# 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.

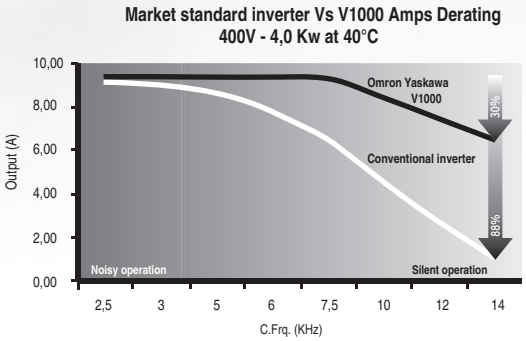
Anders Gullberg, Manager of the Electrical Department at AKAB, says that they choose OMRON-Yaskawa products because "we export 98% of our product, so machine failure is simply not allowed."

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!"

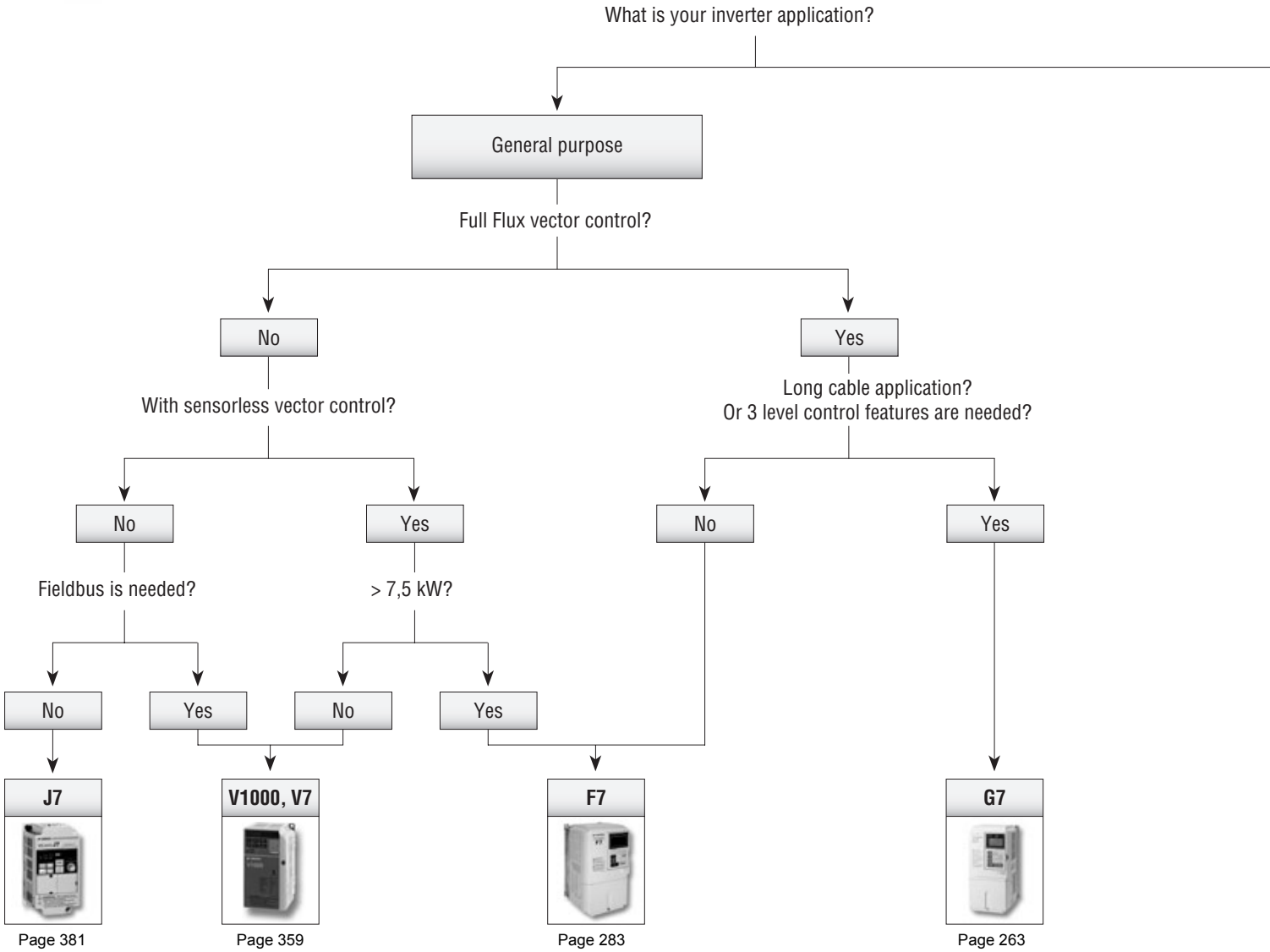
**So what's the secret?**
Yaskawa has developed a unique algorithm that perfectly balances the carrier frequency and the output current of the inverter. This not only allows but guarantees high current output at silent operation.

Figure 1 depicts the typical curve behaviour of a 4.0 kW V1000 inverter against a conventional inverter in the market. Note that in near-silent mode operation, the V1000 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 V1000 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

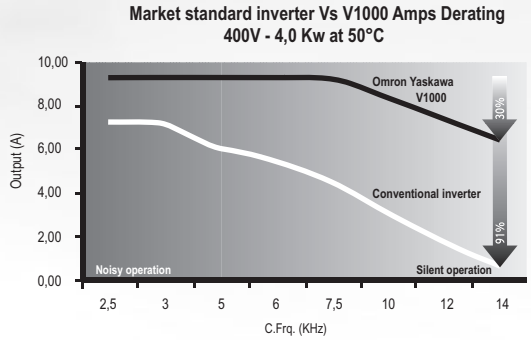



Note: Dark grey means highest acoustic noise.



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 V1000 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 V1000 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!

# Table of contents





Pumps & fans

Lift application

E7

Page 323

L7

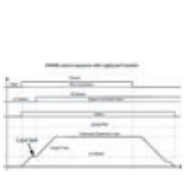
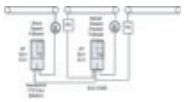
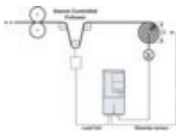
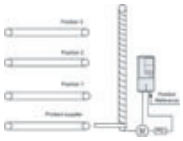
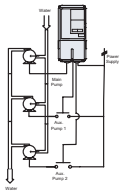
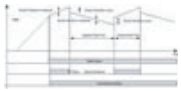
Page 303

# Selection table

| Model | G7 | F7 | L7 | E7 |
|---|---|---|---|---|
| |  |  |  |  |
| **Type** | **World's first three level inverter architecture** | **The industrial workhorse** | **Made to drive lifts** | **Drive your energy cost down** |
| **400 V three-phase**<br>**200 V three-phase**<br>**200 V single-phase** | **0.4 kW to 300 kW**<br>**0.4 kW to 110 kW**<br>**N/A** | **0.4 kW to 300 kW**<br>**0.4 kW to 110 kW**<br>**N/A** | **4.0 kW to 55 kW**<br>**3.7 kW to 55 kW**<br>**N/A** | **0.4 kW to 300 kW**<br>**0.4 kW to 110 kW**<br>**N/A** |
| **Application** | High performance, long cable lines | General and high-end applications | Lift control with asynchronous or synchronous motors | Pumps and fans (variable torque) |
| **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. | V/F control |
| **Torque features** | 150% at 0.0 Hz (CLV)<br>150% at 0.3 Hz (OLV) | 150% at zero speed (CLV)<br>150% at 0.5 Hz (OLV) | 150% at zero speed (CLV)<br>150% at 0.5 Hz (OLV) | 120% at 0.5 Hz |
| **Connectivity** | Memobus<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>LONWorks<br>Ethernet | Memobus<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>LONWorks<br>Ethernet<br>MECHATROLINK-II | Memobus<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>LONWorks<br>Ethernet | Memobus<br>Metasys N2<br>L&S Apogee<br>LONWorks<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>Ethernet |
| **Customisation options** | - PLC option board<br>- Inverter application software | - PLC option board<br>- Inverter application software | - PLC option board<br>- Inverter application software | - PLC option board<br>- Inverter application software<br>- IP54 enclosure |
| **Page** | 263 | 283 | 303 | 323 |

| Model | V1000 | V7 | J7 |
|---|---|---|---|
| |  |  |  |
| **Type** | **Quality has a new formula** | **Sensorless vector control in a pocket sized inverter** | **Small, simple and smart** |
| **400 V three-Phase**<br>**200 V three-Phase**<br>**200 V single-Phase** | **0.2 kW to 15 kW**<br>**0.1 kW to 15 kW**<br>**0.1 kW to 4.0 kW** | **0.2 kW to 7.5 kW**<br>**0.1 kW to 7.5 kW**<br>**0.1 kW to 4.0 kW** | **0.2 kW to 4.0 kW**<br>**0.1 kW to 4.0 kW**<br>**0.1 kW to 1.5 kW** |
| **Application** | High speed accuracy and high starting torque for compact general purpose applications | Compact general purpose | Simple speed control |
| **Control method** | Open loop for vector and open and close loop for V/F control | Sensorless vector and V/F control | V/F control |
| **Torque features** | 200% at 0.5 Hz | 100% at 0.5 Hz | 150% at 3 Hz |
| **Connectivity** | Memobus<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>CompoNet | Memobus<br>DeviceNet<br>PROFIBUS-DP<br>CANopen<br>MECHATROLINK-II | Memobus |
| **Customisation options** | - Customised Application Software | - PLC option board<br>- Inverter application software<br>- IP65 enclosure | N/A |
| **Page** | 343 | 359 | 381 |

| 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.<br>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<br>RS-232C<br>RS-422/485<br>Compobus/S master<br>DeviceNet slave | Peripheral port<br>RS-232C<br>RS-422/485 |
| Software | CX-Programmer<br>CX-One | CX-Programmer<br>CX-One |
| Page | 395 | 407 |

| 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 | 417 | | | | | |

CIMR-G7C

# Varispeed G7


### World first three level inverter architecture

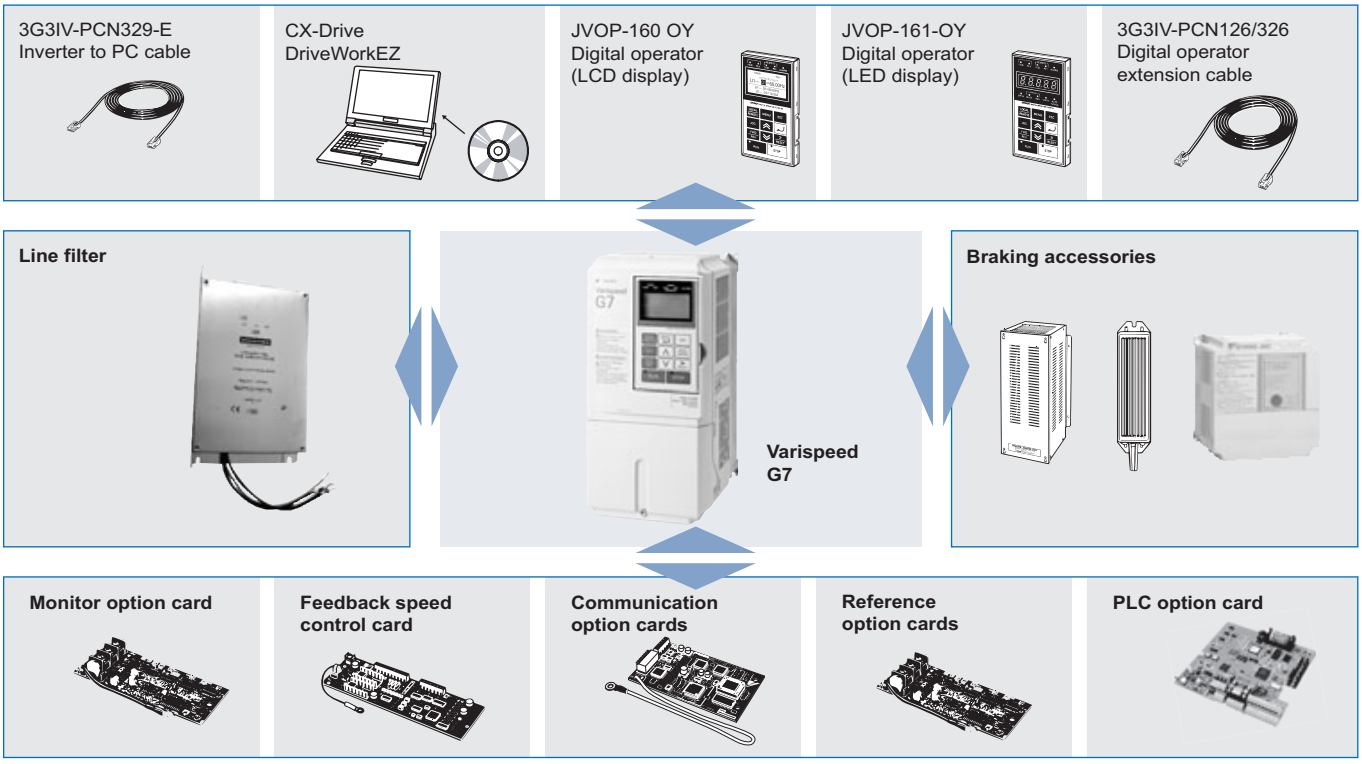
- 3 level control (400 V class)
- Current vector control and V/F with or without PG
- Torque control (closed loop and open loop)
- Silent operation
- Rotary and stationary autotuning
- High slip braking function
- Energy saving function standard
- LCD operator
- Embedded OMRON PLC functionality with 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

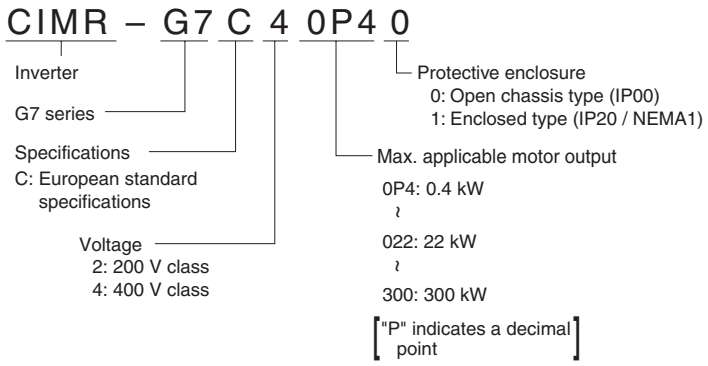


## System configuration



# 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)<br>150% at 0rpm (closed vector control) |
| | Speed control range | 1:200 (open loop vector control 2)<br>1:1000 (closed loop vector control) |
| | Speed control accuracy | ± 0.2% (open loop vector control)<br>± 0.02% (closed loop vector control)<br>(25 °C ± 10 °C) |
| | Speed control response | 10 Hz (open loop vector control 2)<br>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<br>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%<br>(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<br>200% of rated current for 0.5 second |
| | Overvoltage protection | 200 Class Inverter: stops when main-circuit DC voltage is above 410 V.<br>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.<br>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)<br>-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)

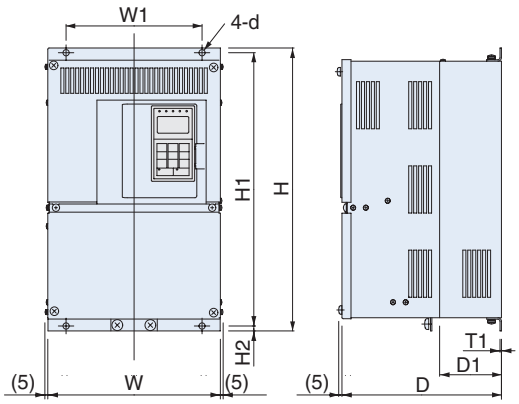



Fig 1

| 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

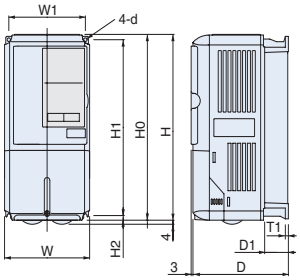



Fig 1

G7C27P51 to G7C20181
G7C47P51 to G7C40181

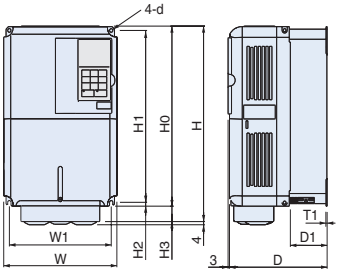



Fig 2

G7C20221 to G7C20751
G7C40221 to G7C41601

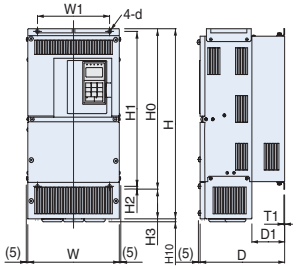



Fig 3

G7C4185 to G7C4300

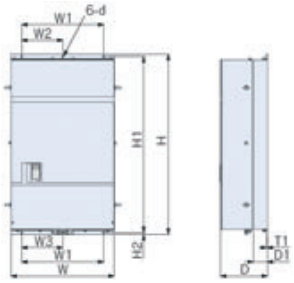
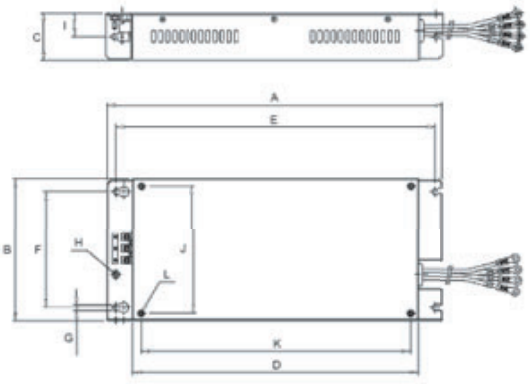



Fig 4

| 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

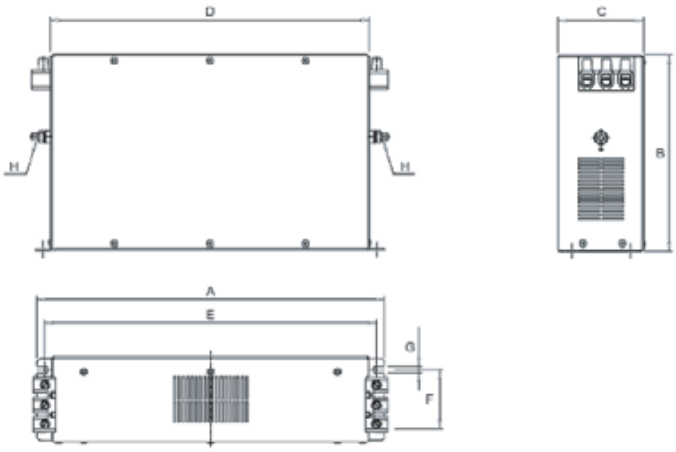
### Footprint / Flat filters




| 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.

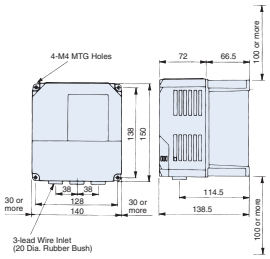
### Bookform filters




| 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 |

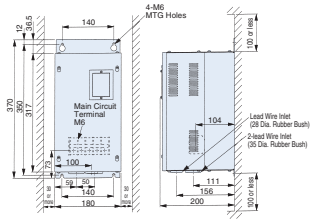
## Braking unit

**Model CDBR-2015 B, -2022 B, -4030B, -4045 B**



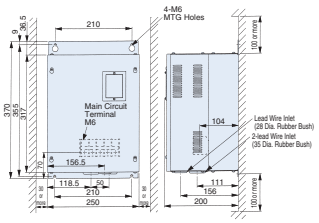

Weight 1.8 Kg

**Model CDBR-2110 B**




Weight 8.5 Kg

**Model CDBR-4220 B**

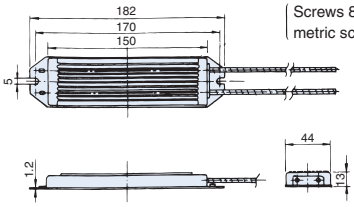



Weight 12 Kg

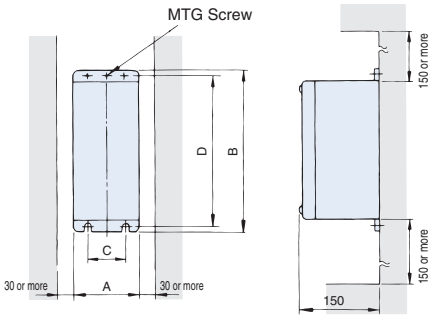
## Braking resistor unit (inverter-mounted type)

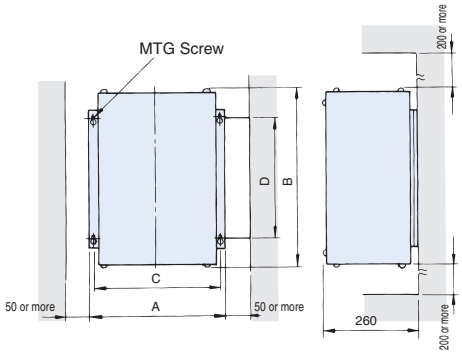
Weight: 0.2 kg
Model ERF-150WJ_

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)



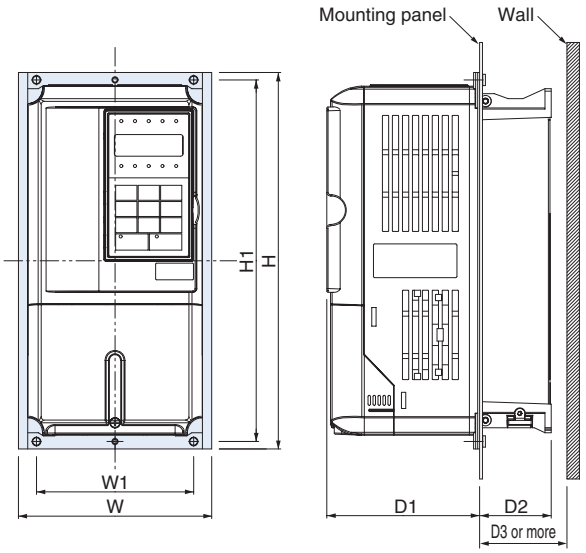

| Voltage | Model LKEB-_ | Dimensions in mm | | | | | Weight kg |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | MTG Screw | |
| 220 V class | 20P7 | 105 | 275 | 50 | 260 | M5 x 3 | 3.0 |
| | 21P5 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 22P2 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 23P7 | 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)

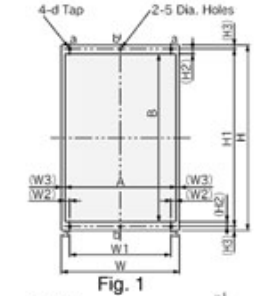


Fig. 1

Fig. 2

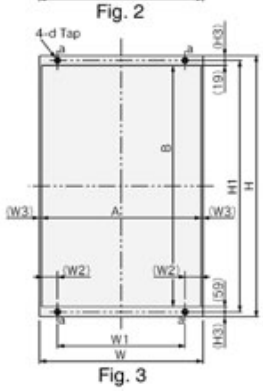


Fig. 3

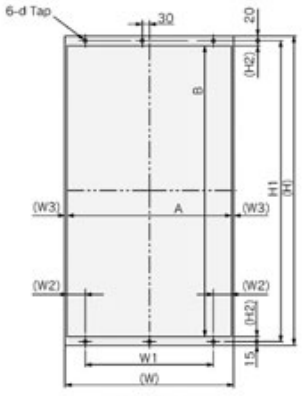


Fig. 4

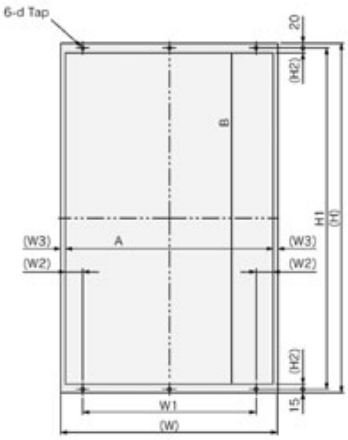


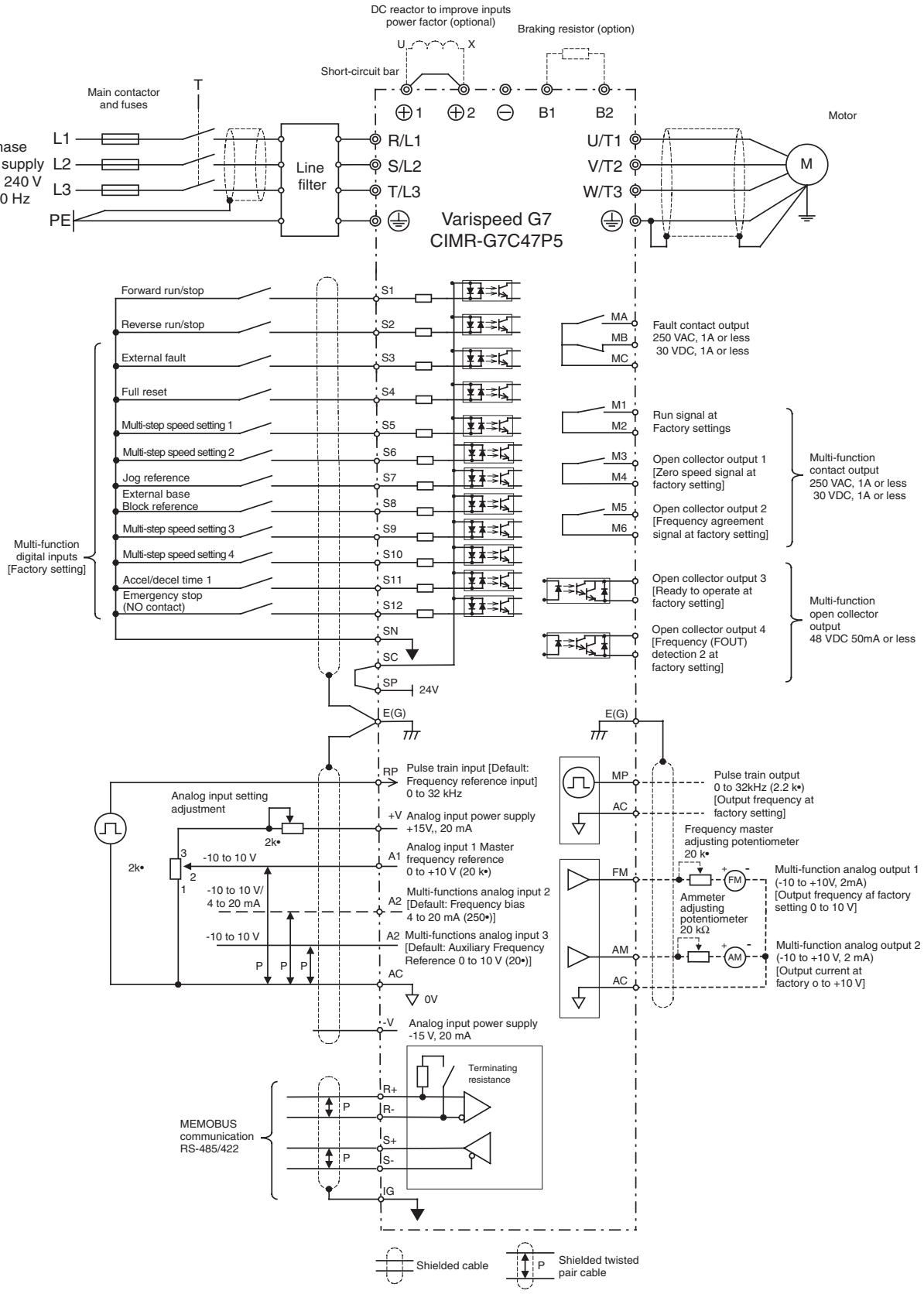
Fig. 5

| 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

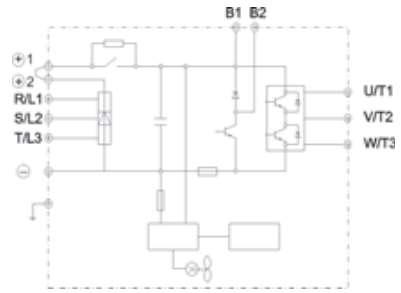
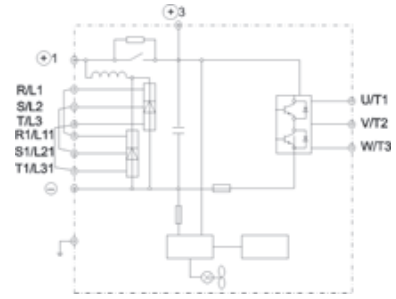
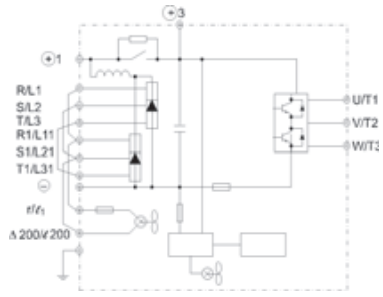
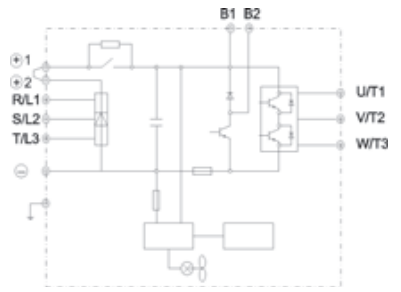
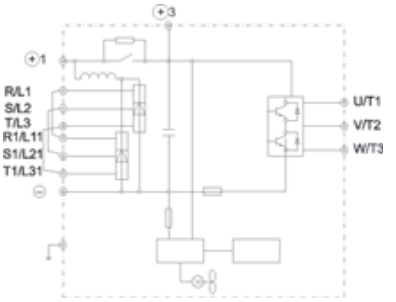
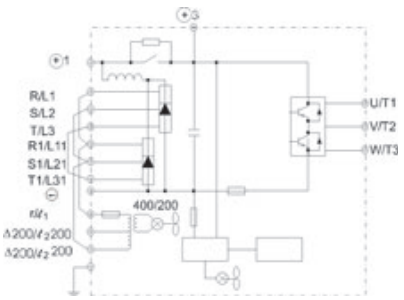
## Standard connections



## 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   |

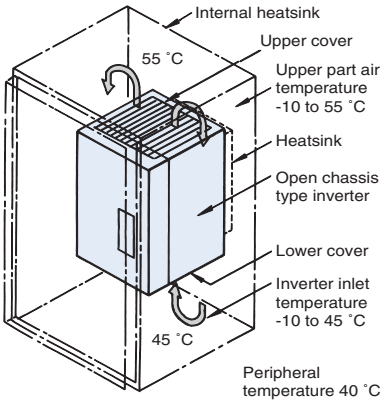
1. For 200 V class filters, consult with standard OMRON supplier.

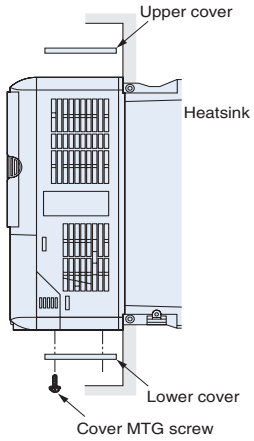
## Control circuit

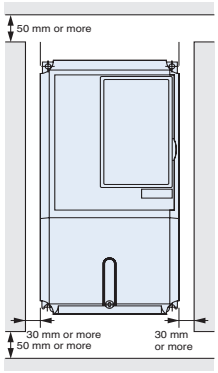
| Type | No. | Signal name | Function | Signal level |
|---|---|---|---|---|
| Sequence input | S1 | Forward run/stop signal | Forward run at “closed”, stop at “open” | Photo-coupler input +24 VDC 8 mA isolation |
| | S2 | Reverse run/stop signal | Reverse run at “closed”, stop at “open” | |
| | S3 | 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.

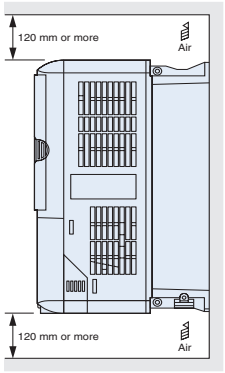
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.



Side spaces



Top and bottom spaces

### Inverter heat loss

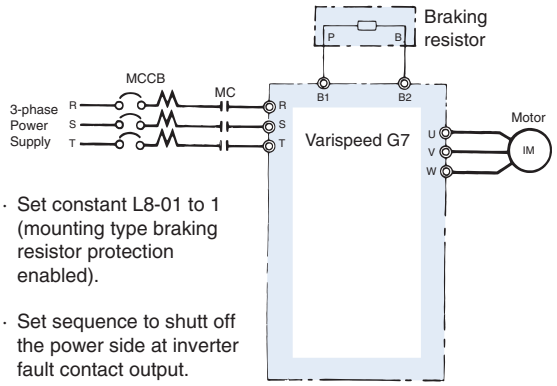
#### 200 V class

| 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

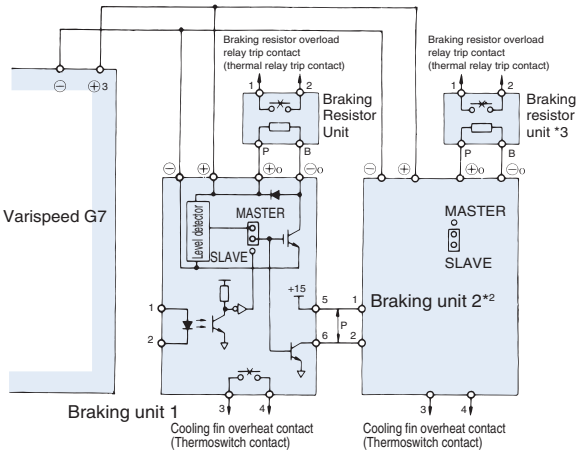
| Model CIMR-G7C☐ | | | 40P4 | 40P7 | 41P5 | 42P2 | 43P7 | 45P5 | 47P5 | 4011 | 4015 | 4018 | 4022 | 4030 | 4037 | 4045 | 4055 | 4075 | 4090 | 4110 | 4132 | 4160 | 4185 | 4220 | 4300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter 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



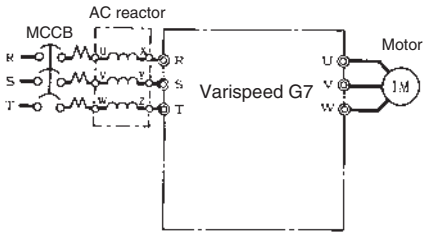

- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

### Connections for braking resistors

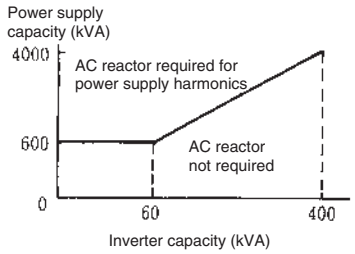


## AC reactor

Connection example

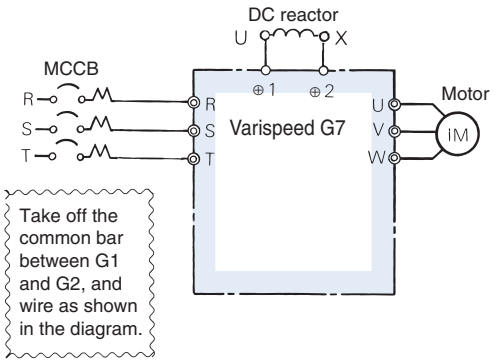


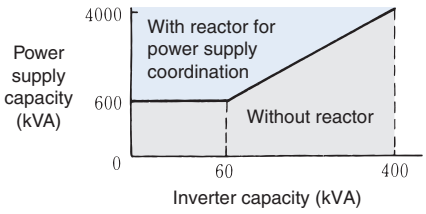

Application example




| 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



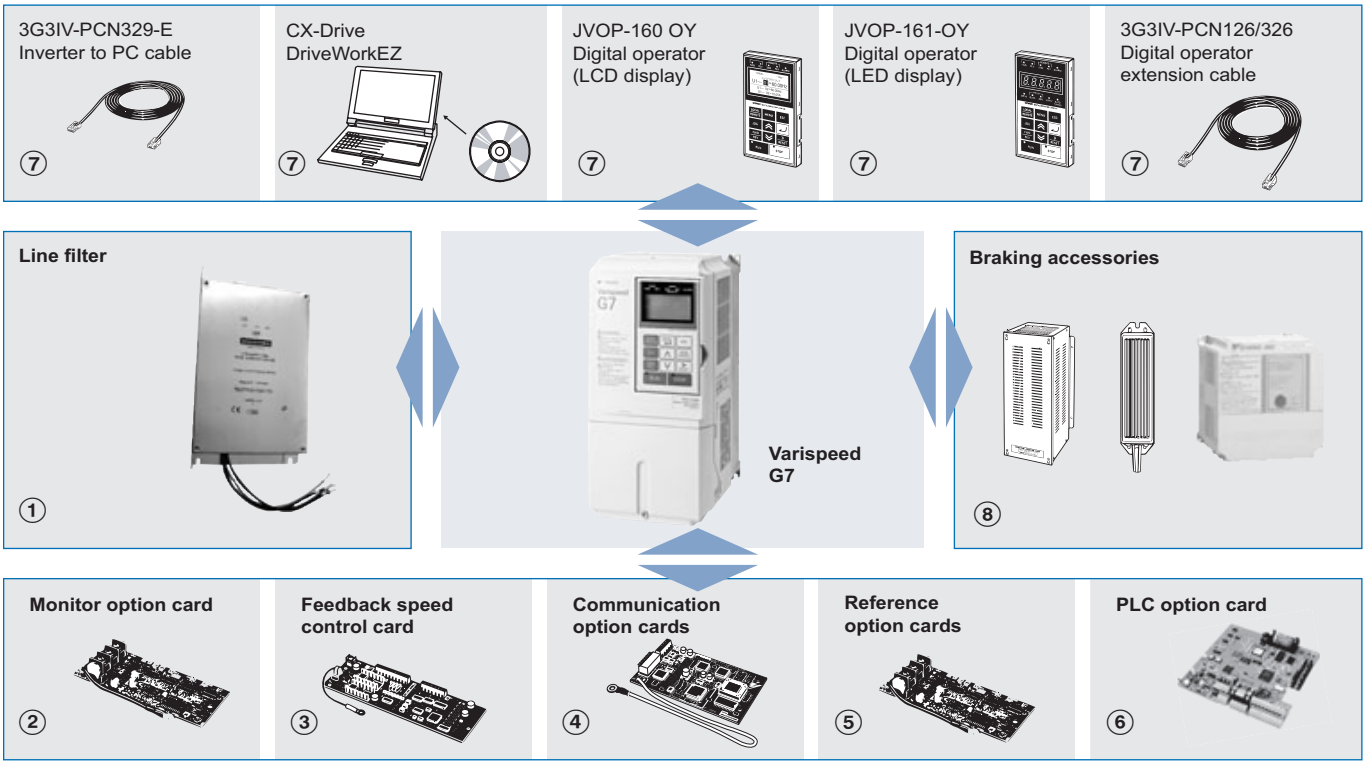

| 200 V class | | | 400 V class | | |
|---|---|---|---|---|---|
| Max. applicable motor output kW | Current value A | Inductance mH | Max. applicable motor output kW | Current value A | Inductance mH |
| 0.4 | 5.4 | 8 | 0.4 | 3.2 | 28 |
| 0.75 | | | 0.75 | | |
| 1.5 | 18 | 3 | 1.5 | 5.7 | 11 |
| 2.2 | | | 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

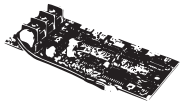
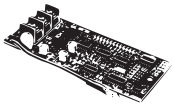
### 200 V

| 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 |

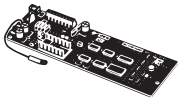
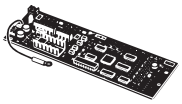
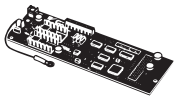
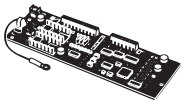
### 400 V

| 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.<br>• Output resolution: 8 bits (1/256)<br>• 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.)<br>• Output resolution: 11 bits (1/2048) + code<br>• Output voltage: \|10 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.) .<br>• 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)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, max. current 200 mA]<br>• Pulse monitor output: +12 V, 20 mA |
| | PG-B2 / 3G3FV-PPGB2  | | • Phase A and B pulse inputs (exclusively for complementary input)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, Max. current 200 mA]<br>• 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)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, Max. current 200 mA]<br>• Pulse monitor output: RS-422 |
| | PG-X2 / 3G3FV-PPGX2  | | • Phase A, B and Z pulse (differential pulse) inputs (RS-422 input)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, Max. current 200 mA]<br>• Pulse monitor output: RS-422 |

### ④ Communication option cards

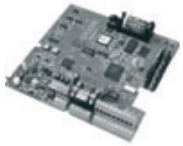
| Type | Model | Description | Function |
|---|---|---|---|
| Communication option card | SI-N1 | DeviceNet option card | • Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through DeviceNet communication with 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<br>• 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.<br>• 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.

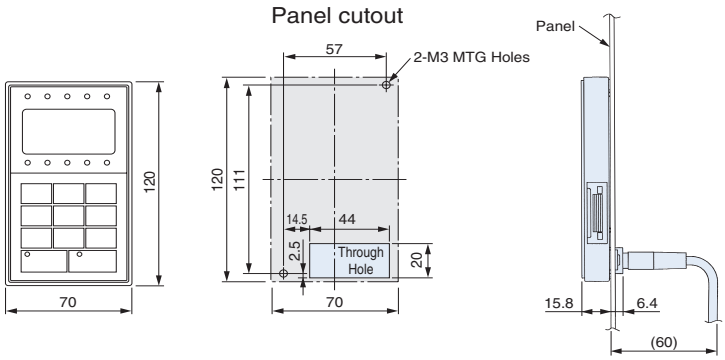
### ⑤ Reference option cards

| Type | Model | Description | Function |
|---|---|---|---|
| Reference option card | AI-14U / 3G3IV-PAI14U | Analog input card | • 2 channel high resolution analog input card<br>• Channel 1: 0 to 10 V (20 KΩ)<br>• Channel 2: 4 to 20 mA (250 Ω)<br>• Resolution 14 bit |
| | AI-14B / 3G3IV-PAI14B | | • 3 Channel high resolution analog input card<br>• Signal level: -10 to +10 V (20 KΩ)<br>• 4 to 20 mA (250 Ω)<br>•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.<br>• Embedded Compubus/S fieldbus<br>• 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 |
|---|---|---|---|
| Digital operator | JVOP-160-OY  | 5 lines LCD digital operator<br>7 language support |   Panel cutout installation |
| | JVOP-161-OY  | 7 segment LED digital operator | |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>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

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 *

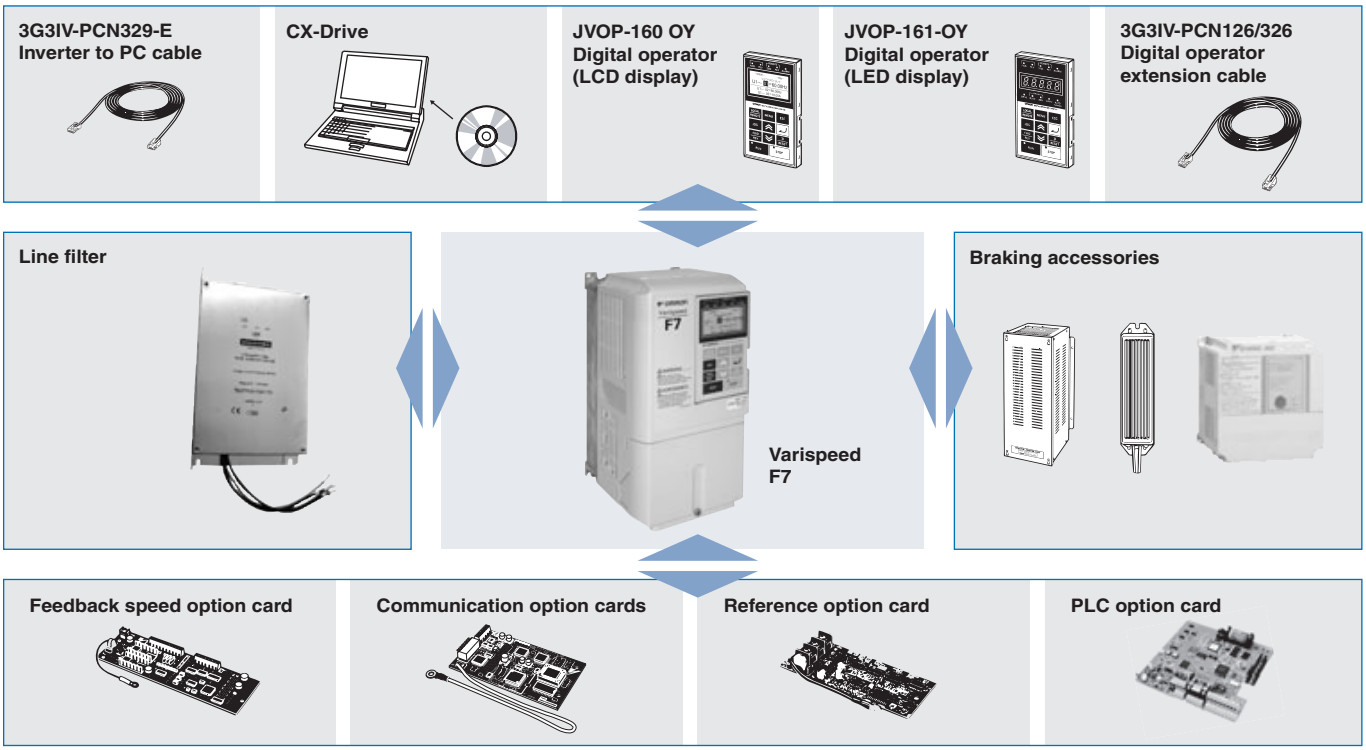
- The inverter software can be customized to meet specific application. Examples:
- Electronic line shaft (S-8169)
- Crane software (S-7071)

* For detailed information please see CASE software section.

## Ratings

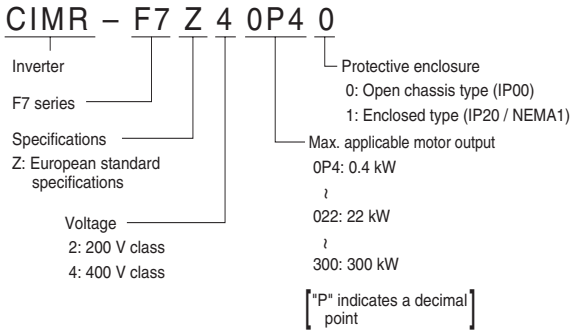
- 200 V Class three-phase 0.4 to 110 kW
- 400 V Class three-phase 0.4 to 300 kW

## 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<br>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<br>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.<br>Normal duty 1 (high carrier, variable torque applications): maximum carrier frequency, depending on inverter capacity, 120% overload for 1 minute.<br>Normal duty 2 (variable torque applications): carrier frequency reduced, continuous overload capability increased |
| | Speed control range | 1:40 (V/f control)<br>1:100 (open loop vector control)<br>1:1000 (closed loop vector control) |
| | Speed control accuracy | ± 3% (V/f control)<br>± 0.03% (V/f control with PG)<br>± 0.2% (open loop vector control)<br>± 0.02% (closed loop vector control)<br>(25 °C ± 10 °C) |
| | Speed control response | 5 Hz (control without PG)<br>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<br>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<br>Normal duty 1 (high carrier, variable torque applications): 120% of rated output current for 1 minute<br>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.<br>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.<br>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)<br>-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)

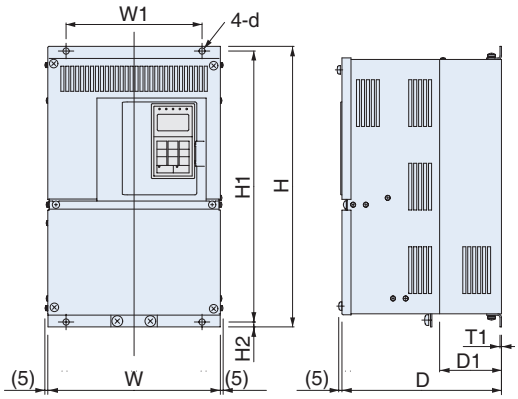



Fig 1

| 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

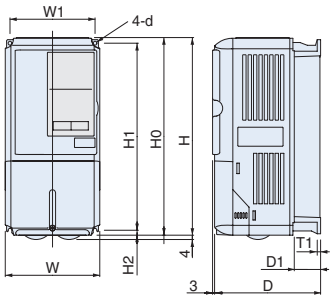



Fig 1

F7Z 27P51 to F7Z20181
F7Z47P51 to F7Z40181

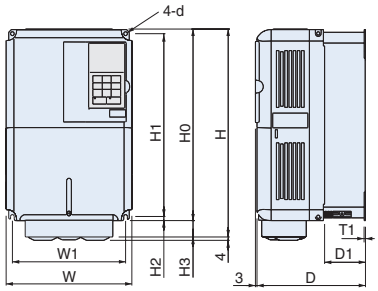



Fig 2

F7Z 20221 to F7Z20751
F7Z40221 to F7Z41601

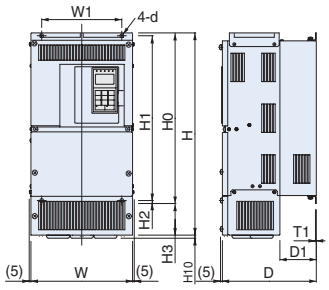
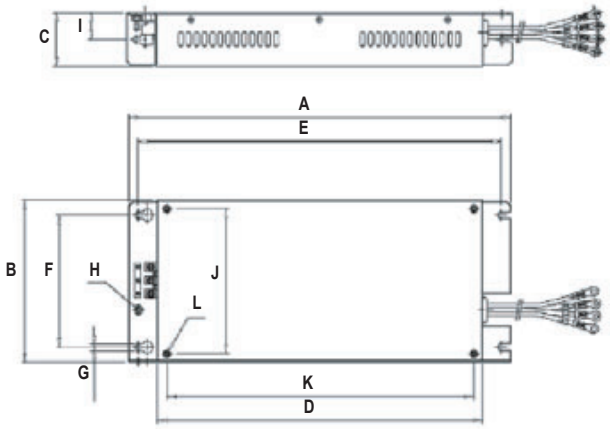



Fig 3

| 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

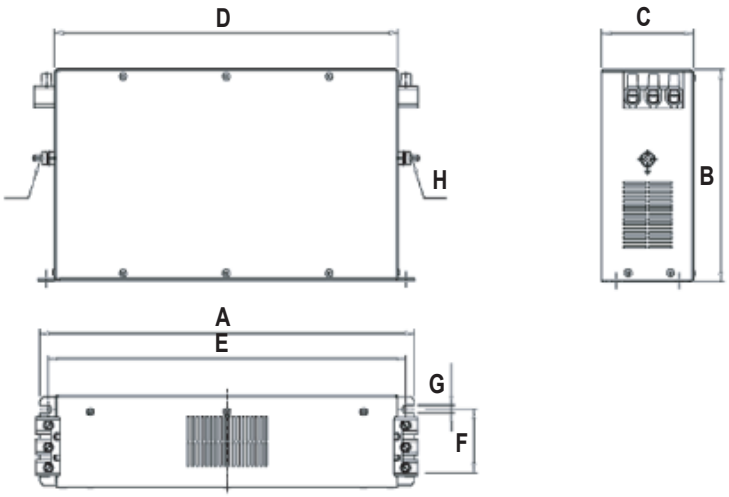
### Footprint / Flat filters




| 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.

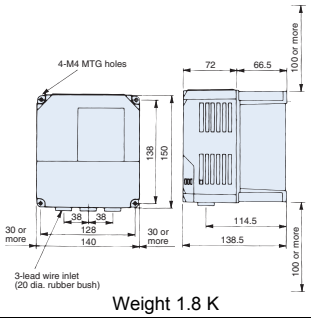
### Bookform filters




| 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 |

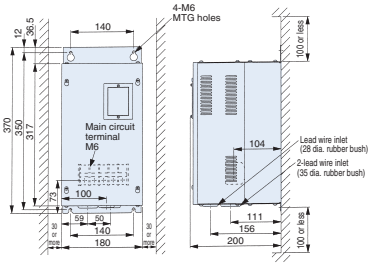
## Braking unit

**Model CDBR-2015 B, -2022 B, -4030B, -4045 B**



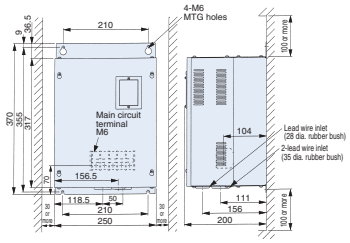

Weight 1.8 K

**Model CDBR-2110 B**




Weight 8.5 Kg

**Model CDBR-4220 B**

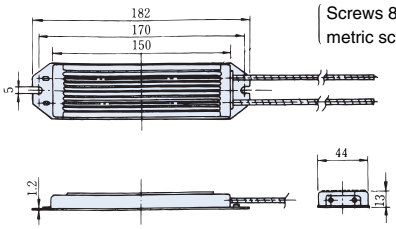



Weight 12 Kg

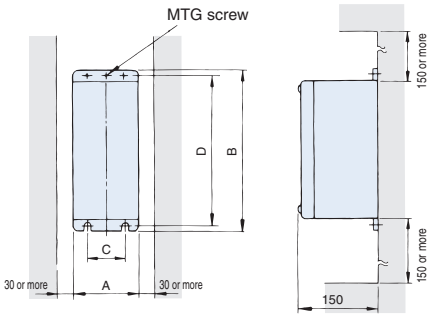
## Braking resistor unit (inverter-mounted type)

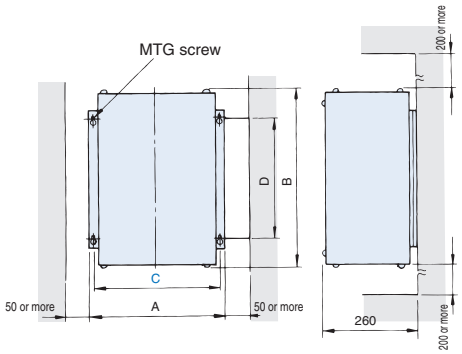
Weight: 0.2 kg
Model ERF-150WJ_

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)



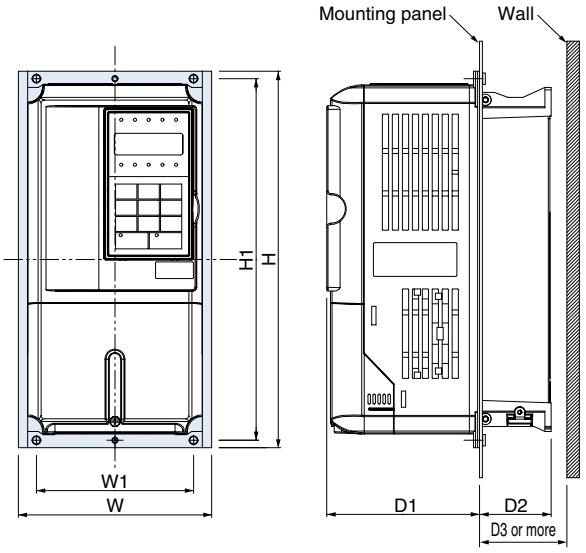

| Voltage | Model LKEB-_ | Dimensions in mm | | | | | Weight kg |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | MTG screw | |
| 220 V class | 20P7 | 105 | 275 | 50 | 260 | M5 x 3 | 3.0 |
| | 21P5 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 22P2 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 23P7 | 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)

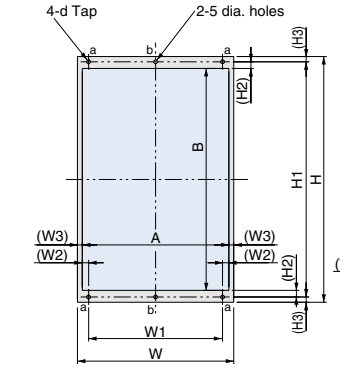



Fig 1

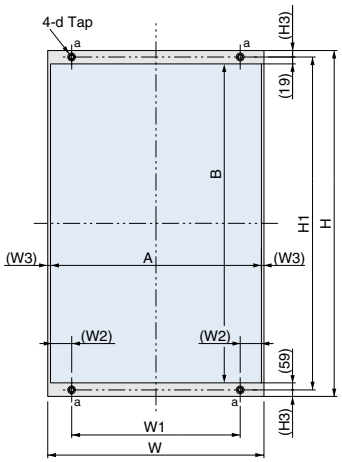



Fig 3

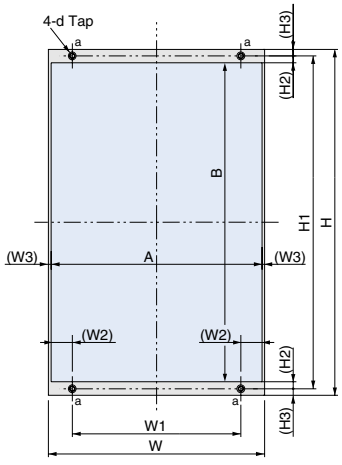


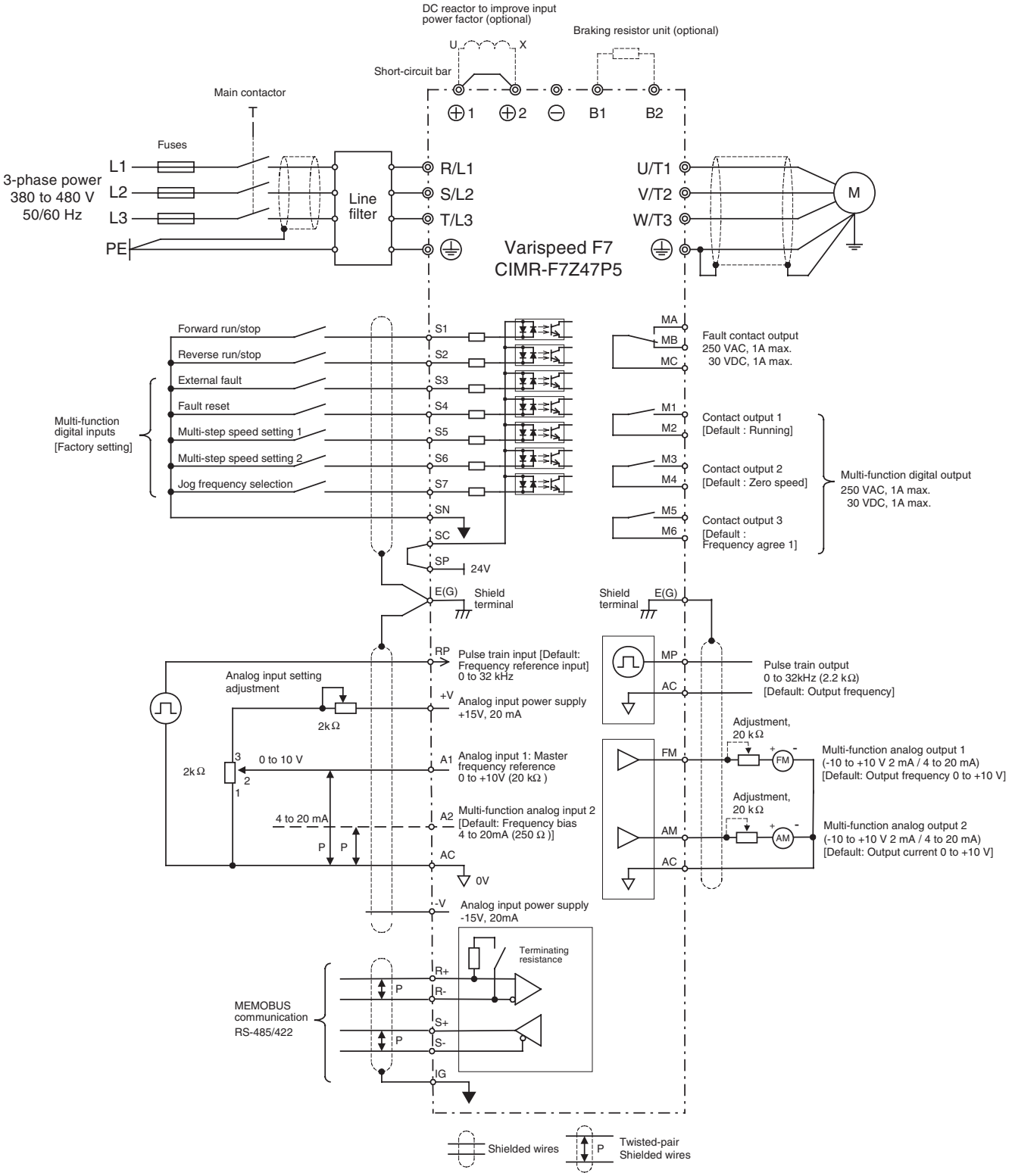

Fig 2

| 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 | |
| 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

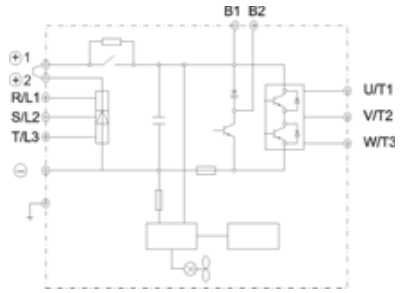
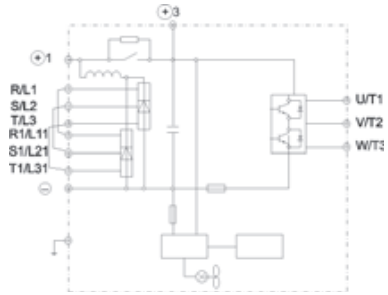
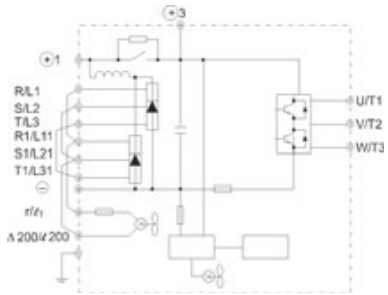
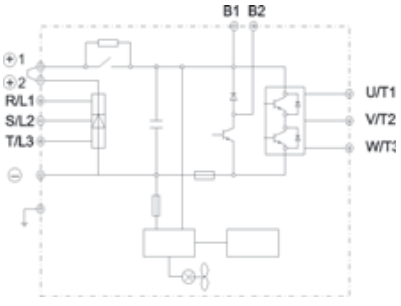
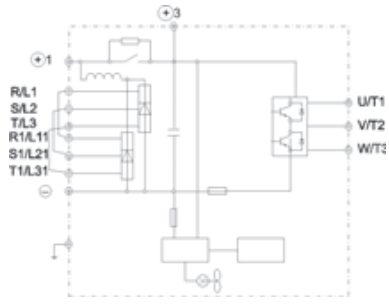
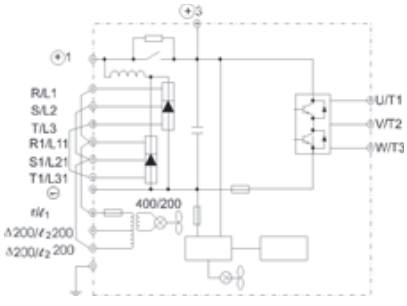
## Standard connections



## 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 | --- | | | --- | | |
| $\mathfrak{z}$ /$I_2$ | ------ | | Cooling fan power supply[2] | --- | | |
| r/$I_1$ | | | | --- | | Cooling fan power supply[3] |
| $\mathfrak{z}$ **200 /** $I_2$ **200** | ------ | | | | | |
| $\mathfrak{z}$ **400 /** $I_2$ **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/$I_1$- $\mathfrak{z}$ /$I_2$: 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/$I_1$ - $\mathfrak{z}$ 200 / $I_2$ 200: 200 to 220 VAC 50 Hz, 200 to 230 VAC 60 Hz, r/$I_1$ - $\mathfrak{z}$ 400 / $I_2$ 400: 380 to 480 VAC 50/60 Hz

| | Main circuit configuration | | |
|---|---|---|---|
| **200 V class** | CIMR-F7Z20P4 to 2018<br>  | CIMR-F7Z2022, 2030<br>  | CIMR-F7Z2037 to 2110<br>  |
| **400 V class** | CIMR-F7Z40P4 to 4018<br>  | CIMR-F7Z4022 to 4055<br>  | CIMR-F7Z4075 to 4300<br>  |

## Control circuite

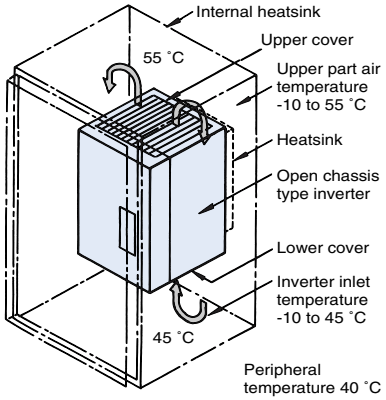
| Type | No. | Signal name | Function | | Signal level |
|---|---|---|---|---|---|
| Digital input signals | S1 | Forward run/stop command | Forward run when ON; stopped when OFF. | | 24 VDC, 8 mA photocoupler |
| | S2 | Reverse run/stop command | Reverse run when ON; stopped when OFF. | | |
| | S3 | 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%<br>-10 V to +10 V/100% | Function is selected by setting H3-09. | 4 to 20 mA(250 Ω)<br>-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<br>Contact capacity:<br>1 A max. at 250 VAC<br>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<br>Fault when OPEN across MB and MC | | Relay contacts<br>Contact capacity:<br>1 A max. at 250 VAC<br>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%<br>2 mA max. |
| | AC | Analog common | – | | 4 to 20 mA current output |
| | 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)<br>High level voltage 3.5 to 13.2 V |
| | MP | Pulse monitor | H6-06 (output frequency) | | 0 to 32 kHz<br>+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 | – | | – |

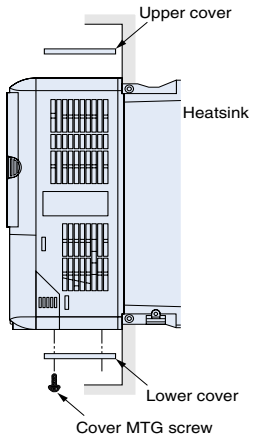
1. The default settings are given for terminals S3 to S7. For a 3-wire sequence, the default settings are a 3-wire sequence for S5, multi-step speed setting 1 for S6 and multi-step speed setting 2 for S7.
2. Do not use this power supply for supplying any external equipment.
3. When driving a reactive 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.

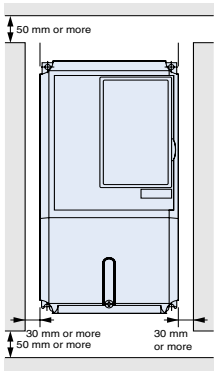
| | |
|---|---|
| Low level voltage | 0.0 to 0.8 V |
| High level voltage | 3.5 to 13.2 V |
| H duty | 30% to 70% |

Remove the upper and lower covers for the models of 15 kW or less in 200 V and 400 V classes.

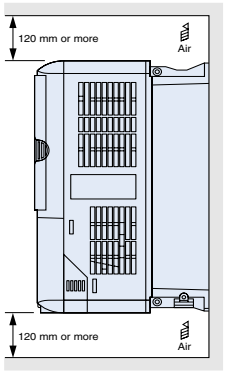
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.



Side spaces



Top and bottom spaces

## Inverter heat loss

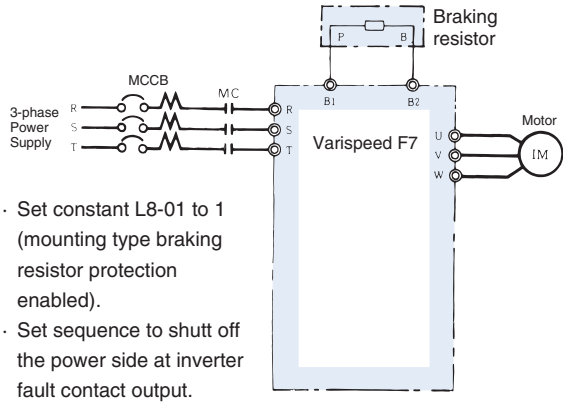
### 200 V class

| 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

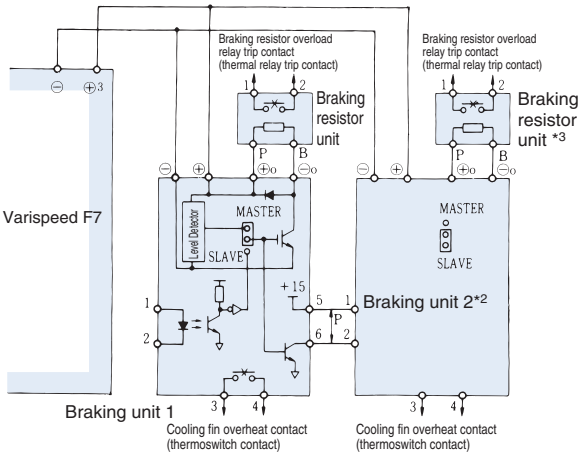
| Model CIMR-F7Z□ | | | 40P4 | 40P7 | 41P5 | 42P2 | 43P7 | 44P0 | 45P5 | 47P5 | 4011 | 4015 | 4018 | 4022 | 4030 | 4037 | 4045 | 4055 | 4075 | 4090 | 4110 | 4132 | 4160 | 4185 | 4220 | 4300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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



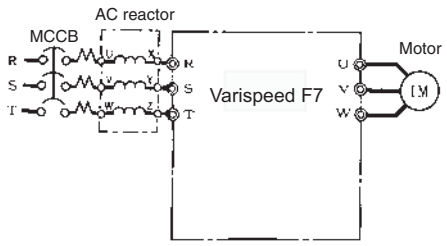

- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

## Connections for braking resistors

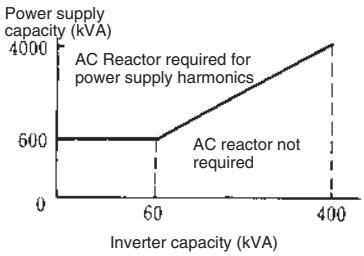


## AC reactor

Connection example

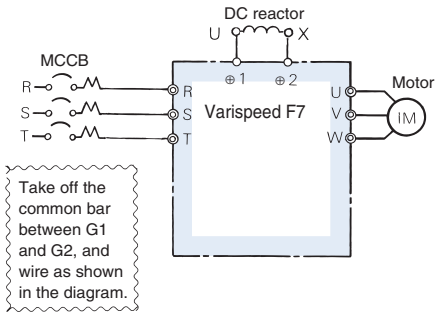


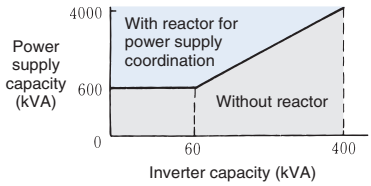

Application example




| 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 | |

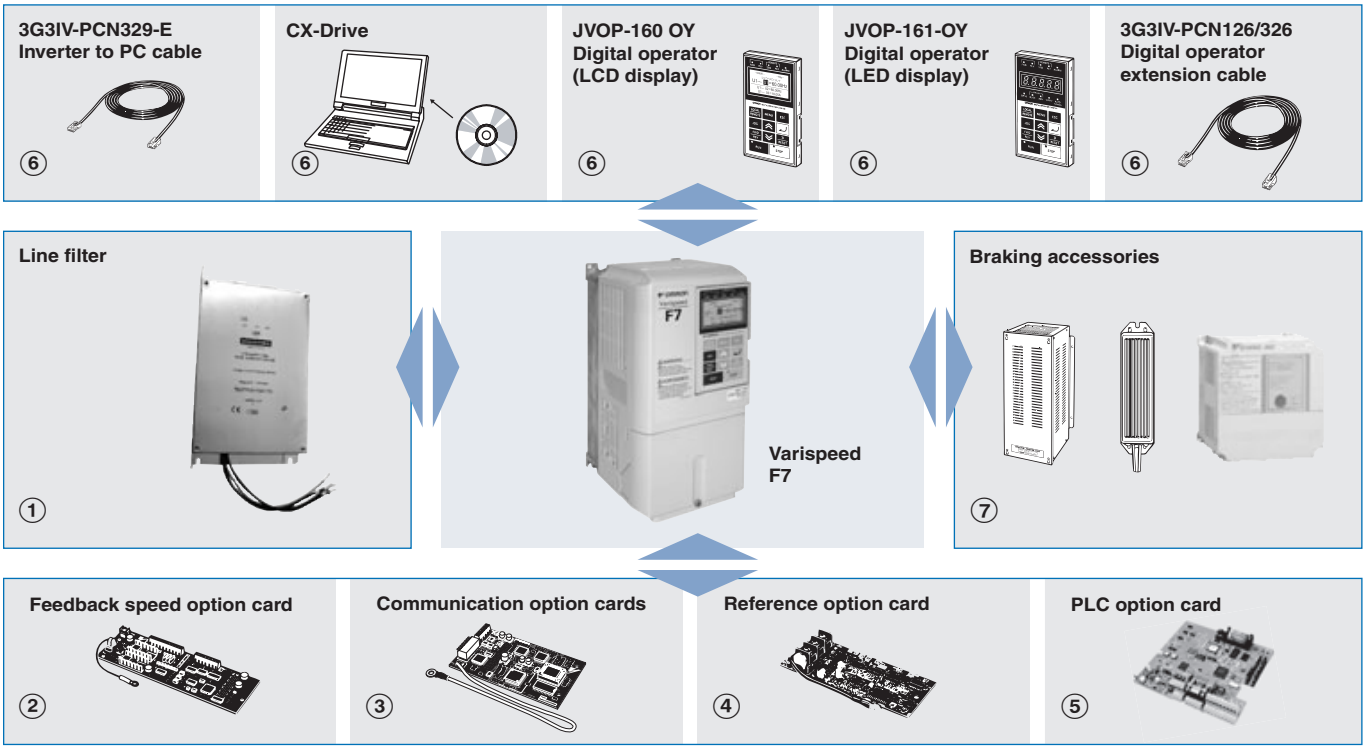
### Fuse installation

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

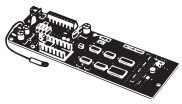
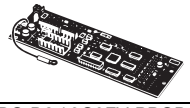
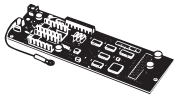
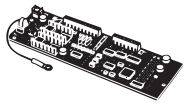
### 200 V

| 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)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, max. current 200 mA]<br>• Pulse monitor output: +12 V, 20 mA |
| | PG-B2 / 3G3FV-PPGB2  | | • Phase A and B pulse inputs (exclusively for complementary input)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, max. current 200 mA]<br>• 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)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, max. current 200 mA]<br>• Pulse monitor output: RS-422 |
| | PG-X2 / 3G3FV-PPGX2  | | • Phase A, B and Z pulse (differential pulse) inputs (RS-422 input)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, max. current 200 mA]<br>• Pulse monitor output: RS-422 |
| | PG-Z2  | | • Phase A, B and Z pulse (differential pulse) inputs (RS-422 input)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, max. current 200 mA]<br>• Pulse monitor output: RS-422<br>• 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.<br>• 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.<br>• Host controller: TrajeXia, MCH or MP series[1] |

1. Please refer to TrajeXia, MCH or MP series section for host controllers detailed information.t

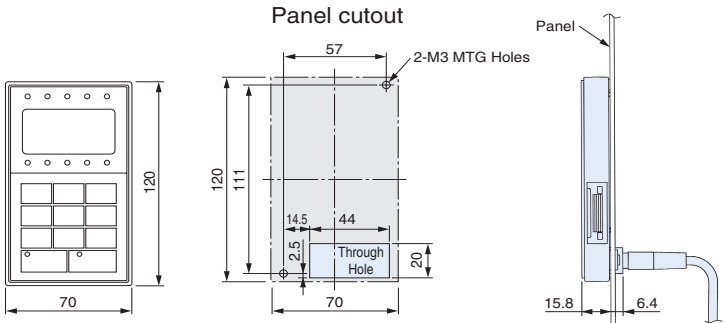
### ④ Reference option cards

| Type | Model | Description | Function |
|---|---|---|---|
| Reference option card | AI-14U / 3G3IV-PAI14U | Analog input card | • 2 channel high resolution analog input card<br>• Channel 1: 0 to 10 V (20 KΩ)<br>• Channel 2: 4 to 20 mA (250 Ω)<br>• Resolution 14 bit |
| | AI-14B / 3G3IV-PAI14B | | • 3 Channel high resolution analog input card<br>• Signal level: -10 to +10V (20 KΩ)<br>s4 to 20 mA (250 Ω)<br>•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<br>  | PLC option | • Full PLC features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs.<br>• Embedded Compubus/S fieldbus<br>• 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<br>7 language support |   Panel cutout installation |
| | JVOP-161-OY  | 7 segment LED digital operator | |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>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_ | 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 (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

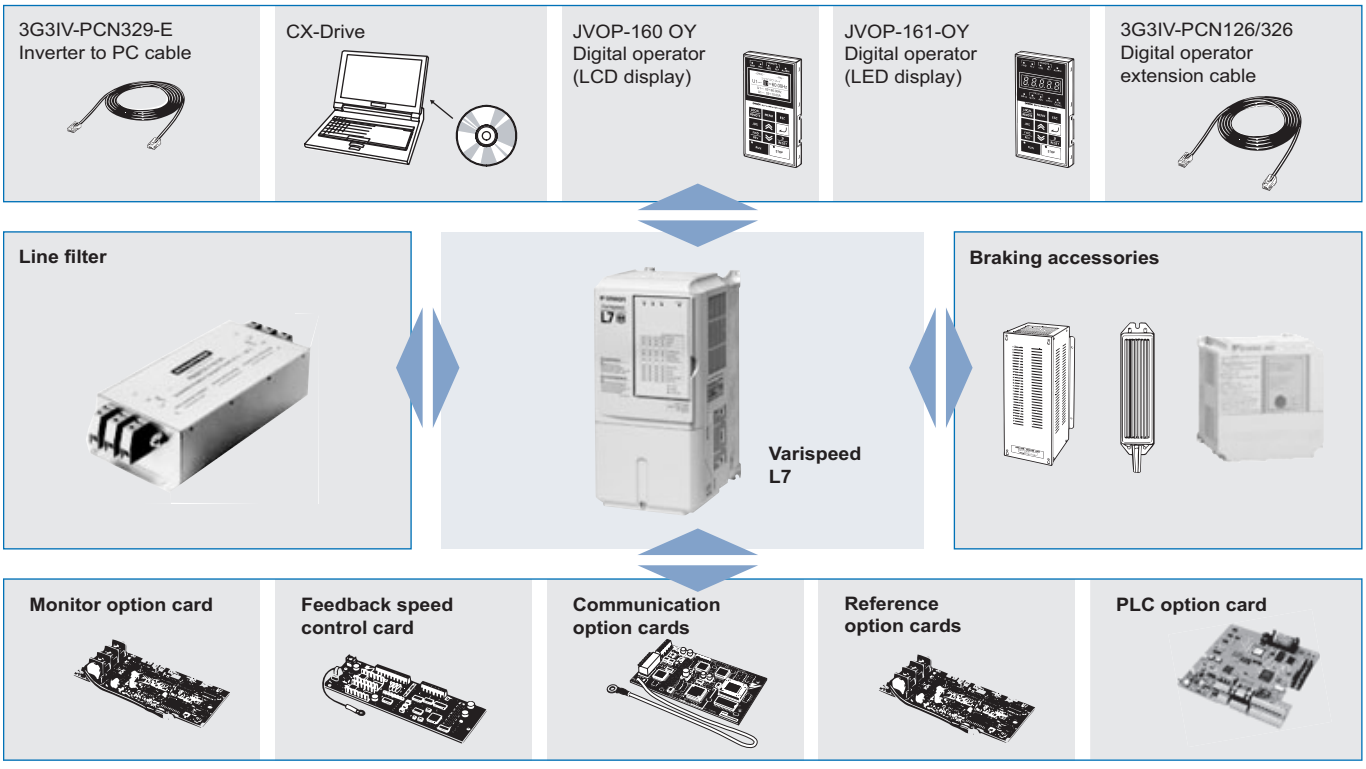

## Made to drive lifts

- 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

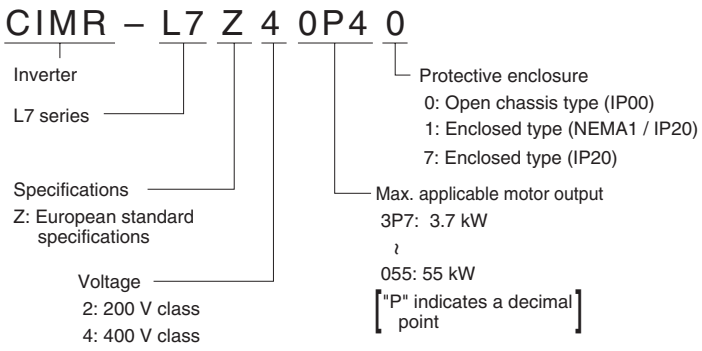
- 200 V Class three-phase 3.7 to 55 kW
- 400 V Class three-phase 4.0 to 55 kW

## 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<br>closed loop vector control, open loop vector control, V/f control |
| | Control method synchronous | Sine wave PWM<br>closed loop vector control using endat and hiperface |
| | Carrier frequency | 8 kHz<br>higher carrier frequency possible with current derating. |
| | Speed control range | 1:40 (V/f control)<br>1:100 (open loop vector control)<br>1:1000 (closed loop vector control) |
| | Speed control accuracy | ± 3% (V/f control)<br>± 0.2% (open loop vector control)<br>± 0.02% (closed loop vector control)<br>(25 °C ± 10 °C) |
| | Speed control response | 5 Hz (control without PG)<br>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.<br>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.<br>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<br>Enclosed wall-mounted type (NEMA 1): 18.5 kW or less (same for 200 V and 400 V class inverters)<br>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)

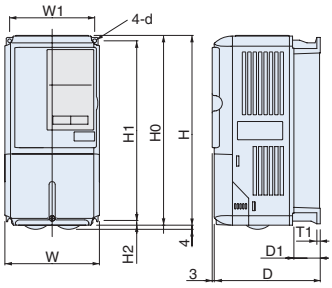



Fig 1

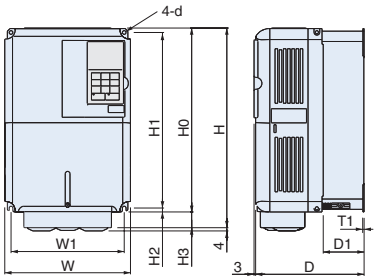



Fig 2

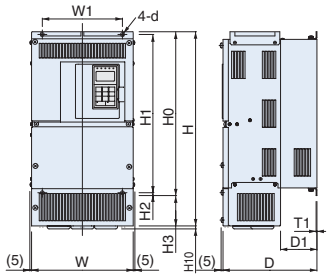


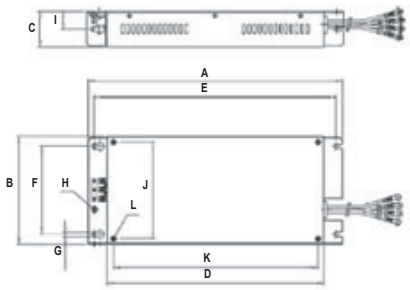

Fig 3

| 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

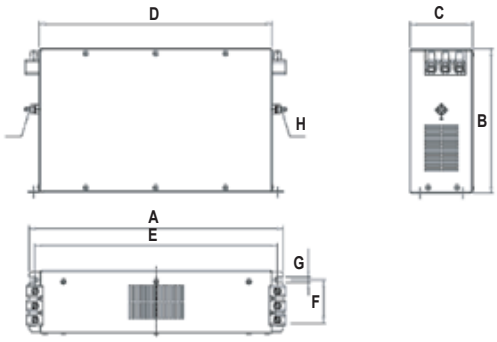
## Filters

### Footprint filters



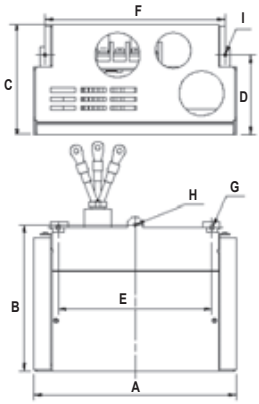

| Model | | Dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L |
| 200 V | 3G3RV-PFI2035-SE | 330 | 141 | 46 | 281 | 313 | 115 | 5.5 | M5 | 23 | 126 | 266 | M5 |
| | 3G3RV-PFI2060-SE | 355 | 206 | 60 | 302 | 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 |

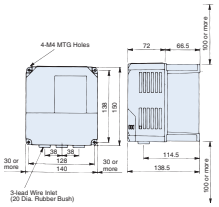
### Bottom filters




| 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**

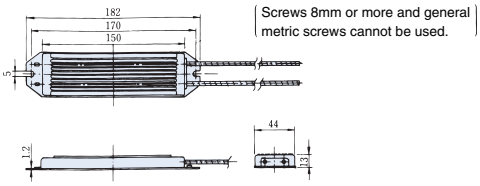



Weight 1.8 Kg

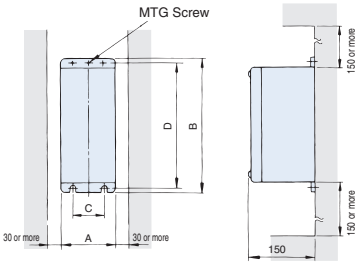
## Braking resistor unit (Inveter-mounted type)

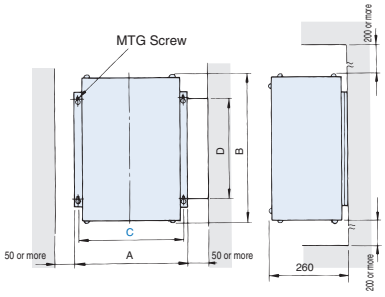
Weight: 0.2 kg
Model ERF-150WJ_

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)



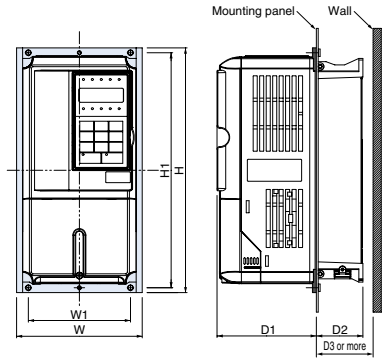




| Voltage | Model LKEB-_ | Dimensions in mm | | | | | Weight kg |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | MTG screw | |
| 220 V class | 23P7 | 130 | 350 | 75 | 335 | M5 x 4 | 5.0 |
| | 25P5 | 250 | 350 | 200 | 335 | M6 x 4 | 7.5 |
| | 27P5 | 250 | 350 | 200 | 335 | M6 x 4 | 8.5 |
| 400 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

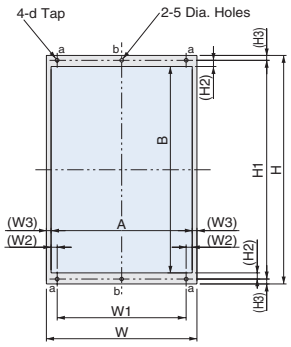
### Heatsink external mounting attachment

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.)

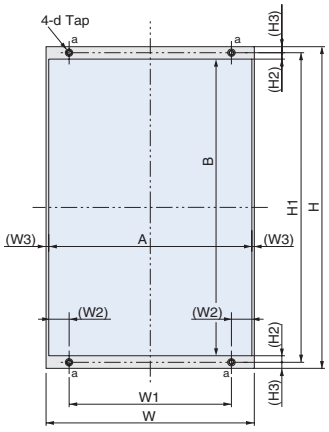



| Model CIMR-L7Z_ | Attachment order code | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | W | H | W1 | H1 | D1 | D2 | D3 |
| 23P7 | EZZ08676A | 155 | 302 | 126 | 290 | 122.6 | 57.4 | 60 |
| 25P5 | | | | | | | | |
| 27P5 | EZZ08676B | 210 | 330 | 180 | 316 | 136.1 | 63.4 | 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

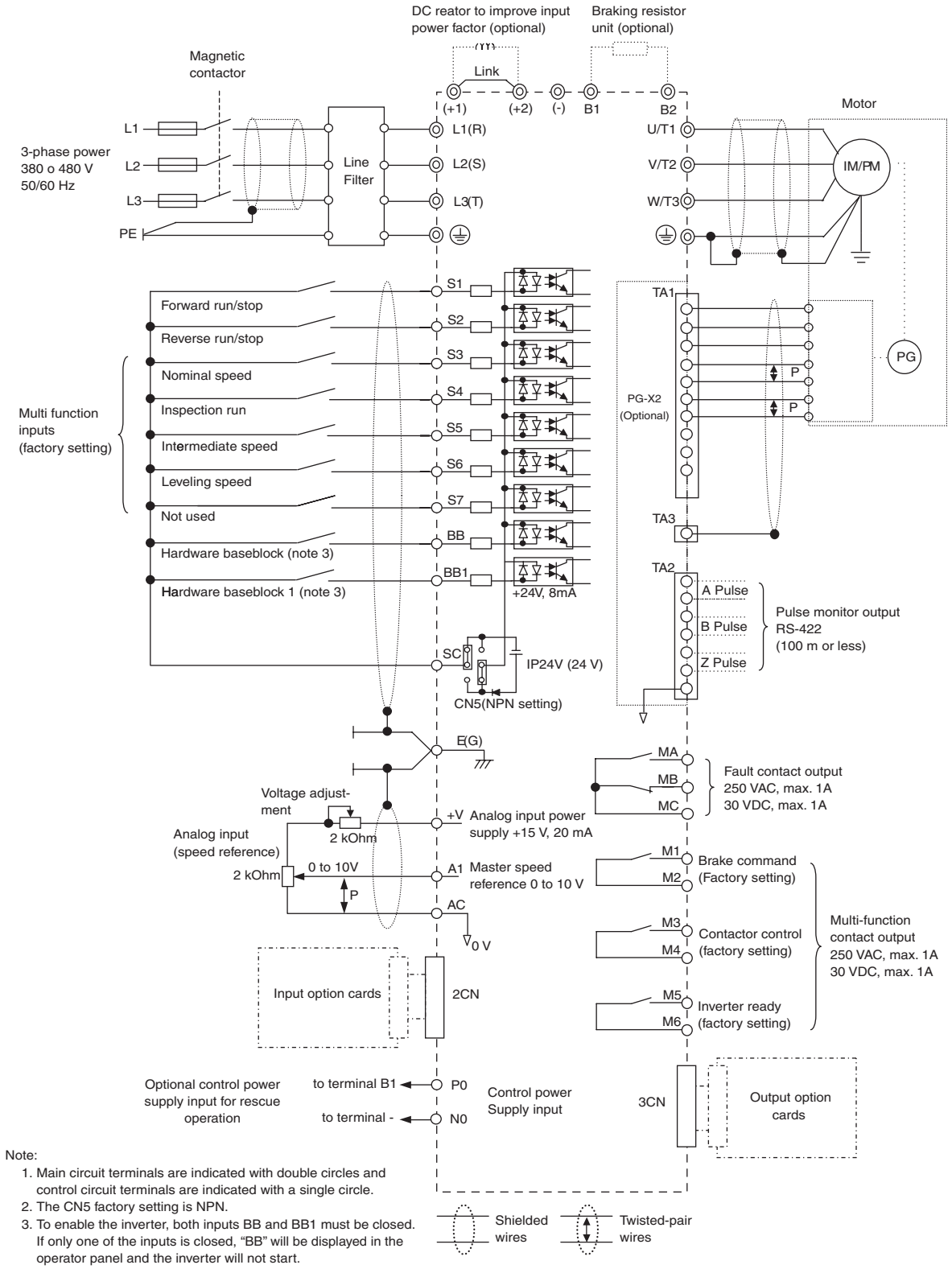



Drawing 2

| Model CIMR-L7Z_ | Draw-ing | 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



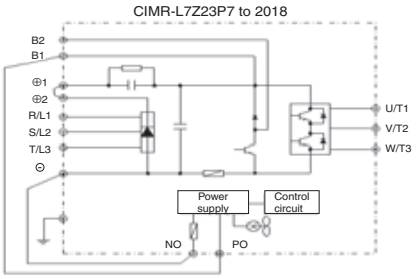

Note:

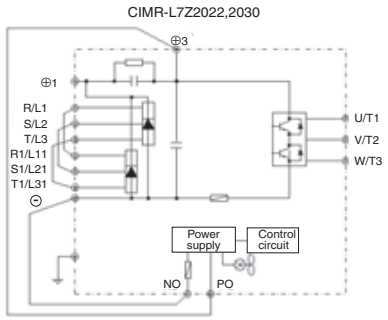
1. Main circuit terminals are indicated with double circles and control circuit terminals are indicated with a single circle.
2. The CN5 factory setting is NPN.
3. To enable the inverter, both inputs BB and BB1 must be closed. If only one of the inputs is closed, “BB” will be displayed in the operator panel and the inverter will not start.

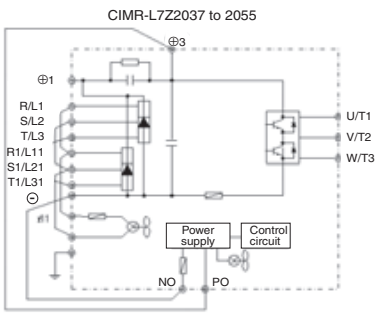
## Main circuit

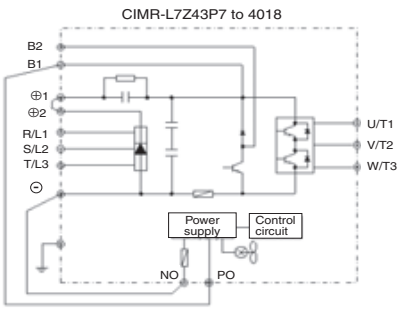
| Voltage | 200 V | | | 400 V | |
|---|---|---|---|---|---|
| Model CIMR-L7Z□ | 20P4 to 2018 | 2022 and 2030 | 2037 to 2055 | 40P4 to 4018 | 4022 to 4055 |
| Max. applicable motor output | 0.4 to 18.5 kW | 22 and 30 kW | 37 to 55 kW | 0.4 to 18.5 kW | 22 to 55 kW |
| R/L1 | Main circuit input power supply | Main circuit input power supply<br>R-R1, S-S1 and T-T1 have been wired before shipment. | | Main circuit input power supply | Main circuit input power supply<br>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<br>Ground terminal (100 Ω or less) | | | Battery power input | |
| NO | | | | | |
| ⏚ | | | | Ground terminal (10 Ω or less) | |

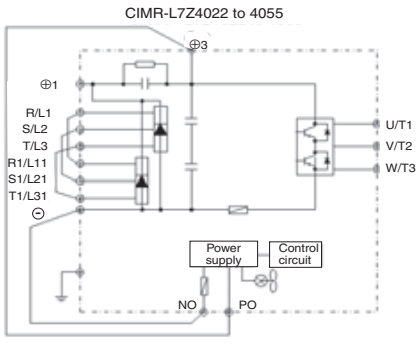
| | Main circuit configuration | | |
|---|---|---|---|
| 200 V class | CIMR-L7Z23P7 to 2018 | CIMR-L7Z2022,2030 | CIMR-L7Z2037 to 2055 |
| 400 V class | CIMR-L7Z43P7 to 4018 | CIMR-L7Z4022 to 4055 | |



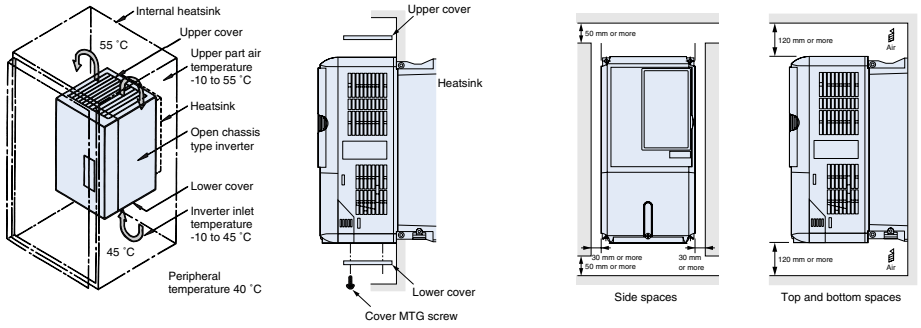
## Control circuit

| 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<br>Contact capacity:<br>1 A max. at 250 VAC<br>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<br>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

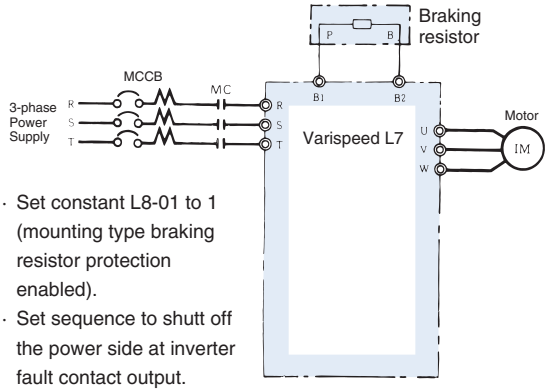
### 200 V class

| 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

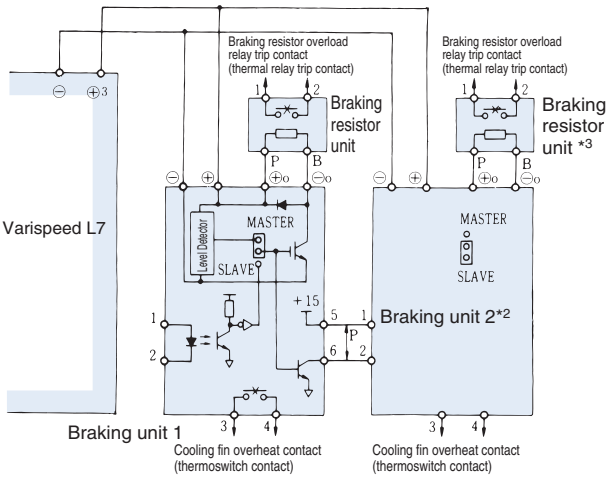
| Model CIMR-L7Z□ | | | 44P0 | 45P5 | 47P5 | 4011 | 4015 | 4018 | 4022 | 4030 | 4037 | 4045 | 4055 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter capacity | | kVA | 5.8 | 9.5 | 13 | 18 | 24 | 30 | 34 | 46 | 57 | 69 | 85 |
| Rated current | | A | 7.6 | 12.5 | 17 | 24 | 31 | 39 | 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

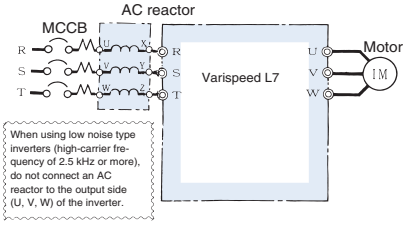



- Set constant L8-01 to 1 (mounting type braking resistor protection enabled).
- Set sequence to shutt off the power side at inverter fault contact output.

## Connections for braking units

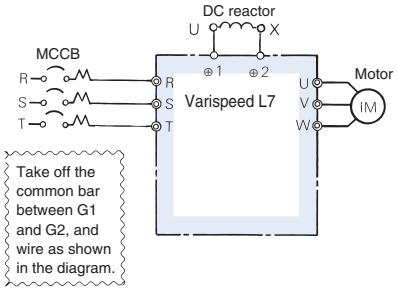


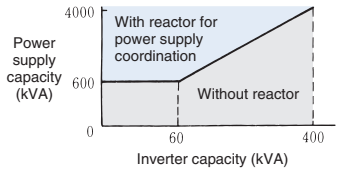

## AC reactor




| 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

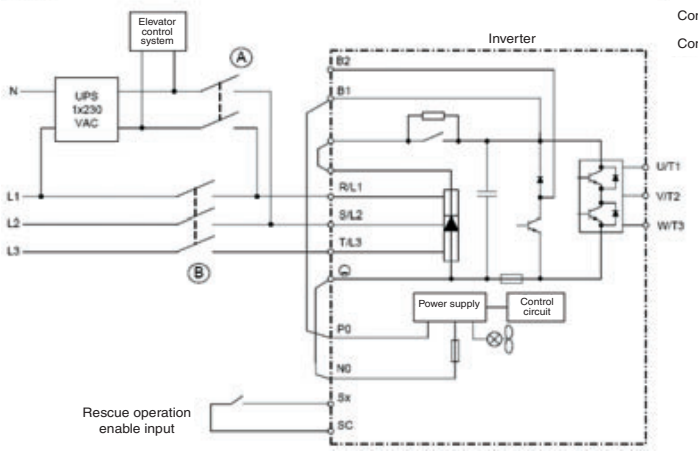
To protect the inverter, it is recommended to use semiconductor fuses as shown in the table below

| 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.

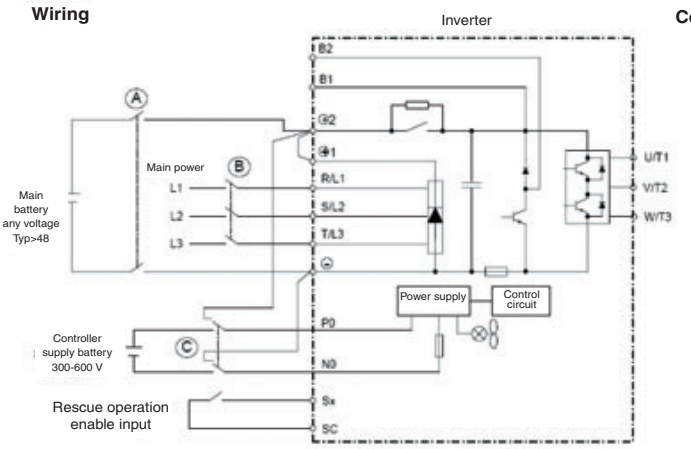
**Wiring**




**Contactor sequence**


### Example 2: two batteries.

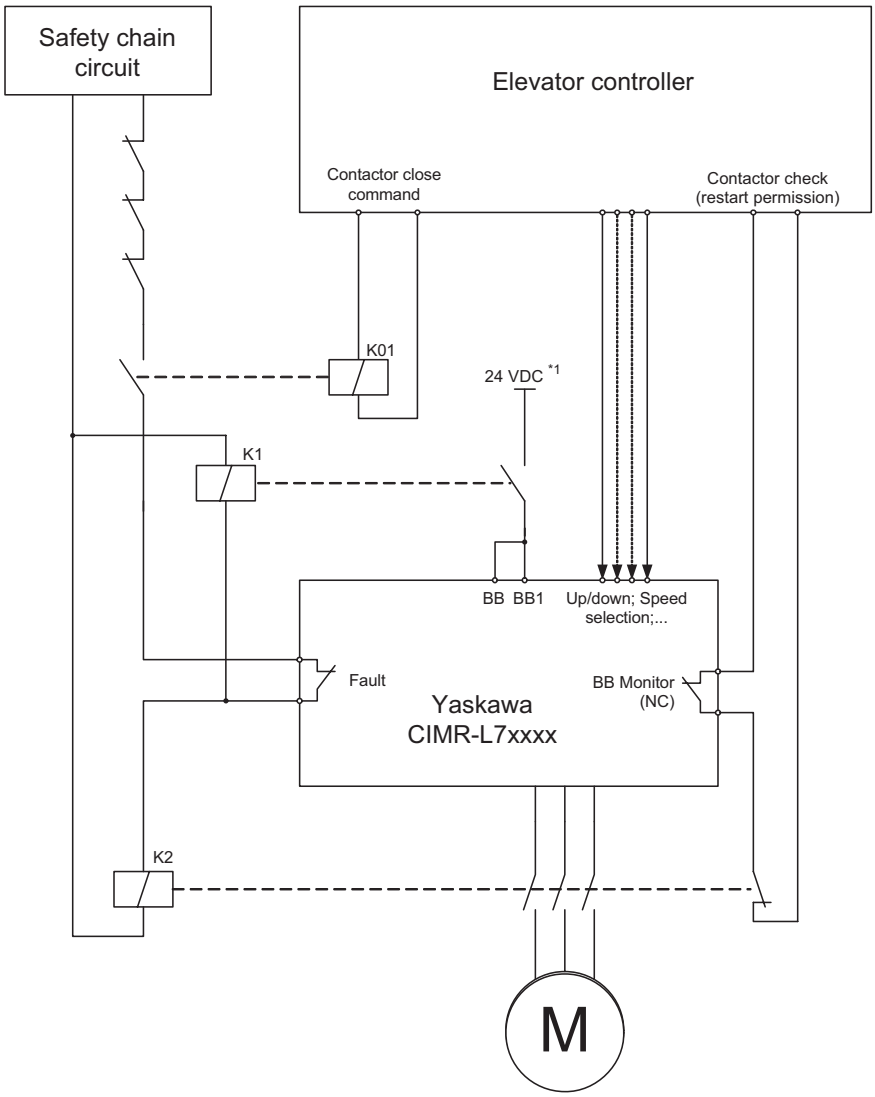
**Wiring**




**Contactor sequence**

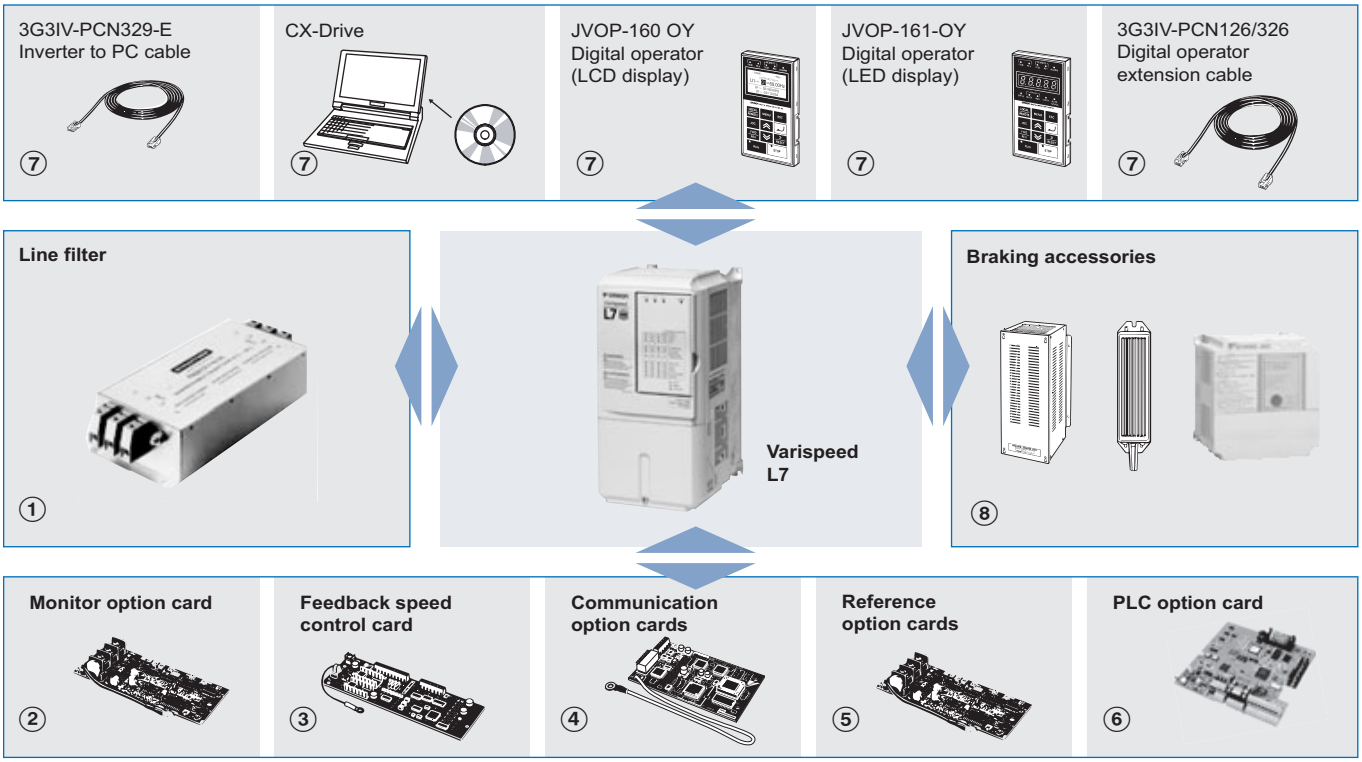
**Safety system**

**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

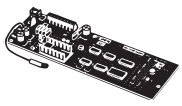
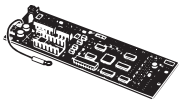
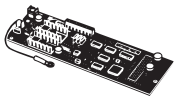
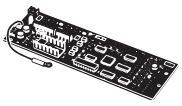
### Botton filters

| 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.).<br>Output channel: Photo coupler 6 channels (48 V, 50 mA or less)<br>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)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, max. current 200 mA]<br>• Pulse monitor output: +12 V, 20 mA |
| | PG-B2 / 3G3FV-PPGB2  | | • Phase A and B pulse inputs (exclusively for complementary input)<br>• PG frequency range: Approx. 30 kHz max.<br>[Power supply output for PG: +12 V, max. current 200 mA]<br>• 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)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, max. current 200 mA]<br>• Pulse monitor output: RS-422 |
| | PG-X2 / 3G3FV-PPGX2  | | • Phase A, B and Z pulse (differential pulse) inputs (RS-422 input)<br>• PG frequency range: Approx. 300 kHz max.<br>[Power supply output for PG: +5 V or +12 V, max. current 200 mA]<br>• Pulse monitor output: RS-422 |
| | PG-F2  | | • Hiperface and endat encoder option. |

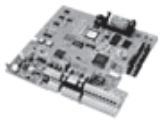
## ④ Communication option cards

| 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.<br>• 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. |

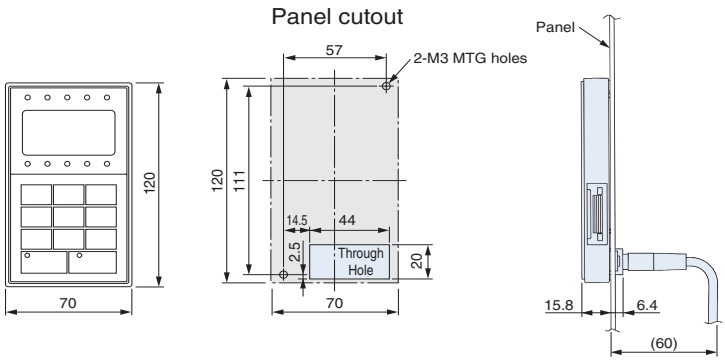
## ⑤ Reference option cards

| Type | Model | Description | Function |
|---|---|---|---|
| Reference option card | AI-14U / 3G3IV-PAI14U | Analog input card | • 2 channel high resolution analog input card<br>• Channel 1: 0 to 10 V (20 KΩ)<br>• Channel 2: 4 to 20 mA (250 Ω)<br>• Resolution 14 bit |
| | AI-14B / 3G3IV-PAI14B | | • 3 channel high resolution analog input card<br>• Signal level: -10 to +10V (20 KΩ)<br>4 to 20 mA (250 Ω)<br>•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.<br>• Embedded Compubus/S fieldbus<br>• 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<br>7 language support |   Panel cutout installation |
| | JVOP-161-OY  | 7 segment LED digital operator | |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>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

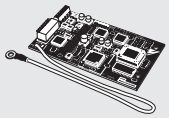
**Braking accessories**

LKEB_ braking
resistor unit

CDBR_B
braking unit

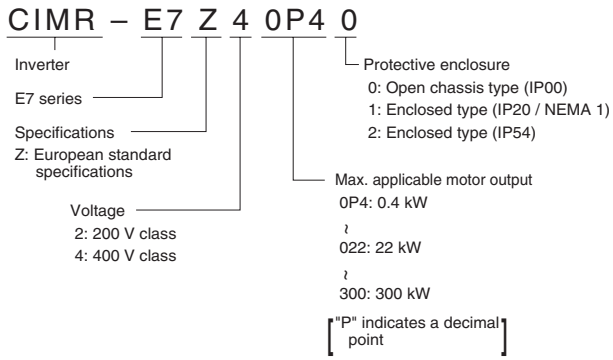
* E7 IP54 types are built-in filter inverters.

**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<br>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.<br>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.<br>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)<br>Open chassis type (IP00): 22 kW or more (same for 200 V and 400 V class inverters)<br>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)<br>- 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)

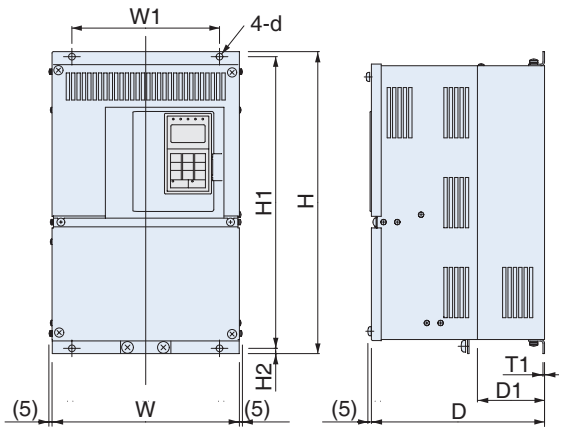



Fig 1

| 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

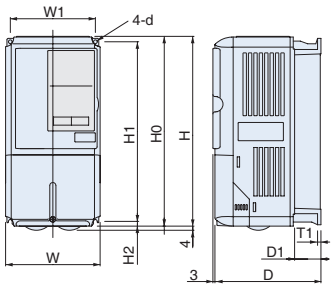



Fig 1

E7Z 27P51 to E7Z20181
E7Z47P51 to E7Z40181

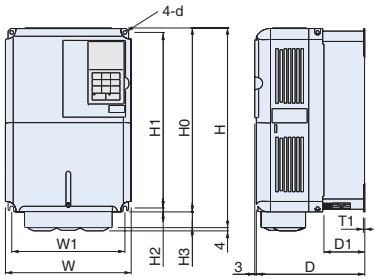



Fig 2

E7Z 20221 to E7Z20751
E7Z40221 to E7Z41601

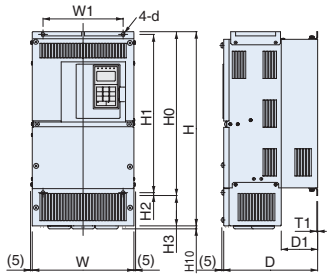
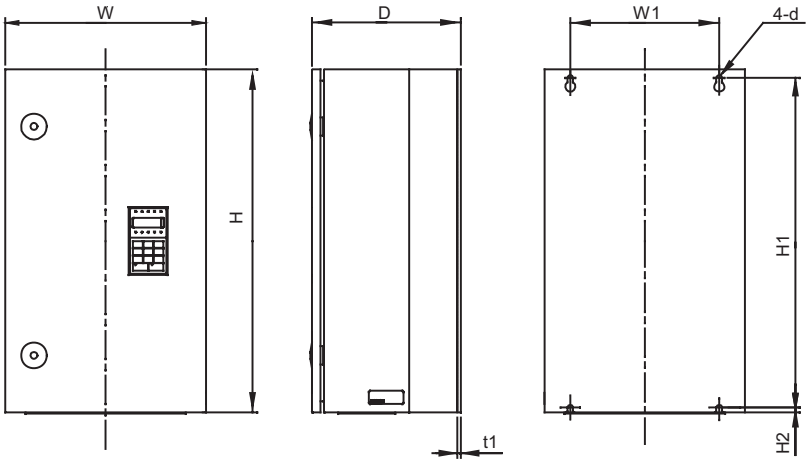



Fig 3

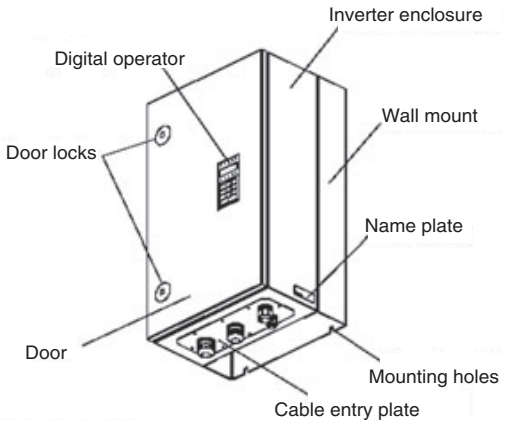
| Voltage | Max. applicable motor output kW | Inverter CIMR-E7Z□ | Fig | Dimensions in mm | | | | | | | | | | | Approx. weight kg | Cooling method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | W | H | D | W1 | H0 | H1 | H2 | H3 | D1 | T1 | d | | |
| 200 V class (3-phase) | 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 | |

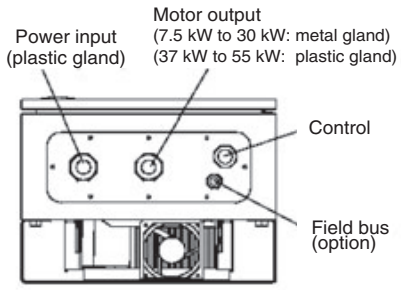
### Enclosed wall-mounted inverters (IP54 type)




| 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

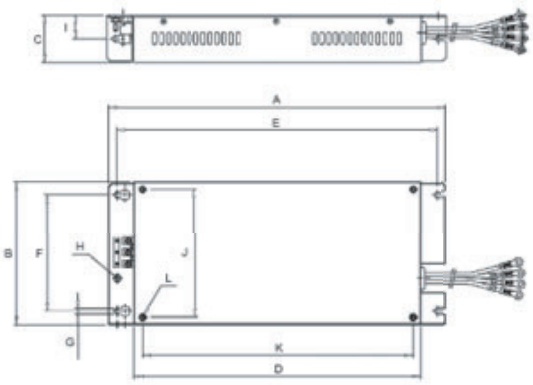
Following parts are delivered in the package with the inverter.

| 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

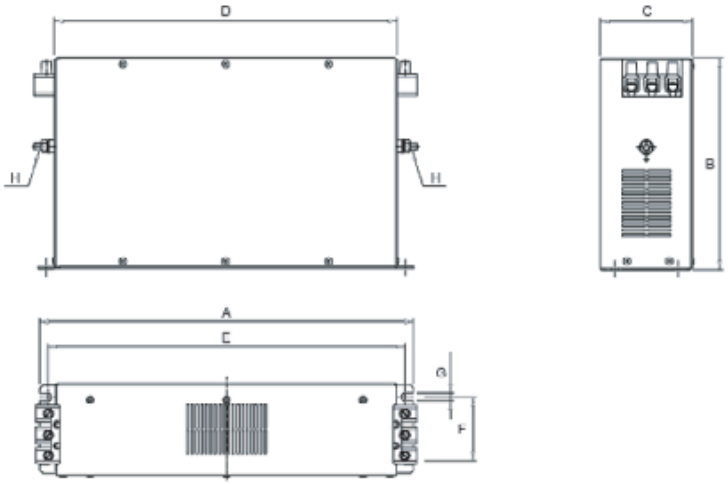
### Footprint / Flat filters



| 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.

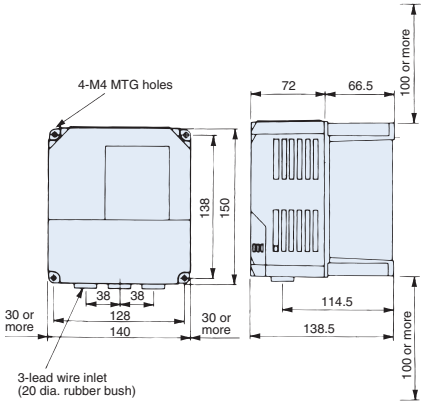
### Bookform filters



| 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 |

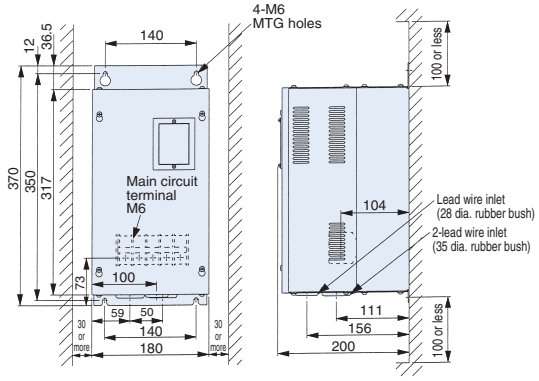
## Braking unit dimensions

**Model CDBR-2015 B, -2022 B, -4030B, -4045 B**



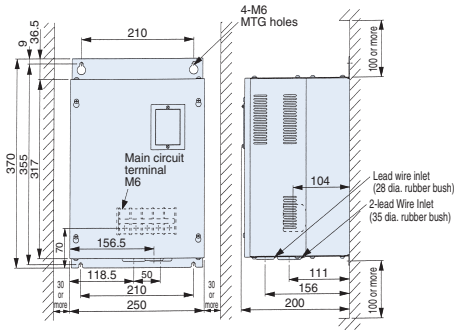

Weight 1.8 Kg

**Model CDBR-2110 B**



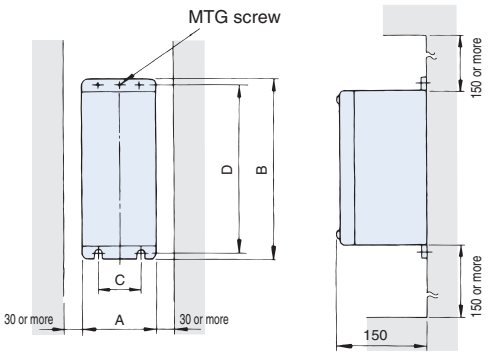

Weight 8.5 Kg

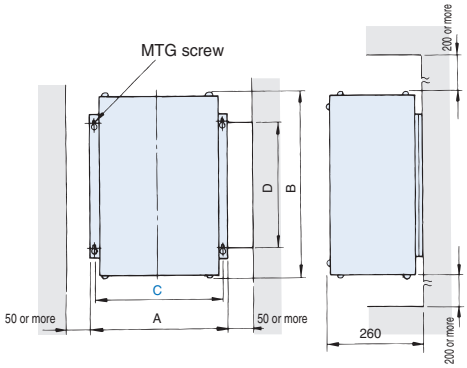
**Model CDBR-4220 B**




Weight 12 Kg

## Braking resistor unit (separately-installed type) dimensions



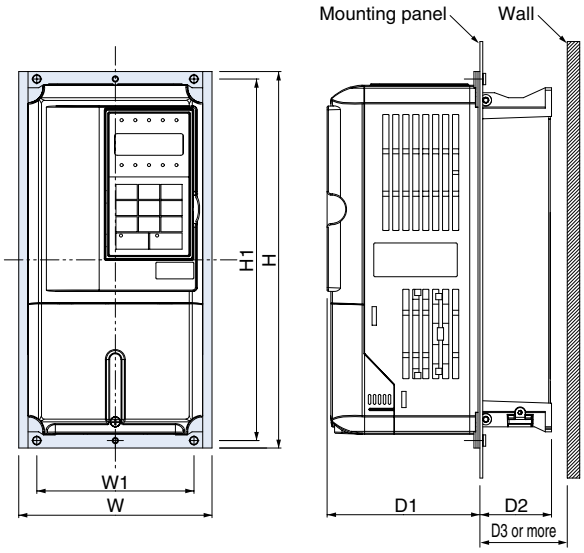

| Voltage | Model LKEB-_ | Dimensions in mm | | | | | Weight kg |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | MTG screw | |
| 220 V class | 20P7 | 105 | 275 | 50 | 260 | M5 x 3 | 3.0 |
| | 21P5 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 22P2 | 130 | 350 | 75 | 335 | M5 x 4 | 4.5 |
| | 23P7 | 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)

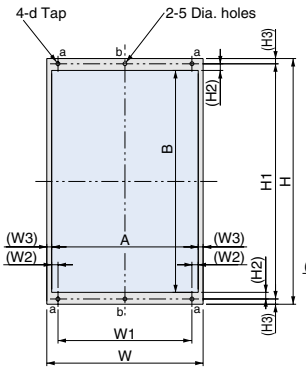



Fig 1

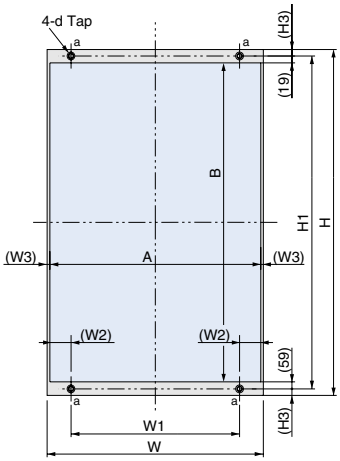



Fig 3

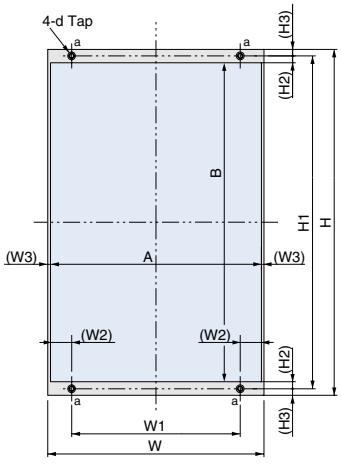


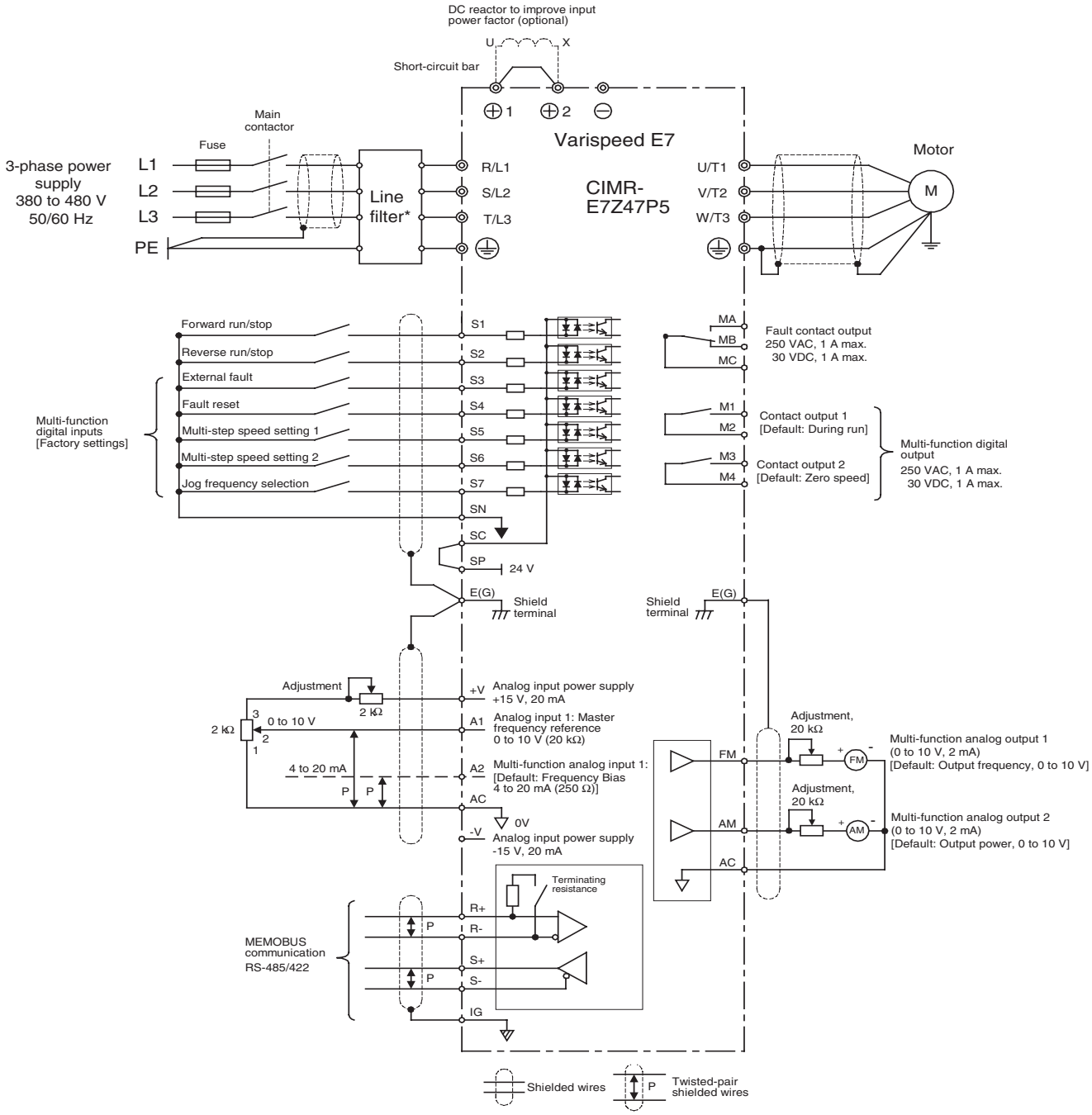

Fig 2

| 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 | 1 | 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 | 2 | 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 | 2 | 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 | 1 | 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 | 2 | 450 | 725 | 325 | 54.5 | 8 | 700 | 13.5 | 12.5 | 434 | 673 | M10 |
| 4090 | | | | | | | | | | | | |
| 4110 | 2 | 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

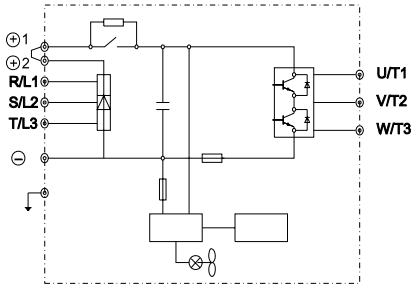
| Voltage | 200 V | | | 400 V | | |
|---|---|---|---|---|---|---|
| Model CIMR-E7Z□ | 20P4 to 2018 | 2022, 2030 | 2037 to 2110 | 40P4 to 4018 | 4022 to 4055 | 4075 to 4300 |
| Max. applicable motor output | 0.4 to 18.5 kW | 22 to 30 kW | 37 to 110 kW | 0.4 to 18.5 kW | 22 to 55 kW | 75 to 300 kW |
| 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 | --- | | | --- | | |
| ⏚ /I2 | ------ | | Cooling fan power supply[2] | --- | | |
| r/I1 | | | | | | Cooling fan power supply[3] |
| ⏚ 200 / I2 200 | ------ | | | --- | | |
| ⏚ 400 / I2 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

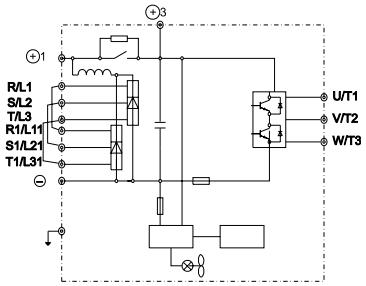
**Main circuit configuration**

**200 V class**

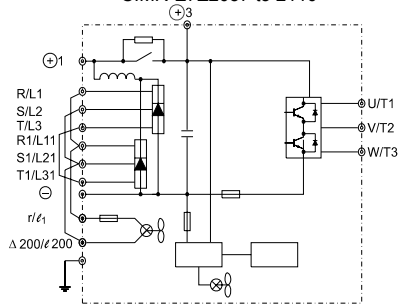
CIMR-E7Z20P4 to 2018




CIMR-E7Z2022, 2030

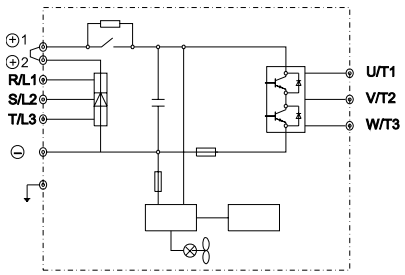



CIMR-E7Z2037 to 2110

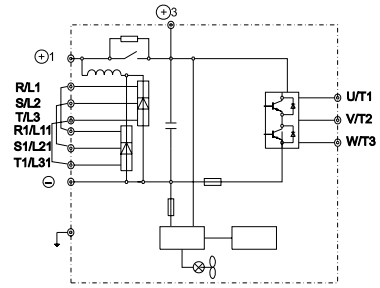



**400 V class**

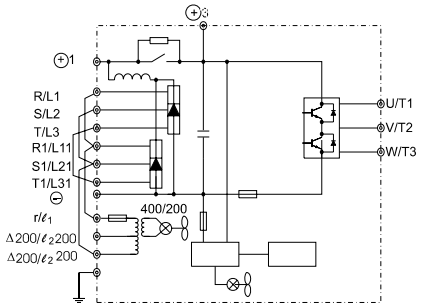
CIMR-E7Z40P4 to 4018




CIMR-E7Z4022 to 4055

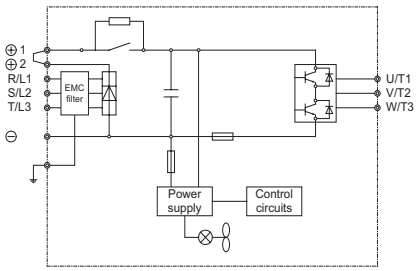



CIMR-E7Z4075 to 4300

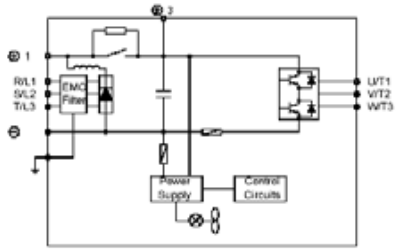



**400V class IP54**

CIMR-E7Z47P5 to 40182




CIMR-E7Z40222 to 40552



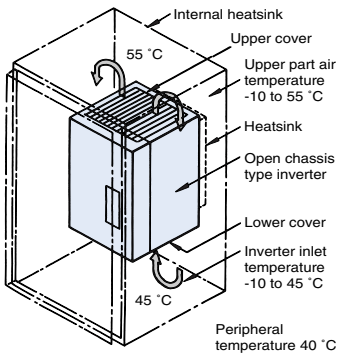
## Control circuit

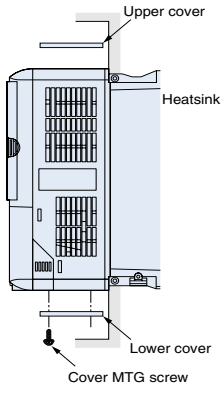
| Type | No. | Signal name | Function | | Signal level |
|---|---|---|---|---|---|
| Digital input signals | S1 | Forward run/stop command | Forward run when ON; stopped when OFF. | | 24 VDC, 8 mA photocoupler isolation |
| | S2 | Reverse run/stop command | Reverse run when ON; stopped when OFF. | | |
| | 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%<br>0 V to +10 V/100%<br>0 to 20 mA/100% | Function is selected by setting H3-09. | 4 to 20 mA (250 Ω)<br>0 V to +10 V (20 kΩ)<br>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<br>contact capacity:<br>1 A max. at 250 VAC<br>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<br>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%<br>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 | – | | – |

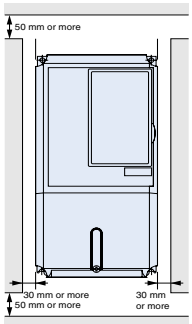
Note: 1.The default settings are given for terminals S3 to S7. For a 3-wire sequence, the default settings are a 3-wire sequence for S5, multi-step speed setting 1 for S6 and multi-step speed setting 2 for S7.
2.Do not use this power supply for supplying any external equipment.
3.When driving a reactive 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.

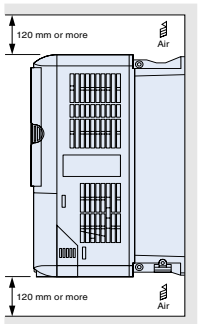
When using open chassis type inverters of 200 V/400 V 22 kW or more, secure spaces for eyebolts and wiring of the main circuit.



Side spaces



Top and bottom spaces

### Inverter heat loss

## 200 V class

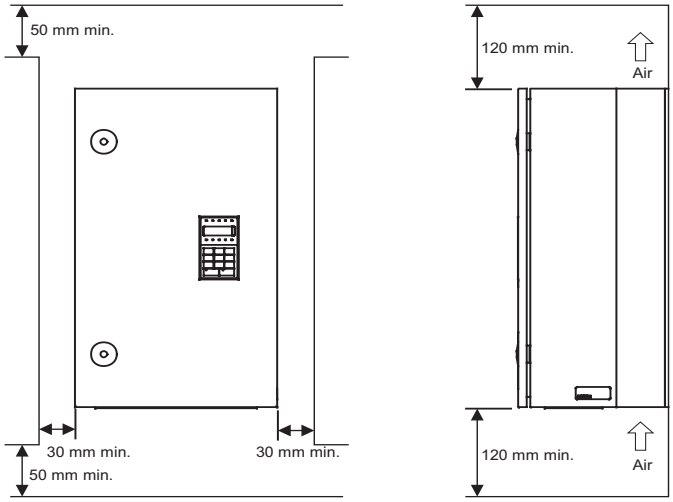
| Model CIMR-E7Z□ | | | 20P4 | 20P7 | 21P5 | 22P2 | 23P7 | 25P5 | 27P5 | 2011 | 2015 | 2018 | 2022 | 2030 | 2037 | 2045 | 2055 | 2075 | 2090 | 2110 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter capacity | | kVA | 1.2 | 1.6 | 2.7 | 3.7 | 5.7 | 8.8 | 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

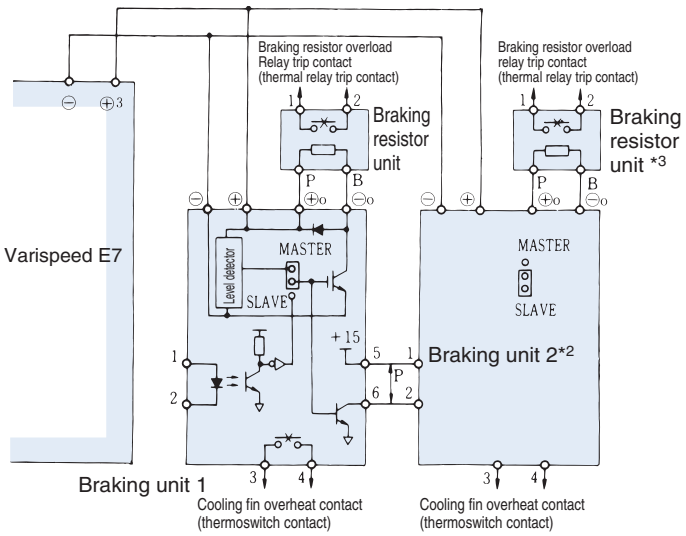
Install the inverter vertically in order to ensure a proper cooling. When installing the inverter, always provide the following minimum installation space to allow normal heat dissipation.




Horizontal space　　Vertical space

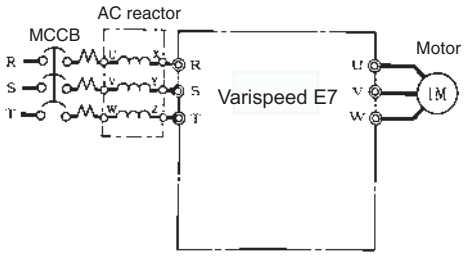
1. Always provide enough space for the main circuit or control lines including cable gland.
2. If installing inverters next to one another provide a minimum spacing of 60 mm.

## Connections for braking units

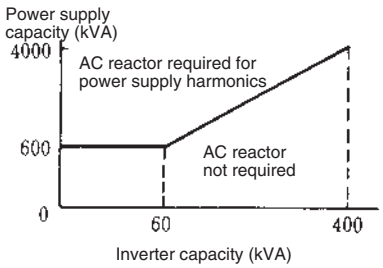



## AC reactor

Connection example

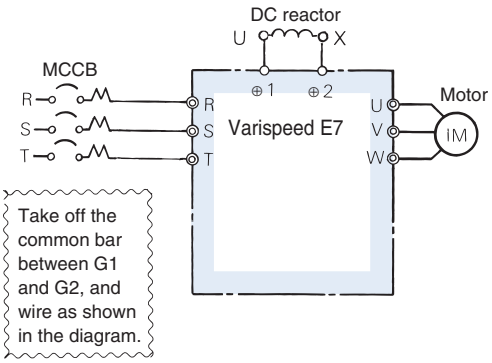


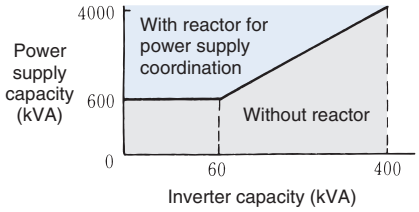

Application example




| 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 | |

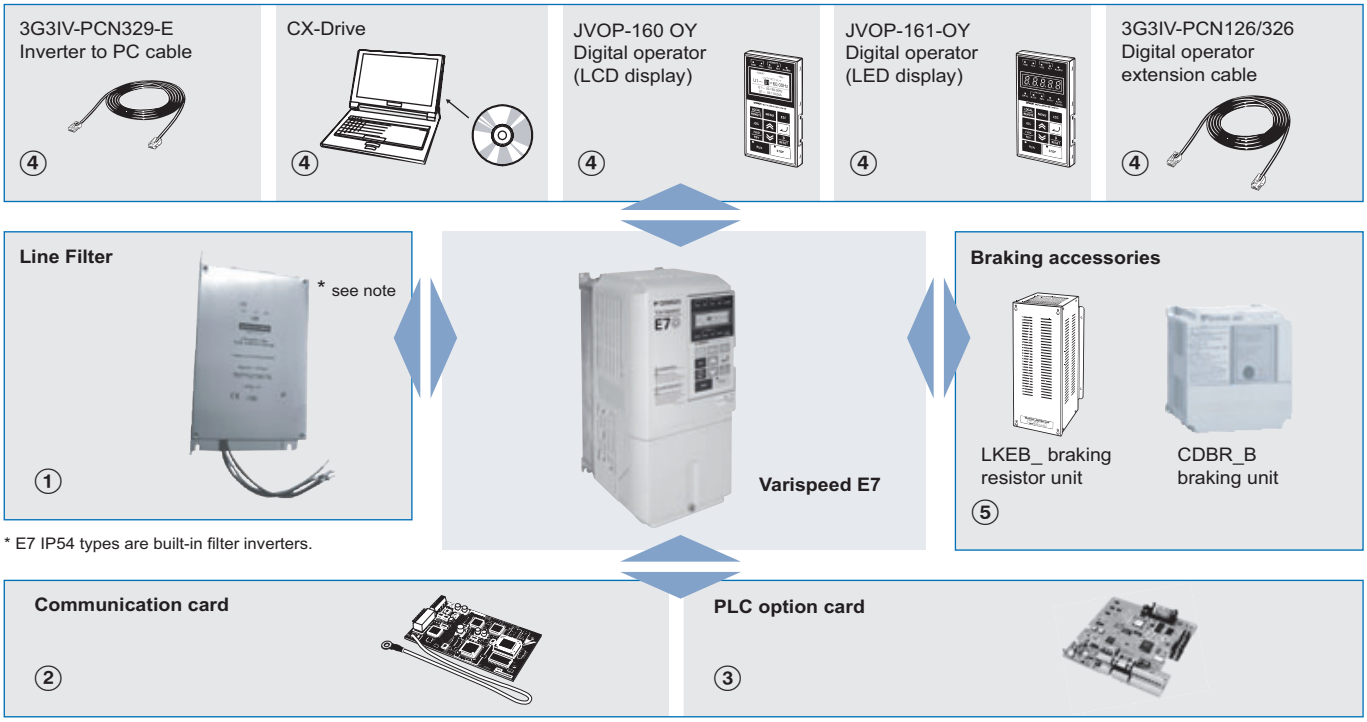
### Fuse installation

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.

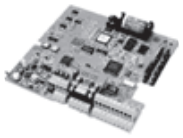
### 400 V

| 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 |

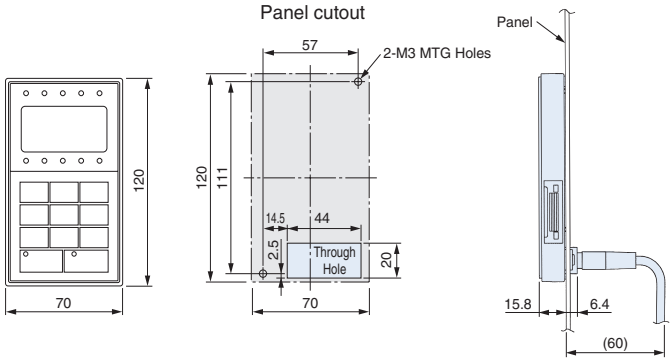
## ② Communication cards

| 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<br>  <br>3G3-P10CDT-E-DRT | PLC option | • Full features, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs<br>• Embedded Compobus/S fieldbus<br>• 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<br>  | 5 lines LCD digital operator [1] |  <br>Panel cutout installation |
| | JVOP-161-OY<br>  | 7 segment LED digital operator | |
| | JVOP-162<br>  | Hand-Off auto operator | |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>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<br>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.

VZ

# V1000

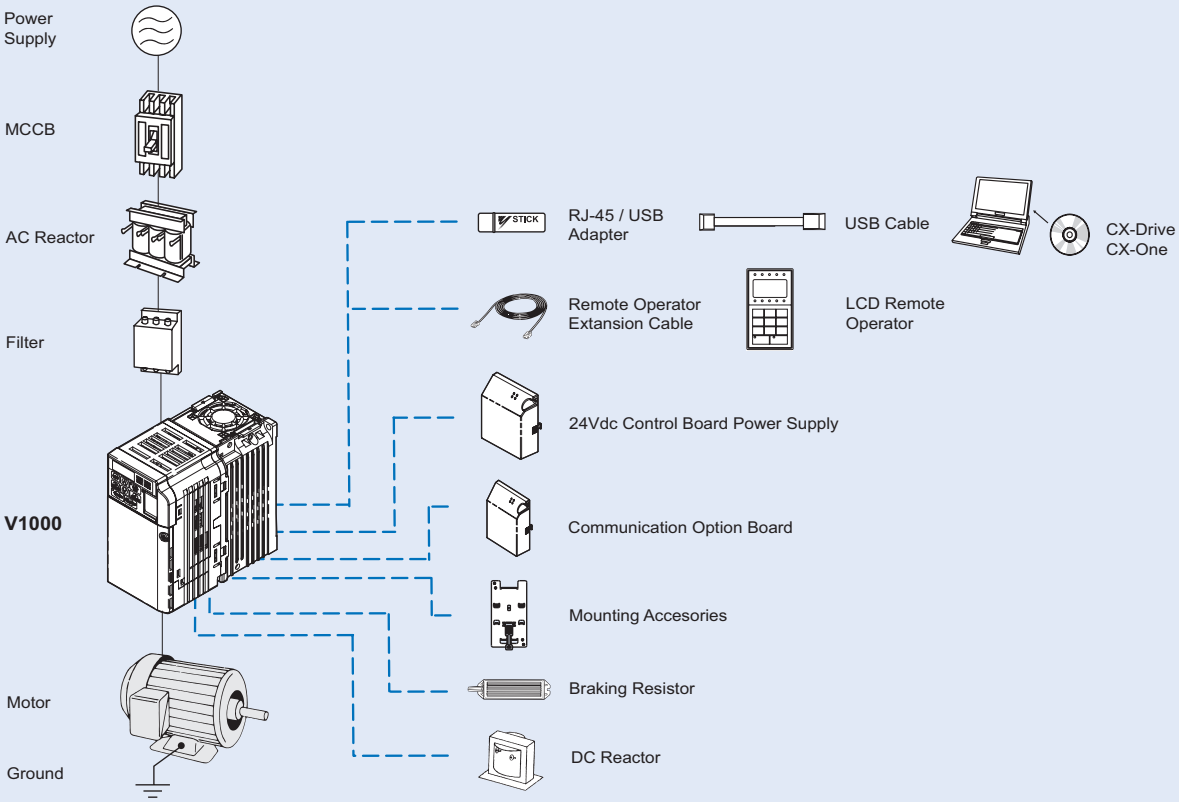

## More performance & Quality in less space

- Current vector control
- High starting torque (200% / 0.5 Hz)
- 1:100 speed control range
- Double rating ND 120%/1min and HD 150%/1 min
- IM&PM motor control
- Online Tuning
- Low-noise Low carrier technology
- 10 years lifetime design
- Built-in filter
- Screw-less terminals
- Control Terminals with memory backup
- 24 VDC control board power supply option
- Fieldbus communications: Modbus, Profibus, CanOpen, DeviceNet, Lonworks, CompoNet, Ethernet
- Safety embedded (EN954-1 safety cat. 3)
- CE, UL, cUL and TUV

## Ratings

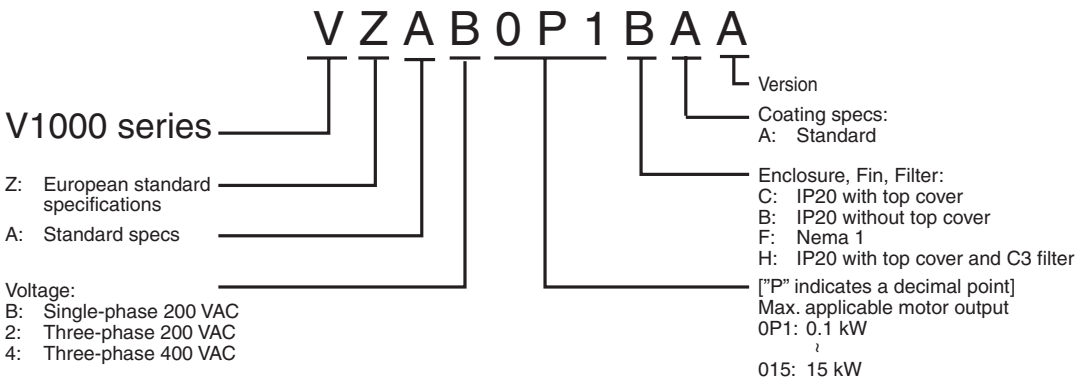
- 200 V Class single-phase 0.1 to 4 kW
- 200 V Class three-phase 0.1 to 15 kW
- 400 V Class three-phase 0.2 to 15 kW

## System configuration



## Specifications

### Type designation




### 200 V class

| Single-phase: VZ-□ | | B0P1 | B0P2 | B0P4 | B0P7 | B1P5 | B2P2 | B4P0 | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Three-phase: VZ-□ | | 20P1 | 20P2 | 20P4 | 20P7 | 21P5 | 22P2 | 24P0 | 25P5 | 27P5 | 2011 | 2015 |
| Motor kW[1] | For HD setting | 0.12 | 0.25 | 0.4 | 0.75 | 1.5 | 2.2 | 4.0 | 5.5 | 7.5 | 11 | 15 |
| | For ND setting | 0.18 | 0.37 | 0.75 | 1.1 | 2.2 | 3.0 | 5.5 | 7.5 | 11 | 15 | 18.5 |
| Output characteristics | Inverter capacity kVA | 0.3 | 0.6 | 1.1 | 1.9 | 3.0 | 4.2 | 6.7 | 9.5 | 13 | 18 | 23 |
| | Rated output current (A) at HD | 0.8 | 1.6 | 3.0 | 5.0 | 8.0 | 11.0 | 17.5 | 25.0 | 33.0 | 47.0 | 60.0 |
| | Rated output current (A) at ND | 1.2 | 1.9 | 3.5 | 6.0 | 9.6 | 12.0 | 21.0 | 30.0 | 40.0 | 56.0 | 69.0 |
| | 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<br>3-phase 200..240 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:
Heavy Duty (HD) mode with a 150% overload capacity
Normal Duty (ND) mode with a 120% overlaod capacity

### 400 V class

| Three-phase: VZ-□ | | 40P2 | 40P4 | 40P7 | 41P5 | 42P2 | 43P0 | 44P0 | 45P5 | 47P5 | 4011 | 4015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor kW[1] | For HD setting | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.0 | 4.0 | 5.5 | 7.5 | 11 | 15 |
| | For ND setting | 0.37 | 0.75 | 1.5 | 2.2 | 3.0 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 |
| Output characteristics | Inverter capacity kVA | 0.9 | 1.4 | 2.6 | 3.7 | 4.2 | 5.5 | 7.2 | 9.2 | 14.8 | 18 | 24 |
| | Rated output current (A) at HD | 1.2 | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 | 14.8 | 18.0 | 24 | 31 |
| | Rated output current (A) at ND | 1.2 | 2.1 | 4.1 | 5.4 | 6.9 | 8.8 | 11.1 | 17.5 | 23 | 31 | 38 |
| | Max. output voltage | 0..480V (proportional to input voltage) | | | | | | | | | | |
| | Max. output frequency | 400 Hz | | | | | | | | | | |
| Power supply | Rated input voltage and frequency | 3-phase 380..480 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:
Heavy Duty (HD) mode with a 150% overload capacity
Normal Duty (ND) mode with a 120% overlaod capacity

# Specifications

## Commom specifications

| Model number VZ-□ | | Specifications |
|---|---|---|
| Control functions | Control methods | Sine wave PWM (V/f control, sensorless current vector control) |
| | Output frequency range | 0.1..400 Hz |
| | Frequency tolerance | Digital set value: ±0.01% (-10..+50 ºC) |
| | | Analogue set value: ±0.1% (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 | Heavy duty use: 150% rated output current for one minute<br>Normal duty use: 120% rated output current for one minute |
| | Frequency set value | 0..10 V (20 kΩ), 4..20 mA (250 Ω), 0..20 mA (250 Ω)<br>Pulse train input, frequency setting value (selectable) |
| | Braking torque (short term peak torque) | Short-term average deceleration torque: 150% (up 1.5 kW), 100% (for 1.5 kW), 50% (for 2.2 kW), 20% (fof bigger size)<br>Continous regenerative torque: Aprox 20% (125% with optional braking resistor, 10%ED, 10 s, braking transistor built itn) |
| | V/f Characteristics | Possible to program any V/f pattern |
| Functionality | Inputs signals | Seven 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, speed search command, UP/DOWN command, accel/decel hold command, LOCAL/REMOTE selection, communication/control circuit terminal selection, mergency stop fault, emergency stop alarm, self test |
| | Output signals | Following output signals are selectable (NO/NC contact output, 2 photo-coupler outputs): Fault, running, zero speed, speed agree, 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 | Open-loop vector control, full-range automatic torque boost, slip compensation, 17-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, MEMOBUS communications (RS-485/422, max. 115K bps), fault retry, speed search, frequency upper/lower limit setting, overtorque detection, frequency jump, accel/decel time switch, accel/decel prohibited, S-curve accel/decel, PID control, energy-saving control, constant copy. |
| | 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 | Heavy Duty: Motor coasts to a stop after 1 minute at 150% of inverter rated output current<br>Normal Duty: Motor coasts to a stop after 1 minute at 120% 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. 190 V or less (double for 400 V class)<br>(approx. 150 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 thermister |
| | Stall prevention level | Stall prevention during acceleration/deceleration and constant speed operation |
| | Ground fault | Protected by electronic circuit (operation level is approx. 250% of rated output current) |
| | Power charge indication | Indicates until the main circuit voltage reaches 50 V. |
| Ambient conditions | Degree of protection | IP20, NEMA1 |
| | Cooling | Cooling fan is provided for 200 V, 0.75 kW (1HP) (3/single-phase)<br>400 V, 1.5 kW (2HP) (3-phase), others are self-cooling |
| | Ambient humidity | 95% RH or less (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 | Up to 1 G at 10 to less than 20 Hz, Up to 0.65 G at 20 to 50 Hz |

## Dimensions

### IP 20 type 0.1 to 4 kW

Figure 1

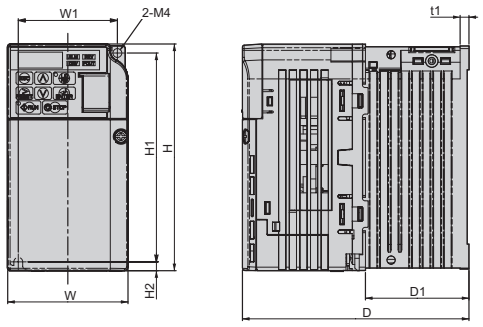
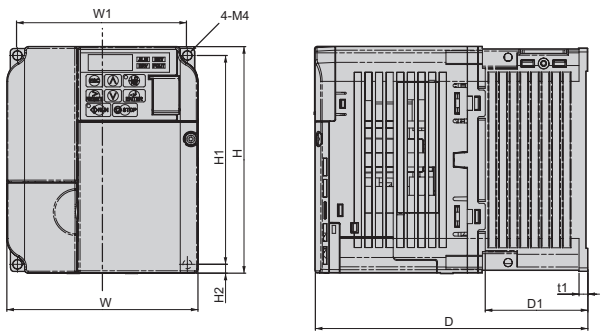
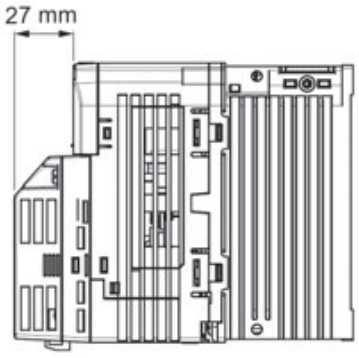



Figure 2

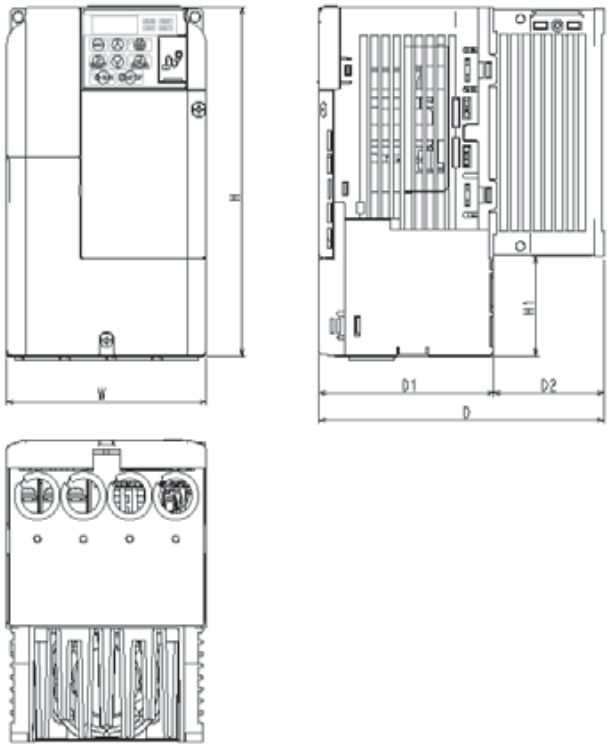



| Voltage class | Max. applicable motor output kW | Inverter model VZA | Figure | Dimensions in mm | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | W1 | H1 | W | H | D | t1 | H2 | D1 | H3 | H4 | Weight |
| Single-phase 200 V | 0.12 | B0P1 | 1 | 56 | 118 | 68 | 128 | 76 | 3 | 5 | 6.5 | - | - | 0.6 |
| | 0.25 | B0P2 | | | | | | | | | | | | 0.7 |
| | 0.55 | B0P4 | | | | | | 108 | 5 | | 38.5 | | | 1.0 |
| | 1.1 | B0P7 | 2 | 96 | | 108 | | 137.5 | | | 58 | | | 1.5 |
| | 1.5 | B1P5 | | | | | | 154 | | | | | | 1.5 |
| | 2.2 | B2P2 | | 128 | | 140 | | 163 | | | 65 | | | 2.1 |
| | 4.0 | B4P0 | Under development | | | | | | | | | | | |
| Three-phase 200 V | 0.12 | 20P1 | 1 | 56 | 118 | 68 | 128 | 76 | 3 | 5 | 6.5 | - | - | 0.6 |
| | 0.25 | 20P2 | | | | | | | | | | | | 0.6 |
| | 0.55 | 20P4 | | | | | | 108 | 5 | | 38.5 | | | 0.9 |
| | 1.1 | 20P7 | | | | | | 128 | | | | | | 1.1 |
| | 1.5 | 21P5 | 2 | 96 | | 108 | | 129 | | | 58 | | | 1.3 |
| | 2.2 | 22P2 | | | | | | 137.5 | | | | | | 1.4 |
| | 4.0 | 24P0 | | 128 | | 140 | | 143 | | | 65 | | | 2.1 |
| | 5.5 | 25P5 | 3 | 122 | 248 | 140 | 254 | 140 | - | 6 | 55 | 13 | 6.2 | 3.8 |
| | 7.5 | 27P5 | | | | | | | | | | | | 3.8 |
| | 11 | 2011 | | 160 | 284 | 180 | 290 | 163 | | 8 | 75 | 15 | | 5.5 |
| | 15 | 2015 | | 192 | 336 | 220 | 358 | 187 | | 7 | 78 | | 7.2 | 9.2 |
| Three-phase 400 V | 0.37 | 40P2 | 2 | 96 | 118 | 108 | 128 | 81 | 5 | 5 | 10 | - | - | 0.8 |
| | 0.55 | 40P4 | | | | | | 99 | | | 28 | | | 1.0 |
| | 1.1 | 40P7 | | | | | | 137.5 | | | 58 | | | 1.4 |
| | 1.5 | 41P5 | | | | | | 154 | | | | | | 1.5 |
| | 2.2 | 42P2 | | | | | | | | | | | | 1.5 |
| | 3.0 | 43P0 | | | | | | | | | | | | 1.5 |
| | 4.0 | 44P0 | | 128 | | 140 | | 143 | | | 65 | | | 2.1 |
| | 5.5 | 45P5 | 3 | 122 | 248 | 140 | 254 | 140 | - | 6 | 55 | 13 | 6 | 3.8 |
| | 7.5 | 47P5 | | | | | | | | | | | 6.2 | 3.8 |
| | 11 | 4011 | | 160 | 284 | 180 | 290 | 143 | | 8 | | 15 | 6 | 5.2 |
| | 15 | 4015 | | | | | | 163 | | | 75 | | | 5.5 |

### V1000 + Option board

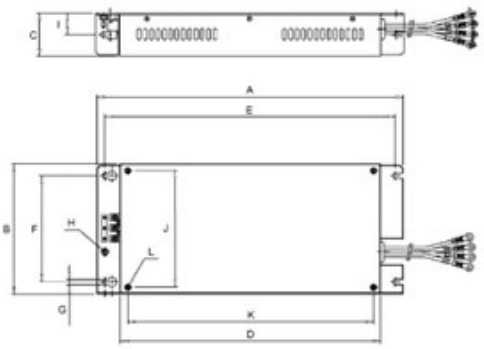


## Built-in Filter Dimensions



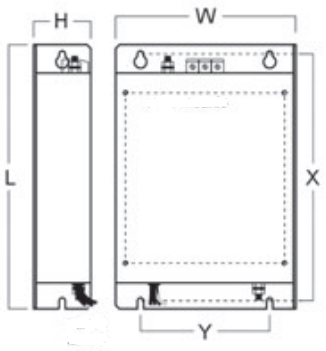

| VZA- | Dimensions in mm | | | | | |
|---|---|---|---|---|---|---|
| | W | H | H1 | D1 | D2 | D |
| B0P1 | 68 | 178 | 50 | 69.5 | 6.5 | 76 |
| B0P2 | | | | | | |
| B0P4 | | | | 79.5 | 38.5 | 118 |
| B0P7 | 108 | | | 77.9 | 59.6 | 137.5 |
| B1P5 | | | | 89.4 | 64.6 | 154 |
| B2P2 | 140 | 183 | 55 | 96.4 | 66.6 | 163 |
| B4P0 | Under development | | | | | |
| 40P2 | 108 | 178 | 50 | 69.4 | 11.6 | 81 |
| 40P4 | | | | | 29.6 | 99 |
| 40P7 | | | | 77.9 | 59.6 | 137.5 |
| 41P5 | | | | 94.4 | | 154 |
| 42P2 | | | | | | |
| 43P0 | | | | | | |
| 44P0 | 140 | 183 | 55 | 76.4 | 66.6 | 143 |
| 45P5 | Under development | | | | | |
| 47P5 | | | | | | |
| 4011 | | | | | | |
| 4015 | | | | | | |

## Schaffner footprint Filters




| Schaffner model | | Dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L |
| 3x200 V | A1000-FIV2010-SE | 194 | 82 | 50 | 160 | 181 | 62 | 5.3 | M5 | 25 | 56 | 118 | M4 |
| | A1000-FIV2020-SE | 169 | 111 | 50 | 135 | 156 | 91 | 5.5 | M5 | 25 | 96 | 118 | M4 |
| | A1000-FIV2030-SE | 174 | 144 | 50 | 135 | 161 | 120 | 5.3 | M5 | 25 | 128 | 118 | M4 |
| | A1000-FIV2050-SE | Under development | | | | | | | | | | | |
| | A1000-FIV2100-SE | | | | | | | | | | | | |
| 1x200 V | A1000-FIV1010-SE | 169 | 71 | 45 | 135 | 156 | 51 | 5.3 | M5 | 22 | 56 | 118 | M4 |
| | A1000-FIV1020-SE | 169 | 111 | 50 | 135 | 156 | 91 | 5.3 | M5 | 25 | 96 | 118 | M4 |
| | A1000-FIV1030-SE | 174 | 144 | 50 | 135 | 161 | 120 | 5.3 | M5 | 25 | 128 | 118 | M4 |
| | A1000-FIV1040-SE | 174 | 144 | 50 | 135 | 161 | 150 | 5 | M5 | 25 | 158 | 118 | M4 |
| 3x400 V | A1000-FIV3005-SE | 169 | 111 | 45 | 135 | 156 | 91 | 5.3 | M5 | 22 | 96 | 118 | M4 |
| | A1000-FIV3010-SE | 169 | 111 | 45 | 135 | 156 | 91 | 5.3 | M5 | 22 | 96 | 118 | M4 |
| | A1000-FIV3020-SE | 174 | 144 | 50 | 135 | 161 | 120 | 5 | M5 | 25 | 128 | 118 | M4 |
| | A1000-FIV3030-SE | 304 | 184 | 56 | 264 | 288 | 150 | 6 | M5 | 28 | 164 | 244 | M5 |
| | A1000-FIV3050-SE | Under development | | | | | | | | | | | |

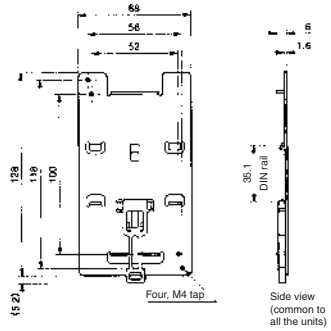
## Rasmi footprint Filters



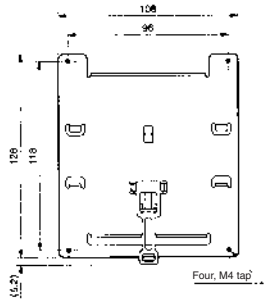

| Rasmi model | | Dimensions | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| | | W | H | L | X | Y | M | KG |
| 3x200 V | A1000-FIV2010-RE | 82 | 50 | 194 | 181 | 62 | M4 | 0.8 |
| | A1000-FIV2020-RE | 111 | 50 | 194 | 181 | 62 | M4 | 1.1 |
| | A1000-FIV2030-RE | 144 | 50 | 174 | 161 | 120 | M4 | 1.3 |
| | A1000-FIV2060-RE | 150 | 52 | 320 | 290 | 122 | M5 | 2.4 |
| | A1000-FIV2100-RE | 188 | 62 | 362 | 330 | 160 | M5 | 4.2 |
| 1x200 V | A1000-FIV1010-RE | 71 | 45 | 169 | 156 | 51 | M4 | 0.6 |
| | A1000-FIV1020-RE | 111 | 50 | 169 | 156 | 91 | M4 | 1.0 |
| | A1000-FIV1030-RE | 144 | 50 | 174 | 161 | 120 | M4 | 5.3 |
| | A1000-FIV1040-RE | Under development | | | | | | |
| 3x400 V | A1000-FIV3005-RE | 111 | 45 | 169 | 156 | 91 | M4 | 1.1 |
| | A1000-FIV3010-RE | 111 | 45 | 169 | 156 | 91 | M4 | 1.1 |
| | A1000-FIV3020-RE | 144 | 50 | 174 | 161 | 120 | M4 | 1.3 |
| | A1000-FIV3030-RE | 150 | 52 | 306 | 290 | 122 | M5 | 2.1 |
| | A1000-FIV3050-RE | 182 | 62 | 357 | 330 | 160 | M5 | 2.9 |

## DIN rail mounting bracket

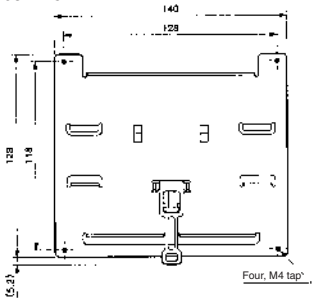
EZZ08122A



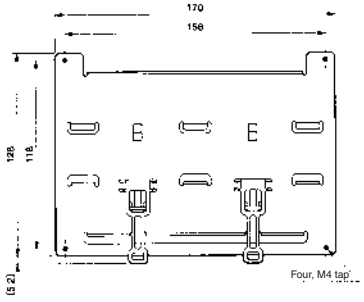

EZZ08122B




EZZ08122C



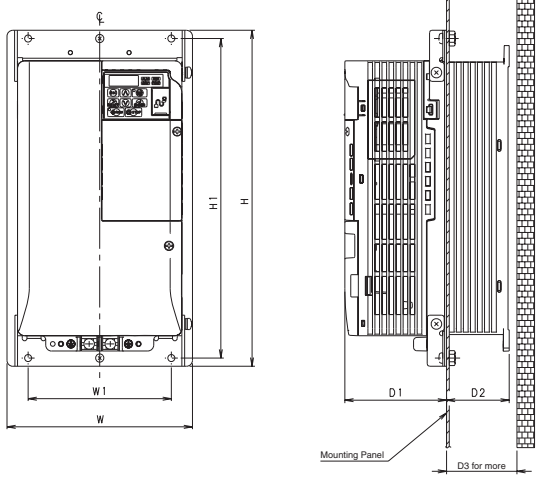

EZZ08122D




| Inverter | | DIN rail mounting bracket |
|---|---|---|
| 3-phase 200 VAC | VZ - 20P1/ 20P2 / 20P4/ 20P7 | EZZ08122A |
| | VZ - 21P5/ 22P2 | EZZ08122B |
| | VZ - 24P0 | EZZ08122C |
| Single-phase 200 VAC | VZ - B0P1/ B0P2/ B0P4 | EZZ08122A |
| | VZ - B0P7/ B1P5 | EZZ08122B |
| | VZ - B2P2 | EZZ08122C |
| | VZ - B4P0 | EZZ08122D |
| 3-phase 400 VAC | VZ - 40P2/ 40P4/ 40P7/ 41P5/ 42P2 | EZZ08122B |
| | VZ - 44P0 | EZZ08122C |

## Heatsink attachment and Panel cut dimensions

Heatsink External Mounting Attachment




Panel Cit for External Mounting of Cooling Fin (Heatsink)

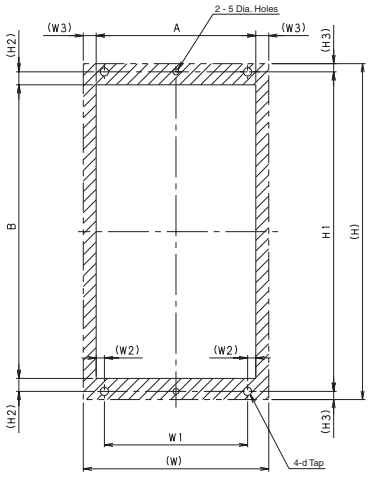



Fig 1

| VZA | | Reference | Frame | | | | | | | Panel Cutting | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | W | H | W1 | H1 | D1 | D2 | D3 | Fig | (W2) | (W3) | (H2) | (H3) | A | B |
| 3x200v | 20P1 | 100-034-075 | 68 | 128 | 56 | 118 | 69.2 | 12 | 30 | 2 | - | | | | | |
| | 20P2 | | | | | | | | | | | | | | | |
| | 20P4 | 100-034-076 | | | | | | 42 | 50 | | | | | | | |
| | 20P7 | 100-034-077 | | | | | | 62 | 70 | | | | | | | |
| | 21P5 | 100-034-079 | 108 | | 96 | | 71 | 58 | 70 | 3 | - | | | | | |
| | 22P2 | | | | | | 79.5 | | | | | | | | | |
| | 24P0 | 100-034-080 | 140 | | 128 | | 86.5 | 53.5 | 60 | 4 | - | | | | | |
| | 25P5 | 100-036-300 | 158 | 286 | 122 | 272 | 86.6 | 53.4 | 60 | 1 | 9 | 9 | 8.5 | 7 | 140 | 255 |
| | 27P5 | | | | | | | | | | | | | | | |
| | 2011 | 100-036-301 | 198 | 322 | 160 | 308 | 89.6 | 73.4 | 80 | | 10 | | 10.5 | | 180 | 287 |
| | 2015 | 100-036-302 | 241 | 380 | 192 | 362 | 110.6 | 76.4 | 85 | | 14 | 10.5 | 10.5 | 9 | 220 | 341 |
| 1X200v | B0P1 | 100-034-075 | 68 | 128 | 56 | 118 | 69.2 | 12 | 30 | 2 | - | | | | | |
| | B0P2 | | | | | | | | | | | | | | | |
| | B0P4 | 100-034-076 | | | | | 79.2 | 42 | 50 | | | | | | | |
| | B0P7 | 100-035-418 | 108 | | 96 | | 79.5 | 58 | 70 | 3 | - | | | | | |
| | B1P5 | 100-034-079 | | | | | 96 | | | | | | | | | |
| | B2P2 | 100-034-080 | 140 | | 128 | | 98 | 65 | | 4 | - | | | | | |
| | B4P0 | 100-036-357 | Under development | | | | | | | | | | | | | |
| 3X400v | 40P2 | 100-034-078 | 108 | 128 | 96 | 118 | 71 | 13.2 | 30 | 3 | - | | | | | |
| | 40P4 | 100-036-418 | | | | | | 28 | 40 | | | | | | | |
| | 40P7 | | | | | | 79.5 | 58 | 70 | | | | | | | |
| | 41P5 | 100-034-079 | | | | | 96 | | | | | | | | | |
| | 42P2 | | | | | | | | | | | | | | | |
| | 43P0 | | | | | | | | | | | | | | | |
| | 44P0 | 100-034-080 | 140 | | 128 | | 78 | 65 | | 4 | - | | | | | |
| | 45P5 | 100-036-300 | 158 | 286 | 122 | 272 | 86.6 | 53.4 | 60 | 1 | 9 | 9 | 8.5 | 7 | 140 | 255 |
| | 47P5 | | | | | | | | | | | | | | | |
| | 4011 | 100-036-301 | 198 | 322 | 160 | 308 | | | | | 10 | | 10.5 | | 180 | 287 |
| | 4015 | | | | | | | 73.4 | 80 | | | | | | | |

Fig 2

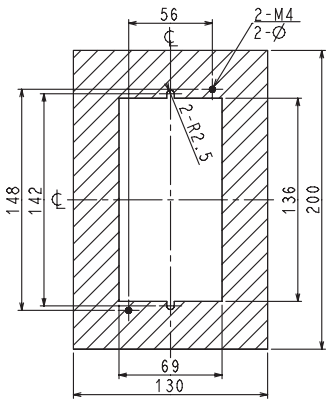



Fig 3

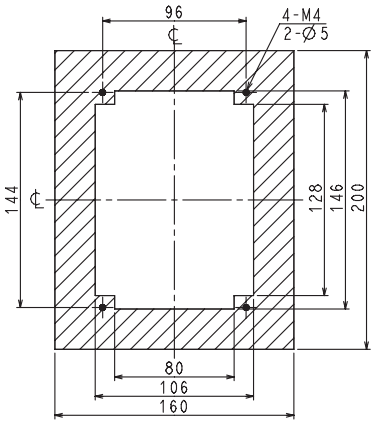
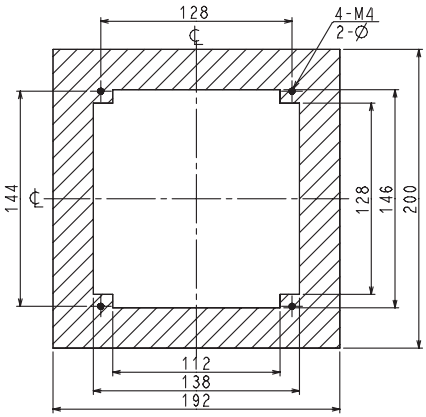
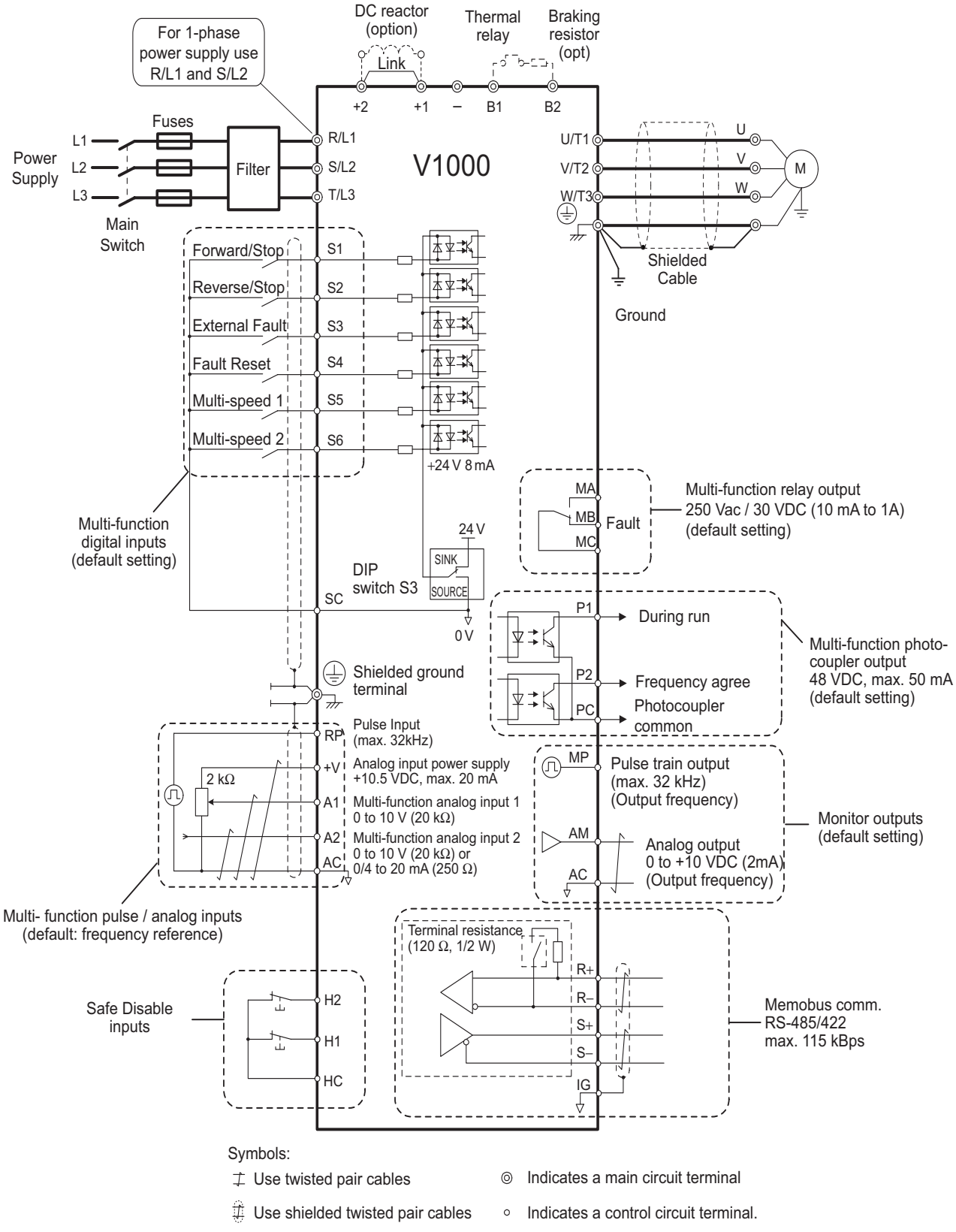



Fig 4



**Standard connections**

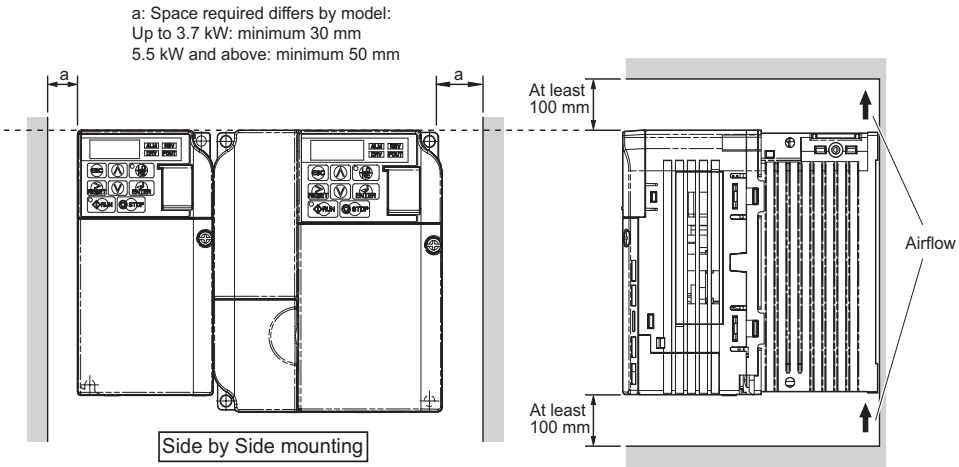


## Main circuit

| Terminal | Name | Function (signal level) |
|---|---|---|
| **R/L1, S/L2, T/L3** | Main circuit power supply input | Used to connect line power to the drive.<br>Drives with single-phase 200 V input power use only terminals R/L1 and S/L2<br>(T/L3 is not connected to anything) |
| **U/T1, V/T2, W/T3** | Inverter output | Used to connect the motor |
| **B1, B2** | Braking resistor connection | Available for connecting a braking resistor or the braking resistor unit option. |
| **+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. | 24 VDC, 8 mA photocoupler insulation |
| | **S2** | Multi-function input selection 2 | Factory setting: runs when CLOSED, stops when OPEN. | |
| | **S3** | Multi-function input selection 3 | Factory setting: External Fault (N.O.) | |
| | **S4** | Multi-function input selection 4 | Factory setting: Fault reset | |
| | **S5** | Multi-function input selection 5 | Factory setting: Multi-step speed cmd 1 | |
| | **S6** | Multi-function input selection 6 | Factory setting: Multi-step speed cmd 2 | |
| | **SC** | Multi-function input selection Common | Common for control signal | |
| **Analog input signals** | **RP** | Main Speed Cmd Pulse Train Input | 32 kHz max. | |
| | **FS** | Power Supply for Frequency Setting | +10 V (allowable max current 20 mA) | |
| | **FR1** | Main Speed Freq Ref | Voltage input or current input<br>0 to +10 VDC (20 kΩ) (resolution 1/1000)<br>4 to 20 mA (250 Ω) or 0 to 20 mA (250 Ω) Resolution: 1/500 | |
| | **FR2** | | | |
| | **FC** | Frequency reference common | 0 V | |
| **Fast Stop Cmd** | **HC** | Power Supply Fast Stop Cmd | +24 V (max allowable current 10 mA) | |
| | **H1** | Special Digital input | Open: Fast Stop Closed: Normal Operation | |
| | **H2** | Special Digital input | | |
| **Digital output signals** | **MA** | NO contact output | Factory setting: "fault" | Contact capacity 250 VAC, 1 A or less 30 VDC, 1 A or less |
| | **MB** | NC Output | | |
| | **MC** | Relay Output common | | |
| | **P1** | Photocoupler output 1 | Factory setting: During run | Photocoupler output: +48 VDC, 50 mA or less |
| | **P2** | Photocoupler output 2 | Factory setting: Frequency Agree | |
| | **PC** | Photocoupler output common | 0 V | |
| **Analog output signals** | **PM** | Pulse train Output | max 33 kHz | |
| | **AM** | Analog monitor output | Factory setting: "output frequency" 0 to +10 V output Resolution: 1/1000 | 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 |
| | **R–** | Communication input (–) | | |
| | **S+** | Communication output (+) | | |
| | **S–** | Communication output (–) | | |




## Inverter heat loss

### Three-phase 200 V class

| Model VZ | | 20P1 | 20P2 | 20P4 | 20P7 | 21P5 | 22P2 | 24P0 | 25P5 | 27P5 | 2011 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter capacity kVA | | 0.3 | 0.6 | 1.1 | 1.9 | 3.0 | 4.2 | 6.7 | 9.5 | 13 | 18 | 23 |
| Rated current (A) at HD | | 0.8 | 1.6 | 3 | 5 | 8 | 11 | 17.5 | 25 | 33 | 47.0 | 60.0 |
| Rated current (A) at ND | | 1.2 | 1.9 | 3.5 | 6.0 | 9.6 | 12.0 | 21.0 | 30.0 | 40.0 | 56.0 | 69.0 |
| Heat loss W HD | Fin | 4.3 | 7.9 | 16.1 | 27.4 | 54.8 | 70.7 | 110.5 | 231.5 | 239.5 | 347.6 | 437.7 |
| | Inside unit | 7.3 | 8.8 | 11.5 | 15.9 | 23.8 | 30.0 | 43.3 | 72.2 | 81.8 | 117.6 | 151.4 |
| | Total heat loss | 11.6 | 16.7 | 27.7 | 43.3 | 78.6 | 100.6 | 153.8 | 303.7 | 321.3 | 465.2 | 589.1 |
| Heat loss W ND | Fin | 4.7 | 7.2 | 14.0 | 35.6 | 48.6 | 57.9 | 93.3 | 236.8 | 258.8 | 342.8 | 448.5 |
| | Inside unit | 7.9 | 9.4 | 13.4 | 16.9 | 25.0 | 29.6 | 45.0 | 87.2 | 11.4 | 149.1 | 182.2 |
| | Total heat loss | 12.6 | 16.6 | 28.5 | 43.1 | 73.6 | 87.5 | 138.2 | 324.0 | 370.3 | 491.9 | 630.7 |
| Cooling Method | | Self Cooled | | | Fan Cooled | | | | | | | |

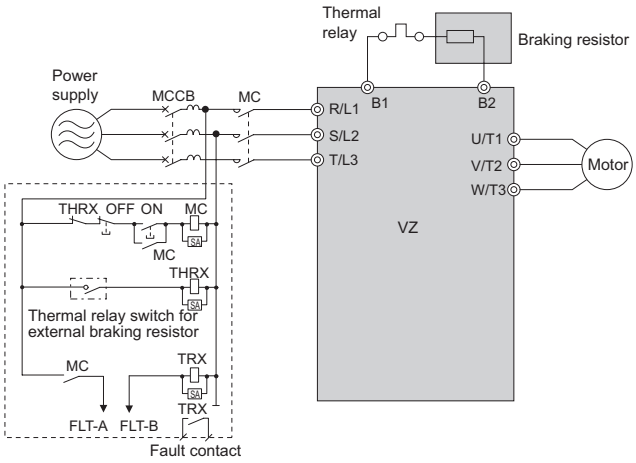
### Single-phase 200 V class

| Model VZ | | 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) at HD | | 0.8 | 1.6 | 3 | 5 | 8 | 11 | 17.5 |
| Rated current (A) at ND | | 1.2 | 1.9 | 3.5 | 6.0 | 9.6 | 12.0 | 21.0 |
| Heat loss W HD | Fin | 4.3 | 7.9 | 16.1 | 42.5 | 54.8 | 70.7 | 110.5 |
| | Inside unit | 7.4 | 8.9 | 11.5 | 19.0 | 25.9 | 34.1 | 51.4 |
| | Total heat loss | 11.7 | 16.7 | 27.7 | 61.5 | 80.7 | 104.8 | 161.9 |
| Heat loss W ND | Fin | 4.7 | 7.2 | 15.1 | 26.2 | 48.6 | 57.9 | 93.3 |
| | Inside unit | 8.4 | 9.6 | 14.3 | 20.8 | 29.0 | 36.3 | 58.5 |
| | Total heat loss | 13.1 | 16.8 | 28.3 | 56.5 | 77.6 | 94.2 | 151.8 |
| Cooling Method | | Self Cooled | | | Fan Cooled | | | |

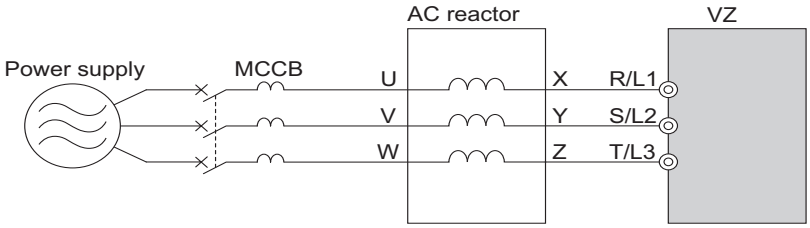
### Three-phase 400 V class

| Model VZ | | 40P2 | 40P4 | 40P7 | 41P5 | 42P2 | 43P0 | 44P0 | 45P5 | 47P5 | 4011 | 4015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inverter capacity kVA | | 0.9 | 1.4 | 2.6 | 3.7 | 4.2 | 5.5 | 7.2 | 9.2 | 14.8 | 18 | 24 |
| Rated current (A) at HD | | 1.2 | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 | 14.8 | 18.0 | 24 | 31 |
| Rated current (A) at ND | | 1.2 | 2.1 | 4.1 | 5.4 | 6.9 | 8.8 | 11.1 | 17.5 | 23 | 31 | 38 |
| Heat loss W HD | Fin | 19.2 | 28.9 | 42.3 | 70.7 | 81.0 | 84.6 | 107.2 | 166.0 | 207.1 | 266.9 | 319.1 |
| | Inside unit | 11.4 | 14.9 | 17.9 | 26.2 | 30.7 | 32.9 | 41.5 | 62.7 | 78.1 | 105.9 | 126.6 |
| | Total heat loss | 30.6 | 43.7 | 60.2 | 96.9 | 111.7 | 117.5 | 148.7 | 228.7 | 285.2 | 372.7 | 445.8 |
| Heat loss W ND | Fin | 8.2 | 15.5 | 26.4 | 37.5 | 49.7 | 55.7 | 71.9 | 170.3 | 199.5 | 268.6 | 298.7 |
| | Inside unit | 9.2 | 13.1 | 15.8 | 20.0 | 26.3 | 29.4 | 43.6 | 78.1 | 105.3 | 142.8 | 152.2 |
| | Total heat loss | 17.4 | 28.6 | 42.2 | 57.5 | 76.0 | 85.1 | 115.5 | 248.4 | 304.8 | 411.4 | 450.9 |
| Cooling Method | | Self Cooled | | | Fan Cooled | | | | | | | |

### Connections for braking resistor

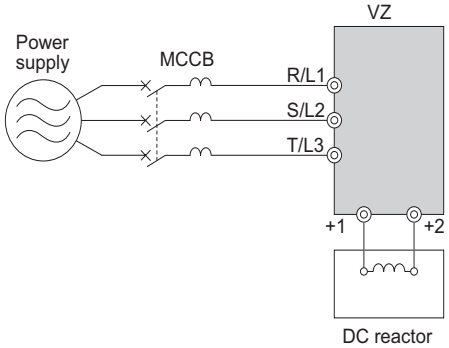



### AC reactor



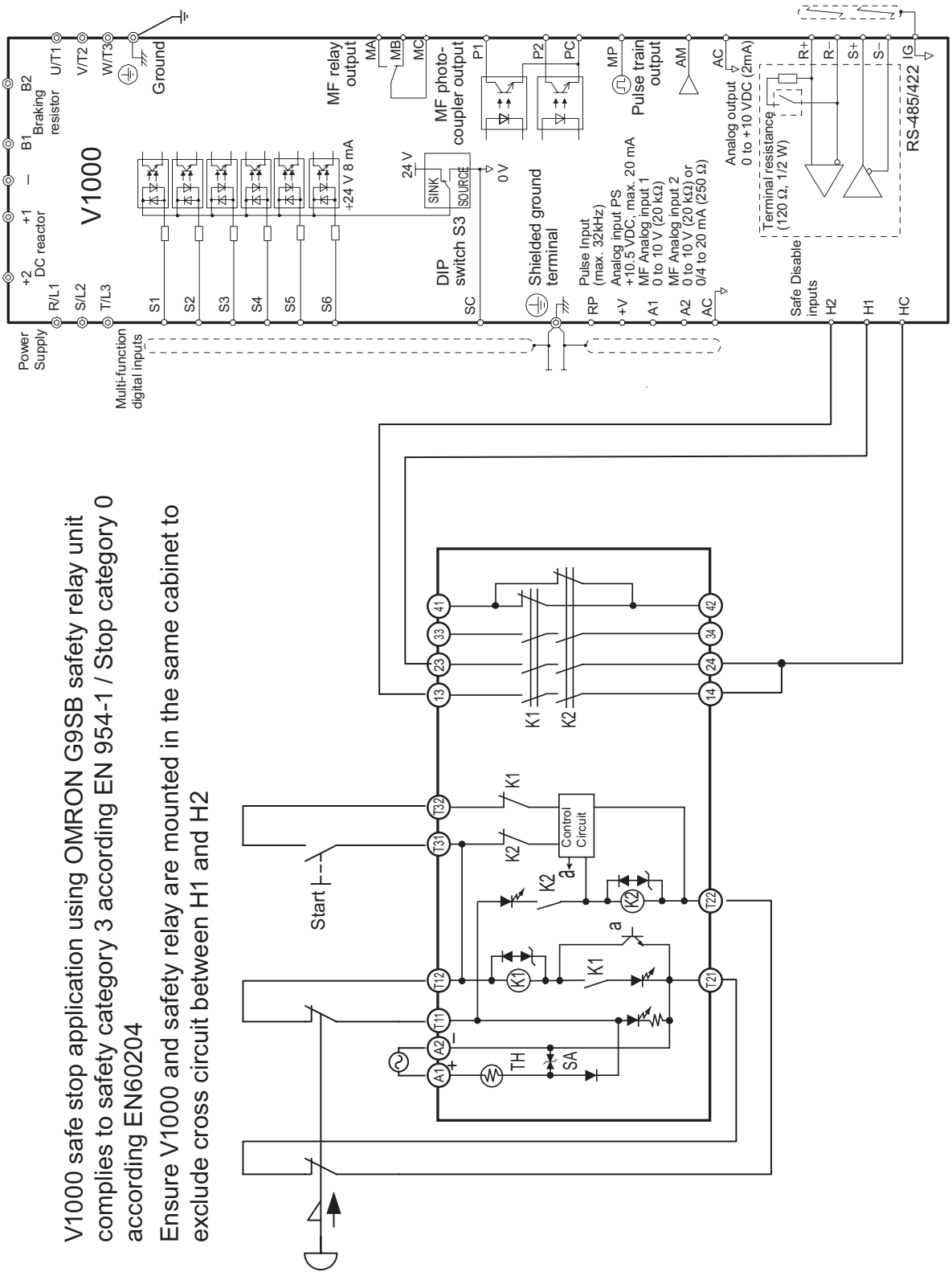

| 200 V class | | | 400 V class | | |
|---|---|---|---|---|---|
| Max. applicable motor output kW | Current value A | Inductance mH | Max. applicable motor output kW | Current value A | Inductance mH |
| 0.12 | 2.0 | 2.0 | | ------ | |
| 0.25 | 2.0 | 2.0 | 0.2 | 1.3 | 18.0 |
| 0.55 | 2.5 | 4.2 | 0.4 | | |
| 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 |
| 11 | 60 | 0.18 | 11 | 30 | 0.7 |
| 15 | 80 | 0.13 | 15 | 40 | 0.53 |

### DC reactor

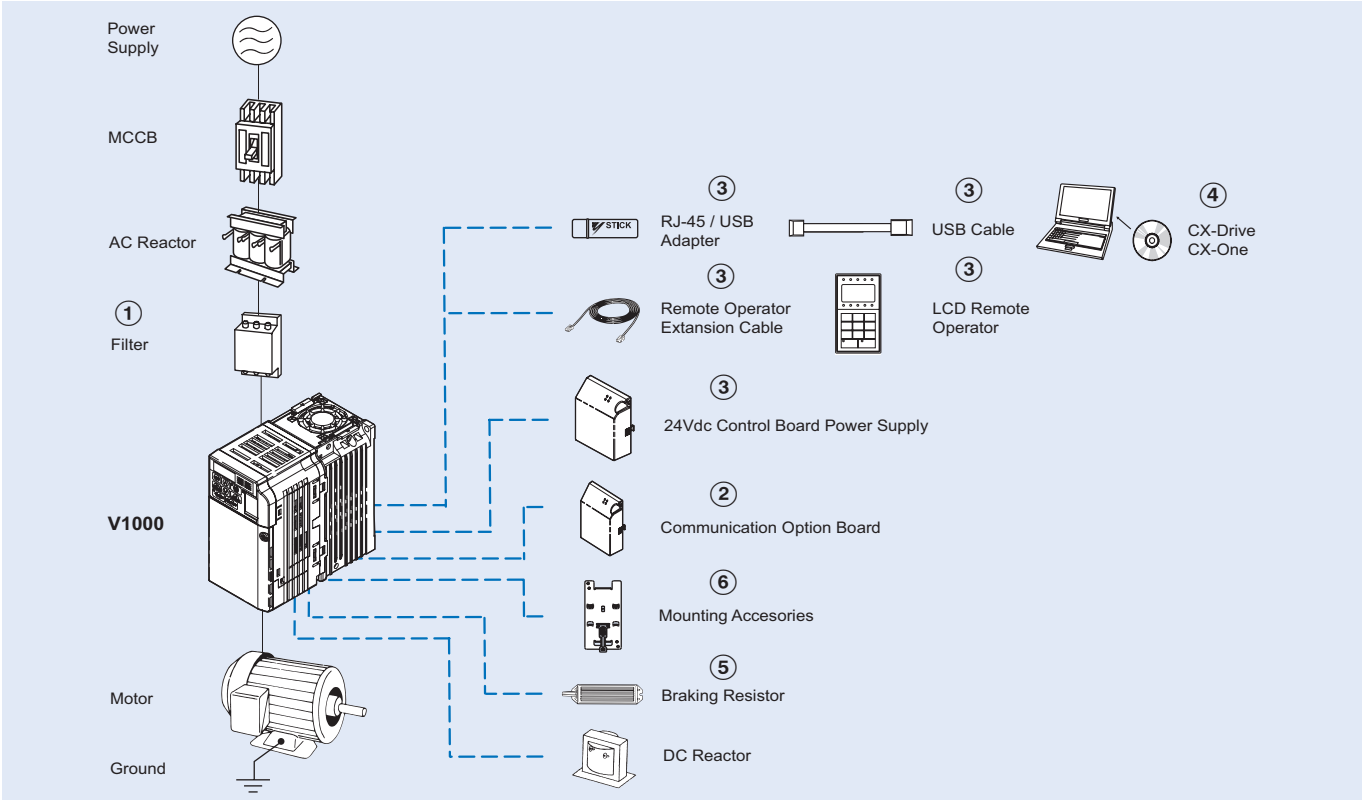



| 200 V class | | | 400 V class | | |
|---|---|---|---|---|---|
| Max. applicable motor output kW | Current value A | Inductance mH | Max. applicable motor output kW | Current value A | Inductance mH |
| 0.12 | 5.4 | 8 | | -------- | |
| 0.25 | | | 0.2 | 3.2 | 28 |
| 0.55 | | | 0.4 | | |
| 1.1 | | | 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 | | |
| 11 | 72 | 0.5 | 11 | 33 | 1.9 |
| 15 | | | 15 | | |

**Safety System**



## Ordering information




### V1000

| Specifications | | | | | Model | |
|---|---|---|---|---|---|---|
| | Heavy Duty | | Normal Duty | | Standard | Built-in filter |
| 1x200 V | 0.12 kW | 0.8 A | 0.18 kW | 0.8 A | VZAB0P1BAA | VZAB0P1HAA |
| | 0.25 kW | 1.6 A | 0.37 kW | 1.6 A | VZAB0P2BAA | VZAB0P2HAA |
| | 0.55 kW | 3.0 A | 0.75 kW | 3.5 A | VZAB0P4BAA | VZAB0P4HAA |
| | 1.1 kW | 5.0 A | 1.1 kW | 6.0 A | VZAB0P7BAA | VZAB0P7HAA |
| | 1.5 kW | 8.0 A | 2.2 kW | 9.6 A | VZAB1P5BAA | VZAB1P5HAA |
| | 2.2 kW | 11.0 A | 3.0 kW | 12.0 A | VZAB2P2BAA | VZAB2P2HAA |
| | 4.0 kW | 17.5 A | 5.5 kW | 21.0 A | VZAB4P0BAA | VZAB4P0HAA |
| 3x200 V | 0.12 kW | 0.8 A | 0.18 kW | 0.8 A | VZA20P1BAA | VZA20P1HAA |
| | 0.25 kW | 1.6 A | 0.37 kW | 1.6 A | VZA20P2BAA | VZA20P2HAA |
| | 0.55 kW | 3.0 A | 0.75 kW | 3.5 A | VZA20P4BAA | VZA20P4HAA |
| | 1.1 kW | 5.0 A | 1.1 kW | 6.0 A | VZA20P7BAA | VZA20P7HAA |
| | 1.5 kW | 8.0 A | 2.2 kW | 9.6 A | VZA21P5BAA | VZA21P5HAA |
| | 2.2 kW | 11.0 A | 3.0 kW | 12.0 A | VZA22P2BAA | VZA22P2HAA |
| | 4.0 kW | 17.5 A | 5.5 kW | 21.0 A | VZA24P0BAA | VZA24P0HAA |
| | 5.5 kW | 25.0 A | 7.5 kW | 30.0 A | VZA25P5FAA | VZA25P5HAA |
| | 7.5 kW | 33.0 A | 11.0 kW | 40.0 A | VZA27P5FAA | VZA27P5HAA |
| | 11 kW | 47.0 A | 15.0 kW | 56.0 A | VZA2011FAA | VZA2011HAA |
| | 15 kW | 60.0 A | 18.5 kW | 69.0 A | VZA2015FAA | VZA2015HAA |
| 3x400 V | 0.2 kW | 1.2 A | 0.37 kW | 1.2 A | VZA40P2BAA | VZA40P2HAA |
| | 0.4 kW | 1.8 A | 0.75 kW | 2.1 A | VZA40P4BAA | VZA40P4HAA |
| | 0.75 kW | 3.4 A | 1.5 kW | 4.1 A | VZA40P7BAA | VZA40P7HAA |
| | 1.5 kW | 4.8 A | 2.2 kW | 5.4 A | VZA41P5BAA | VZA41P5HAA |
| | 2.2 kW | 5.5 A | 3.0 kW | 6.9 A | VZA42P2BAA | VZA42P2HAA |
| | 3.0 kW | 7.2 A | 3.7 kW | 8.8 A | VZA43P0BAA | VZA43P0HAA |
| | 4.0 kW | 9.2 A | 5.5 kW | 11.1 A | VZA44P0BAA | VZA44P0HAA |
| | 5.5 kW | 14.8 A | 7.5 kW | 17.5 A | VZA45P5FAA | VZA45P5HAA |
| | 7.5 kW | 18.0 A | 11.0 kW | 23.0 A | VZA47P5FAA | VZA47P5HAA |
| | 11 kW | 24.0 A | 15.0 kW | 31.0 A | VZA4011FAA | VZA4011HAA |
| | 15 kW | 31.0 A | 18.5 kW | 38.0 A | VZA4015FAA | VZA4015HAA |

## ① Line filters

| Inverter | | Line filter Schaffner | | | Line filter Rasmi | | |
|---|---|---|---|---|---|---|---|
| Voltage | Model VZ | Reference | Rated current (A) | Weight (kg) | Reference | Rated current (A) | Weight (kg) |
| 3-Phase 200 VAC | 20P1 / 20P2 / 20P4 / 20P7 | A1000-FIV2010-SE | 10 | 0.7 | A1000-FIV2010-RE | 10 | 0.8 |
| | 21P5 / 22P2 | A1000-FIV2020-SE | 20 | 0.9 | A1000-FIV2020-RE | 20 | 1.1 |
| | 24P0 | A1000-FIV2030-SE | 30 | 1.0 | A1000-FIV2030-RE | 30 | 1.3 |
| | 25P5 / 27P5 | A1000-FIV2050-SE | Under development | | A1000-FIV2060-RE | 58 | 2.4 |
| | 2011 / 2015 | A1000-FIV2100-SE | | | A1000-FIV2100-RE | 96 | 4.2 |
| Single-Phase 200 VAC | B0P1 / B0P2 / B0P4 | A1000-FIV1010-SE | 10 | 0.5 | A1000-FIV1010-RE | 10 | 0.6 |
| | B0P7 / B1P5 | A1000-FIV1020-SE | 20 | 0.7 | A1000-FIV1020-RE | 20 | 1.0 |
| | B2P2 | A1000-FIV1030-SE | 30 | 1.0 | A1000-FIV1030-RE | 30 | 1.1 |
| | B4P0 | A1000-FIV1040-SE | 40 | 1.1 | A1000-FIV1040-RE | 40 | - |
| 3-Phase 400 VAC | 40P2 / 40P4 | A1000-FIV3005-SE | 5 | 0.5 | A1000-FIV3005-RE | 5 | 1.1 |
| | 40P7 / 41P5 / 42P2 / 43P0 | A1000-FIV3010-SE | 10 | 0.75 | A1000-FIV3010-RE | 10 | 1.1 |
| | 44P0 | A1000-FIV3020-SE | 15 | 1.0 | A1000-FIV3020-RE | 20 | 1.3 |
| | 45P5 / 47P5 | A1000-FIV3030-SE | Under development | | A1000-FIV3030-RE | 29 | 2.1 |
| | 4011 / 4015 | A1000-FIV3050-SE | | | A1000-FIV3050-RE | 48 | 2.9 |

## ② Communication cards

| Type | Model | Description | Function |
|---|---|---|---|
| Communication option board | SI-N3/V | 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-P3/V | 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-S3/V | 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. |
| | A1000 - CRT1 | CompoNet option card | • Under Development |

## ③ Accessories

| Types | Model | Description | Functions |
|---|---|---|---|
| Digital operator | JVOP-180 | LCD remote operator | LCD Display operator with language support |
| | 72606-WV001 | Remote operator cable (1 m) | Cable for connecting remote operator |
| | 72606-WV003 | Remote operator cable (3 m) | |
| Accessories | JVOP-181 | USB converter / USB cable | USB converter unit with copy and backup function |
| | PS-UDC24 | 24 VDC option board | 24V DC control board power supply |

## ④ 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 |

## ⑤ Braking unit, braking resistor unit

| Inverter | | | | | Braking resistor unit | | | |
|---|---|---|---|---|---|---|---|---|
| Voltage | Max. applicable motor output kW | Inverter model VZ | | Connectable min. resistance Ω | Inverter-mounted type (3 %ED, 10 sec max) | | | |
| | | Three-phase | Single-phase | | ERF-150WJ_ | Resistance Ω | No. of used | Braking torque % |
| 200 V (single-/ three-phase) | 0.12 | 20P1 | B0P1 | 300 | 401 | 400 | 1 | 220 |
| | 0.25 | 20P2 | B0P2 | 300 | 401 | 400 | 1 | 220 |
| | 0.55 | 20P4 | B0P4 | 200 | 201 | 200 | 1 | 220 |
| | 1.1 | 20P7 | B0P7 | 120 | 201 | 200 | 1 | 125 |
| | 1.5 | 21P5 | B1P5 | 60 | 101 | 100 | 1 | 125 |
| | 2.2 | 22P2 | B2P2 | 60 | 700 | 70 | 1 | 120 |
| | 4.0 | 24P0 | B4P0 | 32 | 620 | 62 | 1 | 100 |
| | 5.5 | 25P5 | – | 16 | — | --- | | |
| | 7.5 | 27P5 | – | 9.6 | | | | |
| | 11 | 2011 | | 9.6 | | | | |
| | 15 | 2015 | | 9.6 | | | | |
| 400 V (three-phase) | 0.37 | 40P2 | – | 750 | 751 | 750 | 1 | 230 |
| | 0.55 | 40P4 | – | 750 | 751 | 750 | 1 | 230 |
| | 1.1 | 40P7 | – | 510 | 751 | 750 | 1 | 130 |
| | 1.5 | 41P5 | – | 240 | 401 | 400 | 1 | 125 |
| | 2.2 | 42P2 | – | 200 | 301 | 300 | 1 | 115 |
| | 3.0 | 43P0 | – | 100 | 401 | 400 | 2 | 105 |
| | 4.0 | 44P0 | – | | | | | |
| | 5.5 | 45P5 | – | 32 | — | --- | | |
| | 7.5 | 47P5 | – | 32 | | | | |
| | 11 | 4011 | - | 20 | | | | |
| | 15 | 4015 | - | 20 | | | | |

## ⑥ Mounting accesories

| Types | Model | Description | Applicable models |
|---|---|---|---|
| DIN Rail | EZZ08122A | Necessary to mount the inverter on a DIN rail | VZ-20P1/20P2/20P4/20P7<br>VZ-B0P1/B0P2/B0P4 |
| | EZZ08122B | | VZ-21P5/22P2<br>VZ-B0P7/B1P5<br>VZ-40P2/40P4/40P7/41P5/42P2 |
| | EZZ08122C | | VZ-24P0<br>VZ-B2P2<br>VZ-44P0 |
| | EZZ08122D | | VZ-B4P0 |
| Heatsink external mounting attachment | 100-034-075 | Additional items to mount the inverter with the heat-shink out of the panel. | VZ-20P1/20P2<br>VZ-B0P1/B0P2 |
| | 100-034-076 | | VZ-20P4<br>VZ-B0P4 |
| | 100-034-077 | | VZ-20P7 |
| | 100-034-078 | | VZ-40P2 |
| | 100-034-079 | | VZ-21P5/22P2<br>VZ-B1P5<br>VZ-41P5/42P2/43P0 |
| | 100-034-080 | | VZ-24P0<br>VZ-B2P2<br>VZ-44P0 |
| | 100-036-357 | | VZ-B4P0 |
| | 100-036-418 | | VZ-B0P7<br>VZ-40P2/40P4 |
| | 100-036-300 | | VZ-25P5/27P5<br>VZ-45P5/47P5 |
| | 100-036-301 | | VZ-2011<br>VZ-4011/4015 |
| | 100-036-302 | | VZ-2015 |

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. I68E-EN-01

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.

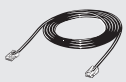
## Ratings

- 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

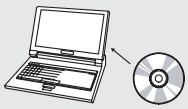


## System configuration

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.

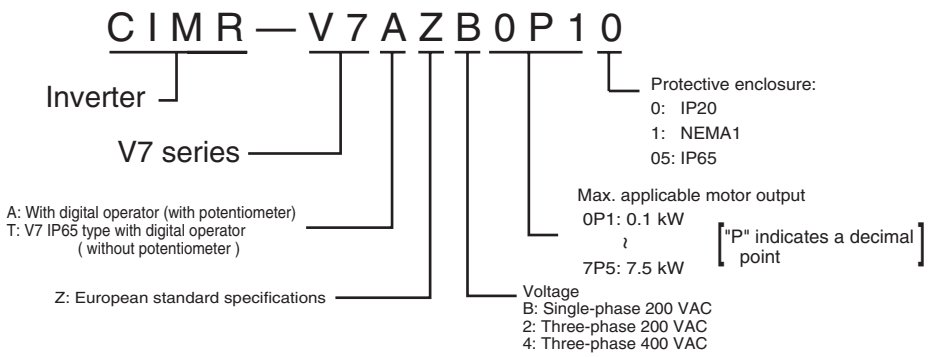
**Communication unit** *See note

**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<br>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

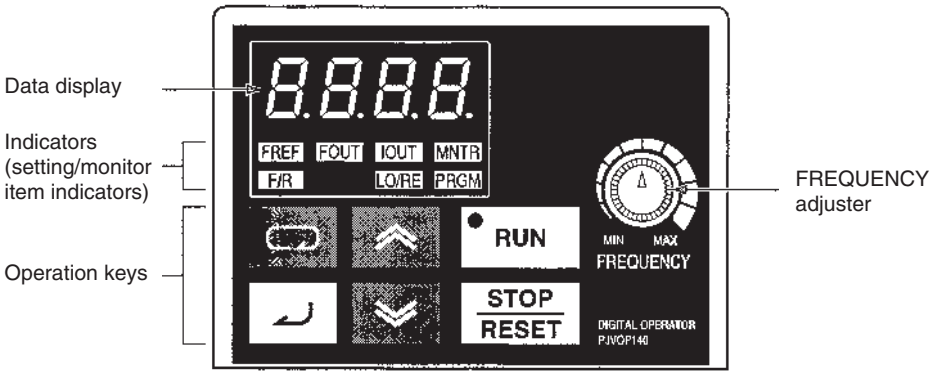
| IP20 three-phase: CIMR-V7AZ | | 40P2 | 40P4 | 40P7 | 41P5 | 42P2 | 43P0 | 44P0 | 45P5 | 47P5 |
|---|---|---|---|---|---|---|---|---|---|---|
| IP65 three-phase: CIMR-V7TZ | | | 40P405 | 40P705 | 41P505 | 42P205 | 43P005 | 44P005 | | |
| Maximum permissible motor output kW[1] | | 0.37 | 0.55 | 1.1 | 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<br>CIMR-V7AZ-□<br>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)<br>Pulse train input, frequency setting value (selectable) |
| | Braking torque<br>(short term peak torque) | Up to 200 W 150% or more<br>550 W to 1.1 kW 100% or more<br>1.5 kW 50% or more<br>>1.5 kW 20% or more<br>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)<br>(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<br>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.<br>(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<br>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

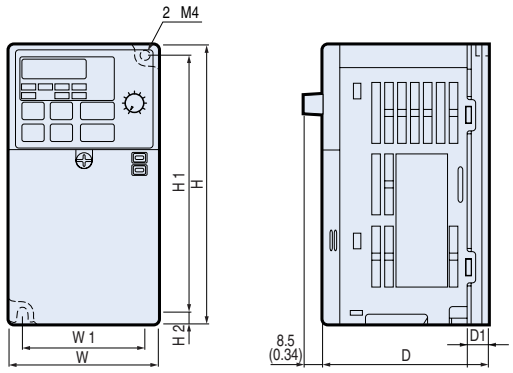



Figure 1

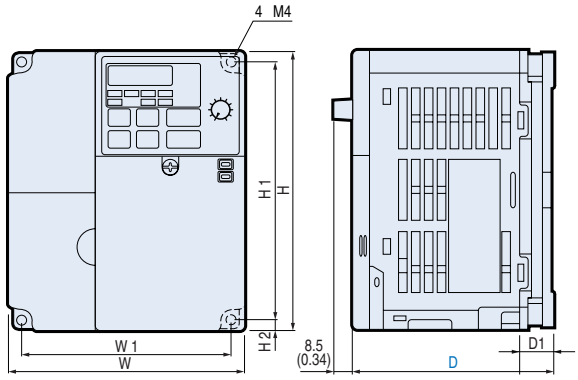



Figure 2

| 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

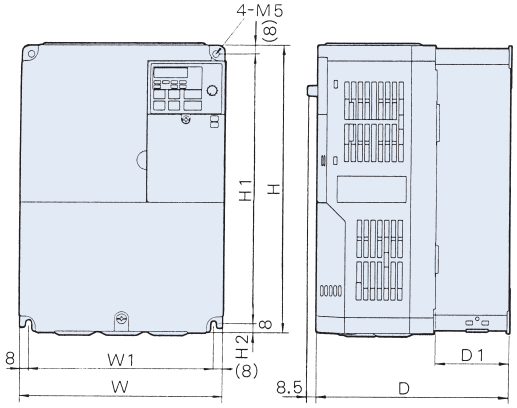



Figure 3

| 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**

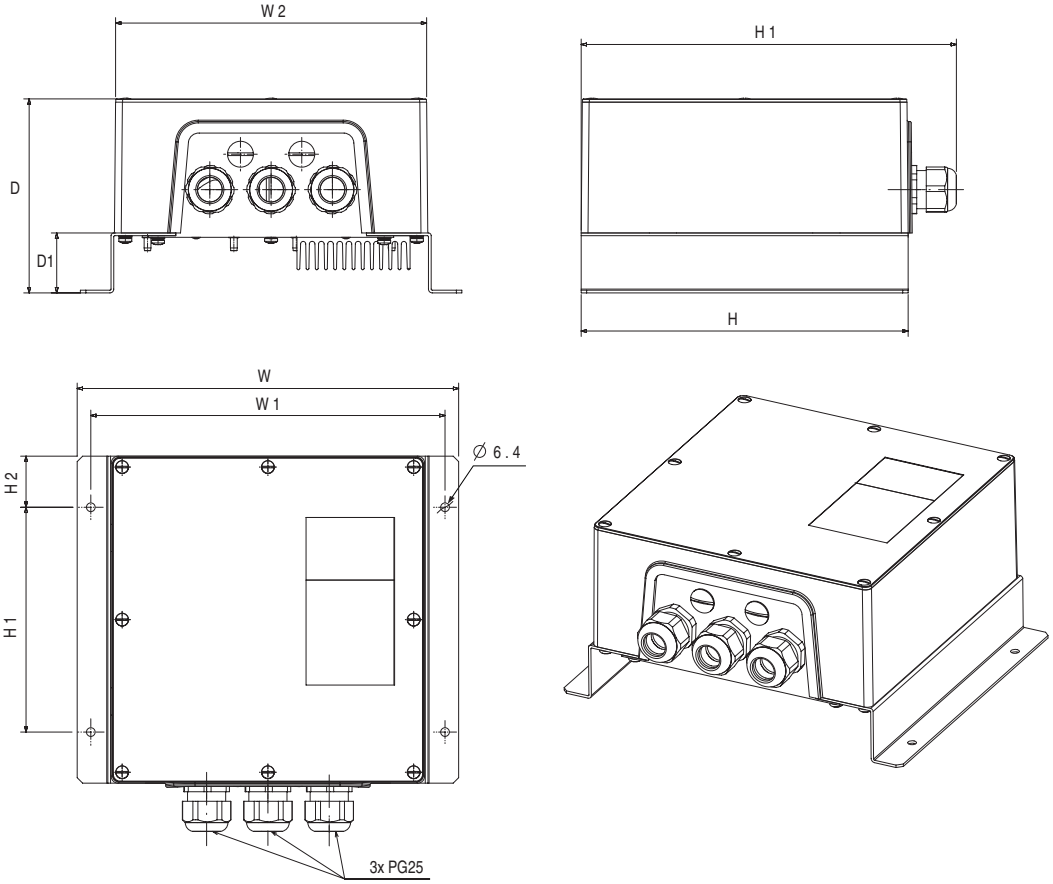



Figure 4

| 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)**

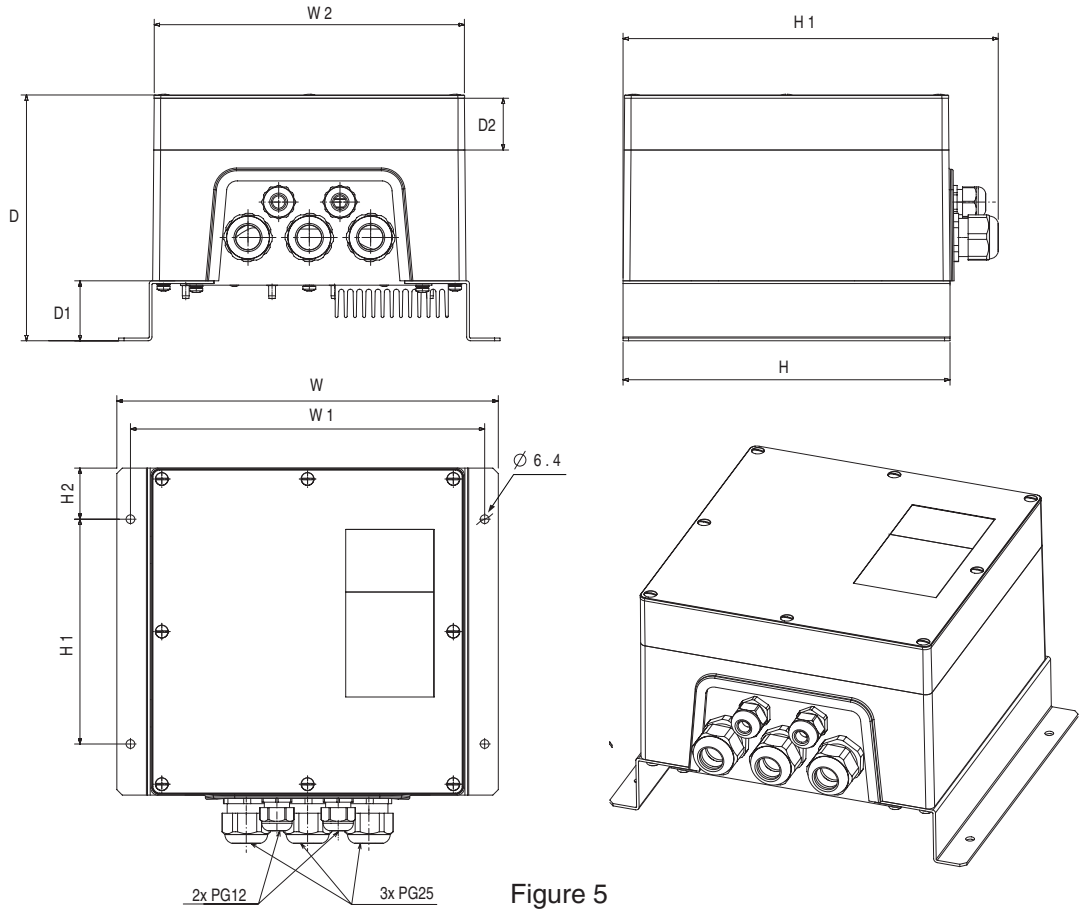
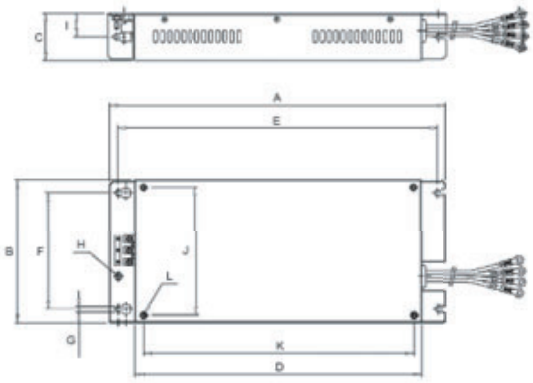


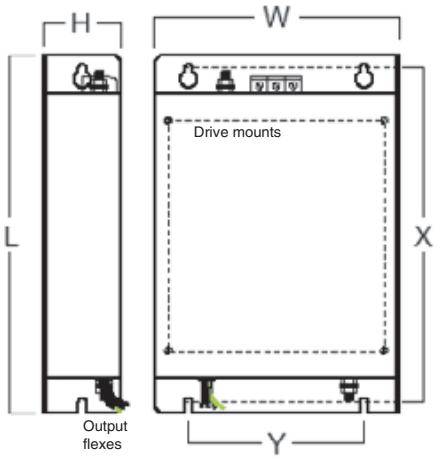

Figure 5

| 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 |

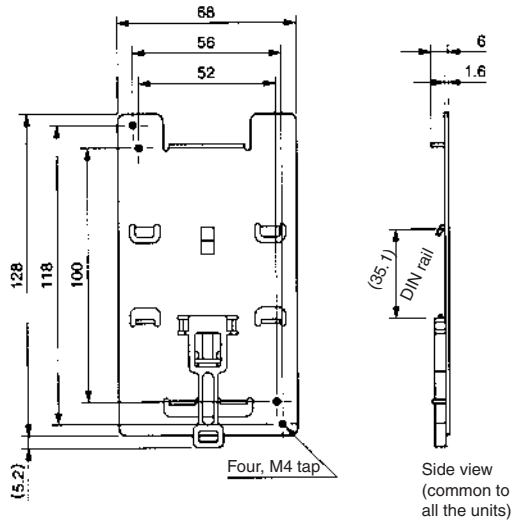



| Rasmi model | | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|
| | | W | H | L | X | Y | Inverter fixing |
| 3x200 V | 3G3MV-PFI2010-E | 82 | 50 | 194 | 181 | 62 | M5 |
| | 3G3MV-PF2020-E | 111 | 50 | 169 | 156 | 91 | M5 |
| | 3G3MV-PFI2030-E | 144 | 50 | 174 | 161 | 120 | M5 |
| | 3G3MV-PFI2050-E | 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 |

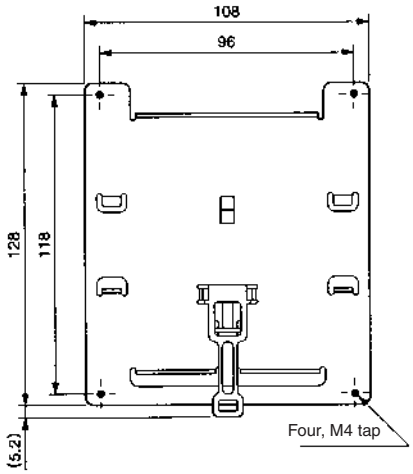
* V7 IP65 types are built-in filter inverters.

## DIN rail mounting bracket

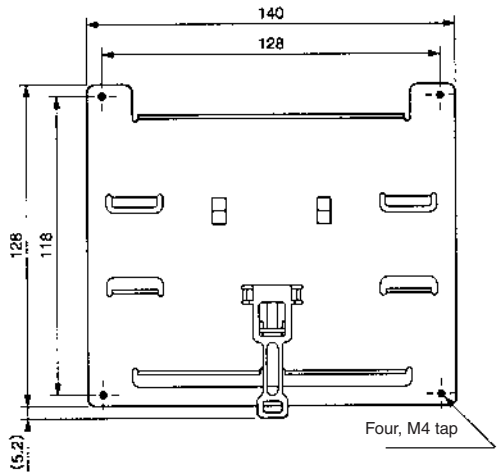
3G3IV-PZZ08122A



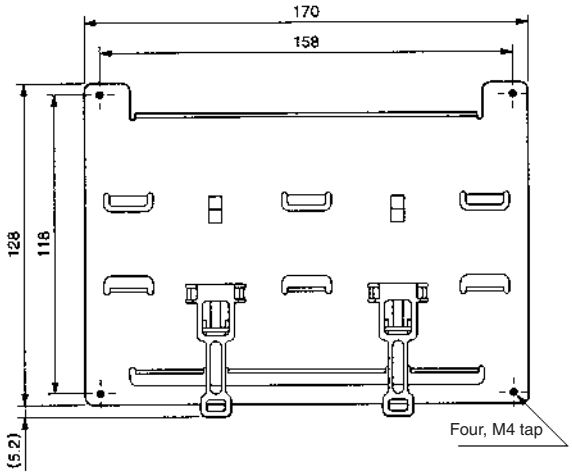

3G3IV-PZZ08122B




3G3IV-PZZ08122C




3G3IV-PZZ08122D

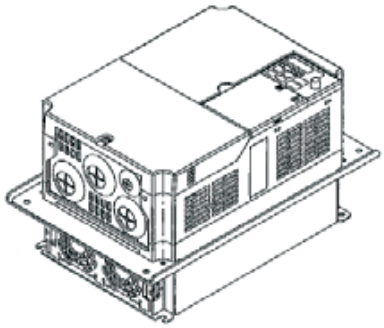


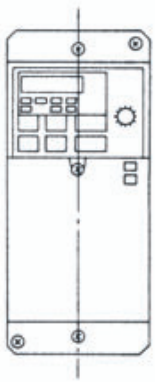

| Inverter | | DIN rail mounting bracket |
|---|---|---|
| 3-phase 200 VAC | CIMR-V7AZ - 20P1/ 20P4/ 20P7 | 3G3IV-PEZZ08122A |
| | CIMR-V7AZ - 21P5/ 22P2 | 3G3IV-PEZZ08122B |
| | CIMR-V7AZ - 24P0 | 3G3IV-PEZZ08122C |
| Single-phase 200 VAC | CIMR-V7AZ - B0P1/ B0P2/ B0P4 | 3G3IV-PEZZ08122A |
| | CIMR-V7AZ - 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 |

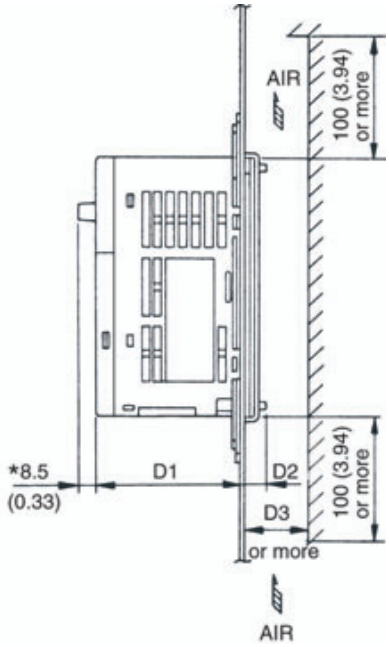
## Attachments

### Heatsink external mounting attachment

When mounting an external cooling-fan to the V7AZ, this attachment is required.



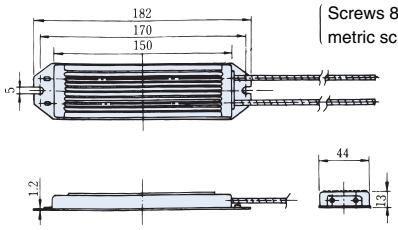




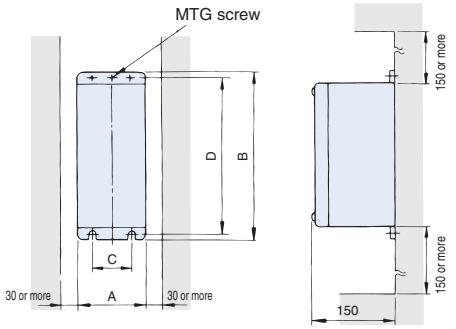

| CIMR-V7AZ | Attachment order code | Dimensions in mm | | |
|---|---|---|---|---|
| | | D1 | D2 | D3 |
| V7AZ-20P1<br>V7AZ-20P2 | EZZ08136A | 69.2 | 12 | 30 |
| V7AZ-20P4 | EZZ08136B | 69.2 | 42 | 50 |
| V7AZ-20P7 | EZZ08136C | 69.2 | 62 | 70 |
| V7AZ-21P5 | EZZ08136D | 73 | 58 | 70 |
| V7AZ-22P2 | | 98 | 58 | 70 |
| V7AZ-24P0 | -EZZ08136F | 78.6 | 64.4 | 70 |
| V7AZ-25P5<br>V7AZ-27P5 | EZZ08136H | 113.8 | 56.2 | 60 |
| V7AZ-B0P1<br>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<br>V7AZ-42P2 | | 98 | 58 | 70 |
| V7AZ-43P0<br>V7AZ-44P0 | EZZ08136F | 78.6 | 64.4 | 70 |
| V7AZ-45P5<br>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.



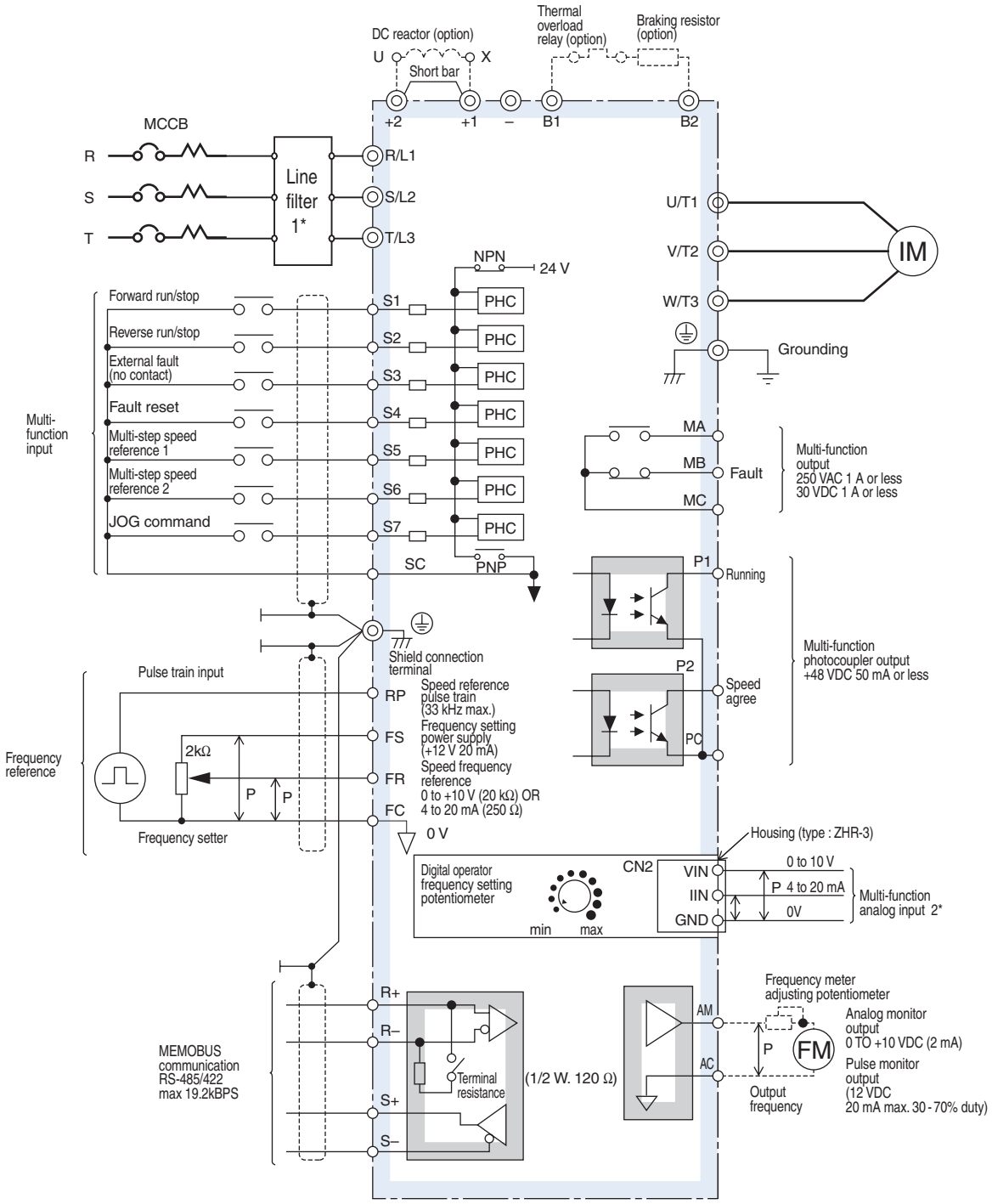

## Braking resistors unit




| 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)

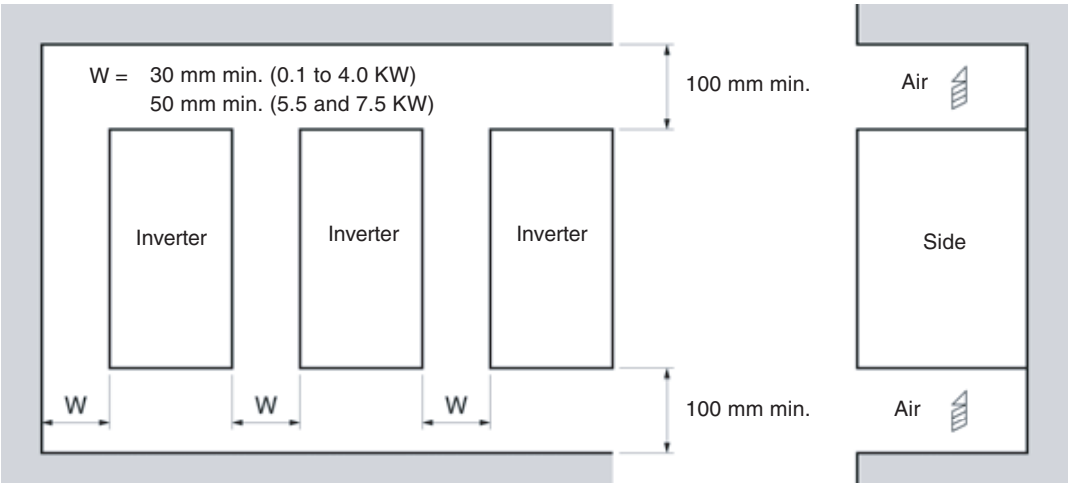
A +24 V power supply is required for sequence connection by PNP transistor (+24 V common) .

## 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

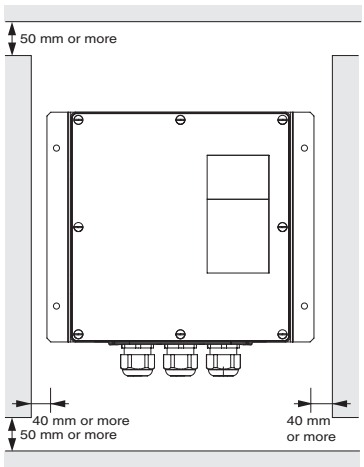
| Model CIMR-V7AZ | | B0P1 | B0P2 | B0P4 | B0P7 | B1P5 | B2P2 | B4P0 |
|---|---|---|---|---|---|---|---|---|
| Inverter capacity kVA | | 0.3 | 0.6 | 1.1 | 1.9 | 3.0 | 4.2 | 6.7 |
| Rated current A | | 0.8 | 1.6 | 3 | 5 | 8 | 11 | 17.5 |
| Heat loss W | Fin | 3.7 | 7.7 | 15.8 | 28.4 | 53.7 | 64.5 | 98.2 |
| | 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

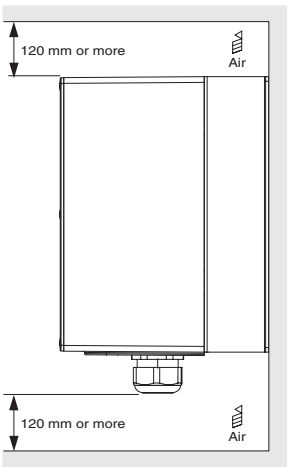
| Model CIMR-V7AZ | | 40P2 | 40P4 | 40P7 | 41P5 | 42P2 | 44P0 | 45P5 | 47P5 |
|---|---|---|---|---|---|---|---|---|---|
| Inverter capacity kVA | | 1.4 | 2.6 | 3.7 | 4.2 | 5.5 | 7.0 | 11 | 14 |
| Rated current A | | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 8.6 | 14.8 | 18 |
| Heat loss W | Fin | 15.1 | 30.3 | 45.8 | 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.



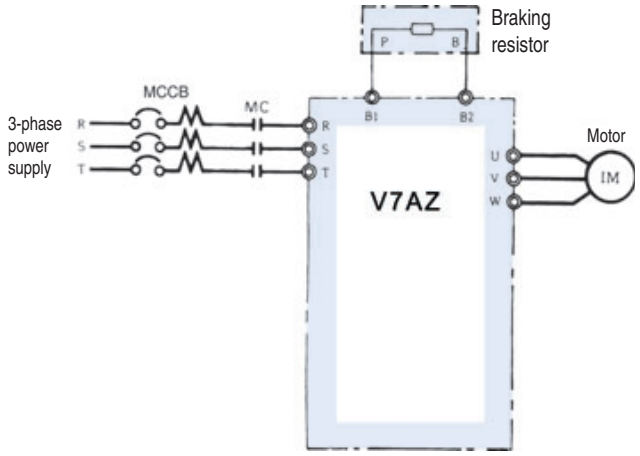

Side spaces



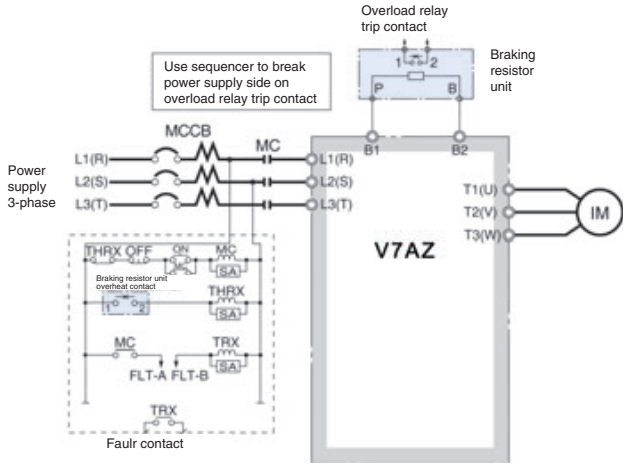

Top and bottom spaces

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.

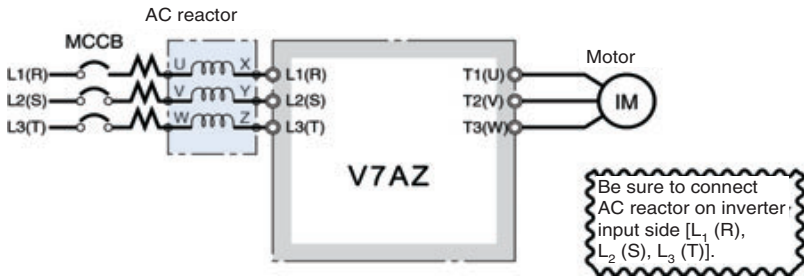
### Connections for braking resistor




### Connections for braking resistor unit

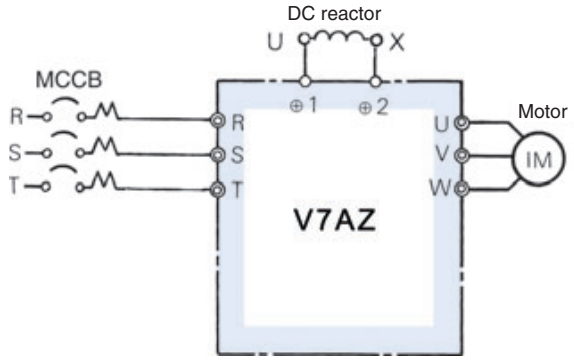



### AC reactor




| 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



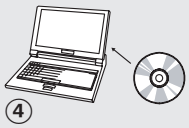

| 200 V class | | | 400 V class | | |
|---|---|---|---|---|---|
| Max. applicable motor output kW | Current value A | Inductance mH | Max. applicable motor output kW | Current value A | Inductance mH |
| 0.12 | 5.4 | 8 | -------- | | |
| 0.25 | | | 0.2 | 3.2 | 28 |
| 0.55 | | | 0.4 | | |
| 1.1 | | | 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

3G3IV-PCN329-E
Inverter to PC cable

④

CX-Drive



④

3G3IV-PEZZ8122_
DIN attachment

④

JVOP-144
Remote digital oper.
with potentiometer

④

JVOP-146
Remote digital oper.
with potentiometer

④

3G3IV-PCN126/326
Digital operator
extension cable

④

**Line filter** *See note

①

**Varispeed V7**

**Braking accessories**

LKEB_

CDBR_B

ERF150WJ_

⑤

* V7 IP65 types are built-in filter inverters.

**Communication unit** *See note

②

**PLC option unit** *See note

③

* 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.<br>• High speed motion bus.<br>• 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

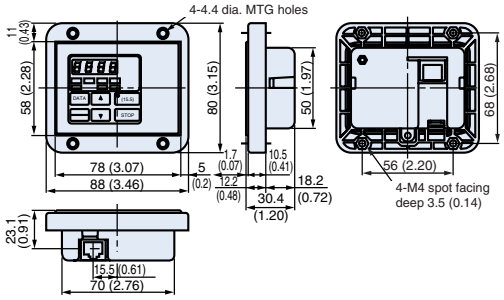
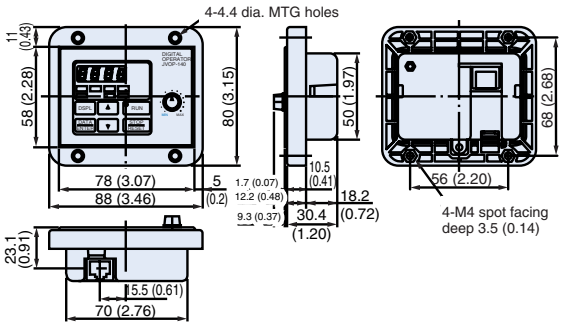
| Type | Model [1] | Description | Function |
|---|---|---|---|
| PLC option | 3G3MV-P10CDT-E  3G3MV-P10CDT3-E | PLC option | • Full PLC featrues, wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs.<br>• Standard OMRON tools can be used for programming<br>• 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<br>  | Remote digital operator without potentiometer |  |
| | JVOP-144<br>  | Remote digital operator with potentiometer |  |
| | 72606-CVS31060 | Blank cover | ----- |
| | 3G3IV-PEZZ0838BA | Digital operator case | same as JVOP-144 without operator |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>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

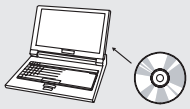
- 200 V class single-phase 0.1 to 1.5 kW
- 200 V class three-phase 0.1 to 4.0 kW
- 400 V class three-phase 0.2 to 4.0 kW

## 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**

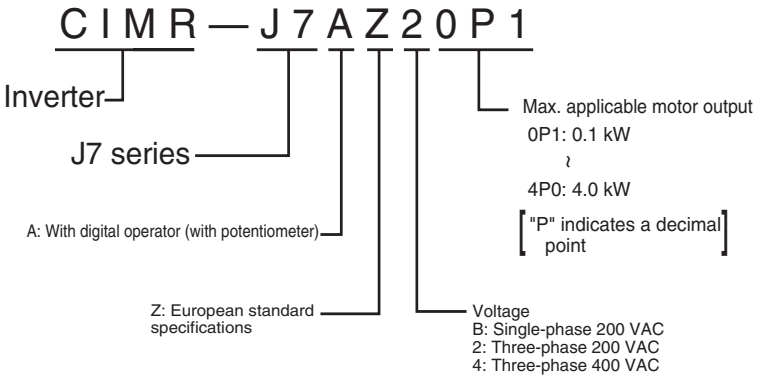

**Varispeed J7**

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)<br>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<br>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% | | | | | | | | | | | | | |

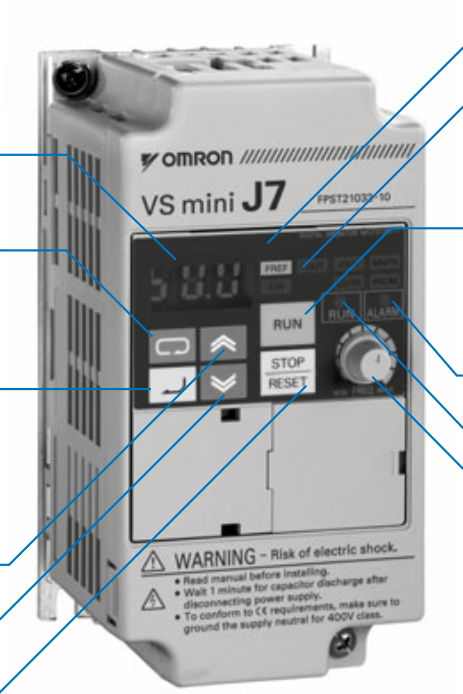
1. Single-phase series inverter output is three-phase (for three-phase motors)
2. Based on a standard 4-pole motor for max. applicable motor output. Select the inverter model whose rated current is larger than motor rated current.

## 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),<br>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)<br>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;<br>0.4/0.75 kW (0,5 HP, 1HP): 100% or more;<br>1.5 kW (2 HP): 50% or more;<br>2.2 kW (3 HP) or more: 20% or more<br>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 commu-nications (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)<br>(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),<br>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,<br>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.<br>(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<br>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.

**Operation key**
Press to run the motor. The RUN light is ON while running.

**Alarm LED**

**Run LED**

**Frequency setting volume**
Set operational frequency with volume.

**Data display**

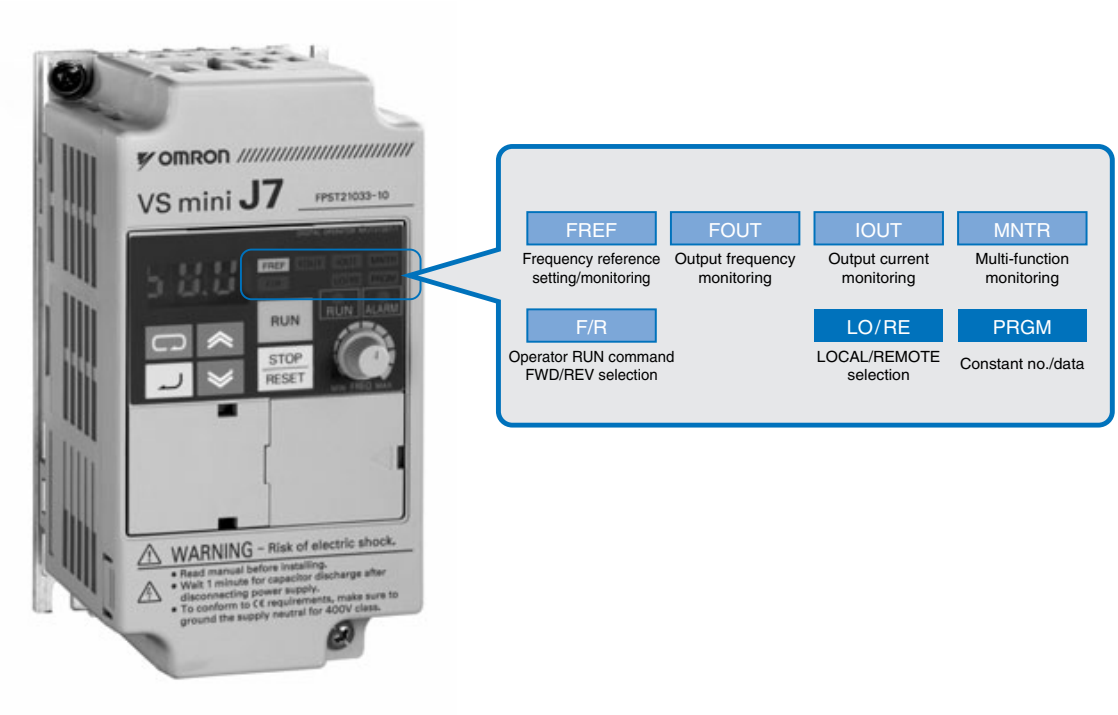
**Display selection key**
Switch functions among function display LEDs.

**Enter key**
Enter data when setting constants. After selecting constant no. at **PRGM** mode, data are displayed.

**Increment key**
Increase constant no. or data.

**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

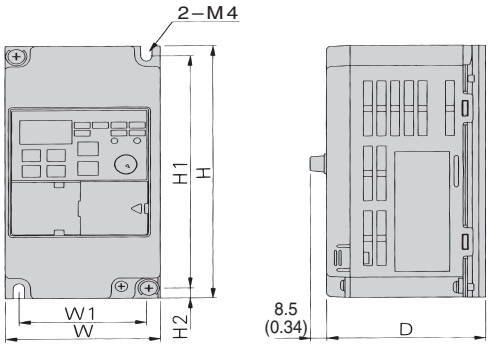



Figure 1

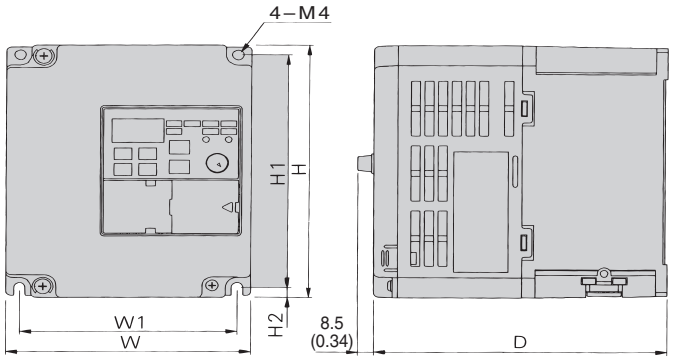
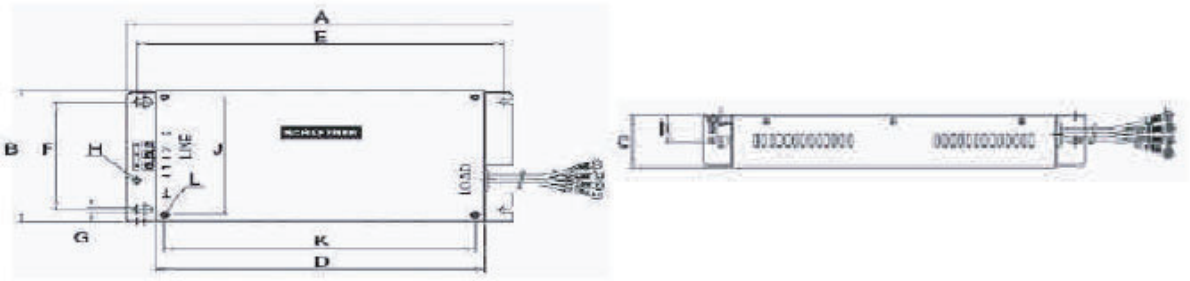


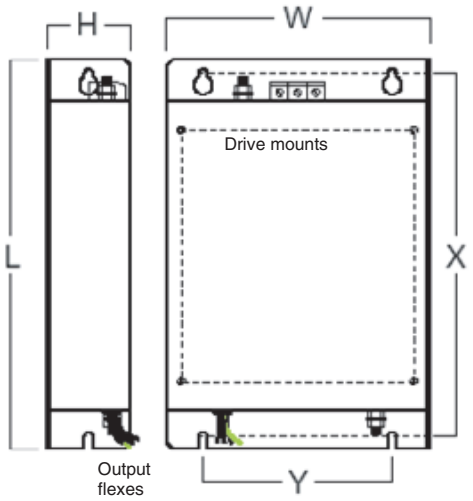

Figure 2

| 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



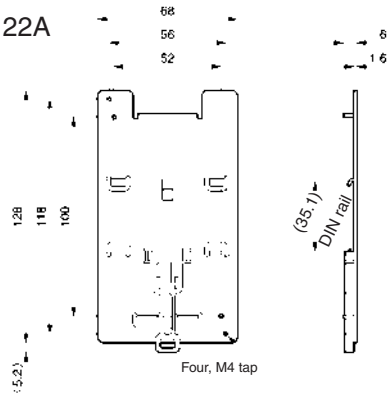

| Schaffner model | | Dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L |
| 3x200 V | 3G3JV-PFI2010-SE | 194 | 82 | 50 | 160 | 181 | 62 | 5.3 | M5 | 25 | 56 | 118 | M4 |
| | 3G3JV-PFI2020-SE | 169 | 111 | 50 | 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 |



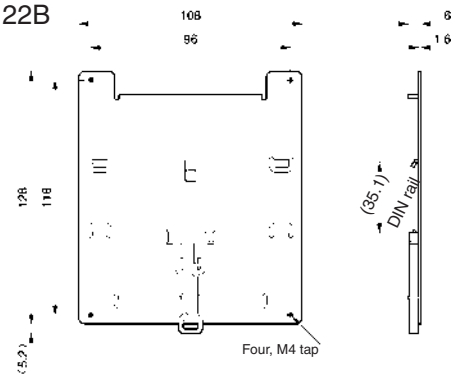

| Rasmi model | | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|
| | | W | H | L | X | Y | Inverter fixing |
| 3x200 V | 3G3JV-PFI2010-E | 82 | 50 | 194 | 181 | 62 | M5 |
| | 3G3JV-PF2020-E | 111 | 50 | 169 | 156 | 91 | M5 |
| | 3G3JV-PFI2030-E | 144 | 50 | 174 | 161 | 120 | M5 |
| 1x200 V | 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

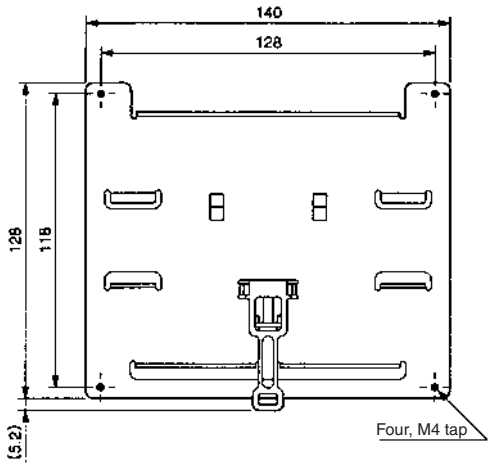
3G3IV-PEZZ08122A




3G3IV-PEZZ08122B



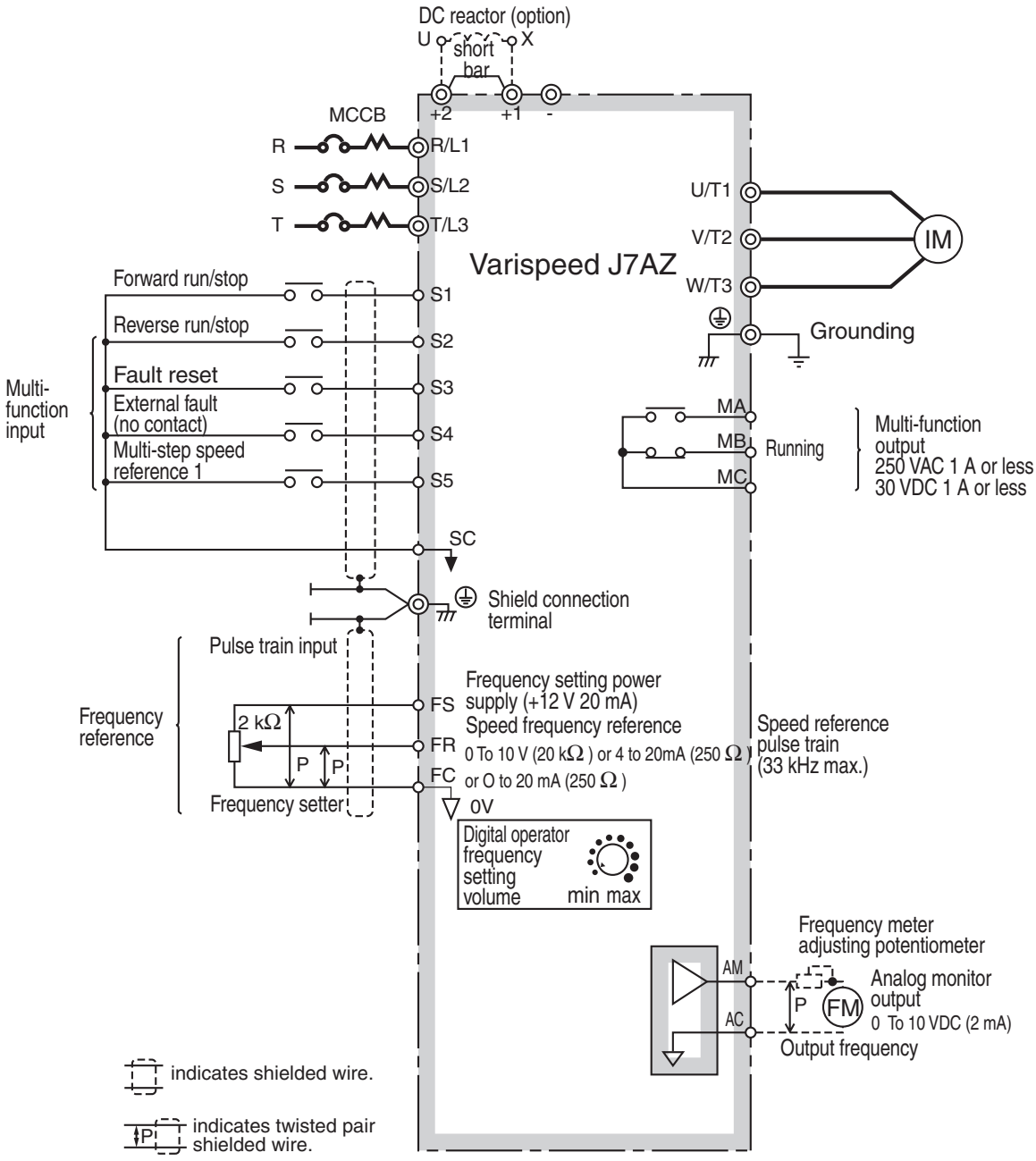

3G3IV-PEZZ08122C




| 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**



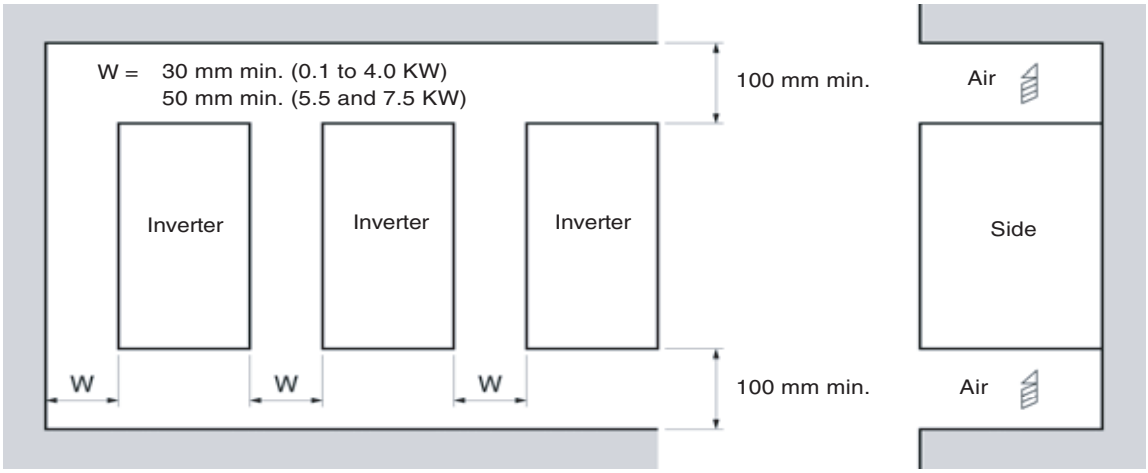

: shows the connection for the following two kinds of sequence input (S1 to S5) signals: no-voltage contact and NPN transistors (0 V common).
For a PNP transistor (+24 V common), a 24 V external power supply is necessary.

## 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 |

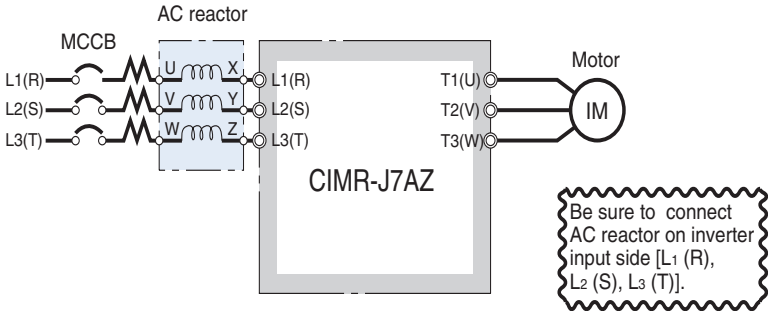
## Single-phase 200 V class

| 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

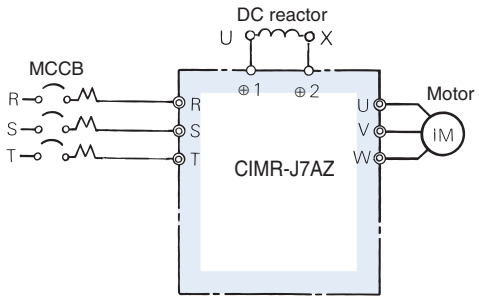
| CIMR-J7AZ□ | | 40P2 | 40P4 | 40P7 | 41P5 | 42P2 | 43P0 | 44P0 |
|---|---|---|---|---|---|---|---|---|
| Inverter capacity kVA | | 0.9 | 1.4 | 2.6 | 3.7 | 4.2 | 5.5 | 7.0 |
| Rated current A | | 1.2 | 1.8 | 3.4 | 4.8 | 5.5 | 7.2 | 9.2 |
| Heat loss W | Fin | 9.4 | 15.1 | 30.3 | 45.8 | 50.5 | 58.2 | 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 |

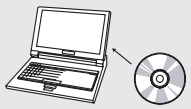
## Ordering information

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 |

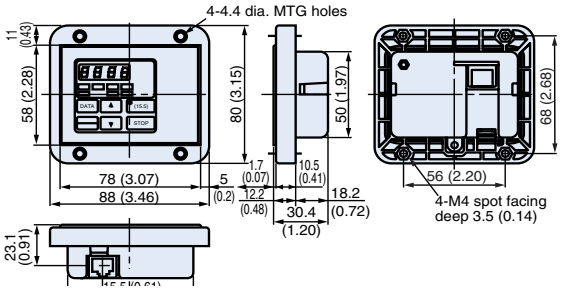
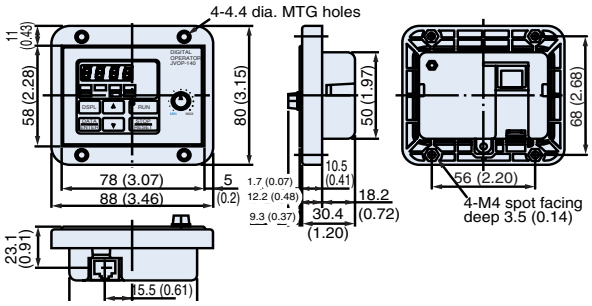
### 400 V

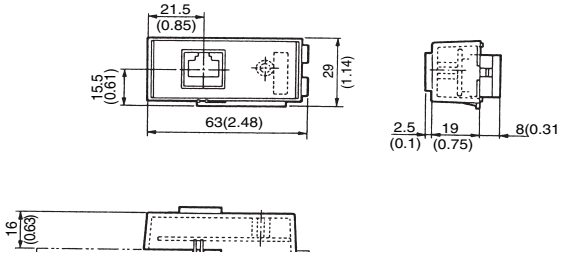
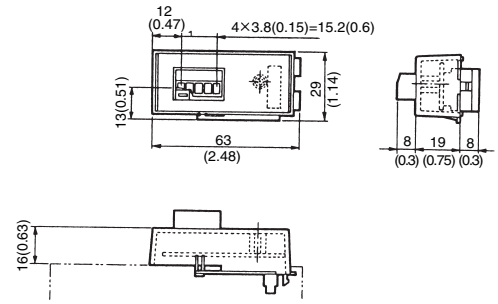
| Specifications | | | Model |
|---|---|---|---|
| 3x400 V | 0.37 Kw | 1.2 A | CIMR-J7AZ40P20 |
| | 0.55 Kw | 1.8 A | CIMR-J7AZ40P40 |
| | 1.1 Kw | 3.4 A | CIMR-J7AZ40P70 |
| | 1.5 Kw | 4.8 A | CIMR-J7AZ41P50 |
| | 2.2 Kw | 5.5 A | CIMR-J7AZ42P20 |
| | 3.0 Kw | 7.2 A | CIMR-J7AZ43P00 |
| | 4.0 Kw | 9.2 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)<br>  | RS232 adapter | Another option SI-232/J7C (3G3JV-PSI232JC) is available, the only difference is that this one is removable.<br>  |
| | SI-485/J7 (3G3JV-PSI485J)<br>  | RS485 adapter |  |
| Accessories | 3G3IV-PCN126<br>3G3IV-PCN326 | Digital operator extension cable<br>1 meter<br>3 meters | SI232/J7 must be connected |
| | 3G3IV-PCN329-E | PC configuration cable | SI232/J7 must be connected |

### ② Accessories

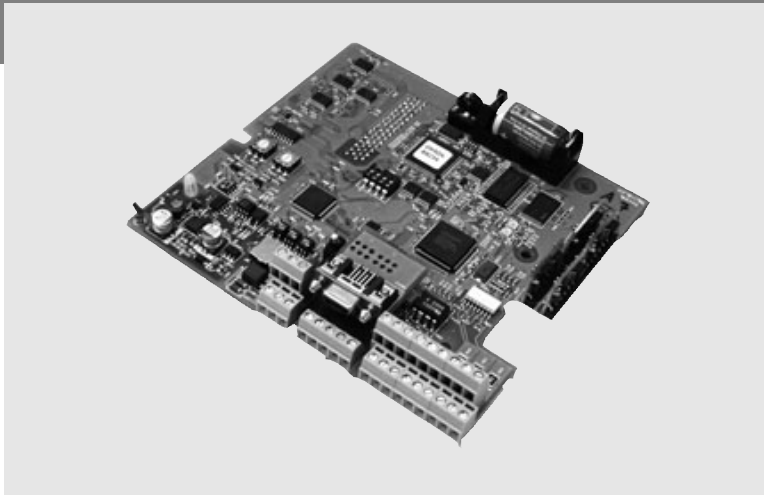
| Type | Model | Description | Installation |
|---|---|---|---|
| Software | CX-drive | Computer software | Configuration and monitoring software tool for drives. |
| | CX-One | Computer software | Complete OMRON automation software including CX-drive. |

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

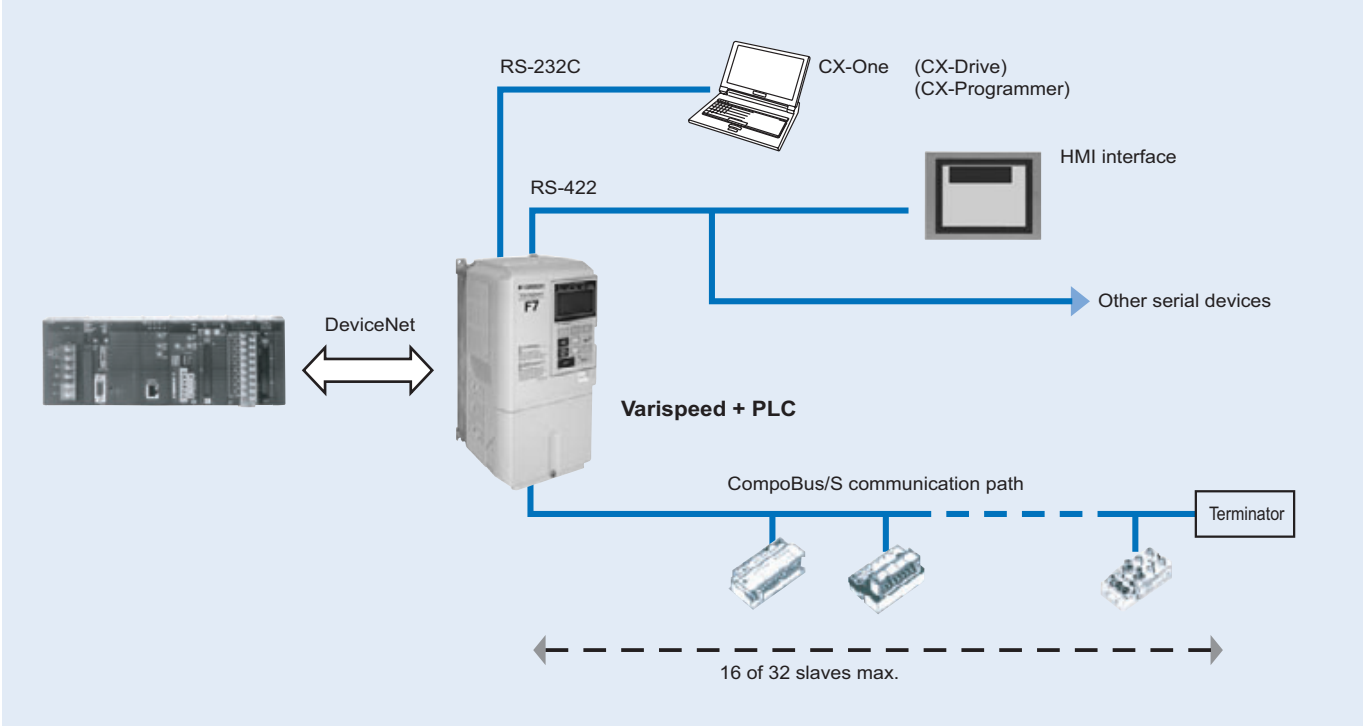


**The OMRON PLC technology embedded in the OMRON Yaskawa inverter family**

- 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.

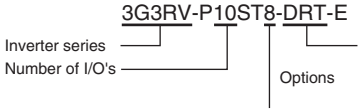


## System configuration



# 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.<br>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<br>• IR-memory<br>• DM-memory<br>• 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)<br>1-ms timers: TMHH(--)<br>10-ms timers: TIMH(15)<br>100-ms timers: TIM<br>1-s/10-s timers: TIML(--)<br>Decrementing counters: CNT<br>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.<br>• The node numbers can be set to 0 to 7 (128-point mode) or 0 to 15 (256-point mode).<br>• 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.<br>The master's I/O can be allocated to the following data areas:<br>IR 000 to IR 049<br>IR 200 to IR 227<br>DM 0000 to DM 2047<br>LR 00 to LR 15<br>HR 00 to HR 19<br>AR 00 to AR 23 (3G3RV-P10ST ' master; read-only)<br>TC 000 to TC 255<br>• Explicit message communications are supported. Any 3G3RV-P10ST data area can be accessed from the DeviceNet master.<br>• 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)<br>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<br>2 inputs<br>Response time: 50 μs | |
| | | Interval timer interrupts<br>1 input<br>Set value: 0.5 to 319,968 ms<br>Precision: 0.1 ms | Scheduled interrupts<br>One-shot interrupt |
| High-speed counters | High-speed counter 1 input, see note 5 | No interrupt | |
| | Differential phase mode (5 kHz)<br>Pulse plus direction input mode (20 kHz)<br>Up/down input mode (20 kHz)<br>Increment mode (20 kHz) | Count-check interrupt<br>(An interrupt can be generated when the count equals the set value or the count lies within a preset range.) | |
| | Interrupt inputs (counter mode)<br>2 inputs<br>Incrementing counter (2 kHz)<br>Decrementing counter (2 kHz) | No interrupt<br>Count-up interrupt | |
| Encoder interface | | 3 input modes:<br>Differential-phase (up/down)<br>Pulse plus direction<br>Up/down pulse<br>Maximum input frequency 50 kHz<br>Maximum counter range 4,294,967,295 (232-1)<br>Two capture registers, 3 selectable registration inputs<br>One comparison value<br>Counter reset through software or Z-phase<br>Interrupt function | |
| Pulse outputs | | • 2 outputs:<br>Single-phase pulse output without acceleration/deceleration (see note 6.)<br>10 Hz to 10 kHz<br>• 2 outputs:<br>Variable duty ratio pulse output (see note 6.)<br>0.1 to 999.9 Hz, duty ratio 0 to 100%<br>• 1 output:<br>Pulse output with trapezoidal acceleration/deceleration (see note 6.)<br>Pulse plus direction output, up/down pulse output, 10 Hz to 10 kHz | |
| Synchronized pulse control | | 1 point, see notes 5 and 6<br>Input frequency range: 10 to 500 Hz, 20 Hz to 1 kHz, or 300 Hz to 20 kHz<br>Output frequency range: 10 Hz to 10 kHz | |
| Pulse catch inputs | | 2 bits<br>Minimum pulse input: 50 μs max.<br>Used in common by input interrupts and input interrupt counter mode. | |
| Analog volume | | None | |
| Input time constant<br>(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:<br>Host link, peripheral bus, no-protocol, programming console<br>Port 2 = RS-232C port:<br>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<br>Memory backup: The read/write DM area, HR area, AR area, and counter values are backed up.<br>(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.

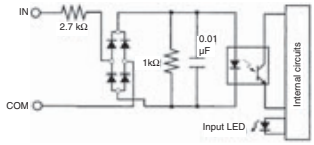
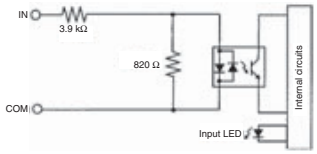
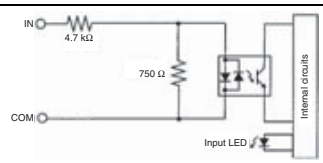
**4.** The above figure for power consumption includes the power consumption of the programming console.

**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.

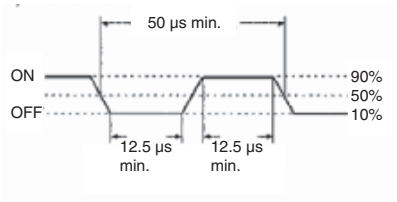
### High-speed counter inputs

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.

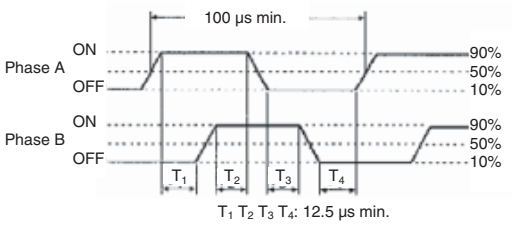
| Input | Function | | | |
|---|---|---|---|---|
| | Differential phase mode | Pulse plus direction input mode | Up/down input mode | Increment mode |
| IN 00000 | A-phase pulse input | Pulse input | Increment pulse input | Increment pulse input |
| IN 00001 | B-phase pulse input | Direction input | 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

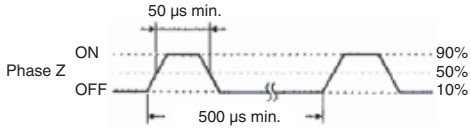



Differential phase mode




$T_1$ $T_2$ $T_3$ $T_4$: 12.5 µs min.

The minimum pulse width for input IN00002 (Z-phase input) is as follows:



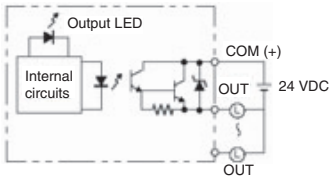

## Interrupt inputs

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<br>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 |  |

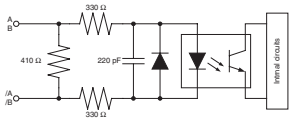
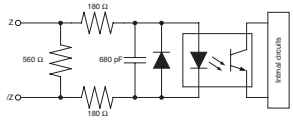


**Note:** When using OUT 01000 or OUT 01001 as a pulse output, connect a dummy resistor as required to bring the load current between 0.01 and 0.1 A. If the load current is below 0.1 A, the ON-to-OFF response time will be longer and high-speed pulses (source-type transistor outputs) will not be output. If the load current is above 0.1 A, the transistor will generate more heat and components may be damaged.

**⚠ Caution**

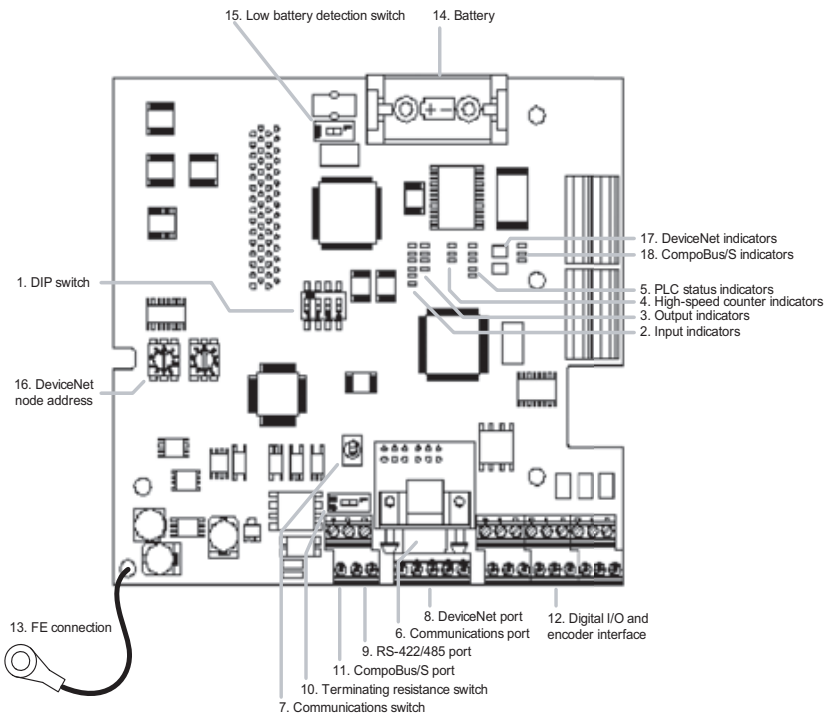
Do not apply voltage in excess of the maximum switching capacity to an output terminal. It may result in damage to the product or fire.

### 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** |  |

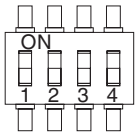
# Operation

## 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.<br>RS-232C port settings: DM 6645 to DM 6649<br>Peripheral port settings: DM 6650 to DM 6654 |
| | ON | The ports operate with the standard communications settings. |

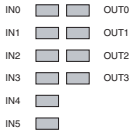


• Operating mode at startup

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)

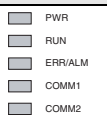
The output indicators are lit when the corresponding output terminal is ON. The indicators are lit during I/O refreshing. The status of an output indicator will also reflect the status of the corresponding output when the output is being used as a pulse output.

### 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.

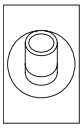
**2.** A C200H-PRO27-E programming console can be connected directly to the PLC with a CS1W-CN224/CN624 connecting cable.

**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

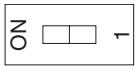
Used to connect to host computers, or standard external devices.

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) |

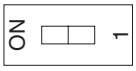
## 13. Functional earth-wire

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

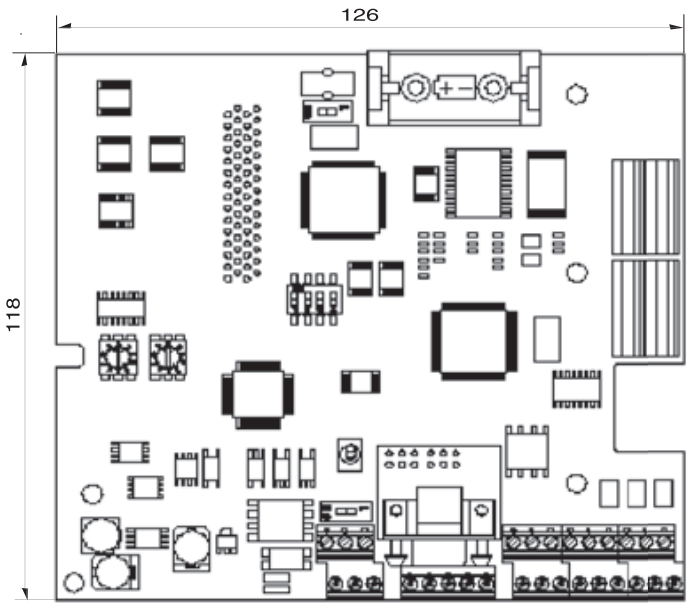
## 17. DeviceNet indicators (-DRT versions only)

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

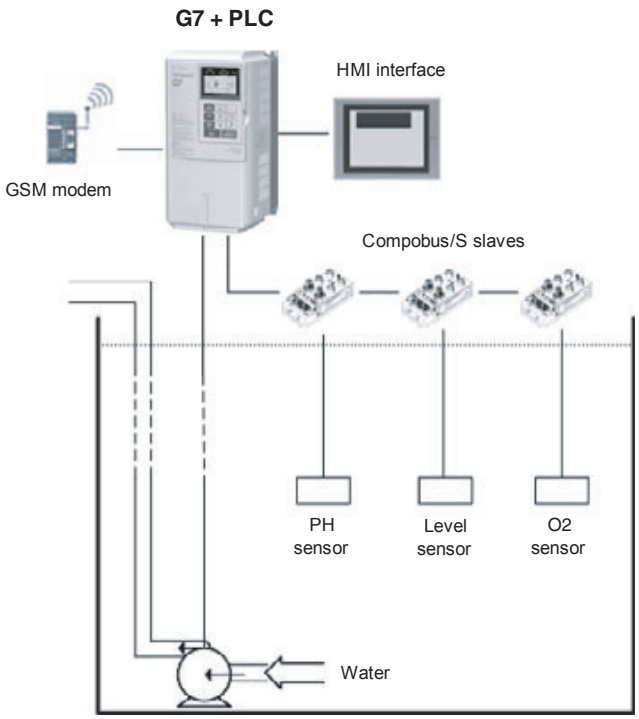



## Application examples

### 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**

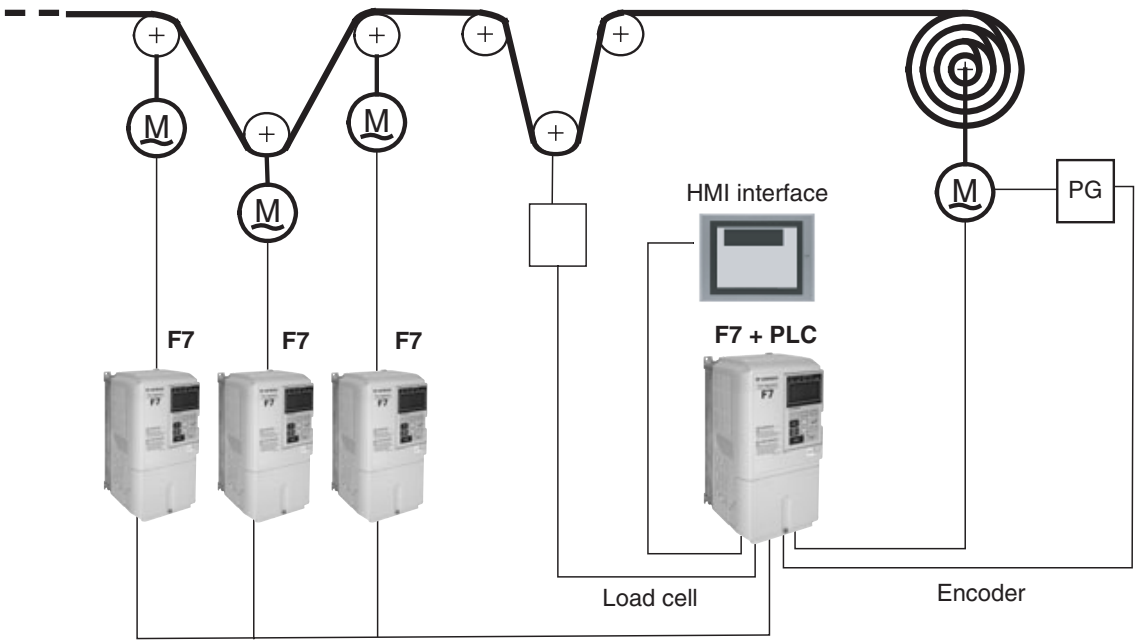



**Note:** For detailed information about the inverter, please see the Varispeed G7 series section.

## 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.**

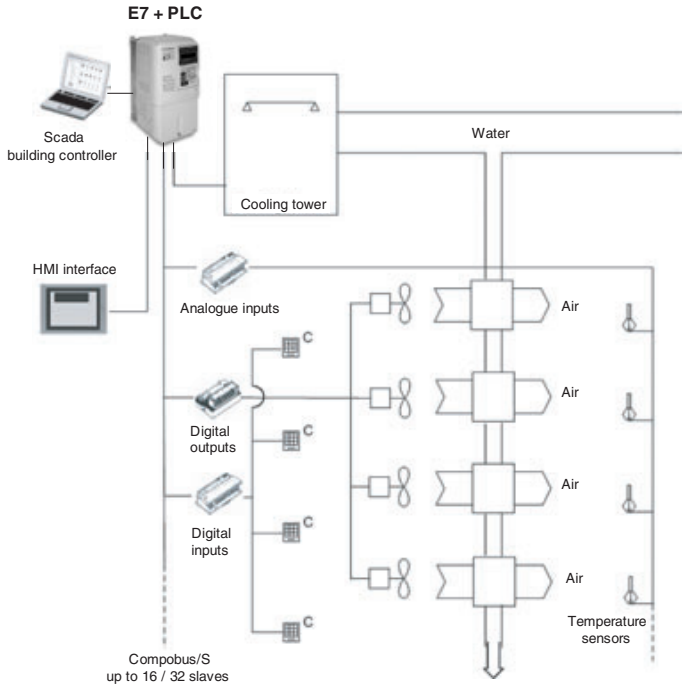



**Note:** For detailed information about the inverter, please see into the Varispeed F7 series section.

## 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**

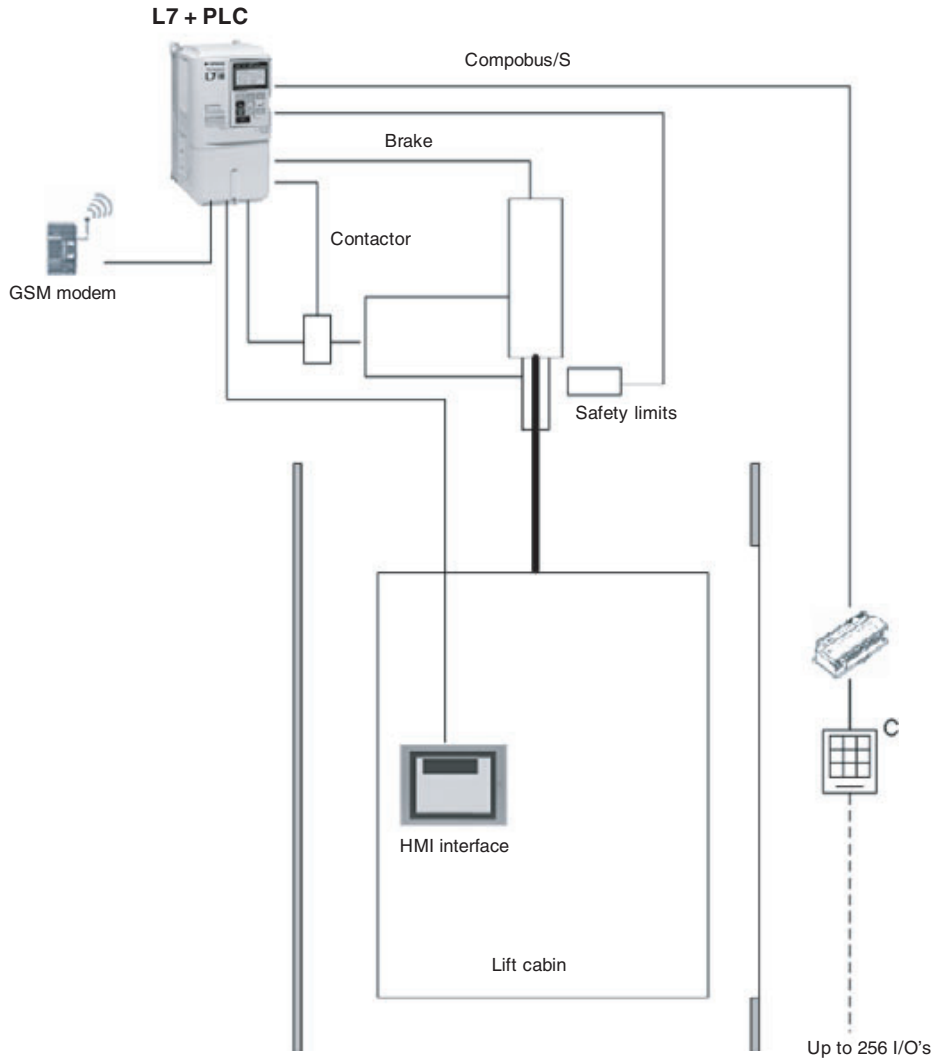



**Note:** For detailed information about the inverter, please see into the Varispeed E7 series section.

## L7 + PLC

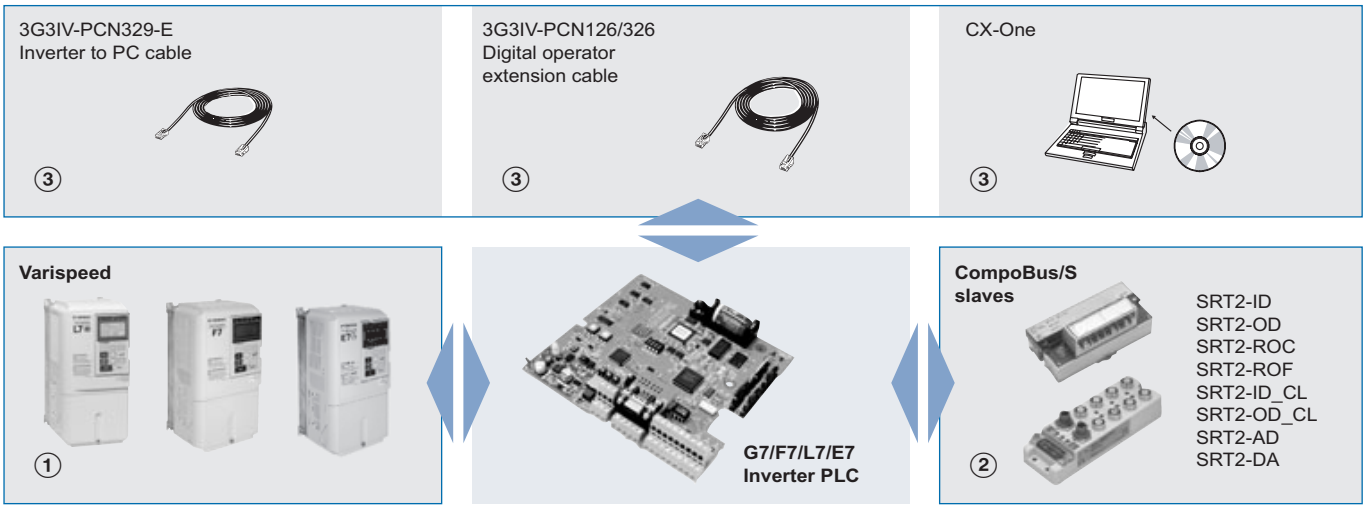
The L7 is the ultimate drive for lift applications up to 3m/s. High starting torque, silent operation, lift-specific operator interface and operation with both AC and PM motors are standard features of the L7 inverter. By combining with PLC option board, it is the ideal solution for controlling distributed 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.

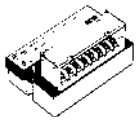
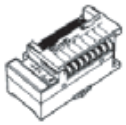
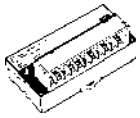
### ② Cables

| 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)<br>4 PNP inputs (– common)<br>4 NPN outputs (– common)<br>4 PNP outputs (+ common) | SRT2-ID04<br>SRT2-ID04-1<br>SRT2-OD04<br>SRT2-OD04-1 |
| | | 8 NPN inputs (+ common)<br>8 PNP inputs (– common)<br>8 NPN outputs (– common)<br>8 PNP outputs (+ common) | SRT2-ID08<br>SRT2-ID08-1<br>SRT2-OD08<br>SRT2-OD08-1 |
| | | 16 NPN inputs (+ common)<br>16 PNP inputs (– common)<br>16 NPN outputs (– common)<br>16 PNP outputs (+ common) | SRT2-ID16<br>SRT2-ID16-1<br>SRT2-OD16<br>SRT2-OD16-1 |
| Relay output terminals |  | 8 Relay outputs<br>8 Power MOS FET relay outputs | SRT2-ROC08<br>SRT2-ROF08 |
| | | 16 Relay outputs<br>16 Power MOS FET relay outputs | SRT2-ROC16<br>SRT2-ROF16 |
| Waterproof terminals |  | 4 NPN inputs (+ common)<br>4 PNP inputs (– common)<br>4 NPN outputs (– common)<br>4 PNP outputs (+ common) | SRT2-ID04CL<br>SRT2-ID04CL-1<br>SRT2-OD04CL<br>SRT2-OD04CL-1 |
| | | 8 NPN inputs (+ common)<br>8 PNP inputs (– common)<br>8 NPN outputs (– common)<br>8 PNP outputs (+ common) | SRT2-ID08CL<br>SRT2-ID08CL-1<br>SRT2-OD08CL<br>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

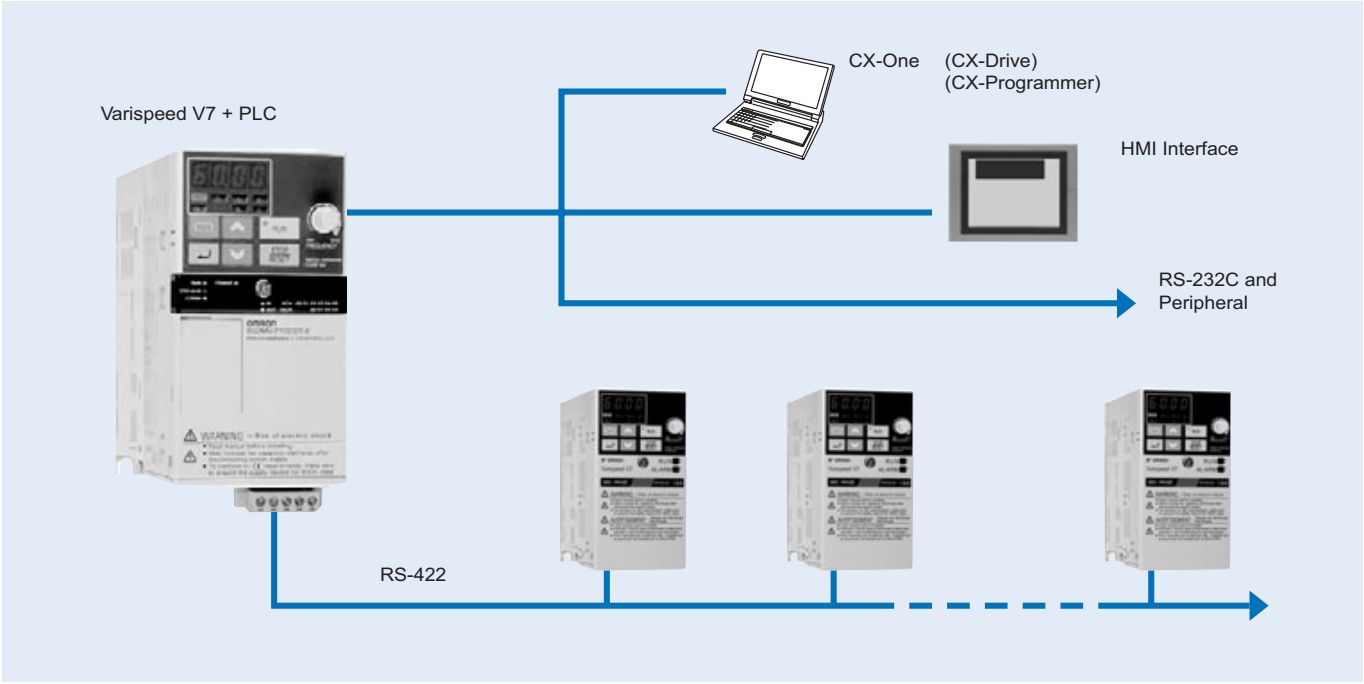
# V7 inverter PLC

**The OMRON PLC technology embedded in the most popular inverter: the V7**

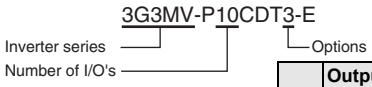
- OMRON PLC programmability for the 3G3MV inverter
- Stand-alone applications.
- Flexibility and intelligence into the 3G3MV.
- Wireless installation and seamless access to the inverter parameters and analogue/digital inputs and outputs.
- Standard OMRON tools can be used for programming and commissioning.
- 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)<br>9.8 m/s$^2$ (57-150 Hz)<br>9.8 m/s$^2$ (57-150 Hz)<br>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<br>• IR-memory<br>• DM-memory<br>• Transfer command |
| IR area | | 880 bits: IR 00100 to IR 00915 (words IR 001 to IR 009),<br>IR 01100 to IR 02815 (words IR 011 to IR 028),<br>IR 03000 to IR 04915 (words IR 030 to IR 049),<br>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<br>2 inputs<br>Response time: 50 µs | |
| | | Interval timer interrupts<br>1 input<br>Set value: 0.5 to 319,968 ms<br>Precision: 0.1 ms | Scheduled interrupts |
| | | | One-shot interrupt |
| High-speed counters | | High-speed counter<br>1 input, see note 5<br>• Differential phase mode (5 kHz)<br>• Pulse plus direction input mode (20 kHz)<br>• Up/down input mode (20 kHz)<br>• Increment mode (20 kHz) | No interrupt |
| | | | Count-check interrupt<br>(an interrupt can be generated when the count equals the set value or the count lies within a preset range.) |
| | | Interrupt inputs (counter mode)<br>2 inputs<br>• Incrementing counter (2 kHz)<br>• Decrementing counter (2 kHz) | No interrupt |
| | | | Count-up interrupt |
| Pulse outputs | | • 2 outputs:<br>Single-phase pulse output without acceleration/deceleration (see note 6.)<br>10 Hz to 10 kHz<br>• 2 outputs:<br>Variable duty ratio pulse output (see note 6.)<br>0.1 to 999.9 Hz, duty ratio 0 to 100%<br>• 1 output:<br>Pulse output with trapezoidal acceleration/deceleration (see note 6.)<br>Pulse plus direction output, up/down pulse output, 10 Hz to 10 kHz | |
| Synchronized pulse control | | 1 point, see notes 5 and 6<br>Input frequency range: 10 to 500 Hz, 20 Hz to 1 kHz, or 300 Hz to 20 kHz<br>Output frequency range: 10 Hz to 10 kHz | |
| Analog volume | | None | |
| Input time constant<br>(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<br>host link, peripheral bus, no-protocol, programming console<br>Port 2 = RS-232C port:<br>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<br>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.

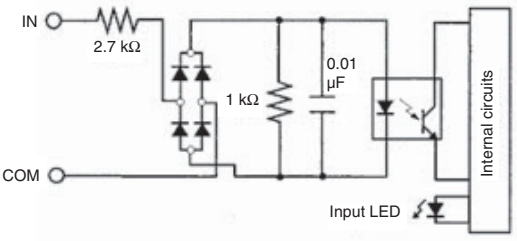
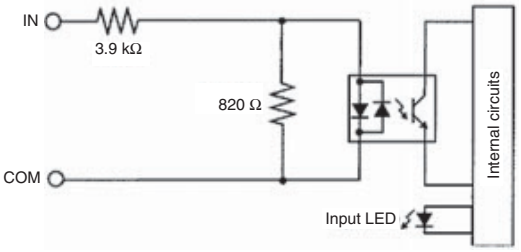
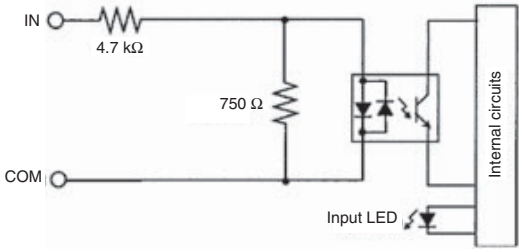
**5.** This input is shared by the high-speed counter and synchronized pulse control functions.

**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.

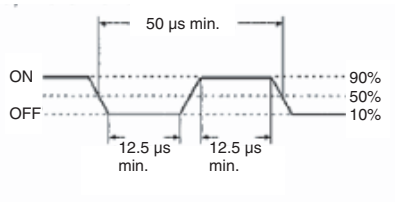
## High speed counter inputs

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.

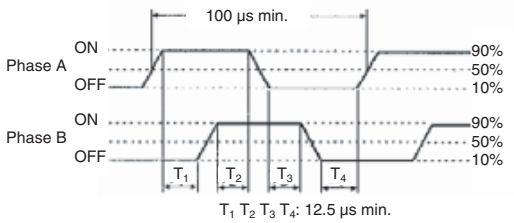
| Input | Function | | | |
|---|---|---|---|---|
| | Differential phase mode | Pulse plus direction input mode | Up/down input mode | Increment mode |
| IN00000 | A-phase pulse input | Pulse input | Increment pulse input | Increment pulse input |
| IN00001 | B-phase pulse input | Direction input | Decrement pulse input | Normal input |
| IN00002 | Z-phase pulse input or hardware reset input<br>(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

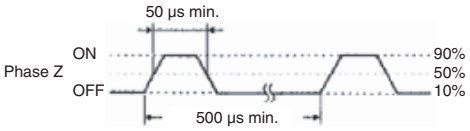



Differential phase mode




$T_1$ $T_2$ $T_3$ $T_4$: 12.5 µs min.

The minimum pulse width for input IN00002 (Z-phase input) is as follows:



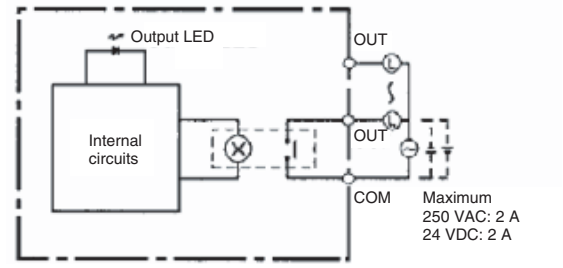

## Interrupt inputs

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.

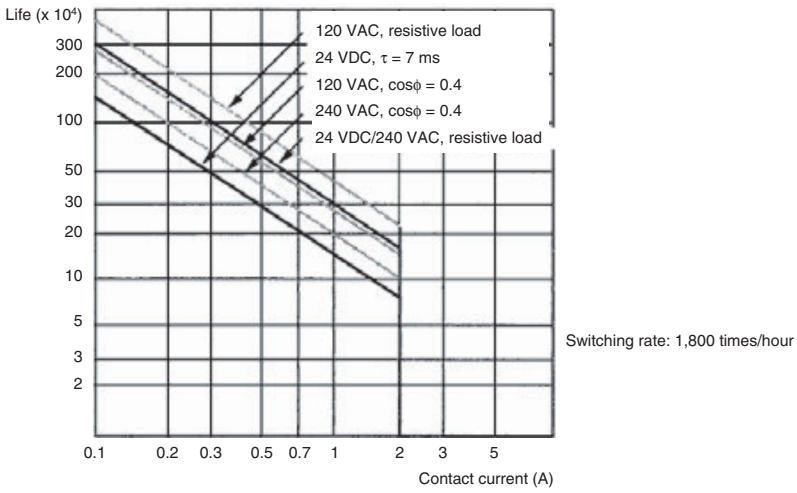
Inputs IN00003 and IN00004 can be used as interrupt inputs.

## Output Specification

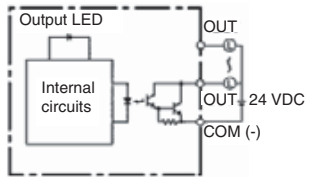
### Relay output

| Item | Specification |
|---|---|
| Maximum switching capacity | 2 A, 250 VAC (cosφ=1)<br>2A, 24VDC |
| Minimum switching load | 10 mA, 5 VDC |
| Service life of relay | Electrical: 150,000 operations (24 VDC resistive load)<br>100,000 operations (240 VAC inductive load cosφ=0.4)<br>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<br>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 |  |

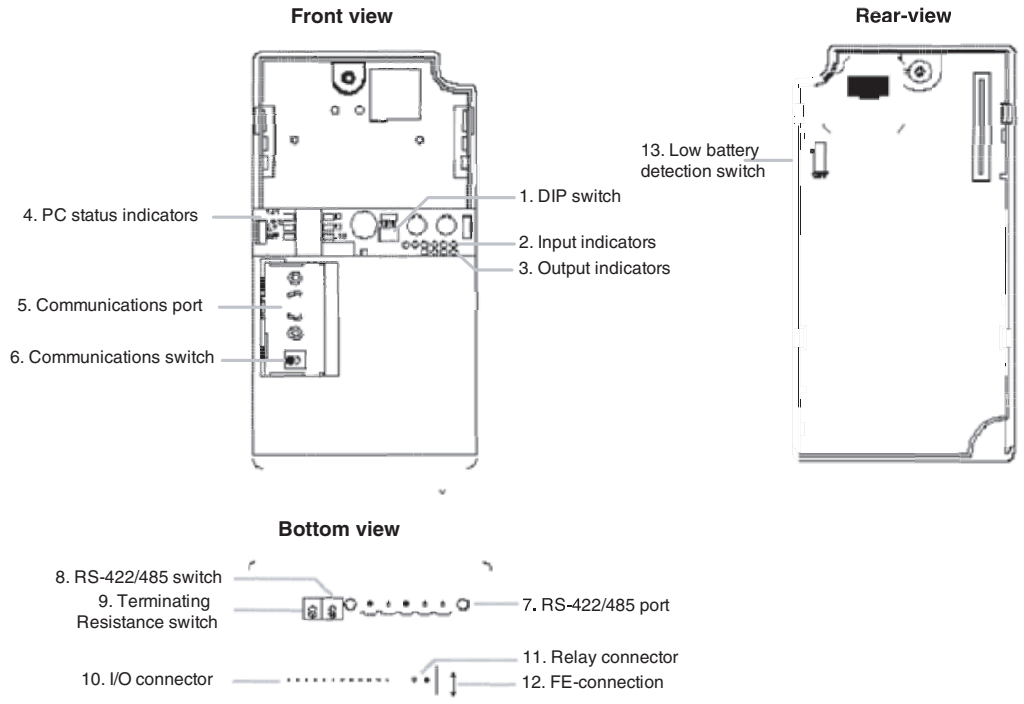
**Note:** When using OUT01000 or OUT01001 as a pulse output, connect a dummy resistor as required to bring the load current between 0.01 and 0.1 A. If the load current is below 0.1 A, the ON-to-OFF response time will be longer and high-speed pulses (source-type transistor outputs) will not be output. 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

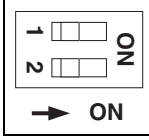
# Operation

## 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.<br>RS-232C port settings: DM 6645 to DM 6649<br>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

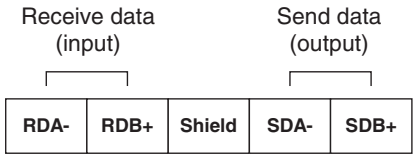
Switch to select port 1 type of connected device

| 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)

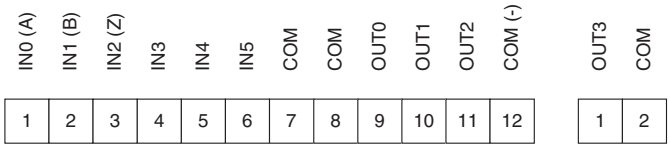
| Position | Termination |
|---|---|
| OFF (down) (default) | Disabled |
| ON (up) | Enabled |

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.

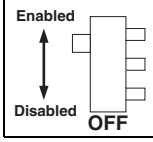
Connector: WAGO 734-102 (wire cross section 0.08 to 1.50 mm2)

### 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.

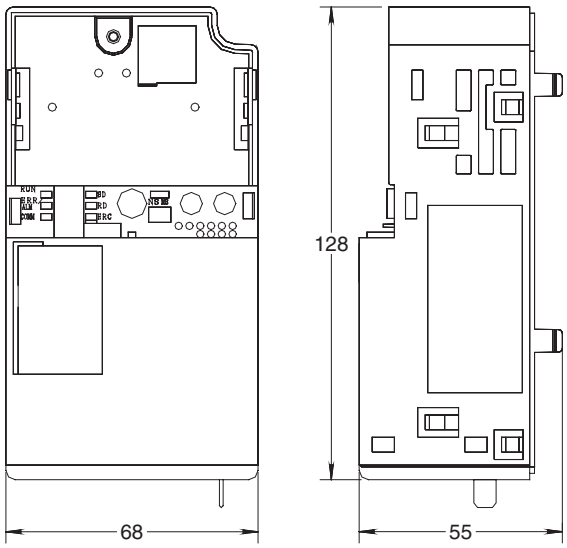
### 13. Low battery detection switch (3G3MV-P10CDT3-E only)

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 |



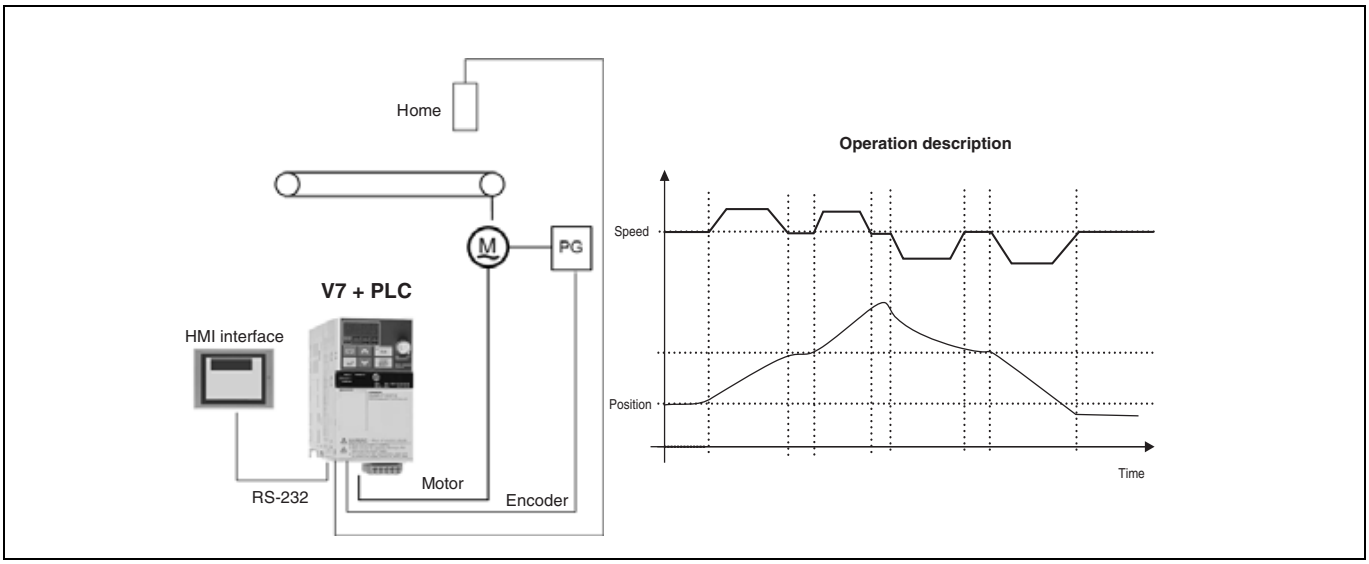
## Dimensions



## Applications examples

### V7 + PLC in positioning application

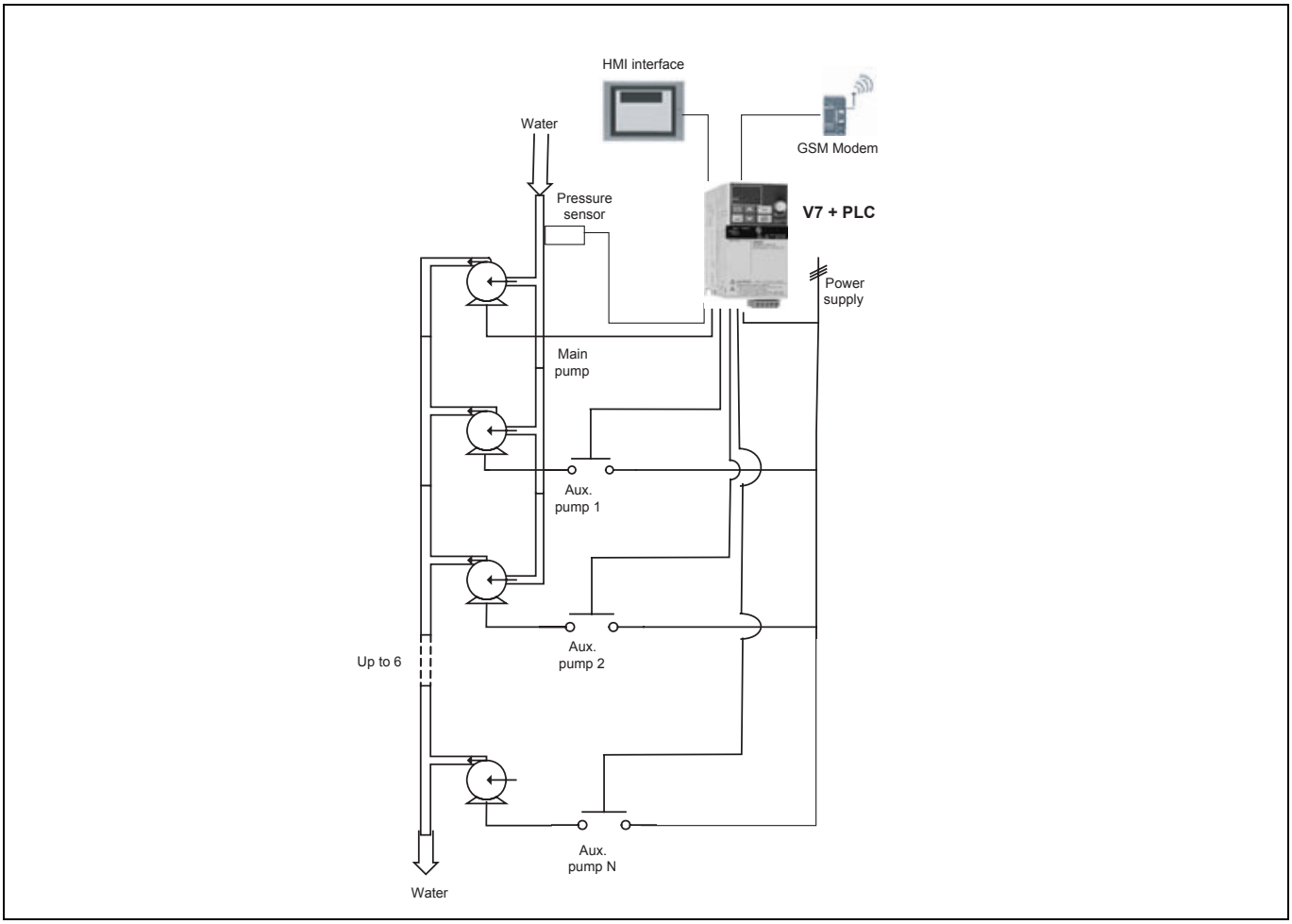
point-to-point applications are posible adding the PLC to the V7, including the possibility to add position and speed tables or even use recipes that could be select using a HMI




**Note:** For detailed information about the inverter, please refer to Varispeed V7 section.

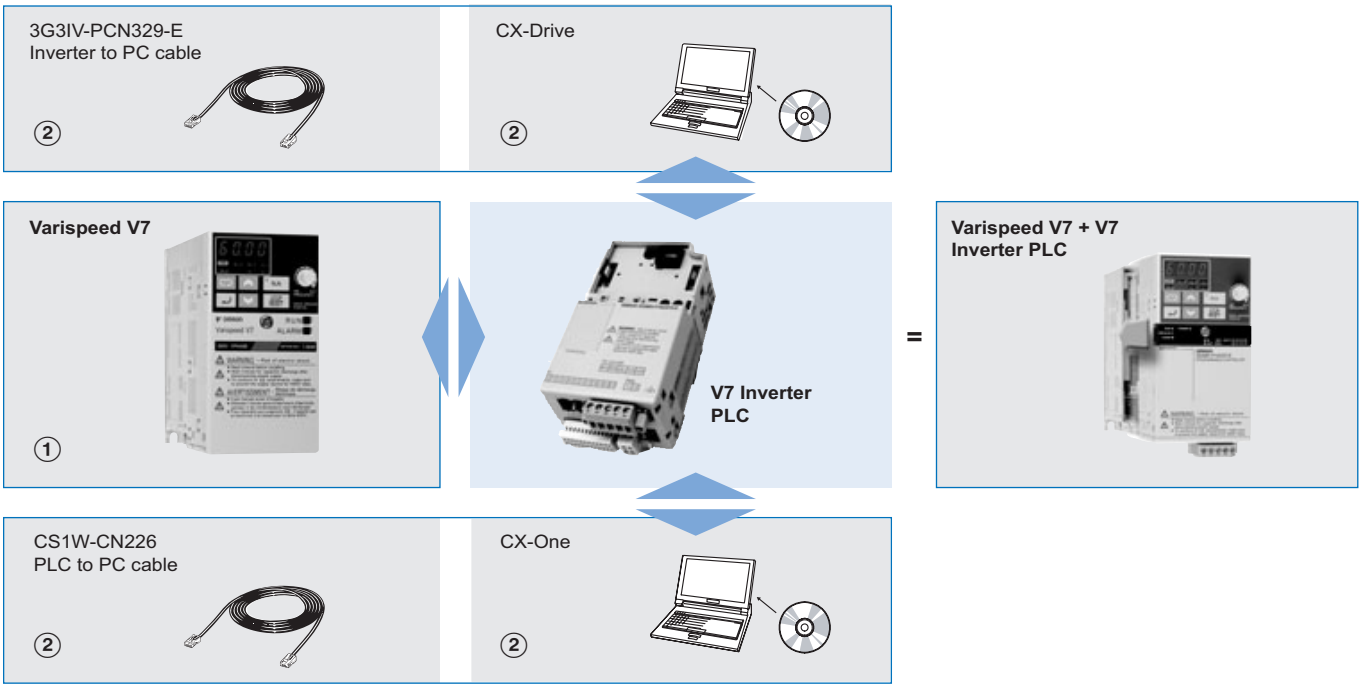
### V7 + PLC with pump

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.

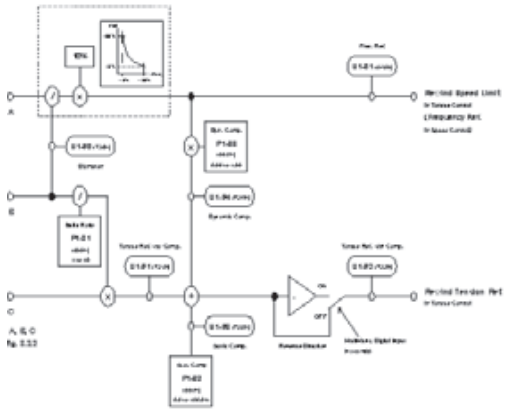
Cat. No. I24E-EN-02 In the interest of product improvement, specifications are subject to change without notice.

The inverter made for you. Inverter application software.

# CASE software

**Customised software to meet your specific application requirements.**

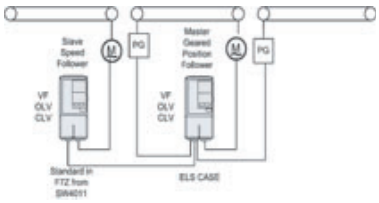
- The customised application software gives to a standard inverter the features of a dedicated solution.
- The CASE software is a special software file that can be downloaded to the standard inverter to provide additional functionality.
- Specific parameters, monitors and alarms can be added with application 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.



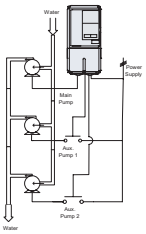


## System configuration

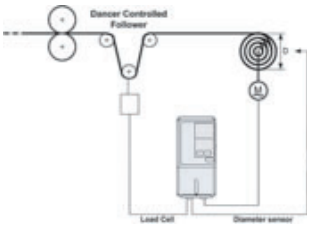
**ELS software S-8161**



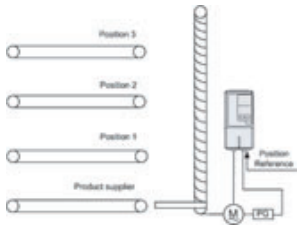
**Pump sequencer software S-8801**



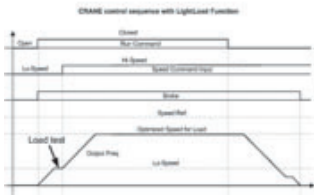
**Winder software S-8180**



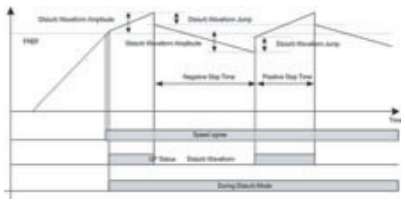
**Point to point software S-8795**



**Crane software S-7071**



**Traverse software S-9381**



Varispeed G7

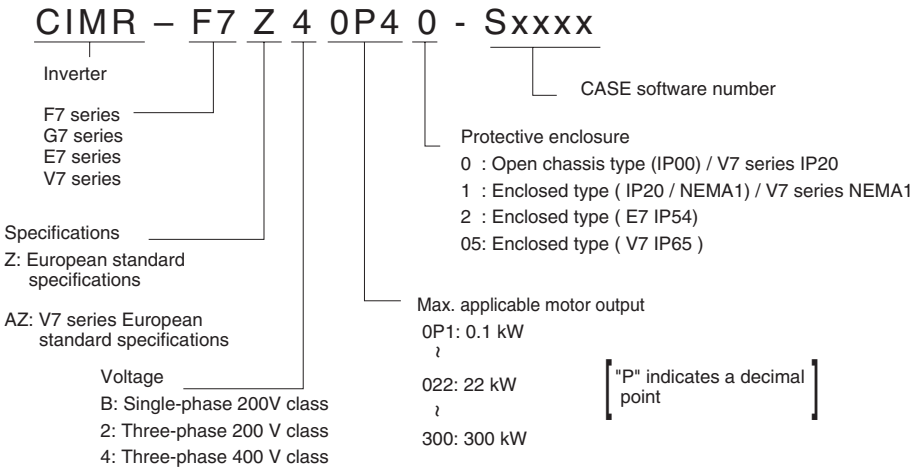
Varispeed F7

Varispeed E7

Varispeed V7

## Specifications

### Type designation




### CASE software

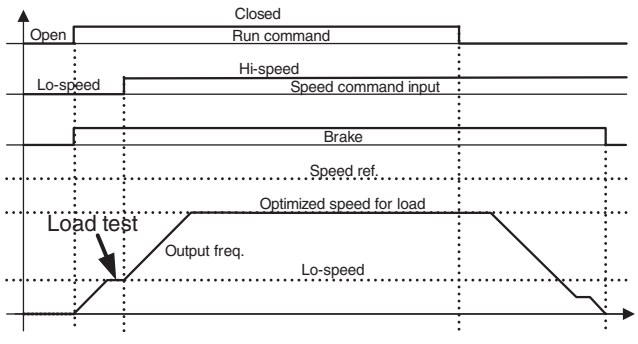
| Compatible inverter | CASE software | Description | Application |
|---|---|---|---|
| Varispeed F7Z | S7071 | Dedicated software for crane applications | Cranes |
| | S8161 | Dedicated software for position and speed follower applications | Sinchronized movements |
| | S8180 | Dedicated software for 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**

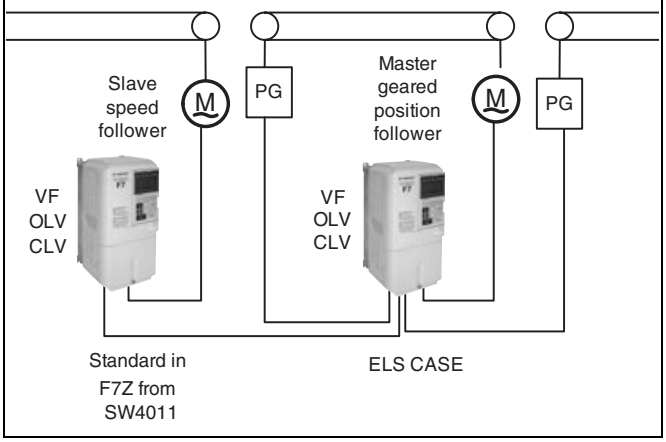
**Crane control sequence with light load function**



### 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

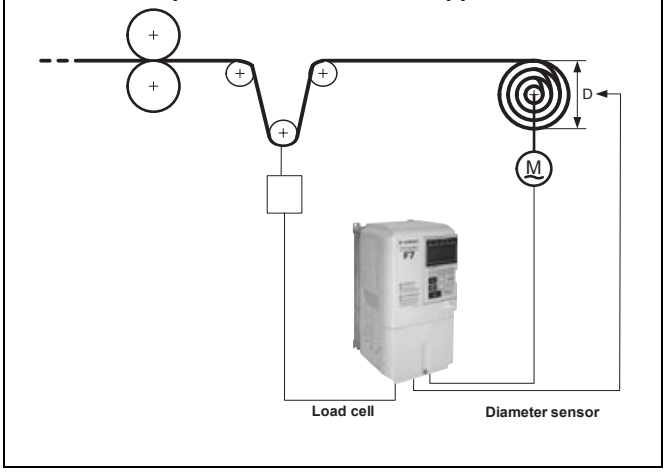
**Example of ELS software application**




### 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

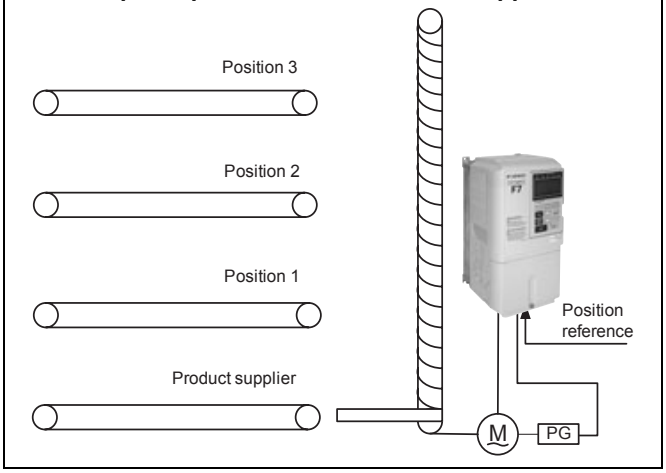
**Example of winder software application**




### 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

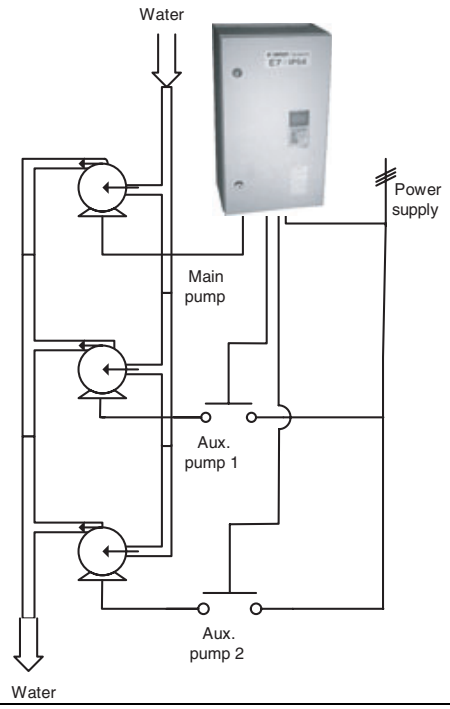
**Example of position control software application**



### 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

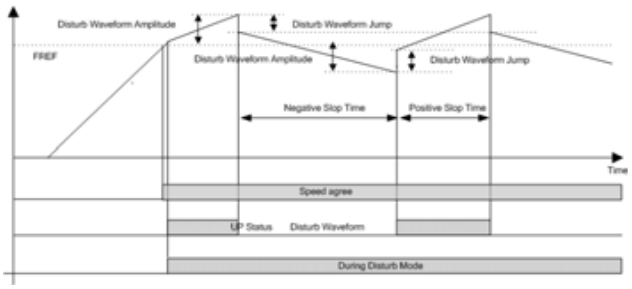
**Example of pump sequencer software application**




### Traverse software

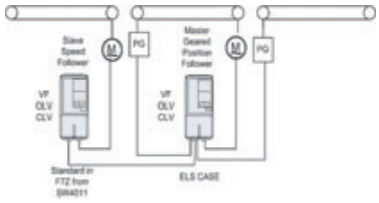
- Dedicated software for textile wire winding applications.
- Disturbed wave form allows perfect wire positioning during winding process, ensuring perfect and smooth unwinding.
- Amplitude and time periods are fully customizable
- Compatible inverters: V7AZ series.

**Operation description in traverse software**

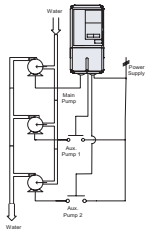


## Ordering information

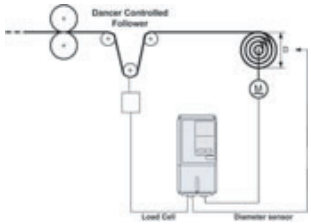
**ELS software S-8161**

① 

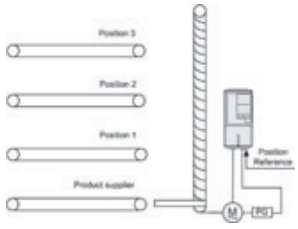
**Pump sequencer software S-8801**

① 

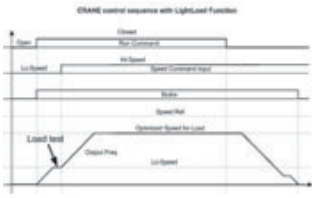
**Winder software S-8180**

① 

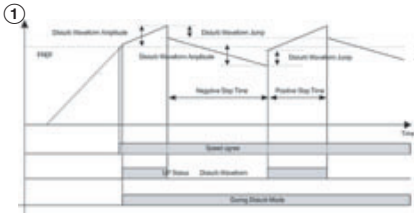
**Point to point software S-8795**

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.