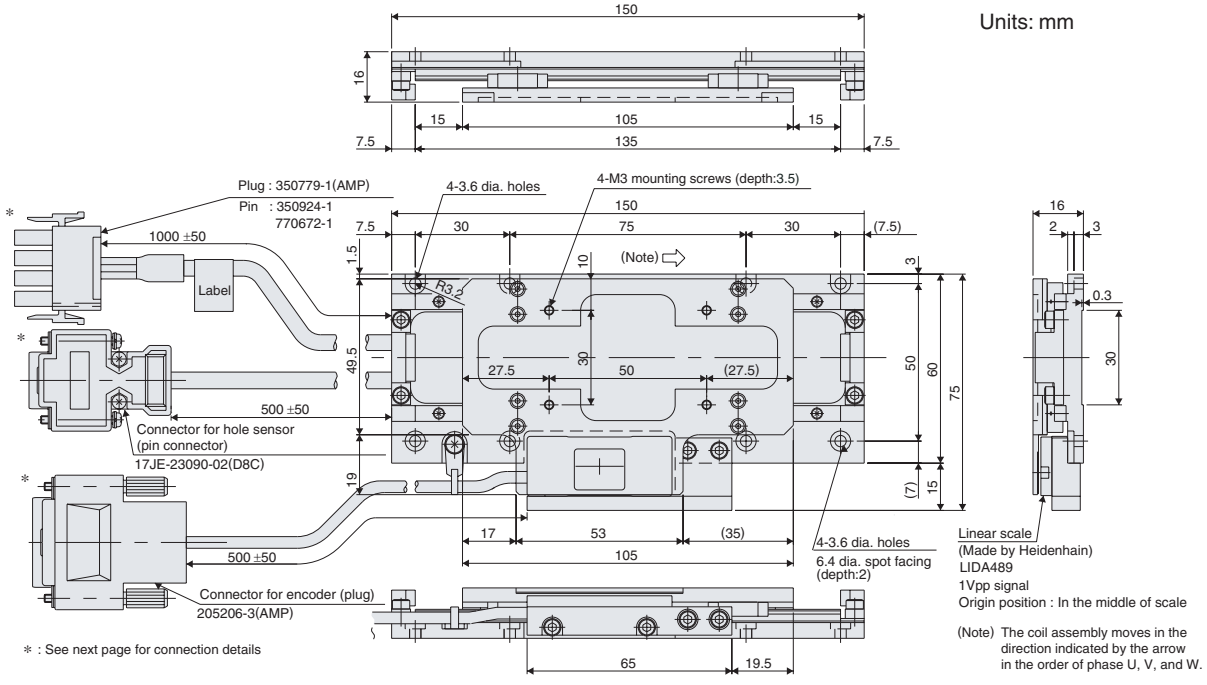
Dimensions

SGTMM01-□

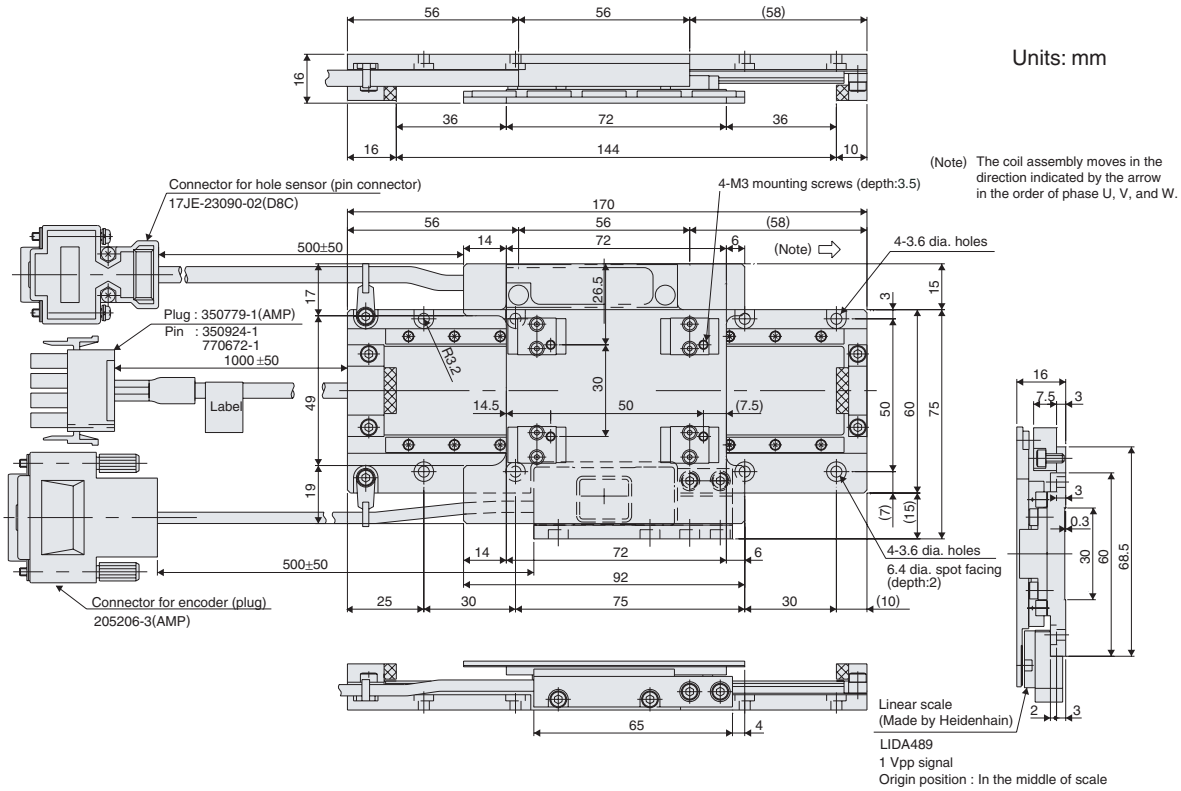
Micro trac model	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	L6 mm	L7 mm	L8 mm	L9 mm	N
SGTMM01-010AM20A	80	75	63	14	42	8	-	11	22.5	3
SGTMM01-030AM20A	100	95	83	10.5	16	42	16	10.5	32.5	4



SGTMM03-025AH20AP



SGTMM03-065AH20AP



Sigma trac-μ connections

SGTMM01-□

Linear servo motor Power connector

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	FG

Linear scale connector
(Signal converter cable JZSP-CLL40 is required)

Pin No.	Signal
1	IW-
2	IW+
3	RESERVED
4	RESERVED
5	RESERVED
6	RESERVED
7	COS+
8	SIN+
9	N/C
10	N/C
11	N/C
12	+5 V
13	GND
14	COS-
15	SIN-
Case	Shield

SGTMM03-□

Linear servo motor Power connector

Pin No.	Name
1	Phase U
2	Phase V
3	Phase W
4	FG

Linear scale connector

Pin No.	Signal
1	cos (A+)
2	0 V
3	sin (B+)
4	+5V
5	Empty
6	Empty
7	/Ref (R-)
8	Empty
9	/cos (A-)
10	0V sensor
11	/sin (B-)
12	5 V sensor
13	Empty
14	Ref (R+)
15	Empty
Case	Shield

Hall sensor connector

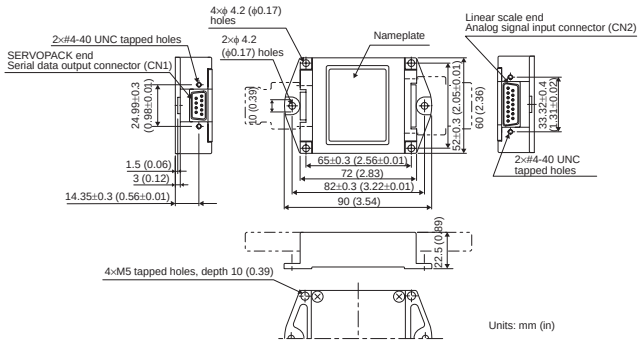
Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Serial converter unit

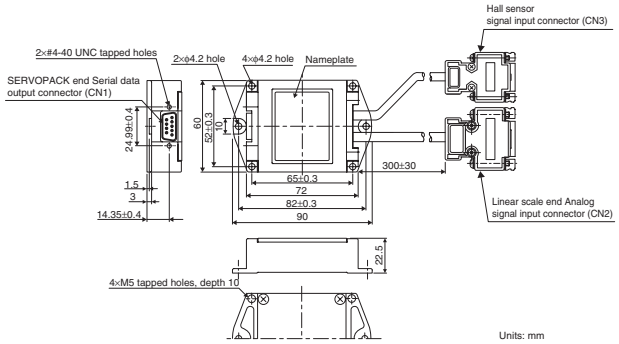
JZDP-D00□-□□□

Items		Specifications
Electrical characteristics	Power supply voltage	+5.0 V ±5%, ripple content 5% max.
	Current consumption	120 mA Typ. 350 mA max.
	Signal resolution	Input 2-phase sine wave: 1/256 pitch
	Max. response frequency	250 kHz
	Analog input signals (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Pole sensor input signal	CMOS level
	Output signals	Position data, hall sensor information and alarms
	Output method	Serial data transmission (HDLC (High-level data link control) protocol format with Manchester codes)
	Transmission cycle	62.5 μs
	Output circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120 Ω
Mechanical characteristics	Approx. mass	150 g
	Vibration resistance	98 m/s^2 max. (1 to 2500 Hz) in three directions
	Shock resistance	980 m/s^2, (11 ms) two times in three directions
Environmental conditions	Operating temperature	0 °C to 55 °C (32 to 131 °F)
	Storage temperature	-20 °C to +80 °C (-4 to +176 °F)
	Humidity	20% to 90% RH (without condensation)

JZDP-D003-□□□

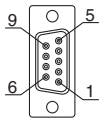


JZDP-D006-□□□



JZDP-D003-□□□
JZDP-D006-□□□

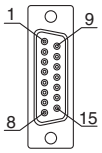
CN1
SERVOPACK end serial data output



Pin No.	Signal
1	+5 V
2	S-phase output
3	Empty
4	Empty
5	0 V
6	/S-phase output
7	Empty
8	Empty
9	Empty
Case	Shield

JZDP-D003-□□□
JZDP-D006-□□□

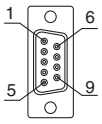
CN2
Linear scale end Analog signal input



Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Empty
6	Empty
7	/Ref input (R-)
8	Empty
9	/cos input (A-)
10	0 V sensor
11	/sin input (B-)
12	5 V sensor
13	Empty
14	Ref input (R+)
15	Empty
Case	Shield

JZDP-D006-□□□

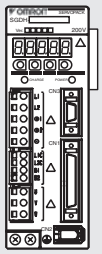
CN3
Hall sensor signal input



Pin No.	Signal
1	+5 V
2	U-phase input
3	V-phase input
4	W-phase input
5	0 V
6	Empty
7	Empty
8	Empty
9	Empty
Case	Shield

Ordering Information

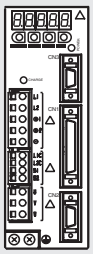
(Refer to servo drive chapter)

③ 

Servo drive with option boards for flexible system configuration

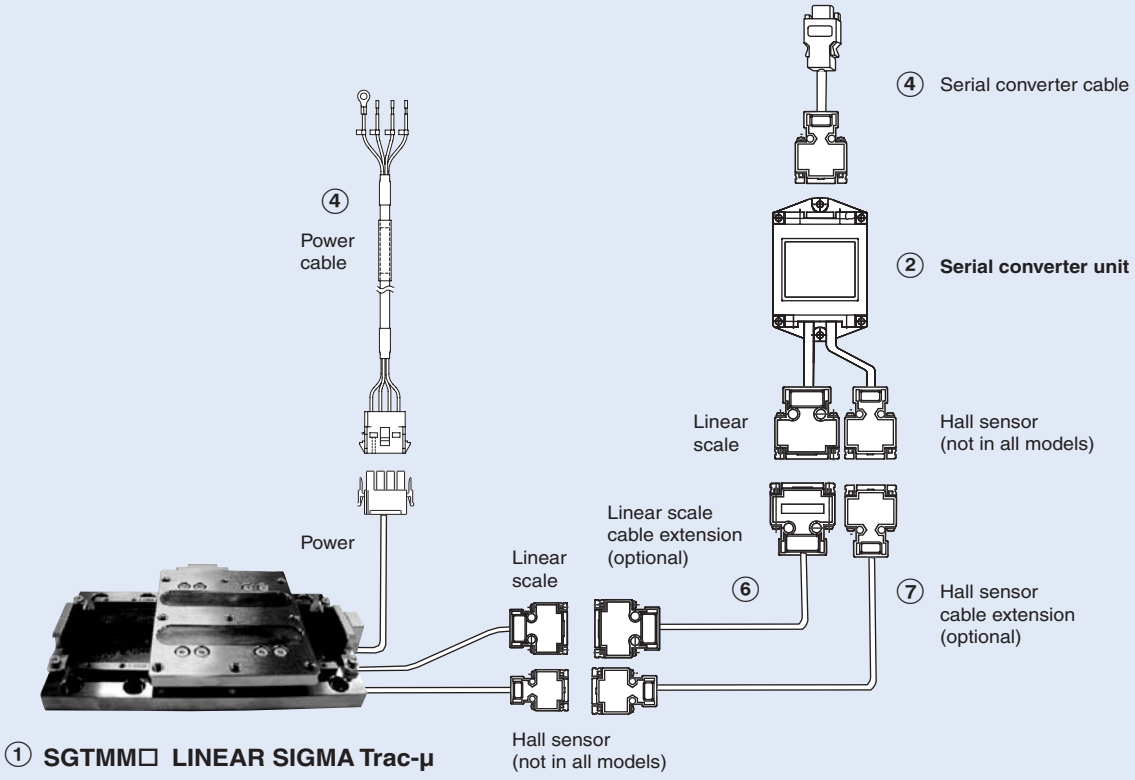
Sigma-II servo drive

Drive options

③ 

Intelligent servo drive

XtraDrive



Note: The symbols ①②③... show the recommended sequence to select the servo motor, cables and serial converter for a linear motors system

Sigma trac-μ

Symbol	Specifications		Model			
	Rated force	Peak force	① Linear axis model	② Serial converter	③ Servo drive	
①②③	3.5 N	10 N	SGTMM01-010AM20A	JZDP-D003-242*1	SGDH-A5AE-OY	XD-P5MN01
	3.5 N	10 N	SGTMM01-030AM20A	JZDP-D003-242*1	SGDH-A5AE-OY	XD-P5MN01
	7 N	25 N	SGTMM03-025AH20AP	JZDP-D006-221	SGDH-01AE-OY	XD-01MN01
	7 N	25 N	SGTMM03-065AH20AP	JZDP-D006-220	SGDH-01AE-OY	XD-01MN01

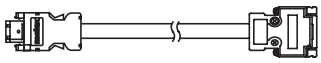
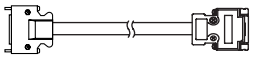
Note: *1. For the SGTMM01-□ motor the signal converter cable **JZSP-CLL40** (0.2 m length) is required.

Servo drive

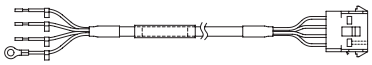
Note: Choosing Sigma-II drive or XtraDrive affects to the serial converter cable needed

③ Refer to Sigma-II or XtraDrive servo drive chapter for detailed drive specifications and selection of drive accessories

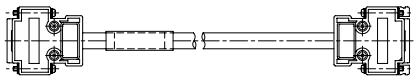
Serial converter cable to servo drive

Symbol	Specifications		Model	Appearance
④	Sigma-II drive to serial converter cable	3 m	JZSP-CLP70-03-E	
		5 m	JZSP-CLP70-05-E	
		10 m	JZSP-CLP70-10-E	
		15 m	JZSP-CLP70-15-E	
		20 m	JZSP-CLP70-20-E	
	XtraDrive to serial converter cable	3 m	XD-CLP70-03-E	
		5 m	XD-CLP70-05-E	
		10 m	XD-CLP70-10-E	
		15 m	XD-CLP70-15-E	
		20 m	XD-CLP70-20-E	

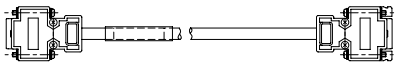
Power cables

Symbol	Specifications		Model	Appearance
⑤	Power cable for sigma trac micro	3 m	R7A-CAA003S-FE	
		5 m	R7A-CAA005S-FE	
		10 m	R7A-CAA010S-FE	
		15 m	R7A-CAA015S-FE	
		20 m	R7A-CAA020S-FE	

Linear scale cable to serial converter

Symbol	Specifications		Model	Appearance
⑥	Extension cable linear scale to serial converter (the extension cable is optional)	1 m	JZSP-CLL00-01-E	
		3 m	JZSP-CLL00-03-E	
		5 m	JZSP-CLL00-05-E	
		10 m	JZSP-CLL00-10-E	
		15 m	JZSP-CLL00-15-E	

Hall sensor cable to serial converter

Symbol	Specifications		Model	Appearance
⑦	Extension cable for linear scale to serial converter (the extension cable is optional)	1 m	JZSP-CLL10-01-E	
		3 m	JZSP-CLL10-03-E	
		5 m	JZSP-CLL10-05-E	
		10 m	JZSP-CLL10-10-E	
		15 m	JZSP-CLL10-15-E	

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I40E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

Frequency inverters

The Secret of the Leader

OMRON-Yaskawa has built a leading position in general-purpose inverters - with a 25% share of the market according to the IMS - thanks to the highest degree of reliability in the market place.
Of course, it's easy for us to say we offer the highest reliability, but what do our customers say?

"At Goodwin Electronics we believe that reliability must follow integrity and quality. Our reputation depends on reliability, which is why we have chosen OMRON for our motion control," says Steve Pritchard, Sales Director, Goodwin Electronics.

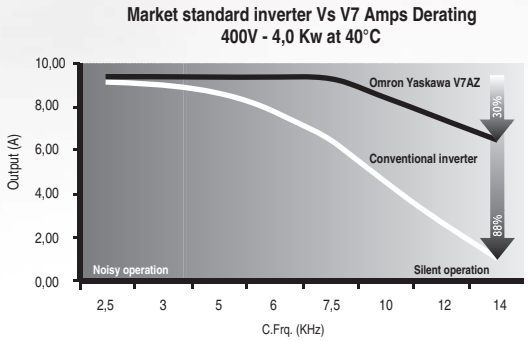
Anders Gullberg, Manager of the Electrical Department at AKAB, says that they choose OMRON-Yaskawa products because "we export 98% of our product, so machine failure is simply not allowed."

Franco Stefani, General Manager of System Ceramics, highlights the benefits of OMRON-Yaskawa reliability. "High reliability reduces cost and increases productivity," he explains. "This is the way to win!"

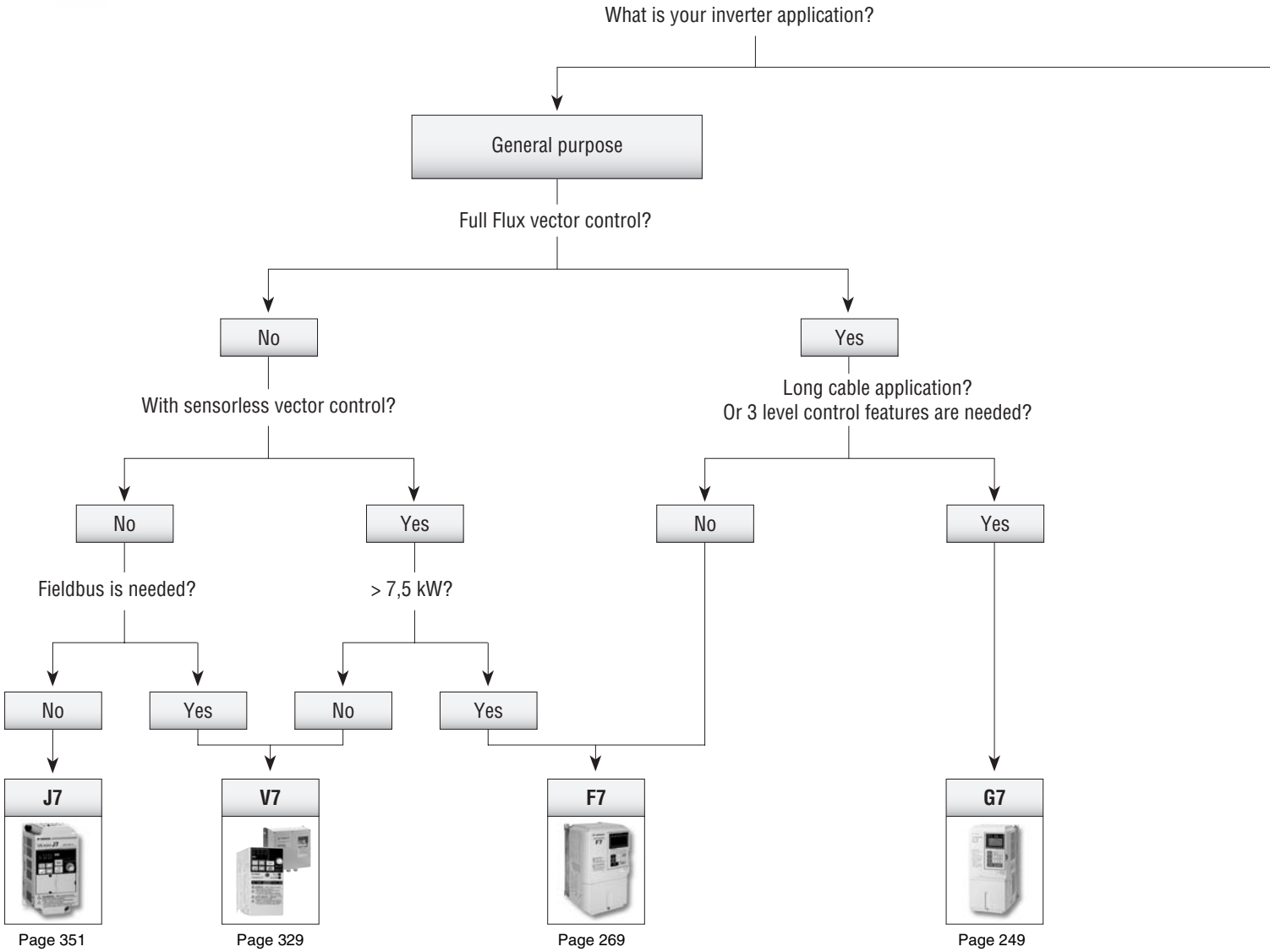
So what's the secret?
Yaskawa has developed a unique algorithm that perfectly balances the carrier frequency and the output current of the inverter. This not only allows but guarantees high current output at silent operation.

Figure 1 depicts the typical curve behaviour of a 4.0 kW V7 inverter against a conventional inverter in the market. Note that in near-silent mode operation, the V7 delivers almost twice as much current as the conventional inverter. In fully silent mode, the conventional inverter just collapses. In most cases the user has to take one or even two sizes bigger to meet his application need. The V7 is designed to drive the matched motor power in silent mode at full torque. This position of
"No Compromise" is something that we take very seriously.

Figure 1

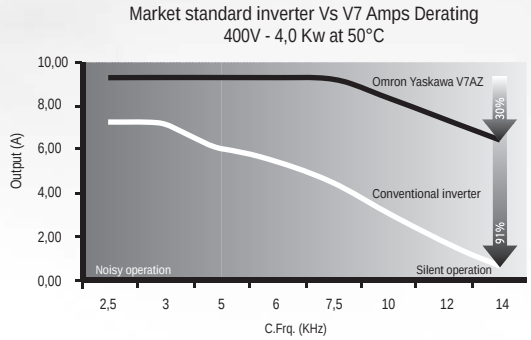


Note: Dark grey means highest acoustic noise.



Another significant difference between the OMRON-Yaskawa drive and the rest is the uncompromising current performance within the temperature range. In Figure 2 you can clearly see that while the V7 performance is stable, the conventional type drops sharply when used at 50 °C.

Figure 2



Note: Dark grey means highest acoustic noise.

What you see is what you get

In a nutshell, with the V7 inverter you get exactly what you see specified, which is significantly better output than with a standard inverter within a high temperature range - even in silent mode.

"No Surprise and No Compromise!"
One of the secrets of a true leader!

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	E7	309
	V7	329
	J7	351
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Pumps & fans

Lift application

E7



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L7



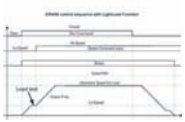
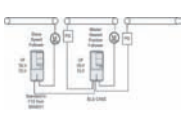
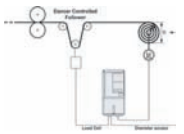
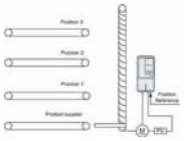
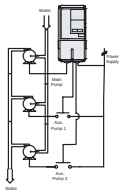
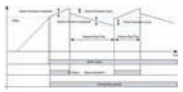
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Selection table

Model	G7	F7	L7
			
Type	**World's first three level inverter architecture**	**The industrial workhorse**	**Made to drive lifts**
400 V three-phase **200 V three-phase** **200 V single-phase**	**0.4 kW to 300 kW** **0.4 kW to 110 kW** **N/A**	**0.4 kW to 300 kW** **0.4 kW to 110 kW** **N/A**	**4.0 kW to 55 kW** **3.7 kW to 55 kW** **N/A**
Application	High performance, long cable lines	General and high-end applications	Lift control with asynchronous or synchronous motors
Control method	Open and close loop for vector and V/F control.	Open and close loop for vector and V/F control.	Open and close loop for vector and V/F control.
Torque features	150% at 0.0 Hz (CLV) 150% at 0.3 Hz (OLV)	150% at zero speed (CLV) 150% at 0.5 Hz (OLV)	150% at zero speed (CLV) 150% at 0.5 Hz (OLV)
Connectivity	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet MECHATROLINK-II	Memobus DeviceNet PROFIBUS-DP CANopen LONWorks Ethernet
Customisation options	- PLC option board - Inverter application software	- PLC option board - Inverter application software	- PLC option board - Inverter application software
Page	249	269	289

Model	E7	V7	J7
			
Type	**Drive your energy cost down**	**Sensorless vector control in a pocket sized inverter**	**Small, simple and smart**
400 V three-Phase **200 V three-Phase** **200 V single-Phase**	**0.4 kW to 300 kW** **0.4 kW to 110 kW** **N/A**	**0.2 kW to 7.5 kW** **0.1 kW to 7.5 kW** **0.1 kW to 4.0 kW**	**0.2 kW to 4.0 kW** **0.1 kW to 4.0 kW** **0.1 kW to 1.5 kW**
Application	Pumps and fans (variable torque)	Compact general purpose	Simple speed control
Control method	V/F control	Sensorless vector and V/F control	V/F control
Torque features	120% at 0.5 Hz.	100% at 0.5 Hz.	150% at 3 Hz.
Connectivity	Memobus Metasys N2 L&S Apogee LONWorks DeviceNet PROFIBUS-DP CANopen	Memobus DeviceNet PROFIBUS-DP CANopen MECHATROLINK-II	Memobus
Customisation options	- PLC option board - Inverter application software - IP54 enclosure	- PLC option board - Inverter application software - IP65 enclosure	N/A
Page	309	329	351

Model	G7/F7/L7/E7 inverter PLC	V7 inverter PLC
		
Type	**The OMRON PLC embedded into the OMRON-Yaskawa inverter family**	**The OMRON PLC embedded into V7 inverter**
Supported inverter	Varispeed G7 / F7 / L7 / E7	Varispeed V7
I/O's	6 DI, 4DO in PLC board. 256 I/O's by Comopbus/S distributed network.	6 DI, 4DO
Calendar / clock	Yes	Available on RS-422/485 type
Encoder interface	Yes	No
Connectivity	Peripheral port RS-232C RS-422/485 Compobus/S master DeviceNet slave	Peripheral port RS-232C RS-422/485
Software	CX-Programmer CX-One	CX-Programmer CX-One
Page	365	377

Inverter application software						
						
	S-7071	**S-8161**	**S-8180**	**S-8795**	**S-8801**	**S-9381**
Type	CRANE software	ELS - electronic line shaft software	Winder software	Point-to-point software	Pump sequencer software	Traverse software
Application	Crane applications	Position and speed follower applications	Winding and unwinding applications	Point-to-point positioning applications	Pump sequencer application up to 2 auxiliary pumps	Textile wire winding application
Supported inverter	Varispeed F7	Varispeed F7	Varispeed F7	Varispeed F7	Varispeed E7	Varispeed V7
Page	387					

CIMR-G7C

Varispeed G7



World first three level inverter architecture

- 3 level control (400 V class)
- Current vector control and V/F with or without PG
- Torque control (closed loop and open loop)
- Silent operation
- Rotary and stationary autotuning
- High slip braking function
- Energy saving function standard
- LCD operator
- Embedded OMRON PLC functionality with PLC option card
- Standard RS-485 communications - Modbus
- Fieldbus options: DeviceNet, PROFIBUS, CANOpen, LONworks, ethernet
- PC configuration tool CX-drive and DriveWorksEZ.
- CE, UL, and cUL marking
- Customised application software

Ratings

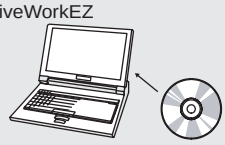
- 200 V Class three-phase 0.4 to 110 kW
- 400 V Class three-phase 0.4 to 300 kW

System configuration

3G3IV-PCN329-E
Inverter to PC cable



CX-Drive
DriveWorkEZ



JVOP-160 OY
Digital operator
(LCD display)



JVOP-161-OY
Digital operator
(LED display)



3G3IV-PCN126/326
Digital operator
extension cable



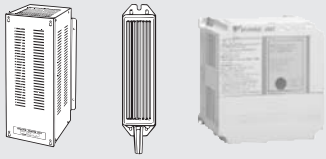
Line filter



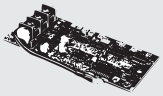


Varispeed G7

Braking accessories



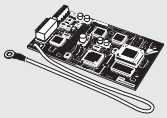
Monitor option card



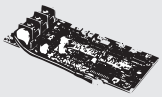
Feedback speed control card



Communication option cards



Reference option cards

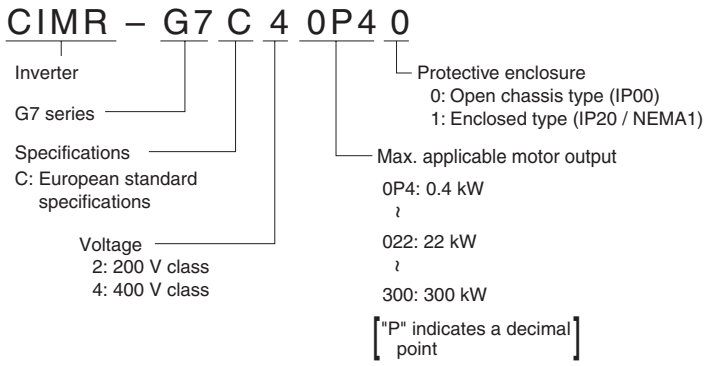


PLC option card



Specifications

Type designation



200 V class[1]

Model CIMR-G7C☐			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output[2]		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter capacity	kVA	1.2	2.3	3.0	4.6	6.9	10	13	19	25	30	37	50	61	70	85	110	140	160
	Rated current	A	3.2	6	8	12	18	27	34	49	66	80	96	130	160	183	224	300	358	415
	Max. voltage		3-phase, 200/208/220/230/240 V (proportional to input voltage)																	
	Max. output frequency		400 Hz (programmable)																	
Power supply	Rated input voltage and frequency		3-phase 200/208/220/230/240 V, 50/60 Hz[3]																	
	Allowable voltage fluctuation		+10%, -15%																	
	Allowable frequency fluctuation		±5%																	
Harmonic wave prevention	DC reactor		Option									Provided								
	12-pulse input		Not available									Available[4]								

1. The main circuit of 200 V class inverters uses 2-level control method.
2. Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
3. When using the inverter of 200 V class 30 kW or more with a cooling fan of three-phase 230 V 50 Hz or 240 V 50/60 Hz power supply, a transformer for the cooling fan is required.
4. A 3-wired transformer is required at 12-pulse input.

400 V class[1]

Model CIMR-G7C☐			40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Max. applicable motor output[2]		kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter capacity	kVA	1.4	2.6	3.7	4.7	6.9	11	16	21	26	32	40	50	61	74	98	130	150	180	210	250	280	340	460
	Rated current	A	1.8	3.4	4.8	6.2	9	15	21	27	34	42	52	65	80	97	128	165	195	240	270	325	370	450	605
	Max. voltage		3-phase, 380/400/415/440/460/480 V (proportional to input voltage)																						
	Max. output frequency		400 Hz (programmable)																						
Power supply	Rated input voltage and frequency		3-phase 380/400/415/440/460/480 V, 50/60 Hz																						
	Allowable voltage fluctuation		+10%, -15%																						
	Allowable frequency fluctuation		±5%																						
Harmonic wave prevention	DC reactor		Option									Provided													
	12-pulse input		Not available									Available[3]													

1. The main circuit of 400 V class inverters uses 3-level control method.
2. Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
3. A 3-wired transformer is required at 12-pulse input.

Enclosures

200 V class	Model CIMR-G7C☐	20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110							
	Enclosed type (IEC IP20)	Available as standard										Available for option						Not available								
	Open chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type										Available as standard														
400 V class	Model CIMR-G7C☐	40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300		
	Enclosed type (IEC IP20)	Available as standard										Available for option										Not available				
	Open chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type										Available as standard														

Commom specifications

Model number CIMR-G7C☐		Specification
Control characteristics	Control method	Sine wave PWM Closed loop vector control, open loop vector control 1&2, V/f control, V/f with PG control
	Torque characteristics	150% at 0.3 Hz (open loop vector control 2) 150% at 0rpm (closed vector control)
	Speed control range	1:200 (open loop vector control 2) 1:1000 (closed loop vector control)
	Speed control accuracy	± 0.2% (open loop vector control) ± 0.02% (closed loop vector control) (25 °C ± 10 °C)
	Speed control response	10 Hz (open loop vector control 2) 30 Hz (control with PG)
	Torque limits	Provided (4 quadrant steps can be changed by constant settings.) (Vector control)
	Torque accuracy	± 5%
	Frequency range	0.01 to 400 Hz
	Frequency accuracy (temperature characteristics)	Digital references: ± 0.01% (-10 °C to +40 °C)
		Analog references: ± 0.1% (25 °C ±10 °C)
	Frequency setting resolution	Digital references: 0.01 Hz
		Analog references: 0.025/50 Hz (11 bits plus sign)
	Output frequency resolution	0.001 Hz
	Overload capacity and maximum current	150% of rated output current for 1 minute 200% of rated output current for 0.5 second
	Frequency setting signal	0 to +10 V, -10 to +10 V, 4 to 20 mA, pulse train
	Accel/decel time	0.01 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration time settings)
	Braking torque	Approximately 20% (Approximately 125% with braking resistor option, braking transistor built into Inverters of 15 kW or less)
	Main control functions	Restarting after momentary power loss, speed search, overtorque/undertorque detection, torque limits, 17-speed control (maximum), 4 acceleration and deceleration times, S-curve acceleration/deceleration, 3-wire control, auto-tuning (rotational or stationary), dwell function, cooling fan ON/OFF control, slip compensation, torque compensation, auto-restart after fault, jump frequencies, upper and lower limits for frequency references, DC braking for starting and stopping, high-slip braking, advanced PID control, energy-saving control, MEMOBUS communications (RS-485/422, 19.2 kbps maximum), 2 motor parameter sets, fault reset and parameter copy function.
Protective functions	Motor protection	Protection by electronic thermal overload relay.
	Instantaneous overcurrent protection	Stops at approx. 200% of rated output current.
	Fuse blown protection	Stops for fuse blown.
	Overload protection	150% of rated current for 1 minute 200% of rated current for 0.5 second
	Overvoltage protection	200 Class Inverter: stops when main-circuit DC voltage is above 410 V. 400 Class Inverter: stops when main-circuit DC voltage is above 820 V.
	Undervoltage protection	200 Class Inverter: stops when main-circuit DC voltage is below 190 V. 400 Class Inverter: stops when main-circuit DC voltage is below 380 V.
	Momentary power loss ride through	By selecting the momentary power loss method, operation can be continued if power is restored within 2 s.
	Cooling fin overheating	Protection by thermistor.
	Stall prevention	Stall prevention during acceleration, deceleration and running independently.
	Grounding protection	Protection by electronic circuits.
	Charge indicator	Illuminates when the main circuit DC voltage is approx. 10 VDC or more.
Environment	Ambient operating temperature	-10 °C to 40 °C (enclosed wall-mounted type) -10 °C to 45 °C (open chassis type)
	Ambient operating humidity	95% max. (with no condensation)
	Storage temperature	- 20 °C to + 60 °C (short-term temperature during transportation)
	Application site	Indoor (no corrosive gas, dust, etc.)
	Altitude	1000 m max.
	Vibration	10 to 20 Hz, 9.8 m/s^2 max.; 20 to 50 Hz, 2 m/s^2 max

Dimensions

Open chassis type (IEC IP00)

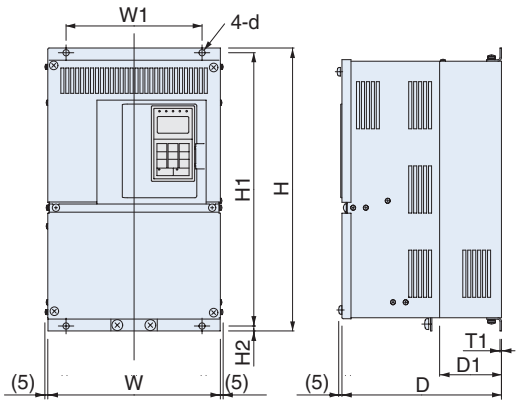


Fig 1

Voltage	Max. applicable motor output kW	Inverter CIMR-G7C□	Fig	Dimensions in mm									Approx. weight kg	Cooling method
				W	H	D	W1	H1	H2	D1	T1	d		
200 V class (3-phase)	0.4	------	Not available please use the IP20 type removing the upper and lower cover											
	0.75	------												
	1.5	------												
	2.2	------												
	3.7	------												
	5.5	------												
	7.5	------												
	11	2011												
	15	2015												
	18.5	2018	1	250	400	258	195	385	7.5	100	2.3	M6	21	Fan cooled
	22	2022		275	450	258	220	435					24	
	30	2030		375	600	298	250	575	12.5	130	3.2	M10	57	
	37	2037				328							63	
	45	2045		450	725	348	325	700					86	
	55	2055											87	
	75	2075		500	850	358	370	820	15	140	4.5	M12	108	
	90	2090		575	885	378	445	855					150	
	110	2110												
400 V class (3-phase)	0.4	------	Not available please use the IP20 type removing the upper and lower cover											
	0.75	------												
	1.5	------												
	2.2	------												
	4.0	------												
	5.5	------												
	7.5	------												
	11	4011												
	15	4015												
	18.5	4018	1	275	450	258	220	435	7.5	100	2.3	M6	26	Fan cooled
	22	4022												
	30	4030		325	550	283	260	535		105			37	
	37	4037												
	45	4045												
	55	4055		450	725	348	325	700	12.5	130	3.2	M10	90	
	75	4075											91	
	90	4090		500	850	358	370	820	15		4.5	M12	109	
	110	4110											127	
	132	4132		575	916	378	445	855	45.8	140			165	
	160	4160											175	
	185	4185		710	1305	415	540	1270	15	126			263	
	220	4220											280	
	300	4300		916	1475		730	1440					415	

Enclosed type (IEC IP20)

G7C20P41 to G7C25P51
G7C40P41 to G7C45P51

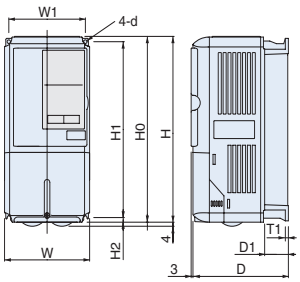


Fig 1

G7C27P51 to G7C20181
G7C47P51 to G7C40181

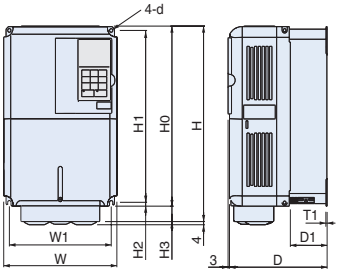


Fig 2

G7C20221 to G7C20751
G7C40221 to G7C41601

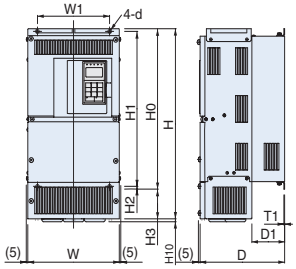


Fig 3

G7C4185 to G7C4300

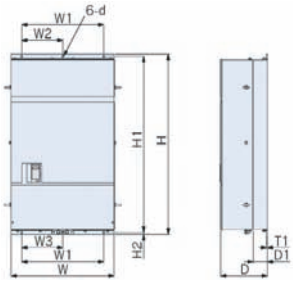
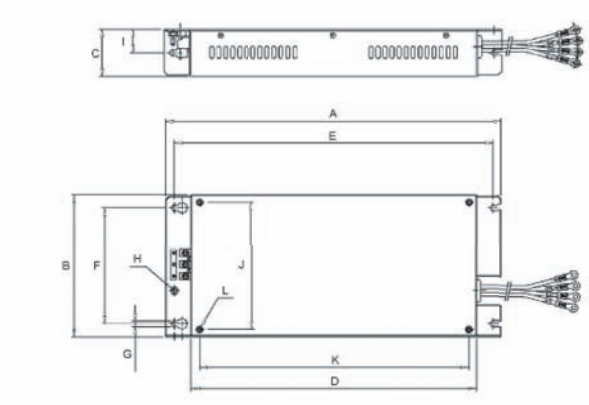


Fig 4

Voltage	Max. applicable motor output kW	Inverter CIMR-G7C□	Fig	Dimensions in mm									Approx. weight kg	Cooling method
				W	H	D	W1	H1	H2	D1	T1	d		
200 V class (3-phase)	0.4	20P4	1	140	280	157	126	266	7	39	5	M5	3	Self cooled
	0.75	20P7												
	1.5	21P5												
	2.2	22P2				177				59			4	Fan cooled
	3.7	23P7												
	5.5	25P5	2	200	300	197	186	285	8	65.5	2.3	M6	6	
	7.5	27P5											7	
	11	2011		240	350	207	216	335	7.5	78			11	
	15	2015												
	18.5	2018	3	250	400	258	195	385		100			21	
	22	2022		275	450		220	435					24	
	30	2030		375	600	298	250	575	12.5	130	3.2	M10	57	
	37	2037				328							63	
	45	2045		450	725	348	325	700					86	
	55	2055											87	
	75	2075		500	850	358	370	820	15	140	4.5	M12	108	
	90	2090		575	885	378	445	855					150	
	110	2110												
400 V class (3-phase)	0.4	40P4	1	140	280	157	126	266	7	39	5	M5	3.5	Self cooled
	0.75	40P7												
	1.5	41P5				177				59			4.5	Fan cooled
	2.2	42P2												
	3.7	43P7												
	5.5	45P5	2	200	300	197	186	285	8	65.5	2.3	M6	7	
	7.5	47P5												
	11	4011		240	350	207	216	335	7.5	78			10	
	15	4015												
	18.5	4018	3	275	450	258	220	435		100			26	
	22	4022												
	30	4030		325	550	283	260	535		105			37	
	37	4037												
	45	4045												
	55	4055		450	725	348	325	700	12.5	130	3.2	M10	90	
	75	4075											91	
	90	4090		500	850	358	370	820	15		4.5	M12	109	
	110	4110											127	
	132	4132		575	916	378	445	855	45.8	140			165	
	160	4160											175	
	185	4185	4	710	1305	415	540	1270	15	126			263	
	220	4220											280	
	300	4300		916	1475		730	1440					415	

Filters

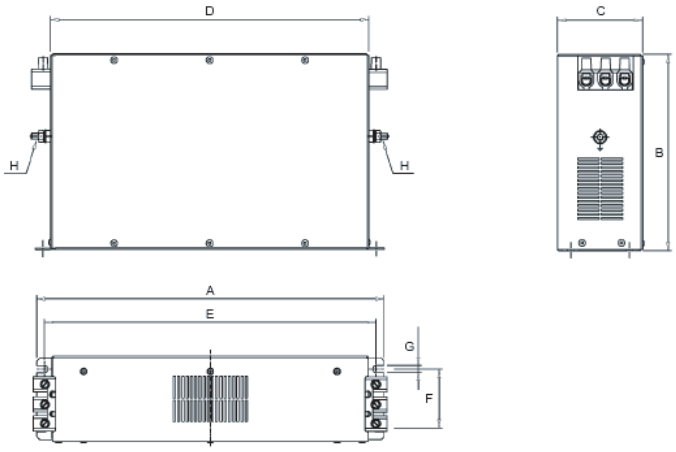
Footprint / Flat filters



Model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
200 V	3G3RV-PFI2035-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI2060-SE	355	206	60	302	336	175	6.5	M6	30	186	285	M6
	3G3RV-PFI2100-SE	408	236	80	355	390	205	6.5	M6	40	216	335	M6
400 V	3G3RV-PFI3010-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3018-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3021-SE	355	206	50	302	336	175	6.5	M4	25	186	285	M5
	3G3RV-PFI3035-SE	355	206	50	302	336	175	6.5	M5	25	186	285	M6
	3G3RV-PFI3060-SE	408	236	65	355	390	205	6.5	M6	32.5	216	335	M6
	3G3RV-PFI3410-SE [1]	386	115	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3600-SE [1]	386	135	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3800-SE [1]	564	160	300	516	420	275	9.0	M12	-	-	-	-

1. Flat filters are not possible to be mounted as footprint filters.

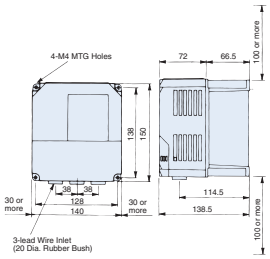
Bookform filters



Model		Dimensions							
		A	B	C	D	E	F	G	H
200 V	3G3RV-PFI2130-SE	366	180	90	280	310	65	6.5	M10
	3G3RV-PFI2160-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI2200-SE	610	240	130	480	518	90	8.2	M10
400 V	3G3RV-PFI3070-SE	331	185	80	300	329	55	6.5	M6
	3G3RV-PFI3100-SE	326	150	90	240	270	65	6.5	M10
	3G3RV-PFI3130-SE	370	180	90	280	310	65	6.5	M10
	3G3RV-PFI3170-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI3200-SE	610	240	130	480	518	90	8.3	M10

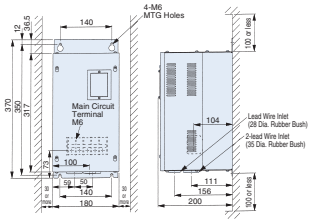
Braking unit

Model CDBR-2015 B, -2022 B, -4030B, -4045 B



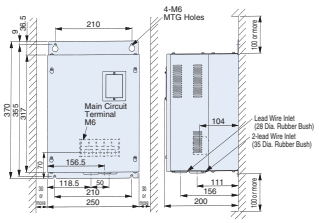
Weight 1.8 Kg

Model CDBR-2110 B



Weight 8.5 Kg

Model CDBR-4220 B

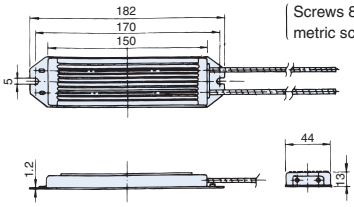


Weight 12 Kg

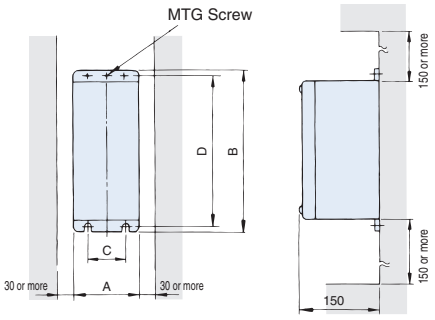
Braking resistor unit (inverter-mounted type)

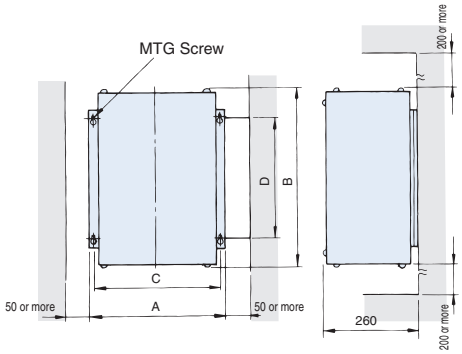
Weight: 0.2 kg
Model ERF-150WJ_

Note: Prepare mounting screws (2-M4x8 tapped screws). Screws 8mm or more and general metric screws cannot be used.



Braking resistor unit (separately-installed type)





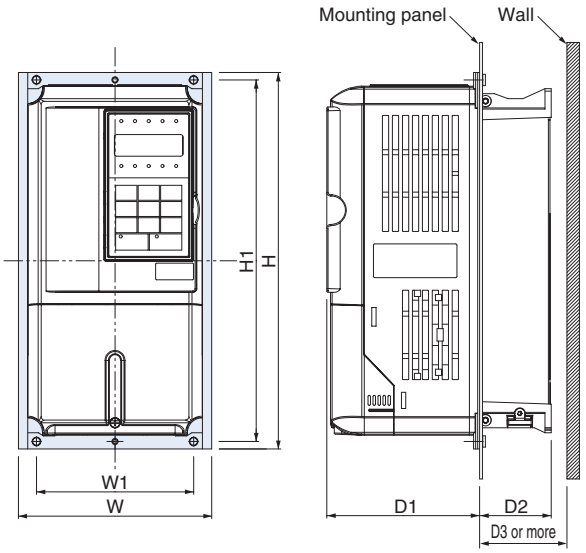
Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG Screw	
220 V class	20P7	105	275	50	260	M5 x 3	3.0
	21P5	130	350	75	335	M5 x 4	4.5
	22P2	130	350	75	335	M5 x 4	4.5
	23P7	130	350	75	335	M5 x 4	5.0
	25P5	250	350	200	335	M6 x 4	7.5
	25P5	250	350	200	335	M6 x 4	8.5
400 V class	40P7	105	275	50	260	M5 x 3	3.0
	41P5	130	350	75	335	M5 x 4	4.5
	42P2	130	350	75	335	M5 x 4	4.5
	43P7	130	350	75	335	M5 x 4	5.0
	45P5	250	350	200	332	M6 x 4	7.5
	47P5	250	350	200	332	M6 x 4	8.5

Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG Screw	
220 V class	2011	266	543	246	340	M8 x 4	10
	2015	356	543	336	340	M8 x 4	15
	2018	446	543	426	340	M8 x 4	19
	2022	446	543	426	340	M8 x 4	19
400 V class	4011	350	412	330	325	M6 x 4	16
	4015	350	412	330	325	M6 x 4	18
	4018	446	543	426	340	M8 x 4	19
	4022	446	543	426	340	M8 x 4	19
	4030	356	956	336	740	M8 x 4	25
	4037	446	956	426	740	M8 x 4	33
	4045	446	956	426	740	M8 x 4	33

Attachments

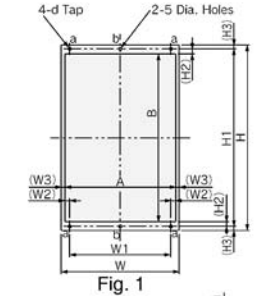
Heatsink external mounting attachment

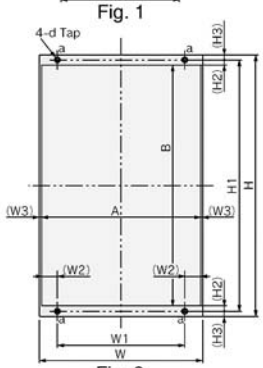
The Varispeed G7 inverters under the 200/400 V class 15 kW or less need this attachment for mounting the heatsink externally. This attachment expands the outer dimensions of the width and height of the inverter. (Attachment is not required for inverters of 18.5 kW or more.)

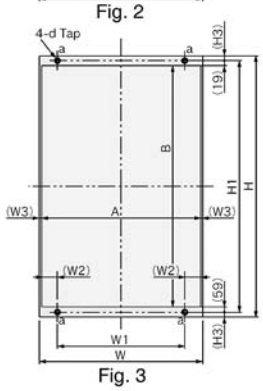


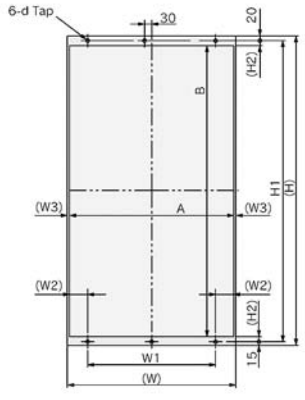
CIMR-G7C□	Attachment order code	Dimensions in mm						
		W	H	W1	H1	D1	D2	D3
20P4	72616 -EZZ08676A	155	302	126	290	122.6	37.4	40
20P7								
21P5								
22P2							57.4	60
23P7								
25P5	72616-EZZ08676B	210	330	180	316	136.1	63.4	70
27P5								
2011	72616-EZZ08676C	250	392	216	372	133.6	76.4	85
2015								
40P4	72616-EZZ08676A	155	302	126	290	122.6	37.4	40
40P7								
41P5							57.4	60
42P2								
43P7								
45P5	72616-EZZ08676B	210	330	180	316	136.1	63.4	70
47P5								
4011	72616-EZZ08676C	250	392	216	372	133.6	76.4	85
4015								

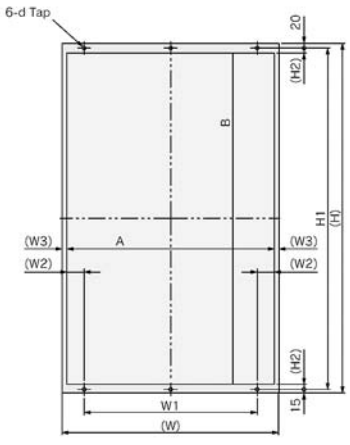
Panel cut for external mounting of cooling fin (heatsink)









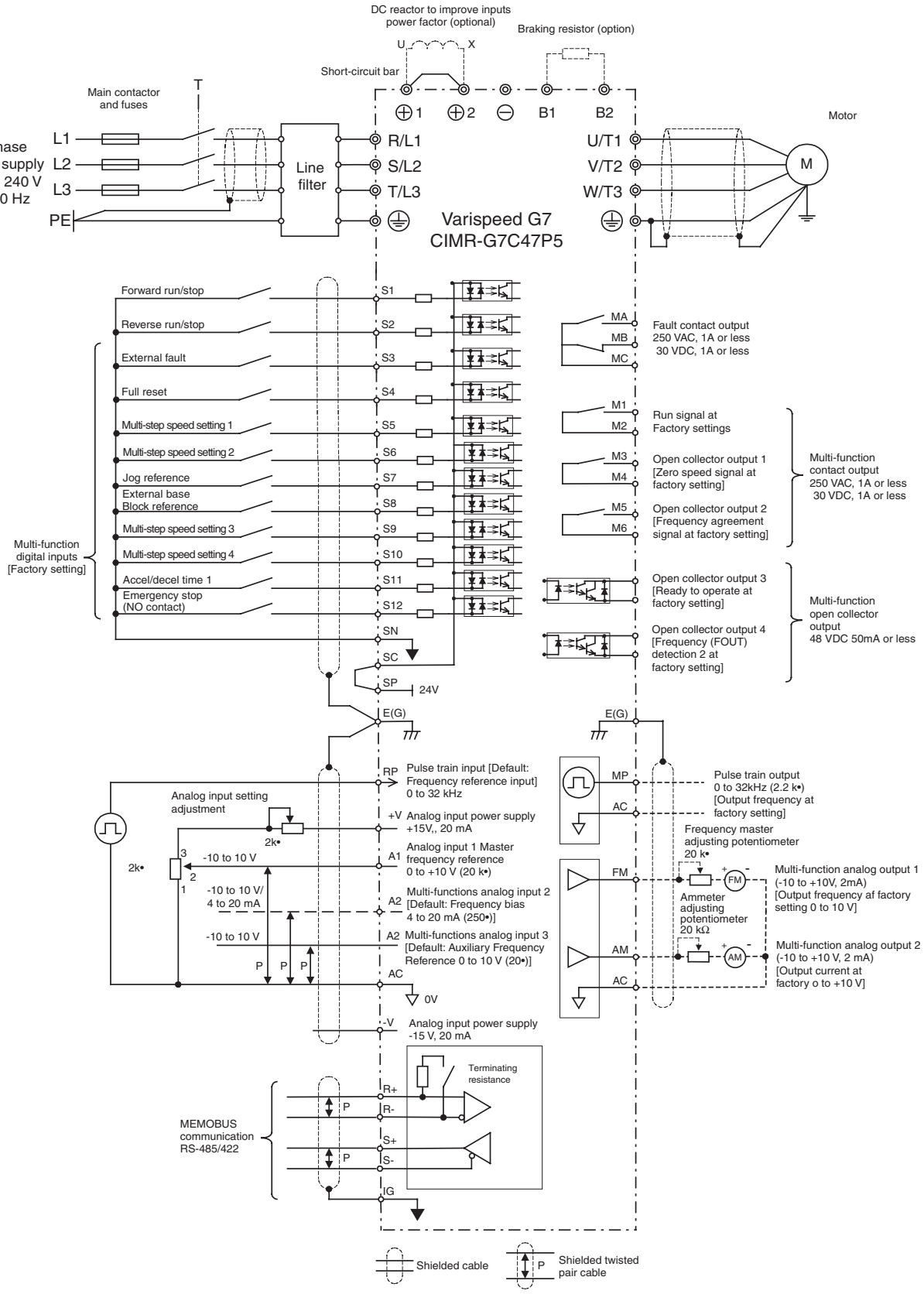


CIMR-G7C□	Fig	Dimensions in mm									
		W	H	W1	(W2)	(W3)	H1	(H2)	(H3)	A	B	d
20P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
20P7												
21P5												
22P2												
23P7												
25P5		210	330	180	8.5	6.5	316	9	7	197	298	M6
27P5												
2011		250	392	216		8.5	372	9.5	10	233	353	
2015												
2018	2	250	400	195	24.5	3	385	8	7.5	244	369	
2022		275	450	220			435			269	419	
2030		375	600	250	54.5	8	575	15	12.5	359	545	M10
2037												
2045		450	725	325			700	13.5		434	673	
2055												
2075		500	850	370	57	8	820	19	15	484	782	M12
2090		575	885	445	55	10	855			555	817	
2100												
40P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
40P7												
41P5												
42P2												
43P7												
45P5		210	330	180	8.5	6.5	316	9	7	197	298	M6
47P5												
4011		250	392	216		8.5	372	9.5	10	233	353	
4015												
4018	2	275	450	220	24.5	3	435	8	7.5	269	419	
4022												
4030		325	550	260		8	535			309	519	
4037												
4045												
4055		450	725	325	54.5		700	13.5	12.5	434	673	M10
4075												
4090		500	850	370	57		820	19	15	484	782	M12
4110												
4132	3	575	925	445	55	10	895	see[1]	15	555	817	
4160												
4185	4	710	1305	540	76.5	8.5	1270	21.5	see[1]	693	1227	
4220												
4300	5	916	1475	730	72.5	20.5	1440	21.5	see[1]	875	1397	

1.The sizes are different between the top and the bottom. Refer to figs. 3 to 5

Installation

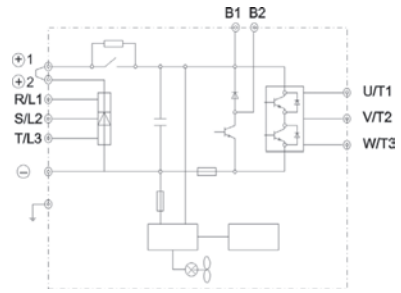
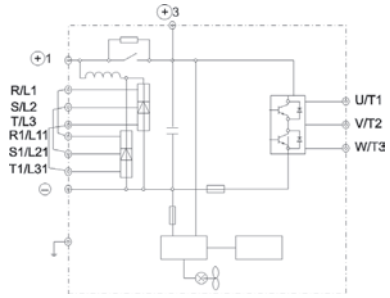
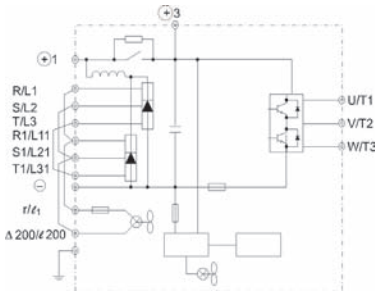
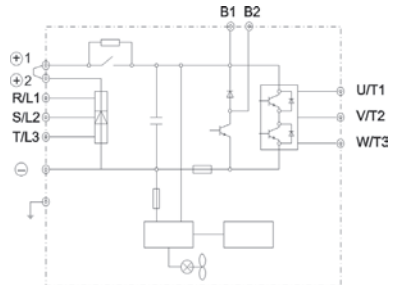
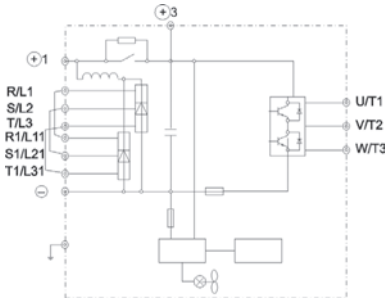
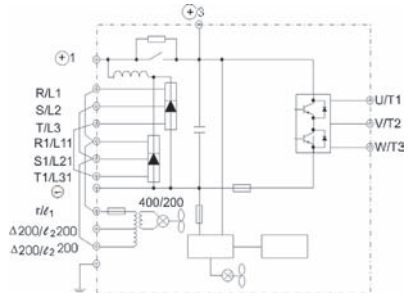
Standard connections



Main circuit

Voltage	200 V			400 V		
Model CIMR-G7C□	20P4 to 2015	2018, 2022	2030 to 2110	40P4 to 4015	4018 to 4045	4055 to 4300
Max. applicable motor output	0.4 to 15 kW	18.5 to 22 kW	30 to 110 kW	0.4 to 15 kW	18.5 to 45 kW	55 to 300 kW
R/L1	Main circuit input power supply	Main circuit input power supply		Main circuit input power supply	Main circuit input power supply	
S/L2						
T/L3						
R1/L11	---	R-R1, S-S1 and T-T1 have been wired before shipment (see P59).		---	R-R1, S-S1 and T-T1 have been wired before shipment	
S1/L21						
T1/L31						
U/T1	Inverter output			Inverter output		
V/T2						
W/T3						
B1	Braking resistor unit	------		Braking resistor unit	------	
B2						
⊖	•DC reactor (⊕1- ⊕2) •DC power supply[1] (⊕1 -⊖)	•DC power supply (⊕1- ⊕2)[1] •Braking unit (⊕3 - ⊖)		•DC reactor (⊕1- ⊕2) •DC power supply[1] (⊕1 - ⊖)	•DC power supply (⊕1- ⊕2)[1] •Braking unit (⊕3 - ⊖)	
⊕1						
⊕2						
⊕3	---			---		
⏚/l_2	------		Cooling fan power supply[2]	---		
r/l_1				---		Cooling fan power supply[3]
⏚ 200 / l_2 200	------					
⏚ 400 / l_2 400						
⏚	Ground terminal (100 Ω or less)			Ground terminal (10 Ω or less)		

1. ⊕1 - ⊖ DC power input does not conform to UL/c-UL listed standard.
2. Cooling fan power supply r/l_1- ⏚/l_2: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz
   (A transformer is required for 230 V 50 Hz or 240 V 50/60 Hz power supply.)
3. Cooling fan power supply r/l_1 - ⏚ 200 / l_2 200: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz, r/l_1 - ⏚ 400 / l_2 400: 380 to 480 VAC 50/60 Hz

	Main circuit configuration		
200V class	CIMR-G7C20P4 to 2015 	CIMR-G7C2018, 2022 	CIMR-G7C2030 to 2110 
400V class	CIMR-G7C40P4 to 4015 	CIMR-G7C4018 to 4045 	CIMR-G7C4055 to 4300 

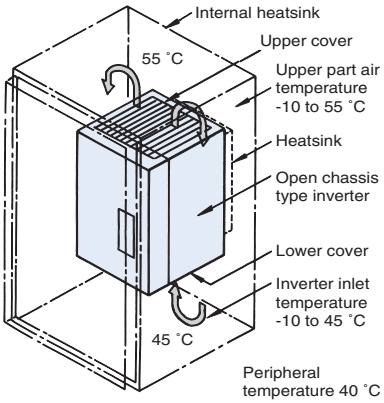
1. For 200 V class filters, consult with standard OMRON supplier.

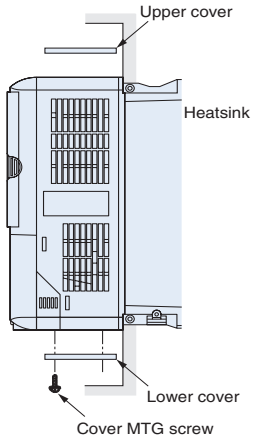
Control circuit

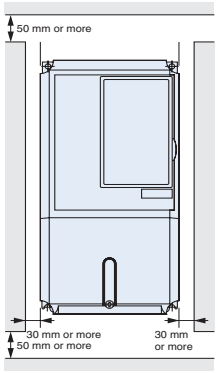
Type	No.	Signal name	Function	Signal level
Sequence input	S1	Forward run/stop signal	Forward run at “closed”, stop at “open”	Photo-coupler input +24 VDC 8 mA isolation
	S2	Reverse run/stop signal	Reverse run at “closed”, stop at “open”	
	S3	Multi-function input selection 1	Factory setting: external fault at “closed”	
	S4	Multi-function input selection 2	Factory setting: fault reset at “closed”	
	S5	Multi-function input selection 3	Factory setting: multi-step speed setting 1 is valid at “closed”	
	S6	Multi-function input selection 4	Factory setting: multi-step speed setting 2 is valid at “closed”	
	S7	Multi-function input selection 5	Factory setting: JOG run at “closed”	
	S8	Multi-function input selection 6	Factory setting: external baseblock at “closed”	
	S9	Multi-function input selection 7	Factory setting: multi-step speed setting 3 is valid at “closed”	
	S10	Multi-function input selection 8	Factory setting: multi-step speed setting 4 is valid at “closed”	
	S11	Multi-function input selection 9	Factory setting: accel/decel time setting 1 is valid at “closed”	
	S12	Multi-function input selection 10	Factory setting: emergency stop (NO contact) is valid at “closed”	
	SC	Sequence control input common	–	
Analog input	+V	+15 V power supply output	For analog reference +15 V power supply	+15 V (allowable current 20 mA max.)
	–V	–15 V power supply output	For analog reference -15 V power supply	-15 V (allowable current 20 mA max.)
	A1	Master speed frequency reference	-10 to +10 V/ -100 to +100%, 0 to +10 V/ 100%	-10 to +10 V, 0 to +10V (input impedance 20 k)
	A2	Multi-function analog input	4 to 20 mA/100%, -10 to +10 V/ -100 to +100%, 0 to +10 V/ 100% Factory setting: added to the terminal A1 (H3-09=0)	4 to 20 mA (input impedance 250 Ω)
	A3	Master speed frequency reference	-10 to +10 V/ -100 to +100%, 0 to +10 V/ 100% Factory setting: preset frequency reference	0 to +10 V (input impedance 20 kΩ)
	AC	Analog common	0 V	–
	E(G)	Connection to shield wire and option ground wire	–	–
Photo-coupler output	P1	Multi-function PHC output 1	Factory setting: zero speed signal “Closed” at or below zero speed level (b2-01)	+48 VDC 50 mA or less
	P2	Multi-function PHC output 2	Factory setting: frequency agreement “Closed” within ±2Hz of setting frequency	
	PC	Photo-coupler output common	–	
	P3	Multi-function PHC output 3	Factory setting: ready to operate (READY).	
	C3			
	P4	Multi-function PHC output 4	Factory setting: frequency (FOUT) detection 2	
	C4			
Relay output	MA	Fault output (NO contact)	Fault at “closed” between terminals MA and MC	Dry contact, contact capacity 250 VAC 1 A or less 30 VDC 1 A or less
	MB	Fault output (NC contact)	Fault at “open” between terminals MB and MC	
	MC	Rely contact output common	–	
	M1	Multi-function contact output (NO contact)	Factory setting: run signal Running at “closed” between terminals M1 and M2	
	M2			
Analog monitor output	FM	Multi-function analog monitor 1	Factory setting: output frequency 0 to 10 V/100% freq.	0 to +10 VDC ±5% 2 mA or less
	AM	Multi-function analog monitor 2	Factory setting: current monitor 5 V / inverter rated current	
	AC	Analog common	–	
Pulse I/O	RP	Multi-function pulse input	Factory setting: frequency reference input (H6-01=0)	0 to 32 kHz (3 kΩ)
	MP	Multi-function pulse monitor	Factory setting: output frequency (H6-06=2)	0 to 32 kHz (2.2 kΩ)
RS-485/422	R+	MEMOBUS communications input	For 2-wire RS-485, short R+ and S+ as well as R- and S-.	Differential input, photocoupler isolation
	R-			
	S+	MEMOBUS communications output		Differential input, photocoupler isolation
	S-			
	IG	Signal common	–	–

Remove the upper and lower covers for the models of 15 kW or less in 200 V and 400 V classes.

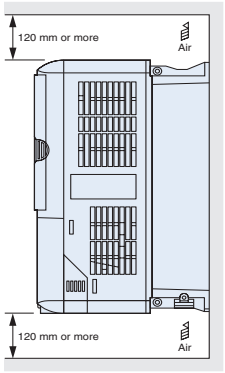
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.







Side spaces



Top and bottom spaces

Inverter heat loss

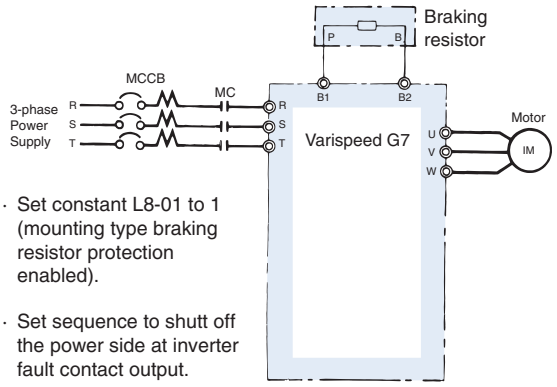
200 V class

Model CIMR-G7C☐			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Inverter capacity		kVA	1.2	2.3	3.0	4.6	6.9	10	13	19	25	30	37	50	61	70	85	110	140	160
Rated current		A	3.2	6	8	12	18	27	34	49	66	80	96	130	160	183	224	300	358	415
Heat loss W	Fin	W	21	43	58	83	122	187	263	357	473	599	679	878	1080	1291	1474	2009	1660	2389
	Inside unit	W	36	42	47	53	64	87	112	136	174	242	257	362	434	510	607	823	871	1194
	Total heat loss	W	57	85	105	136	186	274	375	493	647	839	936	1240	1514	1801	2081	2832	2531	3583
Fin coding			Self cooled			Fan cooled														

400 V class

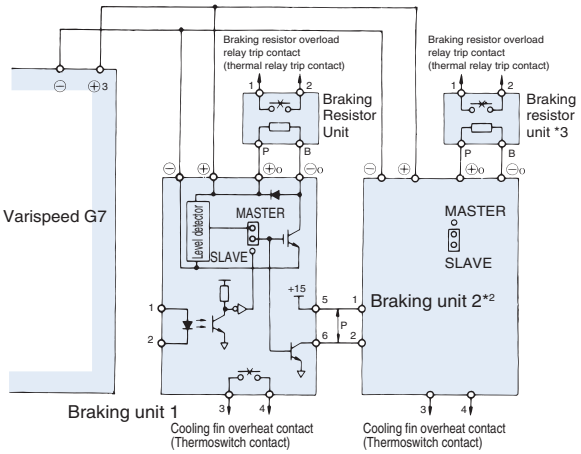
Model CIMR-G7C☐			40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Inverter capacity		kVA	1.4	2.6	3.7	4.7	6.9	11	16	21	26	32	40	50	61	74	98	130	150	180	194	230	280	340	460
Rated current		A	1.8	3.4	4.8	6.2	9	15	21	27	34	42	52	65	80	97	128	165	195	240	255	302	370	450	605
Heat loss W	Fin	W	10	21	33	41	76	132	198	246	311	354	516	633	737	929	1239	1554	1928	2299	2612	3614	4436	5329	6749
	Inside unit	W	39	44	46	49	64	79	106	116	135	174	210	246	285	340	488	596	762	928	1105	1501	1994	2205	2941
	Total heat loss	W	49	65	79	90	140	211	304	362	446	528	726	879	1022	1269	1727	2150	2690	3227	3717	5115	6430	7534	9690
Fin coding			Self cooled		Fan cooled																				

Connections for braking units



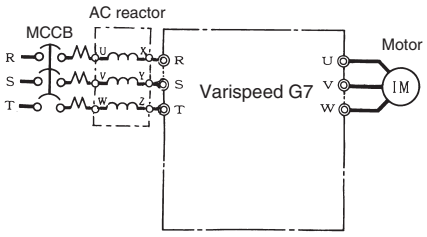
- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

Connections for braking resistors

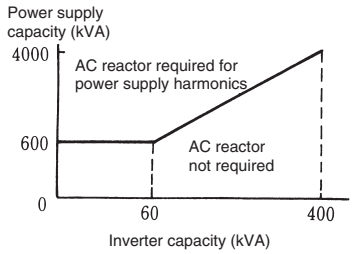


AC reactor

Connection example

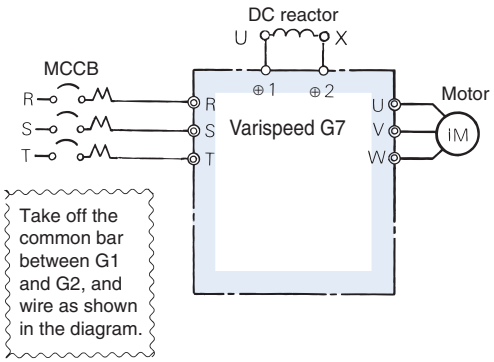


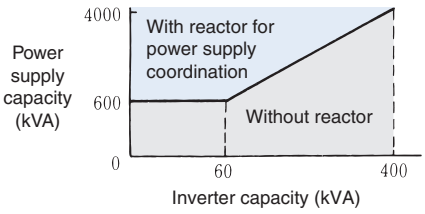
Application example



200 V Class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	2.5	4.2	0.4	1.3	18.0
0.75	5	2.1	0.75	2.5	8.4
1.5	10	1.1	1.5	5	4.2
2.2	15	0.71	2.2	7.5	3.6
3.7	20	0.53	3.7	10	2.2
5.5	30	0.35	5.5	15	1.42
7.5	40	0.265	7.5	20	1.06
11	60	0.18	11	30	0.7
15	80	0.13	15	40	0.53
18.5	90	0.12	18.5	50	0.42
22	120	0.09	22	60	0.36
30	160	0.07	30	80	0.26
37	200	0.05	37	90	0.24
45	240	0.044	45	120	0.18
55	280	0.038	55	150	0.15
75	360	0.026	75	200	0.11
90	500	0.02	90/110	250	0.09
110	500	0.02	132/160	330	0.06
			185	490	0.04
			220		
			300	660	0.03

DC reactor





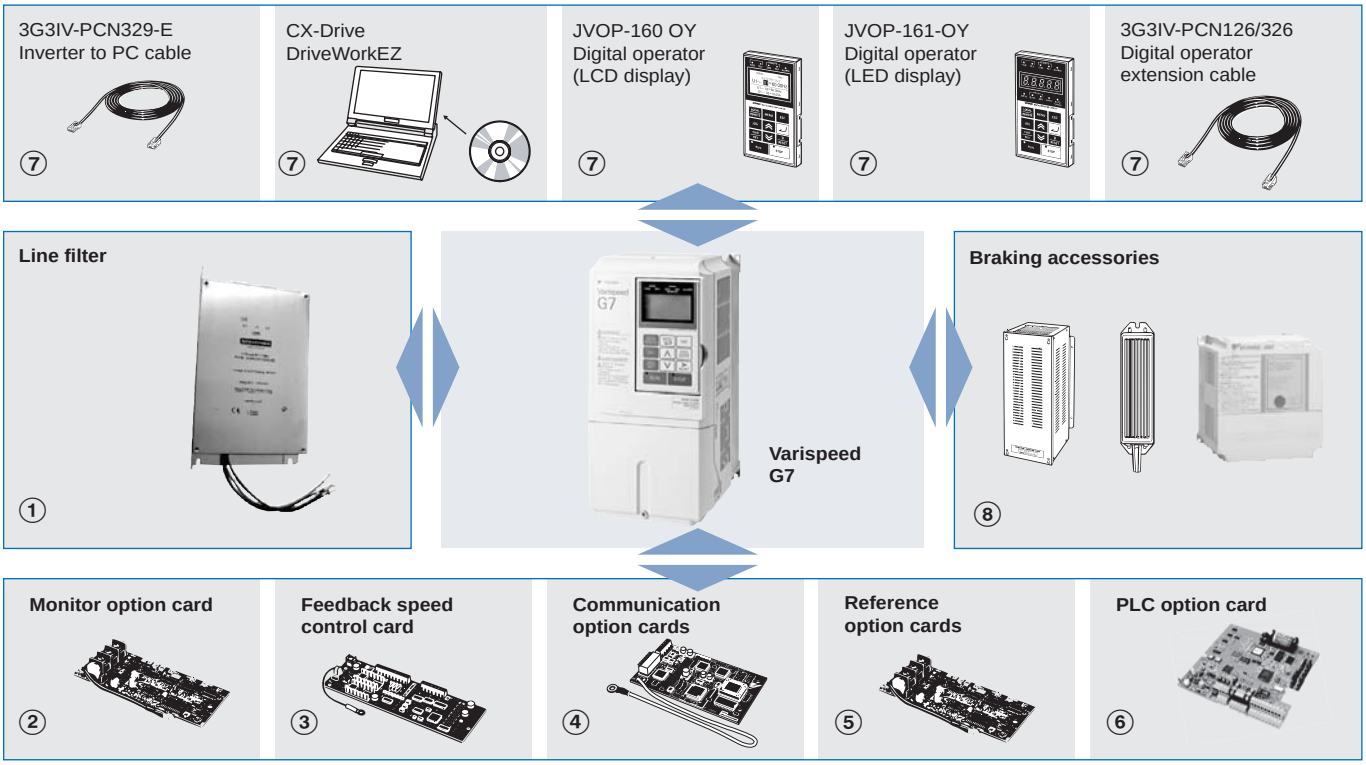
200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	5.4	8	0.4	3.2	28
0.75			0.75		
1.5	18	3	1.5	5.7	11
2.2			2.2		
3.7			3.7	12	6.3
5.5	36	1	5.5	23	3.6
7.5			7.5		
11	72	0.5	11	33	1.9
15			15		
18.5	90	0.4	18.5	47	1.3
22 to 110	Built-in		22 to 300	Built-in	

Fuse installation

To protect the inverter, it is recommended to use semiconductor fuses as shown in the table below

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
20P4	240	10	12~25
20P7	240	15	23~55
21P5	240	20	34~98
22P2	240	30	82~220
23P7	240	40	220~610
25P5	240	60	290~1300
27P5	240	80	450~5000
2011	240	100	1200~7200
2015	240	130	1800~7200
2018	240	150	870~16200
2022	240	180	1500~23000
2030	240	240	2100~19000
2037	240	300	2700~55000
2045	240	350	4000~55000
2055	240	450	7100~64000
2075	240	550	11000~64000
2090	240	600	13000~83000
2110	240	700	13000~83000
40P4	480	5	16~660
40P7	480	10	19~660
41P5	480	10	46~660
42P2	480	15	78~660
43P7	480	20	110~660
44P0	480	25	220~660
45P5	480	30	240~900
47P5	480	40	320~900
4011	480	50	1000~18000
4015	480	60	1500~4100
4018	480	70	530~5800
4022	480	90	1130~5800
4030	480	110	1700~5800
4037	480	140	2000~13000
4045	480	160	3000~13000
4055	480	220	6800~55000
4075	480	300	3800~55000
4090	480	330	12000~23000
4110	480	400	18000~64000
4132	480	450	28000~25000
4160	480	540	40000~250000
4185	480	750	63000~400000
4220	480	750	63000~400000
4300	480	1000	94000~920000

Ordering information



Varispeed G7



200 V

Inverter Model	Line Filters			
Varispeed G7	Type	EN55011 Class	Current (A)	Weight (kg)
CIMR-G7C20P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-G7C20P7				
CIMR-G7C21P5	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-G7C22P2	3G3RV-PFI2035-SE	B, 25 m A, 100 m	35	1.4
CIMR-G7C23P7				
CIMR-G7C25P5	3G3RV-PFI2060-SE	B, 25 m A, 100 m	60	3
CIMR-G7C27P5				
CIMR-G7C2011	3G3RV-PFI2100-SE	B, 25 m A, 100 m	100	4.9
CIMR-G7C2015				
CIMR-G7C2018				
CIMR-G7C2022	3G3RV-PFI2130-SE	A, 100 m	130	4.3
CIMR-G7C2030	3G3RV-PFI2160-SE	A, 100 m	160	6.0
CIMR-G7C2037	3G3RV-PFI2200-SE	A, 100 m	200	11.0
CIMR-G7C2045				
CIMR-G7C2055	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-G7C2075				
CIMR-G7C2090				
CIMR-G7C2110	3G3RV-PFI3600-SE	A, 100 m	600	11.0

400 V

Inverter Model	Line Filters			
Varispeed G7	Type	EN55011 Class	Current (A)	Weight (kg)
CIMR-G7C40P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-G7C40P7				
CIMR-G7C41P5				
CIMR-G7C42P2	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-G7C43P7				
CIMR-G7C44P0				
CIMR-G7C45P5	3G3RV-PFI3021-SE	B, 25 m A, 100 m	21	1.8
CIMR-G7C47P5	3G3RV-PFI3035-SE	B, 25 m A, 100 m	35	2.2
CIMR-G7C4011	3G3RV-PFI3060-SE	B, 25 m A, 100 m	60	4.0
CIMR-G7C4015				
CIMR-G7C4018	3G3RV-PFI3070-SE	B, 25 m A, 100 m	70	3.4
CIMR-G7C4022				
CIMR-G7C4030	3G3RV-PFI3100-SE	A, 100 m	100	4.5
CIMR-G7C4037				
CIMR-G7C4045	3G3RV-PFI3130-SE	A, 100 m	130	4.7
CIMR-G7C4055	3G3RV-PFI3170-SE	A, 100 m	170	6.0
CIMR-G7C4075	3G3RV-PFI3200-SE	A, 100 m	250	11
CIMR-G7C4090	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-G7C4110				
CIMR-G7C4132				
CIMR-G7C4160				
CIMR-G7C4185	3G3RV-PFI3600-SE	A, 100 m	600	11
CIMR-G7C4220	3G3RV-PFI3800-SE	A, 100 m	800	31.0
CIMR-G7C4300				

① Line filters



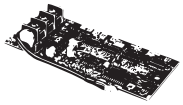
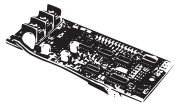
200 V

Inverter model	Line filters			
Varispeed G7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-G7C20P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-G7C20P7				
CIMR-G7C21P5	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-G7C22P2	3G3RV-PFI2035-SE	B, 25 m A, 100 m	35	1.4
CIMR-G7C23P7				
CIMR-G7C25P5	3G3RV-PFI2060-SE	B, 25 m A, 100 m	60	3
CIMR-G7C27P5				
CIMR-G7C2011	3G3RV-PFI2100-SE	B, 25 m A, 100 m	100	4.9
CIMR-G7C2015				
CIMR-G7C2018				
CIMR-G7C2022	3G3RV-PFI2130-SE	A, 100 m	130	4.3
CIMR-G7C2030	3G3RV-PFI2160-SE	A, 100 m	160	6.0
CIMR-G7C2037	3G3RV-PFI2200-SE	A, 100 m	200	11.0
CIMR-G7C2045				
CIMR-G7C2055	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-G7C2075				
CIMR-G7C2090				
CIMR-G7C2110	3G3RV-PFI3600-SE	A, 100 m	600	11.0

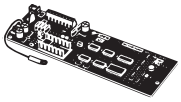
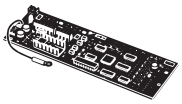
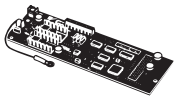
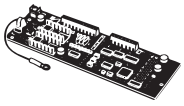
400 V

Inverter model	Line filters			
Varispeed G7	Model	EN 55011 class	Current (A)	Weight (kg)
CIMR-G7C40P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-G7C40P7				
CIMR-G7C41P5				
CIMR-G7C42P2	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-G7C43P7				
CIMR-G7C44P0				
CIMR-G7C45P5	3G3RV-PFI3021-SE	B, 25 m A, 100 m	21	1.8
CIMR-G7C47P5	3G3RV-PFI3035-SE	B, 25 m A, 100 m	35	2.2
CIMR-G7C4011	3G3RV-PFI3060-SE	B, 25 m A, 100 m	60	4.0
CIMR-G7C4015				
CIMR-G7C4018	3G3RV-PFI3070-SE	B, 25 m A, 100 m	70	3.4
CIMR-G7C4022				
CIMR-G7C4030	3G3RV-PFI3100-SE	A, 100 m	100	4.5
CIMR-G7C4037				
CIMR-G7C4045	3G3RV-PFI3130-SE	A, 100 m	130	4.7
CIMR-G7C4055	3G3RV-PFI3170-SE	A, 100 m	170	6.0
CIMR-G7C4075	3G3RV-PFI3200-SE	A, 100 m	250	11
CIMR-G7C4090	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-G7C4110				
CIMR-G7C4132				
CIMR-G7C4160				
CIMR-G7C4185	3G3RV-PFI3600-SE	A, 100 m	600	11.0
CIMR-G7C4220	3G3RV-PFI3800-SE	A, 100 m	800	31.0
CIMR-G7C4300				

② Monitor option cards

Type	Model	Description	Function
Monitor option card	AO-08 / 3G3IV-PAO08 	Analog monitor card	• Outputs analog signal for monitoring inverter output state (output freq., output current etc.) after absolute value conversion. • Output resolution: 8 bits (1/256) • Output voltage: 0 to {10 V (non isolated) EOutput channel: 2 channels
	AO-12 / 3G3IV-PAO12 		• Outputs analog signal for monitoring inverter output state (output freq., output current etc.) • Output resolution: 11 bits (1/2048) + code • Output voltage: I10 to {10 V (non isolated) EOutput channel: 2 channels
	DO-08 / 3G3IV-PDO08	Digital output card	• Outputs isolated type digital signal for monitoring inverter run state (alarm signal, zero speed detection etc.) . • Output channel: photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels (250 VAC, 1 A or less 30 VDC, 1 A or less)
	DO-02C / 3G3IV-PDO02C	2C-relay output card	• Two multi-function contact outputs (2C-relay) can be used other than those of the inverter proper unit.

③ Feedback speed control cards

Type	Model	Description	Function
Feedback speed control card	PG-A2 / 3G3FV-PPGA2 	PG speed controller card (used for V/f control with PG or flux vector)	• Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] • Pulse monitor output: +12 V, 20 mA
	PG-B2 / 3G3FV-PPGB2 		• Phase A and B pulse inputs (exclusively for complementary input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, Max. current 200 mA] • Pulse monitor output: Open collector, +24 V, Max. current 30 mA
	PG-D2 / 3G3FV-PPGD2 		• Phase A pulse (differential pulse) input for V/f control (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] • Pulse monitor output: RS-422
	PG-X2 / 3G3FV-PPGX2 		• Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, Max. current 200 mA] • Pulse monitor output: RS-422

④ Communication option cards

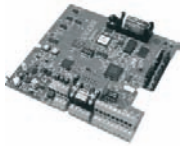
Type	Model	Description	Function
Communication option card	SI-N1	DeviceNet option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.
	SI-P1	PROFIBUS-DP option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.
	SI-S1	CANopen option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.
	SI-J	LONWORKS option card	• Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.
	SI-T	MECHATROLINK-II option board	• High speed motion bus • Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. • Host contoller: Trajexia, MCH and MP series [1]
	CM090	Ethernet option card	• Modbus TCP/IP ethernet interface unit

1. Please refer to Trajexia, MCH or MP series for host controllers detailed information.

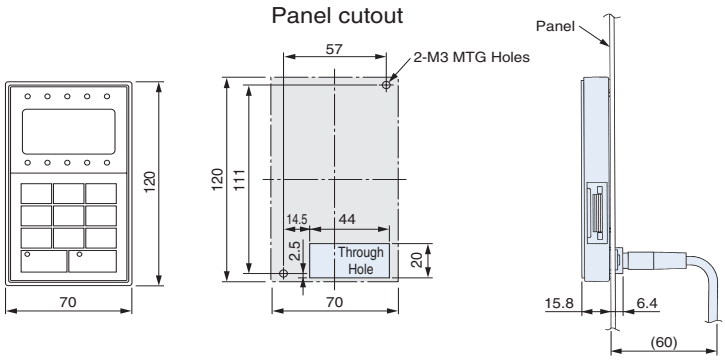
⑤ Reference option cards

Type	Model	Description	Function
Reference option card	AI-14U / 3G3IV-PAI14U	Analog input card	• 2 channel high resolution analog input card • Channel 1: 0 to 10 V (20 KΩ) • Channel 2: 4 to 20 mA (250 Ω) • Resolution 14 bit
	AI-14B / 3G3IV-PAI14B		• 3 Channel high resolution analog input card • Signal level: -10 to +10 V (20 KΩ) • 4 to 20 mA (250 Ω) •Resolution: 13 bit + sign
	DI-08 / 3G3IV-PDI08	Digital reference card	• 8 bit digital speed reference input card
	DI-16H2 / 3G3IV-PDI16H2		• 16 bit digital speed reference input card

⑥ PLC option boards

Type	Model	Description	Function
PLC option	3G3RV-P10ST8-E  3G3RV-P10ST8-DRT-E	PLC option	• Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. • Embedded Compubus/S fieldbus • Standard OMRON tools can be used for programming
		PLC option with DeviceNet	• Same features as standard models with DeviceNet support.

⑦ Accessories

Type	Model	Description	Installation
Digital operator	JVOP-160-OY 	5 lines LCD digital operator 7 language support	 Panel cutout installation
	JVOP-161-OY 	7 segment LED digital operator	
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	-----
	3G3IV-PCN329-E	PC configuration cable	-----

⑦ Accessories

Type	Model	Description	Function
Software	CX-drive 1.1	Computer software	Configuration and monitoring software tool for drives (Version 1.1 or higher)
	DriveWorksEZ	Computer software	Programming special functionality software tool for drives
	CX-One	Computer software	Complete automation software including CX-drive.

⑧ Braking unit, braking resistor unit

Inverter			Braking unit		Braking resistor unit[1]									
					Inverter-mounted type (3 %ED, 10 sec max)[2]				Separately-installed type (10 %ED, 10 sec. max.)[3]					
Voltage	Max. applicable motor output kW	Model CIMR-G7C_	Model CDBR_	No. of used	Model ERF-150WJ_	Resis-tance	No. of Used	Braking torque %	Model LKEB_	Specifications of resistor		No. of Used	Braking torque %	Connectable min resistance value Ω
200 V class	0.4	20P4	Built-in		201	200 Ω	1	220	20P7	70 W	200 Ω	1	220	48
	0.75	20P7			201	200 Ω	1	125	20P7	70 W	200 Ω	1	125	48
	1.5	21P5			101	100 Ω	1	125	21P5	260 W	100 Ω	1	125	48
	2.2	22P2			700	70 Ω	1	120	22P2	260 W	70 Ω	1	120	16
	3.7	23P7			620	62 Ω	1	100	23P7	390 W	40 Ω	1	125	16
	5.5	25P5			---	---			25P5	520 W	30 Ω	1	115	16
	7.5	27P5							27P5	780 W	20 Ω	1	125	9.6
	11	2011							2011	2400 W	13.6 Ω	1	125	9.6
	15	2015							2015	3000 W	10 Ω	1	125	9.6
	18.5	2018							2015	3000 W	10 Ω	1	125	9.6
	22	2022	2022B	1					2022	4800 W	6.8 Ω	1	125	6.4
	30	2030	2015B	2					2015	3000 W	10 Ω	2	125	9.6
	37	2037	2015B	2					2015	3000 W	10 Ω	2	100	9.6
	45	2045	2022B	2					2022	4800 W	6.8 Ω	2	120	6.4
	55	2055	2022B	2					2022	4800 W	6.8 Ω	2	100	6.4
	75	2075	2110B	1					2022	4800 W	6.8 Ω	3	110	1.6
	90	2090	2110B	1					2022	4800 W	6.8 Ω	4	120	1.6
	110	2110	2110B	1					2018	4800 W	8 Ω	5	100	1.6
400 V class	0.4	40P4	Built in		751	750 Ω	1	230	40P7	70 W	750 Ω	1	230	96
	0.75	40P7			751	750 Ω	1	130	40P7	70 W	750 Ω	1	130	96
	1.5	41P5			401	400 Ω	1	125	41P5	260 W	400 Ω	1	125	64
	2.2	42P2			301	300 Ω	1	115	42P2	260 W	250 Ω	1	135	64
	3.7	43P7			201	200 Ω	1	110	43P7	390 W	150 Ω	1	135	32
	4.0	44P0												
	5.5	45P5			---	---			45P5	520 W	100 Ω	1	135	32
	7.5	47P5							47P5	780 W	75 Ω	1	130	32
	11	4011							4011	1040 W	50 Ω	1	135	20
	15	4015							4015	1560 W	40 Ω	1	125	20
	18.5	4018							4018	4800 W	32 Ω	1	125	19.2
	22	4022	4030B	1					4022	4800 W	27.2 Ω	1	125	19.2
	30	4030	4030B	1					4030	6000 W	20 Ω	1	125	19.2
	37	4037	4045B	1					4037	9600 W	16 Ω	1	125	12.8
	45	4045	4045B	1					4045	9600 W	13.6 Ω	1	125	12.8
	55	4055	4030B	2					4030	6000 W	20 Ω	2	135	19.2
	75	4075	4045B	2					4045	9600 W	13.6 Ω	2	145	12.8
	90	4090	4220B	1					4030	6000 W	20 Ω	3	100	3.2
	110	4110	4220B	1					4030	6000 W	20 Ω	3	100	3.2
	132	4132	4220B	1					4045	9600 W	13.6 Ω	4	140	3.2
	160	4160	4220B	1					4045	9600 W	13.6 Ω	4	140	3.2
	185	4185	4220B	1					4045	9600 W	13.6 Ω	4	120	3.2
	220	4220	4220B	1					4037	9600 W	16 Ω	5	110	3.2
	300	4300	4220B	2					4045	9600 W	13.6 Ω	6	110	3.2

1. When connecting a mounting type resistor or braking resistor unit, set system constant L3-04 to 0 (stall prevention disabled during deceleration). If operating without changing the constant, motor does not stop at set deceleration time.
2. When connecting mounting type braking resistor, set system constant L8-01 to 1 (braking resistor protection enabled).
3. Load factor during deceleration to stop a load with constant torque. With constant output or continuous regenerative braking, the load factor is smaller than the specified value.
4. Resistance value per one braking unit. Select a resistance value that is larger than connectable minimum resistance value to obtain enough braking torque.
5. For an application with large regenerative power such as hoisting, the braking torque or other items may exceed the capacity of a braking unit with a braking resistor in a standard combination (can result in capacity overload). Contact your OMRON representatives when the braking torque or any other item exceeds the values in the table.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I37E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

CIMR-F7Z

Varispeed F7



The industrial workhorse

- Flux vector control with or without PG
- Silent operation. No current de-rating in silent mode.
- Torque control
- PID control
- Powerful application oriented functionality
- Stand still autotuning
- High slip braking
- Energy saving function.
- Standard LCD operator
- Standard RS485 communications - Modbus
- Fieldbus options: DeviceNet, PROFIBUS, CANOpen
- Embedded OMRON PLC functionality with PLC option card.
- PC configuration tool: CX-Drive.
- CE, UL, and cUL marking

Customized software *

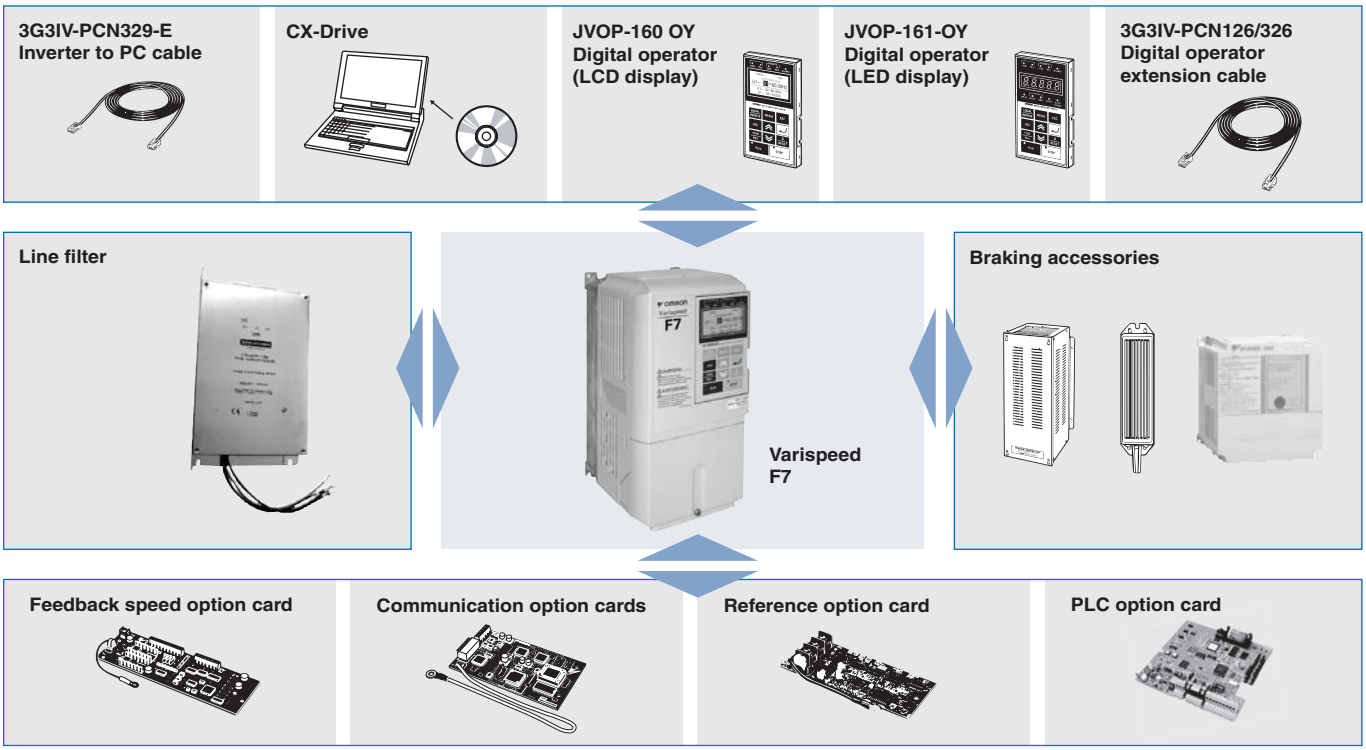
- The inverter software can be customized to meet specific application. Examples:
- Electronic line shaft (S-8169)
- Crane software (S-7071)

* For detailed information please see CASE software section.

Ratings

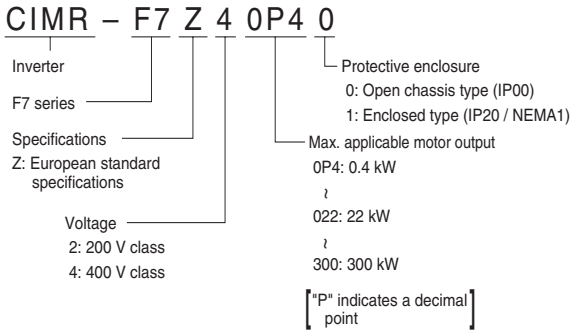
- 200 V Class three-phase 0.4 to 110 kW
- 400 V Class three-phase 0.4 to 300 kW

System configuration



Specifications

Type designation



200 V class

Model CIMR-F7Zo		20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output[1] kW		0.55	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter capacity kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
	Rated current A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415[2]
	Max. voltage	3-phase, 200/208/220/230/240 V (proportional to input voltage)																	
	Max. output frequency	Heavy duty (low carrier, constant torque applications): 150 Hz max Normal duty 1 or 2 (high/reduced carrier, variable torque applications): 400 Hz max																	
Power supply	Rated input voltage and frequency	3-phase 200/208/220/230/240 V, 50/60 Hz[3]																	
	Allowable voltage fluctuation	+10%, -15%																	
	Allowable frequency fluctuation	±5%																	
Harmonic wave prevention	DC reactor	Option										Provided							
	12-pulse input	Not available										Available[4]							

1. Our standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
2. 322 A in case of heavy duty mode
3. When using the inverter of 200 V class 37 kW or more with a cooling fan of three-phase 230 V 50 Hz or 240 V 50/60 Hz power supply, a transformer for the cooling fan is required.
4. A 3-wired transformer is required at 12-pulse input.

400 V class

Model CIMR-F7Zo		40P4	40P7	41P5	42P2	43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Max. applicable motor output[1] kW		0.55	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter capacity kVA	1.4	1.6	2.8	4.0	5.8	6.6	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
	Rated current A	1.8	2.1	3.7	5.3	7.6	8.7	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506[2]	675[3]
	Max. voltage	3-phase, 380/400/415/440/460/480 V (proportional to input voltage)																							
	Max. output frequency	Heavy duty (low carrier, constant torque applications): 150 Hz max Normal duty 1 or 2 (high/reduced carrier, variable torque applications): 400 Hz max																							
Power supply	Rated input voltage and frequency	3-phase 380/400/415/440/460/480 V, 50/60 Hz																							
	Allowable voltage fluctuation	+10%, -15%																							
	Allowable frequency fluctuation	±5%																							
Harmonic wave prevention	DC reactor	Option											Provided												
	12-Pulse input	Not available											Available[4]												

1. Our standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
2. 405 A in case of heavy duty mode
3. 540 A in case of heavy duty mode
4. A 3-wired transformer is required at 12-pulse input.

Common specifications

Enclosures

	Model CIMR-F7Z□	20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
200 V class	Enclosed type - IP20)	Available as standard										Available for option						N/A	
	Open chassis type -IP00	Available by removing the upper and lower cover of enclosed type										Available as standard							

	Model CIMR-F7Z□	40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
400 V class	Enclosed type - IP20	Available as standard										Available for option										N/A		
	Open chassis type - IP00	Available by removing the upper and lower cover of enclosed type										Available as standard												

Common specifications

	Model number CIMR-F7Z□	Specification
Control characteristics	Control method	Sine wave PWM Closed loop vector control, open loop vector control, V/f control, V/f with PG control
	Torque characteristics	Heavy duty (low carrier, constant torque applications): 2 kHz carrier frequency, 150% overload for 1 minute, higher carrier frequency possible with current derating. Normal duty 1 (high carrier, variable torque applications): maximum carrier frequency, depending on inverter capacity, 120% overload for 1 minute. Normal duty 2 (variable torque applications): carrier frequency reduced, continuous overload capability increased
	Speed control range	1:40 (V/f control) 1:100 (open loop vector control) 1:1000 (closed loop vector control)
	Speed control accuracy	± 3% (V/f control) ± 0.03% (V/f control with PG) ± 0.2% (open loop vector control) ± 0.02% (closed loop vector control) (25 °C ± 10 °C)
	Speed control response	5 Hz (control without PG) 30 Hz (control with PG)
	Torque limits	Provided (4 quadrant steps can be changed by constant settings.) (Vector control)
	Torque accuracy	± 5%
	Frequency range	0.01 to 150 Hz (Heavy Duty), 0.01 to 400 Hz (Normal Duty 1 or 2)
	Frequency accuracy (temperature characteristics)	Digital references: ± 0.01% (-10 °C to +40 °C)
		Analog references: ± 0.1% (25°C ±10°C)
	Frequency setting resolution	Digital references: 0.01 Hz
		Analog references: 0.025/50 Hz (11 bits plus sign)
	Output frequency resolution	0.01 Hz
	Overload capacity and maximum current	Heavy duty (low carrier, constant torque applications): 150% of rated output current for 1 minute Normal duty 1 or 2 (high/reduced carrier, variable torque applications): 120% of rated output current for 1 minute
	Frequency setting signal	0 to +10V, -10 to +10 V, 4 to 20 mA, pulse train
	Accel/decel time	0.01 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration time settings)
	Braking torque	Approximately 20% (approximately 125% with braking resistor option, braking transistor built into inverters of 18.5 kW or less)
	Main control functions	Restarting after momentary power loss, speed search, overtorque/undertorque detection, torque limits, 17-speed control (maximum), 4 acceleration and deceleration times, S-curve acceleration/deceleration, 3-wire control, auto-tuning (rotational or stationary), dwell function, cooling fan ON/OFF control, slip compensation, torque compensation, auto-restart after fault, jump frequencies, upper and lower limits for frequency references, DC braking for starting and stopping, high-slip braking, advanced PID control, energy-saving control, MEMOBUS communications (RS-485/422, 19.2 kbps maximum), 2 motor parameter sets, fault reset and parameter copy function.
Protective functions	Motor protection	Protection by electronic thermal overload relay.
	Instantaneous overcurrent protection	Stops at approx. 200% of rated output current.
	Fuse blown protection	Stops for fuse blown.
	Overload protection	Heavy duty (low carrier, constant torque applications): 150% of rated output current for 1 minute Normal duty 1 (high carrier, variable torque applications): 120% of rated output current for 1 minute Normal duty 2 (high carrier, variable torque applications): 120% of rated output current for 1 minute, increased continuous output current.
	Overvoltage protection	200 class inverter: stops when main-circuit DC voltage is above 410 V. 400 class inverter: stops when main-circuit DC voltage is above 820 V.
	Undervoltage protection	200 class inverter: stops when main-circuit DC voltage is below 190 V. 400 class inverter: stops when main-circuit DC voltage is below 380 V.
	Momentary power loss ride through	By selecting the momentary power loss method, operation can be continued if power is restored within 2 s.
	Cooling fin overheating	Protection by thermistor.
	Stall prevention	Stall prevention during acceleration, deceleration and running independently.
	Grounding protection	Protection by electronic circuits.
	Charge indicator	Illuminates when the main circuit DC voltage is approx. 10 VDC or more.
Environment	Ambient operating temperature	-10 °C to 40 °C (enclosed wall-mounted type) -10 °C to 45 °C (open chassis type)
	Ambient operating humidity	95% max. (with no condensation)
	Storage temperature	- 20 °C to + 60 °C (short-term temperature during transportation)
	Application site	Indoor (no corrosive gas, dust, etc.)
	Altitude	1000 m max.
	Vibration	10 to 20 Hz, 9.8 m/s^2 max.; 20 to 50 Hz, 2 m/s^2 max

Dimensions

Open chassis type (IEC IP00)

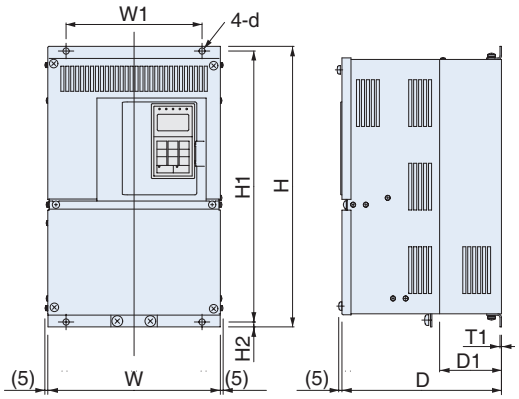


Fig 1

Voltage	Max. applicable motor output kW	Inverter CIMR-F7Z□	Fig	Dimensions in mm									Approx. weight kg	Cooling method
				W	H	D	W1	H1	H2	D1	T1	d		
200 V class (3-phase)	0.4	------	Not available, please use the IP20 type removing the upper and lower cover											
	0.75	------												
	1.5	------												
	2.2	------												
	3.7	------												
	5.5	------												
	7.5	------												
	11	------												
	15	------												
	18.5	------												
	22	2022 0	1	250	400	258	195	385	7.5	100	2.3	M6	21	Fan cooled
	30	2030 0		275	450		220	435					24	
	37	2037 0		375	600	298	250	575	12.5	100	3.2	M10	57	
	45	2045 0				328				130			63	
	55	2055 0		450	725	348	325	700					86	
	75	2075 0											87	
	90	2090 0		500	850	358	370	820	15		4.5	M12	108	
	110	2110 0		575	885	378	445	855		140			150	
400 V class (3-phase)	0.4	------	Not available, please use the IP20 type removing the upper and lower cover											
	0.75	------												
	1.5	------												
	2.2	------												
	4.0	------												
	5.5	------												
	7.5	------												
	11	------												
	15	------												
	18.5	------												
	22	4022 0	1	275	450	258	220	435	7.5	100	2.3	M6	21	Fan cooled
	30	4030 0												
	37	4037 0		325	550	283	260	535		105			36	
	45	4045 0												
	55	4055 0												
	75	4075 0		450	725	348	325	700	12.5	130	3.2	M10	88	
	90	4090 0											89	
	110	4110 0		500	850	358	370	820	15		4.5	M12	102	
	132	4132 0											120	
	160	4160 0		575	916	378	445	855	45.8	140			160	
	185	4185 0		710	1305	413	540	1270	15	125.5			260	
	220	4220 0											280	
	300	4300 0		916	1475	413	730	1440					405	

Enclosed type (IEC IP20)

F7Z 20P41 to F7Z25P51
F7Z40P41 to F7Z45P51

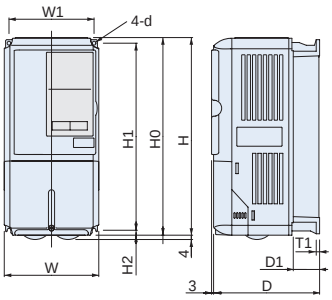


Fig 1

F7Z 27P51 to F7Z20181
F7Z47P51 to F7Z40181

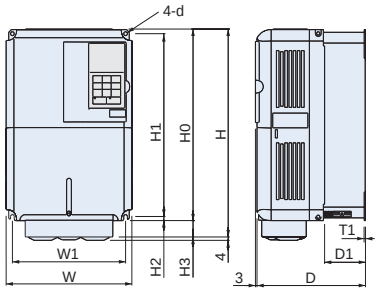


Fig 2

F7Z 20221 to F7Z20751
F7Z40221 to F7Z41601

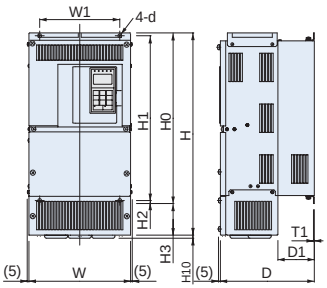
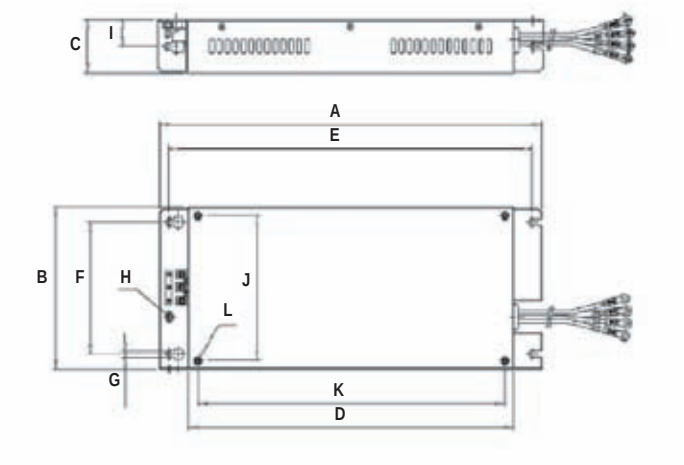


Fig 3

Voltage	Max. applicable motor output kW	Inverter CIMR-F7Z□	Fig	Dimensions in mm											Approx. weight kg	Cooling method
				W	H	D	W1	H0	H1	H2	H3	D1	T1	d		
200 V class (3-phase)	0.4	20P4 1	1	140	280	157	126	280	266	7	---	39	5	M5	3	Self cooled
	0.75	20P7 1														
	1.5	21P5 1														
	2.2	22P2 1														
	3.7	23P7 1				177						59			4	Fan cooled
	5.5	25P5 1														
	7.5	27P5 1	2	200	300	197	186	300	285	8	0	65.5	2.3	M6	6	
	11	2011 1			310						10				7	
	15	2015 1		240	350	207	216	350	335	7.5	0	78			11	
	18.5	2018 1			380						30					
	22	2022 1	3	254	535	258	195	400	385		135	100			24	
	30	2030 1		279	615		220	450	435		165				27	
	37	2037 1		380	809	298	250	600	575	12.5	209	130	3.2	M10	62	
	45	2045 1				328									68	
	55	2055 1		453	1027	348	325	725	700		302				94	
	75	2075 1													95	
400 V class (3-phase)	0.4	40P4 1	1	140	280	157	126	280	266	7	---	39	5	M5	3	Self Cooled
	0.75	40P7 1														
	1.5	41P5 1														
	2.2	42P2 1				177						59			4	Fan cooled
	3.7	43P7 1														
	4.0	44P0 1														
	5.5	45P5 1														
	7.5	47P5 1	2	200	300	197	186	300	285	8	---	65.5	2.3	M6	6	
	11	4011 1														
	15	4015 1		240	350	207	216	350	335	7.5		78			10	
	18.5	4018 1														
	22	4022 1	3	275	535	258	220	450	435		85	100			24	
	30	4030 1														
	37	4037 1		325	715	283	260	550	535		105	105			40	
	45	4045 1														
	55	4055 1														
	75	4075 1		453	1027	348	325	725	700	12.5	302	130	3.2	M10	96	
	90	4090 1													97	
	110	4110 1		504	1243	358	370	850	820	15	393		4.5	M12	122	
	132	4132 1													130	
	160	4160 1		579	1324	378	445	918	855	45.8	408	140			170	

Filters

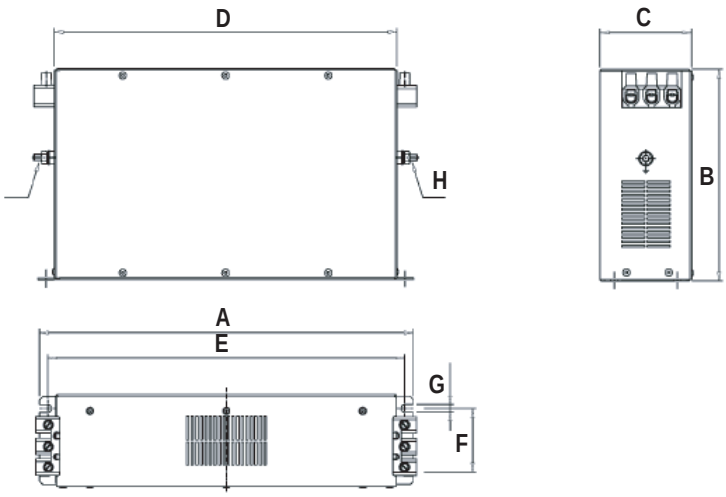
Footprint / Flat filters



Model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
200 V	3G3RV-PFI2035-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI2060-SE	355	206	60	302	336	175	6.5	M6	30	186	285	M6
	3G3RV-PFI2100-SE	408	236	80	355	390	205	6.5	M6	40	216	335	M6
400 V	3G3RV-PFI3010-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3018-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3021-SE	355	206	50	302	336	175	6.5	M4	25	186	285	M5
	3G3RV-PFI3035-SE	355	206	50	302	336	175	6.5	M5	25	186	285	M6
	3G3RV-PFI3060-SE	408	236	65	355	390	205	6.5	M6	32.5	216	335	M6
	3G3RV-PFI3410-SE [1]	386	115	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3600-SE [1]	386	135	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3800-SE [1]	564	160	300	516	420	275	9.0	M12	-	-	-	-

1. Flat filters are not possible to be mounted as footprint filters.

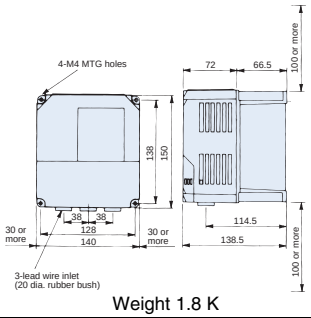
Bookform filters



Model		Dimensions							
		A	B	C	D	E	F	G	H
200 V	3G3RV-PFI2130-SE	366	180	90	280	310	65	6.5	M10
	3G3RV-PFI2160-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI2200-SE	610	240	130	480	518	90	8.2	M10
400 V	3G3RV-PFI3070-SE	331	185	80	300	329	55	6.5	M6
	3G3RV-PFI3100-SE	326	150	90	240	270	65	6.5	M10
	3G3RV-PFI3130-SE	370	180	90	280	310	65	6.5	M10
	3G3RV-PFI3170-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI3200-SE	610	240	130	480	518	90	8.3	M10

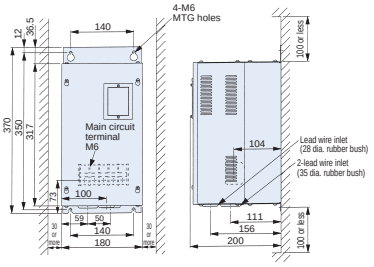
Braking unit

Model CDBR-2015 B, -2022 B, -4030B, -4045 B



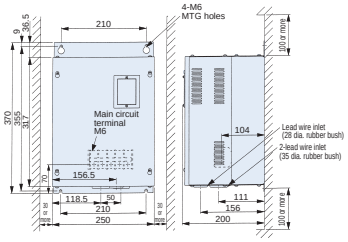
Weight 1.8 K

Model CDBR-2110 B



Weight 8.5 Kg

Model CDBR-4220 B



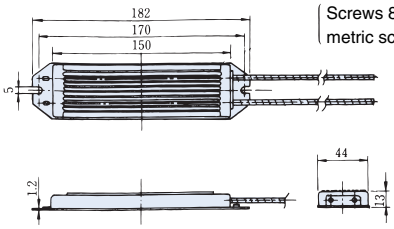
Weight 12 Kg

Braking resistor unit (inverter-mounted type)

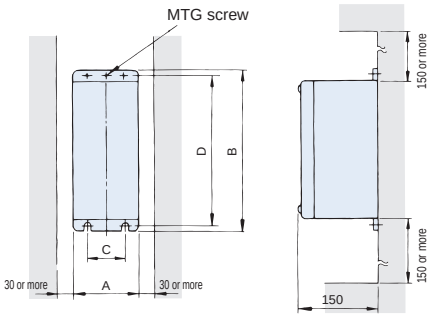


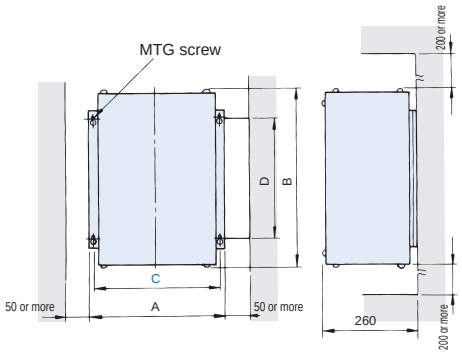
Weight: 0.2 kg
Model ERF-150WJ_

Note: Prepare mounting screws (2-M4x8 tapped screws).
Screws 8mm or more and general metric screws cannot be used.



Braking resistor unit (separately-installed type)





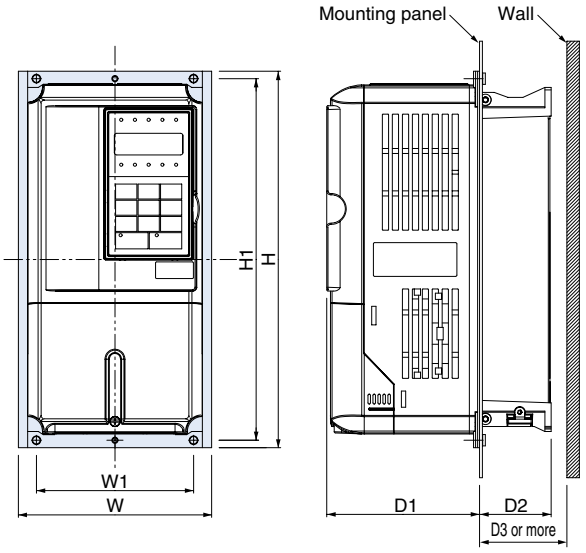
Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG screw	
220 V class	20P7	105	275	50	260	M5 x 3	3.0
	21P5	130	350	75	335	M5 x 4	4.5
	22P2	130	350	75	335	M5 x 4	4.5
	23P7	130	350	75	335	M5 x 4	5.0
	25P5	250	350	200	335	M6 x 4	7.5
	25P5	250	350	200	335	M6 x 4	8.5
400 V class	40P7	105	275	50	260	M5 x 3	3.0
	41P5	130	350	75	335	M5 x 4	4.5
	42P2	130	350	75	335	M5 x 4	4.5
	43P7	130	350	75	335	M5 x 4	5.0
	45P5	250	350	200	332	M6 x 4	7.5
	47P5	250	350	200	332	M6 x 4	8.5

Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG screw	
220 V class	2011	266	543	246	340	M8 x 4	10
	2015	356	543	336	340	M8 x 4	15
	2018	446	543	426	340	M8 x 4	19
	2022	446	543	426	340	M8 x 4	19
400 V class	4011	350	412	330	325	M6 x 4	16
	4015	350	412	330	325	M6 x 4	18
	4018	446	543	426	340	M8 x 4	19
	4022	446	543	426	340	M8 x 4	19
	4030	356	956	336	740	M8 x 4	25
	4037	446	956	426	740	M8 x 4	33
	4045	446	956	426	740	M8 x 4	33

Attachments

Heatsink external mounting attachment

The Varispeed G7 inverters under the 200/400 V class 15 kW or less need this attachment for mounting the heatsink externally. This attachment expands the outer dimensions of the width and height of the inverter. (Attachment is not required for inverters of 18.5 kW or more.)



CIMR-G7C□	Attachment order code	Dimensions in mm						
		W	H	W1	H1	D1	D2	D3
20P4	EZZ08676A	155	302	126	290	122.6	37.4	40
20P7								
21P5								
22P2							57.4	60
23P7								
25P5	EZZ08676B	210	330	180	316	136.1	63.4	70
27P5								
2011	EZZ08676C	250	392	216	372	133.6	76.4	85
2015								
40P4	EZZ08676A	155	302	126	290	122.6	37.4	40
40P7								
41P5							57.4	60
42P2								
43P7								
45P5	EZZ08676B	210	330	180	316	136.1	63.4	70
47P5								
4011	EZZ08676C	250	392	216	372	133.6	76.4	85
4015								

Panel cut for external mounting of cooling fin (heatsink)

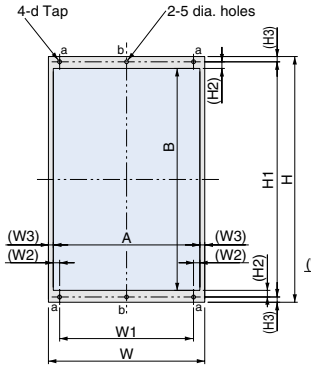


Fig 1

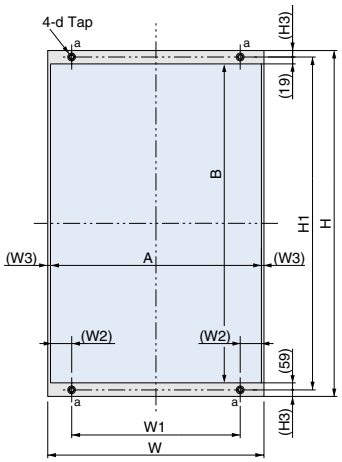


Fig 3

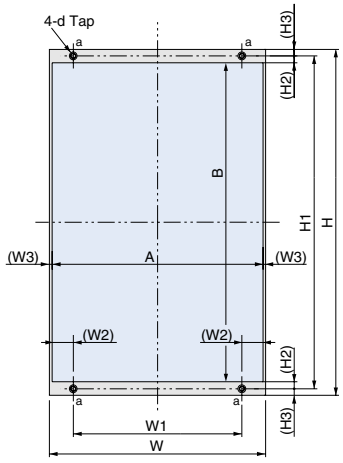


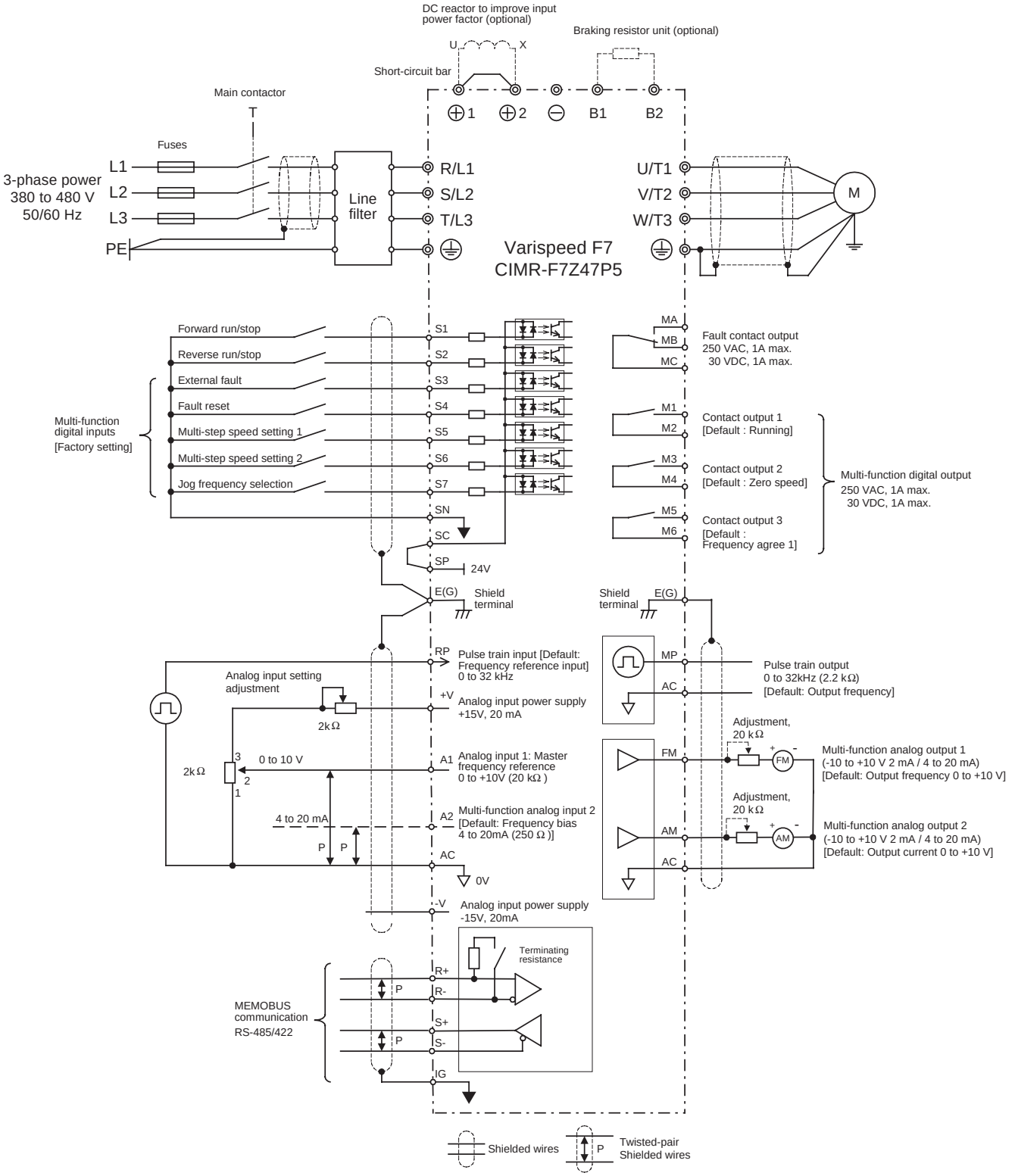
Fig 2

CIMR-F7Z□	Fig	Dimensions in mm									
		W	H	W1	(W2)	(W3)	H1	(H2)	(H3)	A	B	d
20P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
20P7												
21P5												
22P2												
23P7												
25P5												
27P5		210	330	180	8.5	6.5	316	9	7	197	298	M6
2011												
2015		250	392	216		8.5	372	9.5	10	233	353	
2018												
2022	2	250	400	195	24.5	3	385	8	7.5	244	369	
2030		275	450	220			435			269	419	
2037		375	600	250	54.5	8	575	15	12.5	359	545	M10
2045												
2055		450	725	325			700	13.5		434	673	
2075												
2090		500	850	370	57	8	820	19	15	484	782	M12
2110		575	885	445	55	10	855			555	817	
40P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
40P7												
41P5												
42P2												
43P7												
44P0												
45P5												
47P5		210	330	180	8.5	6.5	316	9	7	197	298	M6
4011												
4015		250	392	216		8.5	372	9.5	10	233	353	
4018												
4022	2	275	450	220	24.5	3	435	8	7.5	269	419	M6
4030												
4037		325	550	260		8	535			309	519	
4045												
4055												
4075		450	725	325	54.5	8	700	13.5	12.5	434	673	M10
4090												
4110		500	850	370	57	8	820	19	15	484	782	M12
4132												
4160	3	575	925	445	55	10	895	1	15	555	817	

1.The sizes are different between the top and the bottom. Refer Fig 3

Installation

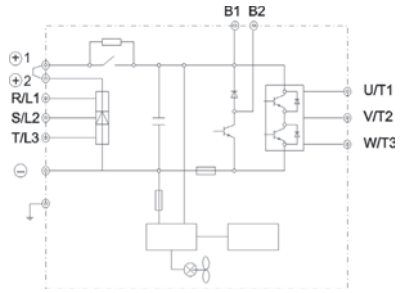
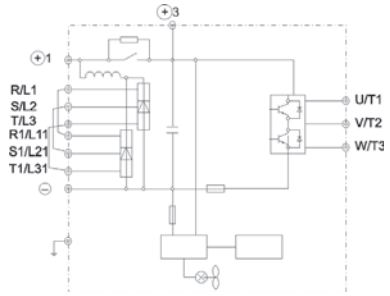
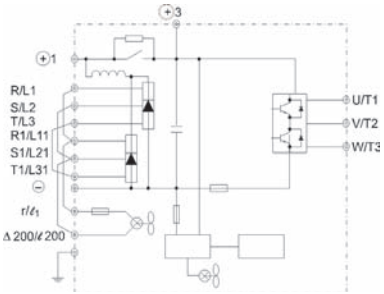
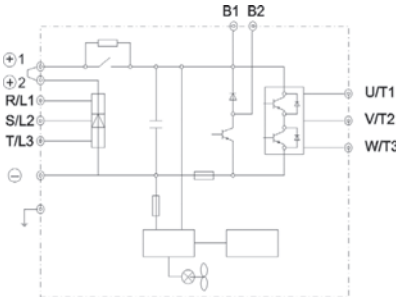
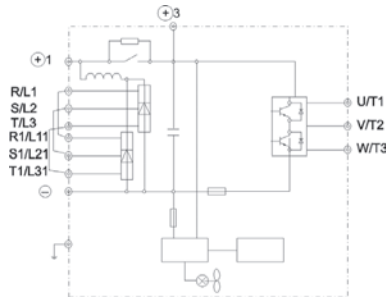
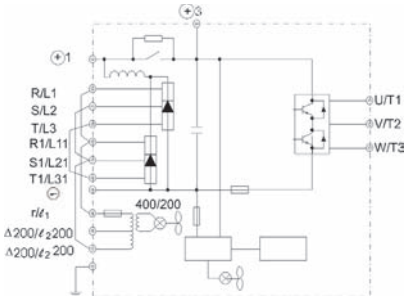
Standard connections



Main circuit

Voltage	200 V			400 V		
Model CIMR-F7Z□	20P4 to 2018	2022, 2030	2037 to 2110	40P4 to 4018	4022 to 4055	4075 to 4300
Max. applicable motor output	0.4 to 18.5 kW	22 to 30 kW	37 to 110 kW	0.4 to 18.5 kW	22 to 55 kW	75 to 300 kW
R/L1	Main circuit input power supply	Main circuit input power supply		Main circuit input power supply	Main circuit input power supply	
S/L2						
T/L3						
R1/L11	---	R-R1, S-S1 and T-T1 have been wired before shipment (See P59).		---	R-R1, S-S1 and T-T1 have been wired before shipment	
S1/L21						
T1/L31						
U/T1	Inverter output			Inverter output		
V/T2						
W/T3						
B1	Braking resistor unit	------		Braking resistor unit	------	
B2						
⊖	•DC reactor (⊕1- ⊕2) •DC power supply[1] (⊕1 - ⊖)	•DC power supply (⊕1- ⊕2)[1] •Braking unit (⊕3 - ⊖)		•DC reactor (⊕1- ⊕2) •DC power supply[1] (⊕1 - ⊖)	•DC power supply (⊕1- ⊕2)[1] •Braking unit (⊕3 - ⊖)	
⊕1						
⊕2						
⊕3	---			---		
⏚ /l_2	------		Cooling fan power supply[2]	---		
r/l_1				---		Cooling fan power supply[3]
⏚ 200 / l_2 200	------					
⏚ 400 / l_2 400						
⏚	Ground terminal (100 Ω or less)			Ground terminal (10 Ω or less)		

1. ⊕1 - ⊖ DC power input does not conform to UL/c-UL listed standard.
2. Cooling fan power supply r/l_1- ⏚ /l_2: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz
   (A transformer is required for 230 V 50 Hz or 240 V 50/60 Hz power supply.)
3. Cooling fan power supply r/l_1 - ⏚ 200 / l_2 200: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz, r/l_1 - ⏚ 400 / l_2 400: 380 to 480 VAC 50/60 Hz

	Main circuit configuration		
200 V class	CIMR-F7Z20P4 to 2018 	CIMR-F7Z2022, 2030 	CIMR-F7Z2037 to 2110 
400 V class	CIMR-F7Z40P4 to 4018 	CIMR-F7Z4022 to 4055 	CIMR-F7Z4075 to 4300 

Control circuite

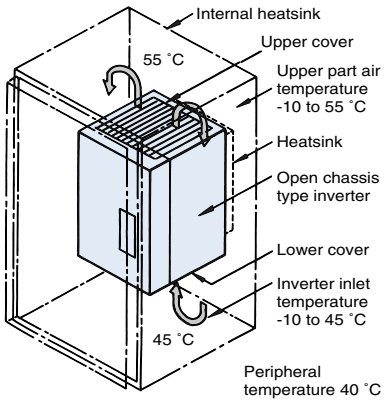
Type	No.	Signal name	Function		Signal level
Digital input signals	S1	Forward run/stop command	Forward run when ON; stopped when OFF.		24 VDC, 8 mA photocoupler
	S2	Reverse run/stop command	Reverse run when ON; stopped when OFF.		
	S3	External fault input [1]	Fault when ON.	Functions are selected by setting H1-01 to H1-05.	
	S4	Fault reset [1]	Reset when ON		
	S5	Multi-step speed reference 1 [1] (master/auxiliary switch)	Auxiliary frequency reference when ON.		
	S6	Multi-step speed reference 2 [1]	Multi-step setting 2 when ON.		
	S7	Jog frequency reference [1]	Jog frequency when ON.		
	SC	Digital input common	–		–
	SN	Digital input neutral	–		–
	SP	Digital input power supply	+24 VDC power supply for digital inputs		24 VDC, 250 mA max. [2]
Analog input signals	+V	15 V power output	15 V power supply for analog references		15 V (max. current: 20 mA)
	-V	-15 V power output	-15 V power supply for analog references		-15 V (max. current: 20 mA)
	A1	Frequency reference	-10 to +10 V/100%		-10 to +10 V(20 kΩ)
	A2	Multi-function analog input	4 to 20 mA/100% -10 V to +10 V/100%	Function is selected by setting H3-09.	4 to 20 mA(250 Ω) -10 V to +10 V(20 kΩ)
	AC	Analog reference common	–		–
	E(G)	Shield wire, optional ground line connection point	–		–
Sequence output signals	M1	Running signal (1NO contact)	Operating when ON.	Multi-function contact outputs	Relay contacts Contact capacity: 1 A max. at 250 VAC 1 A max. at 30 VDC [3]
	M2				
	M3	Zero speed	Zero level (b2-01) or below when ON		
	M4				
	M5	Speed agreement detection	Within ±2 Hz of set frequency when ON.		
	M6				
	MA	Fault output signal	Fault when CLOSED across MA and MC Fault when OPEN across MB and MC		Relay contacts Contact capacity: 1 A max. at 250 VAC 1 A max. at 30 VDC [3]
	MB				
	MC				
Analog output signals	FM	Multi-function analog output (frequency output)	0 to 10 V, 10V=100% output frequency	Multi-function analog output 1	-10 to +10 V max. ±5% 2 mA max. 4 to 20 mA current output
	AC	Analog common	–		
	AM	Multi-function analog output (current monitor)	0 to 10 V, 10V=200% inverter's rated current	Multi-function analog output 2	
Pulse I/O	RP	Pulse input [4]	H6-01 (frequency reference input)		0 to 32 kHz (3 kΩ) High level voltage 3.5 to 13.2 V
	MP	Pulse monitor	H6-06 (output frequency)		0 to 32 kHz +15 V output (2.2 kΩ)
RS-485/422	R+	MEMOBUS communications input	For 2-wire RS-485, short R+ and S+ as well as R- and S-.		Differential input, photocoupler isolation
	R-				
	S+	MEMOBUS communications output			Differential input, photocoupler isolation
	S-				
	IG	Signal common	–		–

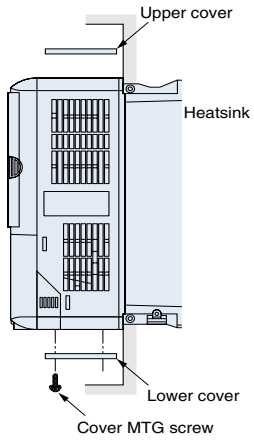
1. The default settings are given for terminals S3 to S7. For a 3-wire sequence, the default settings are a 3-wire sequence for S5, multi-step speed setting 1 for S6 and multi-step speed setting 2 for S7.
2. Do not use this power supply for supplying any external equipment.
3. When driving a reactive load, such as a relay coil with DC power supply, always insert a flywheel diode.
4. Pulse input specifications are given in the following table.

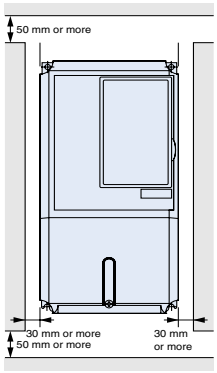
Low level voltage	0.0 to 0.8 V
High level voltage	3.5 to 13.2 V
H duty	30% to 70%

Remove the upper and lower covers for the models of 15 kW or less in 200 V and 400 V classes.

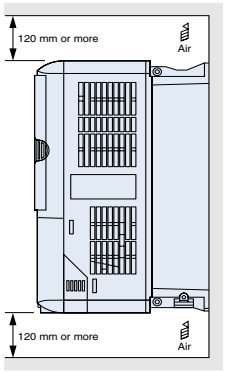
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.







Side spaces



Top and bottom spaces

Inverter heat loss

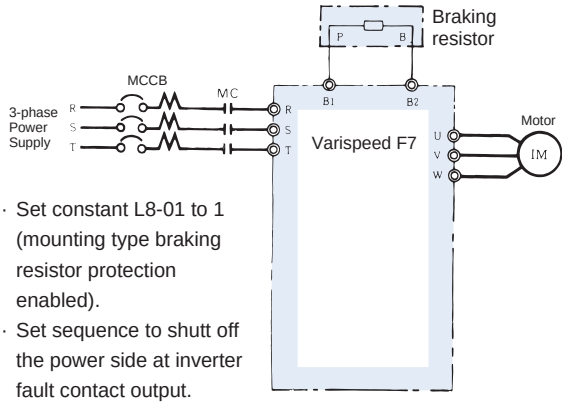
200 V class

Model CIMR-F7Z□			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Inverter capacity		kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
Rated current		A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415
Heat loss W	Fin	W	20	27	50	70	112	164	219	374	429	501	586	865	1015	1266	1588	2019	2437	2733
	Inside unit	W	39	42	50	59	74	84	113	170	183	211	274	352	411	505	619	838	997	1242
	Total heat loss	W	59	69	100	129	186	248	332	544	612	712	860	1217	1426	1771	2207	2857	3434	3975
Fin coding			Self cooled				Fan cooled													

400 V class

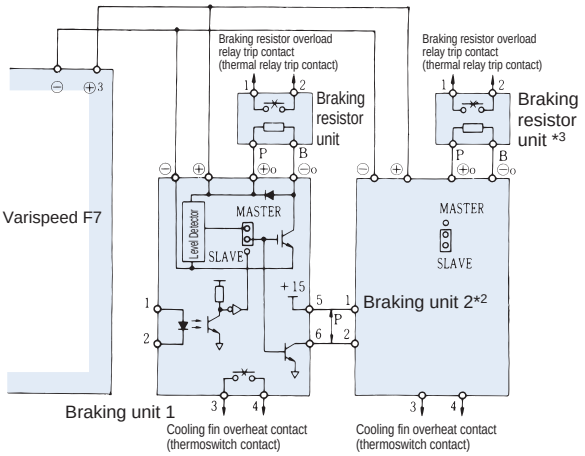
Model CIMR-F7Z□			40P4	40P7	41P5	42P2	43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Inverter capacity		kVA	1.4	1.6	2.8	4.0	5.8	6.0	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
Rated current		A	1.8	2.1	3.7	5.3	7.6	8.0	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506	675
Heat loss W	Fin	W	14	17	36	59	80	91	127	193	252	326	426	466	678	784	901	1203	1399	1614	2097	2388	2791	3237	3740	5838
	Inside unit	W	39	41	48	56	68	70	82	114	158	172	208	259	317	360	415	495	575	671	853	1002	1147	1372	1537	2320
	Total heat loss	W	53	58	84	115	148	161	209	307	410	498	634	725	995	1144	1316	1698	1974	2285	2950	3390	3938	4609	5277	8158
Fin coding			Self cooled				Fan cooled																			

Connections for braking units



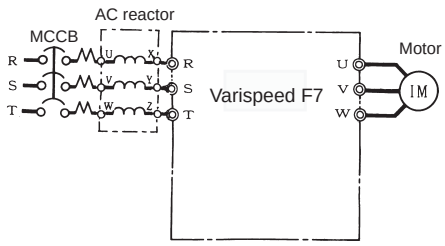
- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

Connections for braking resistors

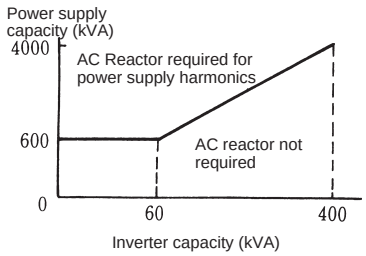


AC reactor

Connection example

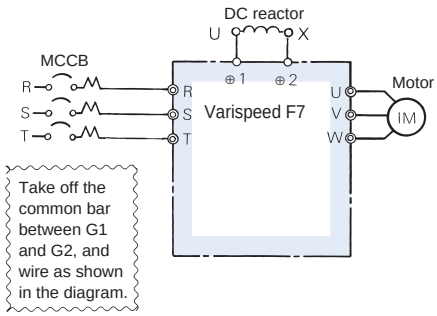


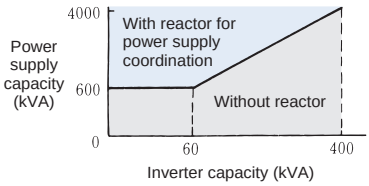
Application example



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	2.5	4.2	0.4	1.3	18.0
0.75	5	2.1	0.75	2.5	8.4
1.5	10	1.1	1.5	5	4.2
2.2	15	0.71	2.2	7.5	3.6
3.7	20	0.53	3.7	10	2.2
5.5	30	0.35	5.5	15	1.42
7.5	40	0.265	7.5	20	1.06
11	60	0.18	11	30	0.7
15	80	0.13	15	40	0.53
18.5	90	0.12	18.5	50	0.42
22	120	0.09	22	60	0.36
30	160	0.07	30	80	0.26
37	200	0.05	37	90	0.24
45	240	0.044	45	120	0.18
55	280	0.038	55	150	0.15
75	360	0.026	75	200	0.11
90	500	0.02	90/110	250	0.09
110	500	0.02	132/160	330	0.06
			185	490	0.04
			220		
			300	660	0.03

DC reactor





200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	5.4	8	0.4	3.2	28
0.75			0.75		
1.5	18	3	1.5	5.7	11
2.2			2.2		
3.7			3.7	12	6.3
5.5	36	1	5.5	23	3.6
7.5			7.5		
11	72	0.5	11	33	1.9
15			15		
18.5	90	0.4	18.5	47	1.3
22 to 110	Built-in		22 to 300	Built-in	

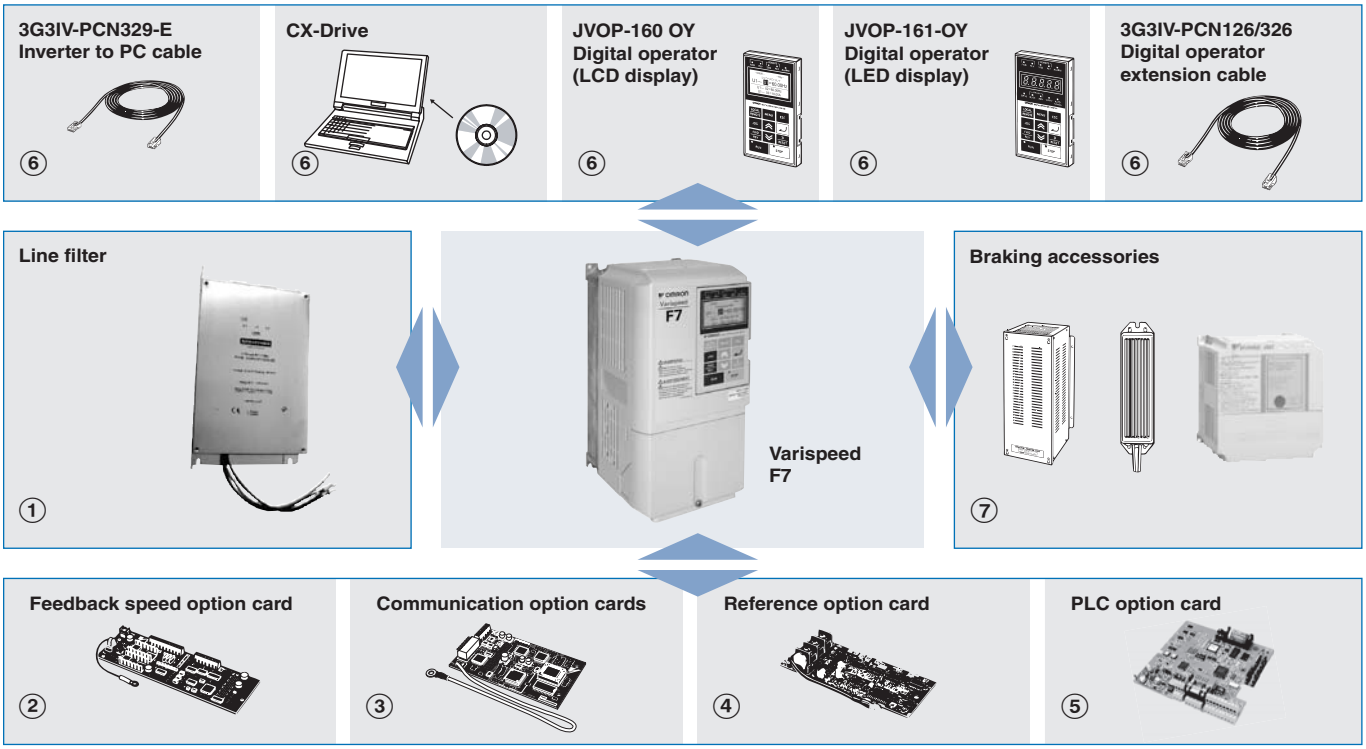
Fuse installation

To protect the inverter, it is recommended to use semiconductor fuses as shown in the table below

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
20P4	240	10	12~25
20P7	240	10	12~25
21P5	240	15	23~55
22P2	240	20	34~98
23P7	240	30	82~220
25P5	240	40	220~610
27P5	240	60	290~1300
2011	240	80	450~5000
2015	240	100	1200~7200
2018	240	130	1800~7200
2022	240	150	870~16200
2030	240	180	1500~23000
2037	240	240	2100~19000
2045	240	300	2700~55000
2055	240	350	4000~55000
2075	240	450	7100~64000
2090	240	550	11000~64000
2110	240	600	13000~83000

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
40P4	480	5	6~55
40P7	480	5	6~55
41P5	480	10	10~55
42P2	480	10	18~55
43P7	480	15	34~72
44P0	480	20	50~570
45P5	480	25	100~570
47P5	480	30	100~640
4011	480	50	150~1300
4015	480	60	400~1800
4018	480	70	700~4100
4022	480	80	240~5800
4030	480	100	500~5800
4037	480	125	750~5800
4045	480	150	920~13000
4055	480	150	1500~13000
4075	480	250	3000~55000
4090	480	300	3800~55000
4110	480	350	5400~23000
4132	480	400	7900~64000
4160	480	450	14000~250000
4185	480	600	20000~250000
4220	480	700	34000~400000
4300	480	900	52000~920000

Ordering information



Varispeed F7



200 V

Specifications			Model
IP20	0.55 Kw	3.2 A	CIMR-F7Z20P41
	0.75 Kw	4.1 A	CIMR-F7Z20P71
	1.5 Kw	7.0 A	CIMR-F7Z21P51
	2.2 Kw	9.6 A	CIMR-F7Z22P21
	3.7 Kw	15 A	CIMR-F7Z23P71
	5.5 Kw	23 A	CIMR-F7Z25P51
	7.5 Kw	31 A	CIMR-F7Z27P51
	11 Kw	45 A	CIMR-F7Z20111
	15 Kw	58 A	CIMR-F7Z20151
	18.5 Kw	71 A	CIMR-F7Z20181
IP00	22 Kw	85 A	CIMR-F7Z20220
	30 Kw	115 A	CIMR-F7Z20300
	37 Kw	145 A	CIMR-F7Z20370
	45 Kw	180 A	CIMR-F7Z20450
	55 Kw	215 A	CIMR-F7Z20550
	75 Kw	283 A	CIMR-F7Z20750
	90 Kw	346 A	CIMR-F7Z20900
	110 Kw	415 A	CIMR-F7Z21100

400 V

Specifications			Model
IP20	0.55 Kw	1.8 A	CIMR-F7Z40P41
	0.75 Kw	2.1 A	CIMR-F7Z40P71
	1.5 Kw	3.7 A	CIMR-F7Z41P51
	2.2 Kw	5.3 A	CIMR-F7Z42P21
	3.7 Kw	7.6 A	CIMR-F7Z43P71
	4.0 Kw	8.7 A	CIMR-F7Z44P01
	5.5 Kw	12.5 A	CIMR-F7Z45P51
	7.5 Kw	17 A	CIMR-F7Z47P51
	11 Kw	24 A	CIMR-F7Z40111
	15 Kw	31 A	CIMR-F7Z40151
	18.5 Kw	39 A	CIMR-F7Z40181
IP00	22 Kw	45 A	CIMR-F7Z40220
	30 Kw	60 A	CIMR-F7Z40300
	37 Kw	75 A	CIMR-F7Z40370
	45 Kw	91 A	CIMR-F7Z40450
	55 Kw	112 A	CIMR-F7Z40550
	75 Kw	150 A	CIMR-F7Z40750
	90 Kw	180 A	CIMR-F7Z40900
	110 Kw	216 A	CIMR-F7Z41100
	132 Kw	260 A	CIMR-F7Z41320
	160 Kw	304 A	CIMR-F7Z41600
	185 Kw	370 A	CIMR-F7Z41850
	220 Kw	506 A	CIMR-F7Z42200
	300 Kw	675 A	CIMR-F7Z43000

① Line filters



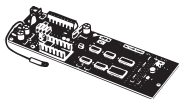
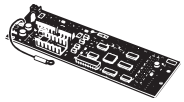
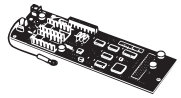
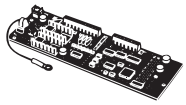
200 V

Inverter model	Line filters			
Varispeed F7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-F7Z20P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-F7Z20P7				
CIMR-F7Z21P5				
CIMR-F7Z22P2	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-F7Z23P7	3G3RV-PFI2035-SE	B, 25 m A, 100 m	35	1.4
CIMR-F7Z25P5				
CIMR-F7Z27P5	3G3RV-PFI2060-SE	B, 25 m A, 100 m	60	3
CIMR-F7Z2011				
CIMR-F7Z2015	3G3RV-PFI2100-SE	B, 25 m A, 100 m	100	4.9
CIMR-F7Z2018				
CIMR-F7Z2022	3G3RV-PFI2130-SE	A, 100 m	130	4.3
CIMR-F7Z2030				
CIMR-F7Z2037	3G3RV-PFI2160-SE	A, 100 m	160	6.0
CIMR-F7Z2045	3G3RV-PFI2200-SE	A, 100 m	200	11.0
CIMR-F7Z2055				
CIMR-F7Z2075	3G3RV-PFI3400-SE	A, 100 m	400	8.6
CIMR-F7Z2090				
CIMR-F7Z2110	3G3RV-PFI3600-SE	A, 100 m	600	11.0

400 V

Inverter model	Line filter			
Varispeed F7	Model	EN 55011 class*	Current (A)	Weight (kg)
CIMR-F7Z40P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-F7Z40P7				
CIMR-F7Z41P5				
CIMR-F7Z42P2				
CIMR-F7Z43P7	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-F7Z44P0				
CIMR-F7Z45P5				
CIMR-F7Z47P5	3G3RV-PFI3021-SE	B, 25 m A, 100 m	21	1.8
CIMR-F7Z4011	3G3RV-PFI3035-SE	B, 25 m A, 100 m	35	2.2
CIMR-F7Z4015	3G3RV-PFI3060-SE	B, 25 m A, 100 m	60	4.0
CIMR-F7Z4018				
CIMR-F7Z4022	3G3RV-PFI3070-SE	B, 25 m A, 100 m	70	3.4
CIMR-F7Z4030				
CIMR-F7Z4037	3G3RV-PFI3100-SE	A, 100 m	100	4.5
CIMR-F7Z4045				
CIMR-F7Z4055	3G3RV-PFI3130-SE	A, 100 m	130	4.7
CIMR-F7Z4075	3G3RV-PFI3170-SE	A, 100 m	170	6.0
CIMR-F7Z4090	3G3RV-PFI3200-SE	A, 100 m	250	11
CIMR-F7Z4110				
CIMR-F7Z4132	3G3RV-PFI3400-SE	A, 100 m	400	8.5
CIMR-F7Z4160				
CIMR-F7Z4185	3G3RV-PFI3600-SE	A, 100 m	600	11.0
CIMR-F7Z4220				
CIMR-F7Z4300	3G3RV-PFI3800-SE	A, 100 m	800	31.0

② Feedback speed control cards

Type	Model	Description	Function
Feedback speed control card	PG-A2 / 3G3FV-PPGA2 	PG speed controller card (used for V/f control with PG or flux vector)	• Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] • Pulse monitor output: +12 V, 20 mA
	PG-B2 / 3G3FV-PPGB2 		• Phase A and B pulse inputs (exclusively for complementary input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] • Pulse monitor output: Open collector, +24 V, Max. current 30 mA
	PG-D2 / 3G3FV-PPGD2 		• Phase A pulse (differential pulse) input for V/f control (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, max. current 200 mA] • Pulse monitor output: RS-422
	PG-X2 / 3G3FV-PPGX2 		• Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, max. current 200 mA] • Pulse monitor output: RS-422
	PG-Z2 		• Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, max. current 200 mA] • Pulse monitor output: RS-422 • Dual channel encoder: 1st channel A, B, Z / 2nd channel A, B, Z or open collector.

③ Communication option cards

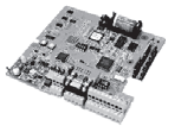
Type	Model	Description	Function
Communication option card	3G3RV-PDRT2	DeviceNet option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.
	SI-P1	PROFIBUS-DP option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.
	SI-S1	CANopen option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.
	SI-J	LONWORKS option card	• Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.
	CM090	Ethernet option card	• MODBUS TCP/IP ethernet interface unit.
	SI-T	MECHATROLINK - II option board	• High speed motion bus. • Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. • Host controller: TrajeXia, MCH or MP series[1]

1. Please refer to TrajeXia, MCH or MP series section for host controllers detailed information.t

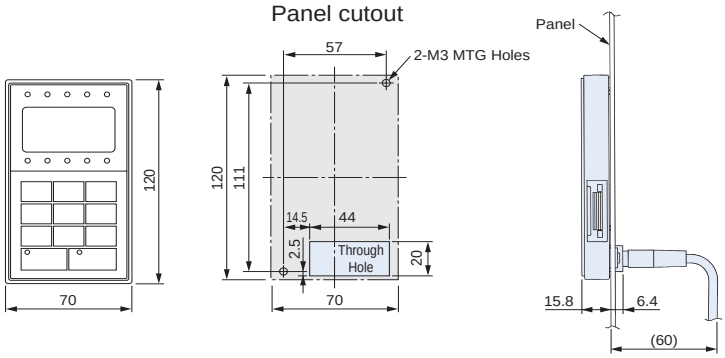
④ Reference option cards

Type	Model	Description	Function
Reference option card	AI-14U / 3G3IV-PAI14U	Analog input card	• 2 channel high resolution analog input card • Channel 1: 0 to 10 V (20 KΩ) • Channel 2: 4 to 20 mA (250 Ω) • Resolution 14 bit
	AI-14B / 3G3IV-PAI14B		• 3 Channel high resolution analog input card • Signal level: -10 to +10V (20 KΩ) s4 to 20 mA (250 Ω) •Resolution: 13 bit + sign
	DI-08 / 3G3IV-PDI08	Digital reference card	• 8 bit digital speed reference input card
	DI-16H2 / 3G3IV-PDI16H2		• 16 bit digital speed reference input card

⑤ PLC option cards

Type	Model	Description	Function
PLC option	3G3RV-P10ST8-E 	PLC option	• Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. • Embedded Compubus/S fieldbus • Standard OMRON tools can be used for programming
	3G3RV-P10ST8-DRT-E	PLC option with DeviceNet	• Same features as standard model with DeviceNet support.

⑥ Accessories

Type	Model	Description	Function
Digital operator	JVOP-160-OY 	5 lines LCD digital operator 7 language support	 Panel cutout installation
	JVOP-161-OY 	7 segment LED digital operator	
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	Extension cable to connect inverter and digital operator.
	3G3IV-PCN329-E	PC configuration cable	Cable to connect the inverter to PC.

⑥ Computer software

Type	Model	Description	Function
Software	CX-drive	Computer software	Configuration and monitoring software tool for drives.
	CX-One	Computer software	Complete OMRON automation software including CX-drive

⑦ Braking unit, braking resistor unit

Inverter			Braking unit		Braking resistor unit[1]									
					Inverter-mounted type (3 %ED, 10 sec max)[2]				Separately-installed type (10 %ED, 10 sec. max.)[3]					
Voltage	Max. applicable motor output kW	Model CIMR-F7Z_	Model CDBR_	No. of used	Model ERF-150WJ_	Resistance	No. of used	Braking torque %	Model LKEB_	Specifications of resistor		No. of used	Braking torque %	Connectable min resistance value Ω
200 V class	0.4	20P4	Built-in		201	200 Ω	1	220	20P7	70 W	200 Ω	1	220	48
	0.75	20P7			201	200 Ω	1	125	20P7	70 W	200 Ω	1	125	48
	1.5	21P5			101	100 Ω	1	125	21P5	260 W	100 Ω	1	125	48
	2.2	22P2			700	70 Ω	1	120	22P2	260 W	70 Ω	1	120	16
	3.7	23P7			620	62 Ω	1	100	23P7	390 W	40 Ω	1	125	16
	5.5	25P5			---	---			25P5	520 W	30 Ω	1	115	16
	7.5	27P5							27P5	780 W	20 Ω	1	125	9.6
	11	2011							2011	2400 W	13.6 Ω	1	125	9.6
	15	2015							2015	3000 W	10 Ω	1	125	9.6
	18.5	2018							2015	3000 W	10 Ω	1	125	9.6
	22	2022	2022B	1					2022	4800 W	6.8 Ω	1	125	6.4
	30	2030	2015B	2					2015	3000 W	10 Ω	2	125	9.6
	37	2037	2015B	2					2015	3000 W	10 Ω	2	100	9.6
	45	2045	2022B	2					2022	4800 W	6.8 Ω	2	120	6.4
	55	2055	2022B	2					2022	4800 W	6.8 Ω	2	100	6.4
	75	2075	2110B	1					2022	4800 W	6.8 Ω	3	110	1.6
	90	2090	2110B	1					2022	4800 W	6.8 Ω	4	120	1.6
	110	2110	2110B	1					2018	4800 W	8 Ω	5	100	1.6
400 V class	0.4	40P4	Built in		751	750 Ω	1	230	40P7	70 W	750 Ω	1	230	96
	0.75	40P7			751	750 Ω	1	130	40P7	70 W	750 Ω	1	130	96
	1.5	41P5			401	400 Ω	1	125	41P5	260 W	400 Ω	1	125	64
	2.2	42P2			301	300 Ω	1	115	42P2	260 W	250 Ω	1	135	64
	3.7	43P7			201	200 Ω	1	110	43P7	390 W	150 Ω	1	135	32
	4.0	44P0												
	5.5	45P5			---	---			45P5	520 W	100 Ω	1	135	32
	7.5	47P5							47P5	780 W	75 Ω	1	130	32
	11	4011							4011	1040 W	50 Ω	1	135	20
	15	4015							4015	1560 W	40 Ω	1	125	20
	18.5	4018							4018	4800 W	32 Ω	1	125	19.2
	22	4022	4030B	1					4022	4800 W	27.2 Ω	1	125	19.2
	30	4030	4030B	1					4030	6000 W	20 Ω	1	125	19.2
	37	4037	4045B	1					4037	9600 W	16 Ω	1	125	12.8
	45	4045	4045B	1					4045	9600 W	13.6 Ω	1	125	12.8
	55	4055	4030B	2					4030	6000 W	20 Ω	2	135	19.2
	75	4075	4045B	2					4045	9600 W	13.6 Ω	2	145	12.8
	90	4090	4220B	1					4030	6000 W	20 Ω	3	100	3.2
	110	4110	4220B	1					4030	6000 W	20 Ω	3	100	3.2
	132	4132	4220B	1					4045	9600 W	13.6 Ω	4	140	3.2
	160	4160	4220B	1					4045	9600 W	13.6 Ω	4	140	3.2
	185	4185	4220B	1					4045	9600 W	13.6 Ω	4	120	3.2
	220	4220	4220B	1					4037	9600 W	16 Ω	5	110	3.2
	300	4300	4220B	2					4045	9600 W	13.6 Ω	6	110	3.2

1. When connecting a mounting type resistor or braking resistor unit, set system constant L3-04 to 0 (stall prevention disabled during deceleration). If operating without changing the constant, motor does not stop at set deceleration time.
2. When connecting mounting type braking resistor, set system constant L8-01 to 1 (braking resistor protection enabled).
3. Load factor during deceleration to stop a load with constant torque. With constant output or continuous regenerative braking, the load factor is smaller than the specified value.
4. Resistance value per one braking unit. Select a resistance value that is larger than connectable minimum resistance value to obtain enough braking torque.
5. For an application with large regenerative power such as hoisting, the braking torque or other items may exceed the capacity of a braking unit with a braking resistor in a standard combination (an result in capacity overload). Contact your OMRON representatives when the braking torque or any other item exceeds the values in the table.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I23E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

CIMR-L7Z

Varispeed L7



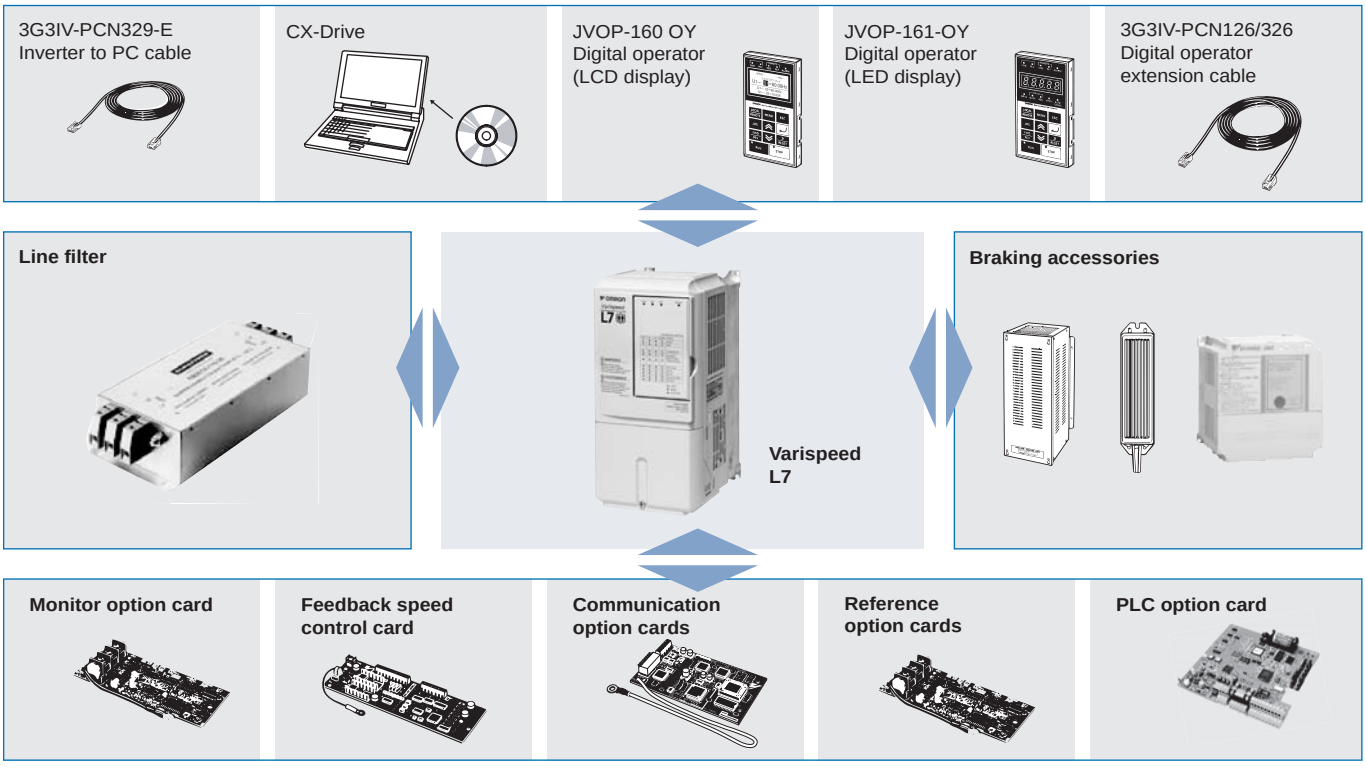
Made to drive lifts

- One model to control AC and PM motors.
- Silent operation with no current de-rating.
- Safety Cat.3 Stop. Cat.0 (EN 954-1 & EN81-1)
- Motor auto-tuning at standstill and at run.
- Three control methods: close loop current vector control, sensorless current vector control, V/F control.
- Direct control of motor brake and contactors
- Dedicated lift sequence built-in
- Lift units.
- Emergency operation by UPS or battery
- 2nd motor setting
- Short floor operation
- Door opening signal
- Electrical motor information and encoder information saved on inverter and encoder
- Embedded OMRON PLC functionality with PLC option card
- Fieldbus options: DeviceNet, CANOpen, PROFIBUS
- PC configuration tool: CX-drive.
- CE, UL, and cUL marking

Ratings

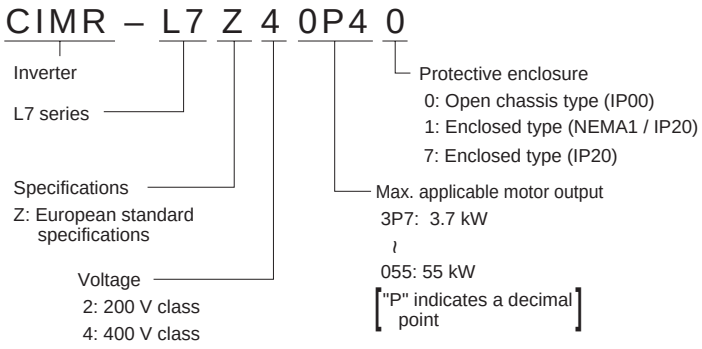
- 200 V Class three-phase 3.7 to 55 kW
- 400 V Class three-phase 4.0 to 55 kW

System configuration example



Specifications

Type designation



200 V class

Model CIMR-L7ZZ□		23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055
Max. applicable motor output[1] kW		3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output characteristics	Inverter capacity kVA	7	10	14	20	27	33	40	54	67	76	93
	Rated current A	17.5	25	33	49	64	80	96	130	160	183	224
	Max. voltage	3-phase; 200, 208, 220, 230, or 240 VAC (proportional to input voltage)										
	Max. output frequency	Up to 120 Hz available by programing										
Power supply	Rated input voltage and frequency	3-phase, 200/208/220/230/240 VAC, 50/60 Hz										
	Rated input current A	21	25	40	52	68	96	115	156	176	220	269
	Allowable voltage fluctuation	+ 10%, - 15%										
	Allowable frequency fluctuation	±5%										
Harmonic wave prevention	DC reactor	Optional						Built In				
	12-pulse input	Not possible						Possible				

1. The maximum applicable motor output is given for a standard 4-pole Yaskawa motor. When selecting the actual motor and inverter, be sure that the inverter's rated current is applicable for the motor's rated current.
2. A transformer with dual star-delta secondary is required on the power supply for 12-pulse rectification.

400 V class

Model CIMR-L7ZZ□		44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055
Max. applicable motor output[1] kW		4.0	5.5	7.5	11	15	18.5	22	30	37	45	55
Output characteristics	Inverter capacity kVA	9	12	15	22	28	34	40	54	67	80	106
	Rated current A	11	14	18	27	34	41	48	65	80	96	128
	Max. voltage	3-phase; 380, 400, 415, 440, 460, or 480 VAC (proportional to input voltage.)										
	Max. output frequency	120 Hz max.										
Power supply	Rated input voltage and frequency	3-phase, 380, 400, 415, 440, 460 or 480 VAC, 50/60 Hz										
	Rated input current A	13.2	17	22	32	41	49	58	78	96	115	154
	Allowable voltage fluctuation	+ 10%, -15%										
	Allowable frequency fluctuation	±5%										
Harmonic wave prevention	DC reactor	Optional						Built In				
	12-pulse input	Not possible						Possible				

1. The maximum applicable motor output is given for a standard 4-pole Yaskawa motor. When selecting the actual motor and inverter, be sure that the inverter's rated current is applicable for the motor's rated current.
2. A transformer with dual star-delta secondary is required on the power supply for 12-pulse rectification.

Enclosures

	Model CIMR-L7Z□	20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055
200 V class	Enclosed type (IEC IP20)	Available as standard														
	Open Chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type														
	Model CIMR-F7Z□	40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055
400 V class	Enclosed type (IEC IP20)	Available as standard														
	Open Chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type														

Common specifications

	Model number CIMR-L7Z□	Specification
Control characteristics	Control method asynchronous	Sine wave PWM closed loop vector control, open loop vector control, V/f control
	Control method synchronous	Sine wave PWM closed loop vector control using endat and hiperface
	Carrier frequency	8 kHz higher carrier frequency possible with current derating.
	Speed control range	1:40 (V/f control) 1:100 (open loop vector control) 1:1000 (closed loop vector control)
	Speed control accuracy	± 3% (V/f control) ± 0.2% (open loop vector control) ± 0.02% (closed loop vector control) (25 °C ± 10 °C)
	Speed control response	5 Hz (control without PG) 30 Hz (control with PG)
	Torque limits	Provided (4 quadrant steps can be changed by constant settings.) (Vector control)
	Torque accuracy	± 5%
	Frequency range	0.01 to 120 Hz
	Frequency accuracy (temperature characteristics)	Digital references: ± 0.01% (-10 °C to +40 °C)
		Analog references: ± 0.1% (25 °C ±10 °C)
	Frequency setting resolution	Digital references: 0.01 Hz
		Analog references: 0.025/50 Hz (11 bits plus sign)
	Output frequency resolution	0.01 Hz
	Overload capacity and maximum current	150% of rated output current for 30 sec.
	Frequency setting signal	0 to +10V
	Accel/decel time	0.01 to 600.00 s (4 selectable combinations of independent acceleration and deceleration time settings)
	Main control functions	Overtorque/undertorque detection, torque limits, 8-speed control (maximum), 4 acceleration and deceleration times, S-curve acceleration/deceleration, auto-tuning (rotational or stationary), dwell function, cooling fan ON/OFF control, slip compensation, torque compensation, auto-restart after fault, DC braking for starting and stopping, a fault reset and parameter copy function, special lift functions and sequences, short floor, hardware baseblock
Protective functions	Motor protection	Protection by electronic thermal overload relay.
	Instantaneous overcurrent protection	Stops at approx. 200% of rated output current.
	Fuse blown protection	Stops for fuse blown.
	Overload protection	OL2 fault at 150% of rated output current for 30 sec
	Overvoltage protection	200 class inverter: stops when main-circuit DC voltage is above 410 V. 400 class inverter: stops when main-circuit DC voltage is above 820 V.
	Undervoltage protection	200 class inverter: stops when main-circuit DC voltage is below 190 V. 400 class inverter: stops when main-circuit DC voltage is below 380 V.
	Cooling fin overheating	Protection by thermistor.
	Stall prevention	Stall prevention during acceleration, deceleration and running independently.
	Grounding protection	Protection by electronic circuits.
	Charge indicator	Illuminates when the main circuit DC voltage is approx. 10 VDC or more.
Protective structure		Enclosed wall-mounted type (IP20): all models Enclosed wall-mounted type (NEMA 1): 18.5 kW or less (same for 200 V and 400 V class inverters) Open chassis type (IP00): 22 kW or more (same for 200 V and 400 V class inverters)
Environment	Ambient operating temperature	- 10 °C to 45 °C
	Ambient operating humidity	95% max. (with no condensation)
	Storage temperature	- 20 °C to + 60 °C (short-term temperature during transportation)
	Application site	Indoor (no corrosive gas, dust, etc.)
	Altitude	1000 m max.
	Vibration	10 to 20 Hz, 9.8 m/s^2 max.; 20 to 50 Hz, 2 m/s^2 max

Dimensions

Enclosed type (IEC IP20)

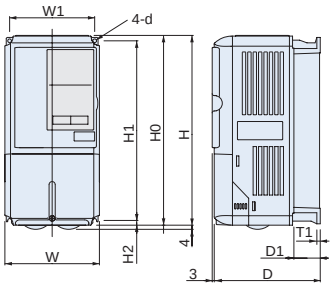


Fig 1

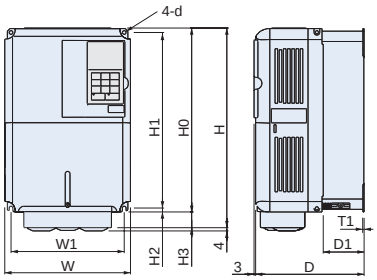


Fig 2

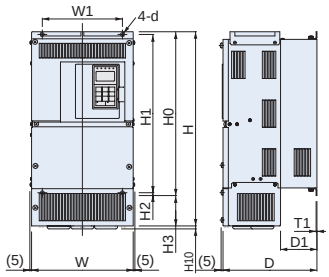


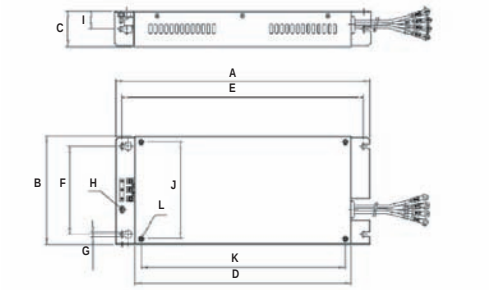
Fig 3

Voltage	Max. applicable motor output kW	Inverter CIMR-L7Z□	Fig	Dimensions in mm											Approx. weight kg	Cooling method
				W	H	D	W1	H0	H1	H2	H3	D1	T1	d		
200 V class (3-phase)	3.7	23P7 7	1	140	280	177	126	280	266	7	---	59	5	M5	4	Fan cooled
	5.5	25P5 7														
	7.5	27P5 7	2	200	300	197	186	300	285	8	0	65.5	2.3	M6	6	
	11	2011 7			310						10				7	
	15	2015 7		240	350	207	216	350	335	7.5	0	78			11	
	18.5	2018 7			380						30					
	22	2022 7		254	464	258	195	400	385		64	100			24	
	30	2030 1[1]	3	279	615		220	450	435		165				27	
	37	2037 1[1]		380	809	298	250	600	575	12.5	209		3.2	M10	62	
	45	2045 1[1]				328						130			68	
	55	2055 1[1]		453	1027	348	325	725	700		302				94	
400 V class (3-phase)	4.0	44P0 7	1	140	280	177	126	280	266	7	---	59	5	M5	4	
	5.5	45P5 7														
	7.5	47P5 7	2	200	300	197	186	300	285	8	---	65.5	2.3	M6	6	
	11	4011 7														
	15	4015 7		240	350	207	216	350	335	7.5		78			10	
	18.5	4018 7														
	22	4022 7	3	275	535	258	220	450	435		64	100			24	
	30	4030 7														
	37	4037 7		325	715	283	260	550	535		79	105			40	
	45	4045 7														
	55	4055 7														

1. F7Z2030 to 2055 meets IP20 / NEMA1

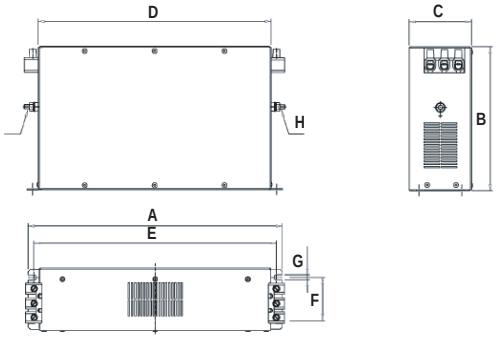
Filters

Footprint filters



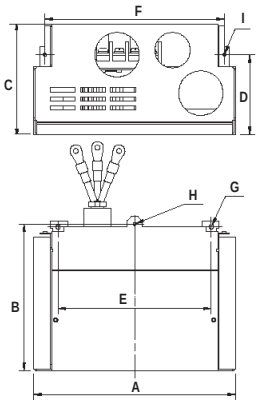
Model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
200 V	3G3RV-PFI2035-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI2060-SE	355	206	60	302	336	175	6.5	M6	30	186	285	M6
	3G3RV-PFI2100-SE	408	236	80	355	390	205	6.5	M6	40	216	335	M6
400 V	3G3RV-PFI3010SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3018-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3021-SE	355	206	50	302	336	175	6.5	M4	25	186	285	M5
	3G3RV-PFI3035-SE	355	206	50	302	336	175	6.5	M5	25	186	285	M6
	3G3RV-PFI3060-SE	408	236	65	355	390	205	6.5	M6	32.5	216	335	M6

Bookform filters



Model		Dimensions							
		A	B	C	D	E	F	G	H
200 V	3G3RV-PFI2130-SE	366	180	90	280	310	65	6.5	M10
	3G3RV-PFI2160-SE	541	170	120	350	380	102	6.5	M10
	3G3RV-PFI2200-SE	610	240	130	480	518	90	8.2	M10
400 V	3G3RV-PFI3070-SE	331	185	80	300	329	55	6.5	M6
	3G3RV-PFI3100-SE	326	150	90	240	270	65	6.5	M10
	3G3RV-PFI3130-SE	370	180	90	280	310	65	6.5	M10

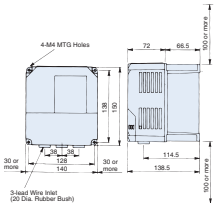
Bottom filters



Model		Dimensions								
		A	B	C	D	E	F	G	H	I
400 V	3G3RV-PFI3018B-SE	116	84.4	107.4	-	86	-	4.5	M4	M4
	3G3RV-PFI3035B-SE	170	152.5	109	79	112	144	4.5	M4	M4
	3G3RV-PFI3060B-SE	200	145	109	79	152	178	4.5	M4	M4

Braking resistor unit

Model CDBR-2015 B, -2022 B, -4030B, -4045 B



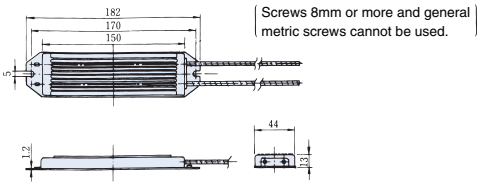
Weight 1.8 Kg

Braking resistor unit (Inveter-mounted type)

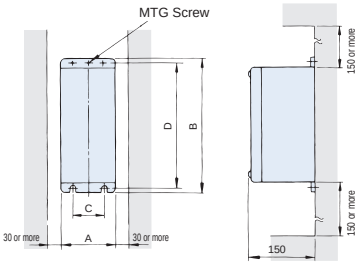


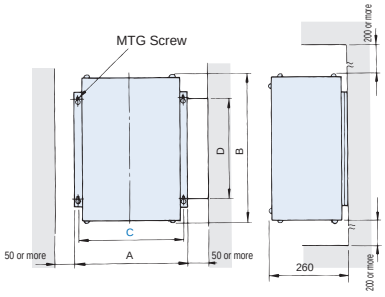
Weight: 0.2 kg
Model ERF-150WJ_

Note: Prepare mounting screws
(2-M4x8 tapped screws).
Screws 8mm or more and general metric screws cannot be used.



Braking resistor unit (separately-installed type)



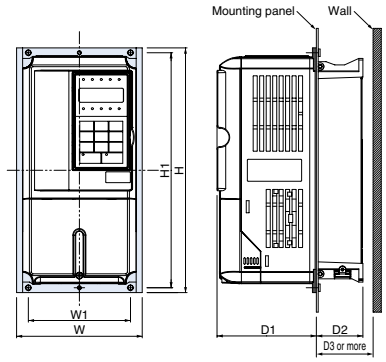


Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG screw	
220 V class	23P7	130	350	75	335	M5 x 4	5.0
	25P5	250	350	200	335	M6 x 4	7.5
	27P5	250	350	200	335	M6 x 4	8.5
400 V class	44P0	130	350	75	335	M5 x 4	5.0
	45P5	250	350	200	332	M6 x 4	7.5
	47P5	250	350	200	332	M6 x 4	8.5
220 V class	2011	266	543	246	340	M8 x 4	10
	2015	356	543	336	340	M8 x 4	15
	2018	446	543	426	340	M8 x 4	19
	2022	446	543	426	340	M8 x 4	19
400 V class	4011	350	412	330	325	M6 x 4	16
	4015	350	412	330	325	M6 x 4	18
	4018	446	543	426	340	M8 x 4	19
	4022	446	543	426	340	M8 x 4	19
	4030	356	956	336	740	M8 x 4	25
	4037	446	956	426	740	M8 x 4	33
	4045	446	956	426	740	M8 x 4	33

Attachments

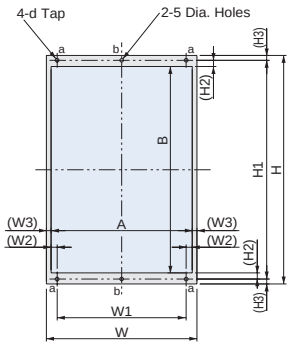
Heatsink external mounting attachment

The Varispeed L7 inverters under the 200/400 V class 18.5 kW or less need this attachment for mounting the heatsink externally.
This attachment expands the outer dimensions of the width and height of the inverter. (Attachment is not required for inverters of 22 kW or more.)

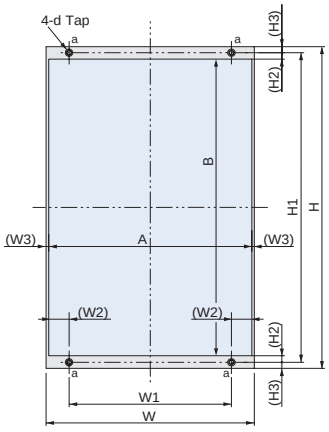


Model CIMR-L7Z_	Attachment order code	Dimensions in mm						
		W	H	W1	H1	D1	D2	D3
23P7	EZZ08676A	155	302	126	290	122.6	57.4	60
25P5								
27P5	EZZ08676B	210	330	180	316	136.1	63.4	70
2011								
2015	EZZ08676C	250	392	216	372	133.6	76.4	85
2018								
40P4	EZZ08676A	155	302	126	290	122.6	57.4	60
45P5								
47P5	EZZ08676B	210	330	180	316	136.1	63.4	70
4011								
4015	EZZ08676C	250	392	216	372	133.6	76.4	85
4018								

Panel cut for external mounting of cooling fin (heatsink)



Drawing 1

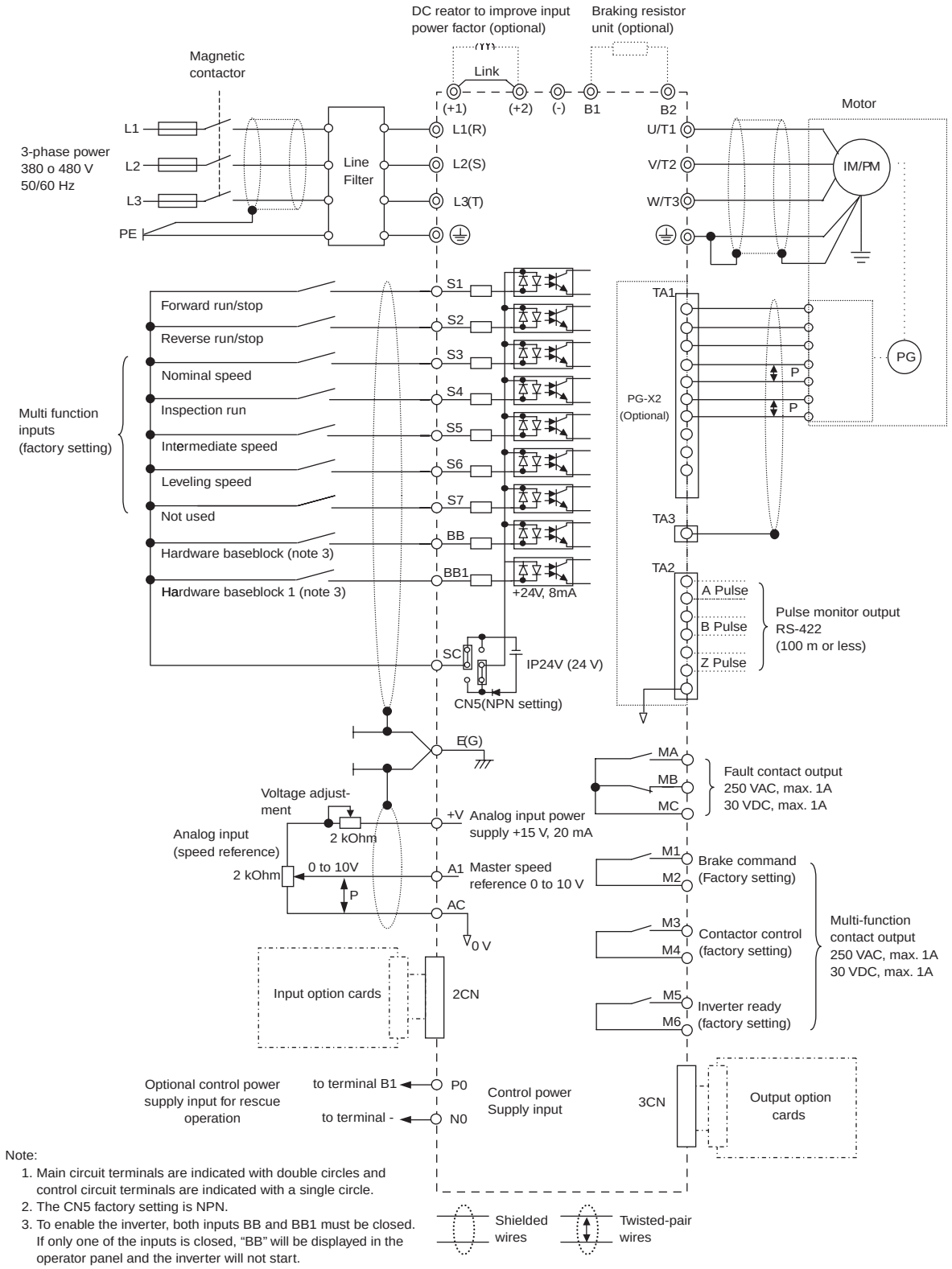


Drawing 2

Model CIMR-L7Z_	Drawing	Dimensions in mm										
		W	H	W1	(W2)	(W3)	H1	(H2)	(H3)	A	B	d
23P7	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
25P5												
27P5	1	210	330	180	8.5	6.5	316	9	7	197	298	M6
2011												
2015	1	250	392	216	8.5	8.5	372	9.5	10	233	353	M6
2018												
2022	2	250	400	195	24.5	3	385	8	7.5	244	369	M6
2030		275	450	220			435			269	419	
2037	2	375	600	250	54.5	8	575	15	12.5	359	545	M10
2045												
2055	2	450	725	325			700	13.5		434	673	
44P0	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
45P5												
47P5	1	210	330	180	8.5	6.5	316	9	7	197	298	M6
4011												
4015	1	250	392	216	8.5	8.5	372	9.5	10	233	353	M6
4018												
4022	2	275	450	220	24.5	3	435	8	7.5	269	419	M6
4030												
4037	2	325	550	260		8	535			309	519	M6
4045												
4055												

Installation

Standard connections



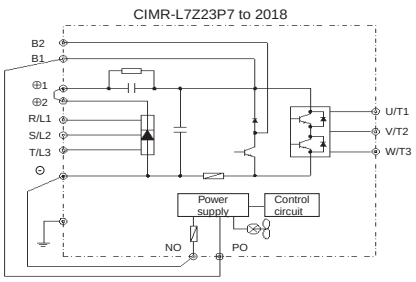
Note:

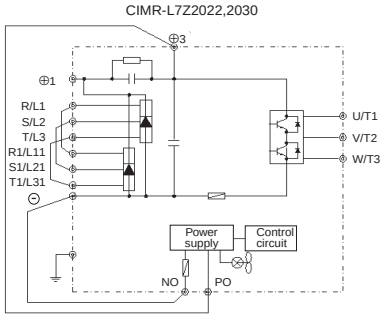
1. Main circuit terminals are indicated with double circles and control circuit terminals are indicated with a single circle.
2. The CN5 factory setting is NPN.
3. To enable the inverter, both inputs BB and BB1 must be closed. If only one of the inputs is closed, “BB” will be displayed in the operator panel and the inverter will not start.

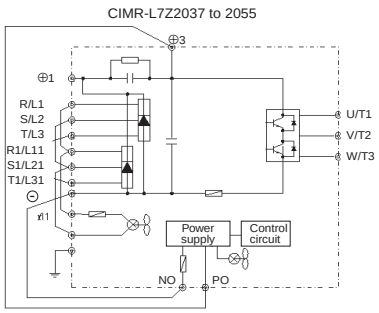
Main circuit

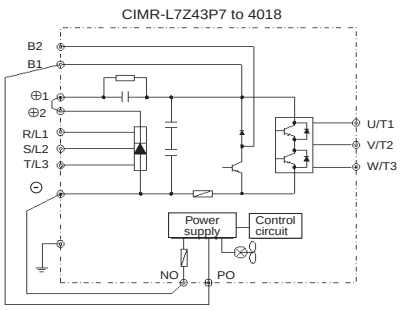
Voltage	200 V			400 V	
Model CIMR-L7Z□	20P4 to 2018	2022 and 2030	2037 to 2055	40P4 to 4018	4022 to 4055
Max. applicable motor output	0.4 to 18.5 kW	22 and 30 kW	37 to 55 kW	0.4 to 18.5 kW	22 to 55 kW
R/L1	Main circuit input power supply	Main circuit input power supply R-R1, S-S1 and T-T1 have been wired before shipment.		Main circuit input power supply	Main circuit input power supply R-R1, S-S1 and T-T1 have been wired before shipment
S/L2					
T/L3					
R1/L11	---			---	
S1/L21					
T1/L31					
U/T1	Inverter output			Inverter output	
V/T2					
W/T3					
B1	Braking resistor unit	------		Braking resistor unit	------
B2					
⊖	DC reactor (⊕1- ⊕2)	Braking unit (⊕3 - ⊖)		DC reactor (⊕1- ⊕2)	Braking unit (⊕3 - ⊖)
⊕1					
⊕2					
⊕3	---			---	
r / l_1	---	---	Cooling fan power supply	---	
⏚ / l_2					
PO	Battery power input Ground terminal (100 Ω or less)			Battery power input	
NO					
⏚				Ground terminal (10 Ω or less)	

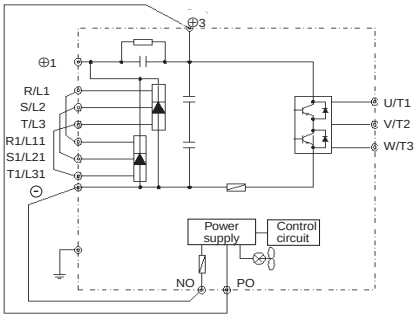
	Main circuit configuration		
200 V class	CIMR-L7Z23P7 to 2018	CIMR-L7Z2022,2030	CIMR-L7Z2037 to 2055
400 V class	CIMR-L7Z43P7 to 4018	CIMR-L7Z4022 to 4055	











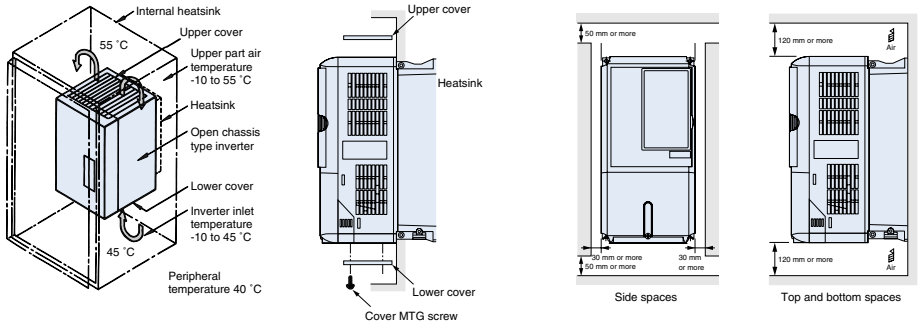
Control circuit

Type	No.	Signal Name	Function		Signal Level
Digital input signals	S1	Forward run/stop command	Forward run when ON; stopped when OFF.		24 VDC, 8 mA photo-coupler
	S2	Reverse run/stop command	Reverse run when ON; stopped when OFF.		–
	S3	Nominal speed	Nominal speed when ON.	Functions are selected by setting H1-01 to H1-05.	
	S4	Inspection run	Inspection RUN when ON.		
	S5	Intermediate speed	Internediate speed when ON.		
	S6	Leveling speed	Leveling speed when ON.		
	S7	Not used	–		
	BB	Hardware baseblock	Safety inputs. To enable the inverter, both inputs BB and BB1 must be closed. If only one of them is closed, “BB” will be displayed in the operator panel and the inverter will not start.		
	BB1	Hardware baseblock 1			
	SC	Digital input common	–		–
Analog input signals	+V	15 V power output	15 V power supply for analog references		15 V (max. current: 20 mA)
	A1	Frequency reference	0 to +10 V/100%		0 to +10 V(20 kΩ)
	AC	Analog reference neutral	–		–
	E(G)	Shield wire, optional ground line connection point	–		–
Sequence output signals	M1	Brake command (1NO contact)	Brake command when ON	Multi-function contact outputs	Relay contacts Contact capacity: 1 A max. at 250 VAC 1 A max. at 30 VDC
	M2				
	M3	Contactor control (1NO contact)	Contactor control when ON		
	M4				
	M5	Inverter ready (1NO contact)	Inverter ready when ON		
	M6				
	MA	Fault output signal (SPDT) (1 change over contact)	Fault when CLOSED across MA and MC Fault when OPEN across MB and MC		
	MB				
	MC				

When driving a reactive load, such as relay coil with DC power supply, always insert a flywheel diode

Remove the upper and lower covers for the models of 15 kW or less in 200 V and 400 V classes.

When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.



Inverter heat loss

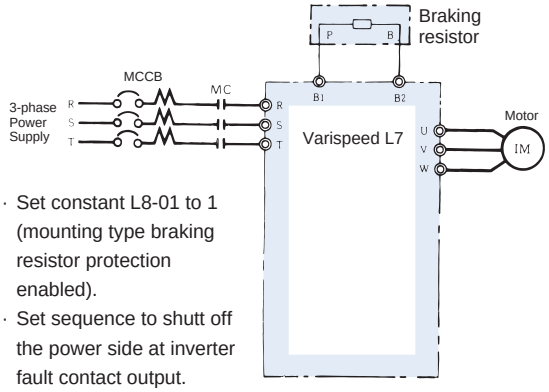
200 V class

Model CIMR-L7Z□			23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055
Inverter capacity		kVA	5.7	8.8	12	17	22	27	32	44	55	69	82
Rated current		A	15	23	31	45	58	71	85	115	145	180	215
Heat loss W	Fin	W	112	164	219	374	429	501	586	865	1015	1266	1588
	Inside unit	W	74	84	113	170	183	211	274	352	411	505	619
	Total heat loss	W	186	248	332	544	612	712	860	1217	1426	1771	2207
Fin coding			Fan cooled										

400 V class

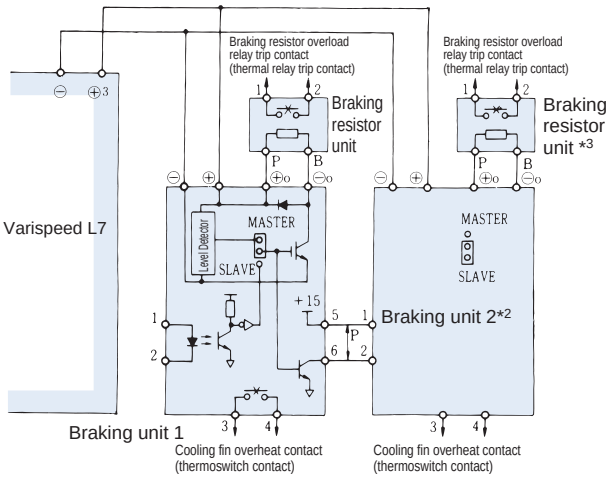
Model CIMR-L7Z□			44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055
Inverter capacity		kVA	5.8	9.5	13	18	24	30	34	46	57	69	85
Rated current		A	7.6	12.5	17	24	31	39	45	60	75	91	112
Heat loss W	Fin	W	91	127	193	252	326	426	466	678	784	901	1203
	Inside unit	W	70	82	114	158	172	208	259	317	360	415	495
	Total heat loss	W	161	209	307	410	498	634	725	995	1144	1316	1698
Fin coding			Fan cooled										

Connections for braking resistors

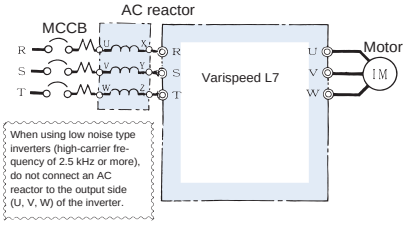


- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

Connections for braking units

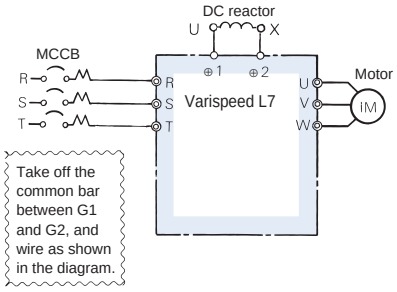


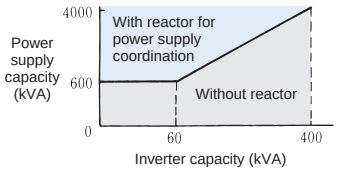
AC reactor



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
4.0	20	0.53	4.0	10	2.2
5.5	30	0.35	5.5	15	1.42
7.5	40	0.265	7.5	20	1.06
11	60	0.18	11	30	0.7
15	80	0.13	15	40	0.53
18.5	90	0.12	18.5	50	0.42
22	120	0.09	22	60	0.36
30	160	0.07	30	80	0.26
37	200	0.05	37	90	0.24
45	240	0.044	45	120	0.18
55	280	0.038	55	150	0.15

DC reactor





200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
4.0	18	3	4.0	12	6.3
5.5	36	1	5.5	23	3.6
7.5			7.5		
11	72	0.5	11	33	1.9
15			15		
18.5	90	0.4	18.5	47	1.3
22 to 55	Built-in		22 to 55	Built-in	

Fuse installation

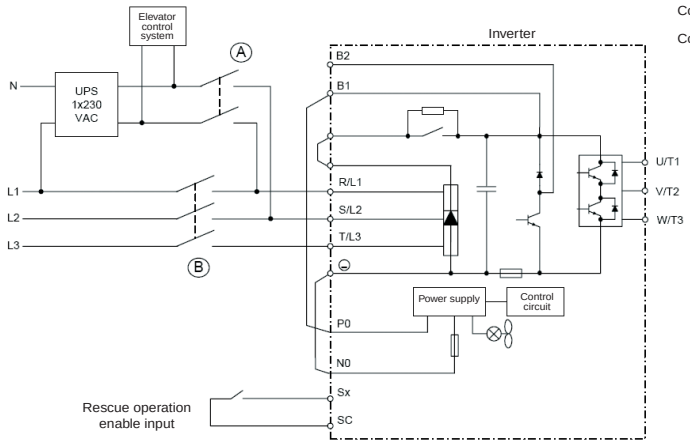
To protect the inverter, it is recommended to use semiconductor fuses as shown in the table below

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
23P7	240	30	82~220
25P5	240	40	220~610
27P5	240	60	290~1300
2011	240	80	450~5000
2015	240	100	1200~7200
2018	240	130	1800~7200
2022	240	150	870~16200
2030	240	180	1500~23000
2037	240	240	2100~19000
2045	240	300	2700~55000
2055	240	350	4000~55000
43P7	480	15	34~72
44P0	480	20	50~570
45P5	480	25	100~570
47P5	480	30	100~640
4011	480	50	150~1300
4015	480	60	400~1800
4018	480	70	700~4100
4022	480	80	240~5800
4030	480	100	500~5800
4037	480	125	750~5800
4045	480	150	920~13000
4055	480	150	1500~13000

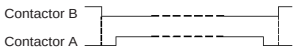
Rescue system

Example 1: 1phase, 230V UPS power supply.

Wiring

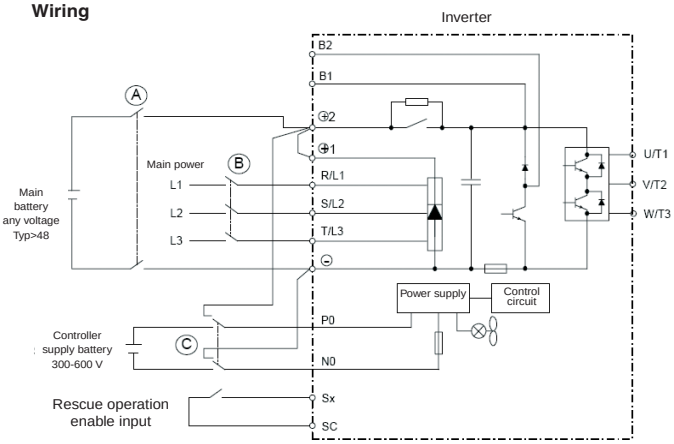


Contactor sequence

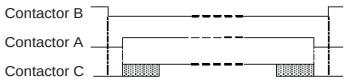


Example 2: two batteries.

Wiring

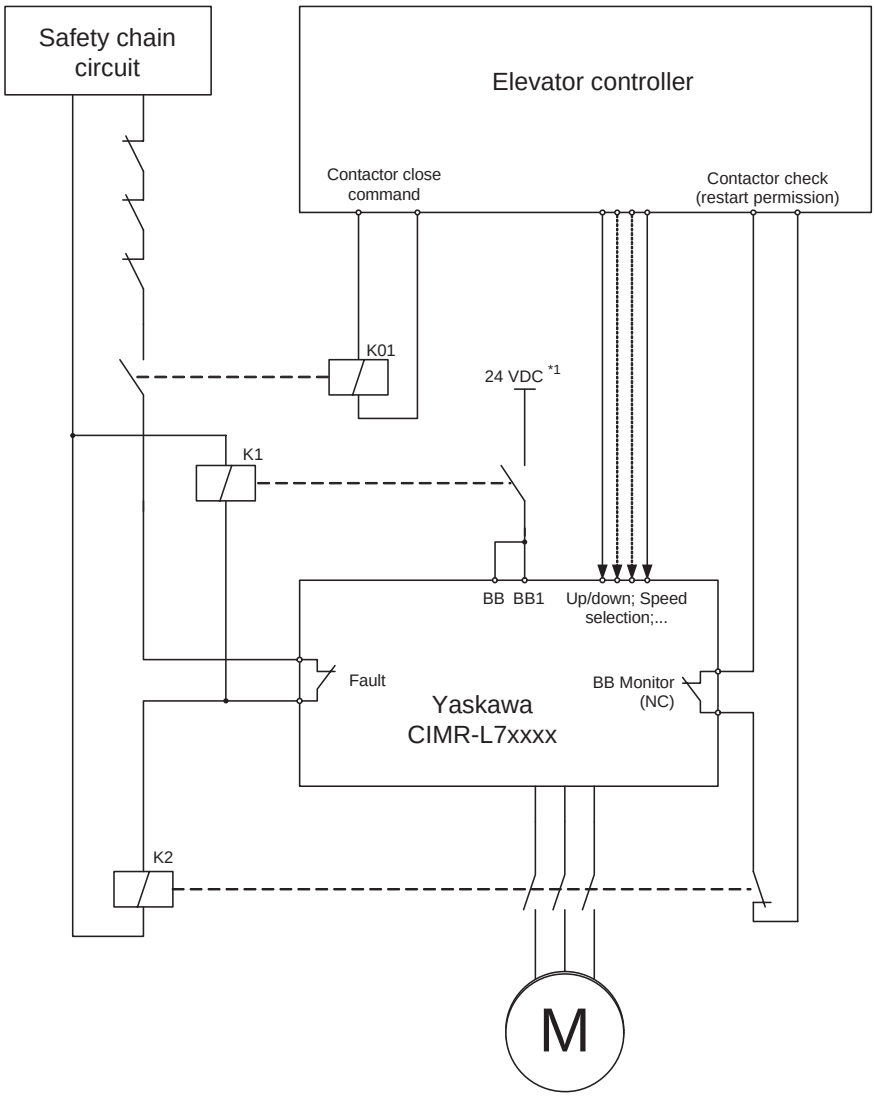


Contactor sequence



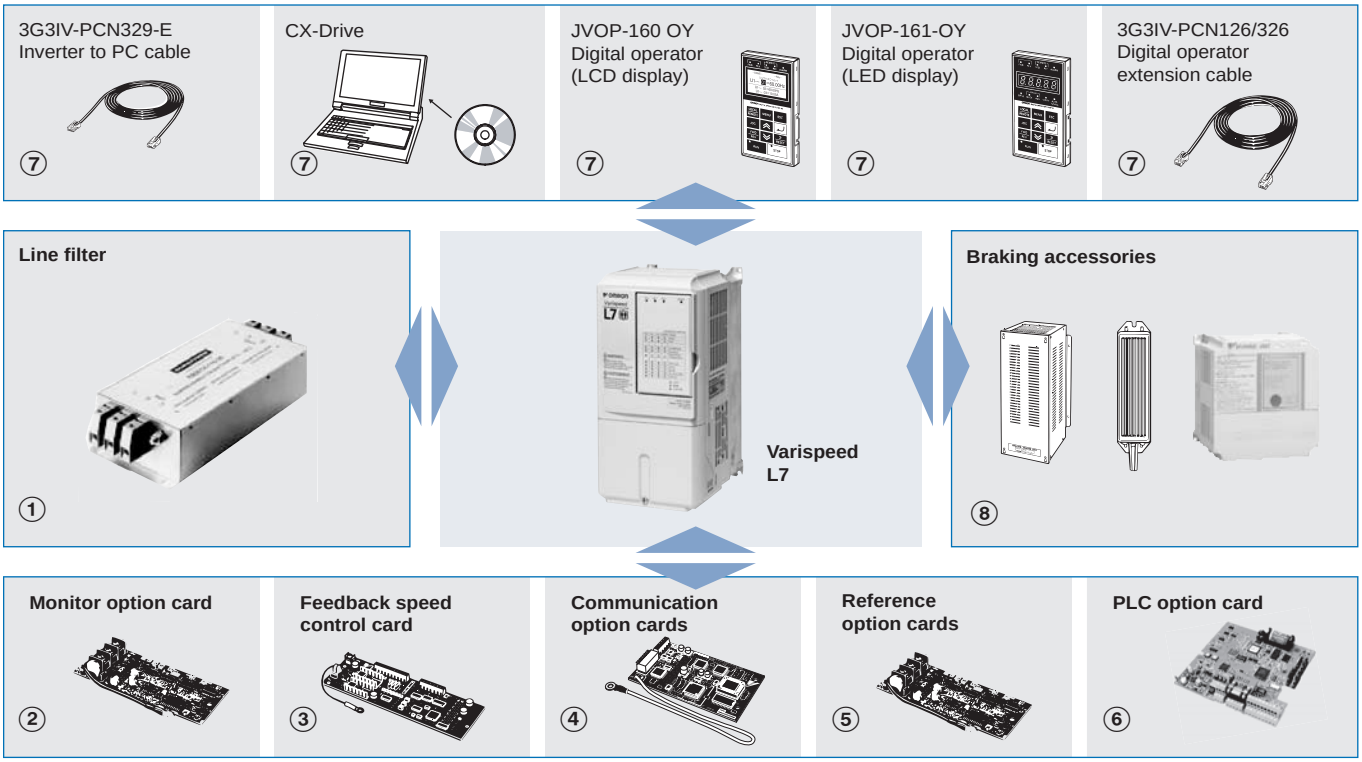
Safety system

Example: EN81-1:1998 compliant installation of L7 with one motor contactor



1. The polarity of this 24 VDC signal depends on the polarity selection for the drives digital inputs. The internal as well as any external 24 VDC power supply can be used.

Ordering information



Varispeed L7



200 V

Specifications			Model
3x200 V	3.7 Kw	17.5 A	CIMR-L7Z23P7
	5.5 Kw	25 A	CIMR-L7Z25P5
	7.5 Kw	33 A	CIMR-L7Z27P5
	11 Kw	49 A	CIMR-L7Z2011
	15 Kw	64 A	CIMR-L7Z2015
	18.5 Kw	80 A	CIMR-L7Z2018
	22 Kw	96 A	CIMR-L7Z2022
	30 Kw	130 A	CIMR-L7Z2030
	37 Kw	160 A	CIMR-L7Z2037
	45 Kw	183 A	CIMR-L7Z2045
	55 Kw	224 A	CIMR-L7Z2055

400 V

Specifications			Model
3x400 V	4.0 Kw	11 A	CIMR-L7Z44P0
	5.5 Kw	14 A	CIMR-L7Z45P5
	7.5 Kw	18 A	CIMR-L7Z47P5
	11 Kw	27 A	CIMR-L7Z4011
	15 Kw	34 A	CIMR-L7Z4015
	18.5 Kw	41 A	CIMR-L7Z4018
	22 Kw	48 A	CIMR-L7Z4022
	30 Kw	65 A	CIMR-L7Z4030
	37 Kw	80 A	CIMR-L7Z4037
	45 Kw	96 A	CIMR-L7Z4045
	55 Kw	128 A	CIMR-L7Z4055

① Input filters

Footprint / bookform filters



200 V

Inverter model	Line filters			
Varispeed L7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-L7Z23P7	3G3RV-PFI2035-SE	B, 25 m A 100 m	35	1.4
CIMR-L7Z25P5				
CIMR-L7Z27P5	3G3RV-PFI2060-SE	B, 25 m A 100 m	60	3
CIMR-L7Z2011				
CIMR-L7Z2015	3G3RV-PFI2100-SE	B, 25 m A 100 m	100	4.9
CIMR-L7Z2018				
CIMR-L7Z2022	3G3RV-PFI2130-SE	A, 100 m	130	4.3
CIMR-L7Z2030				
CIMR-L7Z2037	3G3RV-PFI2160-SE	A, 100 m	160	6.0
CIMR-L7Z2045	3G3RV-PFI2200-SE	A, 100 m	200	11.0
CIMR-L7Z2055				

400 V

Inverter model	Line filters			
Varispeed L7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-L7Z44P0	3G3RV-PFI3018-SE	B, 25 m A 100 m	18	1.3
CIMR-L7Z45P5				
CIMR-L7Z47P5	3G3RV-PFI3021-SE	B, 25 m A 100 m	21	1.8
CIMR-L7Z4011	3G3RV-PFI3035-SE	B, 25 m A 100 m	35	2.2
CIMR-L7Z4015	3G3RV-PFI3060-SE	B, 25 m A 100 m	60	4.0
CIMR-L7Z4018				
CIMR-L7Z4022	3G3RV-PFI3070-SE	B, 25 m A 100 m	70	3.4
CIMR-L7Z4030				
CIMR-L7Z4037	3G3RV-PFI3100-SE	A, 100 m	100	4.5
CIMR-L7Z4045				
CIMR-L7Z4055	3G3RV-PFI3130-SE	A, 100 m	130	4.7

① Input filters

Botton filters



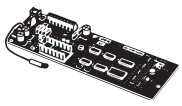
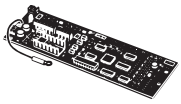
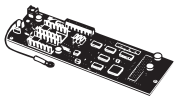
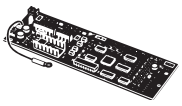


Inverter model	Line filters			
Varispeed L7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-L7Z44P0	3G3RV-PFI3018B-SE	B, 25 m A 100 m	18	1,0
CIMR-L7Z45P5				
CIMR-L7Z47P5	3G3RV-PFI3035B-SE	B, 25 m A 100 m	35	1,5
CIMR-L7Z4011				
CIMR-L7Z4015	3G3RV-PFI3060B-SE	B, 25 m A 100 m	60	2,2
CIMR-L7Z4018				

② Monitor option cards

Type	Model	Description	Function
Monitor option card	DO-08 / 3G3IV-PDO08	Digital output card	Outputs isolated type digital signal for monitoring inverter run state (alarm signal, zero speed detection etc.). Output channel: Photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels (250 VAC, 1 A or less 30 VDC, 1 A or less)
	DO-02C / 3G3IV-PDO02C	2C-relay output card	• Two multi-function contact outputs (2C-relay) can be used other than those of the inverter proper unit.

③ Feedback speed control cards

Type	Model	Description	Function
Feedback speed control card	PG-A2 / 3G3FV-PPGA2 	PG speed controller card (used for V/f control with PG or flux vector)	• Phase A pulse (single pulse) inputs (voltage, complementary, open collector input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] • Pulse monitor output: +12 V, 20 mA
	PG-B2 / 3G3FV-PPGB2 		• Phase A and B pulse inputs (exclusively for complementary input) • PG frequency range: Approx. 30 kHz max. [Power supply output for PG: +12 V, max. current 200 mA] • Pulse monitor output: Open collector, +24 V, Max. current 30 mA
	PG-D2 / 3G3FV-PPGD2 		• Phase A pulse (differential pulse) input for V/f control (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, max. current 200 mA] • Pulse monitor output: RS-422
	PG-X2 / 3G3FV-PPGX2 		• Phase A, B and Z pulse (differential pulse) inputs (RS-422 input) • PG frequency range: Approx. 300 kHz max. [Power supply output for PG: +5 V or +12 V, max. current 200 mA] • Pulse monitor output: RS-422
	PG-F2 		• Hiperface and endat encoder option.

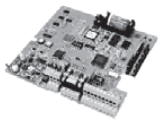
④ Communication option cards

Type	Model	Description	Function
Communication option card	SI-N1	DeviceNet option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.
	SI-P1	PROFIBUS-DP option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.
	SI-S1	CANopen option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller. • It supports DSP402 CANOpen standard protocol for drives control in speed control.
	SI-J	LONWORKS option card	• Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.

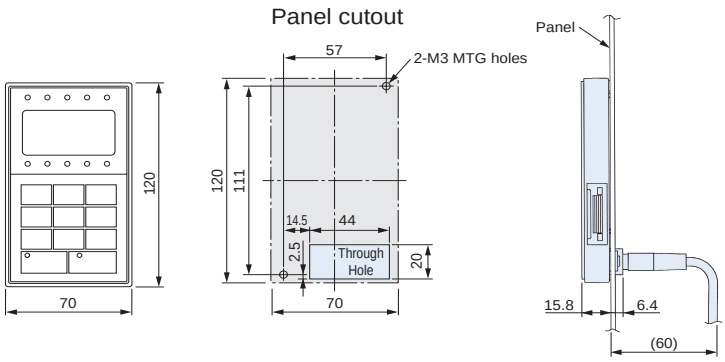
⑤ Reference option cards

Type	Model	Description	Function
Reference option card	AI-14U / 3G3IV-PAI14U	Analog input card	• 2 channel high resolution analog input card • Channel 1: 0 to 10 V (20 KΩ) • Channel 2: 4 to 20 mA (250 Ω) • Resolution 14 bit
	AI-14B / 3G3IV-PAI14B		• 3 channel high resolution analog input card • Signal level: -10 to +10V (20 KΩ) 4 to 20 mA (250 Ω) •Resolution: 13 bit + sign
	DI-08 / 3G3IV-PDI08	Digital reference card	• 8 bit digital speed reference input card
	DI-16H2 / 3G3IV-PDI16H2		• 16 bit digital speed reference input card

⑥ PLC option boards

Type	Model	Description	Function
PLC option	3G3RV-P10ST8-E 	PLC option	• Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. • Embedded Compubus/S fieldbus • Standard OMRON tools can be used for programming
	3G3RV-P10ST8-DRT-E	PLC option with DeviceNet	• Same features as standard models with DeviceNet support.

⑦ Accessories

Type	Model	Description	Installation / Function
Digital operator	JVOP-160-OY 	5 lines LCD digital operator 7 language support	 Panel cutout installation
	JVOP-161-OY 	7 segment LED digital operator	
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	Extension cable to connect inverter and digital operator
	3G3IV-PCN329-E	PC configuration cable	Cable to connect inverter to PC

⑦ Accessories

Symbol	Model	Description	Function
Software	CX-drive	Computer software	Configuration and monitoring software tool for drives.
	CX-One	Computer software	Complete OMRON automation software including CX-drive.

⑧ Braking Unit, braking resistor unit

Inverter			Braking unit		Braking resistor unit[1]									
					Inverter-mounted type (3 %ED, 10 sec max)[2]				Separately-installed type (10 %ED, 10 sec. max.)[3]					
Voltage	Max. applicable motor output kW	Model CIMR-L7Z_	Model CDBR_	No. of used	Model ERF-150WJ_	Resis-tance	No. of used	Braking Torque %	Model LKEB_	Specifications of resistor		No. of used	Braking torque %	Connectable min resistance value Ω
200 V class	3.7	23P7	Built-in		620	62 Ω	1	100	23P7	390 W	40 Ω	1	125	16
	5.5	25P5			---	---			25P5	520 W	30 Ω	1	115	16
	7.5	27P5							27P5	780 W	20 Ω	1	125	9.6
	11	2011							2011	2400 W	13.6 Ω	1	125	9.6
	15	2015							2015	3000 W	10 Ω	1	125	9.6
	18.5	2018							2015	3000 W	10 Ω	1	125	9.6
	22	2022	2022B	1					2022	4800 W	6.8 Ω	1	125	6.4
	30	2030	2015B	2					2015	3000 W	10 Ω	2	125	9.6
	37	2037	2015B	2					2015	3000 W	10 Ω	2	100	9.6
	45	2045	2022B	2					2022	4800 W	6.8 Ω	2	120	6.4
	55	2055	2022B	2					2022	4800 W	6.8 Ω	2	100	6.4
400 V class	4.0	44P0	Built in		201	200 Ω	1	110	44P0	390 W	150 Ω	1	135	32
	5.5	45P5			---	---			45P5	520 W	100 Ω	1	135	32
	7.5	47P5							47P5	780 W	75 Ω	1	130	32
	11	4011							4011	1040 W	50 Ω	1	135	20
	15	4015							4015	1560 W	40 Ω	1	125	20
	18.5	4018							4018	4800 W	32 Ω	1	125	19.2
	22	4022	4030B	1					4022	4800 W	27.2 Ω	1	125	19.2
	30	4030	4030B	1					4030	6000 W	20 Ω	1	125	19.2
	37	4037	4045B	1					4037	9600 W	16 Ω	1	125	12.8
	45	4045	4045B	1					4045	9600 W	13.6 Ω	1	125	12.8
	55	4055	4030B	2					4030	6000 W	20 Ω	2	135	19.2

1. When connecting a mounting type resistor or braking resistor unit, set system constant L3-04 to 0 (stall prevention disabled during deceleration). If operating without changing the constant, motor does not stop at set deceleration time.
2. When connecting mounting type braking resistor, set system constant L8-01 to 1 (braking resistor protection enabled).
3. Load factor during deceleration to stop a load with constant torque. With constant output or continuous regenerative braking, the load factor is smaller than the specified value.
4. Resistance value per one braking unit. Select a resistance value that is larger than connectable minimum resistance value to obtain enough braking torque.
5. For an application with large regenerative power such as hoisting, the braking torque or other items may exceed the capacity of a braking unit with a braking resistor in a standard combination (can result in capacity overload). Contact your OMRON representatives when the braking torque or any other item exceeds the values in the table.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I22E-EN-02 In the interest of product improvement, specifications are subject to change without notice.

CIMR-E7Z

Varispeed E7



Frequency inverter for pumps and fans

- Energy saving function.
- Advanced PID controller with dedicated HVAC functions.
- 12 pulse operation for harmonics reduction.
- Speed search.
- Standard RS-485 communication - MODBUS.
- Optional network cards (DeviceNet, PROFIBUS, CANOpen, LONWORKS).
- CE, UL, and cUL marked and Germanischer Lloyds approval.
- Embedded OMRON PLC functionality with PLC option card
- PC configuration tool CX-drive.
- CE, UL, and cUL marked and Lloyds approval.

E7IP54

- Robust metal chassis.
- LCD operator.
- Built in RFI filter.

Customized software

- The inverter software can be customized to meet specific application. Examples:
- Pump sequencer (S-8801).

*For detailed information please refer to CASE software section.

Ratings

- 200 V Class 0.4 to 110 kW.
- 400 V Class 0.4 to 300 kW.

System configuration

3G3IV-PCN329-E
Inverter to PC cable



CX-Drive



JVOP-160 OY
Digital operator
(LCD display)



JVOP-161-OY
Digital operator
(LED display)



3G3IV-PCN126/326
Digital operator
extension cable



Line filter



* see note



Varispeed E7

Braking accessories



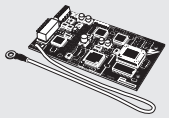
LKEB_ braking
resistor unit



CDBR_B
braking unit

* E7 IP54 types are built-in filter inverters.

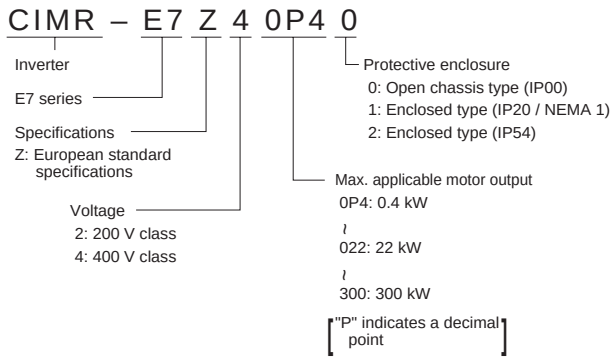
Communication card



PLC option card



Type designation



200 V class

Model CIMR-E7Z□		20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Max. applicable motor output[1] Kw		0.55	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
Output characteristics	Inverter capacity kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
	Rated current A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415
	Max. voltage	3-phase; 200, 220, 230, or 240 VAC (proportional to input voltage)																	
	Max. output frequency	200.0																	
Power supply	Rated input voltage and frequency	3-phase, 200/208/220/230/240 VAC, 50/60 Hz																	
	Allowable voltage fluctuation	+ 10%, - 15%																	
	Allowable frequency fluctuation	±5%																	
Harmonic wave prevention	DC reactor	Optional										Built in							
	12-pulse input	Not possible										Possible*2							

1. Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
2. A 3-wire transformer is required on the power supply for 12-phase rectification.

400 V class

Model CIMR-E7ZZ□		40P4	40P7	41P5	42P2	43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
IP54 model: CIMR-E7Z		---	---	---	---	---	---	---	47P52	40112	40152	40182	40222	40302	40372	40452	40552	---	---	---	---	---	---	---	---
Max. applicable motor output[1] Kw		0.55	0.75	1.5	2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	300
Output characteristics	Inverter capacity kVA	1.4	1.6	2.8	4.0	5.8	6.6	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
	Rated current A	1.8	2.1	3.7	5.3	7.6	8.7	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506	675
	Max. voltage	3-phase; 380, 400, 415, 440, 460, or 480 VAC (proportional to input voltage)																							
	Max. output frequency	200.0																							
Power supply	Rated input voltage and frequency	3-phase, 380, 400, 415, 440, 460 or 480 VAC, 50/60 Hz																							
	Allowable voltage fluctuation	+ 10%, - 15%																							
	Allowable frequency fluctuation	±5%																							
Harmonic wave prevention	DC reactor	Optional											Built in												
	12-pulse input	Not possible											Possible*2												

1. Standard 4-pole motors are used for max. applicable motor output. Choose the inverter model whose rated current is allowable within the motor rated current range.
2. A 3-wire transformer is required on the power supply for 12-phase rectification
* To agg 400 V class

Enclosures

Model CIMR-E7Z□		20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
200 V class	Enclosed type (IEC IP20)	Available as standard										Available for option						Not available	
	Open chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type										Available as standard							

Model CIMR-E7Z□		40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
400 V class	Enclosed type (IEC IP20)	Available as standard										Available for option										Not available		
	Open chassis type (IEC IP00)	Available by removing the upper and lower cover of enclosed type										Available as standard												
	Enclosed type (IP54)	----------					Available as standard										----------							

Commom specifications

Model Number CIMR-E7Z□		Specification
Control characteristics	Control method	Sine wave PWM V/f control
	Speed control range	1:40
	Speed control accuracy	±3 (25 °C ± 10 °C)
	Frequency control range	0.0to 200.0 Hz
	Frequency accuracy (temperature characteristics)	Digital references: ± 0.01% (-10 °C to +40 °C)
		Analog references: ±0.1% (25 °C ±10 °C)
	Frequency setting resolution	Digital references: 0.01 Hz
		Analog references: 0.025/50 Hz (11 bits plus sign)
	Output frequency resolution	0.01 Hz
	Frequency setting signal	0 to +10 V, 4 to 20 mA
	Accel/decel time	0.01 to 6000.0 s (2 selectable combinations of independent acceleration and deceleration settings)
	Braking torque	Approximately 20%
	Main control functions	Restarting for momentary power loss, speed searches, overtorque detection, 5-speed control (maximum), acceleration/deceleration time changes, S-curve acceleration, 3-wire control, autotuning, cooling fan ON/OFF control, torque compensation, jump frequencies, upper and lower limits for frequency references, DC braking for starting and stopping, high-slip braking, PI control (with sleep function), energy-saving control, MEMOBUS communications (RS-485/422, 19.2 kbps maximum), fault reset, and copy function.
Protective functions	Motor protection	Protection by electronic thermal overload relay.
	Instantaneous overcurrent protection	Stops at approx. 200% of rated output current.
	Fuse blown protection	Stops for fuse blown.
	Overload protection	120% of rated output current for 1 minute
	Overvoltage protection	200 class inverter: stops when main-circuit DC voltage is above 410 V. 400 class inverter: stops when main-circuit DC voltage is above 820 V.
	Undervoltage protection	200 class inverter: stops when main-circuit DC voltage is below 190 V. 400 class inverter: stops when main-circuit DC voltage is below 380 V.
	Momentary power loss ride through	By selecting the momentary power loss method, operation can be continued if power is restored within 2 s.
	Cooling fin overheating	Protection by thermistor.
	Stall prevention	Stall prevention during acceleration, deceleration, or running.
	Grounding protection	Protection by electronic circuits.
	Charge indicator	Lights up when the main circuit DC voltage is approx. 50 V or more.
Protective structure		Enclosed wall-mounted type (NEMA 1): 18.5 kW or less (same for 200 V and 400 V class inverters) Open chassis type (IP00): 22 kW or more (same for 200 V and 400 V class inverters) Enclosed wall-mounted type (IP54): From 7.5 Kw to 55 Kw (400 V class inverters)
Environment	Ambient operating temperature	-10 °C to 40 °C (enclosed wall-mounted type) - 10 °C to 45 °C (open chassis type)
	Ambient operating humidity	95% max. (with no condensation)
	Storage temperature	- 20 °C to + 60 °C (short-term temperature during transportation)
	Application site	Indoor (no corrosive gas, dust, etc.)
	Altitude	1000 m max.
	Vibration	10 to 20 Hz, 9.8 m/s2 max.; 20 to 50 Hz, 2 m/s2 max

Dimensions

Open chassis type (IEC IP00)

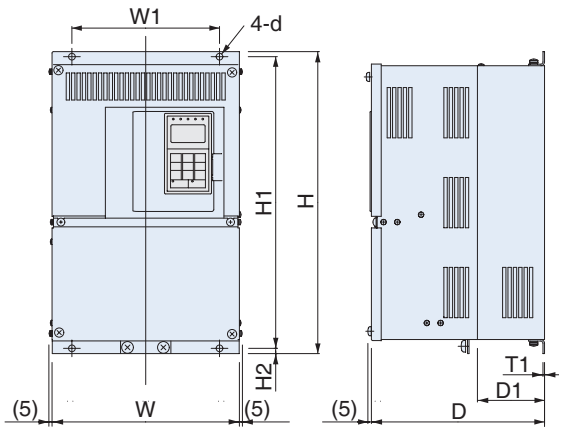


Fig 1

Voltage	Max. applicable motor output kW	Inverter CIMR-E7Z□	Fig	Dimensions in mm									Approx. weight kg	Cooling method
				W	H	D	W1	H1	H2	D1	T1	d		
200 V class (3-phase)	0.4	----	Not available, please use the IP20 type removing the upper and lower cover											
	0.75	----												
	1.5	----												
	2.2	----												
	3.7	----												
	5.5	----												
	7.5	----												
	11	----												
	15	----												
	18.5	----												
	22	2022 0	3	250	400	258	195	385	7.5	100	2.3	M6	21	Fan cooled
	30	2030 0		275	450		220	435					24	
	37	2037 0		375	600	298	250	575	12.5	100	3.2	M10	57	
	45	2045 0				328				130			63	
	55	2055 0		450	725	348	325	700					86	
	75	2075 0											87	
	90	2090 0		500	850	358	370	820	15		4.5	M12	108	
	110	2110 0		575	885	378	445	855		140			150	
400 V class (3-phase)	0.4	----	Not available, please use the IP20 type removing the upper and lower cover											
	0.75	----												
	1.5	----												
	2.2	----												
	4.0	----												
	5.5	----												
	7.5	----												
	11	----												
	15	----												
	18.5	----												
	22	4022 0	3	275	450	258	220	435	7.5	100	2.3	M6	21	Fan cooled
	30	4030 0												
	37	4037 0		325	550	283	260	535		105			36	
	45	4045 0												
	55	4055 0												
	75	4075 0		450	725	348	325	700	12.5	130	3.2	M10	88	
	90	4090 0											89	
	110	4110 0		500	850	358	370	820	15		4.5	M12	102	
	132	4132 0											120	
	160	4160 0		575	916	378	445	855	45.8	140			160	
	185	4185 0		710	1305	413	540	1270	15	125.5			260	
	220	4220 0											280	
	300	4300 0		916	1475	413	730	1440					405	

Enclosed type (IEC IP20)

E7Z 20P41 to E7Z25P51
E7Z40P41 to E7Z45P51

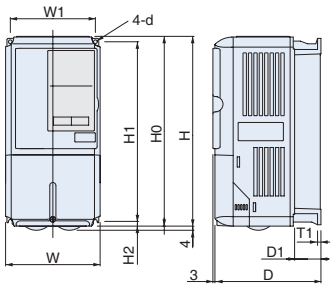


Fig 1

E7Z 27P51 to E7Z20181
E7Z47P51 to E7Z40181

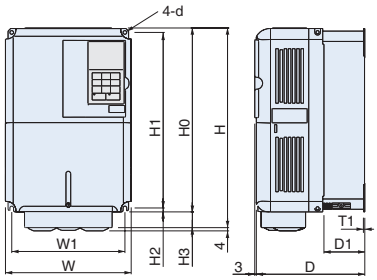


Fig 2

E7Z 20221 to E7Z20751
E7Z40221 to E7Z41601

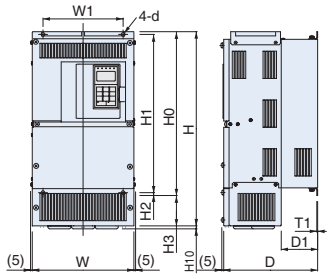
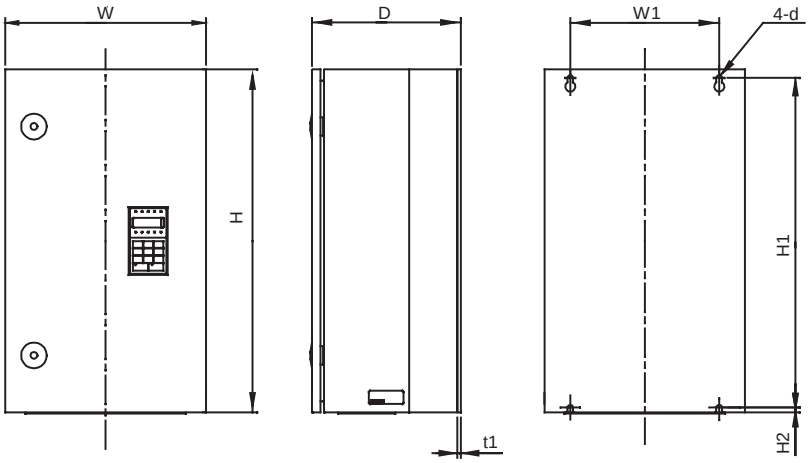


Fig 3

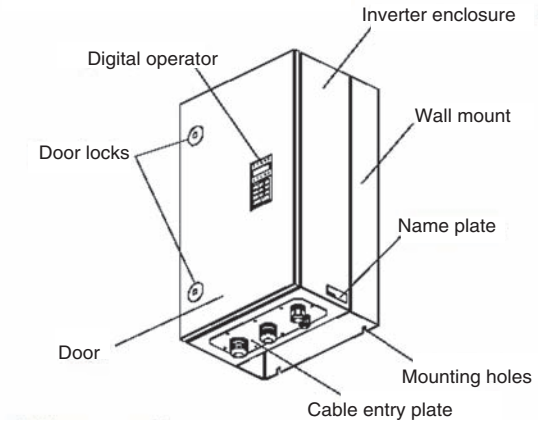
Voltage	Max. applicable motor output kW	Inverter CIMR-E7Z□	Fig	Dimensions in mm											Approx. weight kg	Cooling method
				W	H	D	W1	H0	H1	H2	H3	D1	T1	d		
200 V class (3-phase)	0.4	20P4 1	1	140	280	157	126	280	266	7	---	39	5	M5	3	Self cooled
	0.75	20P7 1														
	1.5	21P5 1														
	2.2	22P2 1														
	3.7	23P7 1				177						59			4	Fan cooled
	5.5	25P5 1														
	7.5	27P5 1	2	200	300	197	186	300	285	8	0	65.5	2.3	M6	6	
	11	2011 1			310						10				7	
	15	2015 1		240	350	207	216	350	335	7.5	0	78			11	
	18.5	2018 1			380						30					
	22	2022 1	3	254	535	258	195	400	385		135	100			24	
	30	2030 1		279	615		220	450	435		165				27	
	37	2037 1		380	809	298	250	600	575	12.5	209		3.2	M10	62	
	45	2045 1				328						130			68	
	55	2055 1		453	1027	348	325	725	700		302				94	
	75	2075 1													95	
400 V class (3-phase)	0.4	40P4 1	1	140	280	157	126	280	266	7	---	39	5	M5	3	Self cooled
	0.75	40P7 1														
	1.5	41P5 1														
	2.2	42P2 1				177						59			4	Fan cooled
	3.7	43P7 1														
	4.0	44P0 1														
	5.5	45P5 1														
	7.5	47P5 1	2	200	300	197	186	300	285	8	---	65.5	2.3	M6	6	
	11	4011 1														
	15	4015 1		240	350	207	216	350	335	7.5		78			10	
	18.5	4018 1														
	22	4022 1	3	275	535	258	220	450	435		85	100			24	
	30	4030 1														
	37	4037 1		325	715	283	260	550	535		105	105			40	
	45	4045 1														
	55	4055 1														
	75	4075 1		453	1027	348	325	725	700	12.5	302	130	3.2	M10	96	
	90	4090 1													97	
	110	4110 1		504	1243	358	370	850	820	15	393		4.5	M12	122	
	132	4132 1													130	
	160	4160 1		579	1324	378	445	918	855	45.8	408	140			170	

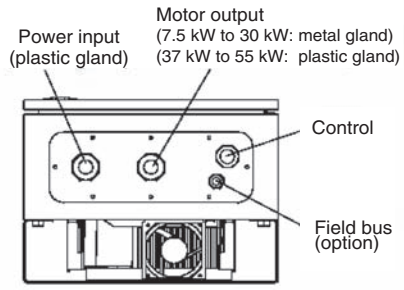
Enclosed wall-mounted inverters (IP54 type)



Voltage	Max. applicable motor output kW	Inverter CIMR-E7Z□	Dimensions in mm									Heat loss (W)	Cooling method
			W	H	D	W1	H1	H2	T1	d	Approx. weight (kg)		
400 V class (3-phase)	7.5	47P52	350	600	240	260	576	9	2.5	M8	25	304	Fan
	11	40112										427	
	15	40152			260						30	536	
	18.5	40182										662	
	22	40222	410	650	300	370	620	12	2.5	M10	43	754	
	30	40302										989	
	37	40372	580	750	330	410	714	11	2.5	M14	71	1145	
	45	40452										1317	
	55	40552										1701	

Component names





Accessories

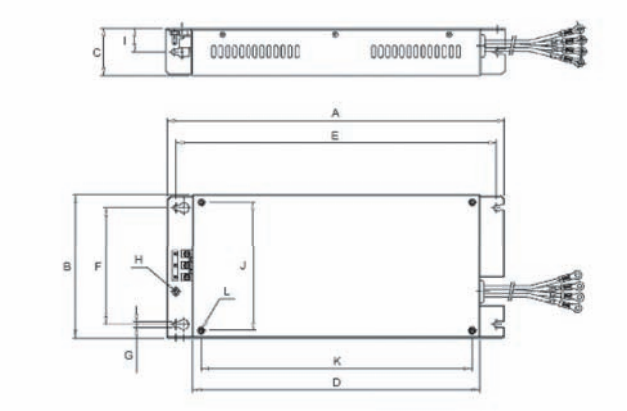
Following parts are delivered in the package with the inverter.

Part name	Qty
Cable gland (for input)*	1
Cable gland (for motor output)*	1
Cable gland (for control)*	1
Cable gland (for fieldbus)*	1
Door key	1
Blind plug (control cable entry)	1
Blind plug (fieldbus cable entry)	1

*Locknuts for each cable gland are also supplied.

Filters

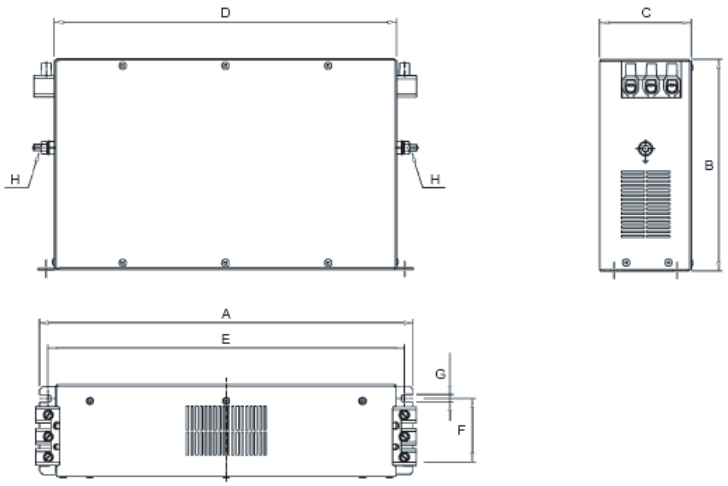
Footprint / Flat filters



Model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
200 V	3G3RV-PFI2035-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI2060-SE	355	206	60	302	336	175	6.5	M6	30	186	285	M6
	3G3RV-PFI2100-SE	408	236	80	355	390	205	6.5	M6	40	216	335	M6
400 V	3G3RV-PFI3010-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3018-SE	330	141	46	281	313	115	5.5	M5	23	126	266	M5
	3G3RV-PFI3021-SE	355	206	50	302	336	175	6.5	M4	25	186	285	M5
	3G3RV-PFI3035-SE	355	206	50	302	336	175	6.5	M5	25	186	285	M6
	3G3RV-PFI3060-SE	408	236	65	355	390	205	6.5	M6	32.5	216	335	M6
	3G3RV-PFI3410-SE [1]	386	115	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3600-SE [1]	386	135	260	306	240	235	12.0	M12	-	-	-	-
	3G3RV-PFI3800-SE [1]	564	160	300	516	420	275	9.0	M12	-	-	-	-

1. Flat filters are not possible to be mounted as footprint filters.

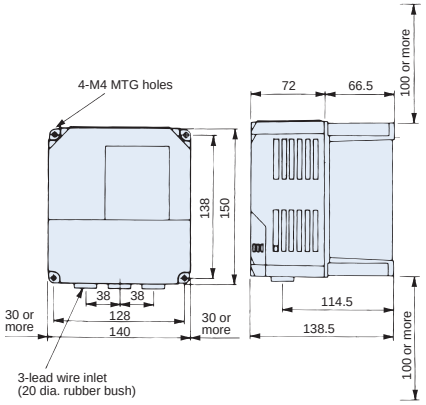
Bookform filters



Model		Dimensions							
		A	B	C	D	E	F	G	H
200 V	3G3RV-PFI2130-SE	366	180	90	280	310	65	6.5	M10
	3G3RV-PFI2160-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI2200-SE	610	240	130	480	518	90	8.2	M10
400 V	3G3RV-PFI3070-SE	331	185	80	300	329	55	6.5	M6
	3G3RV-PFI3100-SE	326	150	90	240	270	65	6.5	M10
	3G3RV-PFI3130-SE	370	180	90	280	310	65	6.5	M10
	3G3RV-PFI3170-SE	451	170	120	350	380	102	6.5	M10
	3G3RV-PFI3200-SE	610	240	130	480	518	90	8.3	M10

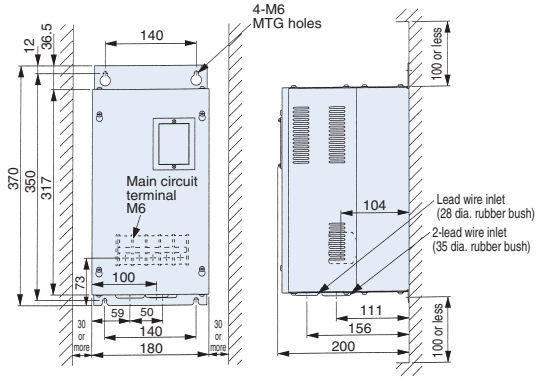
Braking unit dimensions

Model CDBR-2015 B, -2022 B, -4030B, -4045 B



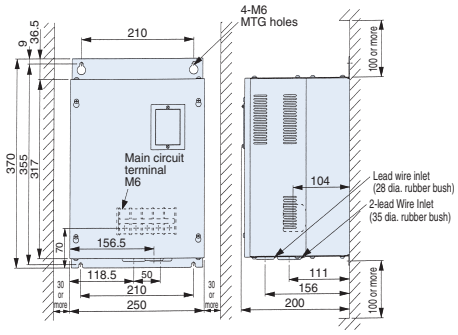
Weight 1.8 Kg

Model CDBR-2110 B



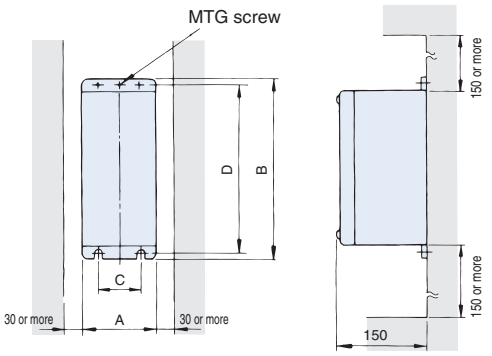
Weight 8.5 Kg

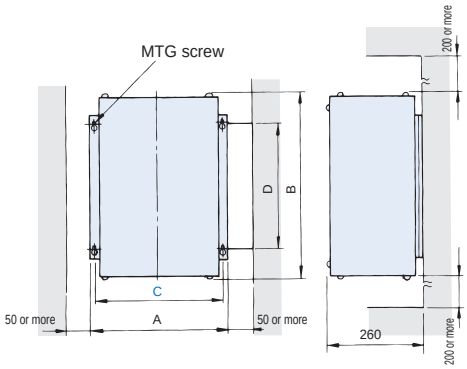
Model CDBR-4220 B



Weight 12 Kg

Braking resistor unit (separately-installed type) dimensions





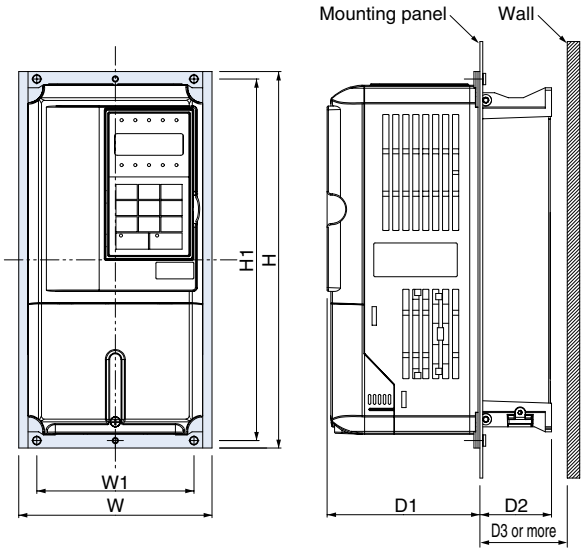
Voltage	Model LKEB-_	Dimensions in mm					Weight kg
		A	B	C	D	MTG screw	
220 V class	20P7	105	275	50	260	M5 x 3	3.0
	21P5	130	350	75	335	M5 x 4	4.5
	22P2	130	350	75	335	M5 x 4	4.5
	23P7	130	350	75	335	M5 x 4	5.0
	25P5	250	350	200	335	M6 x 4	7.5
	25P5	250	350	200	335	M6 x 4	8.5
400 V class	40P7	105	275	50	260	M5 x 3	3.0
	41P5	130	350	75	335	M5 x 4	4.5
	42P2	130	350	75	335	M5 x 4	4.5
	43P7	130	350	75	335	M5 x 4	5.0
	45P5	250	350	200	332	M6 x 4	7.5
	47P5	250	350	200	332	M6 x 4	8.5

Voltage	Model LKEB□	Dimensions in mm					Weight kg
		A	B	C	D	MTG screw	
220 V class	2011	266	543	246	340	M8 x 4	10
	2015	356	543	336	340	M8 x 4	15
	2018	446	543	426	340	M8 x 4	19
	2022	446	543	426	340	M8 x 4	19
400 V class	4011	350	412	330	325	M6 x 4	16
	4015	350	412	330	325	M6 x 4	18
	4018	446	543	426	340	M8 x 4	19
	4022	446	543	426	340	M8 x 4	19
	4030	356	956	336	740	M8 x 4	25
	4037	446	956	426	740	M8 x 4	33
	4045	446	956	426	740	M8 x 4	33

Attachments

Heatsink external mounting attachment

The Varispeed E7 inverters under the 200/400 V class 18.5 kW or less need this attachment for mounting the heatsink externally. This attachment expands the outer dimensions of the width and height of the inverter. (Attachment is not required for inverters of 22 kW or more.)



Model CIMR-E7Z□	Attachment order code	Dimensions in mm						
		W	H	W1	H1	D1	D2	D3
20P4	EZZ08676A	155	302	126	290	122.6	37.4	40
20P7								
21P5								
22P2								
23P7							57.4	60
25P5								
27P5	EZZ08676B	210	330	180	316	136.1	63.4	70
2011								
2015	EZZ08676C	250	392	216	372	133.6	76.4	85
2018								
40P4	EZZ08676A	155	302	126	290	122.6	37.4	40
40P7								
41P5								
42P2								
43P7							57.4	60
45P5								
47P5	EZZ08676B	210	330	180	316	136.1	63.4	70
4011								
4015	EZZ08676C	250	392	216	372	133.6	76.4	85
4018								

Panel cut for external mounting of cooling fin (heatsink)

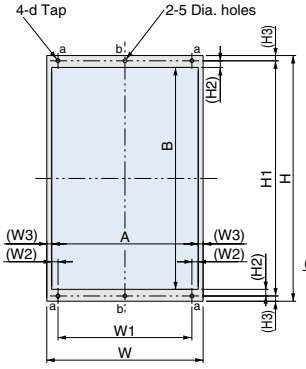


Fig 1

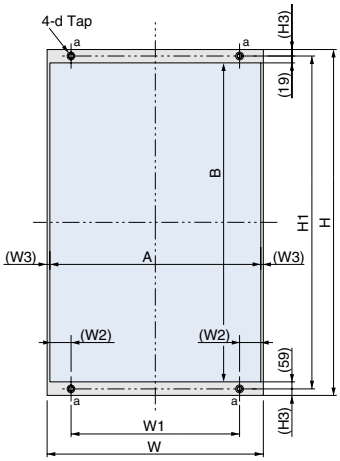


Fig 3

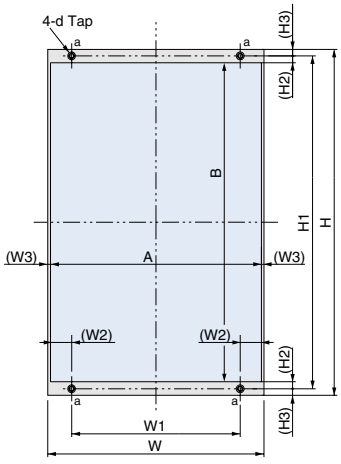


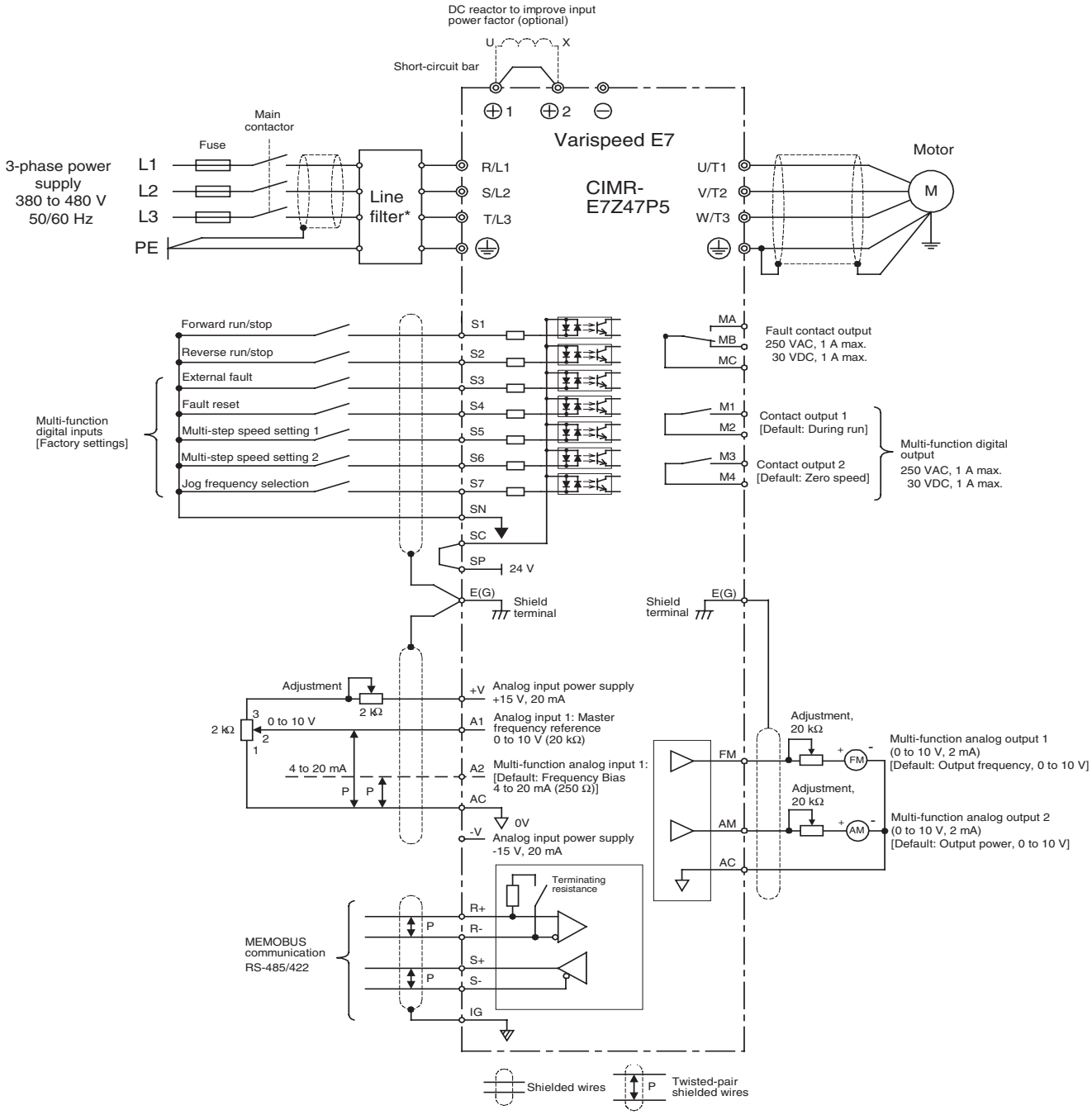
Fig 2

Model CIMR-E7Z□	Drawing	Dimensions in mm										
		W	H	W1	(W2)	(W3)	H1	(H2)	(H3)	A	B	d
20P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
20P7												
21P5												
22P2												
23P7												
25P5												
27P5		210	330	180	8.5	6.5	316	9	7	197	298	
2011												
2015		250	392	216		8.5	372	9.5	10	233	353	M6
2018												
2022	2	250	400	195	24.5	3	385	8	7.5	244	369	
2030		275	450	220			435			269	419	
2037		375	600	250	54.5	8	575	15	12.5	359	545	M10
2045												
2055		450	725	325			700	13.5		434	673	
2075												
2090		500	850	370	57	8	820	19	15	484	782	M12
2110		575	885	445	55	10	855			555	817	
40P4	1	155	302	126	6	8.5	290	9.5	6	138	271	M5
40P7												
41P5												
42P2												
43P7												
45P5												
47P5		210	330	180	8.5	6.5	316	9	7	197	298	
4011												
4015		250	392	216		8.5	372	9.5	10	233	353	
4018												
4022	2	275	450	220	24.5	3	435	8	7.5	269	419	M6
4030												
4037		325	550	260		8	535			309	519	
4045												
4055												
4075		450	725	325	54.5	8	700	13.5	12.5	434	673	M10
4090												
4110		500	850	370	57	8	820	19	15	484	782	M12
4132												
4160	3	575	925	445	55	10	895	[1]	15	555	817	

1. The sizes are different between the top and the bottom. Refer Fig 3

Installation

Standard connections



*E7 IP54 types has RFI filter included as standard

Main circuit

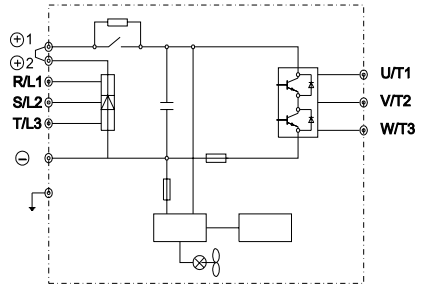
Voltage	200 V			400 V		
Model CIMR-E7Z□	20P4 to 2018	2022, 2030	2037 to 2110	40P4 to 4018	4022 to 4055	4075 to 4300
Max. applicable motor output	0.4 to 18.5 kW	22 to 30 kW	37 to 110 kW	0.4 to 18.5 kW	22 to 55 kW	75 to 300 kW
R/L1	Main circuit input power supply	Main circuit input power supply		Main circuit input power supply	Main circuit input power supply	
S/L2						
T/L3						
R1/L11	---	R-R1, S-S1 and T-T1 have been wired before shipment (see P59).		---	R-R1, S-S1 and T-T1 have been wired before shipment	
S1/L21						
T1/L31						
U/T1	Inverter output			Inverter output		
V/T2						
W/T3						
⊖	DC reactor (⊕1- ⊕2) DC power supply[1] (⊕1 - ⊖)	DC power supply (⊕1- ⊕2)[1] Braking unit (⊕3 - ⊖)		DC reactor (⊕1- ⊕2) DC power supply[1] (⊕1 - ⊖)	DC power supply (⊕1- ⊕2)[1] Braking unit (⊕3 - ⊖)	
⊕1						
⊕2						
⊕3	---			---		
⏚ /l2	------		Cooling fan power supply[2]	---		
r/l1						Cooling fan power supply[3]
⏚ 200 / l2 200	------			---		
⏚ 400 / l2 400						
PE (⏚)	Ground terminal (100 Ω or less)			Ground terminal (10 Ω or less)		

1. ⊕1 - ⊖ DC power input does not conform to UL/c-UL listed standard.
2. Cooling fan power supply r/l_1- ⏚ /l_2: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz
   (A transformer is required for 230 V 50 Hz or 240 V 50/60 Hz power supply.)
3. Cooling fan power supply r/l_1 - ⏚ 200 / l_2 200: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz, r/l_1 - ⏚ 400 / l_2 400: 380 to 480 VAC 50/60 Hz

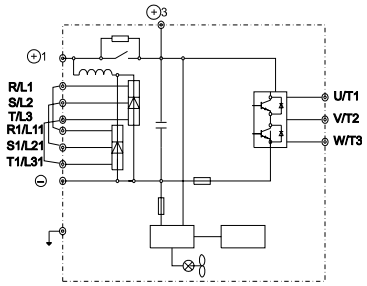
Main circuit configuration

200 V class

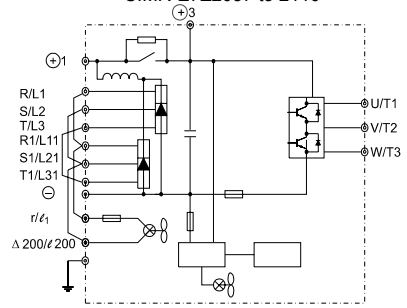
CIMR-E7Z20P4 to 2018



CIMR-E7Z2022, 2030

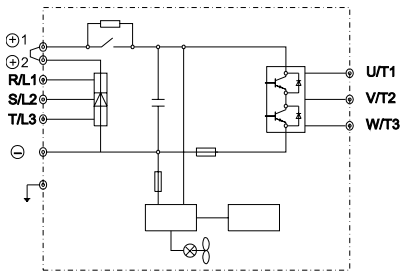


CIMR-E7Z2037 to 2110

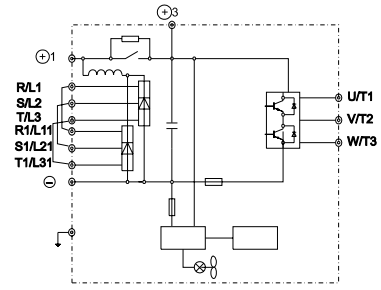


400 V class

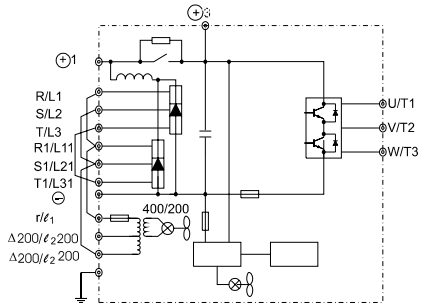
CIMR-E7Z40P4 to 4018



CIMR-E7Z4022 to 4055

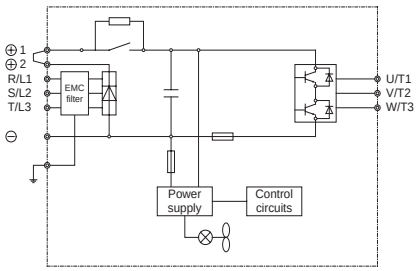


CIMR-E7Z4075 to 4300

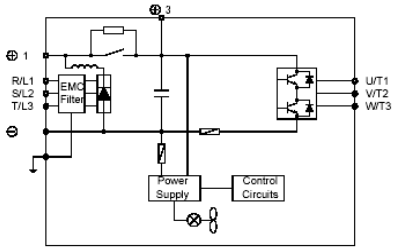


400V class IP54

CIMR-E7Z47P5 to 40182



CIMR-E7Z40222 to 40552



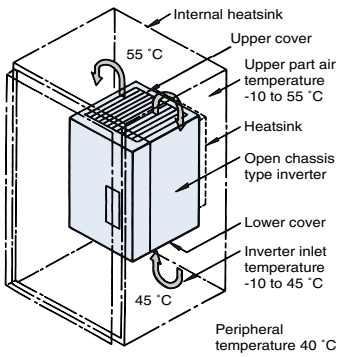
Control circuit

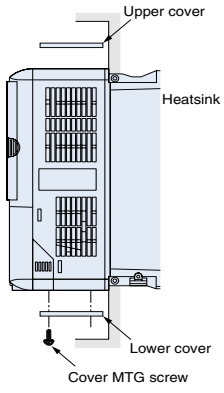
Type	No.	Signal name	Function		Signal level
Digital input signals	S1	Forward run/stop command	Forward run when ON; stopped when OFF.		24 VDC, 8 mA photocoupler isolation
	S2	Reverse run/stop command	Reverse run when ON; stopped when OFF.		
	S3	External fault input*1	Fault when ON.	Functions are selected by setting H1-01 to H1-05.	
	S4	Fault reset*1	Reset when ON		
	S5	Multi-step speed reference 1*1 (Master/auxiliary switch)	Auxiliary frequency reference when ON.		
	S6	Multi-step speed reference 2*1	Multi-step setting 2 when ON.		
	S7	Jog frequency reference*1	Jog frequency when ON.		
	SC	Digital input common	–		–
	SN	Digital input neutral	–		–
	SP	Digital input power supply	+24 VDC power supply for digital inputs		24 VDC, 250 mA max. *2
Analog input signals	+V	15 V power output	15 V power supply for analog references		15 V (max. current: 20 mA)
	A1	Frequency reference	0 to +10 V/100%		0 to +10 V (20 kΩ)
	A2	Multi-function analog input	4 to 20 mA/100% 0 V to +10 V/100% 0 to 20 mA/100%	Function is selected by setting H3-09.	4 to 20 mA (250 Ω) 0 V to +10 V (20 kΩ) 0 to 20 mA (250 Ω)
	AC	Analog reference common	–		–
	E(G)	Shield wire, optional ground line connection point	–		–
Digital output signals	M1	Running signal (1NO contact)	Operating when ON.	Multi-function contact outputs	Relay contacts contact capacity: 1 A max. at 250 VAC 1 A max. at 30 VDC*3
	M2				
	M3	Zero speed	Zero level (b2-01) or below when ON		
	M4				
	MA	Fault output signal	Fault when CLOSED across MA and MC Fault when OPEN across MB and MC		
	MB				
	MC				
Analog output signals	FM	Multi-function analog output (frequency output)	0 to 10 V, 10 V=100% output frequency	Multi-function analog output 1	0 to +10 V max. ±5% 2 mA max.
	AC	Analog common	–		
	AM	Multi-function analog output (current monitor)	0 to 10 V, 10V = 200% of the inverter rated current	Multi-function analog output 2	
RS-485/422	R+	MEMOBUS communications input	For 2-wire RS-485, short R+ and S+ as well as R- and S-.		Differential input, photocoupler isolation
	R-				
	S+	MEMOBUS communications output			Differential input, photocoupler isolation
	S-				
	IG	Signal common	–		–

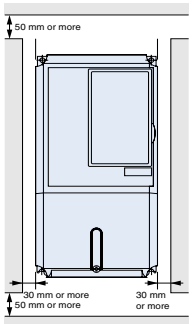
Note: 1.The default settings are given for terminals S3 to S7. For a 3-wire sequence, the default settings are a 3-wire sequence for S5, multi-step speed setting 1 for S6 and multi-step speed setting 2 for S7.
2.Do not use this power supply for supplying any external equipment.
3.When driving a reactive load, such as a relay coil with DC power supply, always insert a flywheel diode.

Remove the upper and lower covers for the models of 15 kW or less in 200 V and 400 V classes.

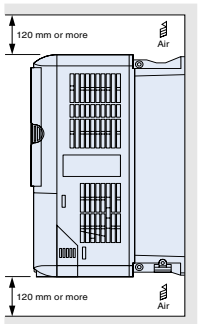
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.







Side spaces



Top and bottom spaces

Inverter heat loss

200 V class

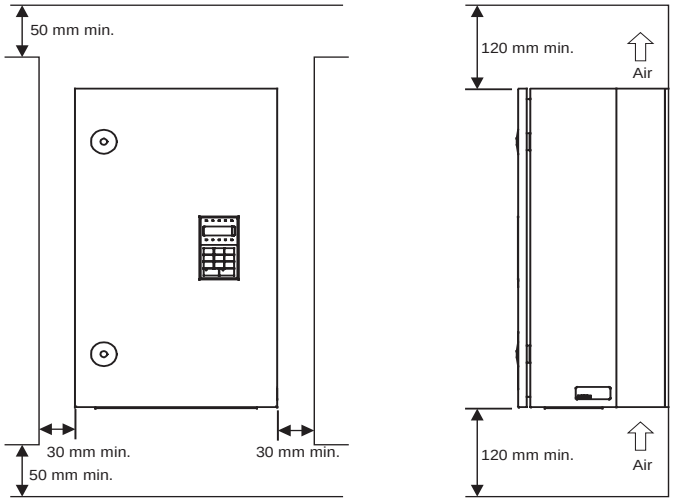
Model CIMR-E7Z□			20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	2090	2110
Inverter capacity		kVA	1.2	1.6	2.7	3.7	5.7	8.8	12	17	22	27	32	44	55	69	82	110	130	160
Rated current		A	3.2	4.1	7.0	9.6	15	23	31	45	58	71	85	115	145	180	215	283	346	415
Heat loss W	Fin	W	20	27	50	70	112	164	219	374	429	501	586	865	1015	1266	1588	2019	2437	2733
	Inside unit	W	39	42	50	59	74	84	113	170	183	211	274	352	411	505	619	838	997	1242
	Total heat loss	W	59	69	100	129	186	248	332	544	612	712	860	1217	1426	1771	2207	2857	3434	3975
Fin cooling			Self cooled				Fan cooled													

400 V class

Model CIMR-E7Z□			40P4	40P7	41P5	42P2	43P7	44P0	45P5	47P5	4011	4015	4018	4022	4030	4037	4045	4055	4075	4090	4110	4132	4160	4185	4220	4300
Inverter capacity		kVA	1.4	1.6	2.8	4.0	5.8	6.0	9.5	13	18	24	30	34	46	57	69	85	110	140	160	200	230	280	390	510
Rated current		A	1.8	2.1	3.7	5.3	7.6	8.0	12.5	17	24	31	39	45	60	75	91	112	150	180	216	260	304	370	506	675
Heat loss W	Fin	W	14	17	36	59	80	91	127	193	252	326	426	466	678	784	901	120	139	161	209	238	279	323	374	583
	Inside unit	W	39	41	48	56	68	70	82	114	158	172	208	259	317	360	415	495	575	671	853	100	114	137	153	232
	Total heat loss	W	53	58	84	115	148	161	209	307	410	498	634	725	995	114	131	169	197	228	295	339	393	460	527	815
Fin cooling			Self cooled			Fan cooled																				

Installation conditions for IP54

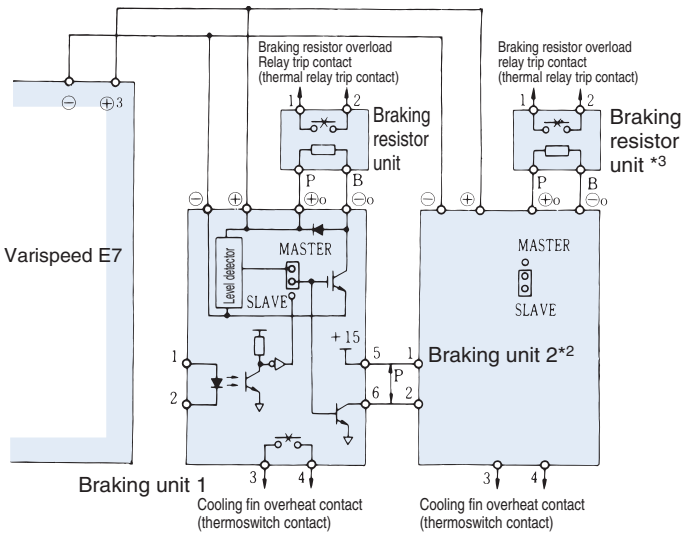
Install the inverter vertically in order to ensure a proper cooling. When installing the inverter, always provide the following minimum installation space to allow normal heat dissipation.



Horizontal space　　Vertical space

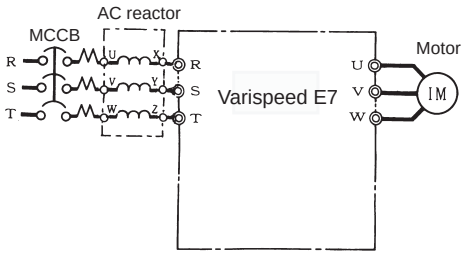
1. Always provide enough space for the main circuit or control lines including cable gland.
2. If installing inverters next to one another provide a minimum spacing of 60 mm.

Connections for braking units

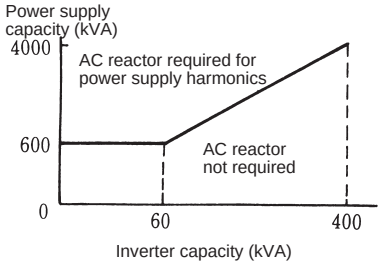


AC reactor

Connection example

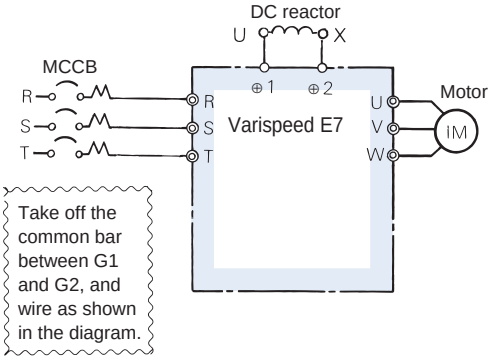


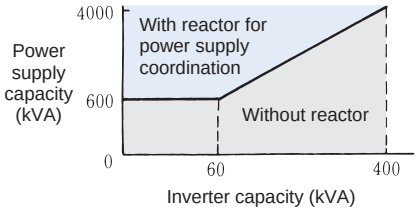
Application example



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	2.5	4.2	0.4	1.3	18.0
0.75	5	2.1	0.75	2.5	8.4
1.5	10	1.1	1.5	5	4.2
2.2	15	0.71	2.2	7.5	3.6
3.7	20	0.53	3.7	10	2.2
5.5	30	0.35	5.5	15	1.42
7.5	40	0.265	7.5	20	1.06
11	60	0.18	11	30	0.7
15	80	0.13	15	40	0.53
18.5	90	0.12	18.5	50	0.42
22	120	0.09	22	60	0.36
30	160	0.07	30	80	0.26
37	200	0.05	37	90	0.24
45	240	0.044	45	120	0.18
55	280	0.038	55	150	0.15
75	360	0.026	75	200	0.11
90	500	0.02	90/110	250	0.09
110	500	0.02	132/160	330	0.06
			185	490	0.04
			220		
			300	660	0.03

DC reactor





200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.4	5.4	8	0.4	3.2	28
0.75			0.75		
1.5	18	3	1.5	5.7	11
2.2			2.2		
3.7			3.7	12	6.3
5.5	36	1	5.5	23	3.6
7.5			7.5		
11	72	0.5	11	33	1.9
15			15		
18.5	90	0.4	18.5	47	1.3
22 to 110	Built-in		22 to 300	Built-in	

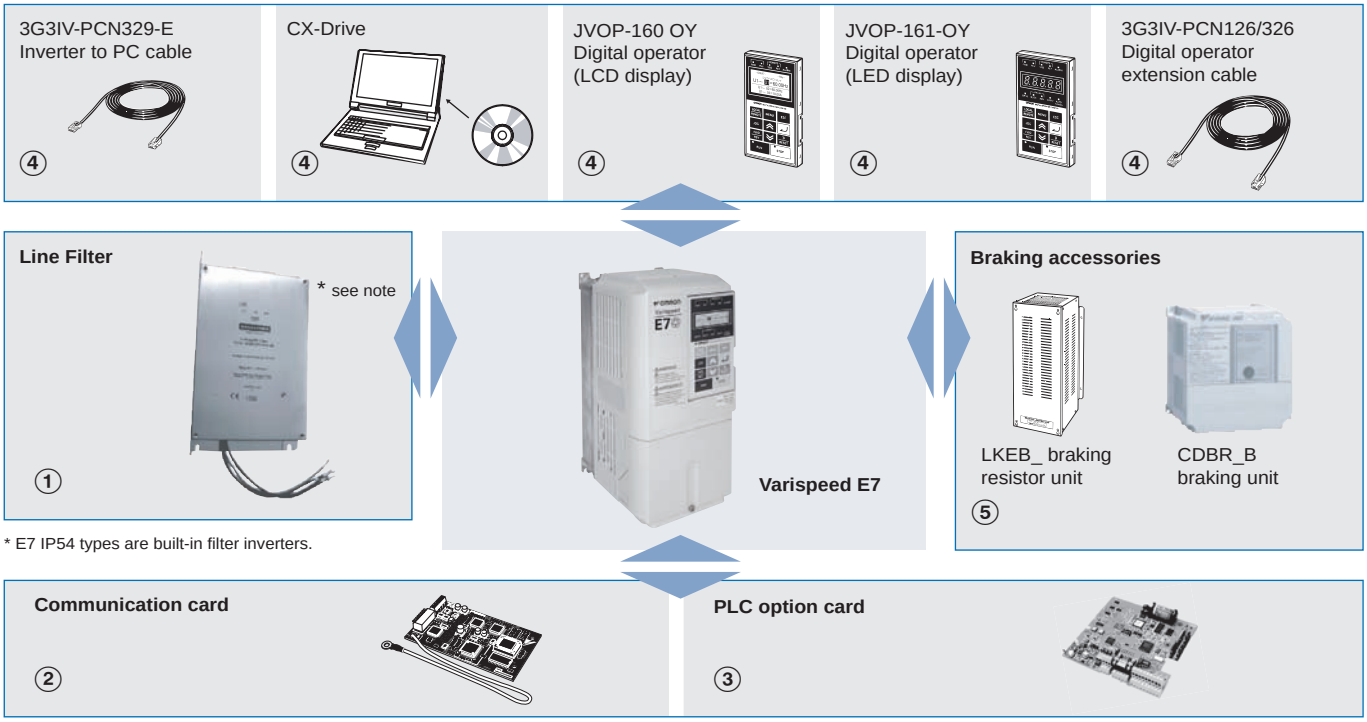
Fuse installation

To protect the inverter, it is recommended to use semiconductor fuses as shown in the table below

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
20P4	240	10	12~25
20P7	240	10	12~25
21P5	240	15	23~55
22P2	240	20	34~98
23P7	240	30	82~220
25P5	240	40	220~610
27P5	240	60	290~1300
2011	240	80	450~5000
2015	240	100	1200~7200
2018	240	130	1800~7200
2022	240	150	870~16200
2030	240	180	1500~23000
2037	240	240	2100~19000
2045	240	300	2700~55000
2055	240	350	4000~55000
2075	240	450	7100~64000
2090	240	550	11000~64000
2110	240	600	13000~83000

Inverter type	FUSE		
	Voltage (V)	Current (A)	I^2t (A^2s)
40P4	480	5	6~55
40P7	480	5	6~55
41P5	480	10	10~55
42P2	480	10	18~55
43P7	480	15	34~72
44P0	480	20	50~570
45P5	480	25	100~570
47P5	480	30	100~640
4011	480	50	150~1300
4015	480	60	400~1800
4018	480	70	700~4100
4022	480	80	240~5800
4030	480	100	500~5800
4037	480	125	750~5800
4045	480	150	920~13000
4055	480	150	1500~13000
4075	480	250	3000~55000
4090	480	300	3800~55000
4110	480	350	5400~23000
4132	480	400	7900~64000
4160	480	450	14000~250000
4185	480	600	20000~250000
4220	480	700	34000~400000
4300	480	900	52000~920000

Ordering information



* E7 IP54 types are built-in filter inverters.

Varispeed E7



200 V

Specifications			Model
IP20	0.55 Kw	3.2 A	CIMR-E7Z20P41
	0.75 Kw	4.1 A	CIMR-E7Z20P71
	1.5 Kw	7.0 A	CIMR-E7Z21P51
	2.2 Kw	9.6 A	CIMR-E7Z22P21
	3.7 Kw	15 A	CIMR-E7Z23P71
	5.5 Kw	23 A	CIMR-E7Z25P51
	7.5 Kw	31 A	CIMR-E7Z27P51
	11 Kw	45 A	CIMR-E7Z20111
	15 Kw	58 A	CIMR-E7Z20151
	18.5 Kw	71 A	CIMR-E7Z20181
IP00	22 Kw	85 A	CIMR-E7Z20220
	30 Kw	115 A	CIMR-E7Z20300
	37 Kw	145 A	CIMR-E7Z20370
	45 Kw	180 A	CIMR-E7Z20450
	55 Kw	215 A	CIMR-E7Z20550
	75 Kw	283 A	CIMR-E7Z20750
	90 Kw	345 A	CIMR-E7Z20900
	110 Kw	415 A	CIMR-E7Z21100

400 V

Specifications			Model
IP20	0.55 Kw	1.8 A	CIMR-E7Z40P41
	0.75 Kw	2.1 A	CIMR-E7Z40P71
	1.5 Kw	3.7 A	CIMR-E7Z41P51
	2.2 Kw	5.3 A	CIMR-E7Z42P21
	3.7 Kw	7.6 A	CIMR-E7Z43P71
	4.0 Kw	8.7 A	CIMR-E7Z44P01
	5.5 Kw	12.5 A	CIMR-E7Z45P51
	7.5 Kw	17 A	CIMR-E7Z47P51
	11 Kw	24 A	CIMR-E7Z40111
	15 Kw	31 A	CIMR-E7Z40151
	18.5 Kw	39 A	CIMR-E7Z40181
IP00	22 Kw	45 A	CIMR-E7Z40220
	30 Kw	60 A	CIMR-E7Z40300
	37 Kw	75 A	CIMR-E7Z40370
	45 Kw	91 A	CIMR-E7Z40450
	55 Kw	112 A	CIMR-E7Z40550
	75 Kw	150 A	CIMR-E7Z40750
	90 Kw	180 A	CIMR-E7Z40900
	110 Kw	216 A	CIMR-E7Z41100
	132 Kw	260 A	CIMR-E7Z41320
	160 Kw	304 A	CIMR-E7Z41600
	185 Kw	370 A	CIMR-E7Z41850
	220 Kw	506 A	CIMR-E7Z42200
	300 Kw	675 A	CIMR-E7Z43000

Varispeed E7 IP54



400 V

Specifications			Model
IP54	7.5 Kw	17 A	CIMR-E7Z47P52
	11 Kw	24 A	CIMR-E7Z40112
	15 Kw	31 A	CIMR-E7Z40152
	18.5 Kw	39 A	CIMR-E7Z40182
	22 Kw	45 A	CIMR-E7Z40222
	30 Kw	60 A	CIMR-E7Z40302
	37 Kw	75 A	CIMR-E7Z40372
	45 Kw	91 A	CIMR-E7Z40452
	55 Kw	112 A	CIMR-E7Z40552

① Input filters



200 V

Inverter model	Line filters [1]			
Varispeed E7	Type	EN55011 class	Current (A)	Weight (kg)
CIMR-E7Z20P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-E7Z20P7				
CIMR-E7Z21P5				
CIMR-E7Z22P2	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-E7Z23P7	3G3RV-PFI2035-SE	B, 25 m A, 100 m	35	1.4
CIMR-E7Z25P5				
CIMR-E7Z27P5	3G3RV-PFI2060-SE	B, 25 m A, 100 m	60	3
CIMR-E7Z2011				
CIMR-E7Z2015	3G3RV-PFI2100-SE	B, 25 m A, 100 m	100	4.9
CIMR-E7Z2018				
CIMR-E7Z2022	3G3RV-PFI2130-SE	A, 100 m	130	4.3
CIMR-E7Z2030				
CIMR-E7Z2037	3G3RV-PFI2160-SE	A, 100 m	160	6.0
CIMR-E7Z2045	3G3RV-PFI2200-SE	A, 100 m	200	11.0
CIMR-E7Z2055				
CIMR-E7Z2075	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-E7Z2090				
CIMR-E7Z2110	3G3RV-PFI3600-SE	A, 100 m	600	11.0

1. Varispeed E7 is a built-in filter inverter.

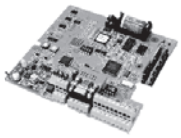
400 V

Inverter model	Line filters			
Varispeed E7	Model	EN 55011 class*	Current (A)	Weight (kg)
CIMR-E7Z40P4	3G3RV-PFI3010-SE	B, 25 m A, 100 m	10	1.2
CIMR-E7Z40P7				
CIMR-E7Z41P5				
CIMR-E7Z42P2				
CIMR-E7Z43P7	3G3RV-PFI3018-SE	B, 25 m A, 100 m	18	1.3
CIMR-E7Z44P0				
CIMR-E7Z45P5				
CIMR-E7Z47P5	3G3RV-PFI3021-SE	B, 25 m A, 100 m	21	1.8
CIMR-E7Z4011	3G3RV-PFI3035-SE	B, 25 m A, 100 m	35	2.2
CIMR-E7Z4015	3G3RV-PFI3060-SE	B, 25 m A, 100 m	60	4.0
CIMR-E7Z4018				
CIMR-E7Z4022	3G3RV-PFI3070-SE	B, 25 m A, 100 m	70	3.4
CIMR-E7Z4030				
CIMR-E7Z4037	3G3RV-PFI3100-SE	A, 100 m	100	4.5
CIMR-E7Z4045				
CIMR-E7Z4055	3G3RV-PFI3130-SE	A, 100 m	130	4.7
CIMR-E7Z4075	3G3RV-PFI3170-SE	A, 100 m	170	6.0
CIMR-E7Z4090	3G3RV-PFI3200-SE	A, 100 m	250	11
CIMR-E7Z4110				
CIMR-E7Z4132	3G3RV-PFI3410-SE	A, 100 m	400	8.6
CIMR-E7Z4160				
CIMR-E7Z4185	3G3RV-PFI3600-SE	A, 100 m	600	11,0
CIMR-E7Z4220				
CIMR-E7Z4300	3G3RV-PFI3800-SE	A, 100 m	800	31.0

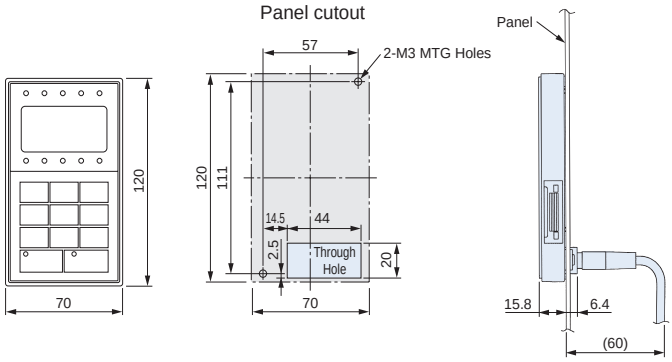
② Communication cards

Type	Model	Description	Function
Communication option cards	3G3RV-PDRT2	DeviceNet option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.
	SI-P1	PROFIBUS-DP option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.
	SI-S1	CANopen option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.
	CM090	Ethernet option card	• MODBUS TCP/IP Ethernet interface unit.
	SI-J	LONWORKS option card	• Used for HVAC control, running or stopping the inverter, setting or referencing parameters, and monitoring output current, watt-hours, or similar items through LONWORKS communications with peripheral devices.

③ PLC Option Card

Type	Model	Description	Function
PLC option cards	3G3RV-P10CDT-E  3G3-P10CDT-E-DRT	PLC option	• Full features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs • Embedded Compobus/S fieldbus • Standard OMRON tools can be used for programming
		PLC option with DeviceNet	• Same features as standard models with DeviceNet support

④ Accessories

Type	Model	Description	Installation
Digital operators	JVOP-160-OY 	5 lines LCD digital operator [1]	 Panel cutout installation
	JVOP-161-OY 	7 segment LED digital operator	
	JVOP-162 	Hand-Off auto operator	
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	-----
	3G3IV-PCN329-E	PC configuration cable	-----

1. LCD digital operator is the Standard in IP54 types.

④ Computer software

Type	Model	Description	Function
Software	CX-drive	Computer software	Configuration and monitoring software tool
	CX-One	Computer software	Configuration and monitoring software tool

⑤ Braking unit, braking resistor unit

Inverter			Braking unit		Braking resistor unit					
					Separately-installed type (10 %ED, 10 sec. max.)[1]  					
Voltage	Max. applicable motor output kW	Model CIMR-E7Z□	Model CDBR□	No. of used	Model LKEB□	Specifications of resistor		No. of used	Braking torque %	Connectable min resistance value Ω
200 V class	0.4	20P4	2015B	1	20P7	70 W	200 Ω	1	220	48
	0.75	20P7			20P7	70 W	200 Ω	1	125	48
	1.5	21P5			21P5	260 W	100 Ω	1	125	48
	2.2	22P2			22P2	260 W	70 Ω	1	120	16
	3.7	23P7			23P7	390 W	40 Ω	1	125	16
	5.5	25P5			25P5	520 W	30 Ω	1	115	16
	7.5	27P5			27P5	780 W	20 Ω	1	125	9.6
	11	2011			2011	2400 W	13.6 Ω	1	125	9.6
	15	2015			2015	3000 W	10 Ω	1	125	9.6
	18.5	2018	2022B	1	2015	3000 W	10 Ω	1	125	9.6
	22	2022			2022	4800 W	6.8 Ω	1	125	6.4
	30	2030	2015B	2	2015	3000 W	10 Ω	2	125	9.6
	37	2037	2015B	2	2015	3000 W	10 Ω	2	100	9.6
	45	2045	2022B	2	2022	4800 W	6.8 Ω	2	120	6.4
	55	2055	2022B	2	2022	4800 W	6.8 Ω	2	100	6.4
	75	2075	2110B	1	2022	4800 W	6.8 Ω	3	110	1.6
	90	2090	2110B	1	2022	4800 W	6.8 Ω	4	120	1.6
	110	2110	2110B	1	2018	4800 W	8 Ω	5	100	1.6
400 V class	0.4	40P4	4030B	1	40P7	70 W	750 Ω	1	230	96
	0.75	40P7			40P7	70 W	750 Ω	1	130	96
	1.5	41P5			41P5	260 W	400 Ω	1	125	64
	2.2	42P2			42P2	260 W	250 Ω	1	135	64
	3.7	43P7			43P7	390 W	150 Ω	1	135	32
	5.5	45P5			45P5	520 W	100 Ω	1	135	32
	7.5	47P5			47P5	780 W	75 Ω	1	130	32
	11	4011			4011	1040 W	50 Ω	1	135	20
	15	4015			4015	1560 W	40 Ω	1	125	20
	18.5	4018			4018	4800 W	32 Ω	1	125	19.2
	22	4022			4022	4800 W	27.2 Ω	1	125	19.2
	30	4030			4030	6000 W	20 Ω	1	125	19.2
	37	4037	4045B	1	4037	9600 W	16 Ω	1	125	12.8
	45	4045	4045B	1	4045	9600 W	13.6 Ω	1	125	12.8
	55	4055	4030B	2	4030	6000 W	20 Ω	2	135	19.2
	75	4075	4045B	2	4045	9600 W	13.6 Ω	2	145	12.8
	90	4090	4220B	1	4030	6000 W	20 Ω	3	100	3.2
	110	4110	4220B	1	4030	6000 W	20 Ω	3	100	3.2
	132	4132	4220B	1	4045	9600 W	13.6 Ω	4	140	3.2
	160	4160	4220B	1	4045	9600 W	13.6 Ω	4	140	3.2
	185	4185	4220B	1	4045	9600 W	13.6 Ω	4	120	3.2
	220	4220	4220B	1	4037	9600 W	16 Ω	5	110	3.2
	300	4300	4220B	2	4045	9600 W	13.6 Ω	6	110	3.2

1. Load factor during deceleration to stop a load with constant torque. With constant output or continuous regenerative braking, the load factor is smaller than the specified value.
2. Resistance value per one braking unit. Select a resistance value that is larger than connectable minimum resistance value to obtain enough braking torque.
3. For an application with large regenerative power such as hoisting, the braking torque or other items may exceed the capacity of a braking unit with a braking resistor in a standard combination (can result in capacity overload). Contact your OMRON representatives when the braking torque or any other item exceeds the values in the table.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I21E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

CIMR-V7AZ

Varispeed V7



Sensorless vector in pocket size

- Nominal torque at 0.5 Hz
- Autotuning
- High carrier up to 14 khz
- Stop accuracy function.
- Integrated PID controller and bidirectional PID-out put
- Motor protection with PTC input
- Pulse input
- Standard digital operator with copy function
- Fieldbus: Modbus, DeviceNet, PROFIBUS, CANopen
- High speed motion bus: ML- II
- Plug-in PLC option unit. Total inverter access.
- CE, UL, and cUL marked

V7 IP65

- Compact size
- Easy wiring
- Built-in filter (Class B)

Customized software*

- The inverter software can be customized to meet specific application. Examples:
- Traverse sofware S-9381.

*For detailed information please refer to case software section.

Ratings

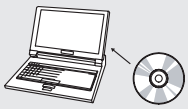
- 200 V Class single-phase 0.1 to 4 kW
- 200 V Class three-phase 0.1 to 7.5 kW
- 400 V Class three-phase 0.2 to 7.5 kW

System configuration

3G3IV-PCN329-E
Inverter to PC cable



CX-Drive



3G3IV-PEZZ8122_
DIN attachment



JVOP-144
Remote digital oper. with potentiometer



JVOP-146
Remote digital oper. with potentiometer



3G3IV-PCN126/326
Digital operator extension cable



Line filter *See note





Varispeed V7

Braking accessories



LKEB_



CDBR_B



ERF150WJ_

* V7 IP65 types are built-in filter inverters.

Communication unit *See note



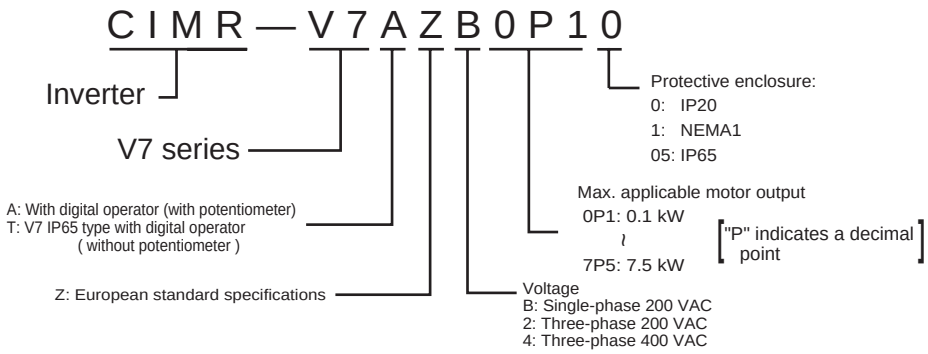
PLC option unit *See note



* Option frames are needed for V7 IP65 type.

Specifications

Type designation



200 V class

IP20 single-phase: CIMR-V7AZ		B0P1	B0P2	B0P4	B0P7	B1P5	B2P2	B4P0
IP65 single-phase: CIMR-V7TZ		---	---	B0P405	B0P705	B1P505	B2P205	---
IP20 three-phase: CIMR-V7AZ		20P1	20P2	20P4	20P7	21P5	22P2	24P0
Maximum permissible motor output kW[1]		0.12	0.25	0.55	1.1	1.5	2.2	4.0
Output characteristics	Inverter capacity kVA	0.3	0.6	1.1	1.9	3.0	4.2	6.7
	Rated output current A	0.8	1.6	3.0	5.0	8.0	11.0	17.5
	Max. output voltage	Proportional to input voltage: 0..240 V						
	Max. output frequency	400 Hz						
Power supply	Rated input voltage and frequency	Single-phase 200..240 V 50/60 Hz 3-phase 200..230 V 50/60 Hz						
	Allowable voltage fluctuation	-15%..+10%						
	Allowable frequency fluctuation	+5%						

1. Based on a standard 4-pole motor for maximum applicable motor output. Select the inverter model within the allowable motor rated current

400 V class

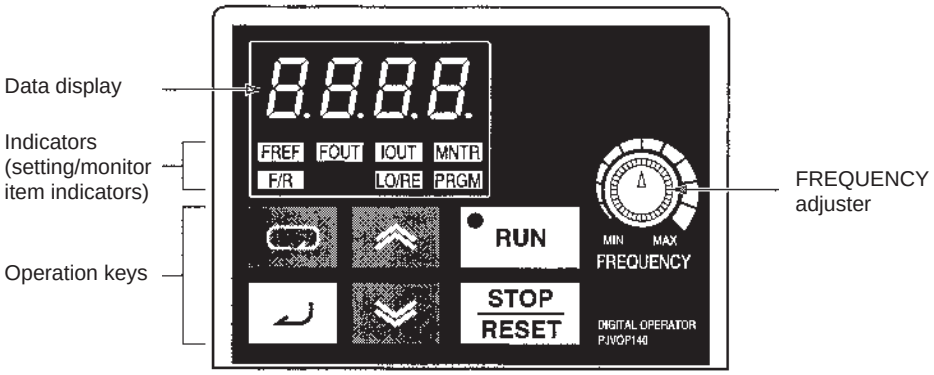
IP20 three-phase: CIMR-V7AZ		40P2	40P4	40P7	41P5	42P2	43P0	44P0	45P5	47P5
IP65 three-phase: CIMR-V7TZ			40P405	40P705	41P505	42P205	43P005	44P005		
Maximum permissible motor output kW[1]		0.37	0.55	1.1	1.5	2.2	3.0	4.0	5.5	7.5
Output characteristics	Inverter capacity kVA	0.9	1.4	2.6	3.7	4.2	5.5	7.0	11.0	14.0
	Rated output current A	1.2	1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0
	Max. output voltage	Proportional to input voltage: 0..400 V								
	Max. output frequency	400 Hz								
Power supply	Rated input voltage and frequency	3-phase 380..460 VAC, 50/60 Hz								
	Allowable voltage fluctuation	-15%..+10%								
	Allowable frequency fluctuation	+5%								

1. Based on a standard 4-pole motor for maximum applicable motor output. Select the inverter model within the allowable motor rated current

Commom specifications

Model number CIMR-V7AZ-□ CIMR-V7TZ-□		Specifications
Control functions	Control methods	Sine wave PWM (V/f control, sensorless vector control)
	Output frequency range	0.1..400 Hz
	Frequency tolerance	Digital set value: ±0.01% (-10..+50 ºC)
		Analogue set value: ±0.5% (25 ±10 ºC)
	Resolution of frequency set value	Digital set value: 0.01 Hz (<100 Hz), 0.1 Hz (>100 Hz)
		Analogue set value: 1/1000 of maximum frequency
	Resolution of output frequency	0.01 Hz
	Overload capability	150%/60 s
	Frequency set value	0..10 V (20 kΩ), 4..20 mA (250 Ω), 0..20 mA (250 Ω) Pulse train input, frequency setting value (selectable)
	Braking torque (short term peak torque)	Up to 200 W 150% or more 550 W to 1.1 kW 100% or more 1.5 kW 50% or more >1.5 kW 20% or more Continuous braking torque approx. 20% without, 150% with external braking resistor
Functionality	Binary inputs	7 freely programmable inputs
	Binary outputs	1 relay output, 2 freely programmable open collector outputs
	Analogue output	1 programmable analogue output (0..10 V)/pulse output
	Analogue inputs	2 analogue inputs, 0..10 V, 4..20 mA, 0..20 mA
	Braking/acceleration times	0.01..6000 s
	Display	Optionally frequency, current or set value
		Error and status LED
Protection functions	Motor overload protection	Electronic thermal overload relay
	Instantaneous overcurrent	Motor coasts to a stop at approx. 250% of inverter rated current
	Overload	Motor coasts to a stop after 1 minute at 150% of inverter rated output current
	Overvoltage	Motor coasts to a stop if DC bus voltage exceed 410 V (double for 400 V class)
	Undervoltage	Stops when DC bus voltage is approx. 200 V or less (double for 400 V class) (approx. 160 V or less for single-phase series)
	Momentary power loss	Following items are selectable: not provided (stop if power loss is 15 ms or longer), continuous operation if power loss is approx. 0.5 s or shorter, continuous operation
	Cooling fin overheat	Protected by electronic circuit
	Stall prevention level	Individual levels during accel/constant speed. Decel ON/OFF available. During decel enable/disable selectable.
	Cooling fan fault	Detected by electronic circuit (fan lock detection)
	Ground fault	Protected by electronic circuit (operation level is approx. 250% of rated output current)
	Power charge indication	RUN lamp stays ON or digital operator LED stays ON until the DC bus voltage becomes 50 V or less. (Charge LED is provided for 400 V)
Ambient conditions	Degree of protection	IP20, NEMA1, IP65
	Cooling	Self cooling for 200 V 0.1..0.4 kW (3 or single phase) and for 400 V 0.2..0.75 kW Cooling fan for 200 V 0.75 to 7.5 kW and for 400 V 1.5 to 7.5 kW
	Ambient temperature	Open air mounting: -10 ºC..50 ºC
		Wall mounting: -10 ºC..40 ºC
	Ambient humidity	95% (without condensation)
	Storage temperature	-20 ºC..+60 ºC (short-term temperature during transportation)
	Installation	Indoor (no corrosive gas, dust, etc.)
	Installation height	Max. 1000 m
	Vibration	10 to 20 Hz, 9.8 m/s^2 max; 20 to 50 Hz, 2 m/s^2 max

Digital operator



Appearance	Name	Function
	Data display	Displays relevant data items, such as frequency reference, output frequency, and parameter set values.
	Frequency adjuster	Sets the frequency reference within a range between 0 Hz and the maximum frequency. [1]
FREF	Frequency reference indicator	The frequency reference can be monitored or set while this indicator is lit.
FOUT	Output frequency indicator	The output frequency of the inverter can be monitored while this indicator is lit.
IOUT	Output current indicator	The output current of the inverter can be monitored while this indicator is lit.
MNTR	Multi-function monitor indicator	The values set in U01 through U10 are monitored while this indicator is lit.
F/R	Forward/reverse selection indicator	The direction of rotation can be selected while this indicator is lit when operating the inverter with the RUN key.
LO/RE	Local/remote selection indicator	The operation of the inverter through the digital operator or according to the set parameters is selectable while this indicator is lit. [2]
PRGM	Parameter setting indicator	The parameters in n001 through n179 can be set or monitored while this indicator is lit. [3]
	Mode key	Switches the simplified-LED (setting and monitor) item indicators in sequence. Parameter being set will be canceled if this key is pressed before entering the setting.
	Increment key	Increases multi-function monitor numbers, parameter numbers, and parameter set values.
	Decrement key	Decreases multi-function monitor numbers, parameter numbers, and parameter set values.
	Enter key	Enters multi-function monitor numbers, parameter numbers, and internal data values after they are set or changed.
RUN	RUN key	Starts the inverter running when the 3G3MV is in operation with the digital operator
STOP RESET	STOP/RESET key	Stops the inverter unless parameter n007 is set to disable the STOP key. Used to reset the inverter when an error occurs. [4]

1. V7 IP65 types have digital operator without frequency adjuster.
2. The status of the local/remote selection indicator can be only monitored while the inverter is in operation. Any RUN comand input is ignored while this indicator is lit.
3. While inverter is in operation, the parameters can be only monitored and only some parameters can be changed. Any RUN command is ignored while the parameter setting indicator is lit.
4. For safety reasons, the reset function cannot be used while an operation instruction (forward/reverse) is being input. Turn the operation instruction OFF before using this function.

Dimensions

IP 20 type 0.1 to 4 Kw

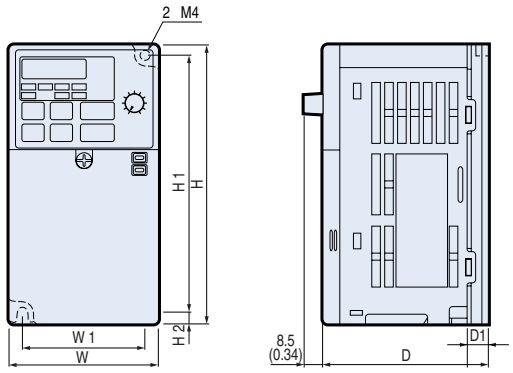


Figure 1

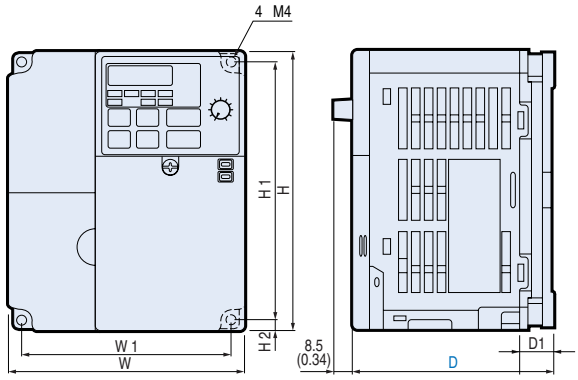


Figure 2

Voltage class	Max. applicable motor output kW	Inverter model CIMR V7AZ	Figure	Dimensions in mm							Weight kg	Cooling method
				W	H	D	W1	H1	H2	D1		
Three-phase 200 V	0.12	20P1	1	68	128	76	56	118	5	10	0.6	Self cooled
	0.25	20P2									0.6	
	0.55	20P4				108				42	0.9	
	1.1	20P7				128				62	1.1	Fan cooled
	1.5	21P5	2	108		131	96		5	64	1.4	
	2.2	22P2				140					1.5	
	4.0	24P0		140		143	128			71	2.1	
Single-phase 200 V	0.12	B0P1	1	68	128	76	56	118	5	10	0.6	Self cooled
	0.25	B0P2				76					0.7	
	0.55	B0P4				131				42	1.0	
	1.1	B0P7	2	108		140	96	118	5	64	1.5	Fan cooled
	1.5	B1P5				156	96				1.5	
	2.2	B2P2		140		163	128			71	2.2	
	4.0	B4P0		170		180	158				2.9	
Three-phase 400 V	0.37	40P2	2	108	128	92	96	118	5	16	1.0	Self cooled
	0.55	40P4				110				34	1.1	
	1.1	40P7				140				64	1.5	
	1.5	41P5				156					1.5	Fan cooled
	2.2	42P2									1.5	
	3.0	43P0		140		143	128			71	2.1	
	4.0	44P0									2.1	

IP20 / NEMA1 type 5.5/7.5 Kw

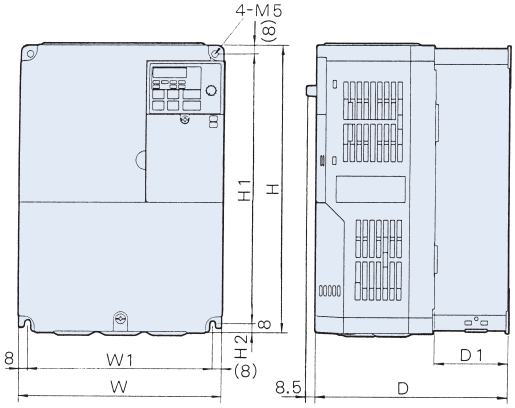


Figure 3

Voltage class	Max. applicable motor output kW	Inverter model CIMR - V7AZ	Figure	Dimensions in mm (inches)							Weight kg	Cooling method
				W	H	D	W1	H1	H2	D1		
Three-phase 200 V	5.5	25P5	3	180	260	170	164	244	8	65	4.6	Fan cooled
	7.5	27P5									4.8	
Three-phase 400 V	5.5	45P5		180	260	170	164	244	8	65	4.8	
	7.5	47P5									4.8	

IIP65 type 0.55 to 4 Kw

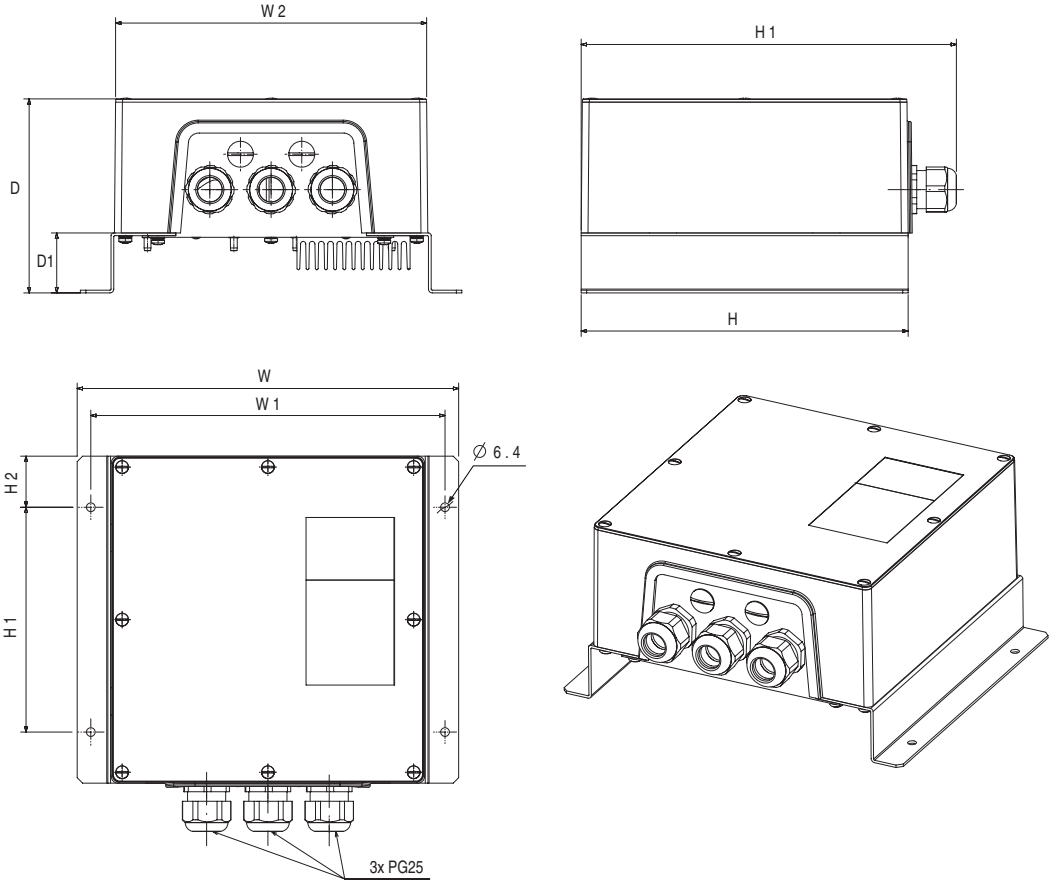


Figure 4

Voltage class	Max. applicable motor output kW	Inverter model CIMR V7TZ	Figure	Dimensions in mm									Weight kg	Cooling method
				W	H	D	W1	W2	H1	H2	H3	D1		
Single-phase 200 V	0.55	B0P405	4	280	240	142	260	228	165	38	275	44	3.4	Self cooled
	1.1	B0P705											4.3	Fan cooled
	1.5	B1P505											3.7	
	2.2	B2P205											4.2	
Three-phase 400 V	0.55	40P405		280	240	142	260	228	165	38	275	44	4.2	Self cooled
	1.1	40P705											4.3	Fan cooled
	1.5	41P505											3.7	
	2.2	42P205											3.7	
	3.0	43P005											4.1	
	4.0	44P005											4.1	

IP65 type 0.55 to 4Kw (with option frame accessory attached)

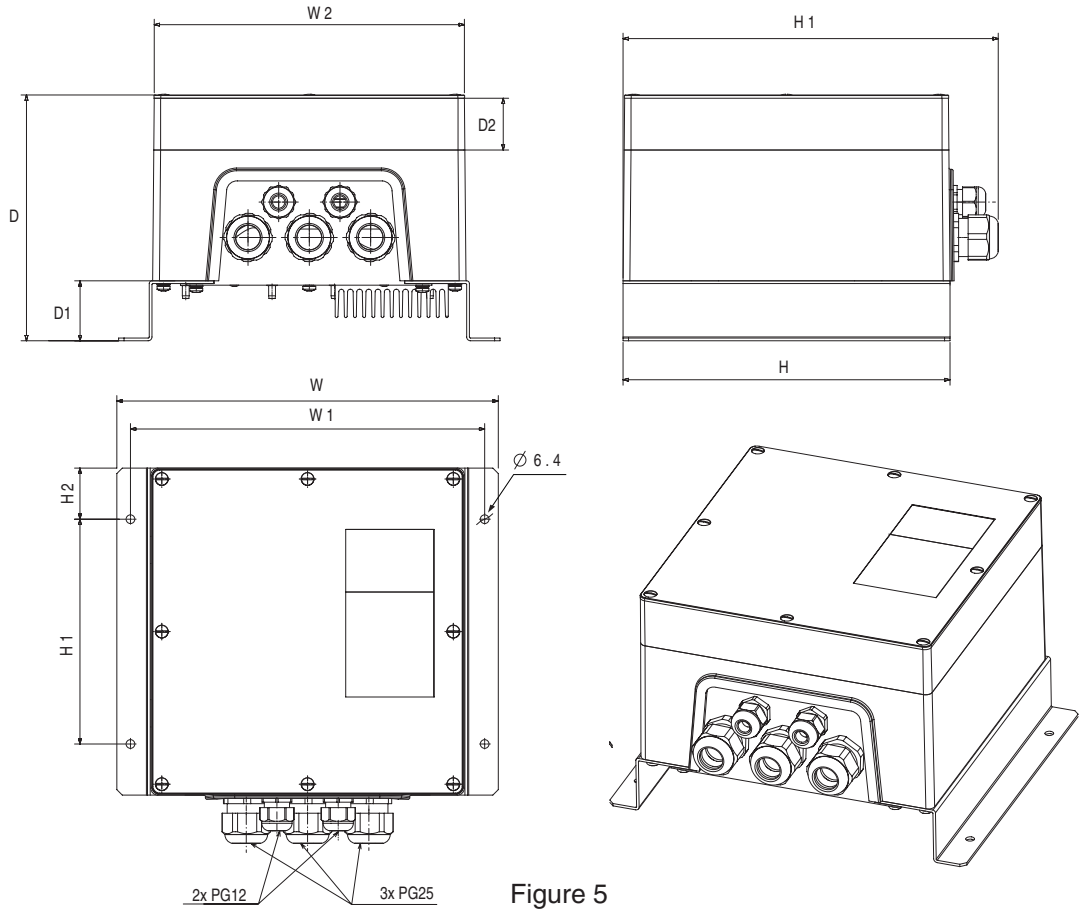
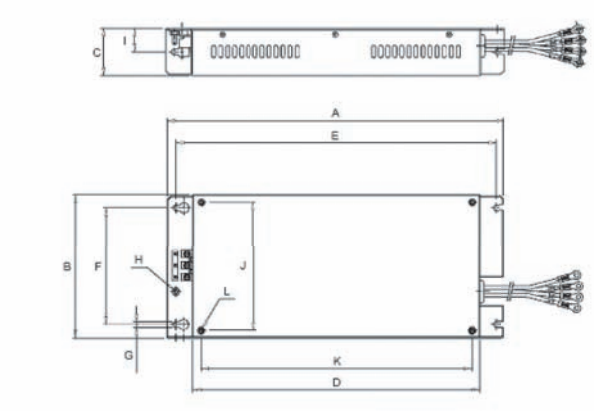


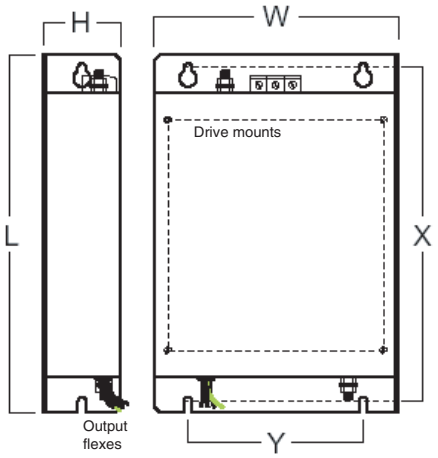
Figure 5

Voltage class	Max. applicable motor output kW	Inverter model CIMR V7TZ	Figure	Dimensions in mm										Weight kg	Cooling method
				W	H	D	W1	W2	H1	H2	H3	D1	D2		
Single-phase 200 V	0.55	B0P405	5	280	240	180	260	228	165	38	275	44	38	3.6	Self cooled
	1.1	B0P705												4.5	Fan cooled
	1.5	B1P505												3.9	
	2.2	B2P205												4.4	
Three-phase 400 V	0.55	40P405		280	240	180	260	228	165	38	275	44	38	4.4	Self cooled
	1.1	40P705												4.5	Fan cooled
	1.5	41P505												3.9	
	2.2	42P205												3.9	
	3.0	43P005												4.3	
	4.0	44P005												4.3	

Filters *



Schaffner model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
3x200 V	3G3MV-PFI2010-SE	194	82	50	160	181	62	5.3	M5	25	56	118	M4
	3G3MV-PFI2020-SE	169	111	50	135	156	91	5.5	M5	25	96	118	M4
	3G3MV-PFI2030-SE	174	144	50	135	161	120	5.3	M5	25	128	118	M4
1x200 V	3G3MV-PFI1010-SE	169	71	45	135	156	51	5.3	M5	22	56	118	M4
	3G3MV-PFI1020-SE	169	111	50	135	156	91	5.3	M5	25	96	118	M4
	3G3MV-PFI1030-SE	174	144	50	135	161	120	5.3	M5	25	128	118	M4
	3G3MV-PFI1040-SE	174	144	50	135	161	150	5	M5	25	158	118	M4
3x400 V	3G3MV-PFI3005-SE	169	111	45	135	156	91	5.3	M5	22	96	118	M4
	3G3MV-PFI3010-SE	169	111	45	135	156	91	5.3	M5	22	96	118	M4
	3G3MV-PFI3020-SE	174	144	50	135	161	120	5	M5	25	128	118	M4
	3G3MV-PFI3030-SE	304	184	56	264	288	150	6	M5	28	164	244	M5

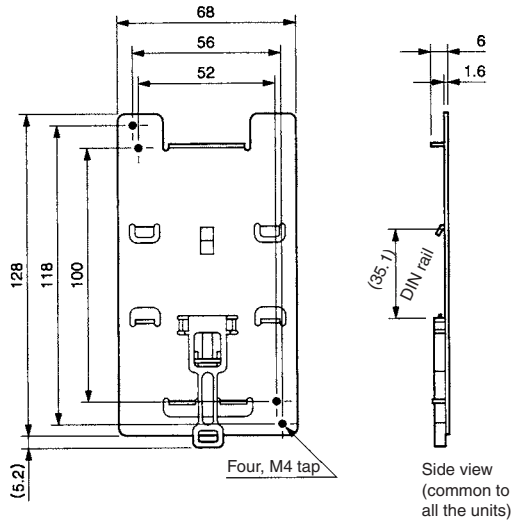


Rasmi model		Dimensions					
		W	H	L	X	Y	Inverter fixing
3x200 V	3G3MV-PFI2010-E	82	50	194	181	62	M5
	3G3MV-PF2020-E	111	50	169	156	91	M5
	3G3MV-PFI2030-E	144	50	174	161	120	M5
	3G3MV-PFI2050-E	184	56	304	288	150	M5
1x200 V	3G3MV-PFI1010-E	71	45	169	156	51	M5
	3G3MV-PFI1020-E	111	50	169	156	91	M5
	3G3MV-PFI1030-E	144	50	174	161	120	M5
	3G3MV-PFI1040-E	174	50	174	161	150	M5
3x400 V	3G3MV-PFI3005-E	111	50	169	156	91	M5
	3G3MV-PFI3010-E	111	50	169	156	91	M5
	3G3MV-PFI3020-E	144	50	174	161	120	M5
	3G3MV-PFI3030-E	184	56	304	288	150	M5

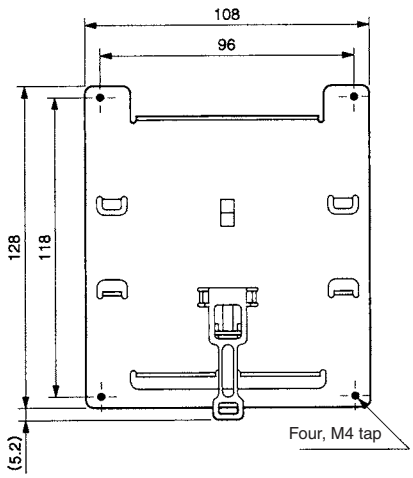
* V7 IP65 types are built-in filter inverters.

DIN rail mounting bracket

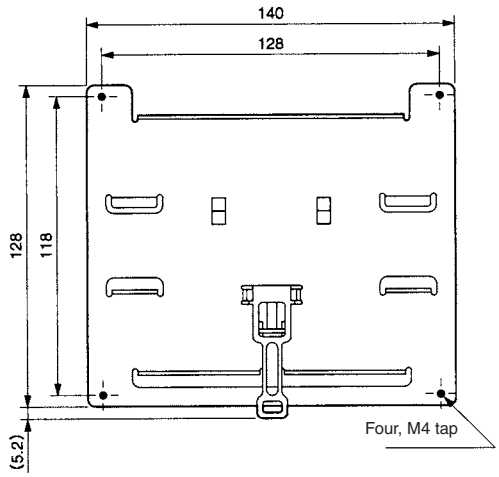
3G3IV-PZZ08122A



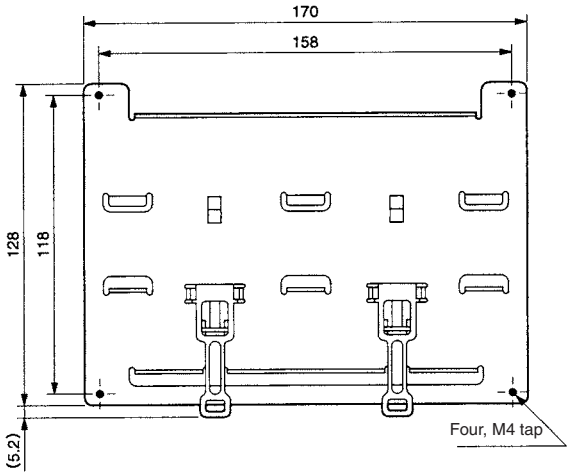
3G3IV-PZZ08122B



3G3IV-PZZ08122C



3G3IV-PZZ08122D

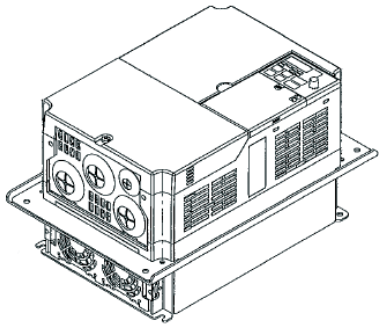


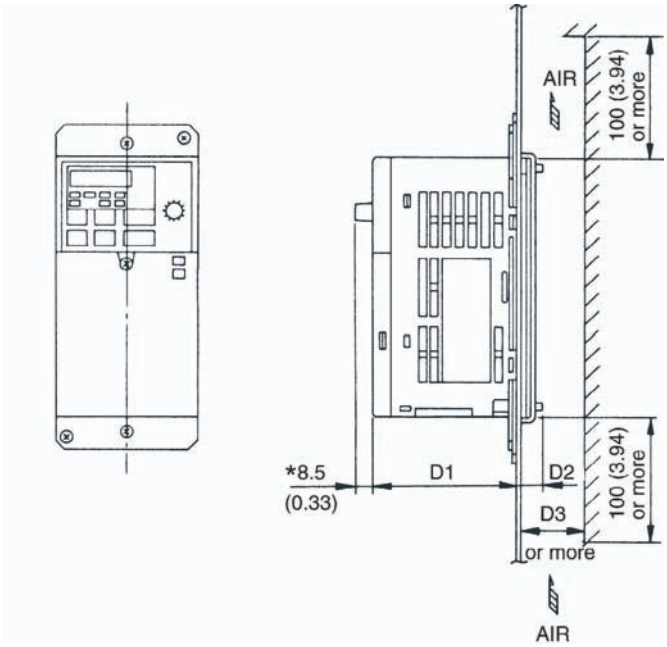
Inverter		DIN rail mounting bracket
3-phase 200 VAC	CIMR-V7AZ - 20P1/ 20P4/ 20P7	3G3IV-PEZZ08122A
	CIMR-V7AZ - 21P5/ 22P2	3G3IV-PEZZ08122B
	CIMR-V7AZ - 24P0	3G3IV-PEZZ08122C
Single-phase 200 VAC	CIMR-V7AZ - B0P1/ B0P2/ B0P4	3G3IV-PEZZ08122A
	CIMR-V7AZ - B0P7/ B1P5	3G3IV-PEZZ08122B
	CIMR-V7AZ - B2P2	3G3IV-PEZZ08122C
	CIMR-V7AZ - B4P0	3G3IV-PEZZ08122D
3-phase 400 VAC	CIMR-V7AZ - 40P2/ 40P4/ 40P7/ 41P5/ 42P2	3G3IV-PEZZ08122B
	CIMR-V7AZ - 44P0	3G3IV-PEZZ08122C

Attachments

Heatsink external mounting attachment

When mounting an external cooling-fan to the V7AZ, this attachment is required.

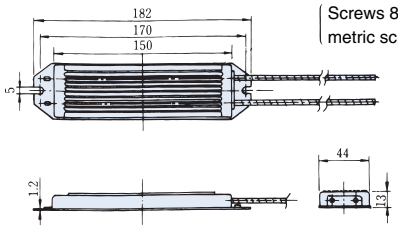




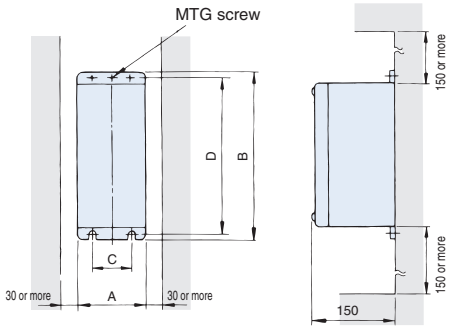
CIMR-V7AZ	Attachment order code	Dimensions in mm		
		D1	D2	D3
V7AZ-20P1 V7AZ-20P2	EZZ08136A	69.2	12	30
V7AZ-20P4	EZZ08136B	69.2	42	50
V7AZ-20P7	EZZ08136C	69.2	62	70
V7AZ-21P5	EZZ08136D	73	58	70
V7AZ-22P2		98	58	70
V7AZ-24P0	-EZZ08136F	78.6	64.4	70
V7AZ-25P5 V7AZ-27P5	EZZ08136H	113.8	56.2	60
V7AZ-B0P1 V7AZ-B0P2	EZZ08136A	69.2	12	30
V7AZ-B0P4	EZZ08136B	92.2	42	50
V7AZ-B0P7	EZZ08136D	82	58	70
V7AZ-B1P5		98	58	70
V7AZ-B2P2	EZZ08136F	98.6	64.4	70
V7AZ-B4P0	EZZ08136G	115.6	64.4	70
V7AZ-40P2	EZZ08136E	82	13.2	30
V7AZ-40P4	EZZ08136D	82	28	40
V7AZ-40P7		82	58	70
V7AZ-41P5 V7AZ-42P2		98	58	70
V7AZ-43P0 V7AZ-44P0	EZZ08136F	78.6	64.4	70
V7AZ-45P5 V7AZ-47P5	EZZ08136H	113.8	56.2	60

Braking resistor unit ERF-150WJ

Note: Prepare mounting screws
(2-M4x8 tapped screws).
Screws 8mm or more and general metric screws cannot be used.



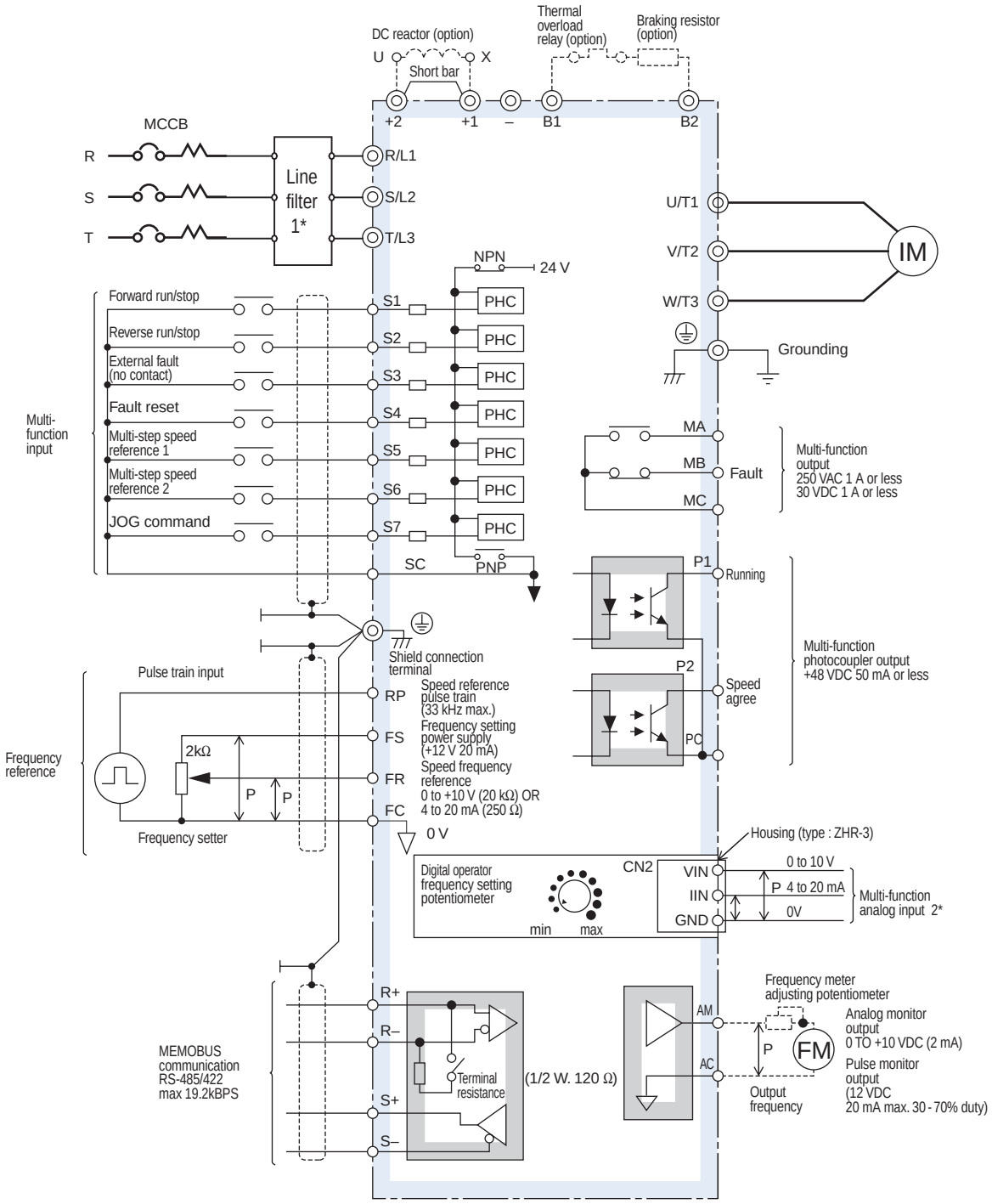
Braking resistors unit



Voltage	Model LKEB-□	Dimensions in mm					Approx. weight kg
		A	B	C	D	MTG.screw	
200 V class	20P7	105	275	50	260	M5x3	3.0
	21P5	130	350	75	335	M5x4	4.5
	22P2	130	350	75	335	M5x4	4.5
	40P7	130	350	75	350	M5x4	5.0
	25P5	250	350	200	335	M6x4	7.5
	27P5	350	350	200	335	M6x4	8.5
400 V class	40P7	105	275	50	260	M5x3	3.0)
	41P5	130	350	75)	335	M5x4	4.5
	42P2	130	350	75)	335	M5x4	4.5
	43P0	130	350	75	335	M5x4	5.0
	43P7						
	45P5	250	350	200	335	M6x4	7.5
	47P5	350	350	200	335	M6x4	8.5

Installation

Standard connections



1* V7 IP65 types are built-in filter.

2* A housing is required when using the CN2 terminal on the back side of the digital operator.
1m analog input cable (code no. 3G3MV-PCN-CN2) is available for housing on request

: shielded wire : twisted pair shielded wire

Shows the following two kinds of connections (factory setting) :
· Input signals (S1 to S7) are non-voltage contacts
· Sequence connection by NPN transistor (0V common)

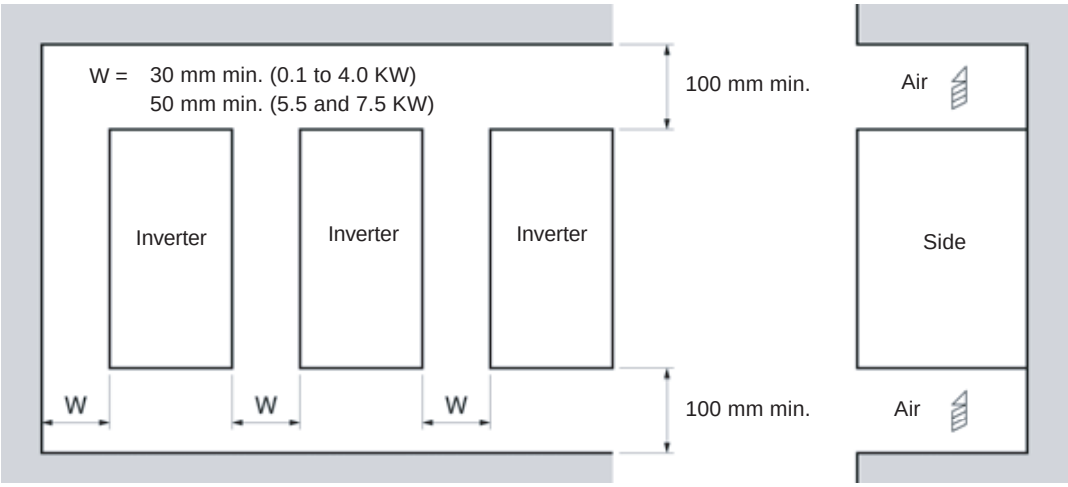
A +24 V power supply is required for sequence connection by PNP transistor (+24 V common) .

Main circuit

Terminal	Name	Function (signal level)
R/L1, S/L2, T/L3	AC power supply input	Main circuit power supply input (use R/L1 and S/L2 for single-phase power supply inverter. Do not use T/L3 of the models less than 0.75 kW for other usage, such as a junction terminal.)
U/T1, V/T2, W/T3	Inverter output	For inverter output
B1, B2	Braking resistor connection	For braking resistor connection
+2, +1	DC reactor connection	Remove the short bar between +2 and +1 when connecting DC reactor (option)
+1, –	DC power supply input	For power supply input (+1: positive electrode; – : negative electrode)*
⏚	Grounding	For grounding (grounding should conform to the local grounding code.)

Control Circuit

Type	No.	Signal name	Function	Signal level
Digital input signals	**S1**	Multi-function input selection 1	Factory setting: runs when CLOSED, stops when OPEN.	24VDC, 8mA photocoupler insulation
	S2	Multi-function input selection 2	Factory setting: runs when CLOSED, stops when OPEN.	
	S3	Multi-function input selection 3	Factory setting: "fault reset"	
	S4	Multi-function input selection 4	Factory setting: "external fault (NO contact)"	
	S5	Multi-function input selection 5	Factory setting: "multi-step speed reference 1"	
	S6	Multi-function input selection 6	Factory setting: "multi-step speed reference 2"	
	S7	Multi-function input selection 7	Factory setting: "JOG command"	
	SC	Multi-function input selection Common	Common for control signal	
Analog input signals	**RP**	Speed reference pulse train input	33 kHz max.	
	FS	Power supply terminal for frequency setting	+12V (allowable current: 20 mA max.)	
	FR	Speed frequency reference	0 to +10 VDC (20 kΩ) or 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) (resolution 1/1000)	
	FC	Frequency reference common	0 V	
	1 (CN2)	Multi-function analog voltage input	Voltage input (between terminals 1 and 3): 0 to 10 VDC (input impedance: 20 kΩ)	
	2 (CN2)	Multi-function analog current input	Current input (between terminals 2 and 3): 4 to 20 mA (input impedance: 250 Ω)	
	3 (CN2	Multi-function analog input common		
Digital output signals	**MA**	NO contact output	Factory setting: "fault"	Contact capacity 250 VAC, 1 A or less 30 VDC, 1 A or less
	NC	Contact output		
	MC	Contact output common		
	P1	Photocoupler output 1	Factory setting: "running"	Photocoupler output: +48 VDC, 50 mA or less
	P2	Photocoupler output 2	Factory setting: "at frequency"	
	PC	Photocoupler output common	0 V	
Analog output signals	**AM**	Analog monitor output	Factory setting: "output frequency" 0 to +10 V output (pulse monitor output available by setting constants. Duty: 30 to 70%)	0 to 10 V 2 mA or less Resolution: 8 bits
	AC	Analog monitor common	0 V	
RS-485/422	**R+**	Communication input (+)	For MEMOBUS communication operation by RS-485 or RS-422 communication is available.	RS-485/422 MEMOBUS protocol 19.2 kBPS max.
	R–	Communication input (–)		
	S+	Communication output (+)		
	S–	Communication output (–)		



Inverter heat loss

Three-phase 200 V class

Model CIMR-V7AZ		20P1	20P2	20P4	20P7	21P5	22P2	24P0	25P5	27P5
Inverter capacity kVA		0.3	0.6	1.1	1.9	3.0	4.2	6.7	9.5	13
Rated current A		0.8	1.6	3	5	8	11	17.5	25	33
Heat loss W	Fin	3.7	7.7	15.8	28.4	53.7	60.4	96.7	170.4	219.2
	Inside unit	9.3	10.3	12.3	16.7	19.1	34.4	52.4	79.4	98.9
	Total heat loss	13.0	18.0	28.1	45.1	72.8	94.8	149.1	249.8	318.1

Single-phase 200 V class

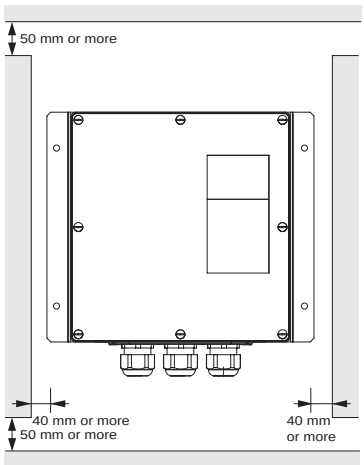
Model CIMR-V7AZ		B0P1	B0P2	B0P4	B0P7	B1P5	B2P2	B4P0
Inverter capacity kVA		0.3	0.6	1.1	1.9	3.0	4.2	6.7
Rated current A		0.8	1.6	3	5	8	11	17.5
Heat loss W	Fin	3.7	7.7	15.8	28.4	53.7	64.5	98.2
	Inside unit	10.4	12.3	16.1	23.0	29.1	49.1	78.2
	Total heat loss	14.1	20.0	31.9	51.4	82.8	113.6	176.4

Three-phase 400 V class

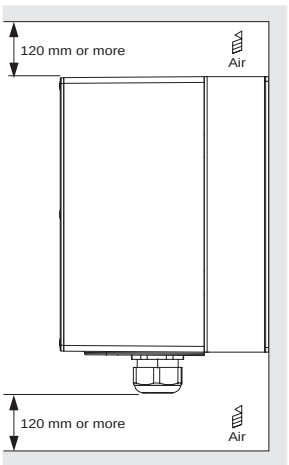
Model CIMR-V7AZ		40P2	40P4	40P7	41P5	42P2	44P0	45P5	47P5
Inverter capacity kVA		1.4	2.6	3.7	4.2	5.5	7.0	11	14
Rated current A		1.8	3.4	4.8	5.5	7.2	8.6	14.8	18
Heat loss W	Fin	15.1	30.3	45.8	50.5	58.2	73.4	168.8	209.6
	Inside unit	15.0	24.6	29.9	32.5	37.6	44.5	87.7	99.3
	Total heat loss	30.1	54.9	75.7	83.0	95.8	117.9	256.5	308.9

Installation conditions for IP65

Install the inverter vertically in order to ensure proper cooling. When installing the inverter, always provide the following minimum installation space to allow normal heat dissipation.



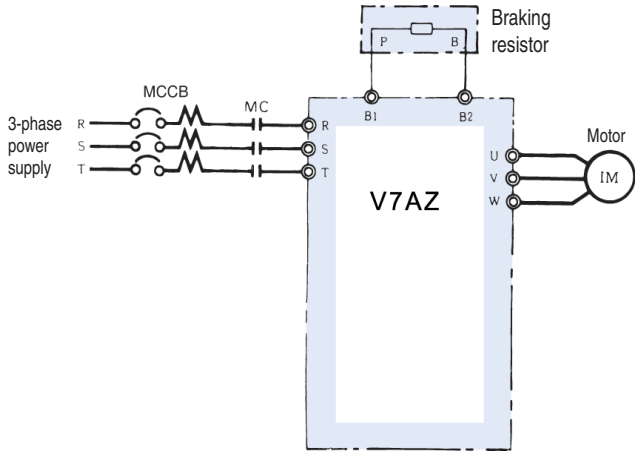
Side spaces



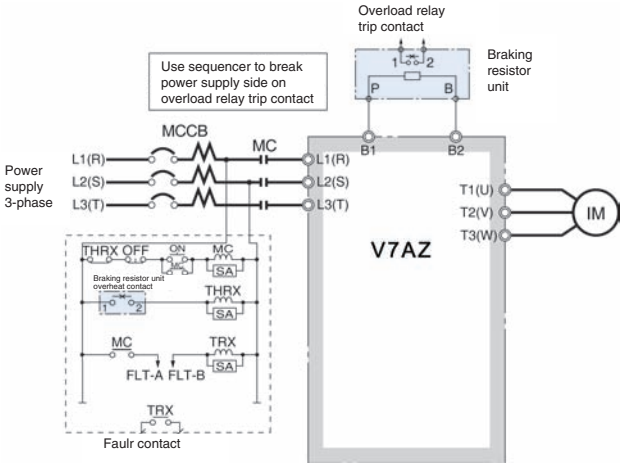
Top and bottom spaces

1. Always provide enough space for the main circuit or control lines including cable gland.
2. If installing inverters next to one another, provide a minimum spacing of 60mm.

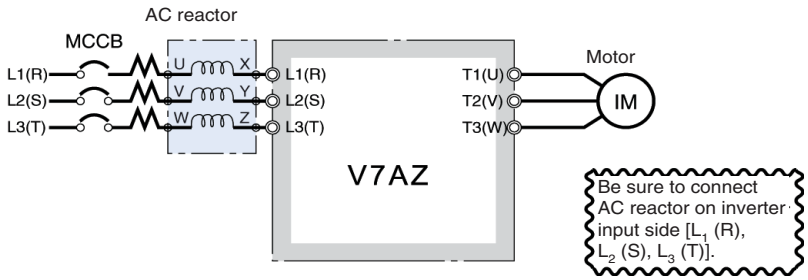
Connections for braking resistor



Connections for braking resistor unit

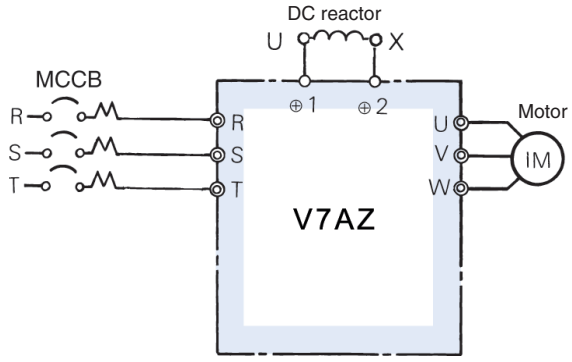


AC reactor



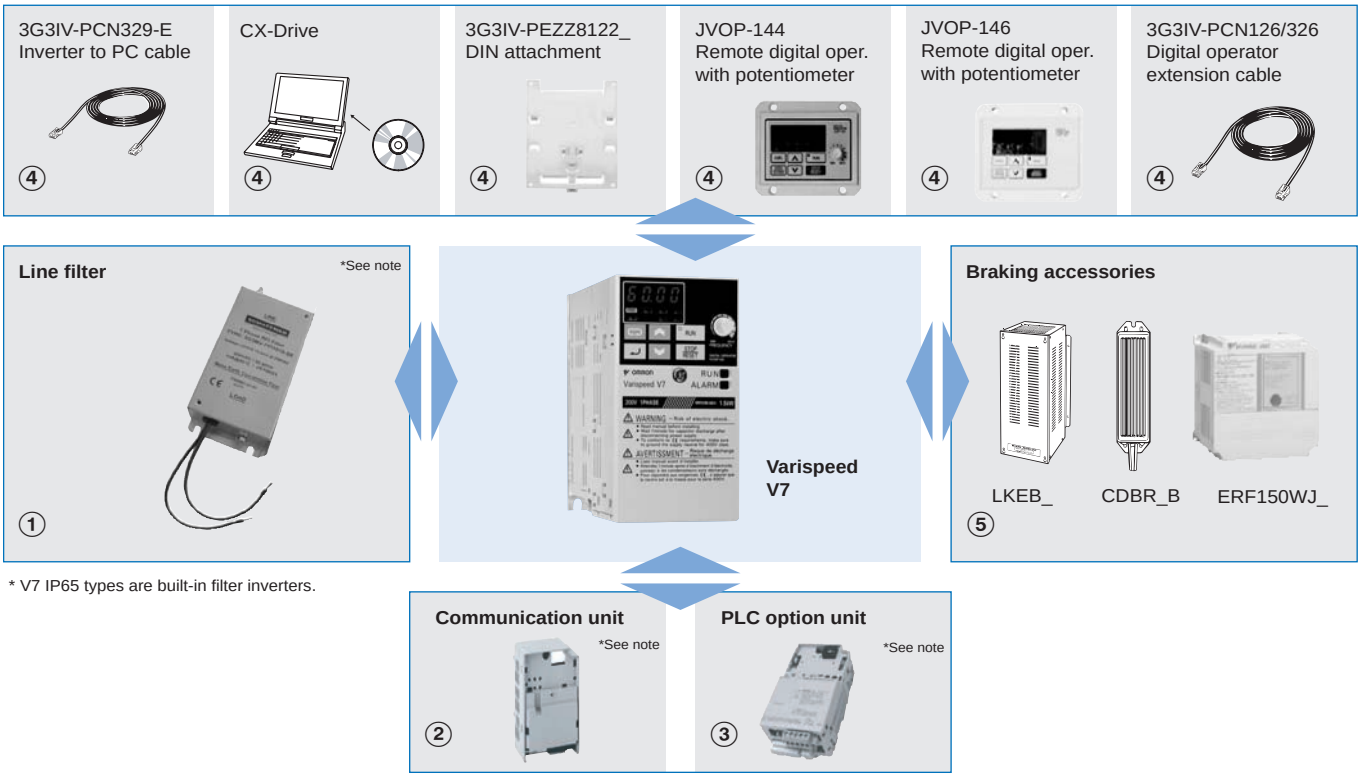
200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.12	2.0	2.0		------	
0.25	2.0	2.0	0.2	1.3	18.0
0.55	2.5	4.2	0.4		
1.1	5	2.1	0.75	2.5	8.4
1.5	10	1.1	1.5	5	4.2
2.2	15	0.71	2.2	7.5	3.6
4.0	20	0.53	4.0	10	2.2
5.5	30	0.35	5.5	15	1.42
7.5	40	0.265	7.5	20	1.06

DC reactor



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.12	5.4	8	--------		
0.25			0.2	3.2	28
0.55			0.4		
1.1			0.75		
1.5	18	3	1.5	5.7	11
2.2			2.2		
4.0			4.0	12	6.3
5.5	36	1	5.5	23	3.6
7.5			7.5		

Ordering information



* V7 IP65 types are built-in filter inverters.

* Option frames are needed for V7 IP65 type.

Varispeed V7



200 V

Specifications			Model
1x200 V	0.12 Kw	0.8 A	CIMR-V7AZB0P10
	0.25 Kw	1.6 A	CIMR-V7AZB0P20
	0.55 Kw	3.0 A	CIMR-V7AZB0P40
	1.1 Kw	5.0 A	CIMR-V7AZB0P70
	1.5 Kw	8.0 A	CIMR-V7AZB1P50
	2.2 Kw	11.0 A	CIMR-V7AZB2P20
	4.0 Kw	17.5 A	CIMR-V7AZB4P00
3x200 V	0.12 Kw	0.8 A	CIMR-V7AZ20P10
	0.25 Kw	1.6 A	CIMR-V7AZ20P20
	0.55 Kw	3.0 A	CIMR-V7AZ20P40
	1.1 Kw	5.0 A	CIMR-V7AZ20P70
	1.5 Kw	8.0 A	CIMR-V7AZ21P50
	2.2 Kw	11.0 A	CIMR-V7AZ22P20
	4.0 Kw	17.5 A	CIMR-V7AZ24P00
	5.5 Kw	25.0 A	CIMR-V7AZ25P51
	7.5 Kw	33.0 A	CIMR-V7AZ27P51

400 V

Specifications			Model
3x400 V	0.37 Kw	1.2 A	CIMR-V7AZ40P20
	0.55 Kw	1.8 A	CIMR-V7AZ40P40
	1.1 Kw	3.4 A	CIMR-V7AZ40P70
	1.5 Kw	4.8 A	CIMR-V7AZ41P50
	2.2 Kw	5.5 A	CIMR-V7AZ42P20
	3.0 Kw	7.2 A	CIMR-V7AZ43P00
	4.0 Kw	9.2 A	CIMR-V7AZ44P00
	5.5 Kw	14.8 A	CIMR-V7AZ45P51
	7.5 Kw	18.0 A	CIMR-V7AZ47P51

Varispeed V7 IP65



200 V

Specifications			Model
1x200 V	0.55 Kw	3.0 A	CIMR-V7TZB0P405
	1.1 Kw	5.0 A	CIMR-V7TZB0P705
	1.5 Kw	8.0 A	CIMR-V7TZB1P505
	2.2 Kw	11.0 A	CIMR-V7TZB2P205

400 V

Specifications			Model
3x400 V	0.55 Kw	1.8 A	CIMR-V7TZ40P405
	1.1 Kw	3.4 A	CIMR-V7TZ40P705
	1.5 Kw	4.8 A	CIMR-V7TZ41P505
	2.2 Kw	5.5 A	CIMR-V7TZ42P205
	3.0 Kw	7.2 A	CIMR-V7TZ43P005
	4.0 Kw	9.2 A	CIMR-V7TZ44P005

①Line filters *





Inverter		Line filter			
Voltage	Model CIMR-V7AZ	Schaffner	Rasmi	Rated current (A)	Weight (kg)
3-Phase 200 VAC	20P1 / 20P2 / 20P4 / 20P7	3G3MV-PFI2010-SE	3G3MV-PFI2010-E	10	0.8
	21P5 / 22P2	3G3MV-PFI2020-SE	3G3MV-PFI2020-E	20	1.0
	24P0	3G3MV-PFI2030-SE	3G3MV-PFI2030-E	30	1.1
	25P5 / 27P5	-	3G3MV-PFI2050-E	50	2.3
Single-Phase 200 VAC	B0P1 / B0P2 / B0P4	3G3MV-PFI1010-SE	3G3MV-PFI1010-E	10	0.6
	B0P7 / B1P5	3G3MV-PFI1020-SE	3G3MV-PFI1020-E	20	1.0
	B2P2	3G3MV-PFI1030-SE	3G3MV-PFI1030-E	30	1.1
	B4P0	3G3MV-PFI1040-SE	3G3MV-PFI1040-E	40	1.2
3-Phase 400 VAC	40P2 / 40P4	3G3MV-PFI3005-SE	3G3MV-PFI3005-E	5	1.0
	40P7 / 41P5 / 42P2	3G3MV-PFI3010-SE	3G3MV-PFI3010-E	10	1.0
	43P0 / 44P0	3G3MV-PFI3020-SE	3G3MV-PFI3020-E	15	1.1
	45P5 / 47P5	3G3MV-PFI3030-SE	3G3MV-PFI3030-E	30	2.3

* V7 IP65 types are built-in filter inverters.

② Communication cards

Type	Model [1]	Description	Function
Communication option board	3G3MV-PDRT2 	DeviceNet option card [2]	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller.
	SI-P1/V7 	PROFIBUS-DP option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFIBUS-DP communication with the host controller.
	SI-S1/V7 	Can open option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.
	3G3MV-PCORT21 	Can open gateway	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.
	SI-T1/V7 	MECHATROLINK-II option card	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through MECHATROLINK-II communication with the host controller. • High speed motion bus. • Host controller: TrajeXia, MCH or MP series.[3]

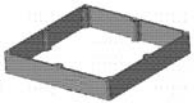
1. Option frame accessory is needed for V7 IP65 types when communications option units are used.
2. For V7 IP65 types with DeviceNet communication, SI-N1/V7 should be used.
3. Please refer to TrajeXia, MCH or MP series section for host controller technical information.

③ PLC option card

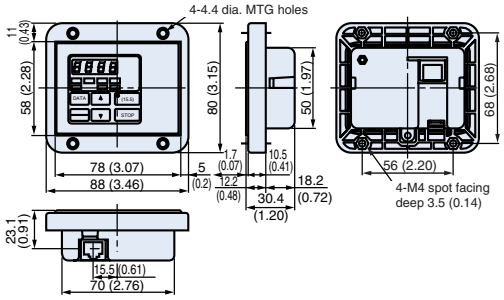
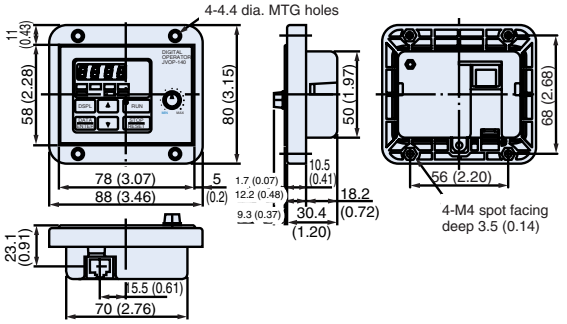
Type	Model [1]	Description	Function
PLC option	3G3MV-P10CDT-E  3G3MV-P10CDT3-E	PLC option	• Full PLC featrues, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs. • Standard OMRON tools can be used for programming • Calendar / clock
		PLC option with RS 422/485	• Same features as standard models with RS 422/485 support.

1. Option frame accessory is needed on V7 IP65 types when PLC option unit is used.

④ Option frame accessory for V7 IP65

Type	Model	Description	Function
Option frame	V7TZ-FR1 	Option frame	• Frame accessory is needed when communication option unit or PLC option unit are used with Varispeed V7 IP65.

⑤ Accessories

Types	Model	Description	Functions
Digital operator	JVOP-146 	Remote digital operator without potentiometer	
	JVOP-144 	Remote digital operator with potentiometer	
	72606-CVS31060	Blank cover	-----
	3G3IV-PEZZ0838BA	Digital operator case	same as JVOP-144 without operator
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	-----
	3G3IV-PCN329-E	PC configuration cable	-----

⑤ Computer software

Types	Model	Description	Installation
Software	CX-drive	Computer software	Configuration and monitoring software tool
	CX-One	Computer software	Configuration and monitoring software tool

⑥ Braking unit, braking resistor unit

Inverter				Braking resistor unit								
Voltage	Max. applicable motor output kW	Inverter model CIMR-V7AZ		Inverter-mounted type (3 %ED, 10 sec max) 				Separately-installed type (10 %ED, 10 sec. max.) 				
		Three-phase	Single-phase	Model ERF-150WJ_	Resistance Ω	No. of used	Braking torque %	Model LKEB-□	Resistor spec. (per one unit) W Ω	No. of used	Braking torque %	Connectable min. resistance Ω
200 V (single-/ three-phase)	0.12	20P1	B0P1	401	400	1	220	–	–	–	–	300
	0.25	20P2	B0P2	401	400	1	220	–	–	–	–	300
	0.55	20P4	B0P4	201	200	1	220	20P7	70 200	1	220	200
	1.1	20P7	B0P7	201	200	1	125	20P7	70 200	1	125	120
	1.5	21P5	B1P5	101	100	1	125	21P5	260 100	1	125	60
	2.2	22P2	B2P2	700	70	1	120	22P2	260 70	1	120	60
	4.0	24P0	B4P0	620	62	1	100	23P7	390 40	1	125	32
	5.5	25P5	–	–	–	–	–	25P5	520 30	1	115	9.6
	7.5	27P5	–	–	–	–	–	27P5	780 20	1	125	9.6
400 V (three-phase)	0.37	40P2	–	751	750	1	230	–	–	–	–	750
	0.55	40P4	–	751	750	1	230	40P7	70 750	1	230	750
	1.1	40P7	–	751	750	1	130	40P7	70 750	1	130	510
	1.5	41P5	–	401	400	1	125	41P5	260 400	1	125	240
	2.2	42P2	–	301	300	1	115	42P2	260 250	1	135	200
	3.0	43P0	–	401	400	2	105	43P7	390 150	1	135	100
	4.0	44P0	–									
	5.5	45P5	–	–	–	–	–	45P5	520 100	1	135	32
	7.5	47P5	–	–	–	–	–	47P5	780 75	1	130	32

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I20E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

CIMR-J7AZ

Varispeed J7

Small, simple and smart

- V/f controlled inverter
- Compact size
- Good torque performance: 100% torque at 1.5 Hz, 150% at 3 Hz
- 150% overload / 60sec
- Overload detection function.
- Motor thermal function
- Freely configurable V/f curve
- 4 programmable digital input
- 1 programmable digital output
- 1 programmable analog output
- Optional RS-232C/485 communication - Modbus
- PC Configuration tool: CX-drive
- CE, UL, and cUL marking

Ratings

- 200 V class single-phase 0.1 to 1.5 kW
- 200 V class three-phase 0.1 to 4.0 kW
- 400 V class three-phase 0.2 to 4.0 kW



System configuration

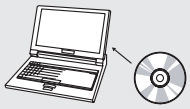
SI-485/J7



SI-232/J7
SI-232/J7C



CX-Drive



JVOP-144
Remote digital oper. with potentiometer



JVOP-146
Remote digital oper. with potentiometer



3G3IV-PEZZ8122_
DIN attachment



Line filter





Varispeed J7

3G3IV-PCN329-E
Inverter to PC cable

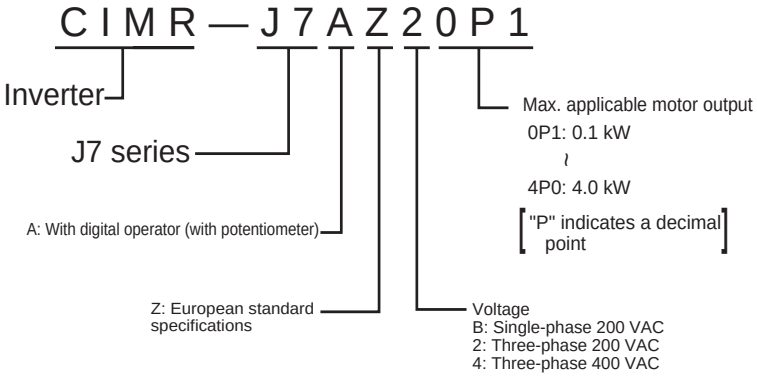


3G3IV-PCN126/326
Digital operator extension cable



Specifications

Type designation



Voltage class		200 V single/three-phase							400 V three-phase						
Model CIMR-J7AZ□	Three-phase	20P1	20P2	20P4	20P7	21P5	22P2	24P0	40P2	40P4	40P7	41P5	42P2	43P0	44P0
	Single-phase[1]	B0P1	B0P2	B0P4	B0P7	B1P5	–	–	–	–	–	–	–	–	–
Max. applicable motor output kW (HP)[2]		0.12	0.25	0.55	1.1	1.5	2.2	4.0	0.37	0.55	1.1	1.5	2.2	3.0	4.0
Output characteristics	Inverter capacity kVA	0.3	0.6	1.1	1.9	3.0	4.2	6.7	0.9	1.4	2.6	3.7	4.2	5.5	7.0
	Rated output current A	0.8	1.6	3	5	8	11	17.5	1.2	1.8	3.4	4.8	5.5	7.2	9.2
	Max. output voltage V	3-phase, 200 to 230 V (proportional to input voltage) Single-phase, 200 to 240 V (proportional to input voltage)							3-phase, 380 to 460 V (proportional to input voltage)						
	Max. output frequency	400 Hz (programmable)													
Power supply	Rated input voltage and frequency	3-phase, 200 to 230 V, 50/60 Hz Single-phase, 200 to 240 V, 50/60 Hz							3-phase, 380 to 460 V, 50/60 Hz						
	Allowable voltage function	–15 to +10%													
	Allowable frequency function	±5%													

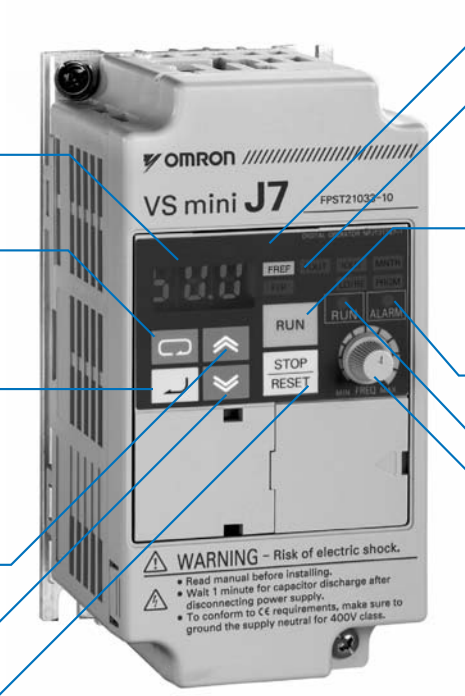
1. Single-phase series inverter output is three-phase (for three-phase motors)
2. Based on a standard 4-pole motor for max. applicable motor output. Select the inverter model whose rated current is larger than motor rated current.

Commom specifications

	Model CIMR-J7AZ□	Specifications
Control functions	Control method	Sine wave PWM (V/f control)
	Output frequency range	0.1 to 400 Hz
	Frequency tolerance	Digital reference: ±0.01% (–10 to +50 °C), Analog reference: ±0.5% (25±10 °C)
	Resolution of frequency set value	Digital reference: 0.01 Hz (less than 100 Hz), 0.1 Hz (100 Hz or more) Analog reference: 1/1000 of max. output frequency
	Resolution of output frequency	0.01 Hz
	Overload capability	150% rated output current for one minute
	Frequency set value	0 to 10 VDC (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω), frequency setting volume (selectable)
	Accel/decel time	0.1 to 999 sex. (accel/decel time are independently programmed)
	Braking torque	Short-term average deceleration torque[1]: 0.1, 0.2 kW (0.13 HP, 0,25 HP): 150% or more; 0.4/0.75 kW (0,5 HP, 1HP): 100% or more; 1.5 kW (2 HP): 50% or more; 2.2 kW (3 HP) or more: 20% or more Continuous regenerative torque: Approx 20%
	V/f characteristics	Possible to program any V/f pattern
Functionality	Digital inputs	Four of the following input signals are selectable: forward/reverse run (3-wire sequence), fault reset, external fault (NO/NC contact input), multi-step speed operation, jog command, accel/decel time select, external baseblock (NO/NC contact input), speed search command, UP/DOWN command, accel/decel hold command, LOCAL/REMOTE selection, communication/ control circuit terminal selection, emergency stop fault, emergency stop alarm, self test
	Digital outputs	Following output signals are selectable (NO/NC contact output): Fault, running, zero speed, speed agreed, frequency detection (output frequency ≤ or ≥ set value), during overtorque detection, minor error, during baseblock, operation mode, inverter run ready, during fault retry, during undervoltage detection, reverse running, during speed search, data output through communication
	Standard functions	Full-range automatic torque boost, slip compensation, 9-step speed operation (max.), restart after momentary power loss, DC injection braking current at stop/start (50% of inverter rated current, 0.5 sec, or less), frequency reference bias/gain, fault retry, speed search, frequency upper/lower limit setting, overtorque detection, frequency jump, accel/decel time switch, accel/ decel prohibited, S-curve accel/decel, frequency reference with built-in volume, constants copy (option) MEMOBUS communications (option)
	Display	Status indicator LED: RUN and ALARM provided as standard LED's
		Digital operator: available to monitor frequency reference, output frequency, output current
Protection	Motor overload protection	Electronic thermal overload relay
	Instantaneous overcurrent	Motor coasts to a stop at approx. 250% of inverter rated current
	Overload	Motor coasts to a stop after 1 minute at 150% of inverter rated output current
	Overvoltage	Motor coasts to a stop if DC bus voltage exceed 410 V (double for 400 V class)
	Undervoltage	Stops when DC bus voltage is approx. 200 V or less (double for 400 V class) (approx. 160 V or less for single-phase series)
	Momentary power loss	Following items are selectable: Nnot provided (stop if power loss is 15ms or longer), continuous operation if power loss is approx. 0.5 s or shorter, continuous operation
	Cooling fin overheat	Protected by thermister
	Stall prevention level	Individual level stall prevention can be set during acceleration or constant running, provided/not provided setting available during deceleration.
	Cooling fan fault	Detected by electronic circuit (fan lock detection)
	Ground fault	Protected by electronic circuit (operation level is approx. 250% of rated output current)
	Power charge indication	ON until the DC bus voltage becomes 50 V or less, RUN lamp stays ON or digital operator LED stays ON. (Charge LED is provided for 400 V)
Ambient conditions	Degree of protection	IP20
	Cooling	Self cooling for 200 V 0,1..0,75 kW (single-phase) 0,1..0,4 kW (Three-phase) and for 400 V 0,2..0,75l kW Cooling fan for 200 V (single-phase), 0.75 kW..4.0 kW (3-phase) and for 400 V 1,5..4.0 kW
	Ambient temperature	-10 ºC to 50 ºC (non-freezing)
	Ambient humidity	90% RH or less (non-condensing)
	Storage temperature	-20 ºC..+60 ºC (short-term temperature during trasnportation)
	Installation	Indoor (no corrosive gas, dust, etc.)
	Installation height	Max. 1000 m
	Vibration	10 to 20 Hz, 9.8 m/s^2 max; 20 to 50 Hz, 2m/s^2 max

1. Shows deceleration torque for uncoupled motor decelerating from 60 Hz with the shortest possible deceleration time.

Digital operator



Digital operator

Function display LEDs
Selected function is lit (see the functions below). Its data is displayed on data display.

Data display

Operation key
Press to run the motor. The RUN light is ON while running.

Display selection key
Switch functions among function display LEDs.

Alarm LED

Enter key
Enter data when setting constants. After selecting constant no. at **PRGM** mode, data are displayed.

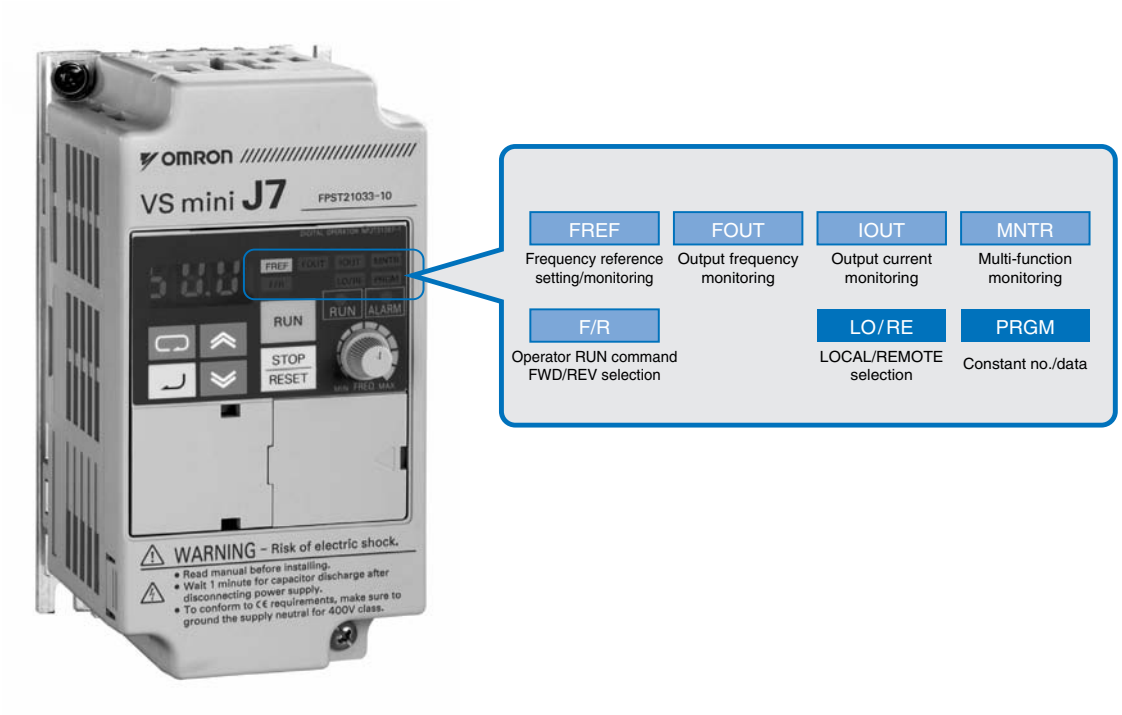
Run LED

Increment key
Increase constant no. or data.

Frequency setting volume
Set operational frequency with volume.

Decrement key
Decrease constant no. or data.

Stop/Reset key
Press to stop the motor. If fault occurs, reset the inverter.



Dimensions

IP 20 type 0.1 to 4 kW

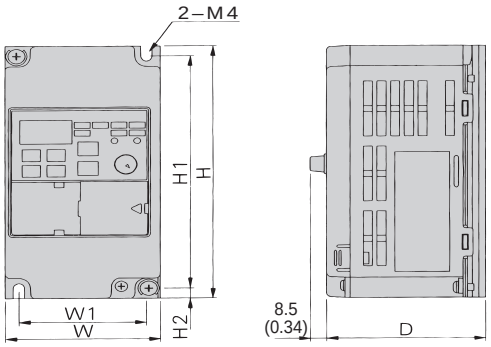


Figure 1

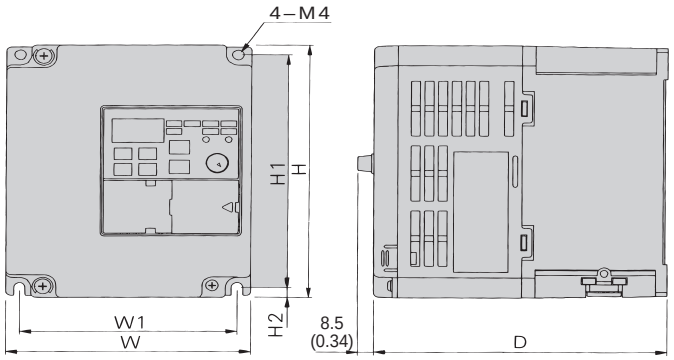
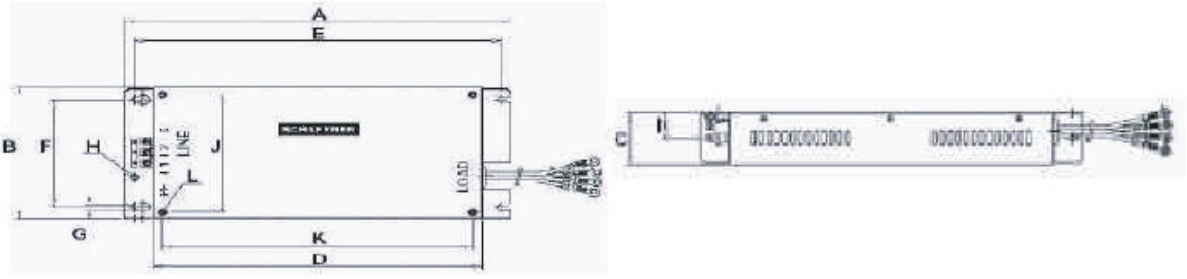


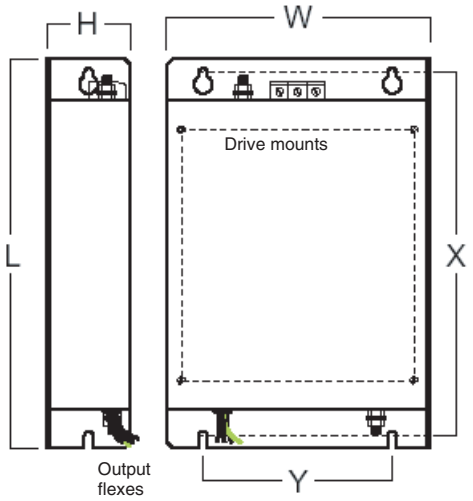
Figure 2

Voltage class	Max. applicable motor output kW	Inverter model CIMR-J7AZ□	Figure	Dimensions in mm						Weight kg	Cooling method
				W	H	D	W1	H1	H2		
200 V three-phase	0.12	20P1	1	68	128	70	56	118	5	0.5	Self cooled
	0.25	20P2								7.7	
	0.55	20P4				102				0.8	
	1.1	20P7				122				0.9	Fan cooled
	1.5	21P5	2	108		129	96	118		1.3	
	2.2	22P2				154				1.5	
	4.0	24P0		140		161	128			2.1	
200 V single-phase	0.1	B0P1	1	68	128	70	56	118	5	0.5	Self cooled
	0.2	B0P2									
	0.4	B0P4				112				0.9	
	0.75	B0P7	2	108		129	96			1.5	Fan cooled
	1.5	B1P5				154					
400 V three-phase	0.37	40P2	2	108	128	81	96	118	5	1.0	Self cooled
	0.55	40P4				99				1.1	
	1.1	40P7				129				1.5	
	1.5	41P5				154					
	2.2	42P2									Fan cooled
	3.0	43P0		140		161	128			2.1	
	4.0	44P0									

Filters



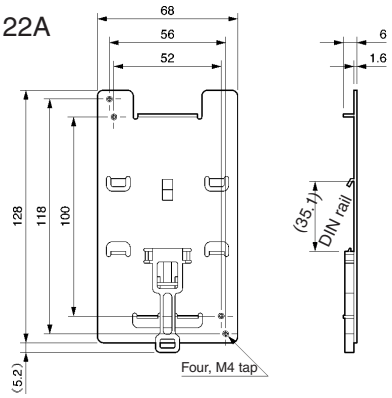
Schaffner model		Dimensions											
		A	B	C	D	E	F	G	H	I	J	K	L
3x200 V	3G3JV-PFI2010-SE	194	82	50	160	181	62	5.3	M5	25	56	118	M4
	3G3JV-PFI2020-SE	169	111	50	135	156	91	5.5	M5	25	96	118	M4
1x200 V	3G3JV-PFI1010-SE	169	71	45	135	156	51	5.3	M5	22	56	118	M4
	3G3JV-PFI1020-SE	169	111	50	135	156	91	5.3	M5	25	96	118	M4
3x400 V	3G3JV-PFI3005-SE	169	111	50	135	156	91	5.3	M5	22	96	118	M4
	3G3JV-PFI3010-SE	169	111	50	135	156	91	5.3	M5	22	96	118	M4
	3G3JV-PFI3020-SE	174	144	50	135	61	120	5	M5	28	128	118	M4



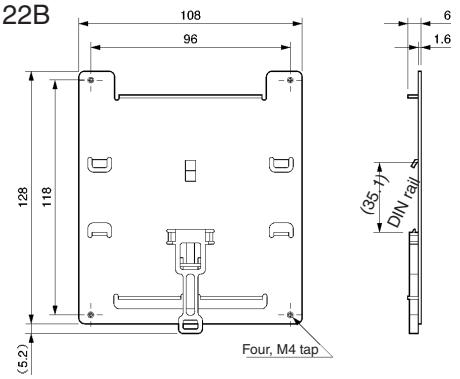
Rasmi model		Dimensions					
		W	H	L	X	Y	Inverter fixing
3x200 V	3G3JV-PFI2010-E	82	50	194	181	62	M5
	3G3JV-PF2020-E	111	50	169	156	91	M5
	3G3JV-PFI2030-E	144	50	174	161	120	M5
1x200 V	3G3JV-PFI1010-E	71	45	169	156	51	M5
	3G3JV-PFI1020-E	111	50	169	156	91	M5
3x400 V	3G3JV-PFI3005-E	111	50	169	156	91	M5
	3G3JV-PFI3010-E	111	50	169	156	91	M5
	3G3JV-PFI3020-E	144	50	174	161	120	M5

DIN rail mounting bracket

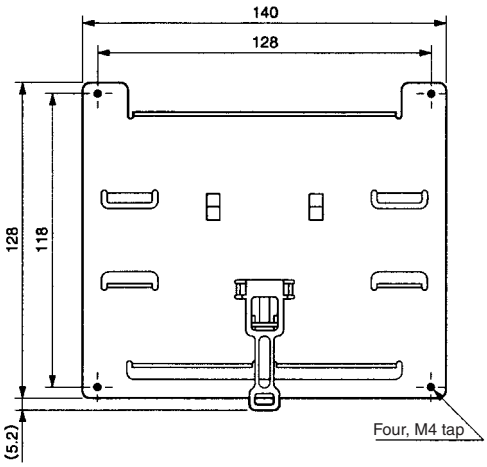
3G3IV-PEZZ08122A



3G3IV-PEZZ08122B



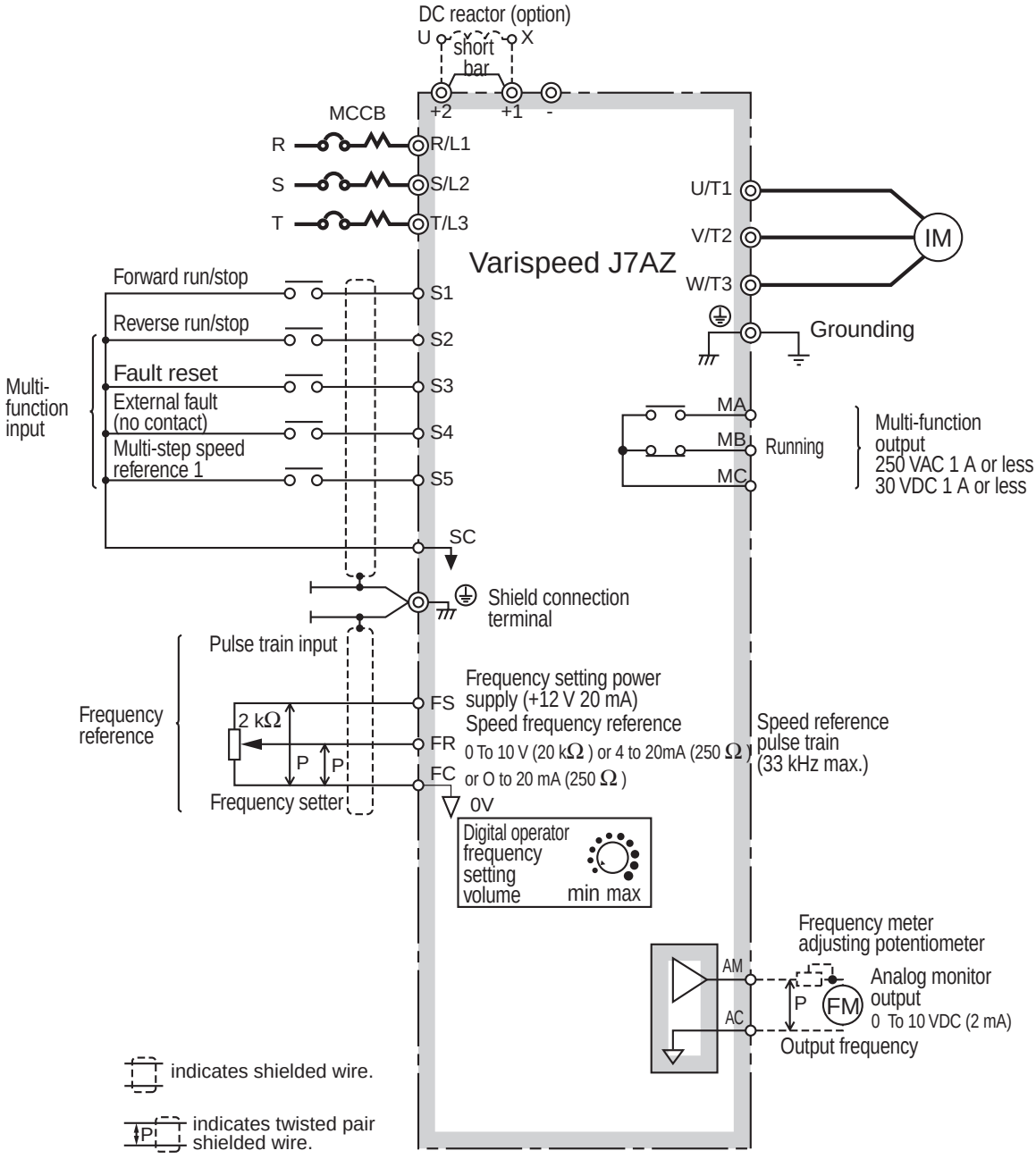
3G3IV-PEZZ08122C



Inverter		DIN rail mounting bracket
3-phase 200 VAC	CIMR-J7AZ20P1/20P2/20P4/20P7	3G3IV-PEZZ08122A
	CIMR-J7AZ21P5/22P2	3G3IV-PEZZ08122B
	CIMR-J7AZ24P0	3G3IV-PEZZ08122C
Single-phase 200 VAC	CIMR-J7AZB0P1/B0P2/B0P4	3G3IV-PEZZ08122A
	CIMR-J7AZB0P7/B1P5	3G3IV-PEZZ08122B
3-phase 400 VAC	CIMR-J7AZ40P2/40P4/40P7/41P5/42P2	3G3IV-PEZZ08122B
	CIMR-J7AZ43P0/44P0	3G3IV-PEZZ08122C

Installation

Standard connections



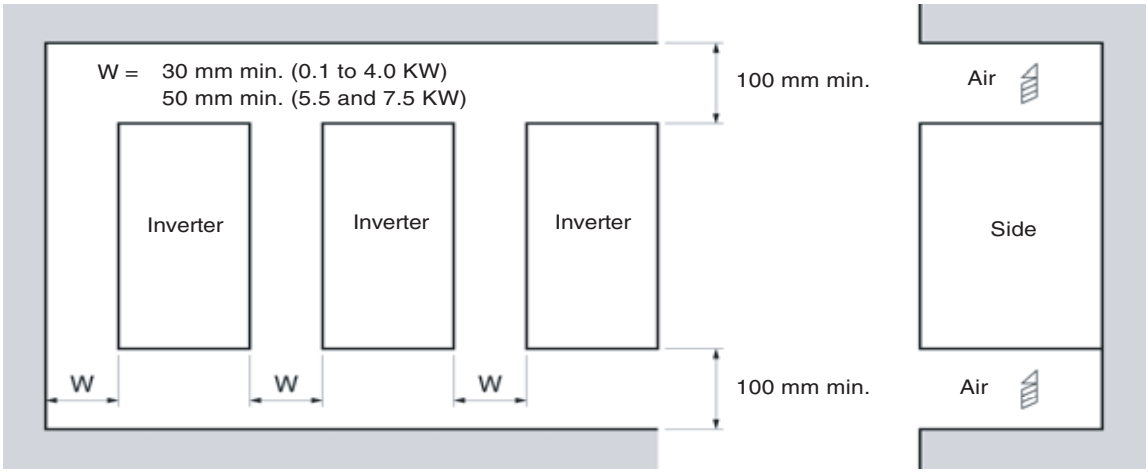
: shows the connection for the following two kinds of sequence input (S1 to S5) signals: no-voltage contact and NPN transistors (0 V common).
For a PNP transistor (+24 V common), a 24 V external power supply is necessary.

Main circuit

Terminal	Name	Function (signal level)
R/L1, S/L2, T/L3	AC power supply input	Main circuit power supply input (Use R/L1 and S/L2 for single-phase power supply inverter. Do not use T/L3 of the models less than 0.75kW for other usage, such as a junction terminal.)
U/T1, V/T2, W/T3	Inverter output	For inverter output
+2, +1	DC reactor connection	Remove the short bar between +2 and +1 when connecting DC reactor (option)
+1, –	DC power supply input	For power supply input (+1: positive electrode; – : negative electrode)*
⏚	Grounding	For grounding (grounding should conform to the local grounding code.)

Control circuit

Type	No.	Signal name	Function	Signal level
Digital input signals	S1	Multi-function input selection 1	Factory setting: runs when CLOSED, stops when OPEN.	24VDC, 8mA photocoupler isolation
	S2	Multi-function input selection 2	Factory setting: runs when CLOSED, stops when OPEN.	
	S3	Multi-function input selection 3	Factory setting: "fault reset"	
	S4	Multi-function input selection 4	Factory setting: "external fault (NO contact)"	
	S5	Multi-function input selection 5	Factory setting: "multi-step speed reference 1"	
	SC	Multi-function input selection common	Common for control signal	
Analog input signals	FS	Power supply terminal for frequency setting	+12V (allowable current: 20 mA max.)	
	FR	Speed frequency reference	0 to +10 VDC (20 kΩ) or 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) (resolution 1/1000)	
	FC	Frequency reference common	0 V	
Digital output signals	MA	NO contact output	Factory setting: "running"	Contact capacity 250 VAC, 1A or less 30 VDC, 1A or less
	MB	NC contact output		
	MC	Contact output common		
Analog output signals	AM	Analog monitor output	Factory setting: "output frequency" 0 to +10 V output	0 to 10 V 2 mA or less Resolution: 8bits
	AC	Analog monitor common	0 V	



Inverter heat loss

Three-phase 200 V class

CIMR-J7AZ□		20P1	20P2	20P4	20P7	21P5	22P2	24P0
Inverter capacity kVA		0.3	0.6	1.1	1.9	3.0	4.2	6.7
Rated current A		0.8	1.6	3.0	5.0	8.0	11.0	17.5
Heat loss W	Fin	3.7	10.3	15.8	28.4	53.7	60.4	96.7
	Inside unit	9.3	18.0	12.3	16.7	19.1	34.4	52.4
	Total heat loss	13.0	18.0	28.1	45.1	72.8	94.8	149.1

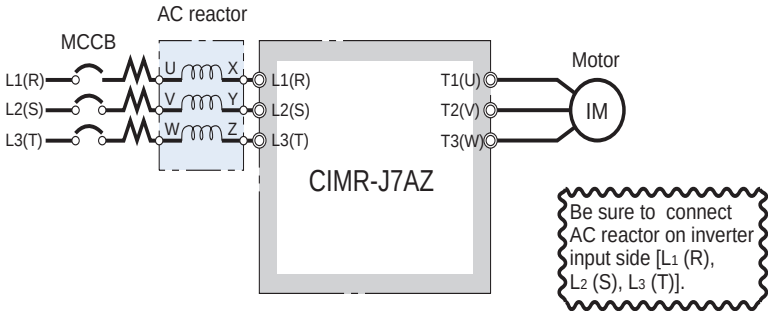
Single-phase 200 V class

CIMR-J7AZ□		B0P1	B0P2	B0P4	B0P7	B1P5
Inverter capacity kVA		0.3	0.6	1.1	1.9	3.0
Rated current A		0.8	1.6	3.0	5.0	8.0
Heat loss W	Fin	3.7	7.7	15.8	28.4	53.7
	Inside unit	10.4	12.3	16.1	23.0	29.1
	Total heat loss	14.1	20.1	31.9	51.4	82.8

Three-phase 400 V class

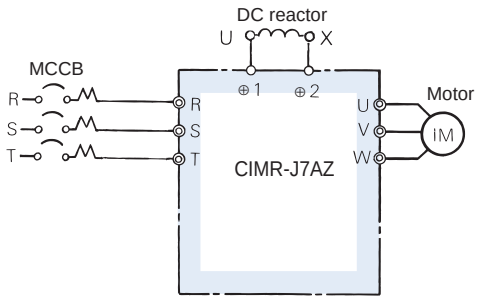
CIMR-J7AZ□		40P2	40P4	40P7	41P5	42P2	43P0	44P0
Inverter capacity kVA		0.9	1.4	2.6	3.7	4.2	5.5	7.0
Rated current A		1.2	1.8	3.4	4.8	5.5	7.2	9.2
Heat loss W	Fin	9.4	15.1	30.3	45.8	50.5	58.2	73.4
	Inside unit	13.7	15.0	24.6	29.9	32.5	37.6	44.5
	Total heat loss	23.7	30.1	54.9	75.7	83.0	95.8	117.9

AC reactor



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.1	2.0	2.0	------		
0.2	2.0	2.0	0.2	1.3	18.0
0.4	2.5	4.2	0.4		
0.75	5	2.1	0.75	2.5	8.4
1.5	10	1.1	1.5	5	4.2
2.2	15	0.71	2.2	7.5	3.6
4.0	20	0.53	4.0	10	2.2

DC reactor



200 V class			400 V class		
Max. applicable motor output kW	Current value A	Inductance mH	Max. applicable motor output kW	Current value A	Inductance mH
0.12	5.4	8	--------		
0.25			0.37	3.2	28
0.55			0.55		
1.1			1.1		
1.5	18	3	1.5	5.7	11
2.2			2.2		
4.0			4.0	12	6.3

Ordering information

SI-485/J7

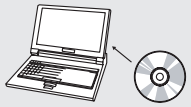


②

SI-232/J7
SI-232/J7C



CX-Drive



JVOP-144
Remote digital oper. with potentiometer



JVOP-146
Remote digital oper. with potentiometer



3G3IV-PEZZ8122_
DIN attachment



Line filter



①



Varispeed J7

3G3IV-PCN329-E
Inverter to PC cable



②

3G3IV-PCN126/326
Digital operator extension cable



Varispeed J7



200 V

Specifications			Model
1x200 V	0.12 Kw	0.8 A	CIMR-J7AZB0P10
	0.25 Kw	1.6 A	CIMR-J7AZB0P20
	0.55 Kw	3.0 A	CIMR-J7AZB0P40
	1.1 Kw	5.0 A	CIMR-J7AZB0P70
	1.5 Kw	8.0 A	CIMR-J7AZB1P50
3x200 V	0.12 Kw	0.8 A	CIMR-J7AZ20P10
	0.25 Kw	1.6 A	CIMR-J7AZ20P20
	0.55 Kw	3.0 A	CIMR-J7AZ20P40
	1.1 Kw	5.0 A	CIMR-J7AZ20P70
	1.5 Kw	8.0 A	CIMR-J7AZ21P50
	2.2 Kw	11.0 A	CIMR-J7AZ22P20
	4.0 Kw	17.5 A	CIMR-J7AZ24P00

400 V

Specifications			Model
3x400 V	0.37 Kw	1.2 A	CIMR-J7AZ40P20
	0.55 Kw	1.8 A	CIMR-J7AZ40P40
	1.1 Kw	3.4 A	CIMR-J7AZ40P70
	1.5 Kw	4.8 A	CIMR-J7AZ41P50
	2.2 Kw	5.5 A	CIMR-J7AZ42P20
	3.0 Kw	7.2 A	CIMR-J7AZ43P00
	4.0 Kw	9.2 A	CIMR-J7AZ44P00

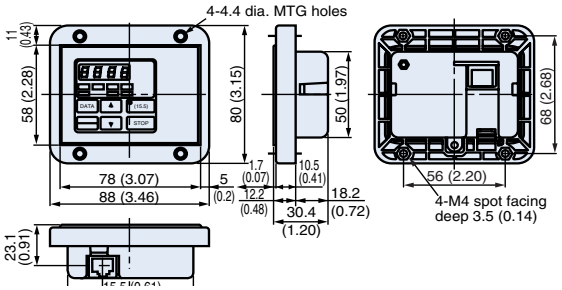
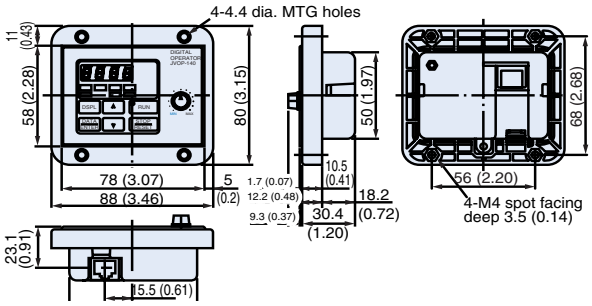
①Line filters

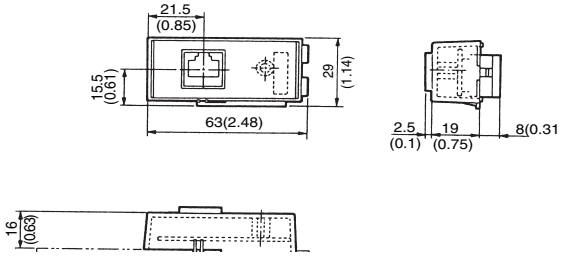
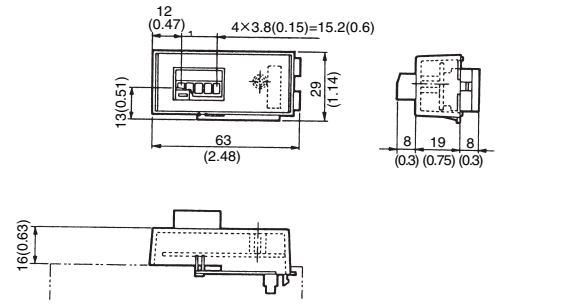




Inverter		Line filter			
Voltage	Model CIMR-J7AZ	Schaffner	Rasmi	Rated current (A)	Weight (kg)
3-phase 200 VAC	20P1 / 20P2 / 20P4 / 20P7	3G3JV-PFI2010-SE	3G3JV-PFI2010-E	10	0.68
	21P5 / 22P2	3G3JV-PFI2020-SE	3G3JV-PFI2020-E	16	0.84
	24P0	---	3G3JV-PFI2030-E	26	1.0
Single-phase 200 VAC	B0P1 / B0P2 / B0P4	3G3JV-PFI1010-SE	3G3JV-PFI1010-E	10	0.45
	B0P7 / B1P5	3G3JV-PFI1020-SE	3G3JV-PFI1020-E	20	0.68
3-phase 400 VAC	40P2 / 40P4	3G3JV-PFI3005-SE	3G3JV-PFI3005-E	5	0.57
	40P7 / 41P5 / 42P2	3G3JV-PFI3010-SE	3G3JV-PFI3010-E	10	0.67
	43P0 / 44P0	3G3JV-PFI3020-SE	3G3JV-PFI3020-E	20 / 15	1.0

② Accessories

Type	Model	Description	Funtions
Digital operator	JVOP-146 	Remote digital operator without potentiometer	
	JVOP-144 	Remote digital operator with potentiometer	

Type	Model	Description	Funtions
Interface units	SI-232/J7 (3G3JV-PSI232J) 	RS232 adapter	Another option SI-232/J7C (3G3JV-PSI232JC) is available, the only difference is that this one is removable. 
	SI-485/J7 (3G3JV-PSI485J) 	RS485 adapter	
Accessories	3G3IV-PCN126 3G3IV-PCN326	Digital operator extension cable 1 meter 3 meters	SI232/J7 must be connected
	3G3IV-PCN329-E	PC configuration cable	SI232/J7 must be connected

② Accessories

Type	Model	Description	Installation
Software	CX-drive	Computer software	Configuration and monitoring software tool for drives.
	CX-One	Computer software	Complete OMRON automation software including CX-drive.

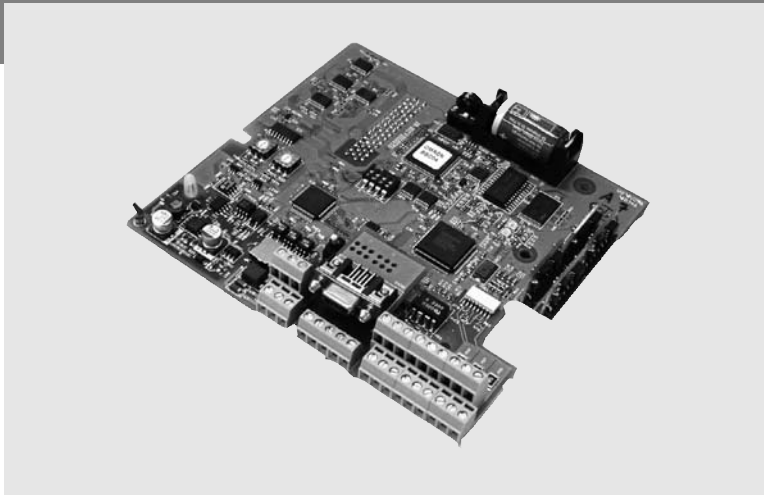
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I19E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

3G3RV-P10ST□-E

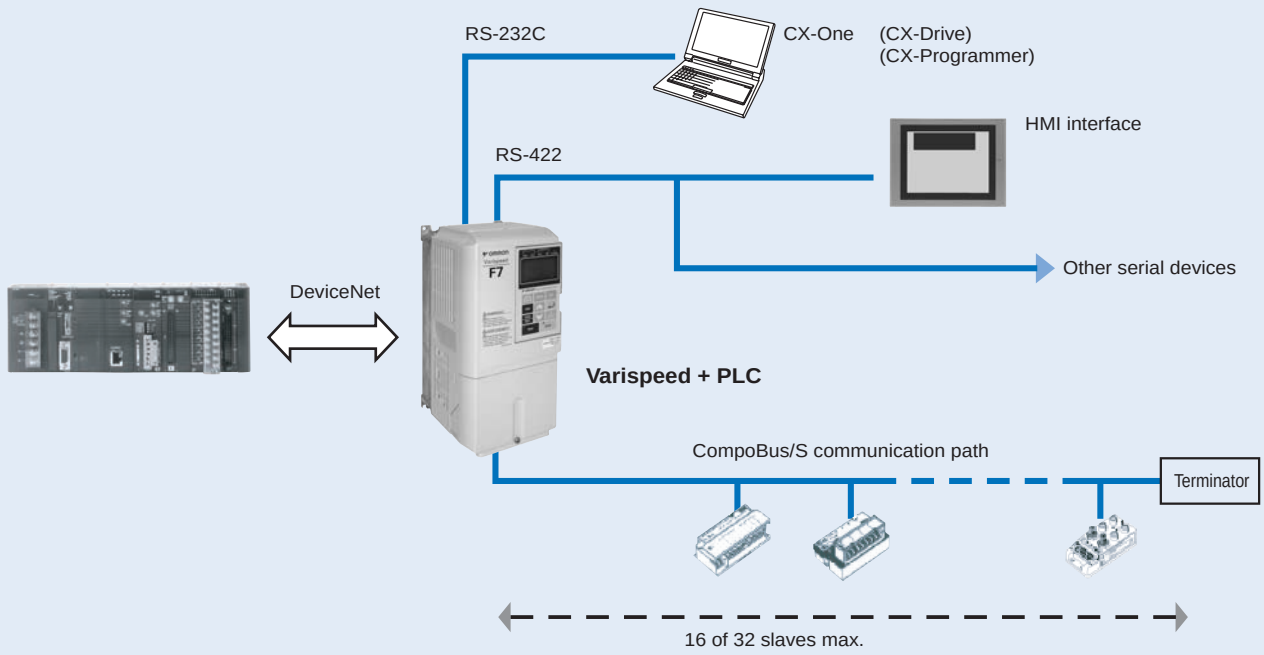
G7/F7/L7/E7 inverter PLC



The OMRON PLC technology embedded in the OMRON Yaskawa inverter family

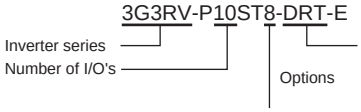
- OMRON PLC programmability in the OMRON Yaskawa inverters.
- Flexibility and intelligence in the OMRON Yaskawa inverter family.
- Wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs.
- OMRON Compobus/S fieldbus inside. Thus, able to control up to 256I/O's.
- Easy to integrate in the automation world: DeviceNet type available.
- Standard OMRON tools can be used for programming and commissioning.
- Ideal for applications like:
  - Pump sequencing, remote control, water treatment,etc together with the HVAC inverter: E7&E7 IP54.
  - Lift as control sequence inside, using the lift inverter: L7.
  - Cranes, winding/rewinding, position control, others combined with the powerful flux vector control inverter: F7Z.
  - General purpouse using the high technology of G7 3-Level vector control.

System configuration



Type designation

PLC inverter



	DeviceNet slave
-	No
DRT	Yes

	Output	RTC	RS422	Remarks
-	NPN	NO	NO	
1	NPN	NO	YES	
2	NPN	YES	NO	
3	NPN	YES	YES	
5	PNP	NO	NO	
6	PNP	NO	YES	
7	PNP	YES	NO	
8	PNP	YES	YES	Standard

Specifications

Specifications by product

Item	3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
PLC core	CPM2C-S	CPM2C-S
Inputs	6 24 VDC inputs	6 24 VDC inputs
Outputs	4 sourcing/PNP transistor outputs	4 sourcing/PNP transistor outputs
Peripheral port	Yes	Yes
RS-232C port	Yes	Yes
RS-422 port	No	Yes
Calendar/clock	Yes	Yes
Memory backup	Flash memory and battery	Flash memory and battery
Compobus/S master interface	Yes	Yes
Encoder interface	Yes	Yes
DeviceNet Slave interface	No	Yes

General specifications

Item		Specifications	
		3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
Rated power supply voltage		24 VDC $^{+10\%}/_{-15\%}$ (external power supply for I/O)	
Communications power supply voltage		---	11 to 25 VDC (supplied by communications connector)
Power consumption supply	Internal power	2 W (supplied internally) (see note)	3 W (supplied internally) (see note)
	Communications power supply	---	30 mA max.
Vibration resistance		10 to 20 Hz, 9.8 m/s2 max. 20 to 50 Hz, 2 m/s2 max	
Ambient operating temperature		-10 to 45 °C	
Ambient operating relative humidity		10% to 90% (no condensation)	
Ambient storage temperature		-20 to 70 °C	
Atmosphere		Must be free from corrosive gas	
Control method		Store program method	
I/O control method		Cyclic scan method	
Programming language		Ladder chart method	
Instruction length		1 step/1 instruction; 1 to 5 words/1 instruction	
Instruction types	Basic	14 types (same as for programmable slaves)	
	Special	105 types, 185 instructions (same as for programmable slaves)	
Processing speed	Basic instructions	0.64 µs (LD)	
	Special instructions	7.8 µs (MOV)	
Program capacity		4,096 words	
Maximum number of I/O points		10	
Input bits		00000 to 00015 (6 physical inputs)	
Output bits		01000 to 01003 (4 physical outputs)	
CompoBus/S input bits		128 bits: IR 02000 to IR 02715 (bits not used for CompoBus/S input bits can be used for work bits.)	
CompoBus/S output bits		128 bits: IR 03000 to IR 03715 (bits not used for CompoBus/S output bits can be used for work bits.)	
Inverter interface		Direct interface with inverter through • IR-memory • DM-memory • Transfer command	
Inverter interface bits		176 bits: IR 20000 to IR 21015	
Encoder interface bits		48 bits: IR 02900 to IR 02915 and IR 04800 to IR 04915	
Work bits		448 bits: IR 02800 to IR 02815, IR 03800 to IR 04715, and IR 21100 to IR 22715	
Special bits (SR area)		448 bits: SR 22800 to SR 25507 (words SR 228 to SR 255)	
Temporary bits (TR area)		8 bits (TR 0 to TR 7)	
Holding bits (HR area)		320 bits: HR 0000 to HR 1915 (words HR 00 to 19)	
Auxiliary bits (AR area)		384 bits: AR 0000 AR 2315 (words AR 00 to AR 23)	

Item		Specifications	
		3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
Link bits (LR area)		256 bits: LR 0000 to LR 1515 (words LR 00 to LR 15)	
Timers/counters		256 timers/counters (TIM/CNT 000 to TIM/CNT) 1-ms timers: TMHH(--) 10-ms timers: TIMH(15) 100-ms timers: TIM 1-s/10-s timers: TIML(--) Decrementing counters: CNT Reversible counters: CNTR(12)	
CompoBus/S master functions		Remote I/O devices can be allocated up to 256 I/O points (128 inputs and 128 outputs) in input area IR 020 to IR 027 and output area IR 030 to IR 037. • The node numbers can be set to 0 to 7 (128-point mode) or 0 to 15 (256-point mode). • The communications mode can be set to high-speed mode (max. length 100 m) or long-distance mode (max. length 500 m).	
DeviceNet slave functions		Up to 64 words (32 input words and 32 output words) can be allocated to the DeviceNet master's I/O. The master's I/O can be allocated to the following data areas: IR 000 to IR 049 IR 200 to IR 227 DM 0000 to DM 2047 LR 00 to LR 15 HR 00 to HR 19 AR 00 to AR 23 (3G3RV-P10ST ' master; read-only) TC 000 to TC 255 • Explicit message communications are supported. Any 3G3RV-P10ST data area can be accessed from the DeviceNet master. • The communications speed can be set to 500 kbps (total network length 100 m max.), 250 kbps (total network length 250 m max.), or 125 kbps (total network length 500 m max.).	
DM area	Read/write	2,029 words (DM 0000 to DM 0999, DM 1019 to DM 2047) DM 2000 to DM 2021: error log storage area	
	Read only	456 words (DM6144 to 6599)	
	Inverter interface	19 words (DM 2022 to DM 2040)	
	Encoder interface	14 words (DM 1986 to DM 1999)	
	PLC setup	56 words (DM 6599 to DM 6655)	
Interrupts		Interrupt inputs 2 inputs Response time: 50 μs	
		Interval timer interrupts 1 input Set value: 0.5 to 319,968 ms Precision: 0.1 ms	Scheduled interrupts One-shot interrupt
High-speed counters	High-speed counter 1 input, see note 5	No interrupt	
	Differential phase mode (5 kHz) Pulse plus direction input mode (20 kHz) Up/down input mode (20 kHz) Increment mode (20 kHz)	Count-check interrupt (An interrupt can be generated when the count equals the set value or the count lies within a preset range.)	
	Interrupt inputs (counter mode) 2 inputs Incrementing counter (2 kHz) Decrementing counter (2 kHz)	No interrupt	
		Count-up interrupt	
Encoder interface		3 input modes: Differential-phase (up/down) Pulse plus direction Up/down pulse Maximum input frequency 50 kHz Maximum counter range 4,294,967,295 (232-1) Two capture registers, 3 selectable registration inputs One comparison value Counter reset through software or Z-phase Interrupt function	
Pulse outputs		• 2 outputs: Single-phase pulse output without acceleration/deceleration (see note 6.) 10 Hz to 10 kHz • 2 outputs: Variable duty ratio pulse output (see note 6.) 0.1 to 999.9 Hz, duty ratio 0 to 100% • 1 output: Pulse output with trapezoidal acceleration/deceleration (see note 6.) Pulse plus direction output, up/down pulse output, 10 Hz to 10 kHz	
Synchronized pulse control		1 point, see notes 5 and 6 Input frequency range: 10 to 500 Hz, 20 Hz to 1 kHz, or 300 Hz to 20 kHz Output frequency range: 10 Hz to 10 kHz	
Pulse catch inputs		2 bits Minimum pulse input: 50 μs max. Used in common by input interrupts and input interrupt counter mode.	
Analog volume		None	
Input time constant (ON response time = OFF response time)		Determines the input time constant for all inputs. (settings: 1, 2, 3, 5, 10, 20, 40, or 80 ms)	
Clock/Calendar function		Shows the current year, month, day of the week, day of the month, hour, minute, and second.	
Communication function		Port 1 = Peripheral and RS-422: Host link, peripheral bus, no-protocol, programming console Port 2 = RS-232C port: Host link, no-protocol, 1:1 PLC link, 1:1 NT link	

Item		Specifications	
		3G3RV-P10ST8-E	3G3RV-P10ST8-DRT-E
Power-interruption hold function		Holds the contents of HR, AR, CNT, and DM areas.	
Memory backup (see notes 1 and 2.)		Flash memory: Program, read-only DM area, and PC setup Memory backup: The read/write DM area, HR area, AR area, and counter values are backed up. (The battery has a 5-year lifetime at 25 °C and it is replaceable.)	
Self-diagnostic function		CPU errors, memory errors, communications errors, setting errors, battery errors	
Program check		No END instruction, program errors (regularly checked during operation)	
Connected tools	CX-programmer	After version 2.1	
	Programming console	C200H-PRO27, CQM1-PRO01	
	SSS	PC98 & PC/AT (SYSMAC support software, all versions)	
	CX-drive	Version 1 or higher	

Note: 1. The DM area, HR area, AR area, and counter values are backed up. If the backup battery or capacitor is discharged, the contents of these areas will be lost and the data values will revert to the defaults.

2. The contents of the program area, read-only DM area (DM6144 to DM6599), and PLC setup (DM 6600 to DM 6655) are stored in flash memory. The contents of these areas will be read from flash memory the next time the power is turned ON, even if the backup battery or capacitor is discharged. When data has been changed in any of these areas, write the new values to flash memory by switching the 3G3RV-P10ST to MONITOR or RUN mode, or by turning the power OFF and then ON again.

3. Changes made while in MONITOR mode using, for example, online editing, are written to flash memory in real-time.

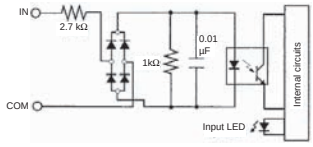
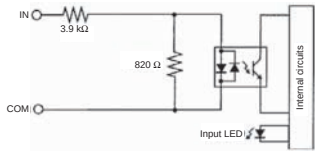
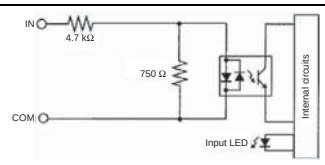
4. The above figure for power consumption includes the power consumption of the programming console.

5. This input is shared by the high-speed counter and synchronized pulse control functions.

6. This output is shared by the pulse output and synchronized pulse control functions.

I/O specifications

Input specifications

Item	Inputs	Specification
Input voltage	All	24 VDC $^{+10\%}/_{-15\%}$
Input impedance	IN 00000 to IN 00001	2.7 kΩ
	IN 00002 to IN 00004	3.9 kΩ
	IN 00005	4.7 kΩ
Input current	IN 00000 to IN 00001	8 mA typical
	IN 00002 to IN 00004	6 mA typical
	IN 00005	5 mA typical
ON voltage/current	IN 00000 to IN 00001	17 VDC min., 5 mA
	IN 00002 to IN 00005	14.4 VDC min., 3.5 mA
OFF voltage/current	All	5.0 VDC max., 1.1 mA
ON delay	All	1 to 80 ms max. Default: 10 ms (see note.)
OFF delay	All	1 to 80 ms max. Default: 10 ms (see note.)
Circuit configuration	IN 00000 to IN 00001	
	IN 00002 to IN 00004	
	IN 00005	

Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PLC setup.

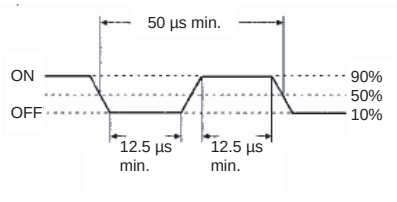
High-speed counter inputs

The following unit input bits can be used as high-speed counter inputs. The maximum count frequency is 5 kHz in differential phase mode and 20 kHz in the other modes.

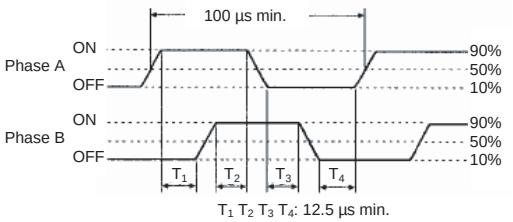
Input	Function			
	Differential phase mode	Pulse plus direction input mode	Up/down input mode	Increment mode
IN 00000	A-phase pulse input	Pulse input	Increment pulse input	Increment pulse input
IN 00001	B-phase pulse input	Direction input	Decrement pulse input	Normal input
IN 00002	Z-phase pulse input or hardware reset input (IN00002 can be used as a normal input when it is not used as a high-speed counter input.)			

The minimum pulse widths for inputs IN00000 (A-phase input) and IN00001 (B-phase input) are as follows:

Pulse plus direction input mode, up/down inputmode, Increment mode

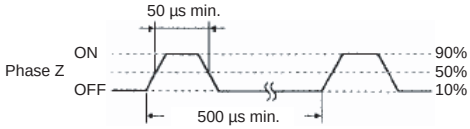


Differential phase mode



T_1 T_2 T_3 T_4: 12.5 µs min.

The minimum pulse width for input IN00002 (Z-phase input) is as follows:



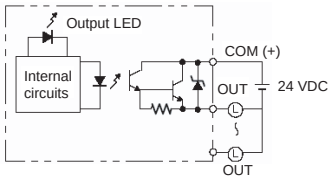
Interrupt inputs

3G3RV-P10ST is equipped with inputs that can be used as interrupt inputs (interrupt input mode or counter mode) and quick-response inputs. The minimum pulse width for these inputs is 50 µs.

Inputs IN 00003 and IN 00004 can be used as interrupt inputs.

Output specifications

Transistor outputs (sourcing/PNP)

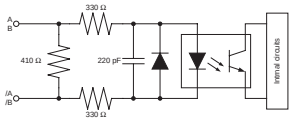
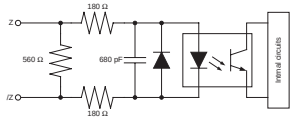
Item	Specification
Maximum switching capacity	4.5 to 30 VDC, 0.2 A/output
Minimum switching capacity	0.5 mA
Maximum inrush current	0.9 A for 10 ms
Leakage current	0.1 mA
Residual voltage	1.5 V max.
ON response time	20 µs max.
OFF response time	40 µs max. for 4.5 to 26.4 VDC, 10 to 100 mA 0.1 ms max for 4.5 to 30 VDC, 10 to 200 mA
Fuse	One fuse per output (cannot be replaced by user)
Circuit configuration	

Note: When using OUT 01000 or OUT 01001 as a pulse output, connect a dummy resistor as required to bring the load current between 0.01 and 0.1 A. If the load current is below 0.1 A, the ON-to-OFF response time will be longer and high-speed pulses (source-type transistor outputs) will not be output. If the load current is above 0.1 A, the transistor will generate more heat and components may be damaged.

⚠ Caution

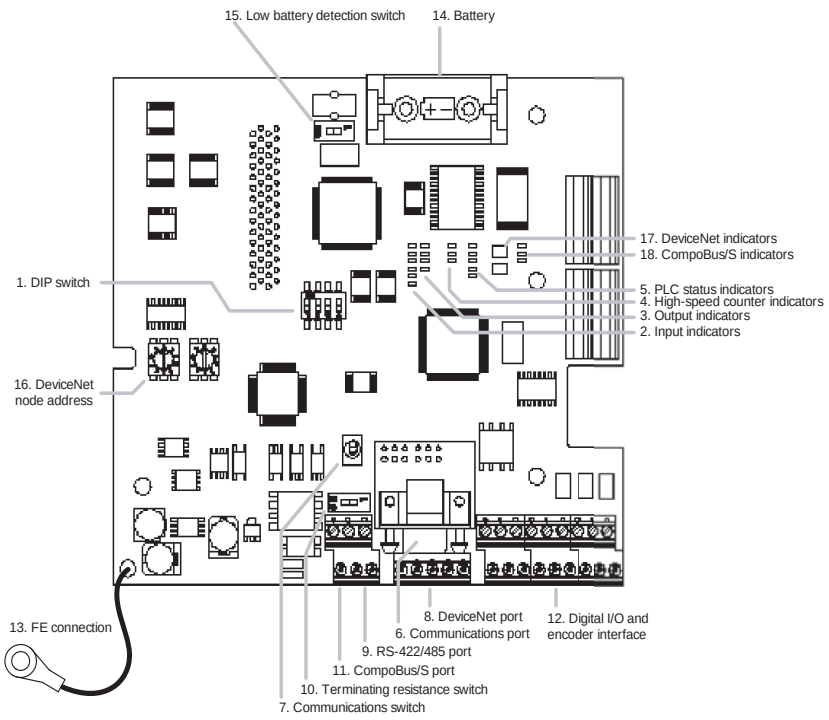
Do not apply voltage in excess of the maximum switching capacity to an output terminal. It may result in damage to the product or fire.

Encoder input specifications

Signal level	**All**	EIA RS-422-A standards
Input impedance	**A- and B-phase**	280 Ω
	Z-phase	260 Ω
Response frequency	**A- and B-phase**	50 kHz max.
	Z-phase	1 kHz max.
Circuit configuration	**A- and B-phase**	
	Z-phase	

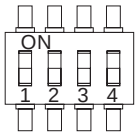
Operation

CPU unit component descriptions



1. DIP switch

• RS-232C and peripheral port settings

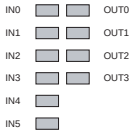
	Pin 1	Effective port settings
	OFF (default)	The ports operate according to the settings in the PLC setup. RS-232C port settings: DM 6645 to DM 6649 Peripheral port settings: DM 6650 to DM 6654
	ON	The ports operate with the standard communications settings.

• Operating mode at startup

Pin 2 determines the operating mode at startup only if there isn't a programming device connected to the peripheral port.

Programming device connected	Startup mode with Pin 2 OFF (default)	Startup mode with Pin 2 ON
None	RUN mode	PROGRAM mode
Programming console	Operating mode set on the programming console's mode switch	
Other device	PROGRAM mode	

2. Input indicators (yellow)



The input indicators are lit when the corresponding input terminal is ON. The status of an input indicator will reflect the status of the input even when that input is being used for a high-speed counter.

Note: 1. When interrupt inputs are used in interrupt input mode, the indicator may not light even when the interrupt condition is met if the input is not ON long enough.

2. Input indicators will reflect the status of the corresponding inputs even when the PLC is stopped, but the corresponding input bits will not be refreshed.

3. Output indicators (yellow)

The output indicators are lit when the corresponding output terminal is ON. The indicators are lit during I/O refreshing. The status of an output indicator will also reflect the status of the corresponding output when the output is being used as a pulse output.

4. High-speed counter indicators (yellow)



The indicators are lit when the corresponding input terminal is ON.

5. PLC status indicators

The following indicators show the operating status of the PLC.

	Indicator	Status	Meaning
	PWR (green)	ON	Power is being supplied to the unit
		OFF	Power isn't being supplied to the unit
	RUN (green)	ON	The PLC is operating in RUN or MONITOR mode
		OFF	The PLC is in PROGRAM mode or a fatal error has occurred.
	ERR/ALM (red)	ON	A fatal error has occurred. (PLC operation stops.)
		Flashing	A non-fatal error has occurred. (PLC operation continues.)
		OFF	Indicates normal operation.
	COMM1 (yellow)	Flashing	Data is being transferred via the peripheral or RS-422/485 port.
		OFF	Data isn't being transferred via communications port.
	COMM2 (yellow)	Flashing	Data is being transferred via the RS-232C port
		OFF	Data isn't being transferred via communications port.

6. Communications port

Connects the PLC to a programming device (including programming consoles), host computer, or standard external device. Use a proper connecting cable (CPM2C-CN111, CS1W-CN114, CS1W-CN118, or CS1W-CN226).

Note: 1. A CQM1H-PRO01-E programming console can be connected directly to the PLC.

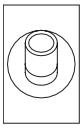
2. A C200H-PRO27-E programming console can be connected directly to the PLC with a CS1W-CN224/CN624 connecting cable.

3. Use a CPM2C-CN111 or CS1W-CN114 connecting cable to connect to the communications port as a peripheral port. The communications port can be used simultaneously as both a peripheral port and RS-232C port by using the CPM2C-CN111 connecting cable.

4. Use a CPM2C-CN111, CS1W-CN118 or CS1W-CN226 connecting cable to connect to the communications port as a RS-232C port. The communications port can be used simultaneously as both a peripheral port and RS-232C port by using the CPM2C-CN111 connecting cable

Note: The peripheral port and RS-422/485 port cannot be used simultaneously. When using the peripheral port disconnect any devices connected to the RS-422/485 port.

7. Communications switch



Switch to select port 1 type of connected device

Position	Communication port 1
OFF (up) (default)	Programming console
ON (down)	RS-422/485 communication

8. DeviceNet port (-DRT versions only)

Terminal arrangement

V-	CAN-L	Shield	CAN-H	V+

9. RS-422/485 port

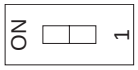
Used to connect to host computers, or standard external devices.

Terminal arrangement

	Send data (output)	Receive data (input)
6	SDB+	RDB+
5	SDA-	RDA-

Note: The maximum line length is 500 m.
The peripheral port and RS-422/485 port cannot be used simultaneously. When using the peripheral port disconnect any devices connected to the RS-422/485 port.
When using RS-485 communication, connect RDA- to SDA- and RDB+ to SDB+.

10. Terminating resistance switch

	Position	Termination
	OFF (right) (default)	Disabled
	ON (left)	Enabled

Set this switch to ON only for double-ended connection to a host link network.

11. CompoBus/S port

Terminal arrangement

BDH	4	2
BDL	3	1

Use special flat cable or VCTF cable for the transmission lines that connect the nodes in the CompoBus/S I/O Link. (Special flat cables and VCTF cables cannot be combined in the same system.)

Name	Model number	Specifications
Flat cable	XB1T-W10	4-core flat cable, 0.75 mm²
VCTF cable	---	2-core VCTF, 0.75 x 20

12. Digital inputs and outputs and encoder interface

Connects the CPU unit to external input and output devices.

Sourcing outputs

Z-	B-	A-	OUT3	OUT1	COM(+)	IN5	IN3	IN1(B)
Z+	B+	A+	OUT2	OUT0	COM	IN4	IN2(Z)	IN0(A)

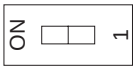
13. Functional earth-wire

To be connected the earth connection inside the inverter.

14. Battery

15. Low battery detection switch

This switch enables or disables the detection of a low-battery error.

	Position	Low-battery detection
	OFF (right) (default)	Error detection enabled
	ON (left)	Error detection disabled

16. DeviceNet node-number (-DRT versions only)

Please refer to the DeviceNet section

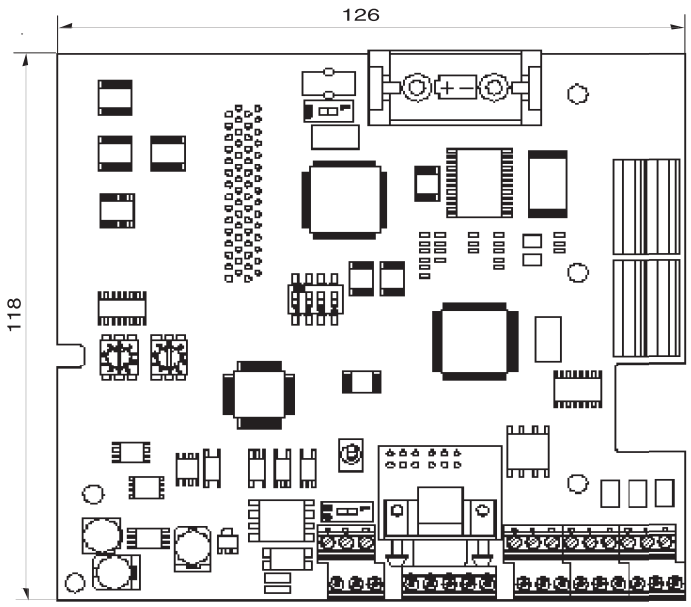
17. DeviceNet indicators (-DRT versions only)

Please refer to the DeviceNet section

18. CompoBus/S indicators

	Indicator	Status	Meaning
	SD (yellow)	Flashing	Data is being transmitted via CompoBus/S
		OFF	Data isn't being transmitted via CompoBus/S
	RD (yellow)	Flashing	Data is being received via CompoBus/S
		OFF	Data isn't being received via CompoBus/S
	ERC (red)	Flashing	A CompoBus/S communications error occurred.
		OFF	A CompoBus/S communications error hasn't occurred.

Dimensions

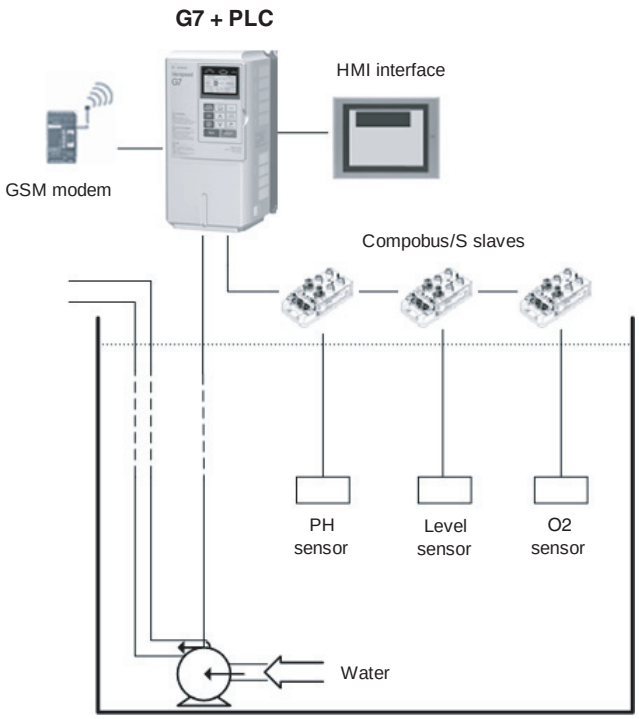


Application examples

G7 + PLC

Varispeed G7 is the OMRON Yaskawa solution using 3 level PWM control technology that provides lower surge voltage, low leakage current, low bearing current, low acoustic noise and better EMC. By combining with PLC option board, it is the ideal solution for winding/unwiding applications, handling / transfer / palletizer point-to-point positioning applications, press control applications, extruder control applications and pump applications for examples ..

G7 + PLC in a water treatment application example

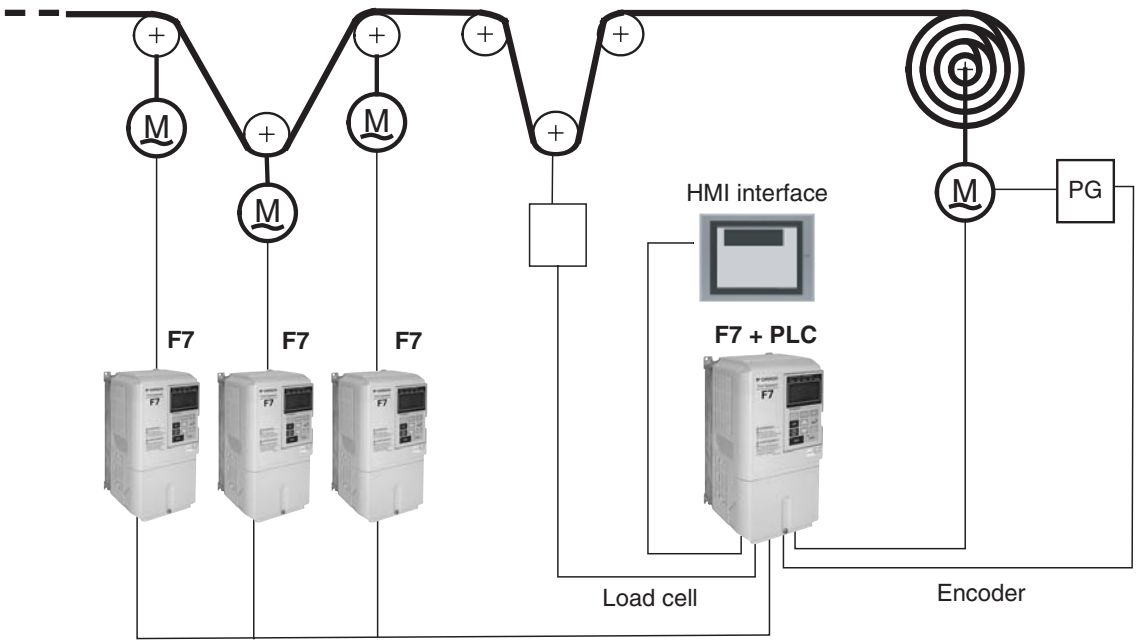


Note: For detailed information about the inverter, please see the Varispeed G7 series section.

F7 + PLC

The F7 drive is a flux vector control inverter. It is intended to handle every conventional drive application found in a typical industrial manufacturing plant from simple variable torque pumping to sophisticated networked material handling. By combining with PLC option board, is ideal solution winding/unwiding applications, handling/ transfer/ palletizer point-to-point positioning applications, food processing, packaging, printing, and textile machines for example .

F7 + PLC in a winding application example.

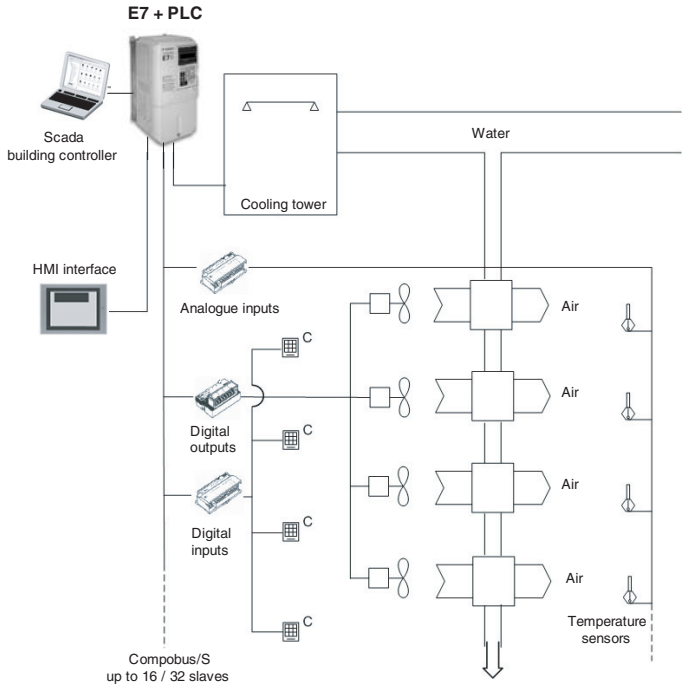


Note: For detailed information about the inverter, please see into the Varispeed F7 series section.

E7 + PLC

Varispeed E7 is the OMRON Yaskawa solution for energy saving applications The E7 is designed for variable torque applications such as fans and centrifugal pumps. By combining with PLC option board, it is the ideal solution for water treatment, pump squencing, building automation and fan applications for example...

E7 + PCL in HVAC application example

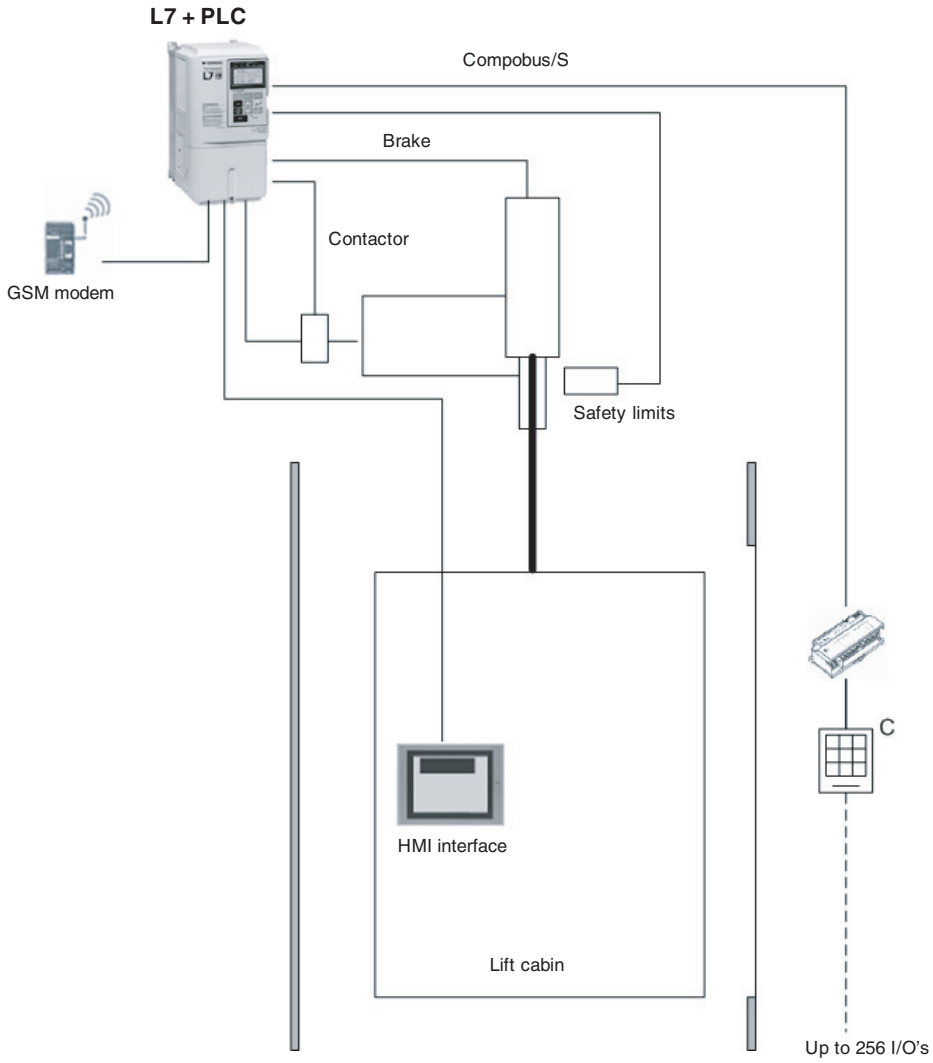


Note: For detailed information about the inverter, please see into the Varispeed E7 series section.

L7 + PLC

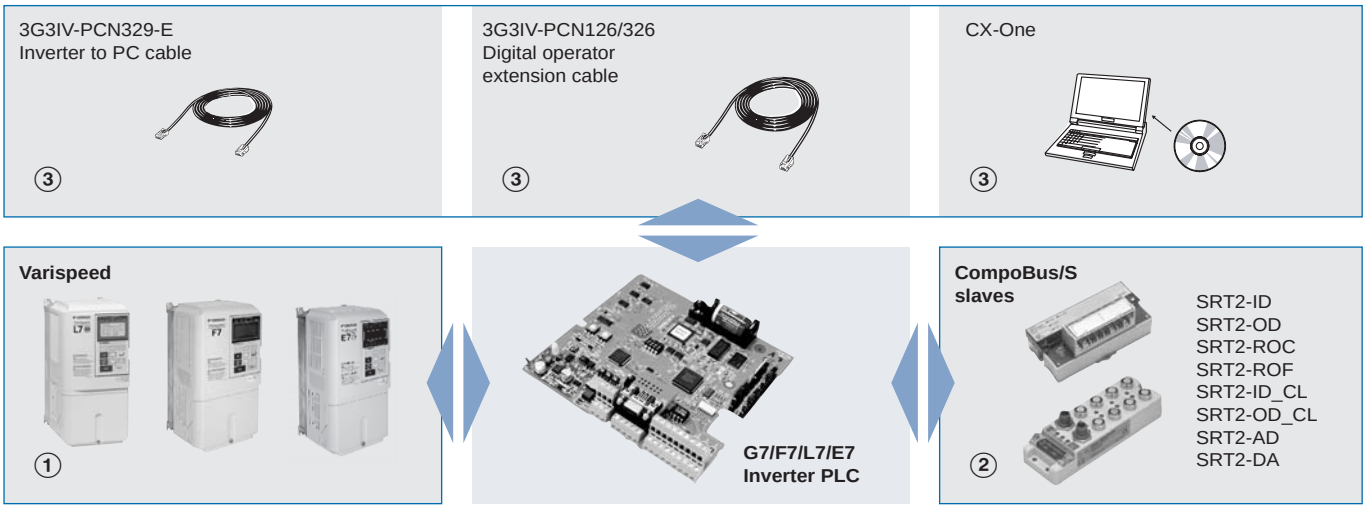
The L7 is the ultimate drive for lift applications up to 3m/s. High starting torque, silent operation, lift-specific operator interface and operation with both AC and PM motors are standard features of the L7 inverter. By combining with PLC option board, it is the ideal solution for controlling distributed I/O's, lift cabin HMI, GSM modem to send alarms for example..

L7 + PLC in lift application example



Note: For detailed information about the inverter, please see into the Varispeed L7 series section.

Ordering information



G7/F7/L7/E7 inverter PLC

Specifications						Model
Inputs	Ouptuts	RTC	Compobus/S master	RS422 port	DeviceNet slave	
6	4	Yes	Yes	Yes	No	3G3RV-P10ST8-E
6	4	Yes	Yes	NO	Yes	3G3RV-P10ST8-DRT-E

① Varispeed

Specifications	Model
The 3-Level control method inverter	Varispeed G7
Flux vector control inverter	Varispeed F7
The lift inverter	Varispeed L7
The pumps and fans inverter	Varispeed E7

Note: For detailed information please refer to Varispeed G7/F7/L7/E7 series section.

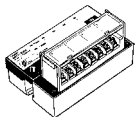
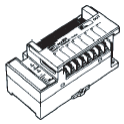
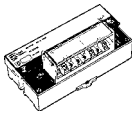
② Cables

Specifications	Model
Computer connecting cable	CS1W-CN226
Programmable console cable	CS1W-CN224

② Computer software

Specifications	Model
PLC programming software: CX-programmer	CX-One
Inverter configurator software: CX-drive	

③ Compobus/S slaves

Product	Appearance	Specifications	Model
Digital I/O terminals		4 NPN inputs (+ common) 4 PNP inputs (– common) 4 NPN outputs (– common) 4 PNP outputs (+ common)	SRT2-ID04 SRT2-ID04-1 SRT2-OD04 SRT2-OD04-1
		8 NPN inputs (+ common) 8 PNP inputs (– common) 8 NPN outputs (– common) 8 PNP outputs (+ common)	SRT2-ID08 SRT2-ID08-1 SRT2-OD08 SRT2-OD08-1
		16 NPN inputs (+ common) 16 PNP inputs (– common) 16 NPN outputs (– common) 16 PNP outputs (+ common)	SRT2-ID16 SRT2-ID16-1 SRT2-OD16 SRT2-OD16-1
Relay output terminals		8 Relay outputs 8 Power MOS FET relay outputs	SRT2-ROC08 SRT2-ROF08
		16 Relay outputs 16 Power MOS FET relay outputs	SRT2-ROC16 SRT2-ROF16
Waterproof terminals		4 NPN inputs (+ common) 4 PNP inputs (– common) 4 NPN outputs (– common) 4 PNP outputs (+ common)	SRT2-ID04CL SRT2-ID04CL-1 SRT2-OD04CL SRT2-OD04CL-1
		8 NPN inputs (+ common) 8 PNP inputs (– common) 8 NPN outputs (– common) 8 PNP outputs (+ common)	SRT2-ID08CL SRT2-ID08CL-1 SRT2-OD08CL SRT2-OD08CL-1
Analog input terminal		1 to 4 inputs (set with DIP switch)	SRT2-AD04
Analog output terminal		1 or 2 outputs (set with DIP switch)	SRT2-DA02

Note: For detailed information about Compobus/S slaves, please refer to catalogue No. Y201-EN2-02 AS.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I25E-EN-02

In the interest of product improvement, specifications are subject to change without notice.

3G3MV-P10CDT□-E

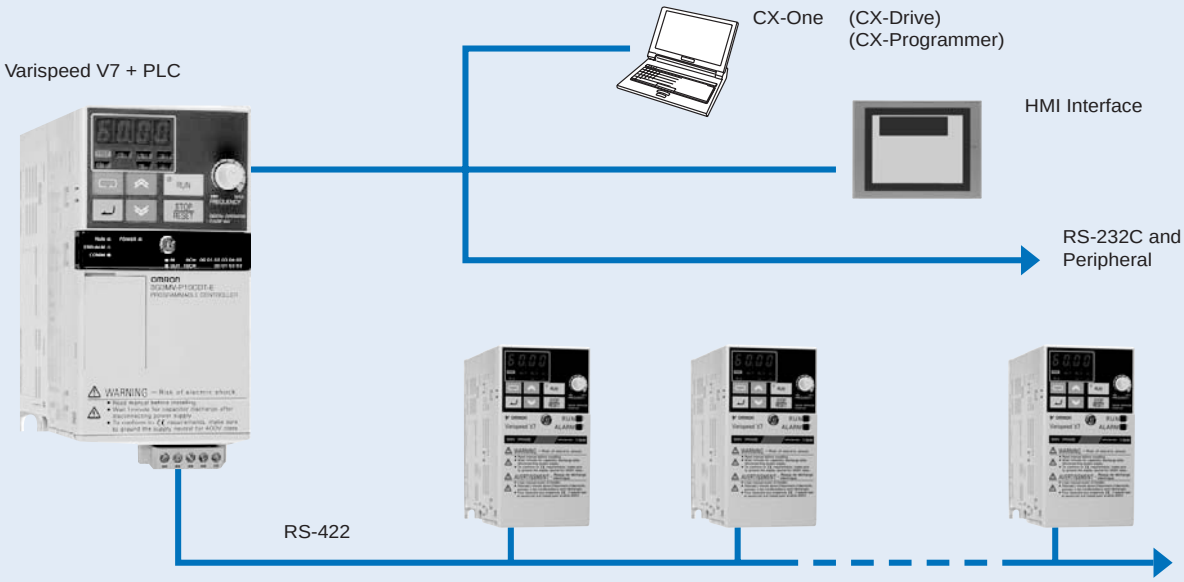
V7 inverter PLC



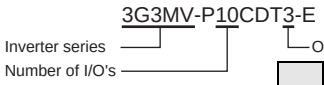
The OMRON PLC technology embedded in the most popular inverter: the V7

- OMRON PLC programmability for the 3G3MV inverter
- Stand-alone applications.
- Flexibility and intelligence into the 3G3MV.
- Wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs.
- Standard OMRON tools can be used for programming and commissioning.
- Ideal for applications like: door control, pump sequencing, Intelligent conveyor, Vertical axis control, Industrial washing machines and general positioning.

System configuration



Type designation



	Output	RTC	RS422	Remarks
-	NPN	NO	NO	Standard
1	NPN	NO	YES	
2	NPN	YES	NO	
3	NPN	YES	YES	Standard
5	PNP	NO	NO	Standard
6	PNP	NO	YES	
7	PNP	YES	NO	
8	PNP	YES	YES	

Specifications

Specifications by product

Item	3G3MV-P10CDT-E	3G3MV-P10CDT5-E	3G3MV-P10CDT3-E
PLC core	CPM2C-S	CPM2C-S	CPM2C-S
Inputs	6 24 VDC inputs	6 24 VDC inputs	6 24 VDC inputs
Outputs	3 sinking/NPN transistor outputs	3 sinking/PNP transistor outputs	3 sinking/NPN transistor outputs
	1 relay output	1 relay output	1 relay output
Peripheral port	Yes	Yes	Yes
RS-232C port	Yes	Yes	Yes
RS-422/485 port	No	No	Yes
Calendar/clock	No	No	Yes
Memory backup	Flash memory and capacitor	Flash memory and capacitor	Flash memory and battery

General specifications

Item		Specifications
Rated power supply voltage		24 VDC $^{+10\%}/_{-15\%}$ (external power supply for I/O)
Vibration resistance		0.15 mm (10-57 Hz) 9.8 m/s^2 (57-150 Hz) 9.8 m/s^2 (57-150 Hz) In all directions (X, Y, Z)
Ambient operating temperature		-10 to 45 °C
Ambient operating relative humidity		10% to 90% (no condensation)
Ambient storage temperature		-20 to 70 °C
Atmosphere		Must be free from corrosive gas
Power consumption		2 W (supplied internally)
Control method		Store program method
I/O control method		Cyclic scan method
Programming language		Ladder chart method
Instruction length		1 step/1 instruction; 1 to 5 words/1 instruction
Instruction types	Basic	14 types (same as for programmable slaves.)
	Special	105 types, 185 instructions (same as for programmable slaves.)
Processing speed	Basic instructions	0.64 μs (LD)
	Special instructions	7.8 μs (MOV)
Program capacity		4,096 words
Maximum number of I/O points		10
Input bits		00000 to 00015 (6 physical inputs)
Output bits		01000 to 01003 (4 physical outputs)
Area allocated to inverter		320 bits: 20000 to 21915
Inverter interface		Direct interface with V7 inverter through • IR-memory • DM-memory • Transfer command
IR area		880 bits: IR 00100 to IR 00915 (words IR 001 to IR 009), IR 01100 to IR 02815 (words IR 011 to IR 028), IR 03000 to IR 04915 (words IR 030 to IR 049), IR 22000 to IR 22715 (words IR 220 to IR 227)
SR area		448 bits: SR 22800 to SR 25507 (words SR 228 to SR 255)
TR area		8 bits (TR 0 to TR 7)
HR area		320 bits: HR 0000 to HR 1915 (words HR 00 to 19)
AR area		384 bits: AR 0000 AR 2315 (words AR 00 to AR 23)
LR area		256 bits: LR 0000 to LR 1515 (words LR 00 to LR 15)
Timer/counter area		256 bits: TC 000 to TC 255
DM area	Read/write	2029 words (DM 0000 to DM 0999, DM 1019 to DM 2047) DM 2000 to DM 2021: error log storage area
	Read only	456 words (DM6144 to 6599)
	Allocated to inverter	19 words (DM 2022 to DM 2040)
	PLC setup	56 words (DM 6599 to DM 6655)
Quick-response input		2 inputs (minimum input signal width: 50 μs)

Item		Specifications	
Interrupt processing	External interrupts	2 bits (used in common for input interrupt counter mode and high-speed inputs.)	
	Scheduled interrupts	1 bit (scheduled interrupts or one-shot interrupts)	
Interrupts		Interrupt inputs 2 inputs Response time: 50 µs	
		Interval timer interrupts 1 input Set value: 0.5 to 319,968 ms Precision: 0.1 ms	Scheduled interrupts
			One-shot interrupt
High-speed counters		High-speed counter 1 input, see note 5 • Differential phase mode (5 kHz) • Pulse plus direction input mode (20 kHz) • Up/down input mode (20 kHz) • Increment mode (20 kHz)	No interrupt
			Count-check interrupt (an interrupt can be generated when the count equals the set value or the count lies within a preset range.)
		Interrupt inputs (counter mode) 2 inputs • Incrementing counter (2 kHz) • Decrementing counter (2 kHz)	No interrupt
			Count-up interrupt
Pulse outputs		• 2 outputs: Single-phase pulse output without acceleration/deceleration (see note 6.) 10 Hz to 10 kHz • 2 outputs: Variable duty ratio pulse output (see note 6.) 0.1 to 999.9 Hz, duty ratio 0 to 100% • 1 output: Pulse output with trapezoidal acceleration/deceleration (see note 6.) Pulse plus direction output, up/down pulse output, 10 Hz to 10 kHz	
Synchronized pulse control		1 point, see notes 5 and 6 Input frequency range: 10 to 500 Hz, 20 Hz to 1 kHz, or 300 Hz to 20 kHz Output frequency range: 10 Hz to 10 kHz	
Analog volume		None	
Input time constant (ON response time = OFF response time)		Determines the input time constant for all inputs. (Settings: 1, 2, 3, 5, 10, 20, 40, or 80 ms)	
Clock/calendar function		Yes. Shows the current year, month, day of the week, day of the month, hour, minute, and second.	
Communication function		Port 1 = Peripheral and RS-422 host link, peripheral bus, no-protocol, programming console Port 2 = RS-232C port: host link, no-protocol, 1:1 PLC link, 1:1 NT link	
Power-interruption hold function		Holds the contents of HR, AR, CNT, and DM areas.	
Memory backup		Non-volatile memory, user program, DM (read only), PLC setup	
		Fixed internal lithium battery (5 years, not replaceable by the user) or capacitor DM (read/write), HR, SR and CNT areas	
Self-diagnostic function		CPU errors, memory errors, communications errors, setting errors, battery errors	
Program check		No END instruction, program errors (regularly checked during operation)	
Connected tools	CX-programmer	After version 2.1	
	Programming console	C200H-PRO27, CQM1-PRO01	
	SSS	PC98 & PC/AT (SYSMAC support software, all version)	
	CX-drive	-	

Note: 1. The DM area, HR area, AR area, and counter values are backed up. If the backup battery or capacitor is discharged, the contents of these areas will be lost and the data values will revert to the defaults.

2. The contents of the program area, read-only DM area (DM6144 to DM6599), and PLC setup (DM 6600 to DM 6655) are stored in flash memory. The contents of these areas will be read from flash memory the next time the power is turned ON, even if the backup battery or capacitor is discharged. When data has been changed in any of these areas, write the new values to flash memory by switching the 3G3MV-P10CDT to MONITOR or RUN mode, or by turning the power OFF and then ON again.

3. Changes made while in MONITOR mode using, for example, online editing, are written to flash memory in real-time.

4. The above figure for power consumption includes the power consumption of the programming console.

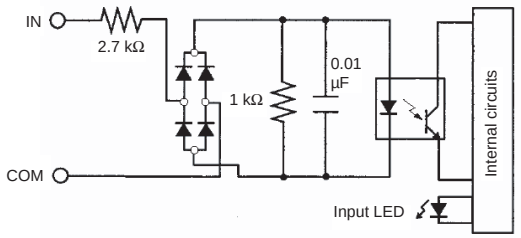
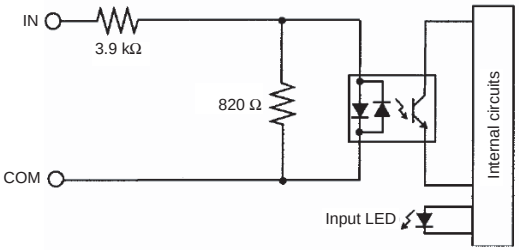
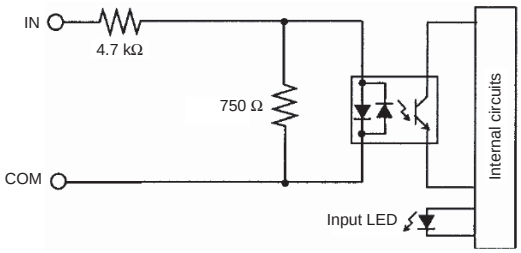
5. This input is shared by the high-speed counter and synchronized pulse control functions.

6. This output is shared by the pulse output and synchronized pulse control functions

I/O specifications

Input specifications

Item	Inputs	Specification
Input voltage	All	24 VDC $^{+10\%}/_{-15\%}$
Input impedance	IN00000 to IN00001	2.7 kΩ
	IN00002 to IN00004	3.9 kΩ
	IN00005	4.7 kΩ
Input current	IN00000 to IN00001	8 mA typical
	IN00002 to IN00004	6 mA typical
	IN00005	5 mA typical
ON voltage/current	IN00000 to IN00001	17 VDC min., 5 mA
	IN00002 to IN00005	14.4 VDC min., 3.5 mA
OFF voltage/current	All	5.0 VDC max., 1.1 mA
ON delay	All	1 to 80 ms max. Default: 10 ms (see note)

Item	Inputs	Specification
OFF delay	All	1 to 80 ms max. default: 10 ms (see note.)
Circuit configuration	IN00000 to IN00001	
	IN00002 to IN00004	
	IN00005	

Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PLC setup.

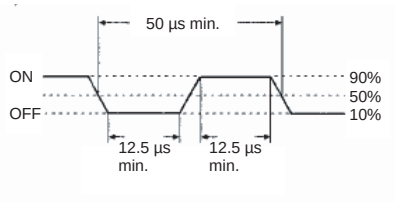
High speed counter inputs

The following unit input bits can be used as high-speed counter inputs. The maximum count frequency is 5 kHz in differential phase mode and 20 kHz in the other modes.

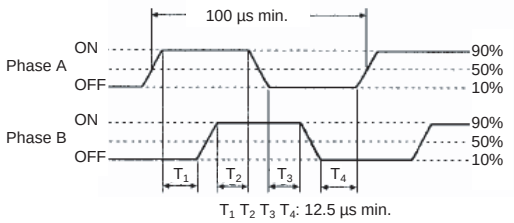
Input	Function			
	Differential phase mode	Pulse plus direction input mode	Up/down input mode	Increment mode
IN00000	A-phase pulse input	Pulse input	Increment pulse input	Increment pulse input
IN00001	B-phase pulse input	Direction input	Decrement pulse input	Normal input
IN00002	Z-phase pulse input or hardware reset input (IN00002 can be used as a normal input when it is not used as a high-speed counter input.)			

The minimum pulse widths for inputs IN00000 (A-phase input) and IN00001 (B-phase input) are as follows:

Pulse plus direction input mode,
Up/down input mode, increment mode

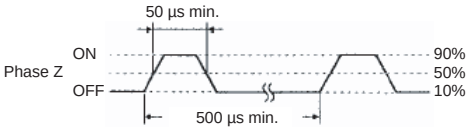


Differential phase mode



T_1 T_2 T_3 T_4: 12.5 µs min.

The minimum pulse width for input IN00002 (Z-phase input) is as follows:



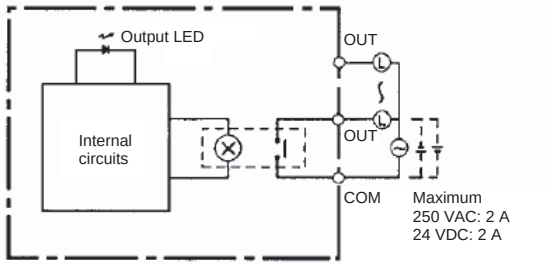
Interrupt inputs

The 3G3MV-P10CDT is equipped with inputs that can be used as interrupt inputs (interrupt input mode or counter mode) and quick-response inputs. The minimum pulse width for these inputs is 50 µs.

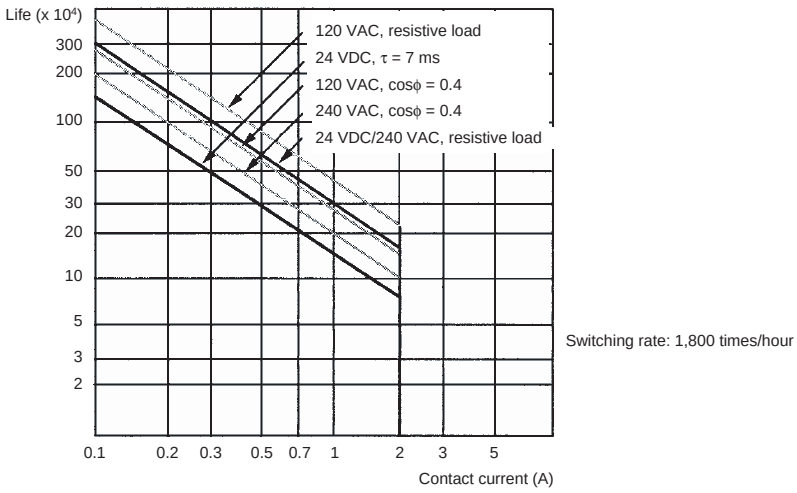
Inputs IN00003 and IN00004 can be used as interrupt inputs.

Output Specification

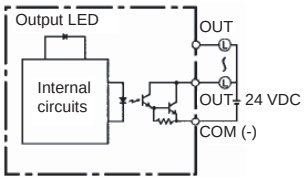
Relay output

Item	Specification
Maximum switching capacity	2 A, 250 VAC (cosφ=1) 2A, 24VDC
Minimum switching load	10 mA, 5 VDC
Service life of relay	Electrical: 150,000 operations (24 VDC resistive load) 100,000 operations (240 VAC inductive load cosφ=0.4) Mechanical: 20,000,000 operations
ON delay	15 ms max.
OFF delay	15 ms max.
Circuit configuration	

Note: The service life of relay output contacts shown in the table assumes the worst conditions. The following graph shows the results of OMRON's service life tests at a switching rate of 1,800 times/hour.



Transistor outputs (sinking/NPN)

Item	Specification
Maximum switching capacity	4.5 to 30 VDC, 0.2 A/ output
Minimum switching capacity	0.5 mA
Maximum inrush current	0.9 A for 10 ms
Leakage current	0.1 mA
Residual voltage	1.5 V max.
ON response time	20 μs max.
OFF response time	40 μs max. for 4.5 to 26.4 VDC, 10 to 100 mA 0.1 ms max for 4.5 to 30 VDC, 10 to 200 mA
Fuse	One fuse per output (cannot be replaced by user)
Circuit configuration	

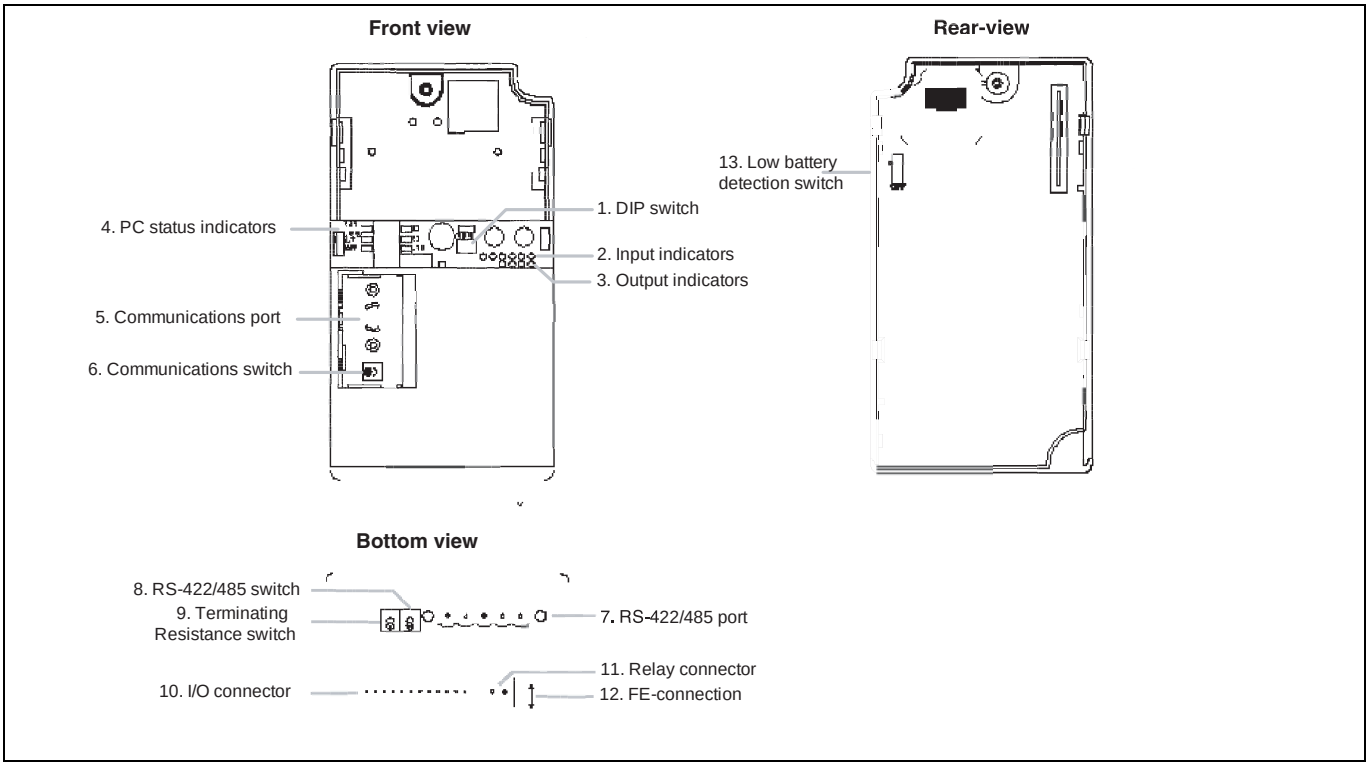
Note: When using OUT01000 or OUT01001 as a pulse output, connect a dummy resistor as required to bring the load current between 0.01 and 0.1 A. If the load current is below 0.1 A, the ON-to-OFF response time will be longer and high-speed pulses (source-type transistor outputs) will not be output. If the load current is above 0.1 A, the transistor will generate more heat and components may be damaged.

⚠ Caution

Do not apply voltage in excess of the maximum switching capacity to an output terminal. It may result in damage to the product or fire

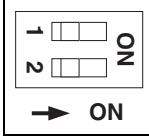
Operation

CPU unit component descriptions



1.DIP switch

• RS-232C and peripheral port settings

	Pin 1	Effective port settings
	OFF (default)	The ports operate according to the settings in the PLC Setup. RS-232C port settings: DM 6645 to DM 6649 Peripheral port settings: DM 6650 to DM 6654
	ON	The ports operate with the standard communications settings.

• Operating mode at startup

Pin 2 determines the operating mode at startup only if there isn't a programming Device connected to the peripheral port.

Programming device connected	Startup mode with pin 2 OFF (default)	Startup mode with pin 2 ON
None	PROGRAM mode	RUN mode
Programming console	Operating mode set on the programming console's mode switch	
Other device	PROGRAM mode	

2. Input indicators (yellow)

The input indicators are lit when the corresponding input terminal is ON. The status of an input indicator will reflect the status of the input even when that input is being used for a high-speed counter.

Note: 1. When interrupt inputs are used in interrupt input mode, the indicator may not light even when the interrupt condition is met if the input is not ON long enough.

2. Input indicators will reflect the status of the corresponding inputs even when the PLC is stopped, but the corresponding input bits will not be refreshed.

3. Output indicators (yellow)

The output indicators are lit when the corresponding output terminal is ON. The indicators are lit during I/O refreshing. The status of an output indicator will also reflect the status of the corresponding output when the output is being used as a pulse output.

4. PLC status indicators

The following indicators show the operating status of the PLC.

Indicator	Status	Meaning
PWR (green)	ON	Power is being supplied to the unit
	OFF	Power isn't being supplied to the unit
RUN (green)	ON	The PLC is operating in RUN or MONITOR mode
	OFF	The PLC is in PROGRAM mode or a fatal error has occurred.
ERR/ALM (red)	ON	A fatal error has occurred. (PLC operation stops.)
	Flashing	A non-fatal error has occurred. (PLC operation continues.)
	OFF	Indicates normal operation.
COMM1 (yellow)	Flashing	Data is being transferred via the peripheral or RS-422/485 port.
	OFF	Data isn't being transferred via communications port.
COMM2 (yellow)	Flashing	Data is being transferred via the RS-232C port
	OFF	Data isn't being transferred via communications port.

5. Communications port

Connects the PLC to a programming device (including programming consoles), host computer, or standard external device. Use a proper connecting cable (CPM2C-CN111, CS1W-CN114, CS1W-CN118, or CS1W-CN226).

Note: 1. A CQM1H-PRO01-E programming console can be connected directly to the PLC.

2. A C200H-PRO27-E programming console can be connected directly to the PLC with a CS1W-CN224/CN624 connecting cable.

3. Use a CPM2C-CN111 or CS1W-CN114 connecting cable to connect to the communications port as a peripheral port. The communications port can be used simultaneously as both a peripheral port and RS-232C port by using the CPM2C-CN111 connecting cable.

4. Use a CPM2C-CN111, CS1W-CN118 or CS1W-CN226 connecting cable to connect to the communications port as a RS-232C port. The communications port can be used simultaneously as both a peripheral port and RS-232C port by using the CPM2C-CN111 connecting cable

Note: The peripheral port and RS-422/485 port cannot be used simultaneously. When using the peripheral port disconnect any devices connected to the RS-422/485 port.

6. Communications switch

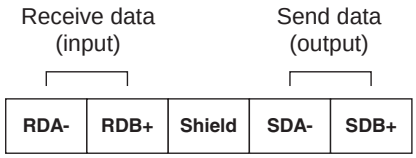
Switch to select port 1 type of connected device

Position	Communication Port 1
OFF (default)	Programming console
ON	RS-422/485 communication

7. RS-422/485 port (3G3MV-P10CDT3-E only)

Used to connect to host computers, or standard external devices.

Terminal arrangement



Connector: Phoenix MSTB 2.5/5-STF-5.08AU

Note: The maximum line length is 500 m.

Note: The peripheral port and RS-422/485 port cannot be used simultaneously. When using the peripheral port disconnect any devices connected to the RS-422/485 port.

8. RS-422/485 switch (3G3MV-P10CDT3-E only)

Switch to select 4-wire (RS-422) or 2-wire (RS-485) communication

Position	Status
OFF (down) (default)	4-wire communications
ON (up)	2-wire communications

9. Terminating resistance switch (3G3MV-P10CDT3-E only)

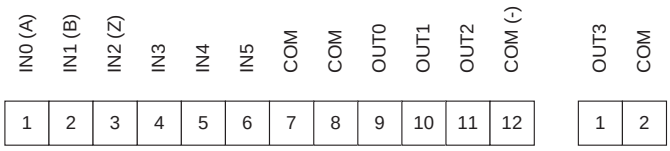
Position	Termination
OFF (down) (default)	Disabled
ON (up)	Enabled

Set this switch to ON only for double-ended connection to a host link network.

10. I/O connector

Connects the CPU unit to external input and output devices.

Sinking/NPN outputs



Connector: WAGO 733-112 (wire cross section 0.08 to 0.50 mm^2)

11. Relay connector

Connects the CPU unit to an external output device.

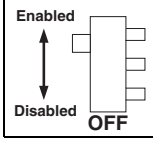
Connector: WAGO 734-102 (wire cross section 0.08 to 1.50 mm2)

12. FE-connection

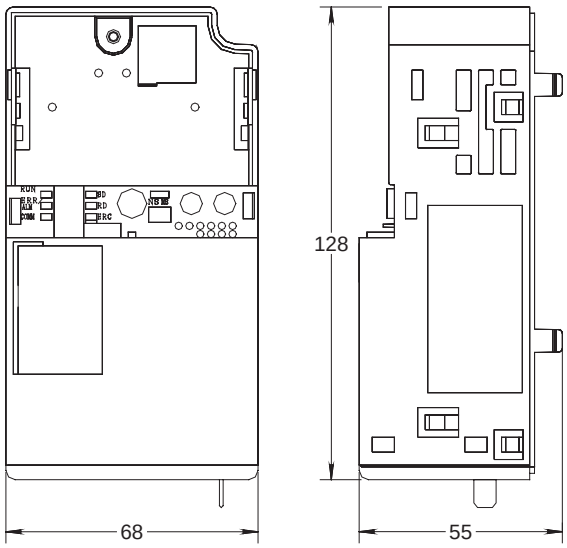
AMP tab to connect functional earth. Internally connected to pin 3 of the RS-422/485 connector and to the shell of the peripheral connector.

13. Low battery detection switch (3G3MV-P10CDT3-E only)

This switch enables or disables the detection of a low-battery error.

	Position	Low-battery detection
	ON (up) (default)	Error detection enabled
	OFF (down)	Error detection disabled

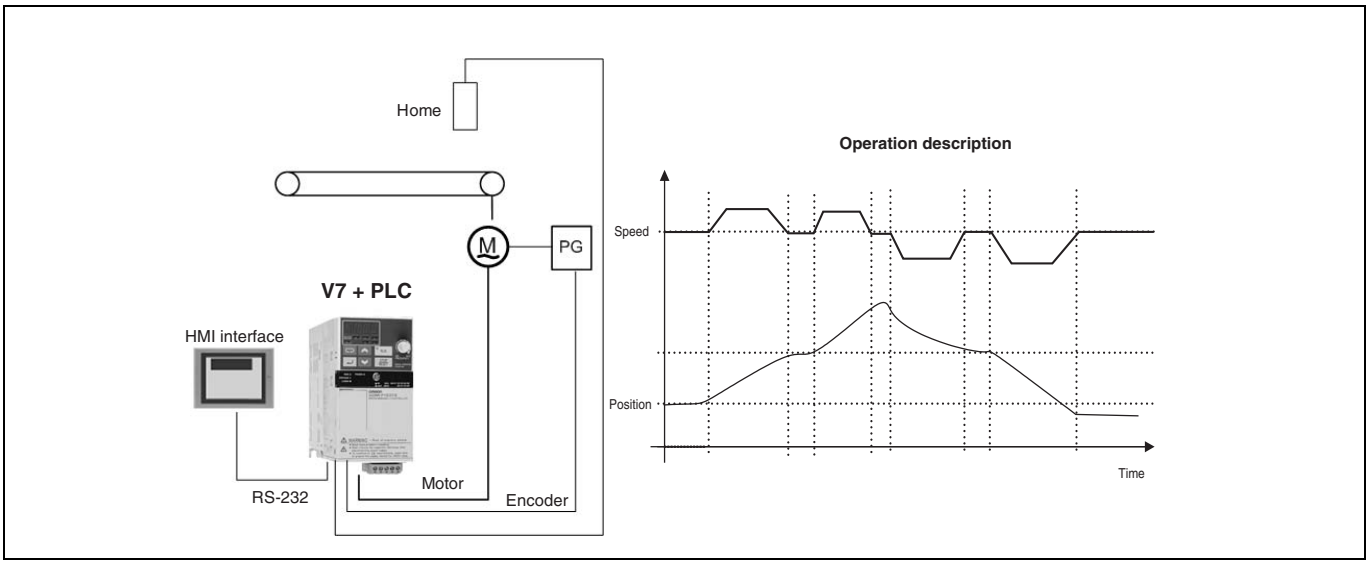
Dimensions



Applications examples

V7 + PLC in positioning application

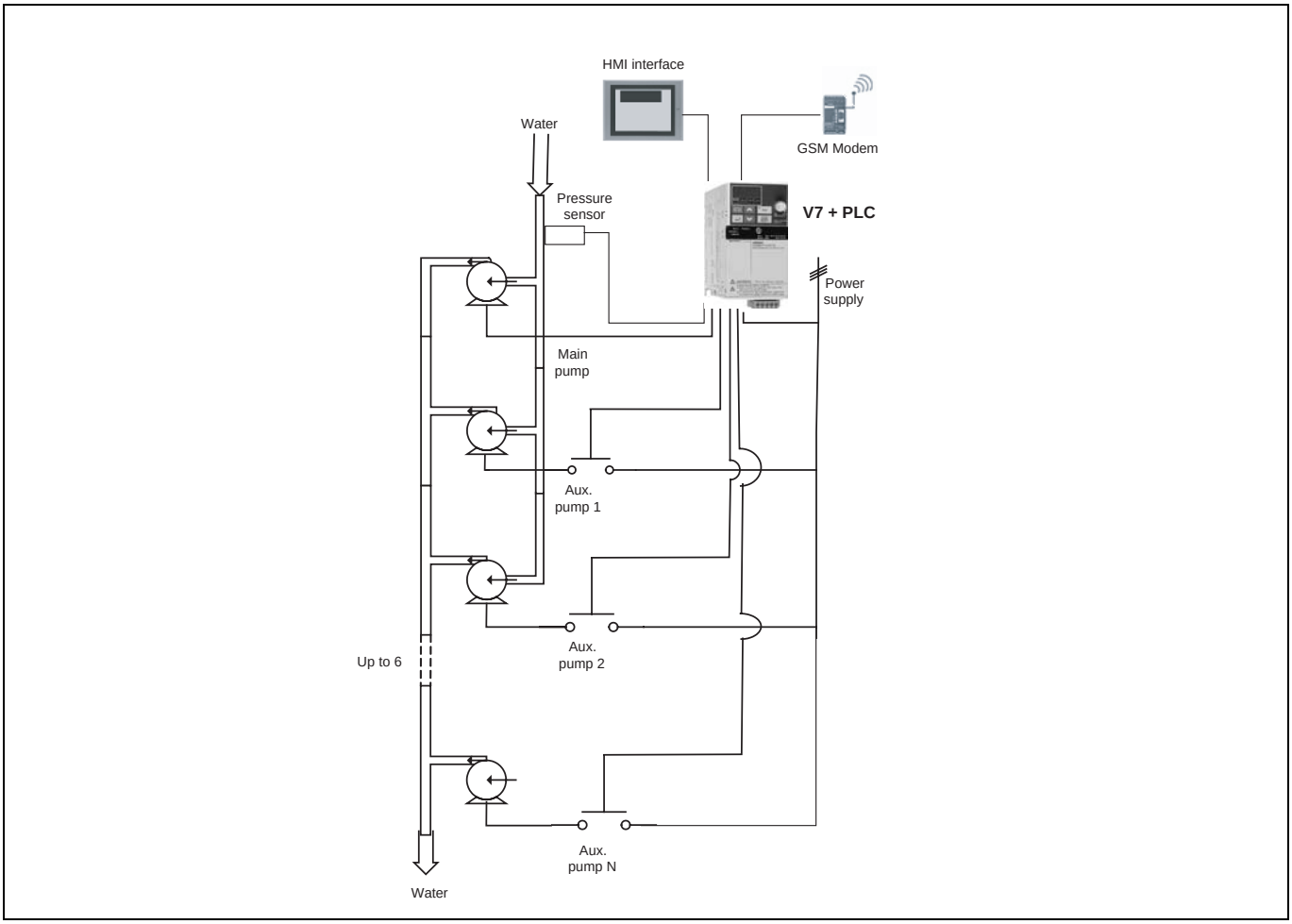
point-to-point applications are posible adding the PLC to the V7, including the possibility to add position and speed tables or even use recipes that could be select using a HMI



Note: For detailed information about the inverter, please refer to Varispeed V7 section.

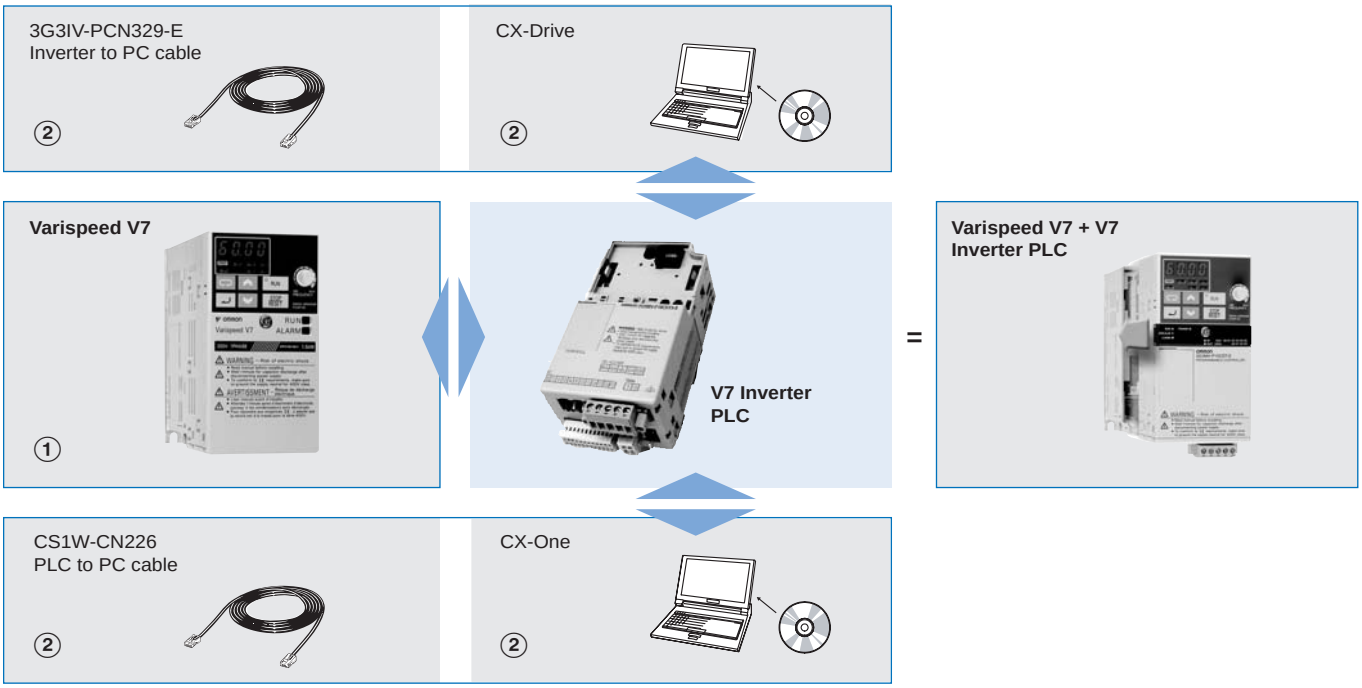
V7 + PLC with pump

Using the PLC, it is possible to control a modulated plus several auxiliar pumps according your own parameters and system demand. It is also possible to add a GSM modem to advice about any problem**.**



Note: For detailed information about the inverter, please see into the Varispeed V7 section.

Ordering information



V7 inverter PLC

Specifications				Model
Inputs	Outputs	RS422 port	RTC	
6	4	No	No	3G3MV-P10CDT-E
6	4	Yes	Yes	3G3MV-P10CDT3-E

① Varispeed

Specifications	Model
Sensorless vector control inverter	Varispeed V7

Note: For detailed information, please refer to Varispeed V7 series section.

② Cables

Specifications	Model
Computer connecting cable	CS1W-CN226
Programmable console cable	CS1W-CN224

② Software

Specifications	Model
PLC programming software: CX-programmer	CX-One
Inverter configurator software: CX-drive	

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I24E-EN-02

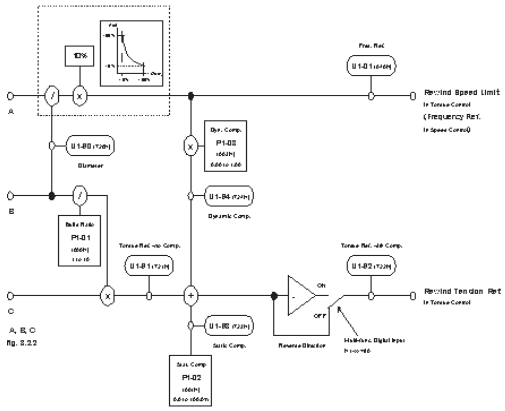
In the interest of product improvement, specifications are subject to change without notice.

The inventer made for you. Inverter application software.

CASE software

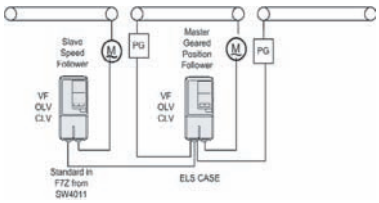
Customised software to meet your specific application requirements.

- The customised application software gives to a standard inverter the features of a dedicated solution.
- The CASE software is a special software file that can be downloaded to the standard inverter to provide additional functionality.
- Specific parameters, monitors and alarms can be added with application units.
- Logic functions can be added.
- I/O´s settings can be set for special functionality.
- CASE software is uploaded in the inverter at the factory.
- More than 30 CASE software versions already available.
- For detailed information, please contact your standard OMRON supplier.

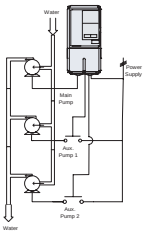


System configuration

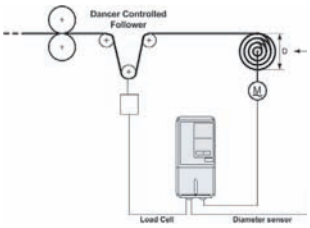
ELS software S-8161



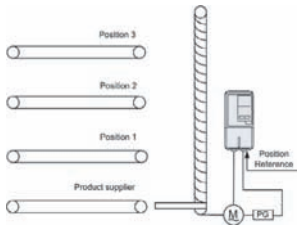
Pump sequencer software S-8801



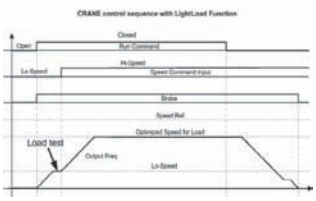
Winder software S-8180



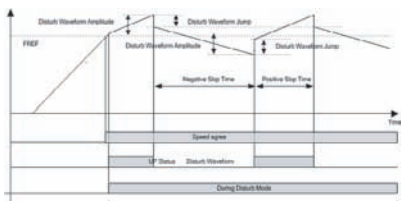
Point to point software S-8795



Crane software S-7071



Traverse software S-9381





Varispeed G7



Varispeed F7



Varispeed E7



Varispeed V7

Specifications

Type designation

CIMR – F7 Z 4 0P4 0 - Sxxxx

- Inverter
- F7 series / G7 series / E7 series / V7 series
- Specifications
  - Z: European standard specifications
  - AZ: V7 series European standard specifications
- Voltage
  - B: Single-phase 200V class
  - 2: Three-phase 200 V class
  - 4: Three-phase 400 V class
- Max. applicable motor output
  - 0P1: 0.1 kW
  - ≀
  - 022: 22 kW
  - ≀
  - 300: 300 kW
  - ["P" indicates a decimal point]
- Protective enclosure
  - 0 : Open chassis type (IP00) / V7 series IP20
  - 1 : Enclosed type (IP20 / NEMA1) / V7 series NEMA1
  - 2 : Enclosed type (E7 IP54)
  - 05: Enclosed type (V7 IP65)
- CASE software number

CASE software

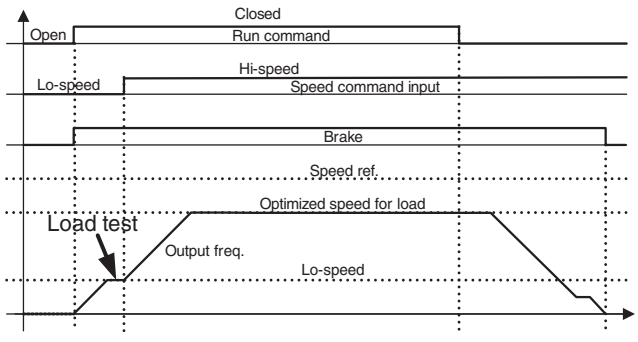
Compatible inverter	CASE software	Description	Application
Varispeed F7Z	S7071	Dedicated software for crane applications	Cranes
	S8161	Dedicated software for position and speed follower applications	Sinchronized movements
	S8180	Dedicated software for rewinding and unwinding applications	Rewinding & unwinding
	S8795	Dedicated software for point-to-point position applications	Point-to-point movements applications
Varispeed E7Z	S8801	Dedicated software for pump squencer applications	Water supply, building HVAC.
Varispeed V7AZ	S9381	Dedicated software for textile wire winding applications.	Textile winding

CRANE software - S7071

- Dedicated software for crane applications.
- Provides specific safety functionality.
- Dedicated brake sequence ensures no load movement.
- Smooth operation thanks to jerk control capabilities.
- Flexible over-load/over-torque detection levels.
- Load holding operation using “zero servo” function (closed loop vector)
- End of travel limit function for increased safety.
- High motor torque and speed accuracy even at low speed.
- Swift lift function optimizes vertical lifting speed to suit the load.
- Compatible inverters: F7 series

Operation description in crane software

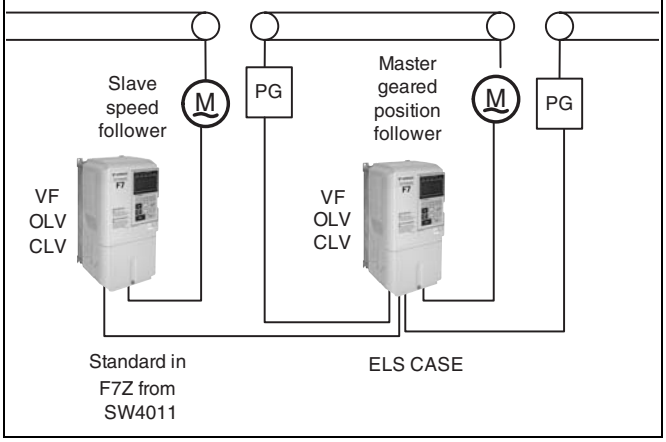
Crane control sequence with light load function



ELS - electronic line shaft software - S8161

- Dedicated software for position & speed follower applications.
- This functionality allows a slave drive to precisely follow a master encoder.
- The follower drive can match its position (phase angle) to the master.
- The speed or position ratio between the master and the follower is infinitely adjustable
- This function is used when the machine being driven requires two mechanically isolated and motor-driven mechanisms to maintain a constant position relationship.
- A gear ratio adjustment can be added to the speed reference via parameter, analogue input, or serial communication.
- Both the master and slave encoder signals are fed into the follower drive´s dual encoder option card. (PG-Z2)
- Position offset advance/retard by digital/parameter or communications.
- Compatible inverters: F7 series

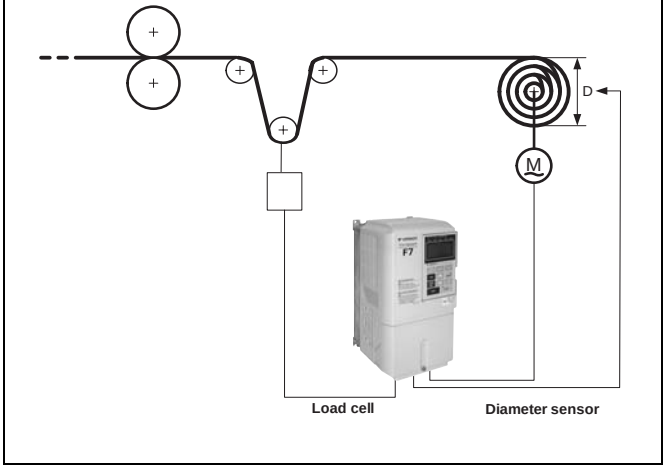
Example of ELS software application



Winder software - S8180

- Dedicated software for rewinding and unwinding applications.
- The software provides a specific calculation of the torque reference and speed limit in torque control for rewinder inverter drives.
- In diameter compensation (with or without external sensor) the rewind drive speed (frequency reference) is changed in relation to incoming web speed , diameter and tension to give the same linear speed as the diameter builds.
- The rewind torque is controlled to give constant tension control, the required tension being set from a potentiometer (analogue input) or from MEMOBUS communication.
- Direct PID based tension control is also available (dancer arm, load cell, etc...)
- Rewind and rewind modes.
- Inertia compensation function as well as static and dynamic friction compensation
- Compatible inverters: F7 series

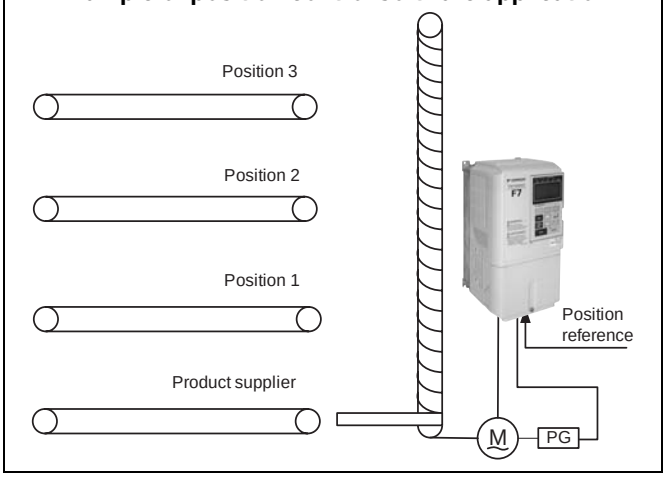
Example of winder software application



Point-to-point position control software - S8795

- Dedicated software for point-to-point position applications.
- Absolute or relative positioning.
- Homing functionality; sensor.
- On the fly position referencing
- 8 position memories with different speed, acceleration or deceleration sets.
- Selectable position reference from digital inputs, analog input or via comunications.
- Brake control.
- Emergency stop sequence
- Overtravel limit switches
- Easy to use.
- Compatible inverters: F7 series

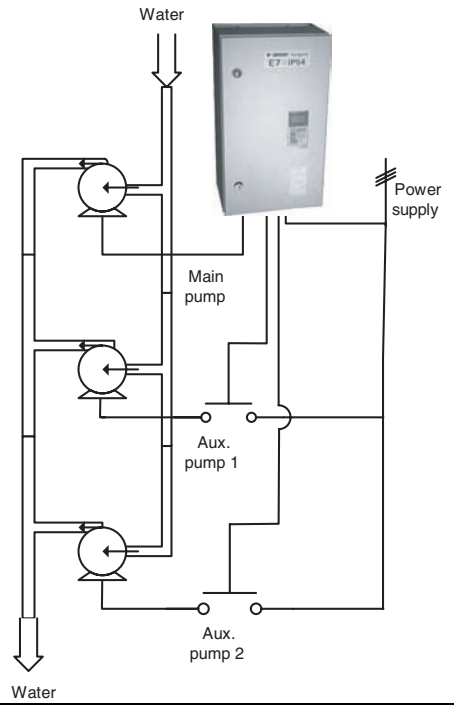
Example of position control software application



Pump sequencer software

- Dedicated software for pump sequencer applications.
- Physical units = Kg / L, bar, liter.
- Control mode selection by macro: pressure, flow, temperature,...
- Modulated pump with advanced PID.
- Auxiliary pump control for up to 2 pumps.
- Pressure feedback signal: 0-10 V, 0-20 mA, 4-20 mA or inverter sensor.
- Modulated pump automatic frequency drop & rise.
- Specific faults and alarms: dry run detection, pressure sensor broken...
- Pump working totalisers.
- Automatic / manual emergency mode operation by pump override.
- Test operation.
- Compatible inverters: E7 series

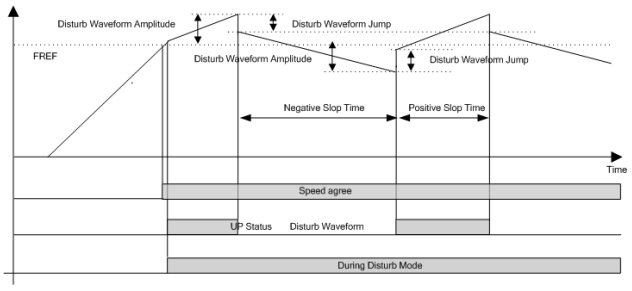
Example of pump sequencer software application



Traverse software

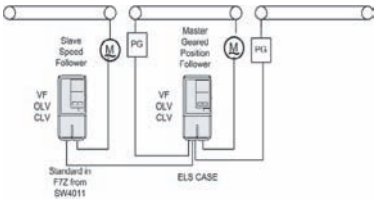
- Dedicated software for textile wire winding applications.
- Disturbed wave form allows perfect wire positioning during winding process, ensuring perfect and smooth unwinding.
- Amplitude and time periods are fully customizable
- Compatible inverters: V7AZ series.

Operation description in traverse software

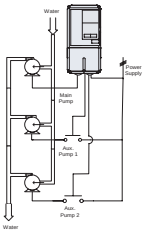


Ordering information

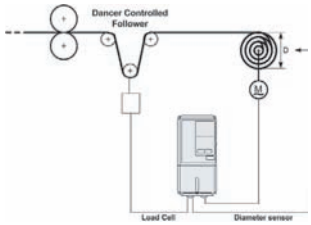
ELS software S-8161

① 

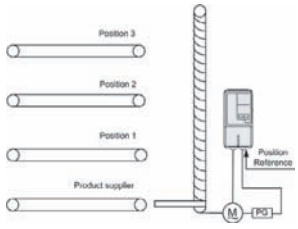
Pump sequencer software S-8801

① 

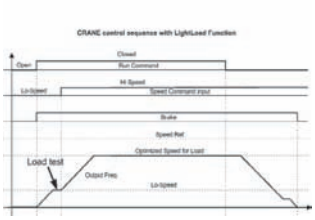
Winder software S-8180

① 

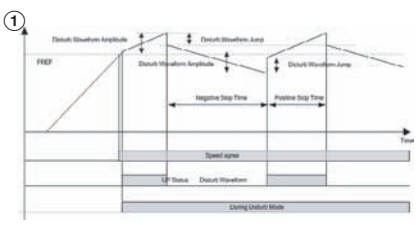
Point to point software S-8795

① 

Crane software S-7071

① 

Traverse software S-9381

① 

② 
Varispeed G7


Varispeed F7


Varispeed E7


Varispeed V7

Note: The symbols ①② show the recommended sequence to build the item name with CASE software.

① CASE software

Type	CASE software	Description	Application
CIMR-F7Zxxxxx-S	7071	Dedicated software for crane applications	Cranes
	8161	Dedicated software for position and speed follower applications	Sinchronized movements
	8180	Dedicated software for rewinding and unwinding applications	Rewinding & unwinding
	8795	Dedicated software for point-to-point positions applications	Point-to-point movements applications
	7061	Dedicated software for 1.000 Hz output frequency	High speed
	8091	Dedicated software for position deceleration	Positioning at stopping.
	8600	Dedicated softeware for local / remote smooth changover	Local / remote control
CIMR-E7Zxxxxx-S	8801	Dedicated software for pump squencer applications	Water supply, building HVAC.
	8810	Dedicated software for dynamic current limitation	Industrial pumping
CIMR-V7AZxxxxx-S	9381	Dedicated software for textile wire winding applications	Textile winding
	5167	Dedicated software for kinetic energy backup	Control under power loss conditions
	9640	Dedicated software for dynamic PID change	Variable load
	9646	Dedicated software for modification on main frequency from F.R.	Fine speed adjustments
	9662	Dedicated software for valve cleaner sequences for filters units	Valves
	9666	Dedicated software for ceramics customized functionality	Ceramics
	9676	Dedicated software for textile customiszed functionality	Textile
	9683	Dedicated software for textile customized functionality	Textile

Note:

1. For other CASE sofware examples and ordering information, please contact your standard OMRON Yaskawa supplier.
2. To request a new CASE software customized to meet application specific functionality, please contact your standard OMROM YASKAWA supplier.

② Varispeed

Specifications	Model
3-level control method inverter	Varispeed G7
Flux vector control inverter	Varispeed F7
Lift inverter	Varispeed L7
Pump and fan inverter	Varispeed E7
Sensorless vector control inverter	Varispeed V7

Note: For detailed information, please refer to Varispeed G7/F7/L7/E7/v7 series section.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. I44E-EN-01

In the interest of product improvement, specifications are subject to change without notice.

Technical information

Mechatronics formulae

Linear movement

Symbol	Description	Units
s	Space	m
v	Velocity	m/s
a	Acceleration	m/s²
F	Force	N
P	Power	W
W	Energy	J
t	Time	s
μ	Friction coefficient	--
g	Gravity acceleration	m/s²
m	Mass	Kg

Speed (m/s)

$$v = \frac{\partial s}{\partial t}$$

Acceleration (m/s²)

$$a = \frac{\partial v}{\partial t}$$

Acceleration force (N)

$$F_a = m \cdot a$$

Force friction (N)

$$F_\mu = \mu \cdot m \cdot g \cdot \cos\beta$$

Force gravity (N)

$$F_g = m \cdot g \cdot \sin\beta$$



Force root means square (N)

$$F_{rms} = \sqrt{\frac{\sum_i t_i \cdot F_i^2}{\sum_i t_i}}$$

Power (W)

$$P = F \cdot v$$

Cynetic energy

$$W = \frac{1}{2} \cdot m \cdot v^2$$

Rotary movement

Symbol	Description	Units
Φ	Angle	rad
ω	Angular velocity	rad/s
α	Angular acceleration	rad/s²
T	Torque	Nm
P	Power	W
W	Energy	J
t	Time	s
i	Gear reduction	--
r	Radius	m
J	Inertia	Kgm²

Speed (rad/s)

$$\omega = \frac{\partial \phi}{\partial t}$$

Acceleration (rad/s²)

$$\alpha = \frac{\partial \omega}{\partial t}$$

Acceleration torque (Nm)

$$T_\alpha = J \cdot \alpha$$

Torque root means square (Nm)

$$T_{rms} = \sqrt{\frac{\sum_i t_i \cdot T_i^2}{\sum_i t_i}}$$

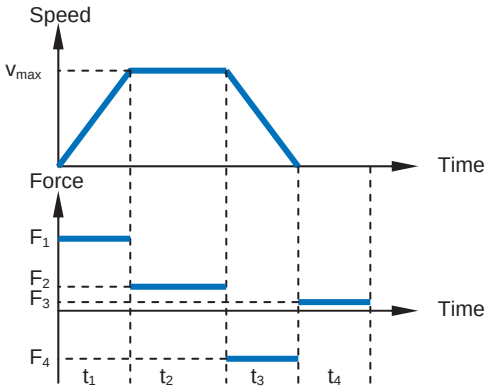
Power (W)

$$P = T \cdot \omega$$

Cynetic energy

$$W = \frac{1}{2} \cdot J \cdot \omega^2$$

Example in case of trapezoidal profile (linear):



1. Acceleration

$$a = \frac{v_{max}}{t_1}$$

$$s_1 = \frac{1}{2} \cdot v_{max} \cdot t_1$$

$$F_a = m \cdot a$$

$$F_{1_Total} = F_a + F_\mu + F_{ext}$$

2. Constant speed

$$a = 0$$

$$s_2 = v_{max} \cdot t_2$$

$$F_{2_Total} = F_\mu + F_{ext}$$

3. Deceleration

$$d = \frac{v_{max}}{t_3}$$

$$s_3 = \frac{1}{2} \cdot v_{max} \cdot t_3$$

$$F_d = m \cdot d$$

$$F_{3_Total} = F_\mu + F_{ext} - F_d$$

4. Dwell

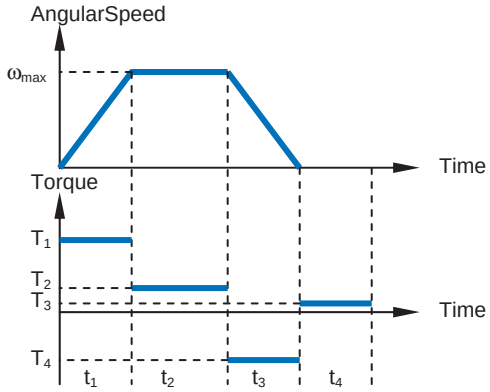
$$s_4 = 0$$

$$F_{4_Total} = F_{ext}$$

Force rms:

$$F_{rms} = \sqrt{\frac{t_1 \cdot F_1^2 + t_2 \cdot F_2^2 + t_3 \cdot F_3^2 + t_4 \cdot F_4^2}{t_1 + t_2 + t_3 + t_4}}$$

Example in case of trapezoidal profile (rotary):



1. Angular acceleration

$$\alpha = \frac{\omega_{max}}{t_1}$$

$$\phi_1 = \frac{1}{2} \cdot \omega_{max} \cdot t_1$$

$$T_\alpha = J \cdot \alpha$$

$$T_{1_Total} = T_\alpha + T_\mu + T_{ext}$$

2. Constant speed

$$\alpha = 0$$

$$\phi_2 = \omega_{max} \cdot t_2$$

$$T_{2_Total} = T_\mu + T3_{ext}$$

3. Deceleration

$$\gamma = \frac{\omega_{max}}{t_3}$$

$$\phi_3 = \frac{1}{2} \cdot \omega_{max} \cdot t_3$$

$$T_\gamma = J \cdot \gamma$$

$$T_{3_Total} = T_\mu + T_{ext} - T_d$$

4. Dwell

$$\phi_4 = 0$$

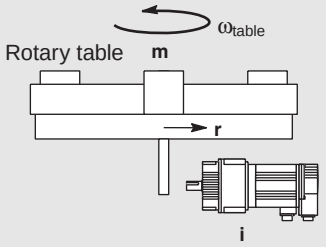
$$T_{4_Total} = T_{ext}$$

Torque rms:

$$T_{rms} = \sqrt{\frac{t_1 \cdot T_1^2 + t_2 \cdot T_2^2 + t_3 \cdot T_3^2 + t_4 \cdot FT_4^2}{t_1 + t_2 + t_3 + t_4}}$$

For linear motors you have just to apply the formulae for linear motors considering the mass of the load plus the mass of the motor. For rotary motors it is necessary to apply some cinematic transformations to have the magnitudes **from the motor side**.

Case of rotary table:

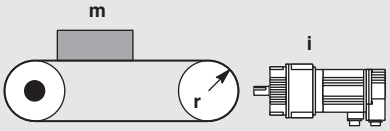


$$J_{total} = J_{motor} + \frac{\frac{1}{2} \cdot m \cdot r^2}{i^2}$$

$$\omega_{motor} = \omega_{table} \cdot i$$

$$T_{motor_side} = J_{total} \cdot \alpha_{motor_side}$$

Case of a belt drive with two pulleys:



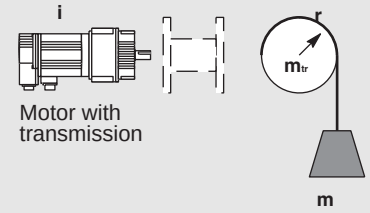
$$J_{total} = J_{motor} + \frac{2 \cdot J_{pulley} + J_{load}}{i^2}$$

$$J_{total} = J_{motor} + \frac{2 \cdot \frac{1}{2} \cdot m_{pulley} \cdot r^2 + m_{load} \cdot r^2}{i^2}$$

$$\alpha_{motor_side} = a \cdot \frac{2\pi}{r} \cdot i$$

$$T_{motor_side} = J_{total} \cdot \alpha_{motor_side} + \frac{m \cdot \mu \cdot g \cdot r}{i}$$

Case of an hanging load:



$$J_{total} = J_{motor} + \frac{2 \cdot J_{reel} + J_{load}}{i^2}$$

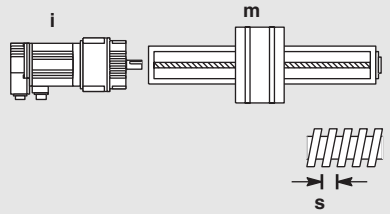
$$J_{total} = J_{motor} + \frac{\frac{1}{2} \cdot m_{reel} \cdot r^2 + m_{load} \cdot r^2}{i^2}$$

$$\alpha_{motor_side} = a \cdot \frac{2\pi}{r} \cdot i$$

$$T_{motor_side} = J_{total} \cdot \alpha_{motor_side} \pm \frac{m \cdot g \cdot r}{i}$$

Note: The sign (±) depends on the direction of the movement

Case of a ballscrew:



$$J_{total} = J_{motor} + \frac{\left(\frac{s}{2\pi}\right)^2 \cdot m + \frac{1}{2} \cdot m_{screw} \cdot r_{screw}^2}{i^2}$$

$$\alpha_{motor_side} = a \cdot \frac{2\pi}{s} \cdot i$$

$$T_{motor_side} = J_{total} \cdot \alpha_{motor_side} + \frac{m \cdot \mu \cdot g \cdot \frac{s}{2\pi}}{i}$$

Motor selection

Linear motor

The selected linear motor must match the next conditions.

$$v_{max_motor} > v_{max_application}$$

$$F_{max_motor} > \frac{F_{peak_application}}{\eta}$$

$$F_{rated_motor} > \frac{F_{rms}}{\eta}$$

Where: η=Mechanical efficiency

Note 1: To calculate $F_{peak_application}$ and F_{rms} it is necessary to consider the motor mass. This may deal to do some iteration to get the right motor.

2: At high speed the motor reduces its rated and maximum force. This may be taken into consideration for high speed application.

3: For linear motors it is important to calculate the surface temperature of the motor in addition to the above calculation.

Rotary motor

The selected linear motor must match the next conditions:

$$\omega_{max_motor} > \omega_{max_application}$$

$$T_{max_motor} > \frac{T_{peak_application}}{\eta}$$

$$T_{rated_motor} > \frac{T_{rms}}{\eta}$$

Where: η=Mechanical efficiency

Note 1: To calculate $T_{peak_application}$ and T_{rms} it is necessary to consider the motor inertia. This may deal to do some iteration to get the right motor.

2: Above rated speed the motor reduces its rated and maximum torque. This may be taken into consideration for high speed application. Refer to the Speed-Torque curves of the motor for details.

Technical documentation



	Product	Title	Model code
Multi-axes motion controllers	Trajexia Motion controller	Datasheet	I53E-EN
	Trajexia Motion controller	Quick start guide	I50E-EN
	Trajexia Motion controller	Hardware manual	I51E-EN
	Trajexia Motion controller	Programming manual	I52E-EN
	CJ1W-MCH71 motion control unit	Datasheet	I33E-EN
	CJ1W-MCH71 motion control unit	Operation manual	W435-E1
	CS1W-MCH71 motion control unit	Datasheet	I08E-EN
	CS1W-MCH71 motion control unit	Operation manual	W419-E1
	CJ1W-NCF71 position control unit	Datasheet	I09E-EN
	CJ1W-NCF71 position control unit	Operation manual	W426-E1
	CS1W-NCF71 position control unit	Datasheet	I10E-EN
	CS1W-NCF71 position control unit	Operation manual	W426-E1
	MP2200 Machine Controller	Datasheet	I36E-EN
	MP2200 Machine Controller & option I/O modules	User's manual	SIEPC88070014
	MP2300 Machine Controller	Datasheet	I34E-EN
	MP2300 Machine Controller & M-II, I/O option modules	User's manual	SIEPC88070003
	MP2200/MP2300 for SVA-01 & SVB-01	User's manual	SIEPC88070016
	MP2200/MP2300 for communication modules	User's manual	SIEPC88070004B
	MP2100 Machine Controller	Datasheet	I35E-EN
	MP2100(M) Machine Controller	User's manual	SIEPC88070001
	MP2100(M) API manual	User's manual	SIEPC88070022
	MP2000 Series, MECHATROLINK I/Os	User's manual	SIE-C887-5.1
	MP2000 Series, MPE720 Software operation	User's manual	SIEP C88070005
	MP2000 Series, Motion editor programming	User's manual	SIEZ-C887-1.3
	MP2000 Series, Ladder editor programming	User's manual	SIEZ-C887-13.1
	MP2000 Series, Ladder editor	User's manual	SIEZ-C887-13.2
	C200HW-MC402-E motion control unit	Datasheet	I07E-EN
	C200HW-MC402-E motion control unit	Operation manual	W903-E2
	CS1W-MC421/221 motion control units	Datasheet	I06E-EN
	CS1W-MC421/221 motion control units	Operation manual	W359-E1
	CJ1W-NCs position control units	Datasheet	I04E-EN
	CJ1W-NCs position control units	Operation manual	W397-E1
	CS1W-NCs position control units	Datasheet	I05E-EN
	CS1W-NCs position control units	Operation manual	W376-E1
Single-axis motion controllers	JUSP-NS300 DeviceNet unit	Datasheet	I11E-EN
	JUSP-NS300 DeviceNet unit	User's manual	SIE-C718-6
	JUSP-NS500 PROFIBUS-DP unit	Datasheet	I12E-EN
	JUSP-NS500 PROFIBUS-DP unit	User's manual	SIE-C718-8
	JUSP-NS600 indexer unit	Datasheet	I13E-EN
	JUSP-NS600 indexer unit	User's manual	SIE-C718-9
	R88A-MCW151-(DRT)-E motion control unit	Datasheet	I14E-EN
	R88A-MCW151-(DRT)-E motion control unit	Operation manual	I209-E2
Servo systems	XtraDrive	Datasheet	I18E-EN-02
	XtraDrive	User's manual	8U0108
	XtraDrive built-in PROFIBUS	User's manual	8U0112
	Sigma-II servo drive	Datasheet	I48E-EN
	Sigma-II rotary motors	Datasheet	I47E-EN
	Sigma-II series up to 15kW	User's manual	SIEPS80000005-__-OY
	Sigma-II large capacity	User's manual	SIE-S800-32.4
	SmartStep servo drive	Datasheet	I46E-EN
	SmartStep rotary motors	Datasheet	I45E-EN
	SmartStep series	User's manual	I533-E1
	SmartStep series	Operation manual	I534-E1
	Direct drive rotary motors	Datasheet	I41E-EN
	Direct drive rotary motors	User's manual	SIEPS80000005
	Sigma Linear Servo Motors	Datasheet	I17E-EN
	Sigma linear motors	User's manual	SIEPS80000019
	Sigma Linear Axis	Datasheet	I42E-EN
	Sigma Linear Micro trac	Datasheet	I40E-EN



	Product	Title	Model code
Frequency inverters	Varispeed G7	Datasheet	I37E-EN
	Varispeed G7	User's manual	TOE-S616-60.2B
	Varispeed F7	Datasheet	I23E-EN
	Varispeed F7	Quick Start Guide	I66E-EN
	Varispeed F7	User's manual	TOE-S616-55.1-__-OY
	Varispeed L7	Datasheet	I22E-EN
	Varispeed L7	Quick Start Guide	I62E-EN
	Varispeed L7	User's manual	TOEPC71067605-__-OY
	Varispeed E7	Datasheet	I21E-EN
	Varispeed E7	Quick Start Guide	I64E-EN
	Varispeed E7 IP54	Quick Start Guide	I65E-EN
	Varispeed E7	User's manual	TOE-S616-56.1-__-OY
	Varispeed V7	Datasheet	I20E-EN
	VARISPEED V7	Quick Start Guide	I43E-EN
	VARISPEED V7	User Manual	TOEPC71060605-__-OY
	Varispeed V7 IP65	Quick Start Guide	I60E-EN
	Varispeed V7 IP65	User Manual	I61E-EN
	Varispeed J7	Datasheet	I19E-EN
	Varispeed J7	User Manual	I63E-EN
	VS mini J7 (CIMR-J7AZ)	Quick Start Guide	I39E-EN
	F7/L7/E7 inverter PLC	Datasheet	I25E-EN
	F7/L7/E7 inverter PLC	User's manual	I03E-EN
	3G3MV inverter PLC	Datasheet	I24E-EN
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