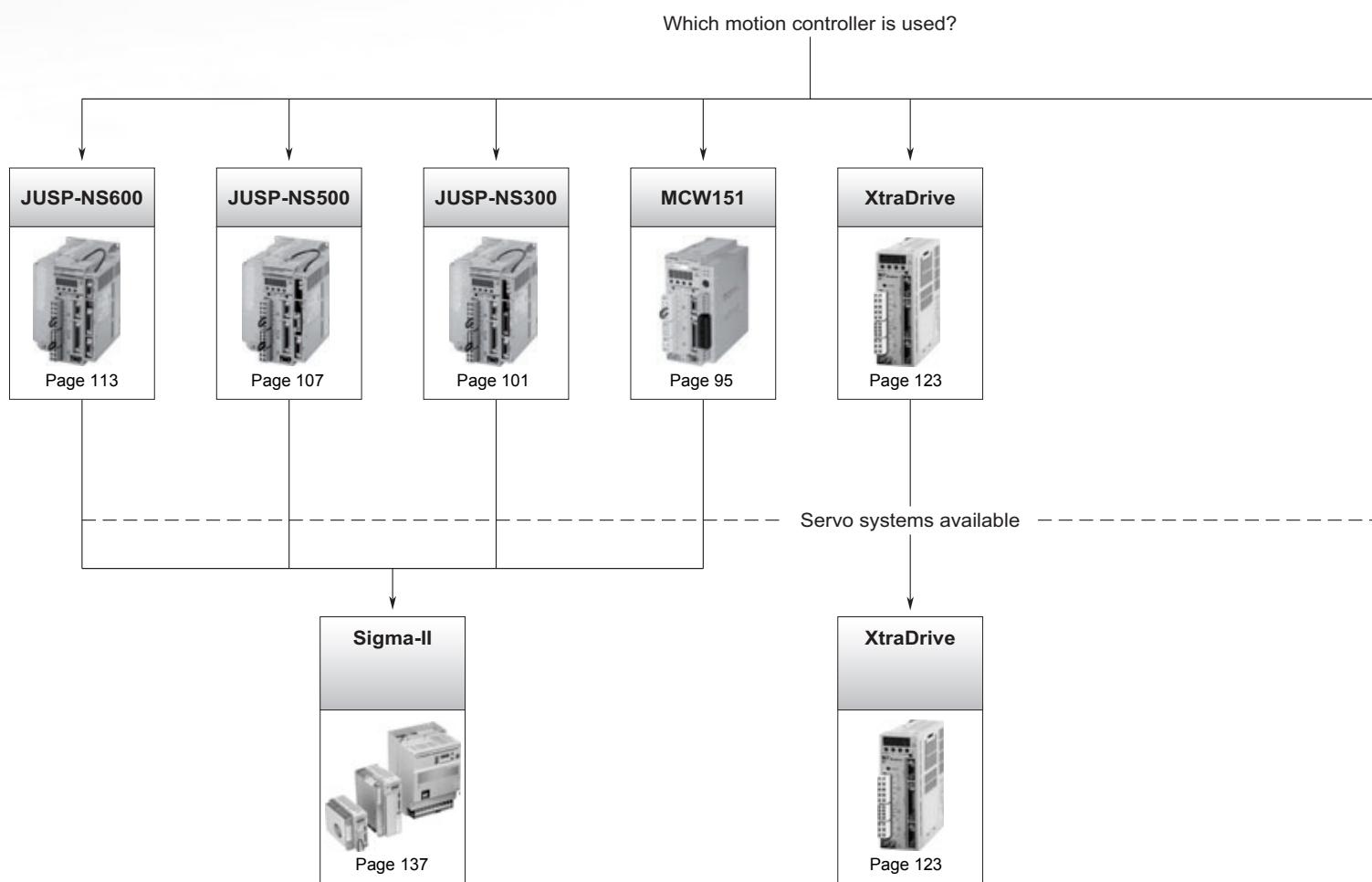
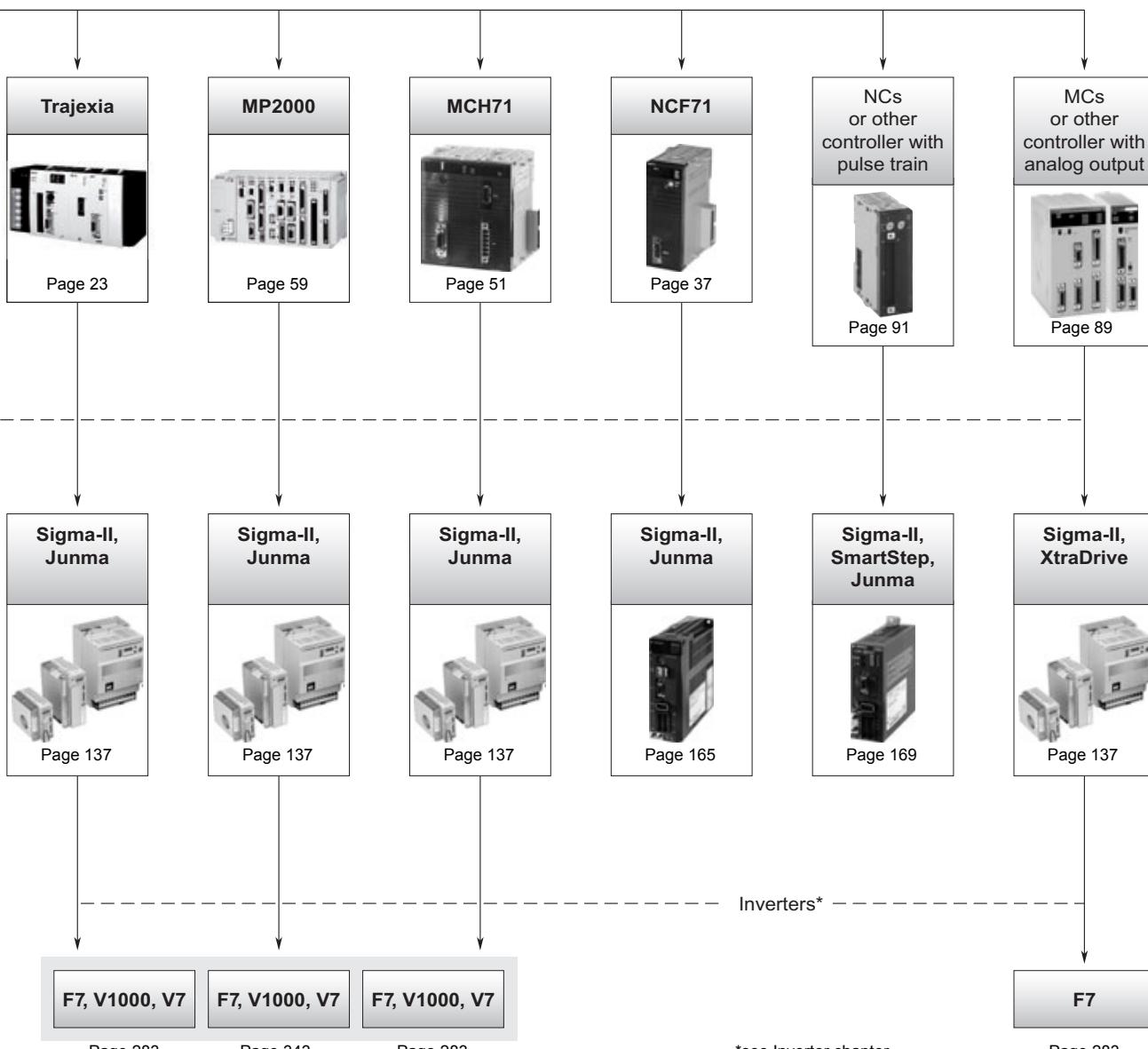


# AC Servo systems



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| <b>Servo drive</b>         | XtraDrive                    |
|                            | Sigma-II servo drive         |
|                            | SmartStep servo drive        |
|                            | Junma ML-II servo drive      |
|                            | Junma Pulse servo drive      |
| <b>Rotary servo motors</b> | Sigma-II rotary servo motors |
|                            | SmartStep servo motors       |
|                            | Junma servo motors           |
|                            | Sigma direct drive motors    |
| <b>Linear servo motors</b> | Sigma linear motors          |
|                            | Sigma linear axis            |
|                            | Sigma linear trac-micro      |



\*see Inverter chapter

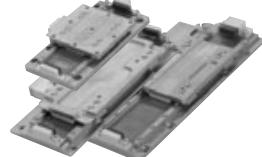
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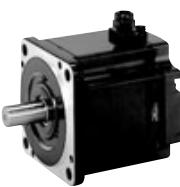
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# Selection table

|  | Servo drives  |  |  |   |   |
|--|---|--|--|---|---|
|  |    |     |     |  |  |
|  | XtraDrive   | Sigma-II   | SmartStep  | Junma ML-II   | Junma Pulse   |
| All in one! Servo drive and motion controller integrated | Designed with ZERO compromise   | Servo capability with stepper simplicity   | A new concept in drive simplicity – save space, save wiring, save time               | No more parameter set up<br>Save space, save time                                   |   |
| <b>Ratings 230 V single-phase</b>                        | 30 W to 1,500 W   | 30 W to 1,500 W  | 30 W to 800 W  | 100 W to 750 W  | 100 W to 750 W  |
| <b>Ratings 400 V single-phase</b>                        | 0.5 kW to 5 kW  | 0.5 kW to 55 kW  | N/A  | N/A   | N/A   |
| <b>Motors applicable</b>                                 | Sigma linear motors, rotary Sigma-II and SmartStep motors                           | Rotary Sigma-II, rotary direct drives and Sigma linear motors                        | SmartStep motors   | Junma motors  | Junma motors  |
| <b>Positioning control</b>                               | Internal program, pulse train input or via PROFIBUS                                 | Pulse train input or via option unit   | Pulse train input  | MECHATROLINK-II   | Pulse train input   |
| <b>Speed control</b>                                     | Internal program, analogue ±10 V or via PROFIBUS                                    | Analogue ±10 V or via option unit  | N/A  | N/A   | N/A   |
| <b>Torque control</b>                                    | Internal program, analogue ±10 V or via PROFIBUS                                    | Analogue ±10 V or via option unit  | N/A  | N/A   | N/A   |
| <b>Page</b>  | 123   | 137  | 155  | 165   | 169   |
| Sigma linear servo motors                                |   |  |  |   |   |
|  |   |   |  |   |   |
|  | SGLFW   | SGLGW  | SGLTW  |   |   |
| Iron-core Sigma linear motor, making the difference      | Coreless GW linear motor construction results in zero attraction force              | Iron-core TW linear motor with magnetic attraction cancellation                      |  |   |   |
| <b>Rated force range</b>                                 | 25 N to 2250 N  | 12.5 N to 325 N  | 300 N to 2000 N  |   |   |
| <b>Peak force range</b>                                  | 86 N to 5400 N  | 40 N to 1300 N   | 600 N to 7500 N  |   |   |
| <b>Maximum speed</b>                                     | 5 m/sec   | 5 m/sec  | 5 m/sec  |   |   |
| <b>Design type</b>                                       | Iron-core coil  | Coreless coil  | Iron-core coil   |   |   |
| <b>Magnetic attraction</b>                               | 314 N to 14600 N  | zero   | zero   |   |   |
| <b>Drives applicable</b>                                 | Sigma-II and XtraDrive  | Sigma-II and XtraDrive   | Sigma-II and XtraDrive   |   |   |
| <b>Page</b>  | 209   |  |  |   |   |
| Sigma linear servo motors                                |   |  |  |   |   |
|  |  |  |  |   |   |
|  | LETLA   | SGTMM  |  |   |   |
| Linear axes ready to use                                 | Flat construction for mounting at narrow spaces                                     |  |  |   |   |
| <b>Rated force range</b>                                 | 80 N to 1120 N  | 3.5 N to 7 N   |  |   |   |
| <b>Peak force range</b>                                  | 220 N to 2400 N   | 10 N to 25 N   |  |   |   |
| <b>Maximum speed</b>                                     | 5 m/sec   | 1.5 m/sec  |  |   |   |
| <b>Design type</b>                                       | Iron-core coil  | Moving magnet  |  |   |   |
| <b>Magnetic attraction</b>                               | 810 N to 6520 N   | zero   |  |   |   |
| <b>Drives applicable</b>                                 | Sigma-II and XtraDrive  | Sigma-II   |  |   |   |
| <b>Page</b>  | 235   | 249  |  |   |   |

| Rotary servo motors       |  |  |
|---------------------------|--|--|
|                           |   |  |
|                           | <b>SGMAH</b>   | <b>SGMPH</b>   |
|                           | Sigma-II rotary motors (6 different motor families to cover all application needs) |  |
|                           | Low-inertia design for high dynamics   | Medium inertia design with flat profile  |
| <b>Rated speed</b>        | 3000 rpm   | 3000 rpm   |
| <b>Maximum speed</b>      | 5000 rpm   | 5000 rpm   |
| <b>Rated torque</b>       | 0.095 Nm to 2.39 Nm  | 0.318 Nm to 4.77 Nm  |
| <b>Sizes</b>              | 30 to 750 W  | 100 to 1500 W  |
| <b>Drives applicable</b>  | Sigma-II and XtraDrive   | Sigma-II and XtraDrive   |
| <b>Encoder resolution</b> | 13 bits-incremental / 16 bits-absolute   | 13 bits-incremental / 16 bits-absolute   |
| <b>IP rating</b>          | IP55   | IP55 (optional IP67)   |
| <b>Page</b>               | 173  | IP67   |

| Rotary servo motors       |  |  |
|---------------------------|--|--|
|                           |   |  |
|                           | <b>SGMSH</b>   | <b>SGMUH</b>   |
|                           | Sigma-II rotary motors (6 different motor families to cover all application needs) |  |
|                           | Low-inertia motors for high dynamics   | High speed servo motors  |
| <b>Rated speed</b>        | 3000 rpm   | 6000 rpm   |
| <b>Maximum speed</b>      | 5000 rpm   | 6000 rpm   |
| <b>Rated torque</b>       | 3.18 Nm to 15.8 Nm   | 1.59 Nm to 6.3 Nm  |
| <b>Sizes</b>              | 1 to 5 kW  | 1 to 5 kW  |
| <b>Drives applicable</b>  | Sigma-II and XtraDrive   | Sigma-II and XtraDrive   |
| <b>Encoder resolution</b> | 17 bits-incremental and absolute   | 17 bits-incremental  |
| <b>IP rating</b>          | IP67   | IP67   |
| <b>Page</b>               | 173  | IP44   |

| Rotary servo motors       |   |  |
|---------------------------|---|--|
|                           |  |  |
|                           | <b>SmartStep</b>  | <b>Junma Motors</b>  |
|                           | SmartStep motors  | Junma  |
|                           | Ultra compact motor   | Medium inertia compact motor   |
| <b>Rated speed</b>        | 3000 rpm  | 3000 rpm   |
| <b>Maximum speed</b>      | 4500 rpm  | 4500 rpm   |
| <b>Rated torque</b>       | 0.095 Nm to 2.39 Nm   | 0.318 Nm to 2.39 Nm  |
| <b>Sizes</b>              | 30 to 800 W   | 100 to 750 W   |
| <b>Drives applicable</b>  | SmartStep and XtraDrive   | Junma (MLII and Pulse)   |
| <b>Encoder resolution</b> | 2000 pulses/revolution  | 13 bits - Analog incremental   |
| <b>IP rating</b>          | IP55  | IP55   |
| <b>Page</b>               | 191   | 199  |
|                           |   | <b>SGMCS</b>   |
|                           |   | Direct drive   |
|                           |   | Gearless high torque rotary motors   |
|                           |   | 150 / 200 rpm  |
|                           |   | 500 rpm  |
|                           |   | 2 Nm to 80 Nm  |
|                           |   | 42 to 1.5 kW   |
|                           |   | Sigma-II   |
|                           |   | 20 bits-absolute   |
|                           |   | IP42   |
|                           |   | 203  |



XD-□, XD-□-E

# XtraDrive

**Intelligent servo drive. Integrated controller and network connectivity.**

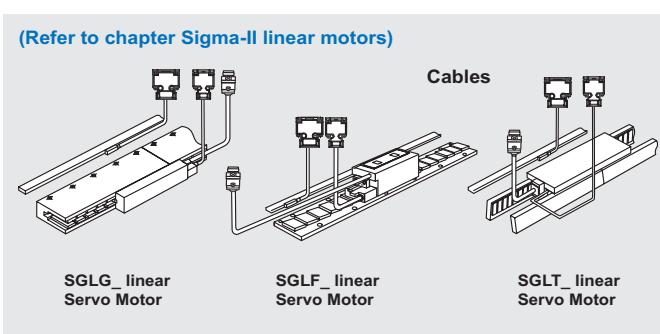
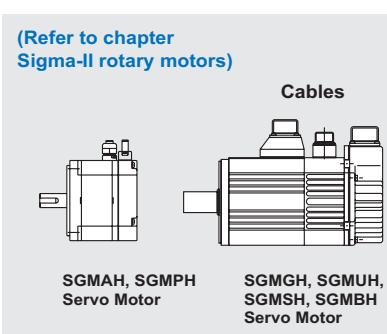
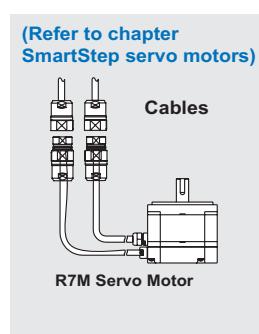
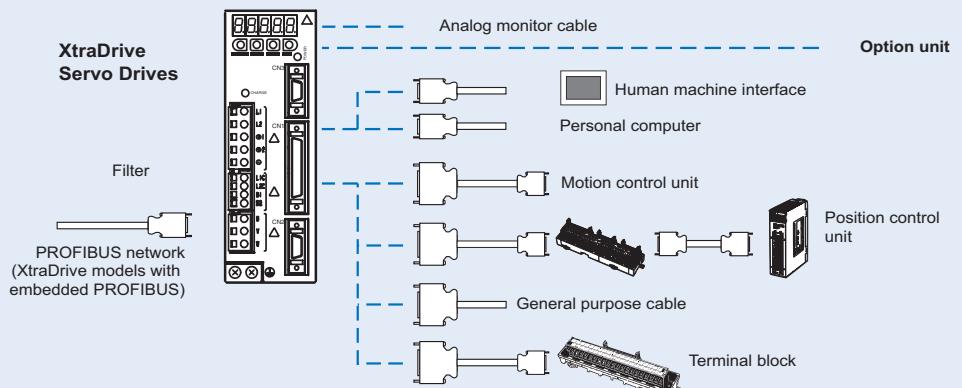
- NCT. Patented non-linear algorithm for tight control
- Very low tracking error with no overshoot and zero settling time
- Supports different servo motor encoder types
- PROFIBUS embedded in the drive available
- XtraDrive model available with electronic CAM
- The ideal drive for linear motor control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

## Ratings

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



## System configuration

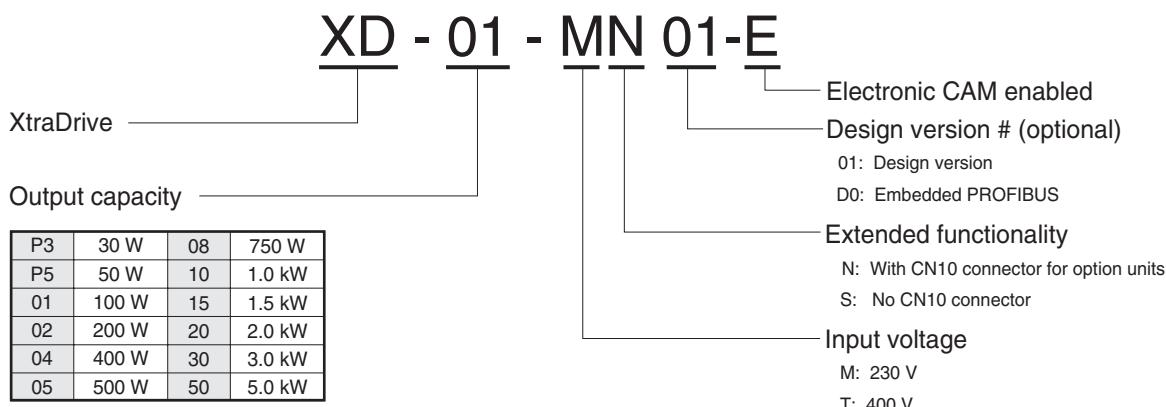


## Servo motor / servo drive combination

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

## Type designation

### Drive



## Servo drive specifications

### Single-phase, 230 V

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

### Three-phase, 400 V

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

## General specifications

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

## I/O specifications

### Terminal specifications

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

## Encoder connector (CN2)

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

## I/O signals (CN1) - input signals

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

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

2. The functions allocated to /S-ON, /P-CON, P-OT, N-OT, /ALM-RST, /P-CL, and /N-CL input signals can be changed by using the parameters.
3. The voltage input range for speed and torque references is a maximum of ±12 V.

## I/O signals (CN1) - output signals

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

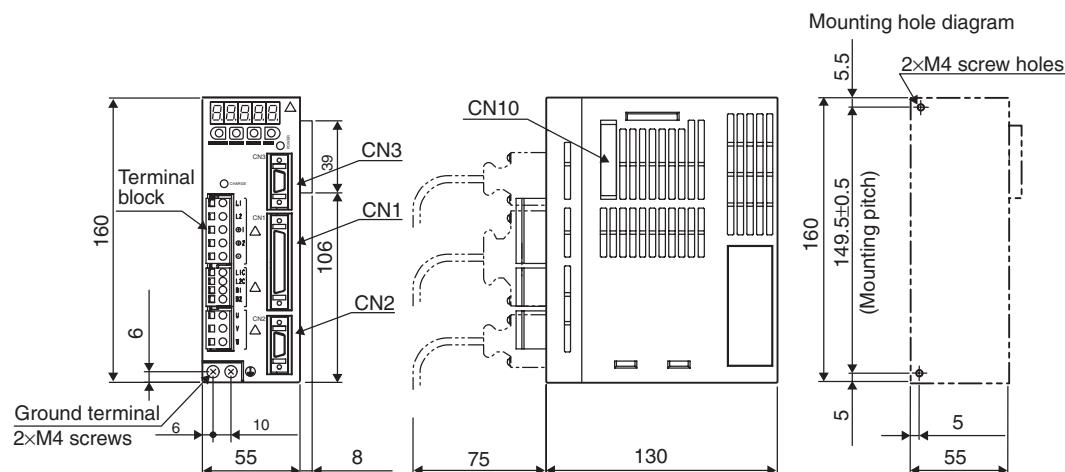
**Note:** 1. Pin numbers in parentheses () indicate signal grounds.

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

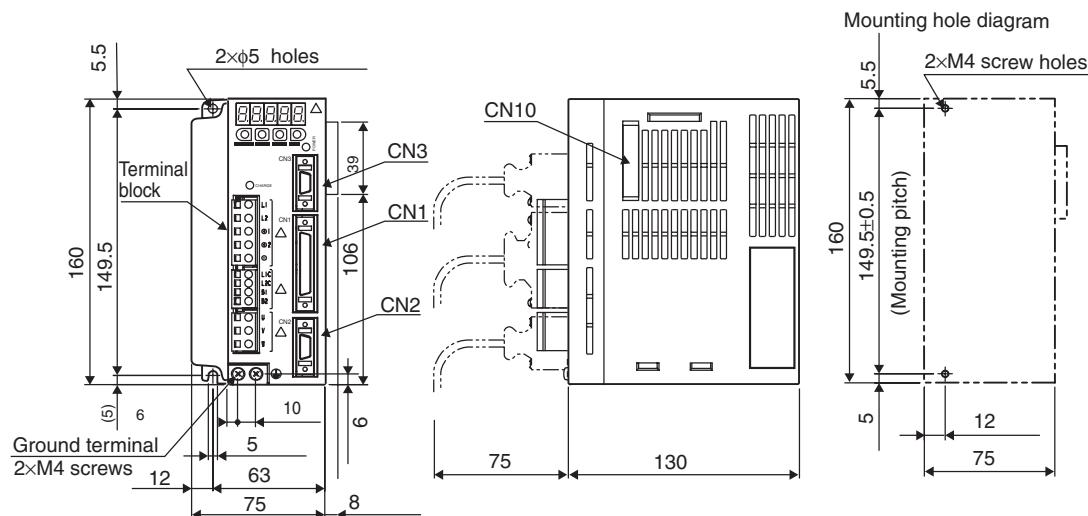
## Dimensions

### Servo drives

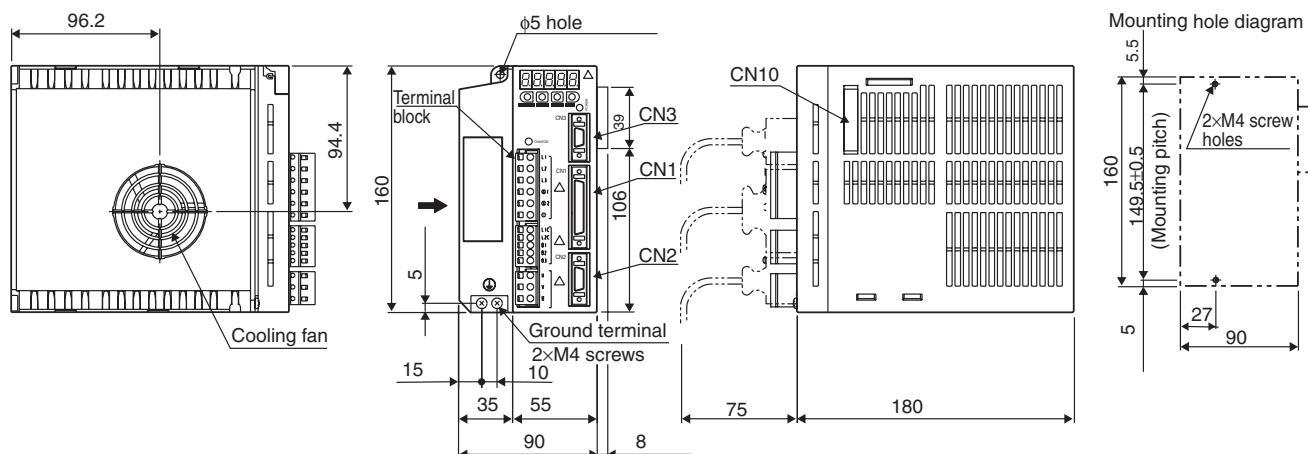
**XD-P3-M□ to XD-02-M□ (230V, 30 to 200W)**



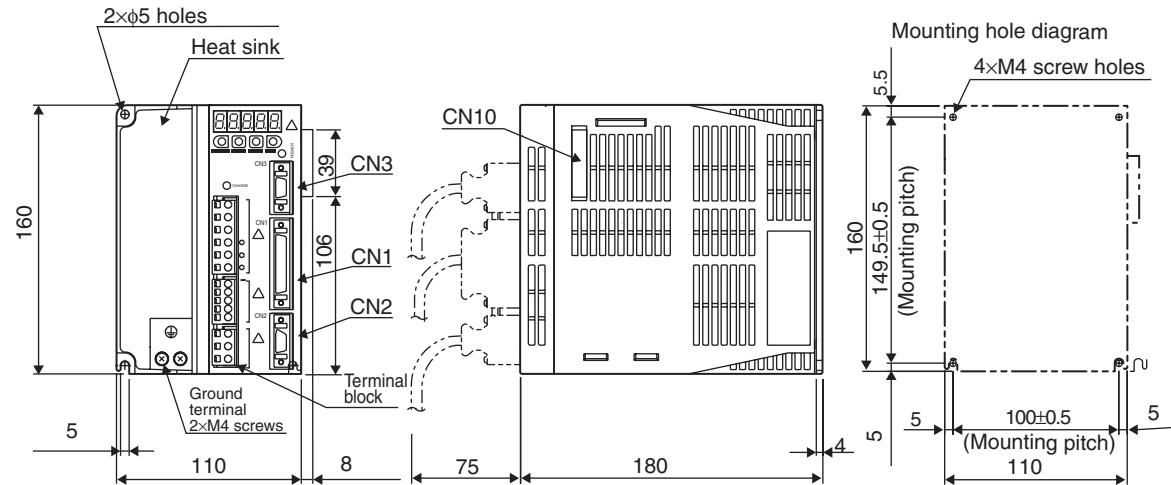
**XD-04-M□ (230V, 400W)**



**XD-08-M□ (230V, 750W)**

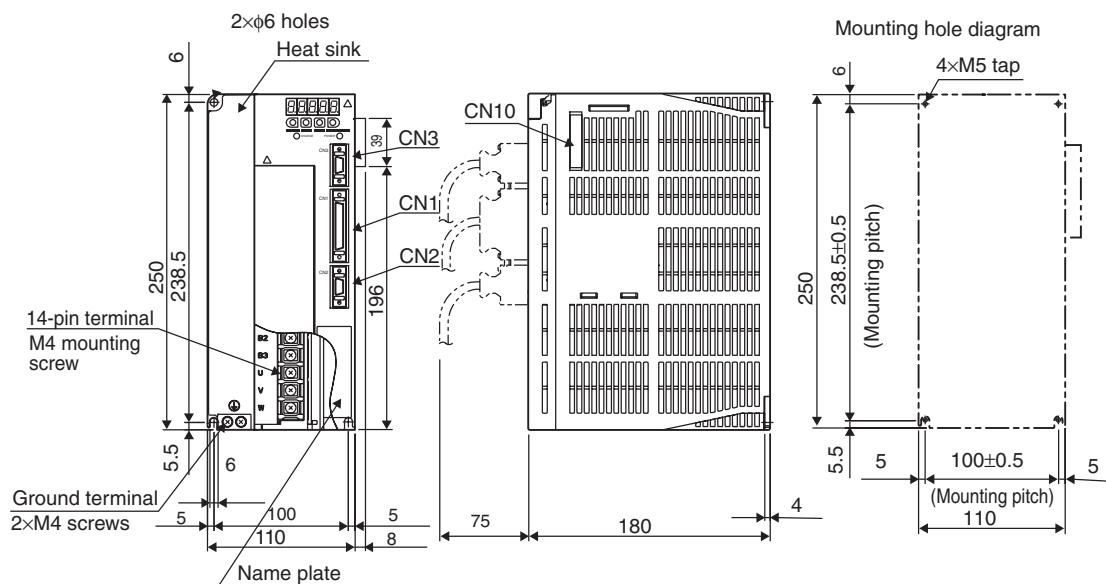


## XD-05-T□ to -15-T□ (400V, 0.5 to 1.5kW)

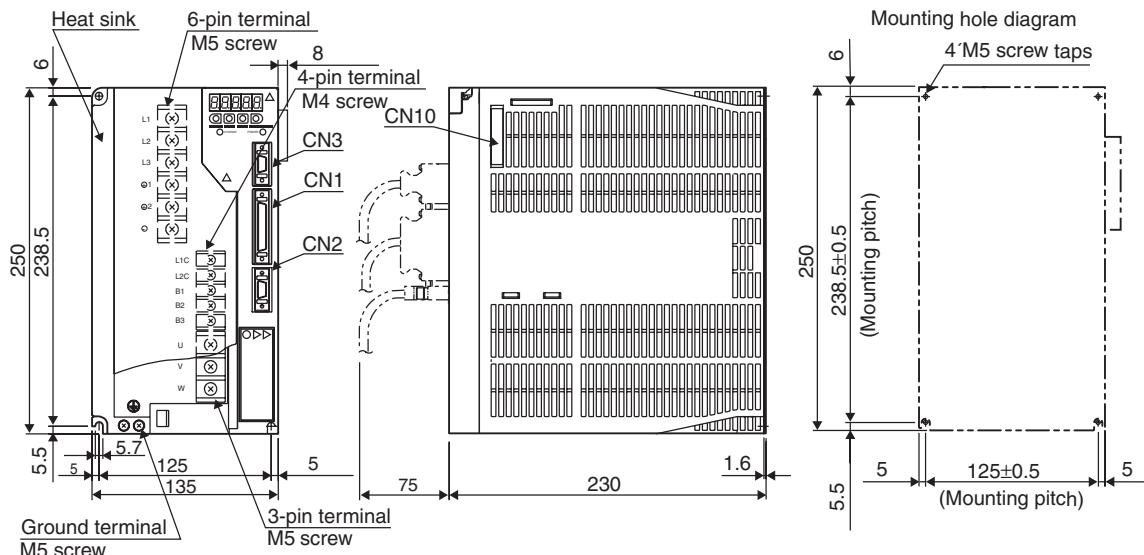


## XD-15-M□ (230V, 1.5kW)

## XD-20-T□, XD-30-T□ (400V, 2/3kW)

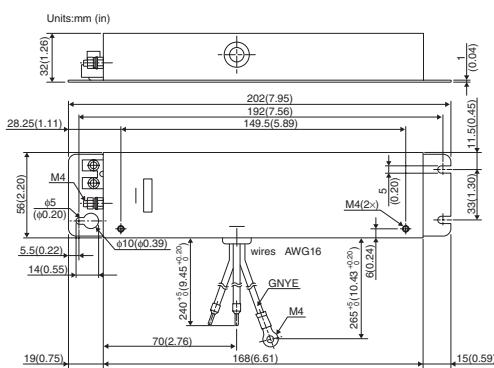


## XD-50-T□ (400V, 5kW)



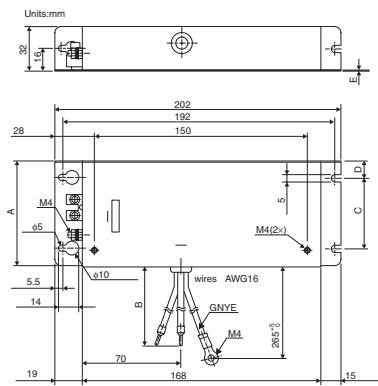
## Filters

R88A-FIW104-SE

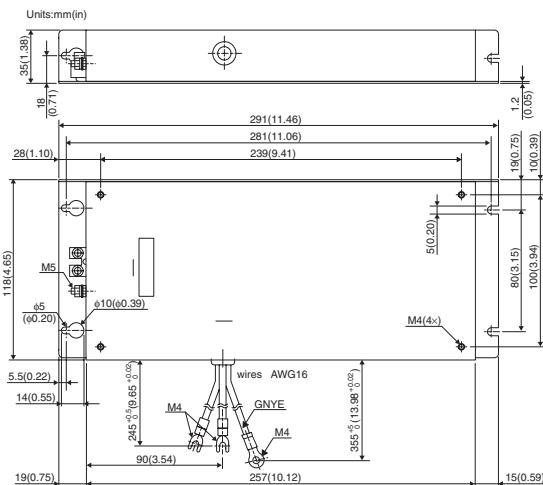


## R88A-FIW107-SE, R88A-FIW115-SE

| Model               |   | R88A-FIW107-SE    | R88A-FIW115-SE    |
|---------------------|---|-------------------|-------------------|
| Dimensions<br>in mm | A | 75                | 90                |
|                     | B | 240 <sup>+5</sup> | 300 <sup>+5</sup> |
|                     | C | 50                | 60                |
|                     | D | 12                | 15                |
|                     | E | 1                 | 1.2               |

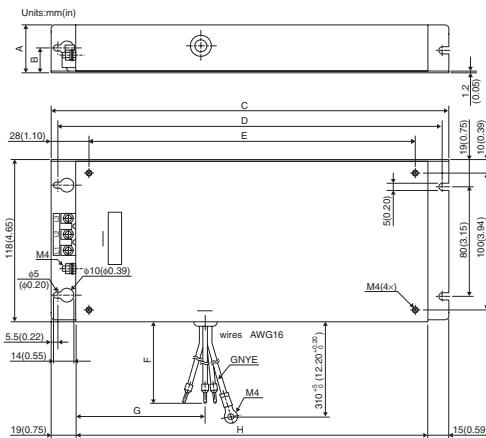


R88A-FIW125-SE

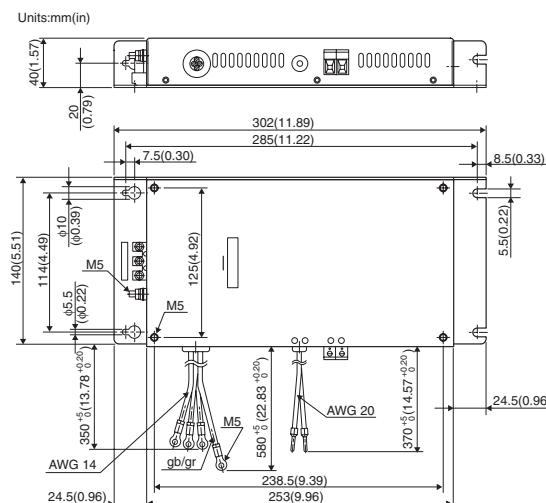


## R88A-FIW4006-SE, R88A-FIW4010-SE

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

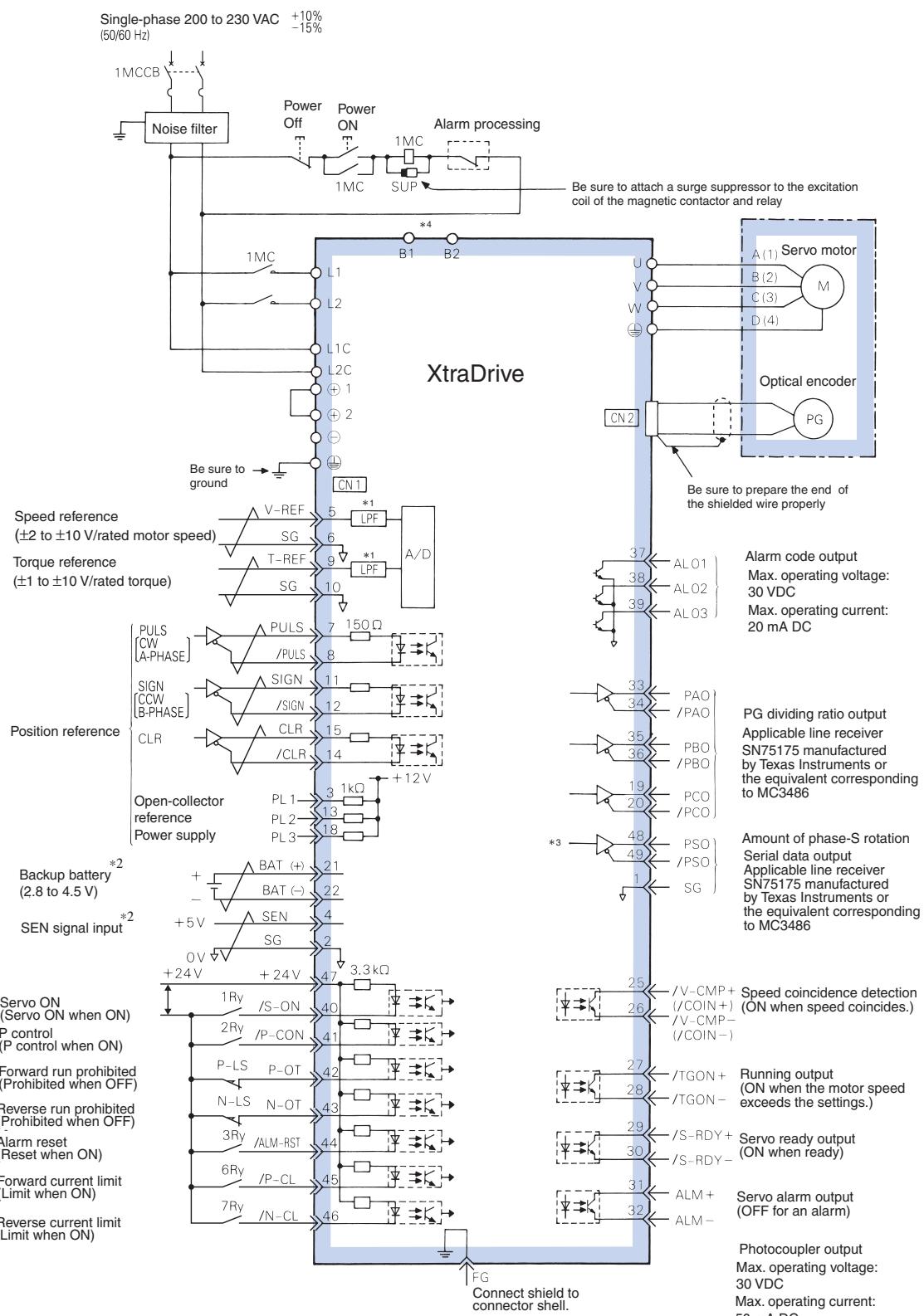


R88A-FIW4020-SE



## Installation

**Single-phase, 230 VAC**



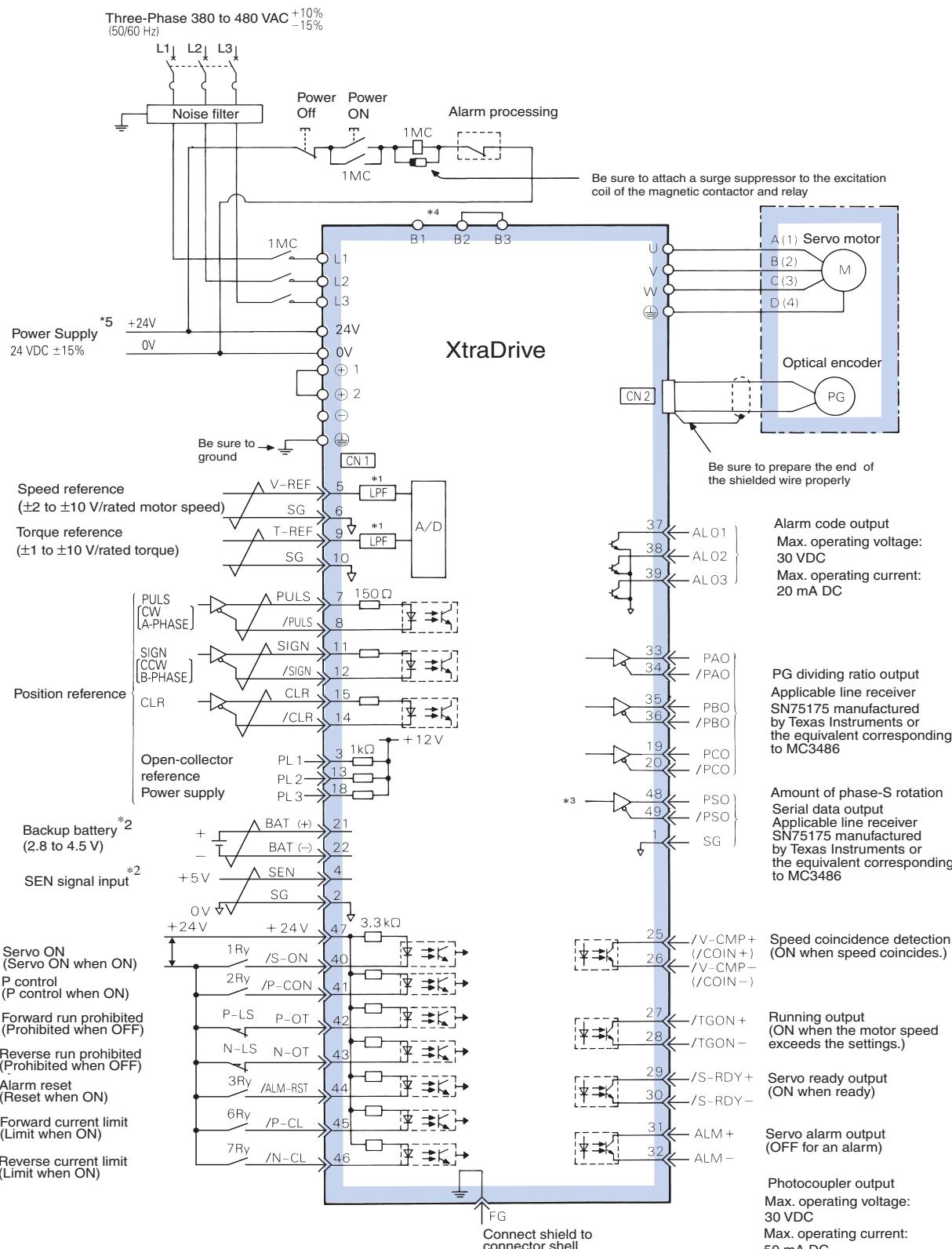
\*1 The time constant for the primary filter is 47  $\mu$ s.

\*2 Connect when using an absolute encoder.

\*3 Used only with an absolute encoder.

\*4 Regenerative resistor can be connected between B1 and B2.

\*<sup>6</sup> TI stands for Texas Instruments Inc.

**Three-phase, 400 VAC**

\*1 The time constant for the primary filter is 47  $\mu$ s.

\*2 Connect when using an absolute encoder.

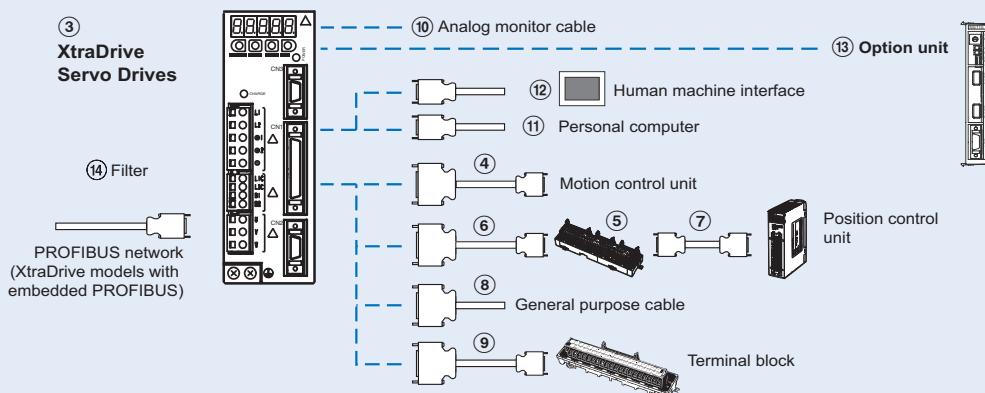
\*3 Used only with an absolute encoder.

\*4 For using an external regenerative resistor, connect it between B1 and B2.

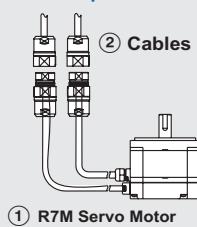
\*5 The 24VDC power is supplied by the user.

\*6 TI stands for Texas Instruments Inc.

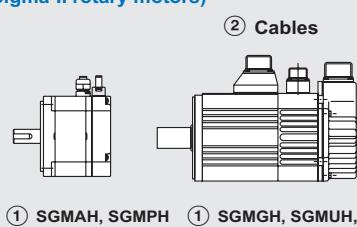
## Ordering information



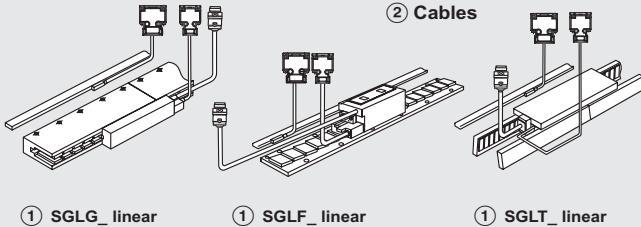
(Refer to chapter SmartStep servo motors)



(Refer to chapter Sigma-II rotary motors)



(Refer to chapter Sigma-II linear motors)



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

**Servo motors, power & encoder cables**

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

**Servo Drives**

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

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

**Control cables (for CN1)**

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

**Cable (for CN5)**

| Symbol | Name                 | Model                        |
|--------|----------------------|------------------------------|
| (10)   | Analog monitor cable | R88A-CMW001S<br>or DE9404559 |

**Options (for CN3)**

| Symbol | Name                      | Model                          |
|--------|---------------------------|--------------------------------|
| (11)   | Computer connecting cable | R88A-CCW002P2<br>or JZSP-CMS02 |

**Human machine interface**

| Symbol | Name                | Model         |
|--------|---------------------|---------------|
| (12)   | 4.1" HMI monochrome | NT3S-ST126B-E |

**Option units (for CN10)**

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

**Filters**

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

**Battery backup for absolute encoder**

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

**Connectors**

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

**Computer software**

| Specifications | Model        |
|----------------|--------------|
| XtraWare       | MOTION TOOLS |

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

SGDH-□

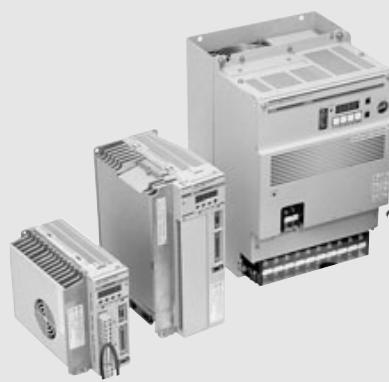
# Sigma-II servo drive

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

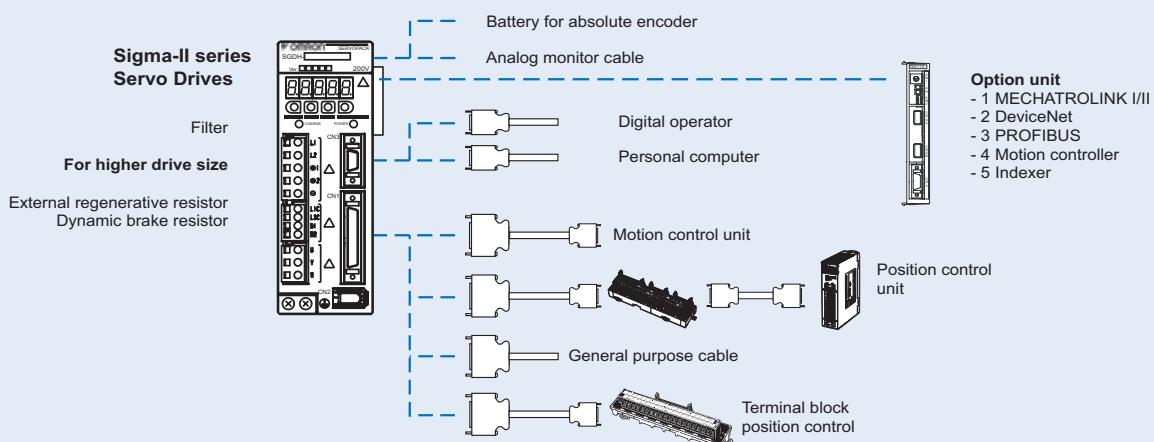
- Online autotuning with 10 levels of rigidity
- Peak torque 300% of nominal during 3 seconds
- Automatic motor recognition
- Analogue control for speed and torque
- Pulse train control for positioning
- Optional units offer network connectivity and flexible system architecture
- Smooth operation
- Oscilloscope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

## Ratings

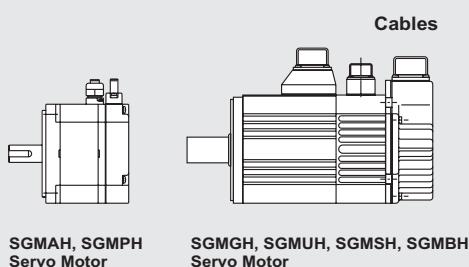
- 230 VAC Single-phase 30 W to 1.5 kW (4.77 Nm)
- 400 VAC Three-phase 450 W to 55 kW (350 Nm)



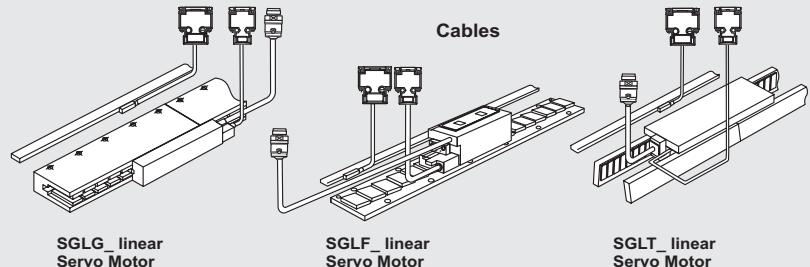
## System configuration



(Refer to chapter Sigma-II rotary motors)



(Refer to chapter Sigma-II linear motors)

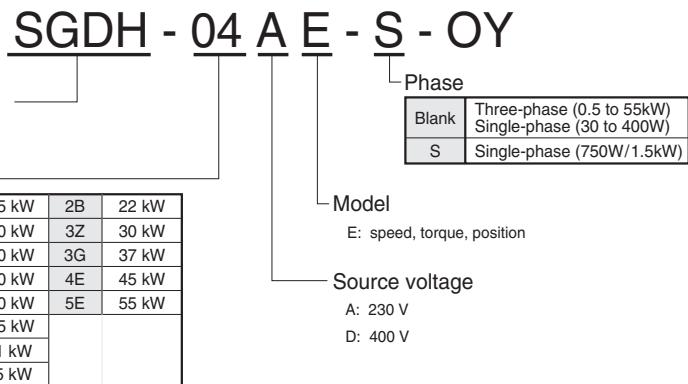


## Servo motor supported

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

## Type designation

### Servo drive



## Servo drive specifications

### Single-phase, 230 V

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

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

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

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

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

### General specifications

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

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

## I/O specifications

### I/O signals (CN1) - input signals

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

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

2. The functions allocated to /S-ON, /P-CON, P-OT, N-OT, /ALM-RST, /P-CL, and /N-CL input signals can be changed by using the parameters.
3. The voltage input range for speed and torque references is a maximum of ±12 V.

## I/O signals (CN1) - output signals

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

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

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

## Terminal specifications (all drives)

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

## Terminal specifications (from 22 kW to 55 kW)

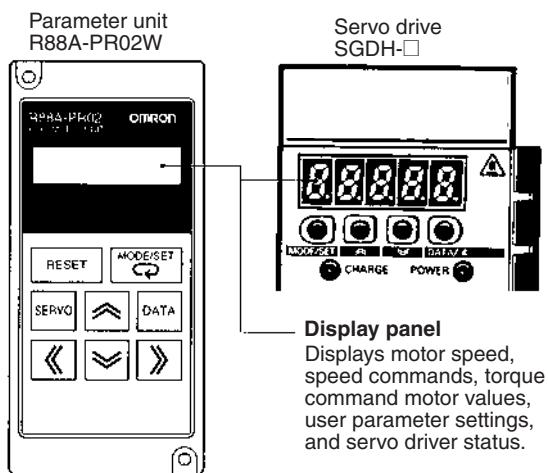
| Symbol                                       | Name  | Function  |
|--|---|---|
| DC24P, DC24N                                 | Control power supply input terminal                   | 24 VDC  |
| DU, DV, DW                                   | DB resistor unit,<br>DB contactor connection terminal |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

## Encoder connector (CN2)

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

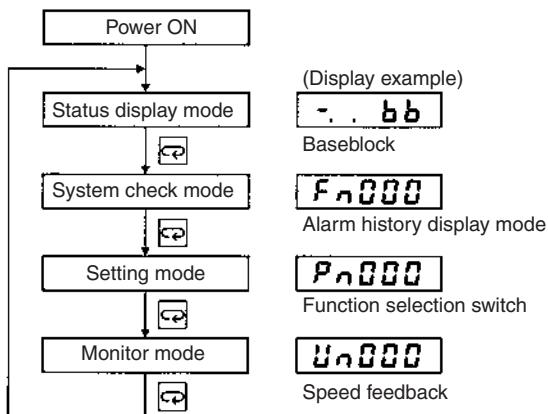
## Operation

### Operating functions

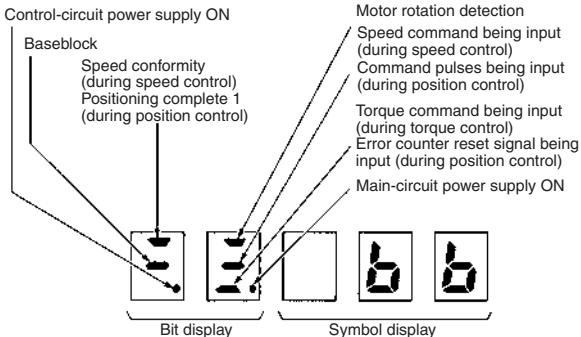


### Changing modes

To change modes, press the MODE/SET key.



### Status display mode

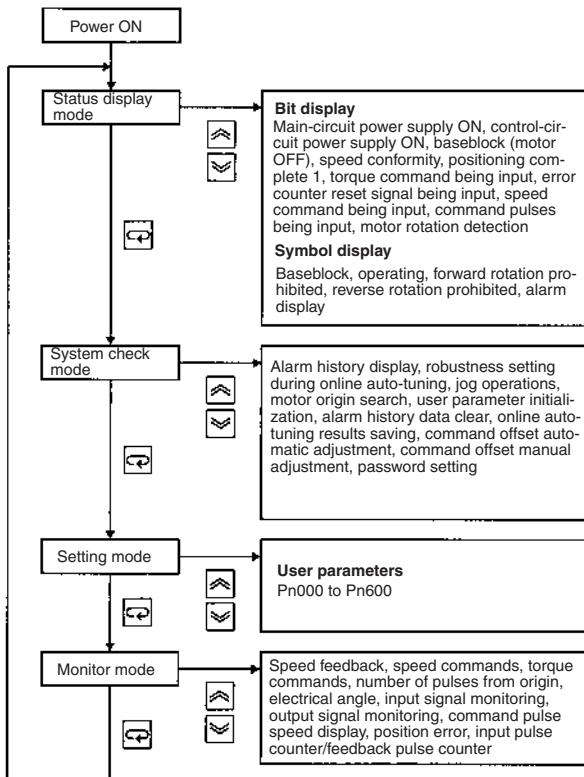


| Symbol     | Status   |
|------------|--|
| <i>bb</i>  | Baseblock (motor OFF)                            |
| <i>run</i> | Operating  |
| <i>Pot</i> | Forward rotation prohibited (forward overtravel) |
| <i>not</i> | Reverse rotation prohibited (reverse overtravel) |
| <i>R02</i> | Alarm display                                    |

### Unit keys

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

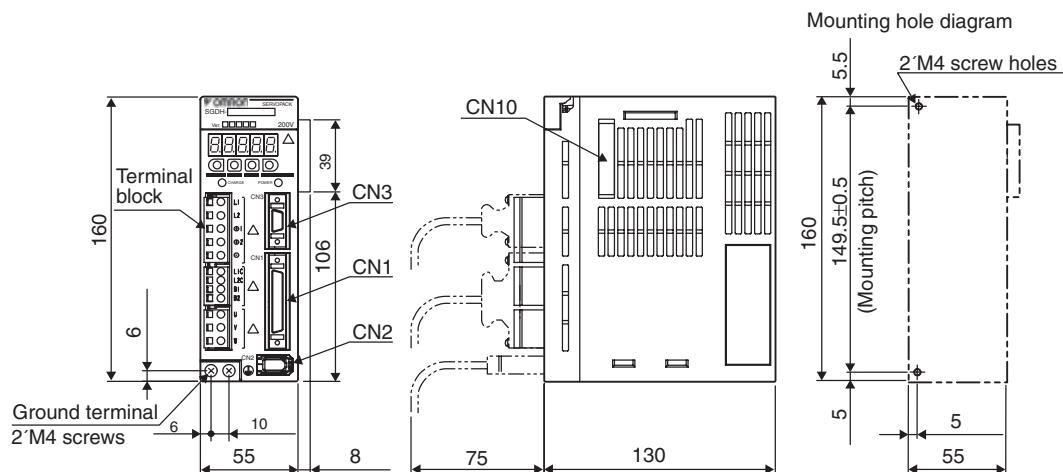
### Mode details



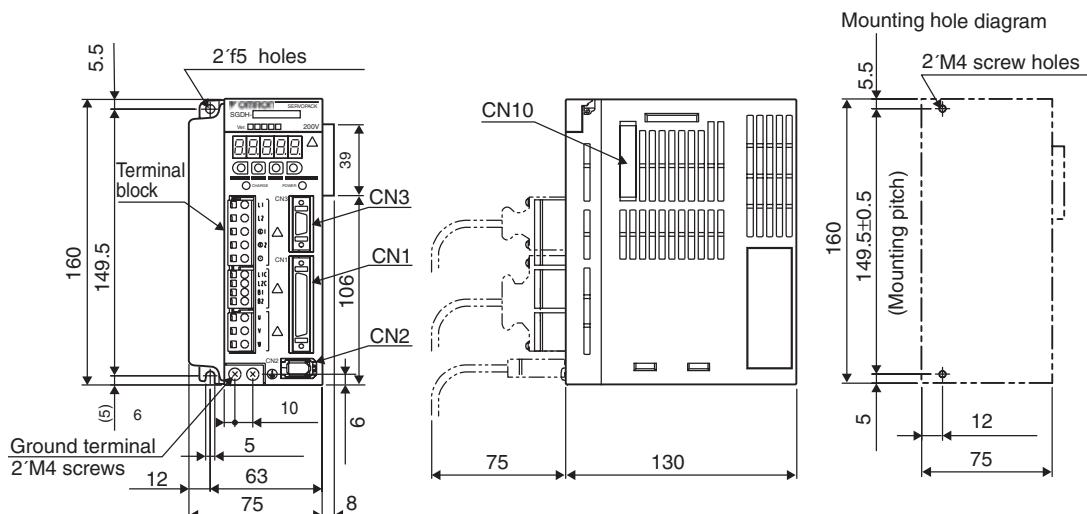
## Dimensions

### Servo drives

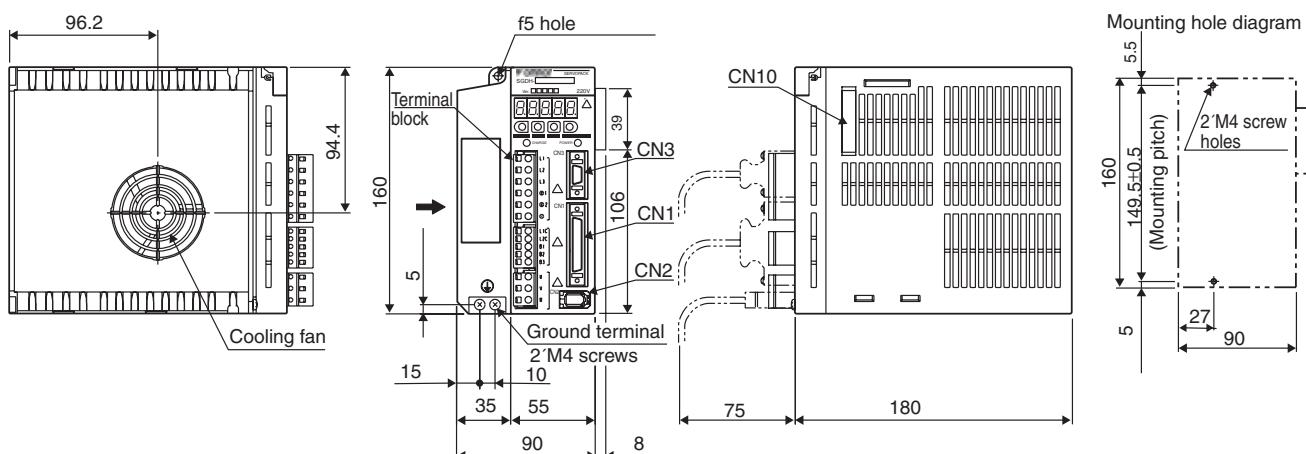
#### SGDH-A3AE-OY to -02AE-OY (230 V, 30 to 200 W)



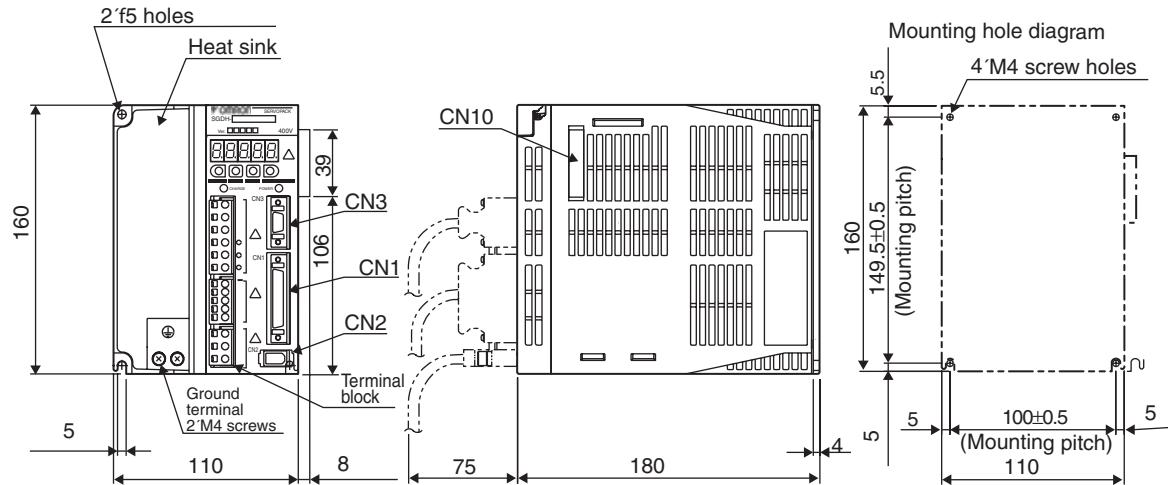
#### SGDH-04AE-OY (230 V, 400 W)



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

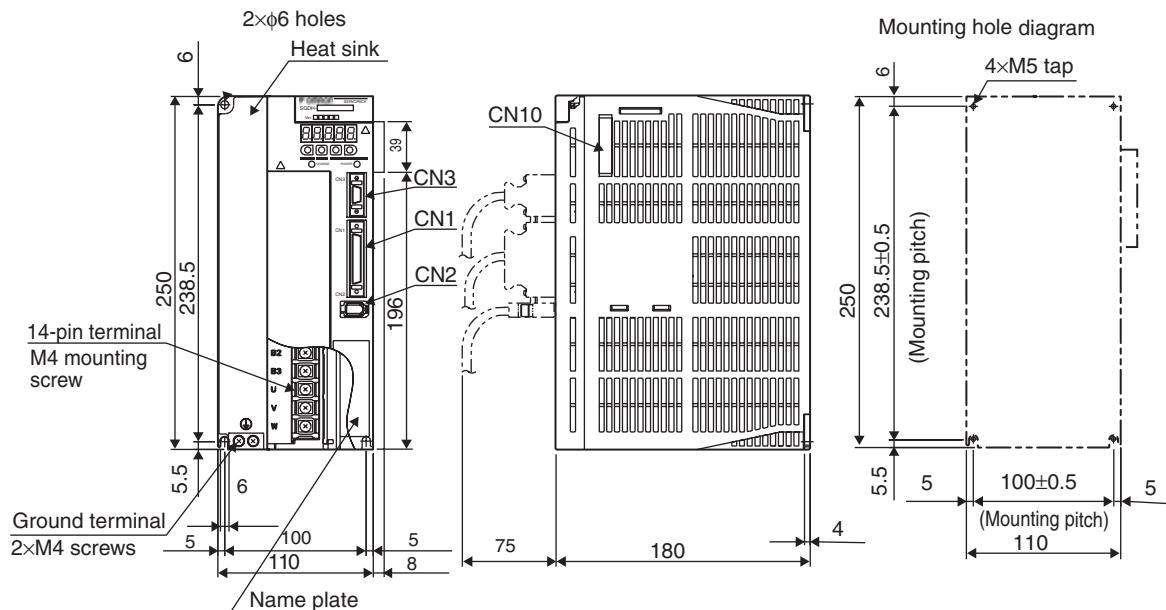


## SGDH-05DE-OY to -15DE-OY (400 V, 0.5 to 1.5 kW)

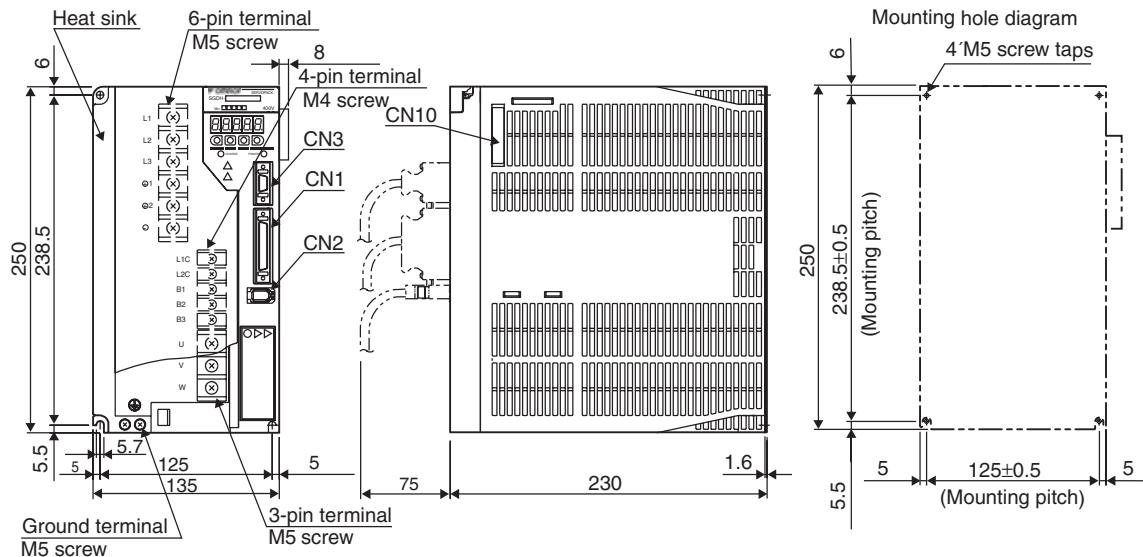


## SGDH-15AE-S (230 V, 1.5 kW)

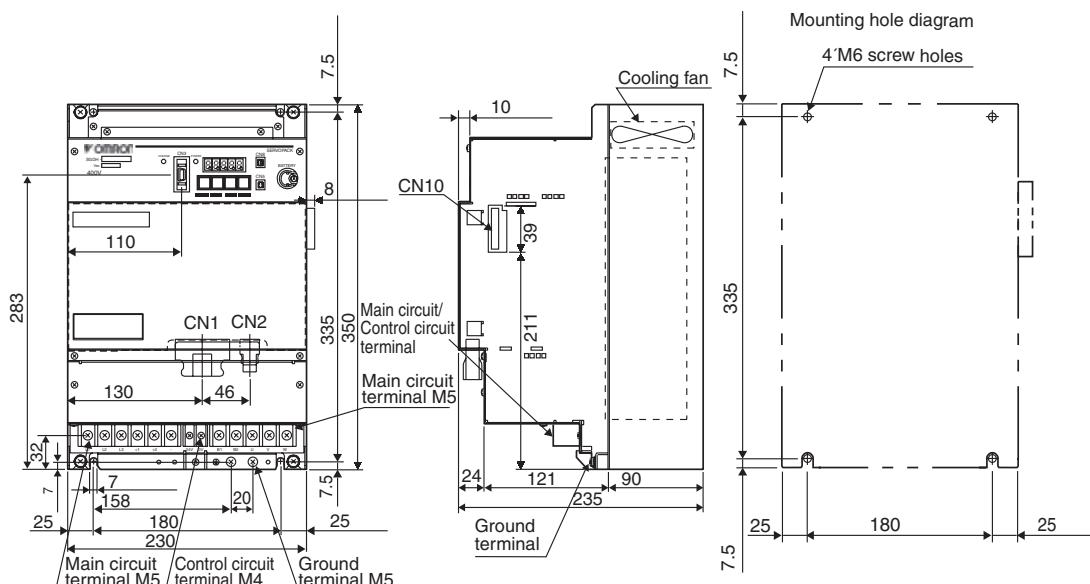
## SGDH-20/30DE-OY (400 V, 2/3 kW)



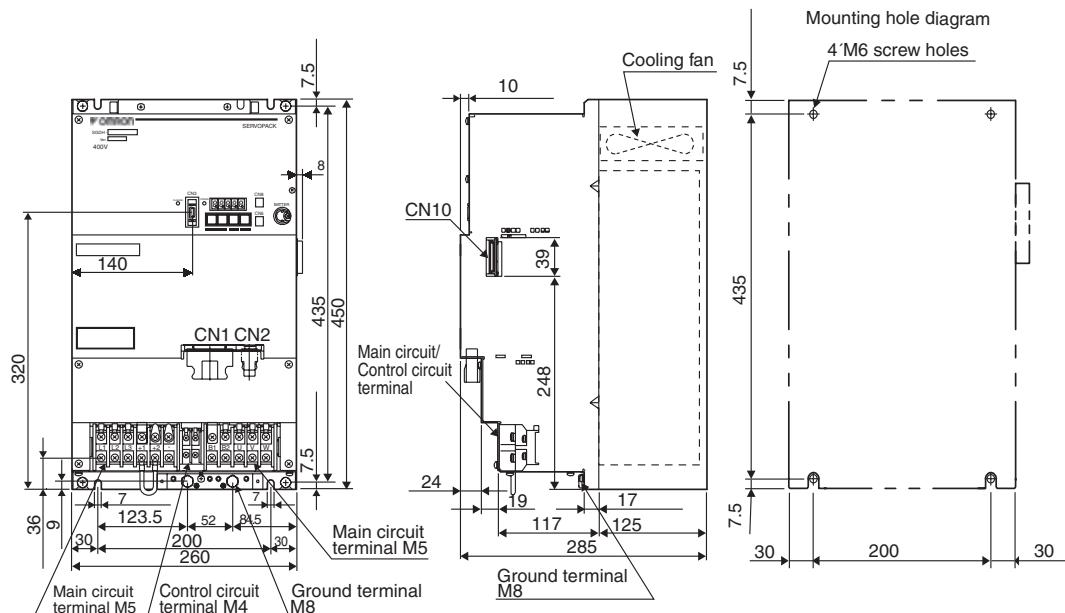
## SGDH-50DE-OY (400 V, 5 kW)



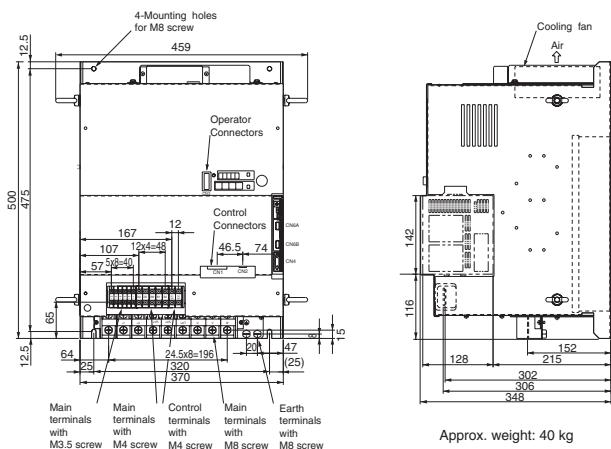
## SGDH-60/75DE-OY (400 V, 6/7.5 kW)



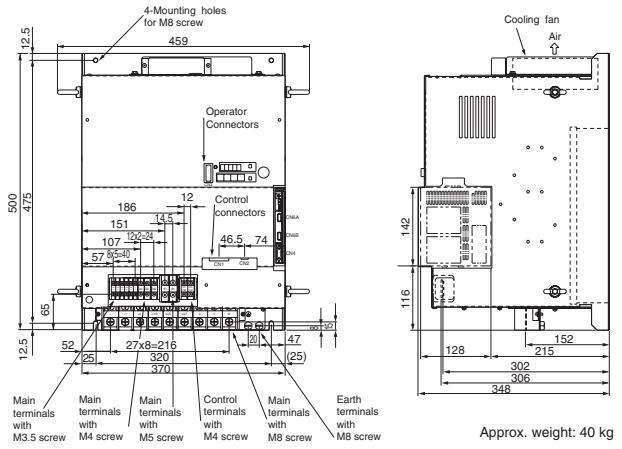
## SGDH-1A/1EDE-OY (400 V, 11/15 kW)



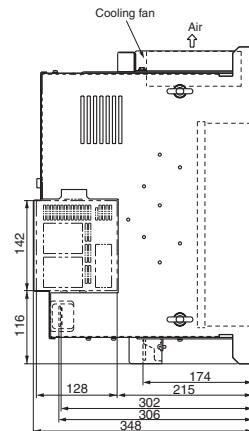
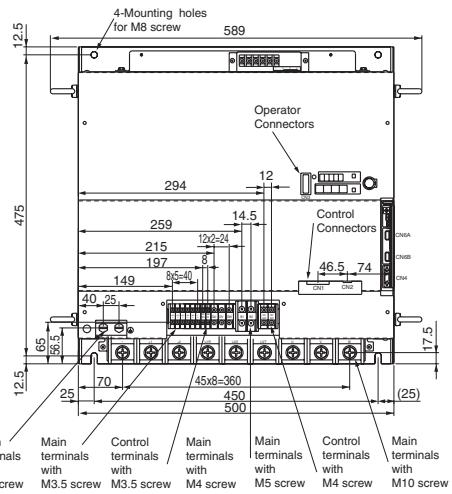
**SGDH-2BDE (400 V, 22 kW)**



**SGDH-3ZDE (400 V, 30 kW)**

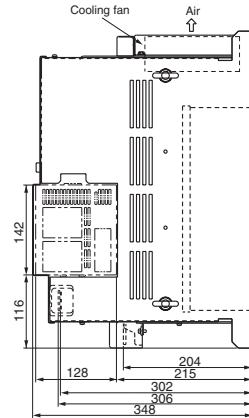
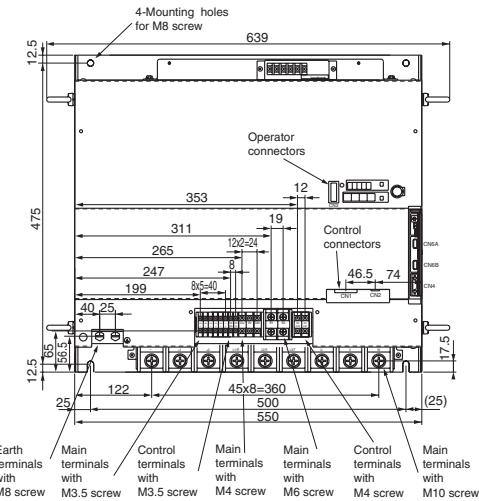


**SGDH-3GDE (400 V, 37 kW)**



Approx. weight: 60 kg

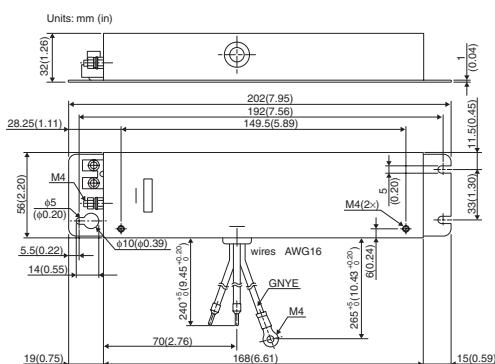
**SGDH-4EDE / -5EDE (400 V, 45/55 kW)**



Approx. weight: 65 kg

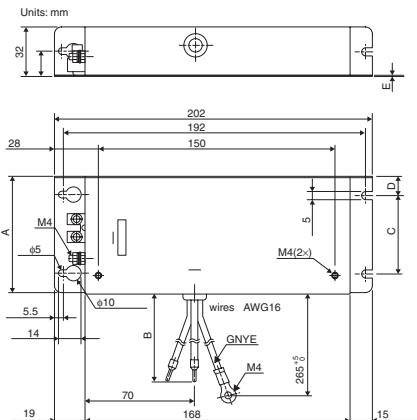
## Filters

### R88A-FIW104-SE

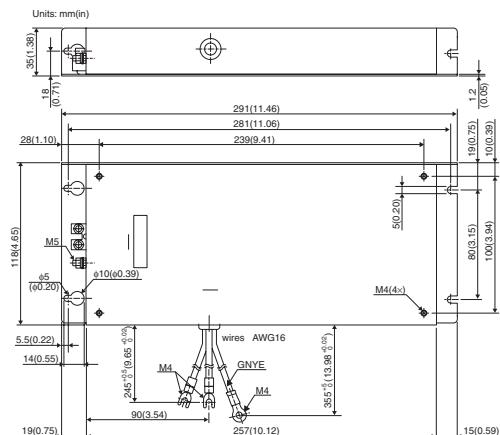


### R88A-FIW107-SE, R88A-FIW115-SE

| Model            | R88A-FIW107-SE                                     | R88A-FIW115-SE                             |
|------------------|--|--|
| Dimensions in mm | A 75<br>B 240 <sup>+5</sup><br>C 50<br>D 12<br>E 1 | 90<br>300 <sup>+5</sup><br>60<br>15<br>1.2 |

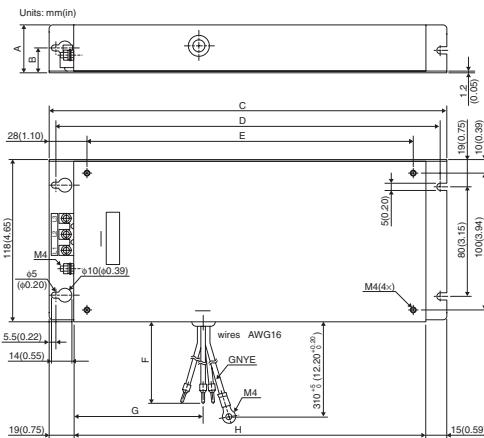


### R88A-FIW125-SE

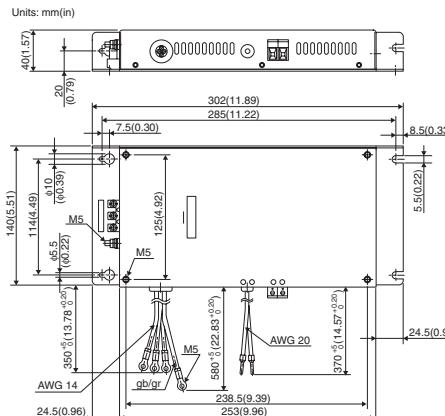


### R88A-FIW4006-SE, R88A-FIW4010-SE

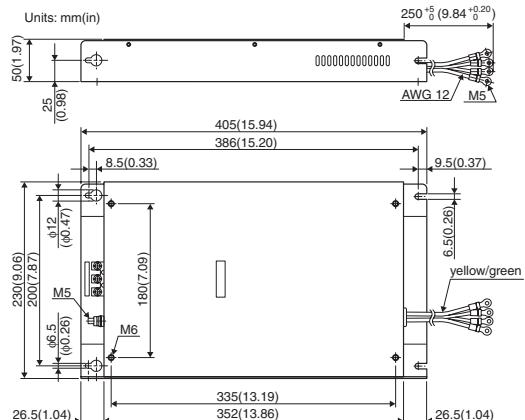
| Model                 | R88A-FIW4006-SE | R88A-FIW4010-SE |
|-----------------------|-----------------|-----------------|
| Dimensions in mm (in) | A 32 (1.26)     | 35 (1.38)       |
|                       | B 16 (0.63)     | 18 (0.71)       |
|                       | C 202 (7.95)    | 291 (11.46)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



### R88A-FIW4020-SE

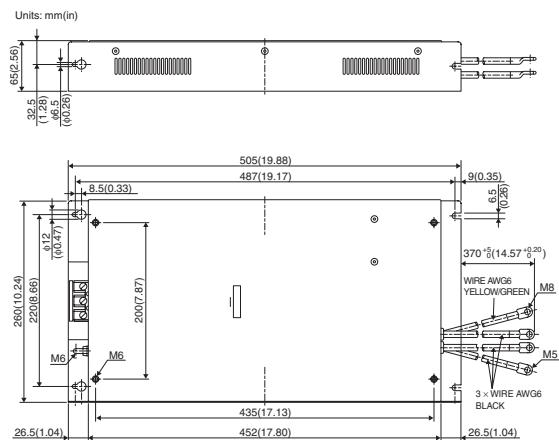


### R88A-FIW4030-SE

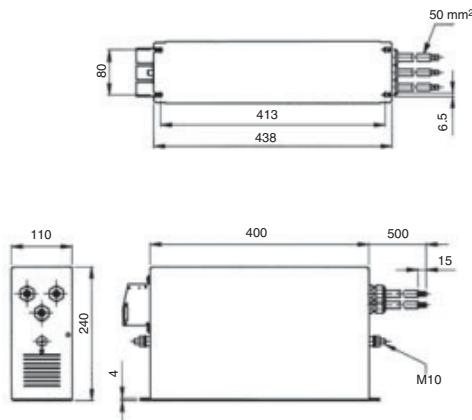


## Filters

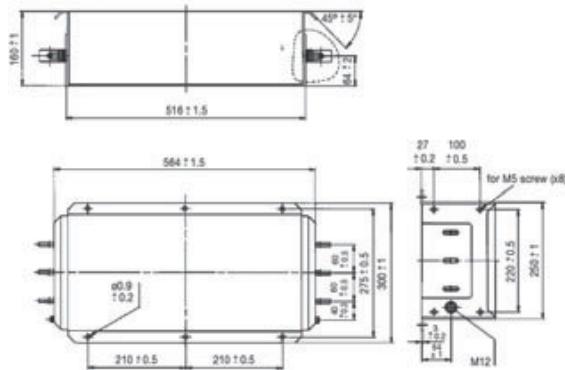
**R88A-FIW4055-SE**



**FN258-180-07**

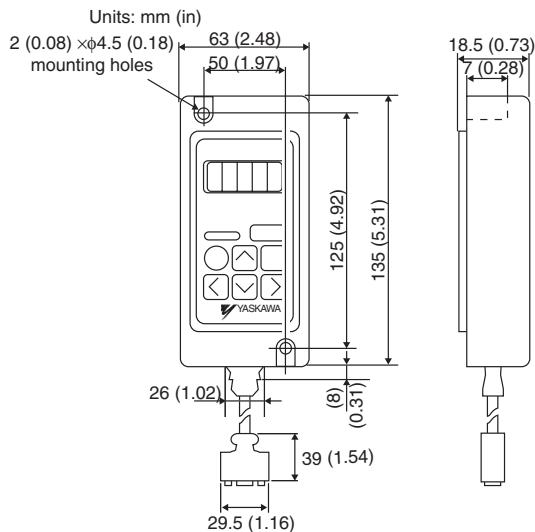


**FN359-250-99**



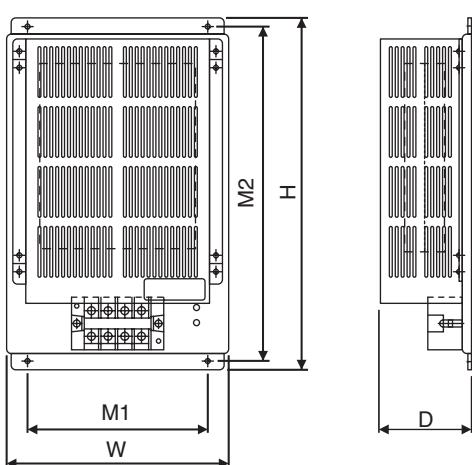
## Digital operator

**JUSP-OP02A-2**



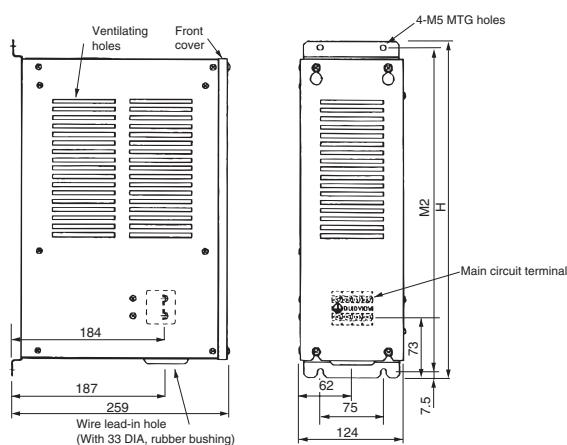
## Regenerative resistor units

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



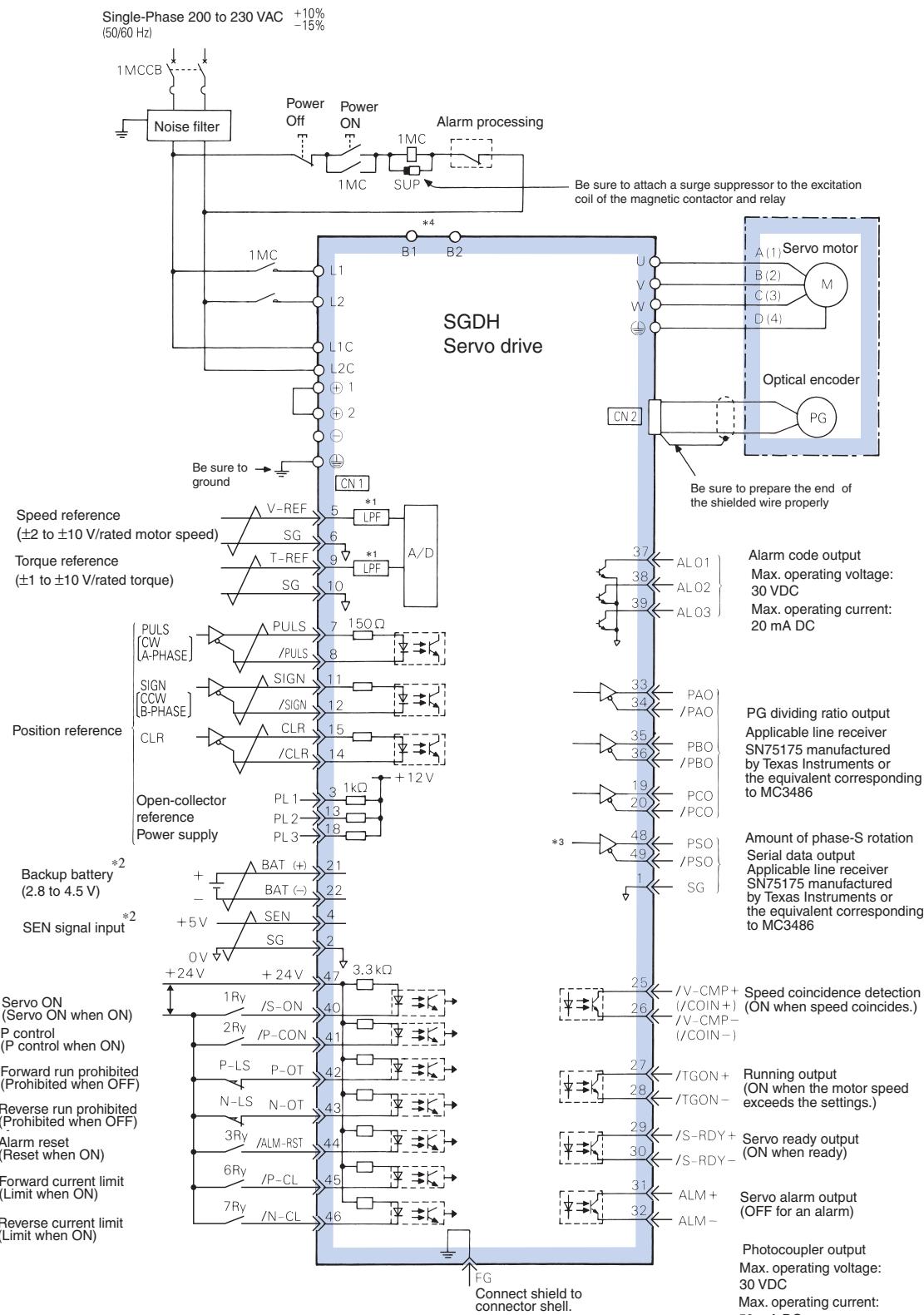
## DB resistor units

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



## Installation

### Single-phase, 230 VAC



\*1 The time constant for the primary filter is 47  $\mu$ s.

\*2 Connect when using an absolute encoder.

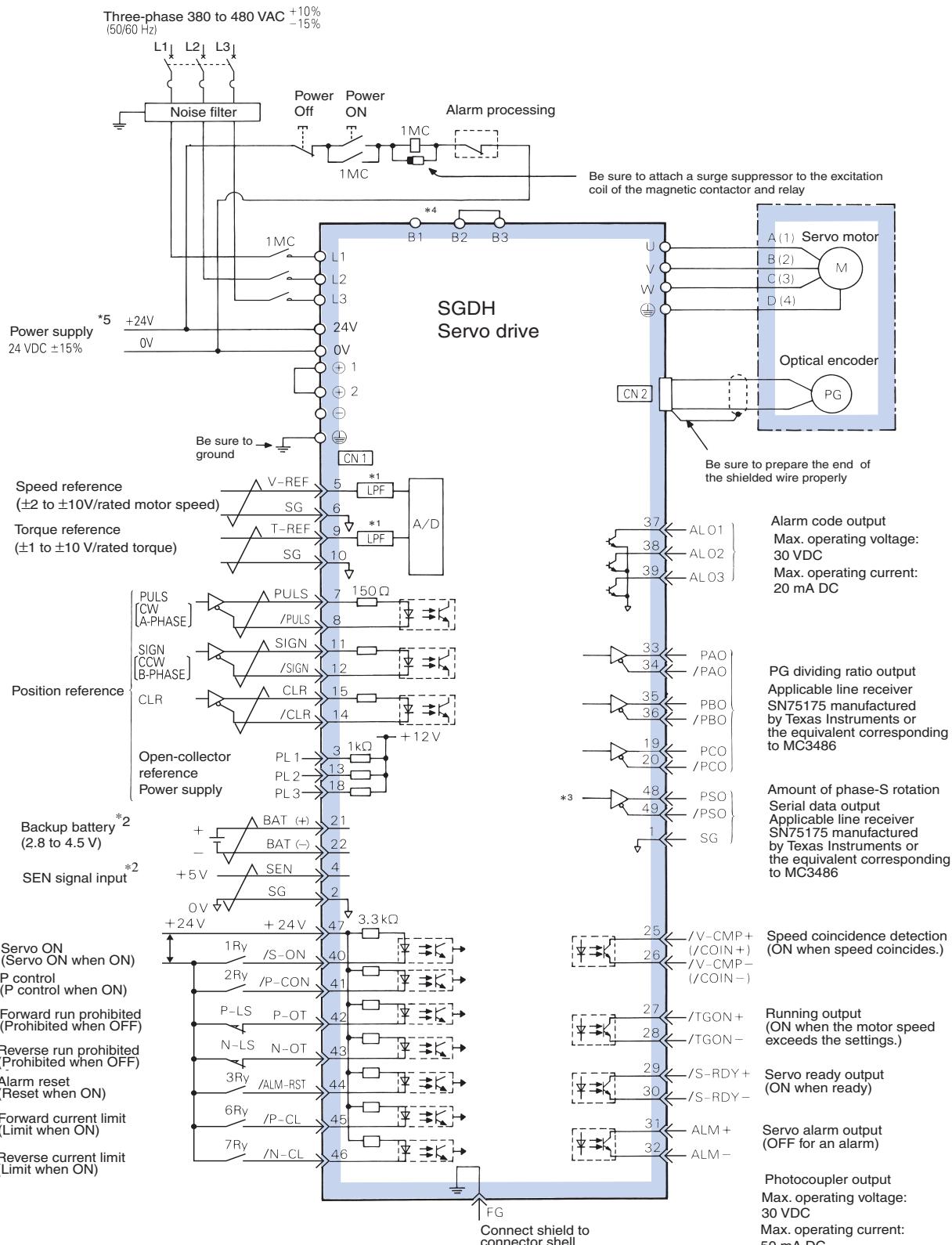
\*3 Used only with an absolute encoder.

\*4 Regenerative resistor can be connected between B1 and B2.

\*5 For types SGDH-08AE-S-OY and SGDH-15AE-S-OY, voltage is 220 to 230 VAC (+10% -15%).

\*6 TI stands for Texas Instruments Inc.

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



\*1 The time constant for the primary filter is 47  $\mu$ s.

\*2 Connect when using an absolute encoder.

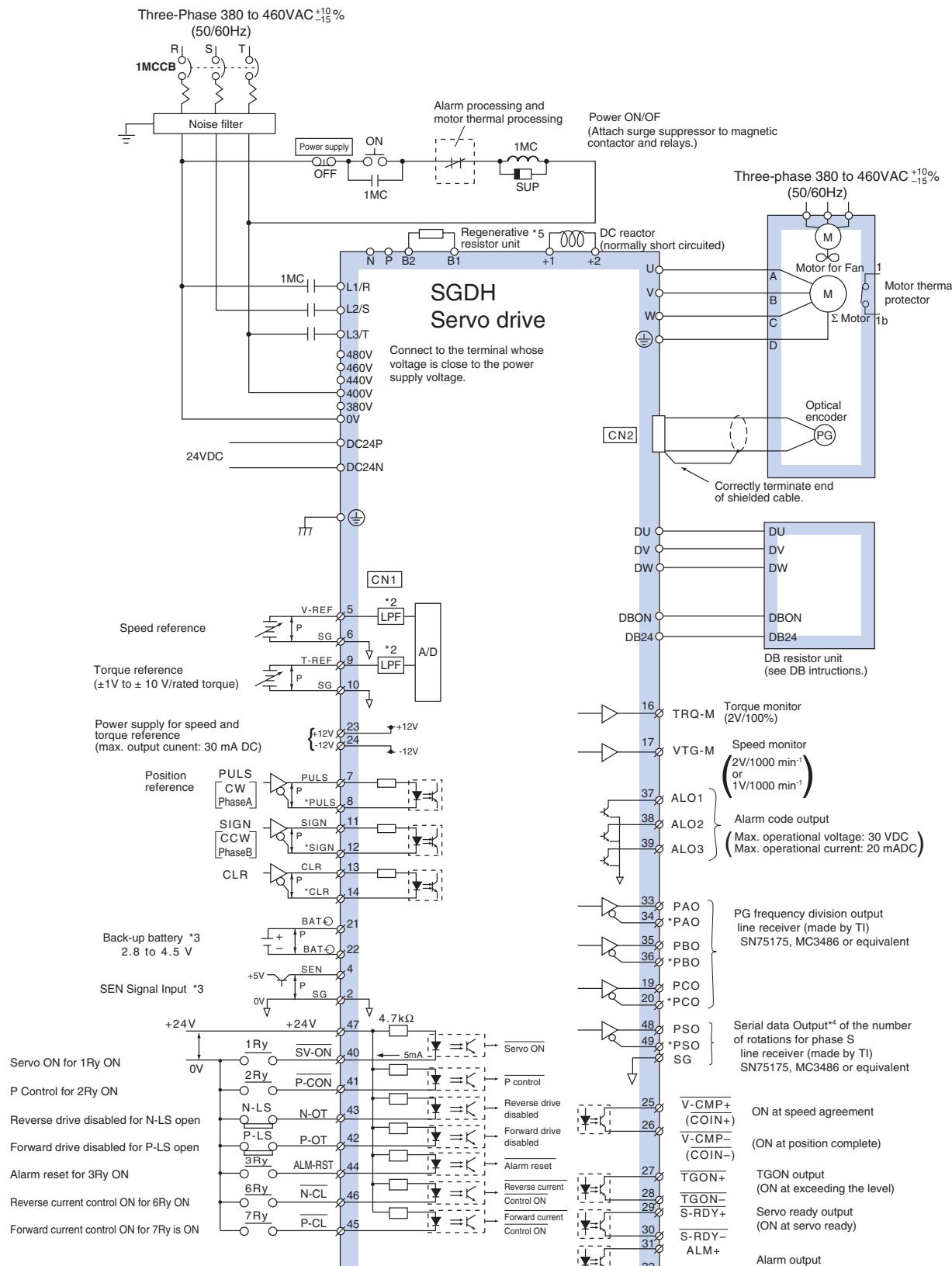
\*3 Used only with an absolute encoder.

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

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

\*6 TI stands for Texas Instruments Inc.

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



\*1 IP represents twisted pair cable.

\*2 Constant number at primary filter is 47μs.

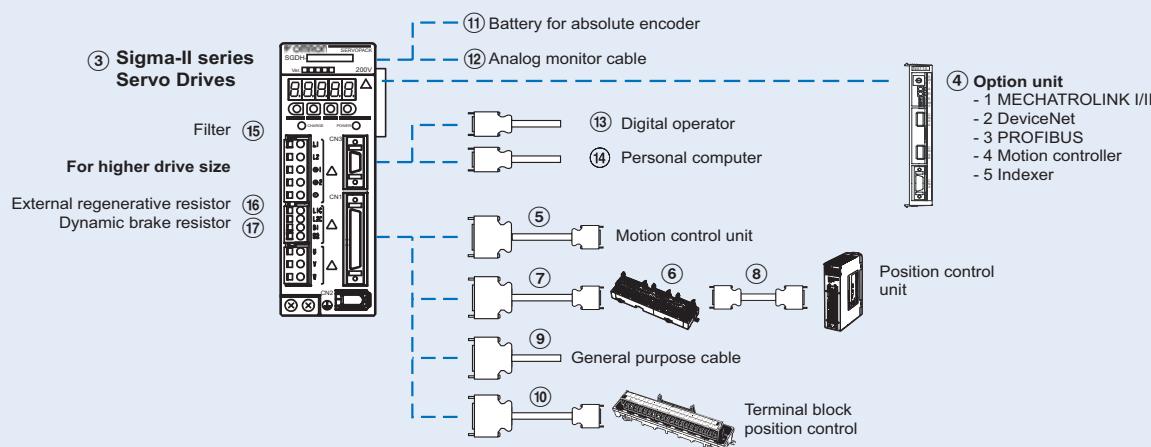
\*3 Connects when using absolute encoder.

\*4 Effective when using 12-bit absolute encoder.

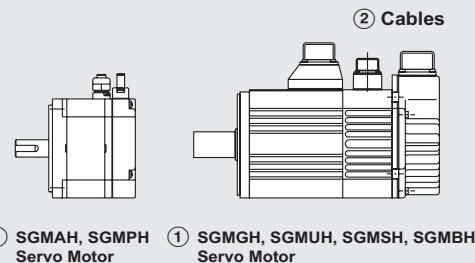
\*5 Regenerative resistor unit (option) should be mounted externally.

\*6 TI stands for Texas Instruments Inc.

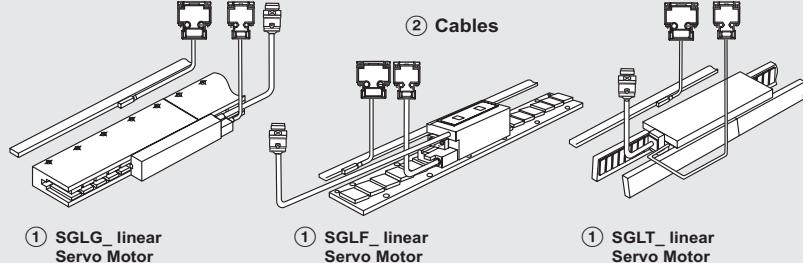
## Ordering information



(Refer to chapter Sigma-II rotary motors)



(Refer to chapter Sigma-II linear motors)



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

## Servo motors, power &amp; encoder cables

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

## Servo drives

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

## Option units (for CN10)

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

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

## Control cables (for CN1)

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

**Battery backup for absolute encoder (for CN8)**

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

**Cable (for CN5)**

| Symbol | Name                 | Model                        |
|--------|----------------------|------------------------------|
| (12)   | Analog monitor cable | R88A-CMW001S<br>or DE9404559 |

**Filters**

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

**External regenerative resistor**

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

**DB resistor units**

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

**Connectors**

| Specification  | Model                    |
|--|--------------------------|
| Control I/O connector (for CN1)  | R88A-CNU11C or JZSP-CK19 |
| Sigma-II drive encoder connector (for CN2)   | JZSP-CMP9-1              |
| Communications connector (for CN3)   | R7A-CNA01R               |
| Hypertac power connector IP67 (for 200 V motors SGMAH-PH-□□A□□□□D-OY)  | SPOC-06K-FSDN169         |
| Hypertac power connector IP67 (for 400 V motors SGMAH-PH-□□D□□□□D-OY)  | LPRA-06B-FRBN170         |
| Hypertac encoder connector IP67 (for motors SGMAH-PH-□□□□□□□D-OY)  | SPOC-17H-FRON169         |
| Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D□, SGMSH-(10/15/20)D□, SGMUH-(10/15)D□) (for SGMBH-□ fan) | MS3108E18-10S            |
| Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D□, SGMSH-(30/40/50)D□, SGMUH-(30/40)D□)                   | MS3108E22-22S            |
| Military power connector IP67 (for 400 V motors SGMGH-(55/75/1A/1E)D□)   | MS3108E32-17S            |
| Military brake connector IP67 (for 400 V servo motors SGMGH-□, SGMSH-□, SGMUH-□)   | MS3108E10SL-3S           |
| Military encoder connector IP67 (for motors SGMGH-□, SGMSH-□, SGMUH-□, SGMBH-□)  | MS3108E20-29S            |

**Computer software**

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

R7D-AP□

# SmartStep servo drive

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

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



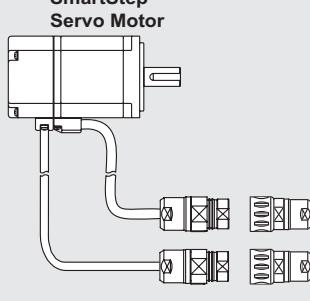
## Ratings

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

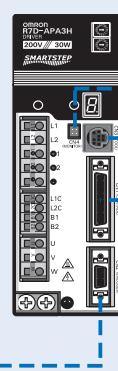
## System configuration

(Refer to chapter SmartStep servo motors)

SmartStep  
Servo Motor



SmartStep  
Servo Drive



Personal computer

Position control  
unit

Connector terminal block  
General purpose controller  
(with pulse output)

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## Servo motor supported

| Servo motor  |         |                     |   |
|--|---------|---------------------|---|
| Family   | Voltage | Models rated torque | Remarks   |
| R7M-A (3000 min <sup>-1</sup> )<br> | 230 V   | 0.095 Nm to 2.39 Nm | Refer to the SmartStep servo motors chapter for details |
| R7M-AP(3000 min <sup>-1</sup> )<br> | 230 V   | 0.318 Nm to 2.39 Nm | Refer to the SmartStep servo motors chapter for details |

## Servo drive specifications

### General specifications

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

### Performance specifications

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

### I/O specifications

#### Terminal specifications

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

### Control I/O (CN1) specifications

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

### Encoder connector (CN2) specifications

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

### Communications connector (CN3) specifications

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

### Monitor output (CN4) specifications

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

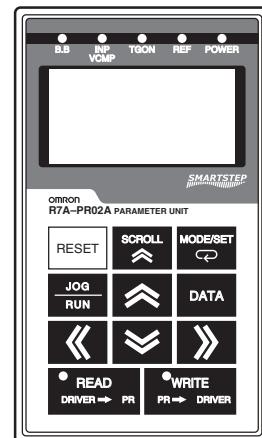
## Digital operator specifications

### General specifications

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

### Function specifications

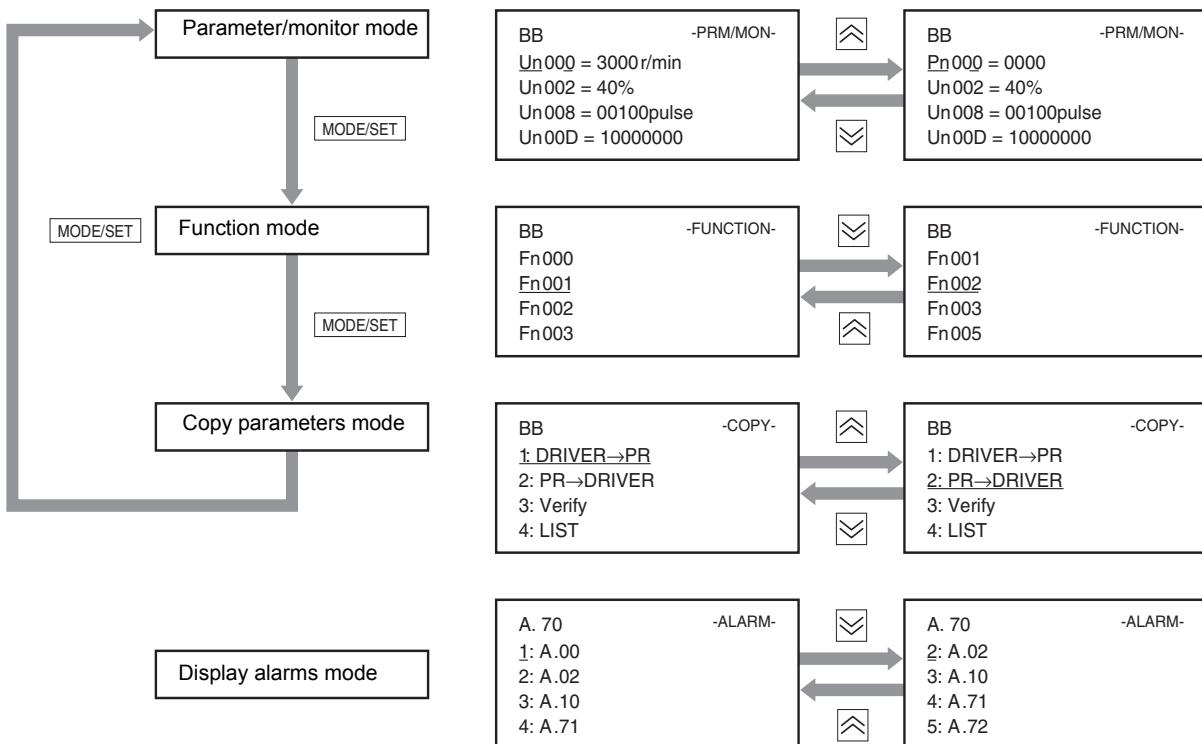
| Item                  | Function  |
|-----------------------|---|
| Setting mode          | Display or change parameter settings.   |
| Monitor mode          | Display monitor values.   |
| Execute function mode | Execute each function mode.   |
| Display alarms        | Display alarms that have occurred.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



R7A-PR02A

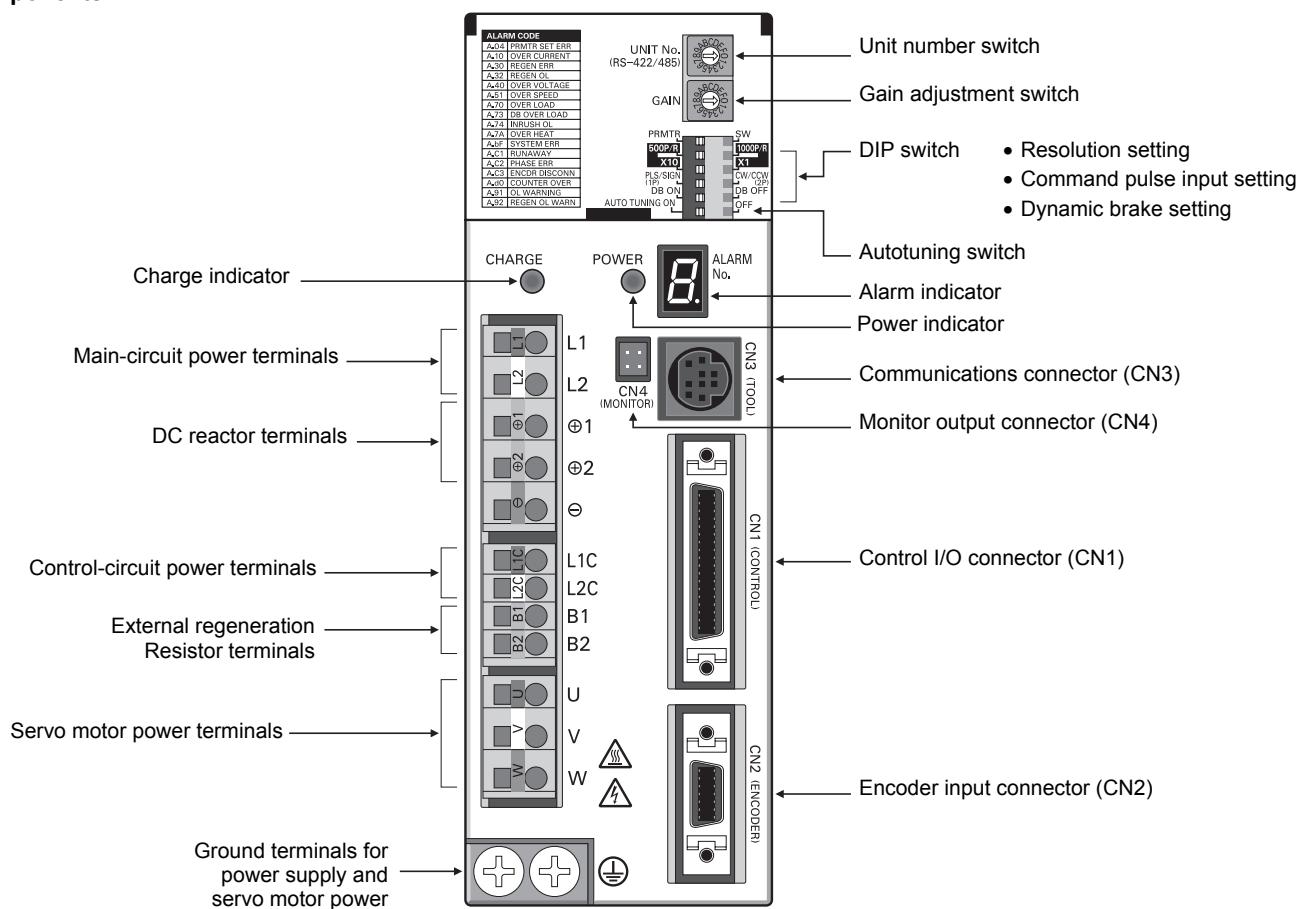
### Mode change specifications

Power ON



## Operation

### Components



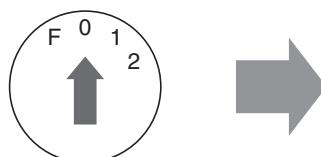
### Switch operations

#### Gain adjustment switch

Adjusts the motor's responsiveness.

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

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



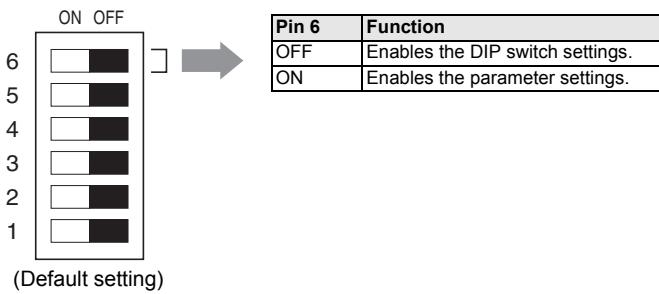
Decrease the switch setting to lower the motor's responsiveness (i.e., so that it moves more smoothly).

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

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

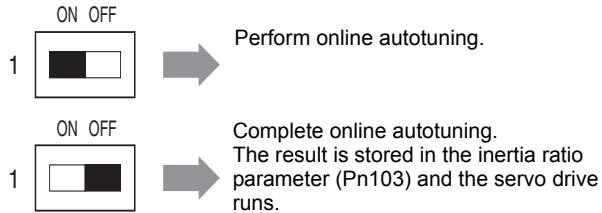
### Enable switch/parameter setting

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



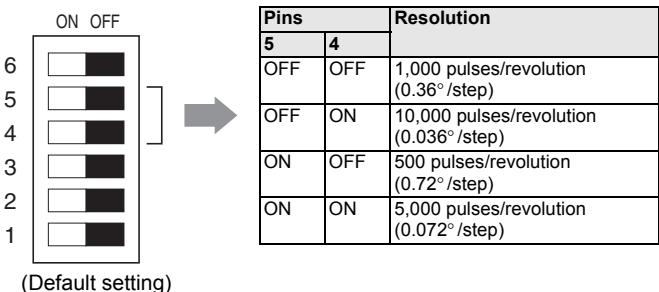
### Online autotuning setting

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



### Resolution setting

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



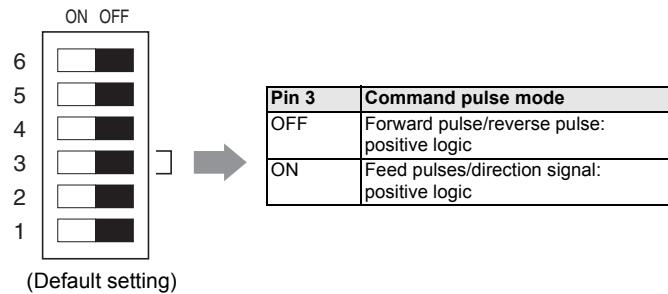
### Alarm Table

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

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

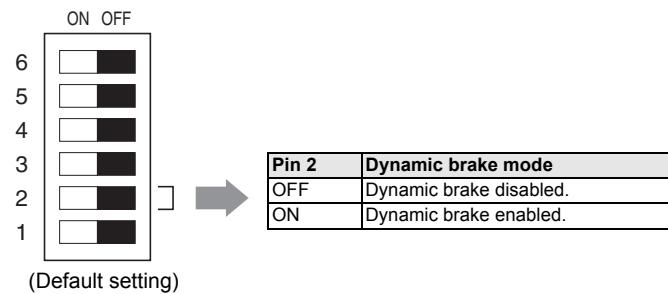
### Command pulse input setting

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



### Dynamic brake setting

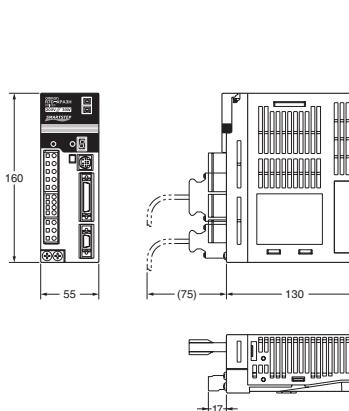
Pin 2 enables or disables dynamic brake operation. If the dynamic brake is enabled, the motor can be brought to an emergency stop when the RUN command goes OFF or an alarm occurs.



## Dimensions

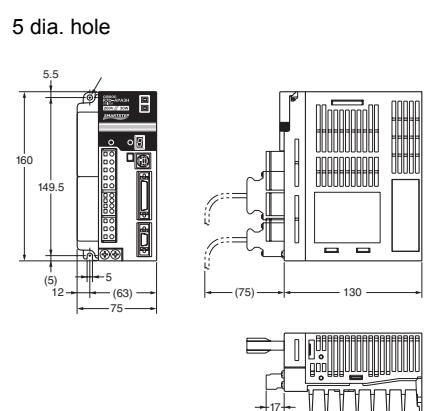
### Servo drives

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



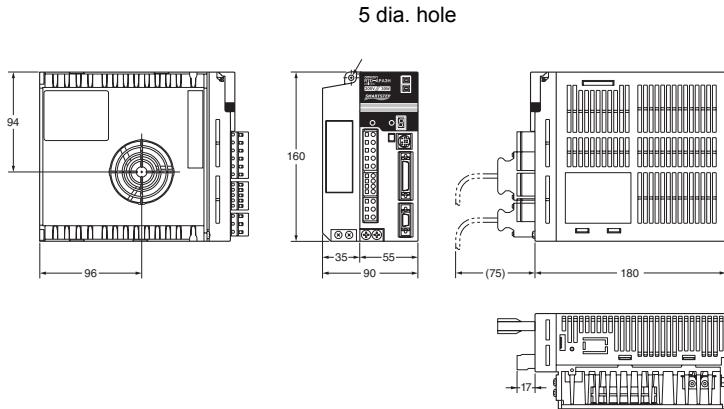
Mounting dimensions

**R7D-AP04H (230 V, 400 W)**



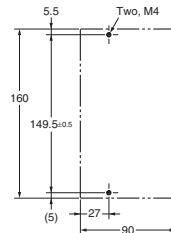
Mounting dimensions

**R7D-AP08H (230 V, 750 W)**



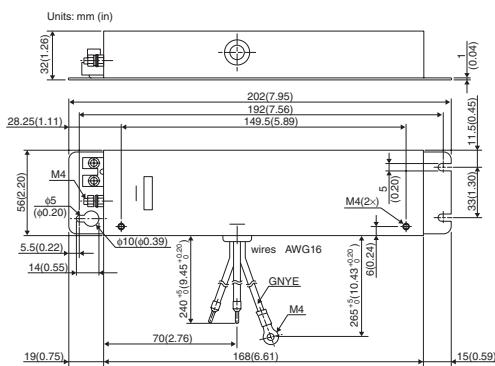
5 dia. hole

Mounting dimensions



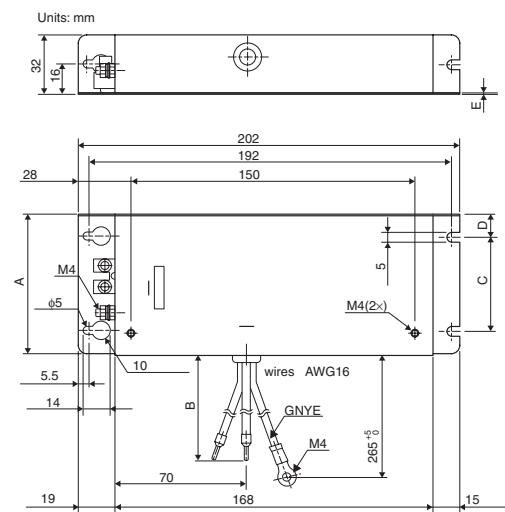
### Filters

**R88A-FIW104-SE**



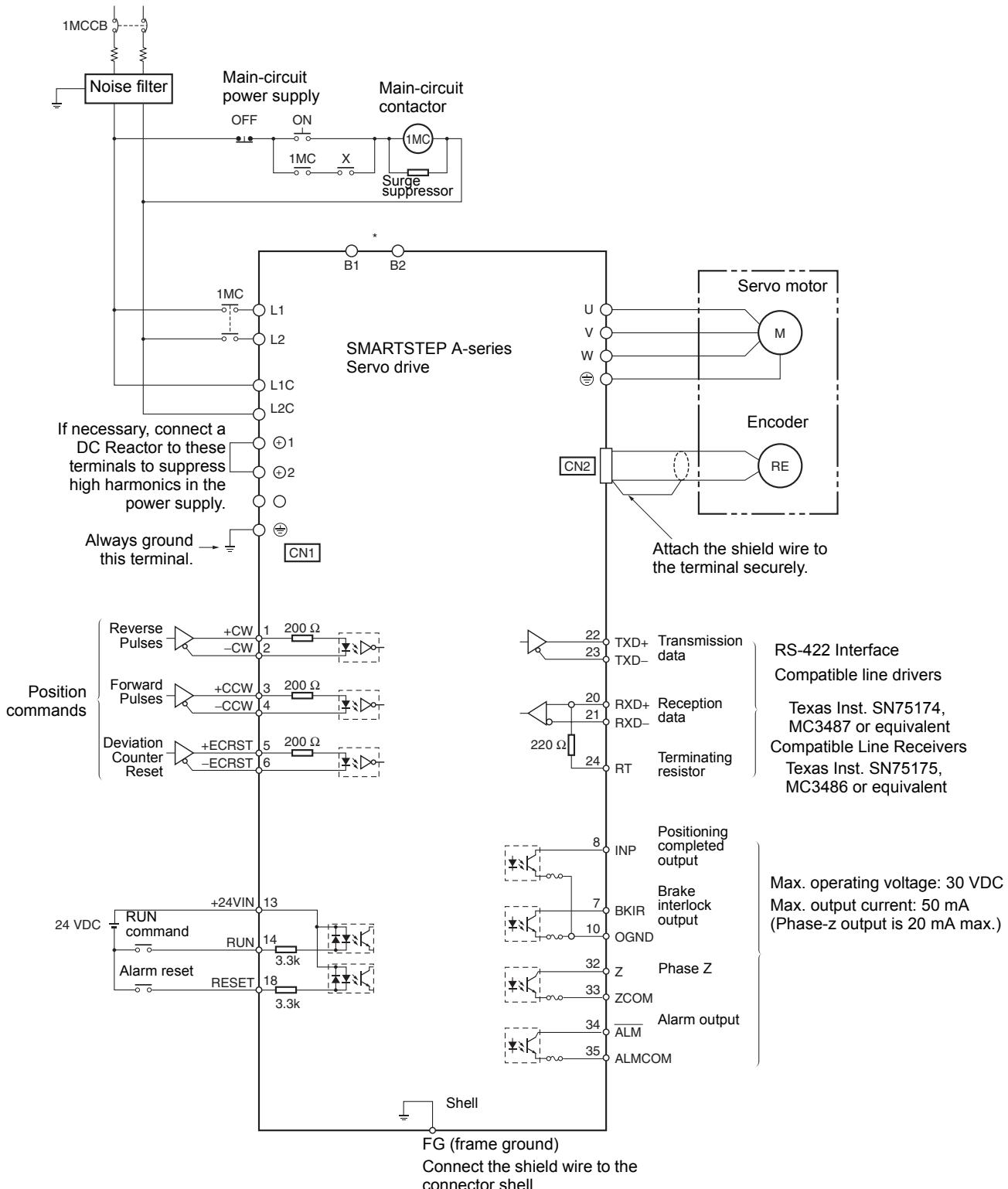
**R88A-FIW107-SE, R88A-FIW115-SE**

| Model               | R88A-FIW107-SE                                     | R88A-FIW115-SE                             |
|---------------------|--|--|
| Dimensions<br>in mm | A 75<br>B 240 <sup>+5</sup><br>C 50<br>D 12<br>E 1 | 90<br>300 <sup>+5</sup><br>60<br>15<br>1.2 |



## Installation

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



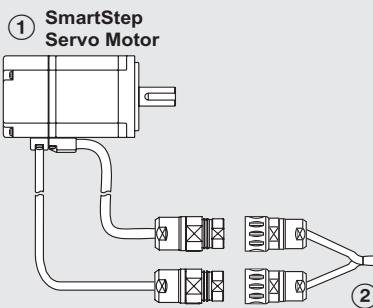
**Note:** \* A regeneration resistor can be connected across the B1 and B2 terminals with 400 W and 750 W servo drives.

When using an external regeneration resistor with a 400 W servo drive, just connect it across the B1 and B2 terminals.

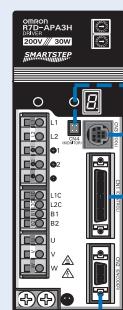
When using an external regeneration resistor with a 750 W servo drive, remove the jumper bar from the B2 and B3 terminals and then connect the regeneration resistor across the B1 and B2 terminals.

## Ordering information

(Refer to chapter SmartStep servo motors)



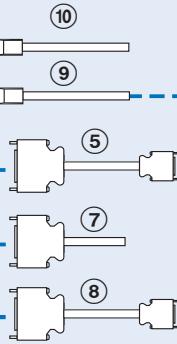
③ SmartStep  
Servo Drive



Personal computer



Position control  
unit



Connector terminal block  
General purpose controller  
(with pulse output)

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

### Servo motors

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

### Servo drives

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

### Servo motor cables (for CN2)

#### Standard cable (power + encoder)

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

#### Flexible cables (power + encoder)

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

**Control cables (for CN1)**

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

**Cable for CN3**

| Symbol | Name                   | Model        |
|--------|------------------------|--------------|
| (9)    | Computer monitor cable | R7A-CCA002P2 |

**Cable for CN4**

| Symbol | Name                 | Model        |
|--------|----------------------|--------------|
| (10)   | Analog monitor cable | R88A-CMW001S |

**Filters**

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

**Connectors**

| Specifications                                      | Model                  |
|---|------------------------|
| Control I/O connector (for CN1)                     | R88A-CNU01C            |
| SmartStep connectors kit.                           | Models included in kit |
| SmartStep encoder connector (for CN2)               | R7A-CNA01R             |
| Hypertac power connector female                     | SPOC-06K-FSDN169       |
| Hypertac encoder connector female                   | SPOC-17H-FRON169       |
| Hypertac power connector male (used in the motor)   | SRUC-06J-MSCN236       |
| Hypertac encoder connector male (used in the motor) | SRUC-17G-MRW087        |

**External regeneration resistor**

| Specification | Model         |
|---------------|---------------|
| 220 W, 47 Ω   | R88A-RR22047S |

**Parameter unit & computer software**

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

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

SJDE-□ANA-OY

# Junma ML-II servo drive

**A new concept in drive simplicity  
Save space, save wiring, save time**

- Ultra compact drive size reduces panel space
- Tuning-less technology, no gain parameters need to be set
- Peak torque 300% of nominal for 3 seconds
- High response, high speed, high torque and high accuracy
- Drive version with MECHATROLINK-II port built-in
- MECHATROLINK-II simplifies wiring and reduces installation time
- MECHATROLINK-II provides access to the system from one point

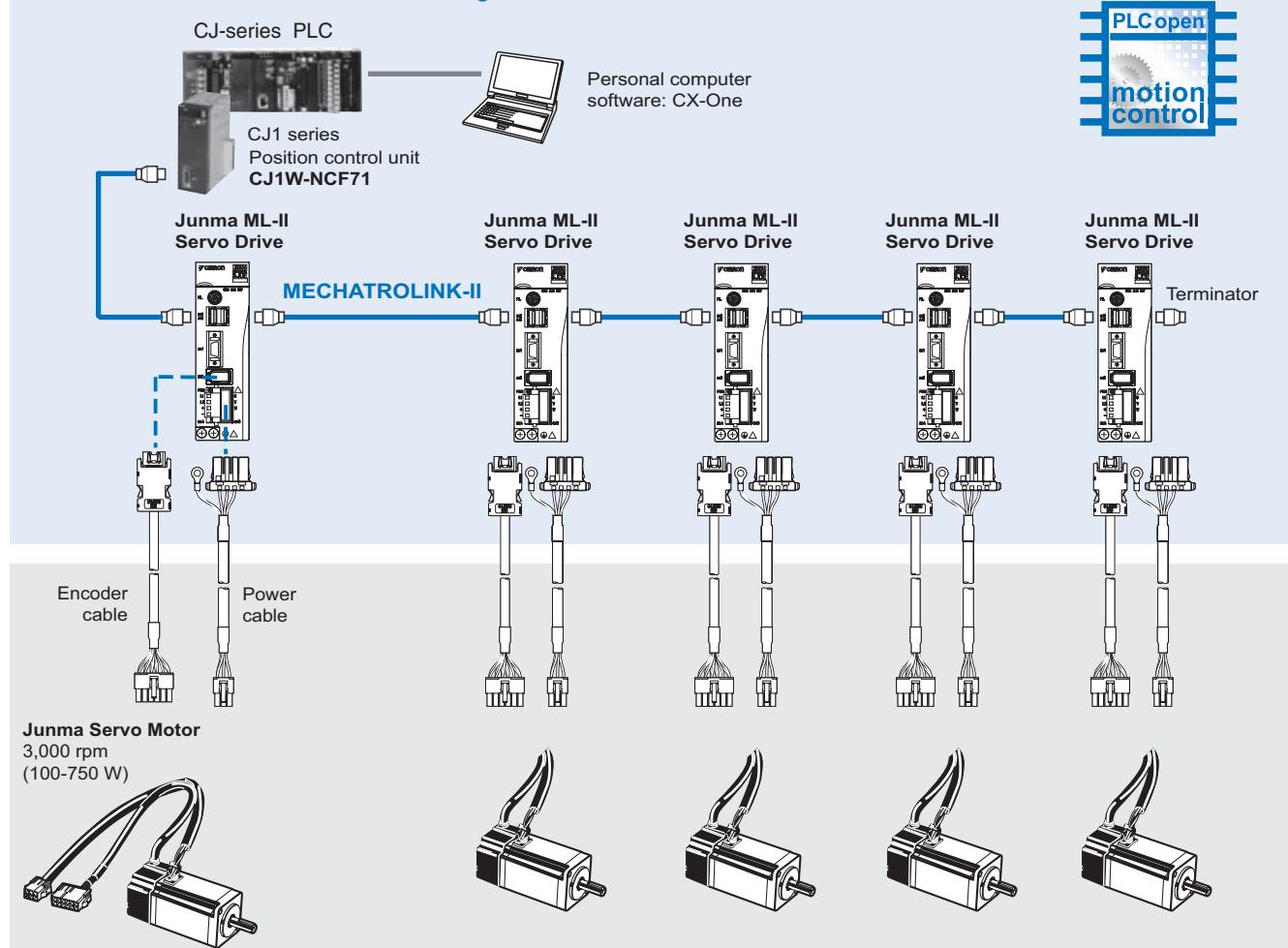


## Ratings

- 230 VAC Single-phase 100 W to 750 W (2.39 Nm)

## System Configuration

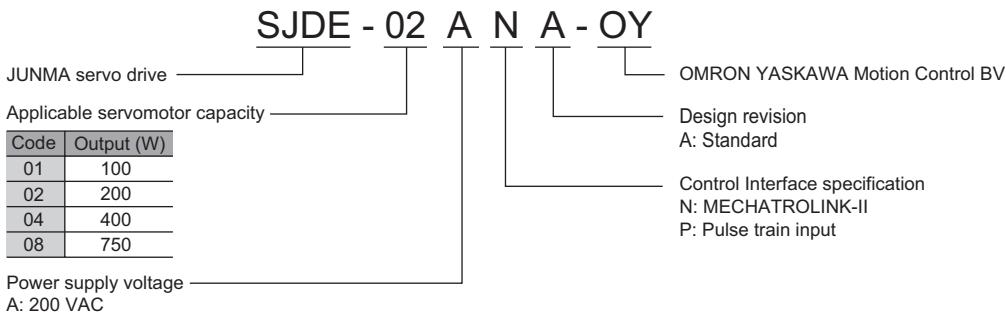
### Junma MECHATROLINK-II Servo Drive Configuration



## Servomotor / Servo Drive Combination

| Junma Servomotor   |         |              |          |                     |                  | Junma servo drive |
|--|---------|--------------|----------|---------------------|------------------|-------------------|
|  | Voltage | Rated Torque | Capacity | Model without brake | Model with brake | MECHATROLINK-II   |
| SJME- (3000 min <sup>-1</sup> )<br> | 200 V   | 0.318 Nm     | 100 W    | SJME-01AMB41-OY     | SJME-01AMB4C-OY  | SJDE-01ANA-OY     |
|  |         | 0.637 Nm     | 200 W    | SJME-02AMB41-OY     | SJME-02AMB4C-OY  | SJDE-02ANA-OY     |
|  |         | 1.27 Nm      | 400 W    | SJME-04AMB41-OY     | SJME-04AMB4C-OY  | SJDE-04ANA-OY     |
|  |         | 2.39 Nm      | 750 W    | SJME-08AMB41-OY     | SJME-08AMB4C-OY  | SJDE-08ANA-OY     |

## Servo Drive Type Designation



## Servo Drive Specifications

### Junma MECHATROLINK-II Servo Drive

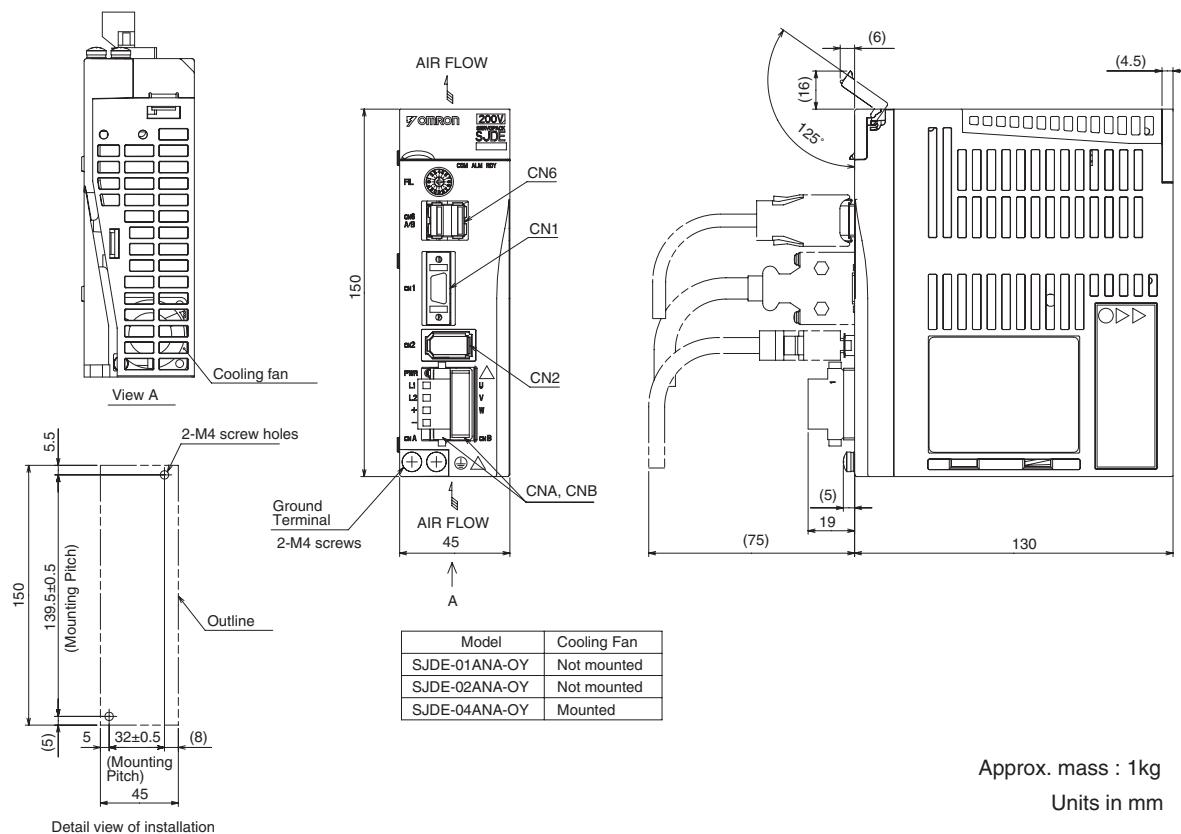
| Servo Drive Type   |   | SJDE- □   | 01ANA-OY               | 02ANA-OY               | 04ANA-OY                | 08ANA-OY |
|--|---|---|------------------------|------------------------|-------------------------|----------|
| Applicable servomotor                                    |   | SJME- □   | 01A □                  | 02A □                  | 04A □                   | 08A □    |
| Max. Applicable Motor capacity                           | W   |   | 100                    | 200                    | 400                     | 750      |
| Continuous output current                                | Arms  |   | 0.84                   | 1.1                    | 2.0                     | 3.7      |
| Max. output current                                      | Arms  |   | 2.5                    | 3.3                    | 6.0                     | 11.1     |
| Input power supply<br>(Main circuit and control circuit) | Voltage<br>Capacity KVA   | Single-phase, 200 to 230 VAC, + 10 to -15% (50/60 Hz)<br>0.40   | 0.40                   | 0.75                   | 1.2                     | 2.2      |
| Control Method   | PWM control, sine wave current drive system   |   |                        |                        |                         |          |
| Feedback   | Analogue incremental encoder (13 bits incremental equivalent)   |   |                        |                        |                         |          |
| Allowable load inertia <sup>*1</sup>                     | kg· m <sup>2</sup>  | 0.6 × 10 <sup>-4</sup>  | 3.0 × 10 <sup>-4</sup> | 5.0 × 10 <sup>-4</sup> | 10.0 × 10 <sup>-4</sup> |          |
| Usage / storage temperature                              | 0 to +55° C / -20 to 70° C  |   |                        |                        |                         |          |
| Usage / storage humidity                                 | 90%RH or less (non-condensing)  |   |                        |                        |                         |          |
| Altitude   | 1000m or less above sea level   |   |                        |                        |                         |          |
| Vibration/shock Resistance                               | 4.9m/s <sup>2</sup> (0.5G) / 19.6m/s <sup>2</sup> (2G)  |   |                        |                        |                         |          |
| Configuration  | Base mounted  |   |                        |                        |                         |          |
| Approx. mass   | Kg  |   | 1.0                    |                        | 1.4                     |          |
| DYNAMIC BRAKE (DB)                                       | Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)   |   |                        |                        |                         |          |
| Regenerative processing                                  | Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)   |   |                        |                        |                         |          |
| Over-travel (OT) prevention function                     | P_OT, N_OT  |   |                        |                        |                         |          |
| Emergency stop   | Emergency stop (E-STP)  |   |                        |                        |                         |          |
| LED display  | 4 LEDs (PWR, RDY, COM, ALM)   |   |                        |                        |                         |          |
| MECHATROLINK-II monitor                                  | MECHATROLINK-II under communication : COM LED (Light ON)  |   |                        |                        |                         |          |
| Servo ON/OFF monitor                                     | At Servo OFF : RDY LED (Light OFF), at Servo ON : RDY LED (Light Blinks)  |   |                        |                        |                         |          |
| Power supply status monitor                              | Control / main-circuit power-supply OFF state: PWR LED (Light OFF)<br>Control / main-circuit power-supply ON state: PWR LED (Light ON)  |   |                        |                        |                         |          |
| Electronic gearing                                       | 0.01 < A/B < 100  |   |                        |                        |                         |          |
| Protection   | Overcurrent, overvoltage, undervoltage, overload, main circuit sensor error, board temperature error, excessive position error overflow, overspeed, encoder signal error, overrun protection, system error, parameter error |   |                        |                        |                         |          |
| MECHATROLINK<br>Communication                            | Comm. protocol  | MECHATROLINK-II   |                        |                        |                         |          |
|  | Transmission rate   | 10 Mbps   |                        |                        |                         |          |
|  | Transmission cycle  | 1ms, 1.5ms, 2ms, 3ms, 4ms   |                        |                        |                         |          |
|  | Data length   | 17 byte and 32 byte   |                        |                        |                         |          |
| Command input  | MECHATROLINK<br>communication   | MECHATROLINK-II commands<br>(For sequence, motion, data setting/reference, monitor, adjustment, and other commands)   |                        |                        |                         |          |
| Sequence Input signal                                    | Fixed input   | 5 points (fixed layout: external latch signal, zero return reduced speed signal, forward drive inhibiting signal, reverse run inhibiting signal, emergency stop signal) |                        |                        |                         |          |
| Sequence Output signal                                   | Fixed output  | 2 points (fixed layout: servo alarm, brake interlock)   |                        |                        |                         |          |

Note: \*1. Value without external regeneration unit

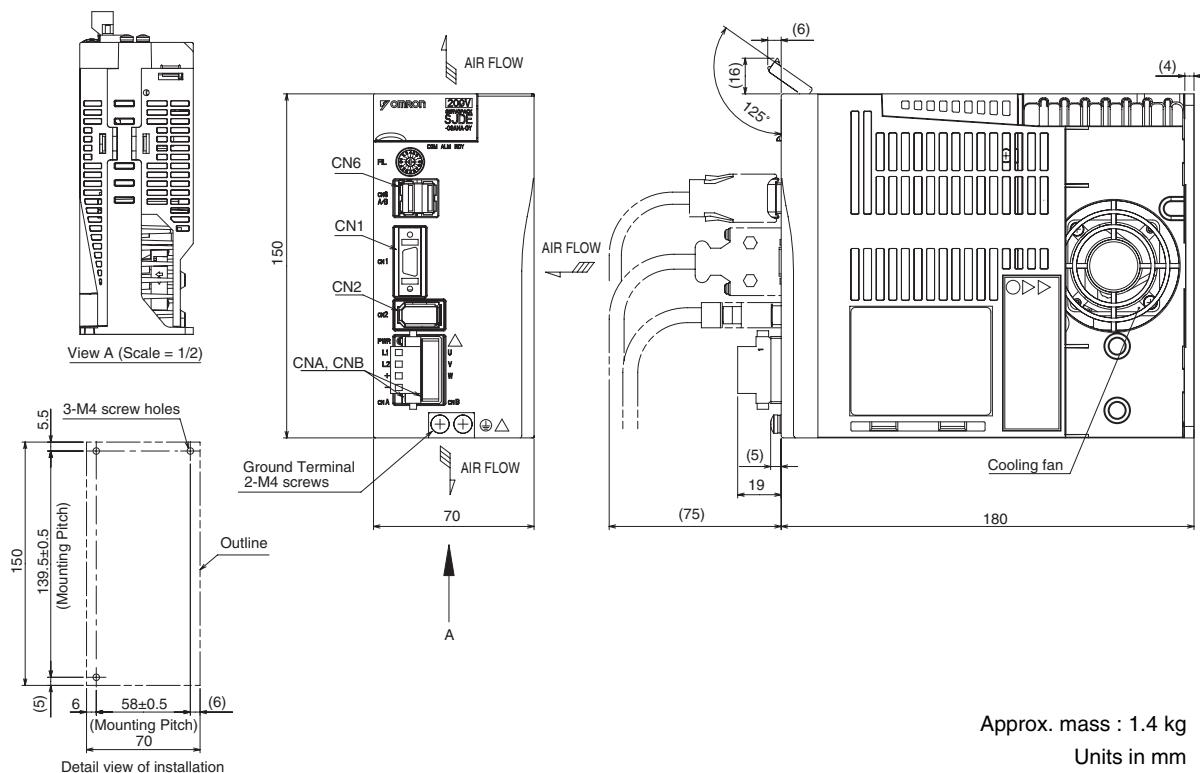
## Dimensions

Junma MECHATROLINK-II servo drives

**SJDE-01, 02, 04ANA-OY (200V, 100 to 400W)**

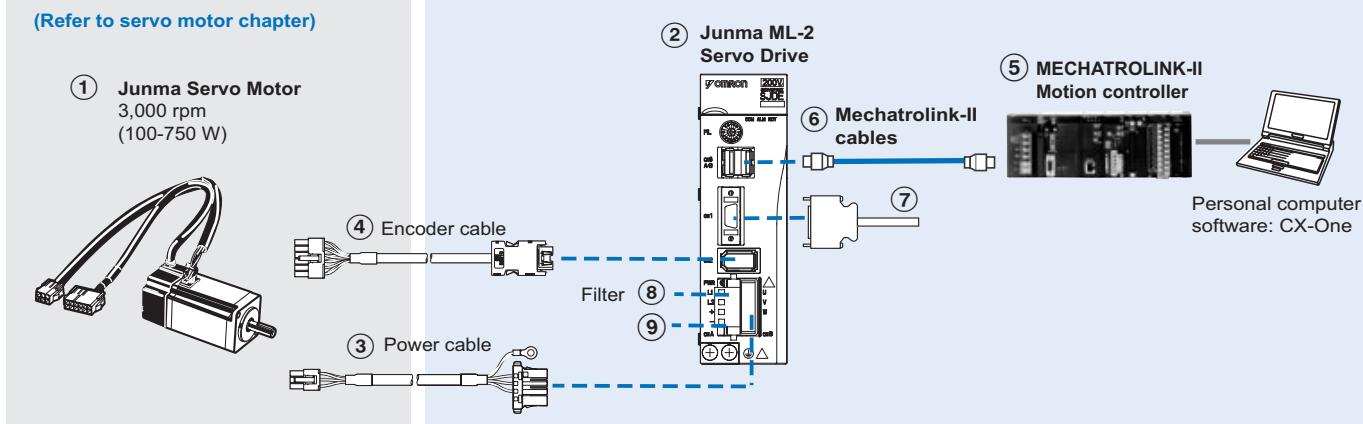


**SJDE-08ANA-OY (200V, 750W)**



## Ordering Information

### Junma MECHATROLINK-II Servo Drive Configuration



### Servomotors and Servo drives

| Symbol | Specifications     |                                 |               |          | (1) Servomotor model | (2) Servo drive model |
|--------|--------------------|---------------------------------|---------------|----------|----------------------|-----------------------|
|        | Voltage            | Encoder and Design              | Rated Torque  | Capacity |                      |                       |
| (1)(2) | 1 Phase<br>200 VAC | Analogue Incremental<br>Encoder | Without brake | 0.318 Nm | 100 W                | SJME-01AMB41-OY       |
|        |                    |                                 |               | 0.637 Nm | 200 W                | SJME-02AMB41-OY       |
|        |                    |                                 |               | 1.27 Nm  | 400 W                | SJME-04AMB41-OY       |
|        |                    |                                 |               | 2.39 Nm  | 750 W                | SJME-08AMB41-OY       |
|        |                    | Straight shaft with key         | With brake    | 0.318 Nm | 100 W                | SJDE-01ANA-OY         |
|        |                    |                                 |               | 0.637 Nm | 200 W                | SJDE-02ANA-OY         |
|        |                    |                                 |               | 1.27 Nm  | 400 W                | SJDE-04ANA-OY         |
|        |                    |                                 |               | 2.39 Nm  | 750 W                | SJDE-08ANA-OY         |
|        |                    |                                 |               |          |                      |                       |

### Power and encoder cables

Note: (3)(4) Refer to the Junma servo motor section for motor cables or connectors selection

### MECHATROLINK-II Motion controllers

| Symbol | Name  | Model      |
|--------|---|------------|
| (5)    | Position Controller Unit for CJ1 PLC            | CJ1W-NCF71 |
|        | Position Controller Unit for CS1 PLC            | CS1W-NCF71 |
|        | Trajexia stand-alone motion controller, 16 axes | TJ1-MC16   |
|        | Trajexia stand-alone motion controller, 4 axes  | TJ1-MC04   |

### MECHATROLINK-II cables

| Symbol | Specifications                      | Model                |
|--------|-------------------------------------|----------------------|
| (6)    | MECHATROLINK-II Terminator resistor | JEPMC-W6022          |
|        | MECHATROLINK-II Cables              | 0.5 m JEPMC-W6003-A5 |
|        |                                     | 1 m JEPMC-W6003-01   |
|        |                                     | 3 m JEPMC-W6003-03   |
|        |                                     | 5 m JEPMC-W6003-05   |
|        |                                     | 10 m JEPMC-W6003-10  |
|        |                                     | 20 m JEPMC-W6003-20  |
|        |                                     | 30 m JEPMC-W6003-30  |

### Cables for I/Os (for CN1)

| Symbol | Name          | Compatible units                  | Model                             |
|--------|---------------|-----------------------------------|-----------------------------------|
| (7)    | Control cable | Cable for servo drive I/O signals | 1 m R7A-CPZ001S or JZSP-CHI003-01 |
|        |               |                                   | 2 m R7A-CPZ002S or JZSP-CHI003-02 |
|        |               |                                   | 3 m JZSP-CHI003-03                |

### Filters

| Symbol | Applicable servo drive | Rated current | Leakage current | Rated voltage      | Filter model   |
|--------|------------------------|---------------|-----------------|--------------------|----------------|
| (8)    | SJDE-01ANA-OY          | 5A            | 1.7 mA          | 250 VAC<br>1-phase | R7A-FIZN105-BE |
|        | SJDE-02ANA-OY          |               |                 |                    | R7A-FIZN109-BE |
|        | SJDE-04ANA-OY          |               |                 |                    |                |
|        | SJDE-08ANA-OY          | 9A            | 1.7 mA          |                    |                |

### Regenerative Unit Model (Option)

| Symbol | Specifications                           | Model (Omron) | Model (Yaskawa) |
|--------|--|---------------|-----------------|
| (9)    | External regenerative unit<br>(Optional) | R88A-RG08UA   | JUSP-RG08D      |

### Connectors

| Specification   | Model (Omron) | Model (Yaskawa) |
|---|---------------|-----------------|
| Control I/O connector (for CN1)                                 | R7A-CNA01R    | JZSP-CHI9-1     |
| Power input connector (for CNB).<br>(Included in drive the box) | R7A-CN01P     | JZSP-CHG9-1     |

### Computer Software

| Specifications  | Model    |
|---|----------|
| Configuration and monitoring software tool via ML2 (CX-Drive version 1.3 or higher) | CX-DRIVE |
| Complete Omron software package including CX-Drive (CX-One 2.0 or higher)           | CX-ONE   |

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

SJDE-□APA-OY

# Junma Pulse servo drive

**A new concept in drive simplicity**

**Save space, save time**

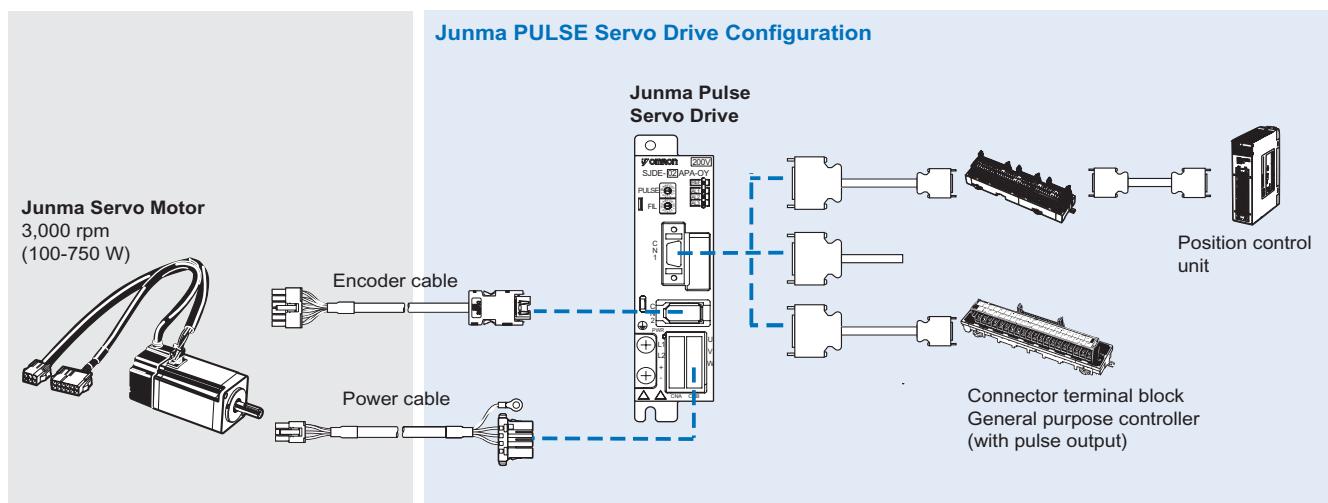
- Ultra compact drive size reduces panel space
- Tuning-less technology, no gain parameters need to be set
- Peak torque 300% of nominal for 3 seconds
- High response, high speed, high torque and high accuracy
- Fully "Parameter-less" just plug and run
- Position resolution of 10,000 steps per revolution



## Ratings

- 230 VAC Single-phase 100 W to 750 W (2.39 Nm)

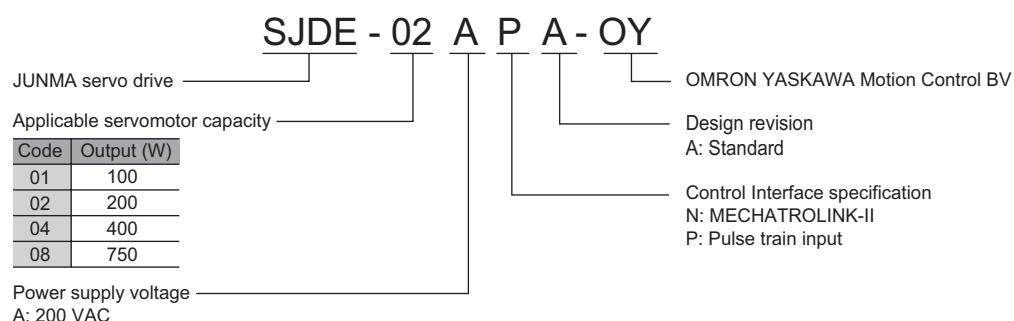
## System Configuration



## Servomotor / Servo Drive Combination

| Junma Servomotor                |         |              |          |                     |                  | Junma servo drive |
|---------------------------------|---------|--------------|----------|---------------------|------------------|-------------------|
|                                 | Voltage | Rated Torque | Capacity | Model without brake | Model with brake | Pulse Control     |
| SJME- (3000 min <sup>-1</sup> ) | 200 V   | 0.318 Nm     | 100 W    | SJME-01AMB41-OY     | SJME-01AMB4C-OY  | SJDE-01APA-OY     |
|                                 |         | 0.637 Nm     | 200 W    | SJME-02AMB41-OY     | SJME-02AMB4C-OY  | SJDE-02APA-OY     |
|                                 |         | 1.27 Nm      | 400 W    | SJME-04AMB41-OY     | SJME-04AMB4C-OY  | SJDE-04APA-OY     |
|                                 |         | 2.39 Nm      | 750 W    | SJME-08AMB41-OY     | SJME-08AMB4C-OY  | SJDE-08APA-OY     |

## Servo Drive Type Designation



## Servo Drive Specifications

## **Junma Pulse Servo Drives**

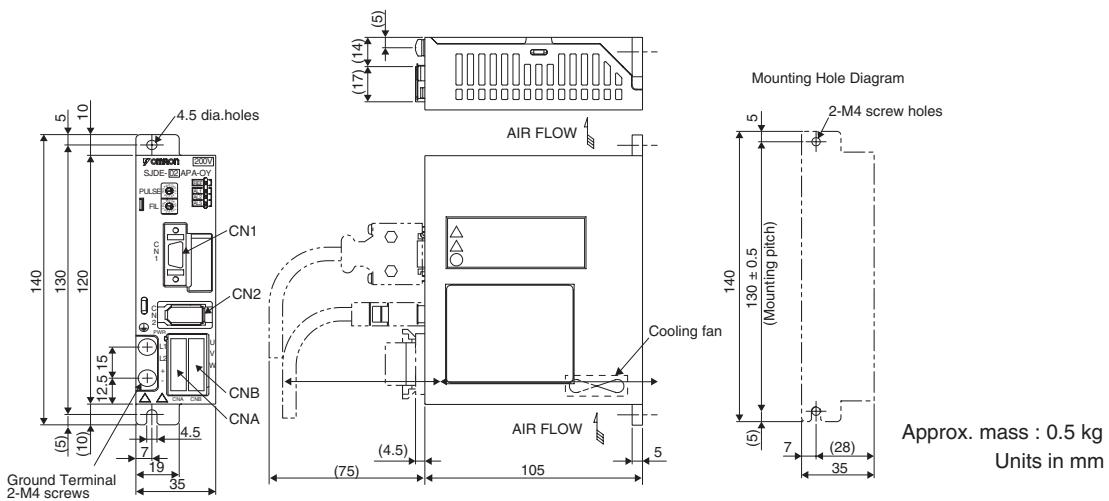
| Servo Drive Type   | <b>SJDE-□</b>  | <b>01APA-OY</b>   | <b>02APA-OY</b>  | <b>04APA-OY</b>      | <b>08APA-OY</b>       |  |  |  |  |
|--|--|---|--|----------------------|-----------------------|--|--|--|--|
| Applicable servomotor                                    | <b>SJME-□</b>  | <b>01A□</b>   | <b>02A□</b>  | <b>04A□</b>          | <b>08A□</b>           |  |  |  |  |
| Max. Applicable Motor capacity                           | W  | 100   | 200  | 400                  | 750                   |  |  |  |  |
| Continuous output current                                | Arms   | 0.84  | 1.1  | 2.0                  | 3.7                   |  |  |  |  |
| Max. output current                                      | Arms   | 2.5   | 3.3  | 6.0                  | 11.1                  |  |  |  |  |
| Input power supply<br>(Main circuit and control circuit) | Voltage  | Single-phase, 200 to 230 VAC, + 10 to -15% (50/60 Hz)   |  |                      |                       |  |  |  |  |
|  | Capacity KVA   | 0.40  | 0.75   | 1.2                  | 2.2                   |  |  |  |  |
| Control Method   | PWM control, sine wave current drive system  |   |  |                      |                       |  |  |  |  |
| Feedback   | Analogue incremental encoder (10000 steps per revolution)  |   |  |                      |                       |  |  |  |  |
| Allowable load inertia <sup>*1</sup>                     | kg·m <sup>2</sup>  | $0.6 \times 10^{-4}$  | $3.0 \times 10^{-4}$   | $5.0 \times 10^{-4}$ | $10.0 \times 10^{-4}$ |  |  |  |  |
| Usage / storage temperature                              | 0 to +55°C / -20 to 70°C   |   |  |                      |                       |  |  |  |  |
| Usage / storage humidity                                 | 90%RH or less (non-condensing)   |   |  |                      |                       |  |  |  |  |
| Altitude   | 1000 m or less above sea level   |   |  |                      |                       |  |  |  |  |
| Vibration/shock Resistance                               | $4.9\text{m/s}^2$ (0.5G) / $19.6\text{m/s}^2$ (2G)   |   |  |                      |                       |  |  |  |  |
| Configuration  | Base mounted   |   |  |                      |                       |  |  |  |  |
| Cooling method   | Forced cooling (built-in fan)  |   |  |                      |                       |  |  |  |  |
| Approx. mass   | kg   | 0.5   |  |                      | 1.0                   |  |  |  |  |
| Dynamic brake (DB)                                       | Operated at main power OFF, servo alarm, servo OFF.(OFF after motor stops; ON when motor power is off.)                      |   |  |                      |                       |  |  |  |  |
| Regenerative processing                                  | Optional (If the regenerated energy is too large, install a regenerative unit JUSP-RG08D)                                    |   |  |                      |                       |  |  |  |  |
| LED display  | 5 (PWE, REF, AL1, AL2, AL3)  |   |  |                      |                       |  |  |  |  |
| Reference filter   | Select one of eight levels with FIL switch   |   |  |                      |                       |  |  |  |  |
| Protection   | Speed errors, overload, encoder errors, voltage errors, overcurrents, disablement of the built-in cooling fan, system errors |   |  |                      |                       |  |  |  |  |
| I/O Signals  | Input signal for reference<br>Designated pulse type and<br>pulse resolution with PULSE<br>switch.                            | Pulse type  | Select one of the following signals:<br>1. CCW + CW<br>2. Sign + pulse train<br>3. CCW + CW (logic reversal)<br>4. Sign + pulse train (logic reversal)   |                      |                       |  |  |  |  |
|  |  | Pulse resolution  | Select one of the following signals:<br>1. 1000 pulses/rev (Open collector/line driver) 75 kpps max.<br>2. 2500 pulses/rev (Open collector/line driver) 187.5 kpps max.<br>3. 5000 pulses/rev (Line driver) 375 kpps max.<br>4. 10000 pulses/rev (Line driver) 750 kpps max. |                      |                       |  |  |  |  |
| Clear input signal                                       |  | Clears the positioning error when turned ON   |  |                      |                       |  |  |  |  |
| Servo ON input signal                                    |  | Turns the servomotor ON or OFF  |  |                      |                       |  |  |  |  |
| Alarm output signal                                      |  | OFF if an alarm occurs. (Note: OFF for 2s when power is turned ON)  |  |                      |                       |  |  |  |  |
| Brake output signal                                      |  | External signal to control brakes. Turn ON to release the brake   |  |                      |                       |  |  |  |  |
| Positioning completed output signal                      |  | ON if the current position is equal to the reference position ±10 pulses. External signal to control brakes.              |  |                      |                       |  |  |  |  |
| Origin output signal                                     |  | ON if the motor is at the origin. (Width: 1/500 rev)<br>(Note: Use the pulse edge that changes the signal from OFF to ON) |  |                      |                       |  |  |  |  |

**Note:** \*1. Value without external regeneration unit

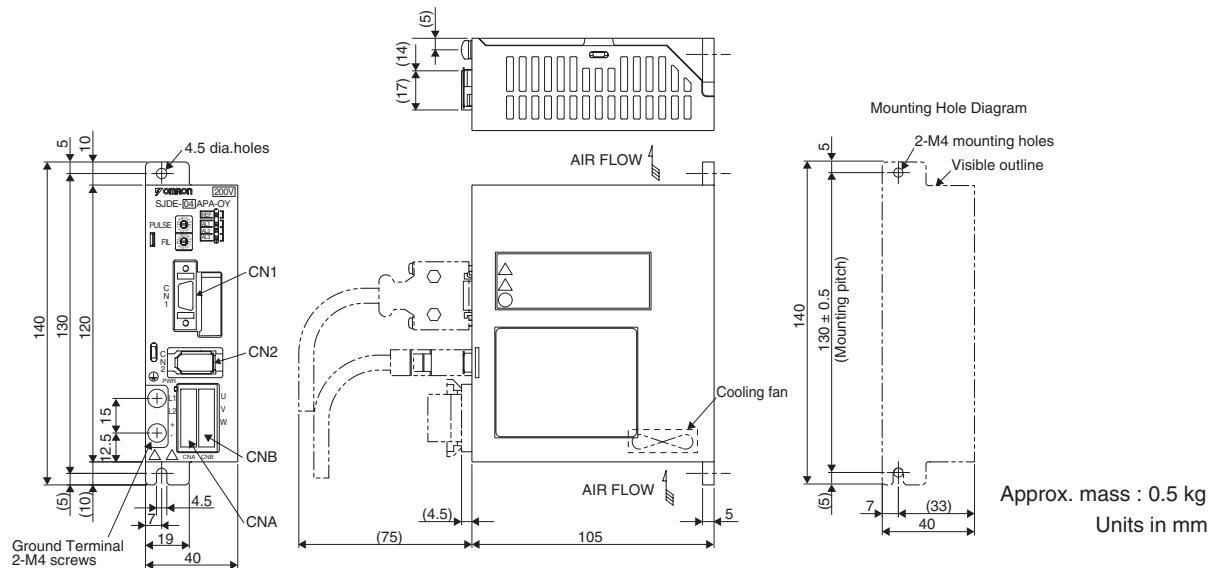
## Dimensions

#### **Junma pulse control servo drives**

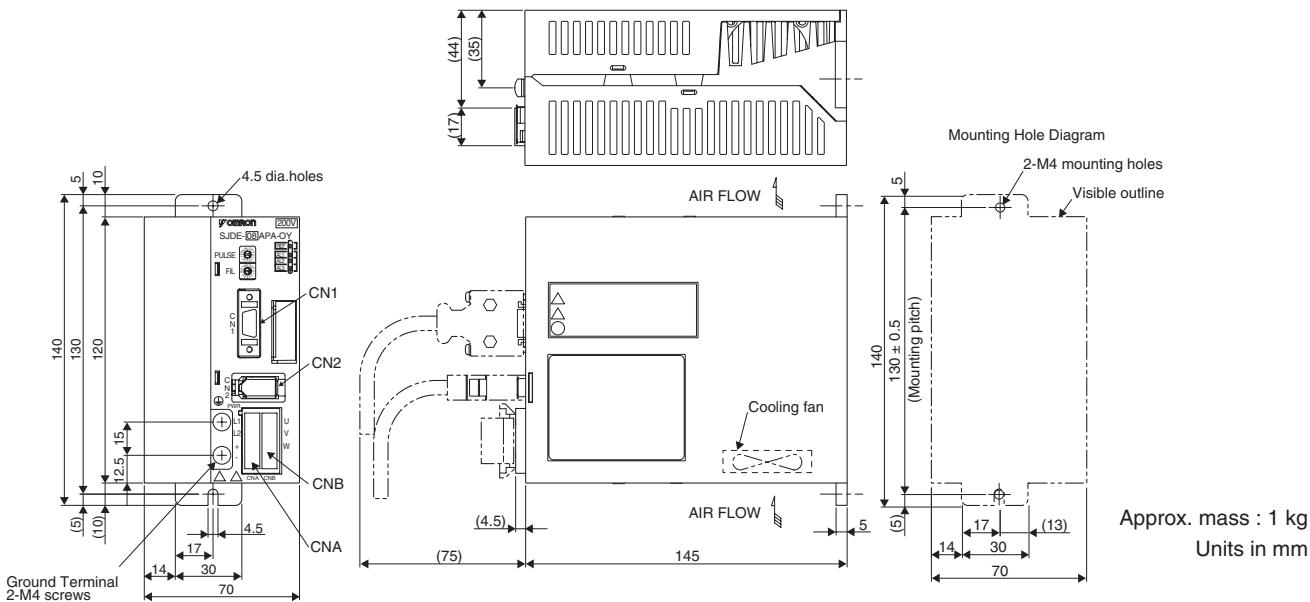
SJDE-01, 02APA-OY (200V, 100 to 200W)



**SJDE-04APA-OY (200V, 400W)**



**SJDE-08APA-OY (200V, 800W)**

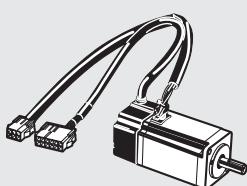


## Ordering Information

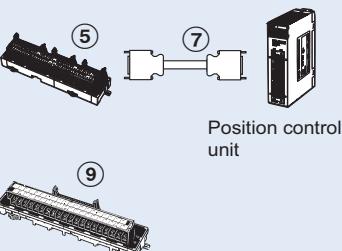
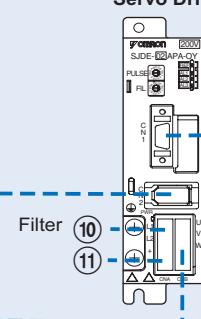
Junma Pulse Servo Drive Configuration

(Refer to servo motor chapter)

- ① Junma Servo Motor  
3,000 rpm  
(100-750 W)



- 



## Connector terminal block General purpose controller (with pulse output)

**Servomotors and Servo drives**

| Symbol | Specifications     |                                 |               |              | (1) Servomotor model | (2) Servo drive model |
|--------|--------------------|---------------------------------|---------------|--------------|----------------------|-----------------------|
|        | Voltage            | Encoder and Design              |               | Rated Torque |                      | Pulse Control         |
| (1)(2) | 1 Phase<br>200 VAC | Analogue Incremental<br>Encoder | Without brake | 0.318 Nm     | 100 W                | SJME-01AMB41-OY       |
|        |                    |                                 |               | 0.637 Nm     | 200 W                | SJME-02AMB41-OY       |
|        |                    |                                 |               | 1.27 Nm      | 400 W                | SJME-04AMB41-OY       |
|        |                    |                                 |               | 2.39 Nm      | 750 W                | SJME-08AMB41-OY       |
|        |                    | Straight shaft with key         | With brake    | 0.318 Nm     | 100 W                | SJDE-01APA-OY         |
|        |                    |                                 |               | 0.637 Nm     | 200 W                | SJDE-02APA-OY         |
|        |                    |                                 |               | 1.27 Nm      | 400 W                | SJDE-04APA-OY         |
|        |                    |                                 |               | 2.39 Nm      | 750 W                | SJDE-08APA-OY         |
|        |                    |                                 |               |              |                      |                       |

**Control cables (for CN1)**

| Symbol | Name                           | Compatible units   |       | Model                    |
|--------|--------------------------------|--|-------|--------------------------|
| (5)    | Servo relay unit               | Units: CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113                        | -     | XW2B-20J6-1B<br>(1 axis) |
|        |                                | Units:<br>CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413 | -     | XW2B-40J6-2B<br>(2 axes) |
|        |                                | Units: CQM1H-PLB21 and CQM1-CPU43-V1                                       | -     | XW2B-20J6-3B<br>(1 axis) |
|        |                                | Use with CJ1M-CPU21/22/23  | -     | XW2B-20J6-8A<br>(1 axis) |
|        |                                |  | -     | XW2B-40J6-9A<br>(2 axes) |
| (6)    | Cable to servo drive           | For the servo relay unit<br>XW2B-□□J6-□B,<br>XW2B-20J6-8A,<br>XW2B-40J6-9A | 1 m   | XW2Z-100J-B17            |
|        |                                |  | 2 m   | XW2Z-200J-B17            |
| (7)    | Cable to position control unit | CQM1H-PLB21 and CQM1-CPU43-V1  | 0.5 m | XW2Z-050J-A3             |
|        |                                |  | 1 m   | XW2Z-100J-A3             |
|        |                                | CS1W-NC113 and C200HW-NC113  | 0.5 m | XW2Z-050J-A8             |
|        |                                |  | 1 m   | XW2Z-100J-A8             |
|        |                                | CS1W-NC213/413 and C200HW-NC213/413  | 0.5 m | XW2Z-050J-A9             |
|        |                                |  | 1 m   | XW2Z-100J-A9             |
|        |                                | CS1W-NC133   | 0.5 m | XW2Z-050J-A12            |
|        |                                |  | 1 m   | XW2Z-100J-A12            |
|        |                                | CS1W-NC233/433   | 0.5 m | XW2Z-050J-A13            |
|        |                                |  | 1 m   | XW2Z-100J-A13            |
|        |                                | CJ1W-NC113   | 0.5 m | XW2Z-050J-A16            |
|        |                                |  | 1 m   | XW2Z-100J-A16            |
|        |                                | CJ1W-NC213/413   | 0.5 m | XW2Z-050J-A17            |
|        |                                |  | 1 m   | XW2Z-100J-A17            |
|        |                                | CJ1W-NC133   | 0.5 m | XW2Z-050J-A20            |
|        |                                |  | 1 m   | XW2Z-100J-A20            |
| (8)    | Control cable                  | For general-purpose controllers  | 0.5 m | XW2Z-050J-A21            |
|        |                                |  | 1 m   | XW2Z-100J-A21            |
|        |                                |  | 0.5 m | XW2Z-050J-A26            |
|        |                                |  | 1 m   | XW2Z-100J-A26            |
| (9)    | Connector terminal block cable | For general-purpose controllers  | 1 m   | XW2Z-100J-B19            |
|        |                                |  | 2 m   | XW2Z-200J-B19            |
|        |                                |  | -     | XW2B-20G5                |

**Filters**

| Symbol | Applicable servo drive | Rated current | Leakage current | Rated voltage      | Filter model   |
|--------|------------------------|---------------|-----------------|--------------------|----------------|
| (10)   | SJDE-01APA-OY          | 5A            | 1.7 mA          | 250 VAC<br>1-phase | R7A-FIZP105-BE |
|        | SJDE-02APA-OY          |               |                 |                    | R7A-FIZP109-BE |
|        | SJDE-04APA-OY          |               |                 |                    |                |
|        | SJDE-08APA-OY          | 9A            | 1.7 mA          |                    |                |

**Regenerative Unit Model (Option)**

| Symbol | Specifications                           | Model (Omron) | Model (Yaskawa) |
|--------|--|---------------|-----------------|
| (11)   | External regenerative unit<br>(Optional) | R88A-RG08UA   | JUSP-RG08D      |

**Connectors**

| Specification   | Model (Omron) | Model (Yaskawa) |
|---|---------------|-----------------|
| Control I/O connector (for CN1)                                 | R7A-CNA01R    | JZSP-CHI9-1     |
| Power input connector (for CNB).<br>(Included in drive the box) | R7A-CNZ01P    | JZSP-CHG9-1     |

**Power and encoder cables**

Note: (3)(4) Refer to the Junma servo motor section for motor cables or connectors selection

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

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

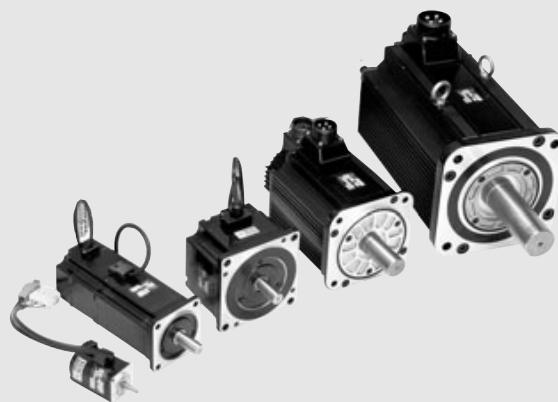
# Sigma-II rotary servo motors

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

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

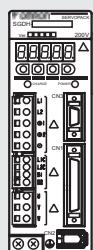
## Ratings

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



## System configuration

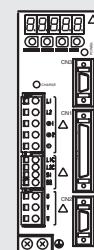
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

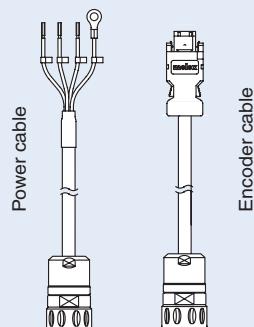
Sigma-II  
Servo Drive

Drive options

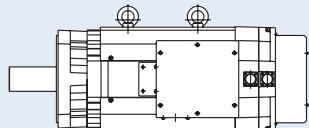
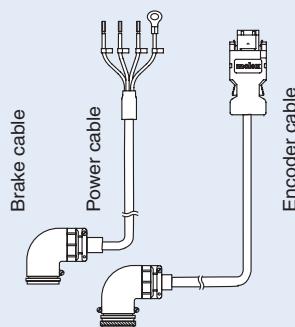


Intelligent  
Servo Drive

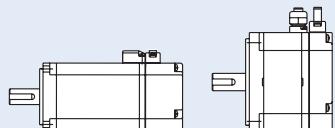
XtraDrive



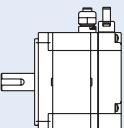
Power and  
encoder cables



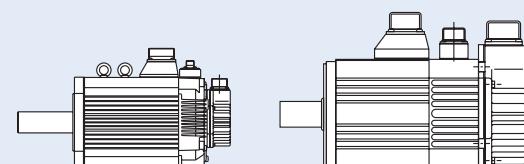
SGMBH  
Servo Motor  
1500 rpm  
(22 kW-55 kW)



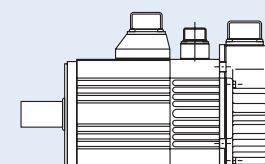
SGMAH  
Servo Motor  
3000 rpm  
(30-750 W)



SGMPH  
Servo Motor  
3000 rpm  
(100-1500 W)



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



SGMUH  
Servo Motor  
3000 rpm  
(1-5 kW)

SGMSH  
Servo Motor  
6000 rpm  
(1-4 kW)

## Servo motor / servo drive combination

| Sigma-II rotary servo motor        |         |              |          |            | Sigma-II servo drive |                 | XtraDrive servo drive |                 |  |
|------------------------------------|---------|--------------|----------|------------|----------------------|-----------------|-----------------------|-----------------|--|
|                                    | Voltage | Rated torque | Capacity | Model      | 230 V (1-phase)      | 400 V (3-phase) | 230 V (1-phase)       | 400 V (3-phase) |  |
| SGMAH<br>(3000 min <sup>-1</sup> ) | 230 V   | 0.095 N.m    | 30 W     | SGMAH-A3A□ | SGDH-A3AE-OY         | -               | XD-P3-MN01            | -               |  |
|                                    |         | 0.159 N.m    | 50 W     | SGMAH-A5A□ | SGDH-A5AE-OY         | -               | XD-P5-MN01            | -               |  |
|                                    |         | 0.318 N.m    | 100 W    | SGMAH-01A□ | SGDH-01AE-OY         | -               | XD-01-MN01            | -               |  |
|                                    |         | 0.637 N.m    | 200 W    | SGMAH-02A□ | SGDH-02AE-OY         | -               | XD-02-MN01            | -               |  |
|                                    |         | 1.27 N.m     | 400 W    | SGMAH-04A□ | SGDH-04AE-OY         | -               | XD-04-MN01            | -               |  |
|                                    |         | 2.39 N.m     | 750 W    | SGMAH-08A□ | SGDH-08AE-S-OY       | -               | XD-08-MN              | -               |  |
|                                    | 400 V   | 0.955 N.m    | 300 W    | SGMAH-03D□ | -                    | SGDH-05DE-OY    | -                     | XD-05-TN        |  |
|                                    |         | 2.07 N.m     | 650 W    | SGMAH-07D□ | -                    | SGDH-10DE-OY    | -                     | XD-10-TN        |  |
| SGMPH<br>(3000 min <sup>-1</sup> ) | 230 V   | 0.318 N.m    | 100 W    | SGMPH-01A□ | SGDH-01AE-OY         | -               | XD-01-MN01            | -               |  |
|                                    |         | 0.637 N.m    | 200 W    | SGMPH-02A□ | SGDH-02AE-OY         | -               | XD-02-MN01            | -               |  |
|                                    |         | 1.27 N.m     | 400 W    | SGMPH-04A□ | SGDH-04AE-OY         | -               | XD-04-MN01            | -               |  |
|                                    |         | 2.39 N.m     | 750 W    | SGMPH-08A□ | SGDH-08AE-S-OY       | -               | XD-08-MN              | -               |  |
|                                    |         | 4.77 N.m     | 1500 W   | SGMPH-15A□ | SGDH-15AE-S-OY       | -               | XD-15-MN              | -               |  |
|                                    | 400 V   | 0.637 N.m    | 200 W    | SGMPH-02D□ | -                    | SGDH-05DE-OY    | -                     | XD-05-TN        |  |
|                                    |         | 1.27 N.m     | 400 W    | SGMPH-04D□ | -                    | SGDH-05DE-OY    | -                     | XD-05-TN        |  |
|                                    |         | 2.39 N.m     | 750 W    | SGMPH-08D□ | -                    | SGDH-10DE-OY    | -                     | XD-10-TN        |  |
|                                    |         | 4.77 N.m     | 1500 W   | SGMPH-15D□ | -                    | SGDH-15DE-OY    | -                     | XD-15-TN        |  |
|                                    |         | 2.84 N.m     | 0.45 kW  | SGMGH-05D□ | -                    | SGDH-05DE-OY    | -                     | XD-05-TN        |  |
| SGMGH<br>(1500 min <sup>-1</sup> ) | 400 V   | 5.39 N.m     | 0.85 kW  | SGMGH-09D□ | -                    | SGDH-1ODE-OY    | -                     | XD-10-TN        |  |
|                                    |         | 8.34 N.m     | 1.3 kW   | SGMGH-13D□ | -                    | SGDH-15DE-OY    | -                     | XD-15-TN        |  |
|                                    |         | 11.5 N.m     | 1.8 kW   | SGMGH-20D□ | -                    | SGDH-20DE-OY    | -                     | XD-20-TN        |  |
|                                    |         | 18.6 N.m     | 2.9 kW   | SGMGH-30D□ | -                    | SGDH-30DE-OY    | -                     | XD-30-TN        |  |
|                                    |         | 28.4 N.m     | 4.4 kW   | SGMGH-44D□ | -                    | SGDH-50DE-OY    | -                     | XD-50-TN        |  |
|                                    |         | 35.0 N.m     | 5.5 kW   | SGMGH-55D□ | -                    | SGDH-60DE-OY    | -                     | -               |  |
|                                    |         | 48.0 N.m     | 7.5 kW   | SGMGH-75D□ | -                    | SGDH-75DE-OY    | -                     | -               |  |
|                                    |         | 70.0 N.m     | 11 kW    | SGMGH-1AD□ | -                    | SGDH-1ADE-OY    | -                     | -               |  |
|                                    |         | 95.4 N.m     | 15 kW    | SGMGH-1ED□ | -                    | SGDH-1EDE-OY    | -                     | -               |  |
|                                    |         | 3.18 N.m     | 1.0 kW   | SGMSH-10D□ | -                    | SGDH-10DE-OY    | -                     | XD-10-TN        |  |
| SGMSH<br>(3000 min <sup>-1</sup> ) |         | 4.90 N.m     | 1.5 kW   | SGMSH-15D□ | -                    | SGDH-15DE-OY    | -                     | XD-15-TN        |  |
|                                    |         | 6.36 N.m     | 2.0 kW   | SGMSH-20D□ | -                    | SGDH-20DE-OY    | -                     | XD-20-TN        |  |
|                                    |         | 9.80 N.m     | 3.0 kW   | SGMSH-30D□ | -                    | SGDH-30DE-OY    | -                     | XD-30-TN        |  |
|                                    |         | 12.6 N.m     | 4.0 kW   | SGMSH-40D□ | -                    | SGDH-50DE-OY    | -                     | XD-50-TN        |  |
|                                    |         | 15.8 N.m     | 5.0 kW   | SGMSH-50D□ | -                    | SGDH-50DE-OY    | -                     | XD-50-TN        |  |
| SGMUH (6000 min <sup>-1</sup> )    | 400 V   | 1.59 N.m     | 1.0 kW   | SGMUH-10D□ | -                    | SGDH-10DE-OY    | -                     | XD-10-TN        |  |
|                                    |         | 2.45 N.m     | 1.5 kW   | SGMUH-15D□ | -                    | SGDH-15DE-OY    | -                     | XD-15-TN        |  |
|                                    |         | 4.9 N.m      | 3.0 kW   | SGMUH-30D□ | -                    | SGDH-30DE-OY    | -                     | XD-30-TN        |  |
|                                    |         | 6.3 N.m      | 4.0 kW   | SGMUH-40D□ | -                    | SGDH-50DE-OY    | -                     | XD-50-TN        |  |
|                                    |         | 140 Nm       | 22 kW    | SGMBH-2BD□ | -                    | SGDH-2BDE       | -                     | -               |  |
| SGMBH (1500 min <sup>-1</sup> )    |         | 191 Nm       | 30 kW    | SGMBH-3ZD□ | -                    | SGDH-3ZDE       | -                     | -               |  |
|                                    |         | 236 Nm       | 37 kW    | SGMBH-3GD□ | -                    | SGDH-3GDE       | -                     | -               |  |
|                                    |         | 286 Nm       | 45 kW    | SGMBH-4ED□ | -                    | SGDH-4EDE       | -                     | -               |  |
|                                    |         | 350 Nm       | 55 kW    | SGMBH-5ED□ | -                    | SGDH-5EDE       | -                     | -               |  |

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

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

## Type designation

### Servo motor

**SGMAH - 01 A 1 A 6 S D - OY**

Sigma-II servo motor type

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

Capacity (kW)

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

Voltage

A: 230 V

D: 400 V

Connector specifications

|       |                                  |
|-------|----------------------------------|
| Blank | No option                        |
| D     | Hypertac connector (SGMAH,SGMPH) |

Brake, oil seal specifications

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

Shaft end specifications

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

○: Standard ○: Option

Design procedure:

A: Standard

E: SGMPH (IP67)

F: SGMAH (prepared for oil seal mounting)

Serial encoder specifications

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

○: Standard ○: Option

**SGMBH - 2 B D 2 A**

Sigma-II series large

Type : SGMBH

Motor output

2B: 22 kW 4E: 45 kW

3Z: 30 kW 5E: 55 kW

3G: 37 kW

Voltage

D:400 V

Encoder specifications

2:17-bit absolute (standard)

C:17-bit incremental (standard)

3: 20-bit absolute (option)

Design revision

A: Max. torque 200%

Option

1: Oil seal (V type)

B: Oil seal (V type) and holding brake (90 VDC)

C: Oil seal (V type) and holding brake (24 VDC)

S: Oil seal (S type)

D: Oil seal (S type) and holding brake (90 VDC)

E: Oil seal (S type) and holding brake (24 VDC)

Note : Options are not available for 55 kW motors.

Motor specifications

2 : Flange, straight shaft

6 : Flange, straight shaft } For 45 kW or less  
(with key and tap)

K : Foot mount, straight shaft

L : Foot mount, straight shaft } For 37 kW or more  
(with key and tap)

## Servo motor specifications

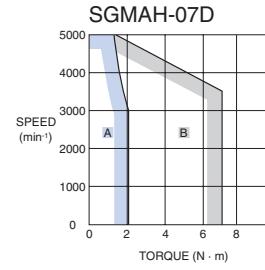
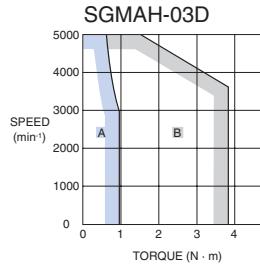
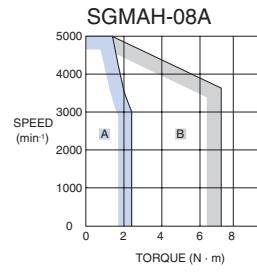
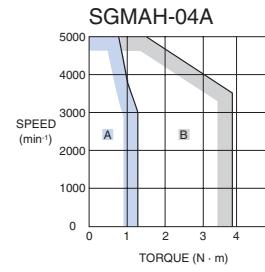
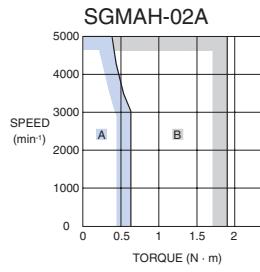
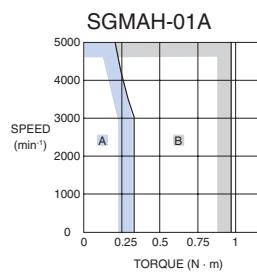
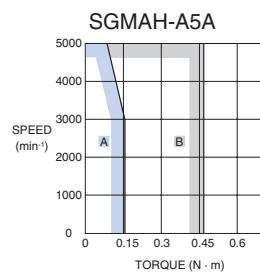
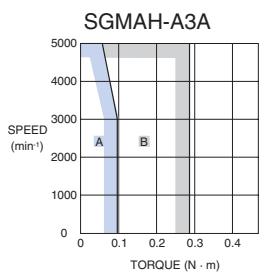
Type SGMAH, 230 V/400 V

### Ratings and specifications

| Applied voltage                       |                                     | 230 V   |        |       |       |       |       | 400 V |       |
|---------------------------------------|-------------------------------------|---|--------|-------|-------|-------|-------|-------|-------|
| Servo motor model SGMAH- □            |                                     | A3A□  | A5A□   | 01A□  | 02A□  | 04A□  | 08A□  | 03D□  | 07D□  |
| Rated output                          | W                                   | 30  | 50     | 100   | 200   | 400   | 750   | 300   | 650   |
| Rated torque                          | N·m                                 | 0.096   | 0.159  | 0.318 | 0.637 | 1.27  | 2.39  | 0.955 | 2.07  |
| Instantaneous peak torque             | N·m                                 | 0.286   | 0.477  | 0.955 | 1.91  | 3.82  | 7.16  | 3.82  | 7.16  |
| Rated current                         | A (rms)                             | 0.44  | 0.64   | 0.91  | 2.1   | 2.8   | 4.4   | 1.3   | 2.2   |
| Instantaneous max. current            | A (rms)                             | 1.3   | 2.0    | 2.8   | 6.5   | 8.5   | 13.4  | 5.1   | 7.7   |
| Rated speed                           | min <sup>-1</sup>                   |   |        |       | 3000  |       |       |       |       |
| Max. speed                            | min <sup>-1</sup>                   |   |        |       | 5000  |       |       |       |       |
| Torque constant                       | N·m/A (rms)                         | 0.238   | 0.268  | 0.378 | 0.327 | 0.498 | 0.590 | 0.837 | 1.02  |
| Rotor moment of inertia (JM)          | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 0.017   | 0.022  | 0.036 | 0.106 | 0.173 | 0.672 | 0.173 | 0.672 |
| Allowable load moment of inertia (JL) | Multiple of (JM)                    |   |        | 30    |       |       | 20    |       |       |
| Rated power rate                      | kW/s                                | 5.49  | 11.5   | 27.8  | 38.2  | 93.7  | 84.8  | 52.9  | 63.8  |
| Rated angular acceleration            | rad/s <sup>2</sup>                  | 57500   | 72300  | 87400 | 60100 | 73600 | 35500 | 55300 | 30800 |
| Applicable encoder                    | Standard                            | Incremental encoder (13 bits)                                 |        |       |       |       |       |       |       |
|                                       | Option                              | Incremental/absolute encoder (16 bits)                        |        |       |       |       |       |       |       |
| Holding brake moment of inertia J     | kg·m <sup>2</sup> ×10 <sup>-4</sup> |   | 0.0085 |       |       | 0.058 |       | 0.14  | 0.058 |
|                                       |                                     |   |        |       |       |       |       |       | 0.14  |
| Basic specifications                  | Time rating                         | Continuous  |        |       |       |       |       |       |       |
|                                       | Insulation class                    | Class B   |        |       |       |       |       |       |       |
|                                       | Ambient temperature                 | 0 to +40 °C   |        |       |       |       |       |       |       |
|                                       | Ambient humidity                    | 20 to 80% (non-condensing)                                    |        |       |       |       |       |       |       |
|                                       | Vibration class                     | 15 µm or below  |        |       |       |       |       |       |       |
|                                       | Enclosure                           | Totally-enclosed, self-cooled, IP55 (excluding shaft opening) |        |       |       |       |       |       |       |
|                                       | Vibration resistance                | Vibration acceleration 49 m/s <sup>2</sup>                    |        |       |       |       |       |       |       |
|                                       | Mounting                            | Flange-mounted  |        |       |       |       |       |       |       |

### Torque-speed characteristics

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

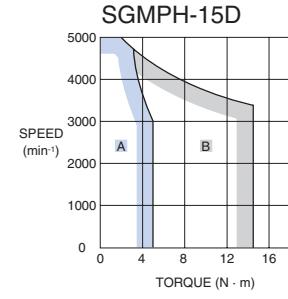
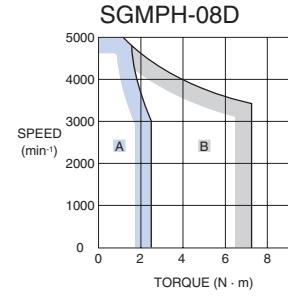
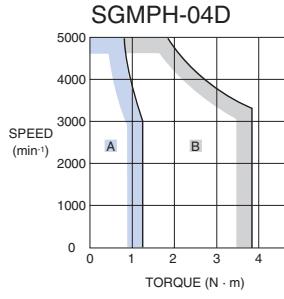
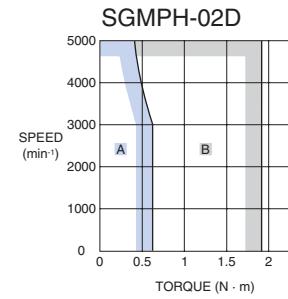
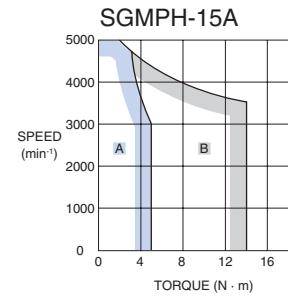
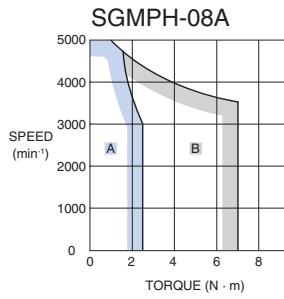
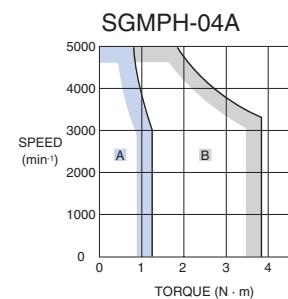
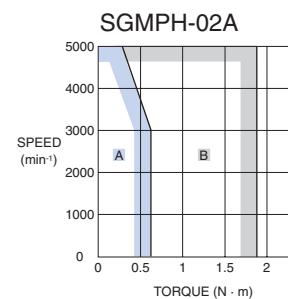
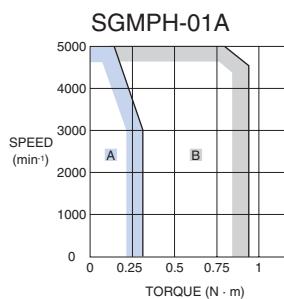


**Type SGMPH, 230 V/400 V****Ratings and specifications**

| Applied voltage                       |                                     | 230 V   |       |       |       |       | 400 V |       |       |       |
|---------------------------------------|-------------------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| Servo motor model SGMPH-              | □                                   | 01A   | 02A   | 04A   | 08A   | 15A   | 02D   | 04D   | 08D   | 15D   |
| Rated output                          | W                                   | 100   | 200   | 400   | 750   | 1500  | 200   | 400   | 750   | 1500  |
| Rated torque                          | N·m                                 | 0.318   | 0.637 | 1.27  | 2.39  | 4.77  | 0.637 | 1.27  | 2.39  | 4.77  |
| Instantaneous peak torque             | N·m                                 | 0.955   | 1.91  | 3.82  | 7.16  | 14.3  | 1.91  | 3.82  | 7.16  | 14.3  |
| Rated current                         | A (rms)                             | 0.89  | 2.0   | 2.6   | 4.1   | 7.5   | 1.4   | 1.4   | 2.6   | 4.5   |
| Instantaneous max. current            | A (rms)                             | 2.8   | 6.0   | 8.0   | 13.9  | 23.0  | 4.6   | 4.4   | 7.8   | 13.7  |
| Rated speed                           | min <sup>-1</sup>                   |   |       |       |       | 3000  |       |       |       |       |
| Max. speed                            | min <sup>-1</sup>                   |   |       |       |       | 5000  |       |       |       |       |
| Torque constant                       | N·m/A (rms)                         | 0.392   | 0.349 | 0.535 | 0.641 | 0.687 | 0.481 | 0.963 | 0.994 | 1.14  |
| Rotor moment of inertia (JM)          | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 0.0491  | 0.193 | 0.331 | 2.10  | 4.02  | 0.193 | 0.331 | 2.10  | 4.02  |
| Allowable load moment of inertia (JL) | Multiple of (JM)                    | 25  | 15    | 7     | 5     |       | 15    | 7     | 5     |       |
| Rated power rate                      | kW/s                                | 20.6  | 21.0  | 49.0  | 27.1  | 56.7  | 21.0  | 49.0  | 27.1  | 56.7  |
| Rated angular acceleration            | rad/s <sup>2</sup>                  | 64800   | 33000 | 38500 | 11400 | 11900 | 33000 | 38500 | 11400 | 11900 |
| Applicable encoder                    | Standard                            | Incremental encoder (13 bits)                                 |       |       |       |       |       |       |       |       |
|                                       | Option                              | Incremental/absolute encoder (16 bits)                        |       |       |       |       |       |       |       |       |
| Holding brake moment of inertia J     | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 0.029   | 0.109 |       | 0.875 |       | 0.109 |       | 0.875 |       |
| Basic specifications                  | Time rating                         | Continuous  |       |       |       |       |       |       |       |       |
|                                       | Insulation class                    | Class B   |       |       |       |       |       |       |       |       |
|                                       | Ambient temperature                 | 0 to +40 °C   |       |       |       |       |       |       |       |       |
|                                       | Ambient humidity                    | 20 to 80% (non-condensing)                                    |       |       |       |       |       |       |       |       |
|                                       | Vibration class                     | 15 µm or below  |       |       |       |       |       |       |       |       |
|                                       | Enclosure                           | Totally-enclosed, self-cooled, IP55 (excluding shaft opening) |       |       |       |       |       |       |       |       |
|                                       | Vibration resistance                | Vibration acceleration 49 m/s <sup>2</sup>                    |       |       |       |       |       |       |       |       |
|                                       | Mounting                            | Flange-mounted  |       |       |       |       |       |       |       |       |

**Torque-speed characteristics**

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



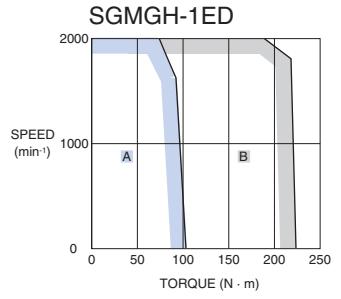
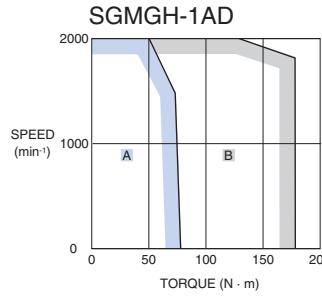
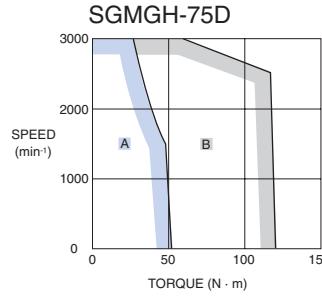
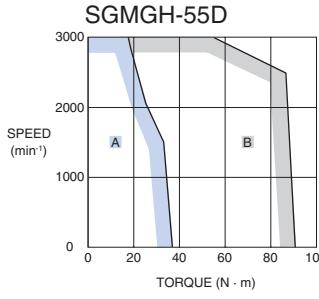
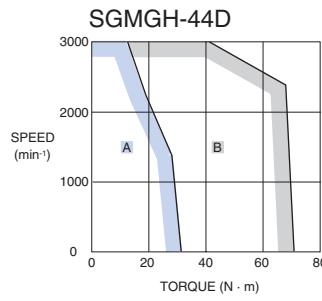
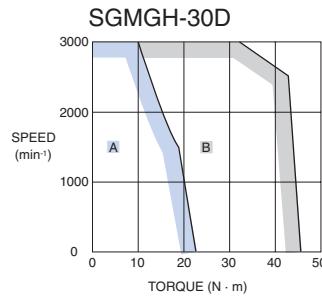
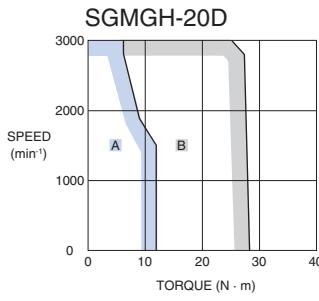
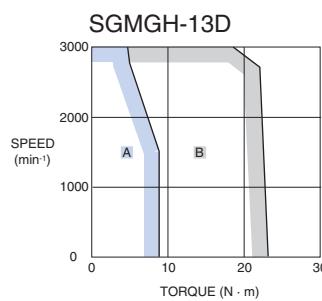
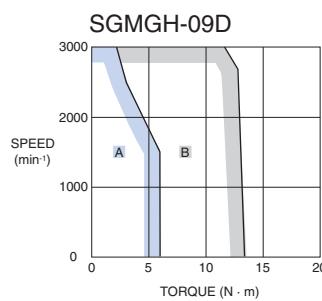
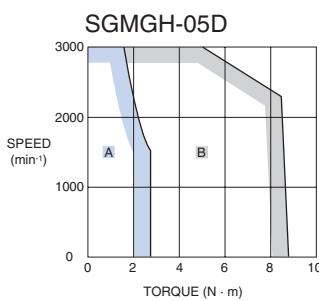
## Type SGMGH, 400 V

## Ratings and specifications

| Applied voltage                       |                                     | 400 V   |      |      |      |      |      |      |      |      |      |
|---------------------------------------|-------------------------------------|---|------|------|------|------|------|------|------|------|------|
| Servo motor model SGMGH-□             |                                     | 05D   | 09D  | 13D  | 20D  | 30D  | 44D  | 55D  | 75D  | 1AD  | 1ED  |
| Rated output                          | kW                                  | 0.45  | 0.85 | 1.3  | 1.8  | 2.9  | 4.4  | 5.5  | 7.5  | 11   | 15   |
| Rated torque                          | N·m                                 | 2.84  | 5.39 | 8.34 | 11.5 | 18.6 | 28.4 | 35.0 | 48.0 | 70.0 | 95.4 |
| Instantaneous peak torque             | N·m                                 | 8.92  | 13.8 | 23.3 | 28.7 | 45.1 | 71.1 | 90.7 | 123  | 175  | 221  |
| Rated current                         | A (rms)                             | 1.9   | 3.5  | 5.4  | 8.4  | 11.9 | 16.5 | 20.8 | 25.4 | 28.1 | 37.2 |
| Instantaneous max. current            | A (rms)                             | 5.5   | 8.5  | 14   | 20   | 28   | 40.5 | 55   | 65   | 70   | 85   |
| Rated speed                           | min <sup>-1</sup>                   |   |      |      |      |      | 1500 |      |      |      |      |
| Max. speed                            | min <sup>-1</sup>                   |   |      |      |      | 3000 |      |      |      | 2000 |      |
| Torque constant                       | N·m/A (rms)                         | 1.64  | 1.65 | 1.68 | 1.46 | 1.66 | 1.82 | 1.74 | 2.0  | 2.56 | 2.64 |
| Rotor moment of inertia (JM)          | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 7.24  | 13.9 | 20.5 | 31.7 | 46.0 | 67.5 | 89.0 | 125  | 281  | 315  |
| Allowable load moment of inertia (JL) | Multiple of (JM)                    |   |      |      |      |      | 5    |      |      |      |      |
| Rated power rate                      | kW/s                                | 11.2  | 20.9 | 33.8 | 41.5 | 75.3 | 120  | 137  | 184  | 174  | 289  |
| Rated angular acceleration            | rad/s <sup>2</sup>                  | 3930  | 3880 | 4060 | 3620 | 4050 | 4210 | 3930 | 3850 | 2490 | 3030 |
| Applicable encoder                    | Standard                            | Incremental encoder (17 bits)                                 |      |      |      |      |      |      |      |      |      |
|                                       | Option                              | Absolute encoder (17 bits)                                    |      |      |      |      |      |      |      |      |      |
| Holding brake moment of inertia J     | kg·m <sup>2</sup> ×10 <sup>-4</sup> |   | 2.10 |      |      | 8.50 |      |      | 18.8 | 37.5 |      |
| Basic specifications                  | Time rating                         | Continuous  |      |      |      |      |      |      |      |      |      |
|                                       | Insulation class                    | Class F   |      |      |      |      |      |      |      |      |      |
|                                       | Ambient temperature                 | 0 to +40 °C   |      |      |      |      |      |      |      |      |      |
|                                       | Ambient humidity                    | 20 to 80% (non-condensing)                                    |      |      |      |      |      |      |      |      |      |
|                                       | Vibration class                     | 15 µm or below  |      |      |      |      |      |      |      |      |      |
|                                       | Enclosure                           | Totally-enclosed, self-cooled, IP67 (excluding shaft opening) |      |      |      |      |      |      |      |      |      |
|                                       | Vibration resistance                | Vibration acceleration 24.5 m/s <sup>2</sup>                  |      |      |      |      |      |      |      |      |      |
|                                       | Mounting                            | Flange-mounted  |      |      |      |      |      |      |      |      |      |

## Torque-speed characteristics

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

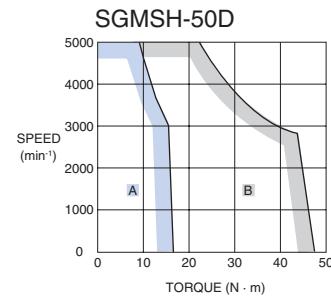
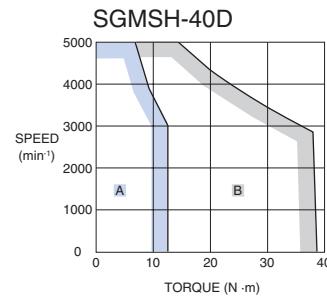
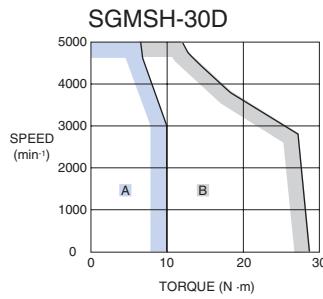
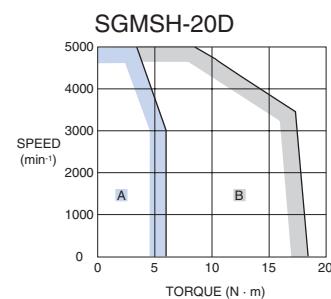
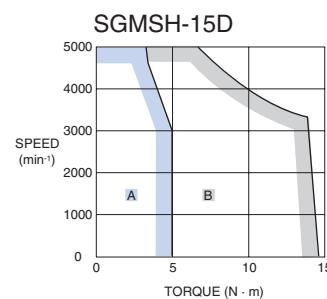
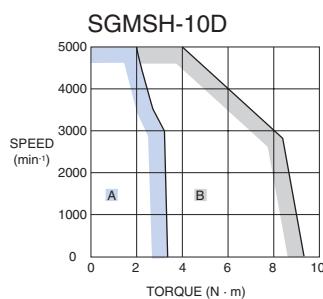


**Type SGMSH, 400 V****Ratings and specifications**

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

**Torque-speed characteristics**

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



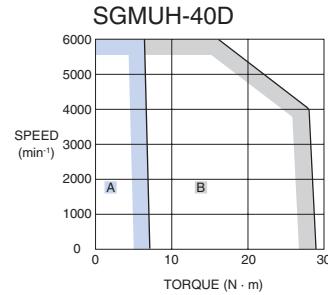
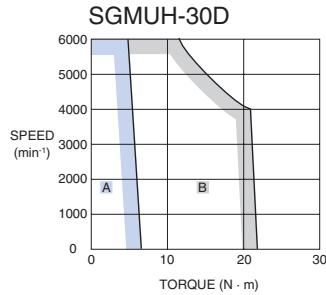
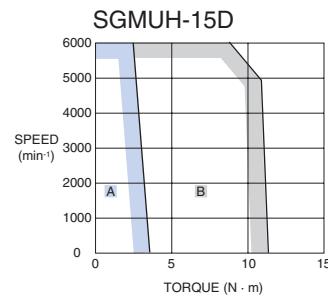
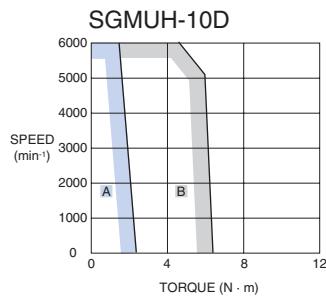
## Type SGMUH, 400V

## Ratings and specifications

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

## Torque-speed characteristics

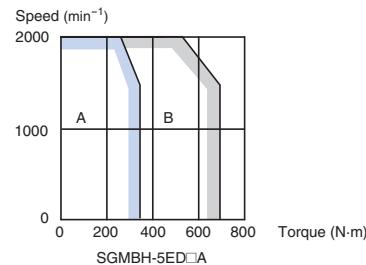
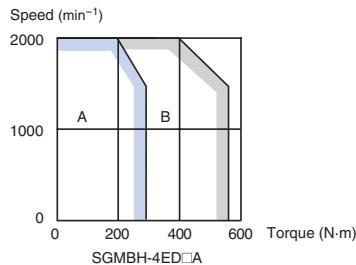
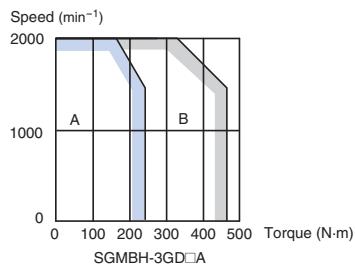
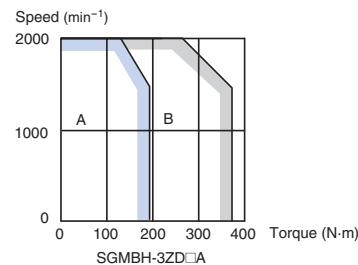
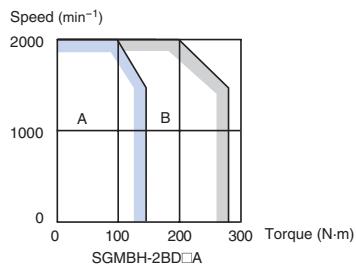
( A : Continuous duty zone B : Intermittent duty zone)



**Type SGMBH, 400 V****Ratings and specifications**

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

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

**Torque-speed characteristics**

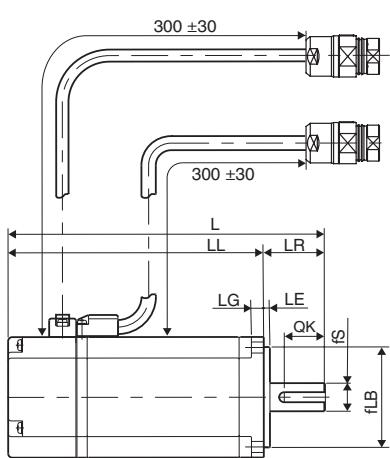
[A] Continuous duty zone  
[B] Intermittent duty zone

## Dimensions

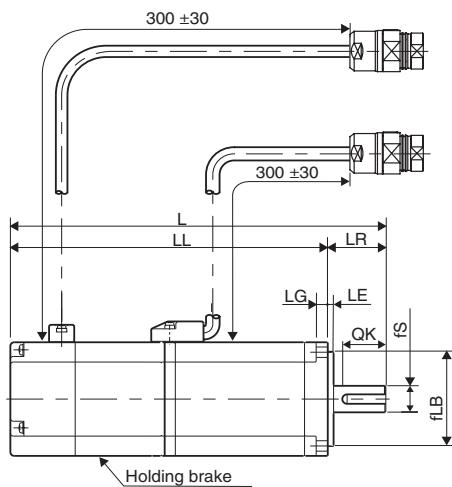
### Servo motors

#### Type SGMAH (230/400 V)

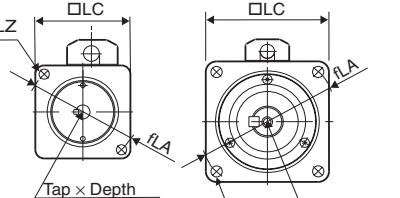
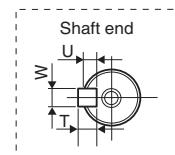
| Dimensions (mm)   | Without brake |       | With brake |       | LR | Flange surface |                  |    |     |    | Shaft end |                  |    |   |   | Aprox. Mass (Kg) |             |                  |               |
|-------------------|---------------|-------|------------|-------|----|----------------|------------------|----|-----|----|-----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



Models without brake



Models with brake

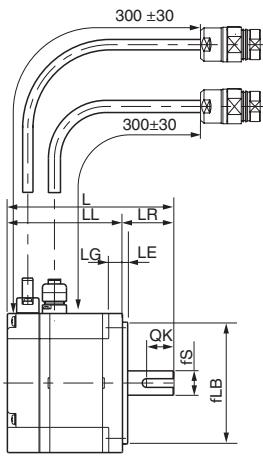


SGMAH-A3,-A5,-01

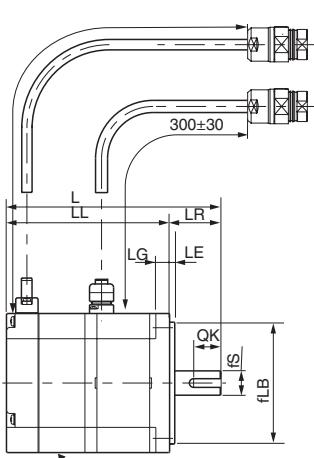
SGMAH-02 to -08

#### Type SGMPH (230/400 V)

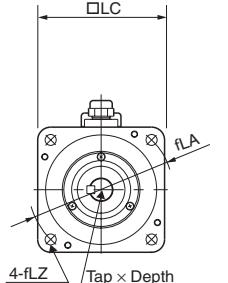
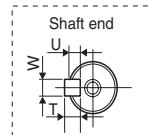
| Dimensions (mm)   | Without brake |       | With brake |       | LR | Flange surface |                   |     |     |    | Shaft end |                  |    |   |   | Aprox. Mass (Kg) |             |                  |               |
|-------------------|---------------|-------|------------|-------|----|----------------|-------------------|-----|-----|----|-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



Models without brake

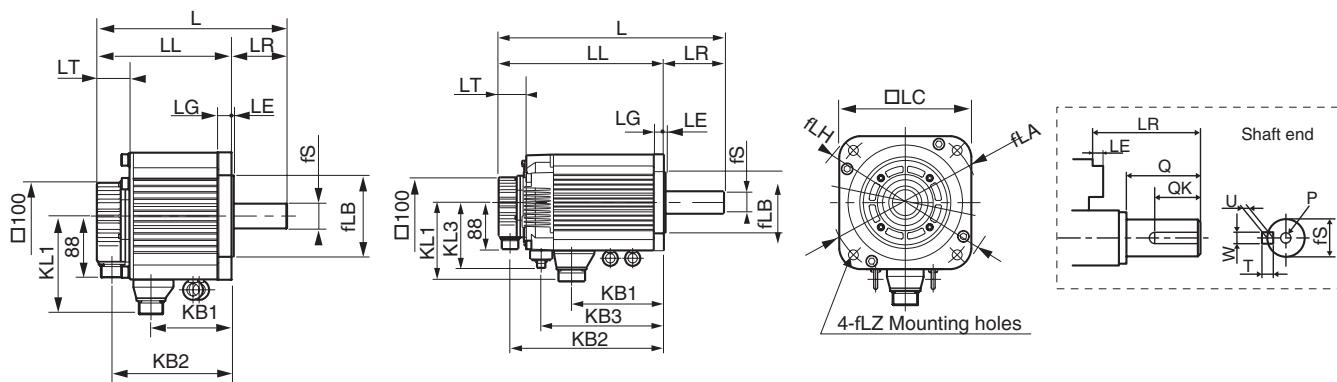


Models with brake



## Type SGMGH (400 V)

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

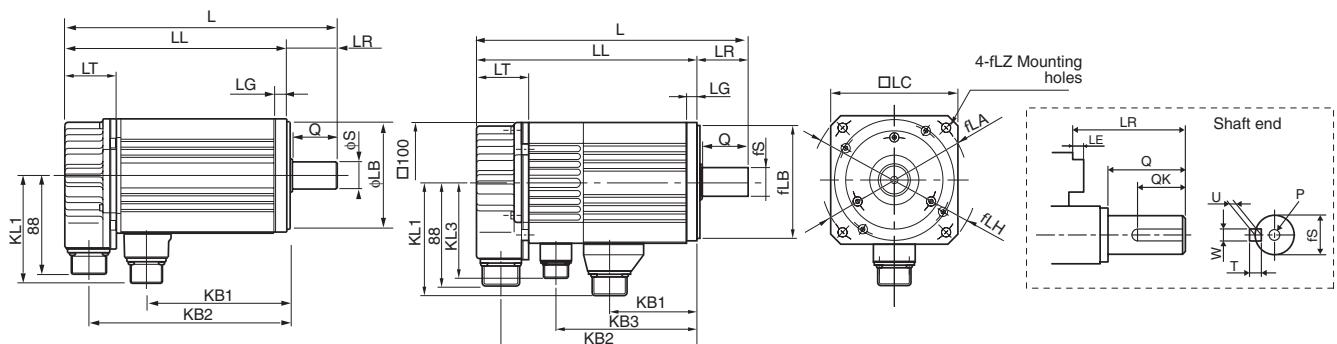


Models without brake

Models with brake

## Type SGMSH (400 V)

| Dimensions (mm)  | Without brake |     |     | With brake |     |     |     |     | LR | LT | KB1 | KL1 | Flange surface |                  |     |    |    |     |    | Shaft end        |    |    |   |   |   |    | Aprox. Mass (Kg) |            |     |
|------------------|---------------|-----|-----|------------|-----|-----|-----|-----|----|----|-----|-----|----------------|------------------|-----|----|----|-----|----|------------------|----|----|---|---|---|----|------------------|------------|-----|
|                  | L             | LL  | KB2 | L          | LL  | KB2 | KB3 | KL3 |    |    |     |     | LA             | LB               | LC  | LE | LG | LH  | LZ | S                | Q  | QK | W | T | U | P  | Without brake    | With brake |     |
| SGMSH-10D□A6□-OY | 194           | 149 | 128 | 238        | 193 | 171 | 120 | 85  | 45 | 46 | 76  | 96  | 115            | 95 <sup>b</sup>  | 100 | 3  | 10 | 130 | 7  | 24 <sup>nb</sup> | 40 | 32 | 8 | 7 | 4 | M8 | 4.6              | 6.0        |     |
| SGMSH-15D□A6□-OY | 220           | 175 | 154 | 264        | 219 | 197 | 146 |     |    |    | 102 |     |                |                  |     |    |    |     |    |                  |    |    |   |   |   | x  | 5.8              | 7.5        |     |
| SGMSH-20D□A6□-OY | 243           | 198 | 177 | 287        | 242 | 220 | 169 |     |    |    | 125 |     |                |                  |     |    |    |     |    |                  |    |    |   |   |   |    |                  | 7.0        | 8.5 |
| SGMSH-30D□A6□-OY | 262           | 199 | 178 | 300        | 237 | 216 | 170 | 98  | 63 |    | 124 | 114 | 145            | 110 <sup>b</sup> | 130 | 6  | 12 | 165 | 9  | 28 <sup>nb</sup> | 55 | 50 |   |   |   |    |                  | 11         | 14  |
| SGMSH-40D□A6□-OY | 299           | 236 | 215 | 337        | 274 | 253 | 207 |     |    |    | 161 |     |                |                  |     |    |    |     |    |                  |    |    |   |   |   | x  | 14               | 17         |     |
| SGMSH-50D□A6□-OY | 339           | 276 | 255 | 377        | 314 | 293 | 247 |     |    |    | 201 |     |                |                  |     |    |    |     |    |                  |    |    |   |   |   |    |                  | 17         | 20  |

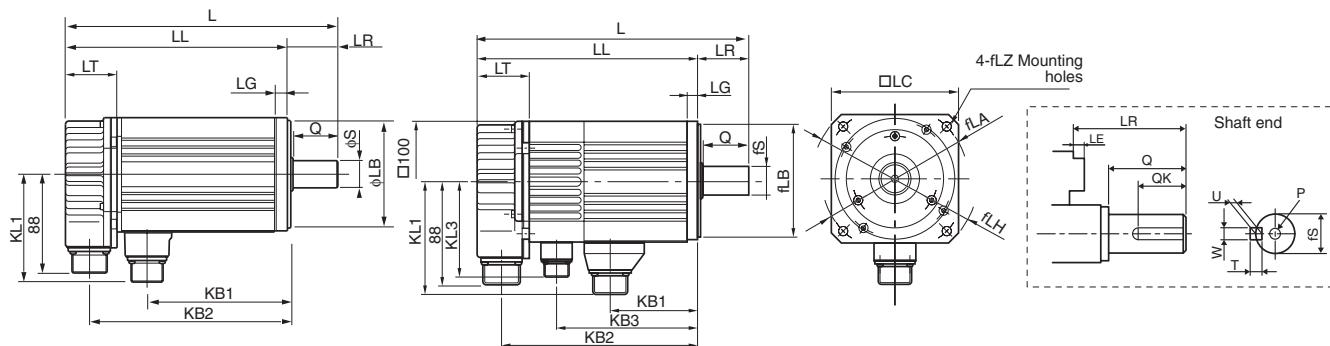


Models without brake

Models with brake

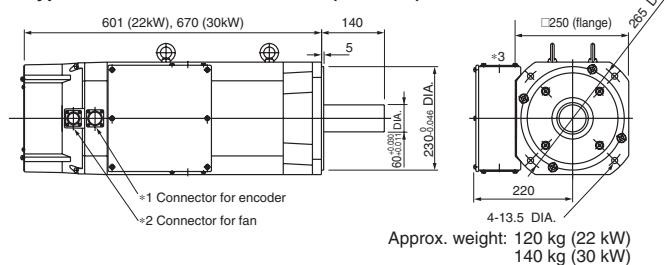
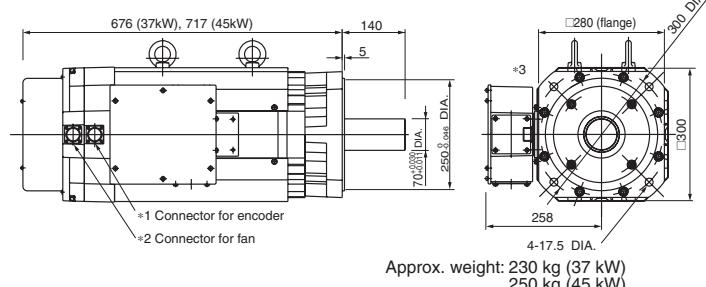
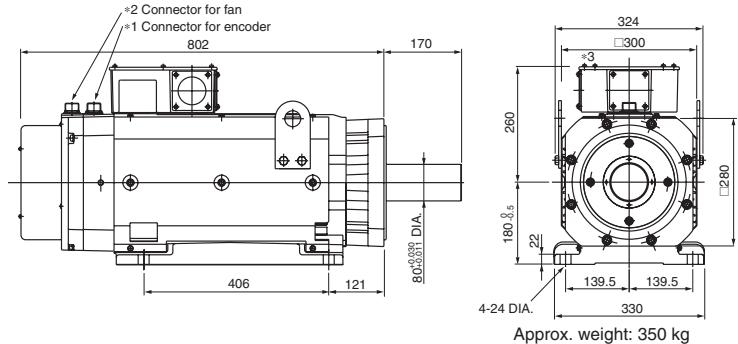
**Type SGMUH (400 V)**

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



Models without brake

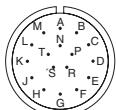
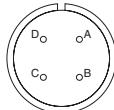
Models with brake

**Type SGMBH (400 V)****Type: SGMBH-2BD □A/-3ZD □A (22/30kW)**Approx. weight: 120 kg (22 kW)  
140 kg (30 kW)**Type: SGMBH-3GD □A /-4E □A37/45kW**Approx. weight: 230 kg (37 kW)  
250 kg (45 kW)**Type: SGMBH-5ED □A (55kW)**

Approx. weight: 350 kg

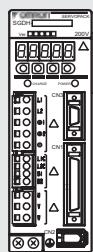
\*1 Connector for encoder

\*2 Connector for fan

Receptacle: 97F-3102E20-29P  
Plug IP67 (L-shape): MS3108E20-29SReceptacle: CE05-2A18-10PD-B  
Plug IP67 (L-shape): MS3108E18-10S

## Ordering information

(Refer to servo drive chapter)

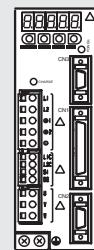


Servo drive with option boards for flexible system configuration

**Sigma-II  
Servo Drive**

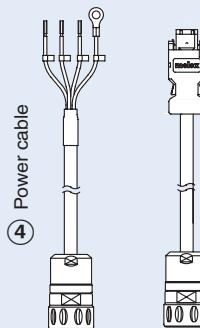
②

Drive options

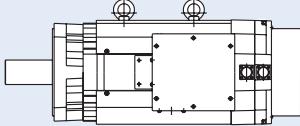
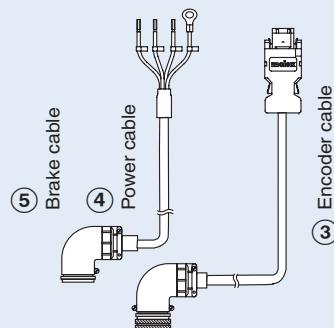


Intelligent servo drive

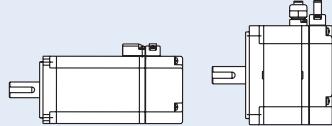
**② XtraDrive**



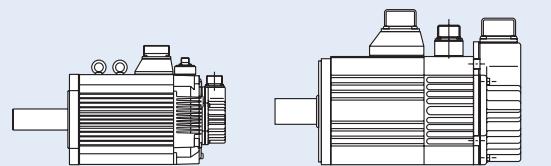
Power and  
encoder cables



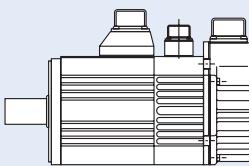
**① SGMBH  
Servo Motor  
1500 rpm  
(22 kW-55 kW)**



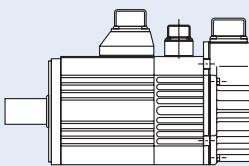
**① SGMAH  
Servo Motor  
3000 rpm  
(30-750 W)**



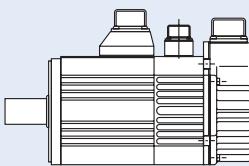
**① SGMPH  
Servo Motor  
3000 rpm  
(100-1500 W)**



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



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



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

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

### Servo motor

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

### Servo drive

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

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

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

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

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

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

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

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

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

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

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

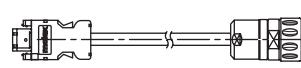
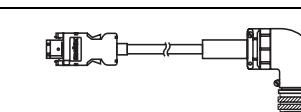
| Symbol | Specifications |  |               |          | Servo motor model | Compatible servo drives (2) |              |          |
|--------|----------------|--|---------------|----------|-------------------|-----------------------------|--------------|----------|
|        | Voltage        | Encoder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

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

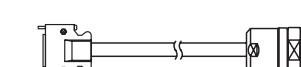
| Symbol | Specifications |  |                               |          | Servo motor model | Compatible drives(2) |           |
|--------|----------------|--|-------------------------------|----------|-------------------|----------------------|-----------|
|        | Voltage        | Encoder and design   | Rated torque                  | Capacity |                   | Sigma-II             |           |
| (1)    | 400 V          | Incremental encoder<br>(17 bit)<br>Straight shaft with key & tap | Without brake<br>Flange mount | 140 Nm   | 22 kW             | SGMBH-2BDCA61        | SGDH-2BDE |
|        |                |  |                               | 191 Nm   | 30 kW             | SGMBH-3ZDCA61        | SGDH-3ZDE |
|        |                |  |                               | 236 Nm   | 37 kW             | SGMBH-3GDCA61        | SGDH-3GDE |
|        |                |  |                               | 286 Nm   | 45 kW             | SGMBH-4EDCA61        | SGDH-4EDE |
|        |                |  | Without brake<br>Foot mount   | 236 Nm   | 37 kW             | SGMBH-3GDCA61        | SGDH-3GDE |
|        |                |  |                               | 286 Nm   | 45 kW             | SGMBH-4EDCAL1        | SGDH-4EDE |
|        |                |  |                               | 350 Nm   | 55 kW             | SGMBH-5EDCAL1        | SGDH-5EDE |
|        |                |  | With brake<br>Flange mount    | 140 Nm   | 22 kW             | SGMBH-2BDCA6C        | SGDH-2BDE |
|        |                |  |                               | 191 Nm   | 30 kW             | SGMBH-3ZDCA6C        | SGDH-3ZDE |
|        |                |  | With brake<br>Foot mount      | 236 Nm   | 37 kW             | SGMBH-3GDCA6C        | SGDH-3GDE |
|        |                | Absolute encoder<br>(17 bit)<br>Straight shaft with key & tap    |                               | 286 Nm   | 45 kW             | SGMBH-4EDCALC        | SGDH-4EDE |
|        |                |  | Without brake<br>Flange mount | 140 Nm   | 22 kW             | SGMBH-2BD2A61        | SGDH-2BDE |
|        |                |  |                               | 191 Nm   | 30 kW             | SGMBH-3ZD2A61        | SGDH-3ZDE |
|        |                |  |                               | 236 Nm   | 37 kW             | SGMBH-3GD2A61        | SGDH-3GDE |
|        |                |  |                               | 286 Nm   | 45 kW             | SGMBH-4ED2A61        | SGDH-4EDE |
|        |                |  | Without brake<br>Foot mount   | 236 Nm   | 37 kW             | SGMBH-3GD2AL1        | SGDH-3GDE |
|        |                |  |                               | 286 Nm   | 45 kW             | SGMBH-4ED2AL1        | SGDH-4EDE |
|        |                |  |                               | 350 Nm   | 55 kW             | SGMBH-5ED2AL1        | SGDH-5EDE |
|        |                |  | With brake<br>Flange mount    | 140 Nm   | 22 kW             | SGMBH-2BD2A6C        | SGDH-2BDE |
|        |                |  |                               | 191 Nm   | 30 kW             | SGMBH-3ZD2A6C        | SGDH-3ZDE |
|        |                |  | With brake<br>Foot mount      | 236 Nm   | 37 kW             | SGMBH-3GD2A6C        | SGDH-3GDE |
|        |                |  |                               | 286 Nm   | 45 kW             | SGMBH-4ED2A6C        | SGDH-4EDE |

## Encoder Cables

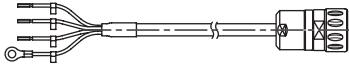
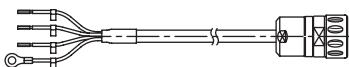
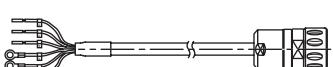
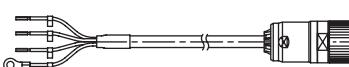
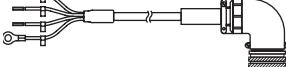
## for sigma-II servo drive

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

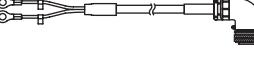
## for XtraDrive servo drive

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

## Power cables

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

## Brake cable (for SGMGH/SH/UH Motors)

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

**Connectors**

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

R7M-A□, R7M-AP□

# SmartStep servo motors

## The smart alternative to stepper motors

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

## Ratings

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



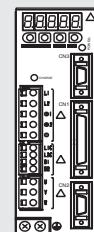
## System configuration

(Refer to servo drive chapter)

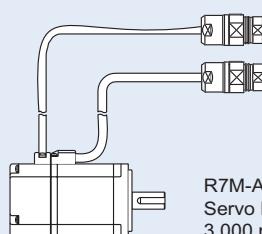


Servo Drive controlled by pulses  
SmartStep Servo Drive

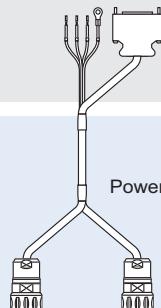
Drive options



Intelligent Servo Drive  
XtraDrive



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



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

## Servo motor / servo drive combination

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

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

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

## Servo motor specifications

### General specifications

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

### Performance specifications

#### Flat servo motors

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

## Cylindrical servo motors

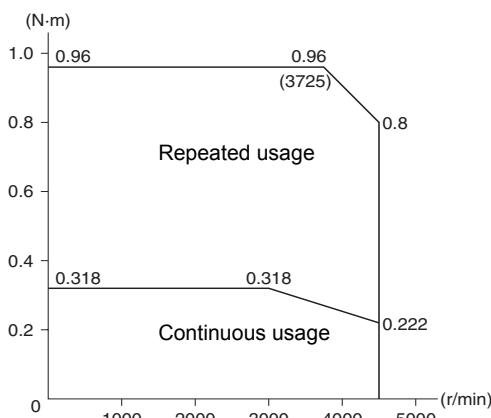
| Item                             | R7M-A03030-□  | R7M-A05030-□                            | R7M-A10030-□                            | R7M-A20030-□                            | R7M-A40030-□                            | R7M-A75030-□                            |
|----------------------------------|---|---|---|---|---|---|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

## Torque and rotation speed characteristics

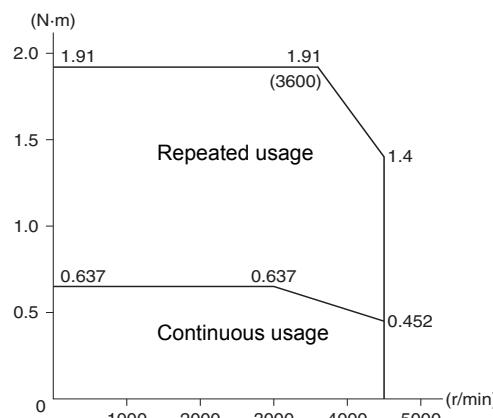
### Flat servo motors

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

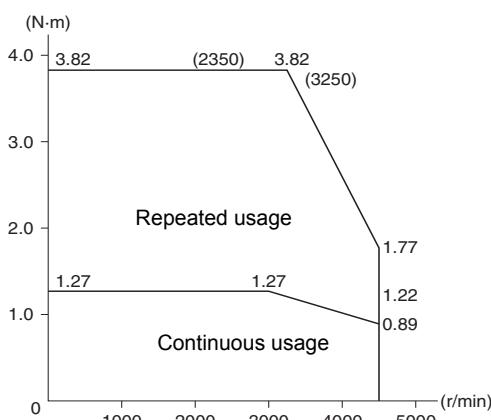
**R7M-AP10030 (100 W)**



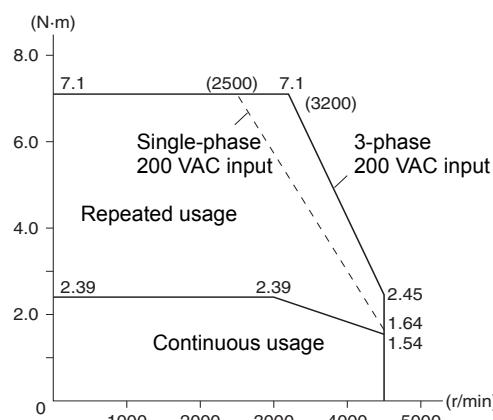
**R7M-AP20030 (200 W)**



**R7M-AP40030 (400 W)**

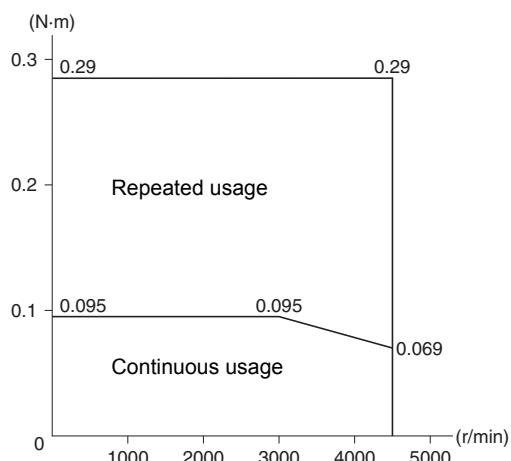
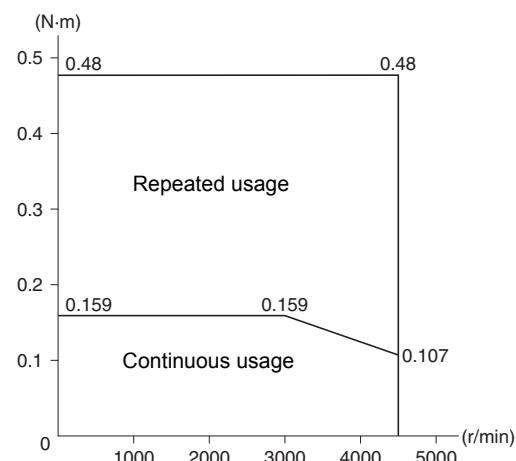
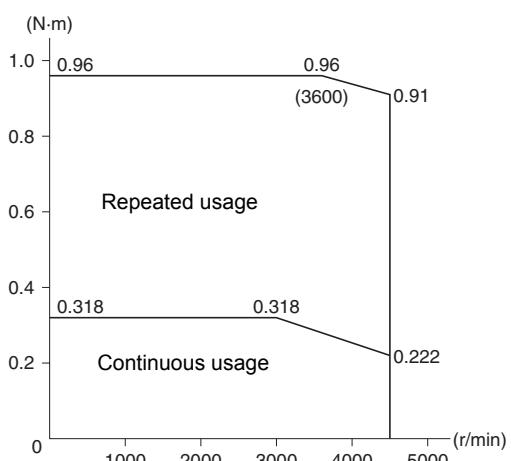
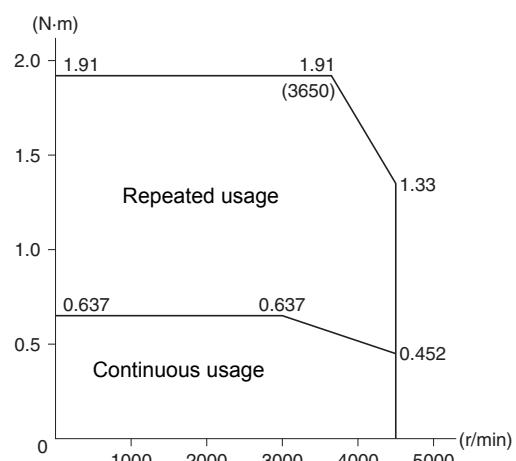
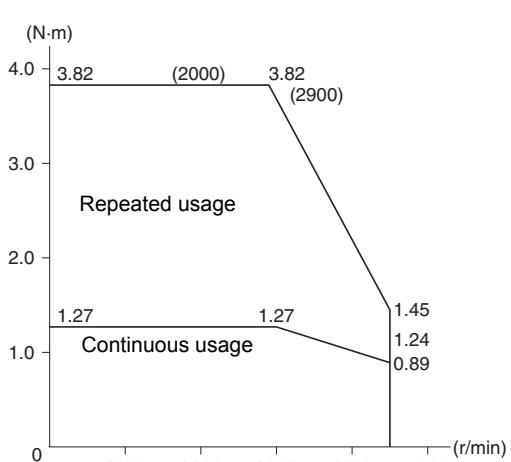
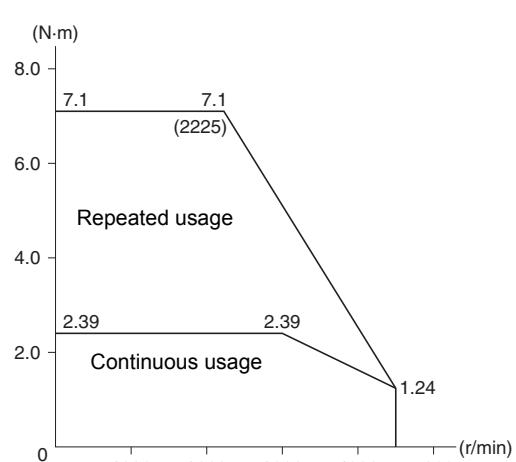


**R7M-AP75030 (750 W)**



**Torque and rotation speed characteristics****Cylindrical servo motors**

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

**R7M-A03030 (30 W)****R7M-A05030 (50 W)****R7M-A10030 (100 W)****R7M-A20030 (200 W)****R7M-A40030 (400 W)****R7M-A75030 (750 W)**

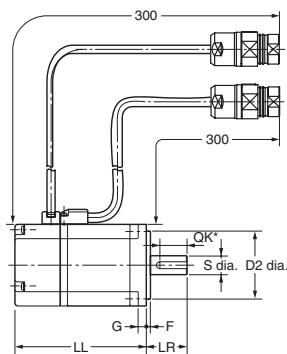
## Dimensions

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

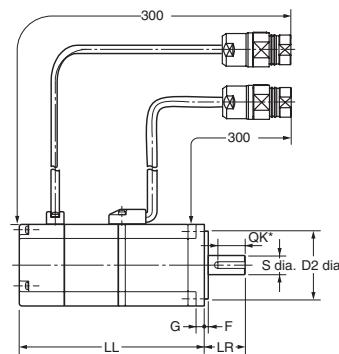
Without brake: R7M-A03030-S1-D/A05030-S1-D/A10030-S1-D/A20030-S1-D/A40030-S1-D/A75030-S1-D  
With brake: R7M-A03030-BS1-D/A05030-BS1-D/A10030-BS1-D/A20030-BS1-D/A40030-BS1-D/A75030-BS1-D

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

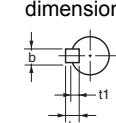
R7M-A□□□30-S1-D (Without brake)



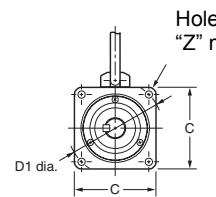
R7M-A□□□30-BS1-D (With brake)



Axis end dimensions



Hole with "Z" mark



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

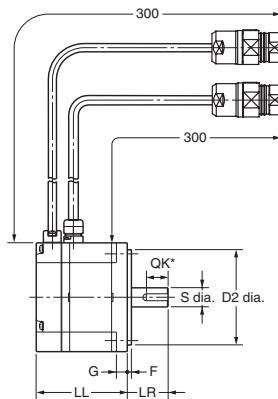
200 VAC: 100W/200W/400W/750W

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

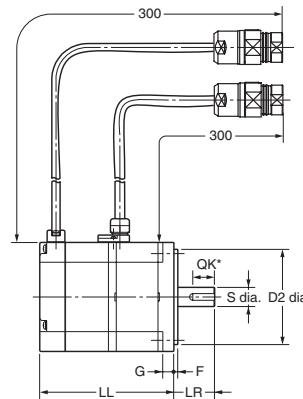
With brake: R7M-AP10030-BS1-D/AP20030-BS1-D/AP40030-BS1-D/AP75030-BS1-D

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

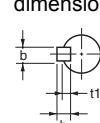
R7M-AP□□□30-S1-D (Without brake)



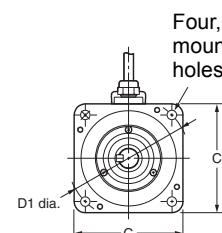
R7M-AP□□□30-BS1-D (With brake)



Axis end dimensions

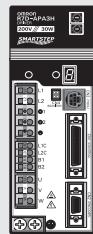


Four, Z-dia. mounting holes



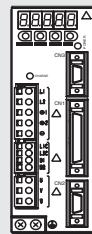
## Ordering information

(Refer to servo drive chapter)



Servo Drive controlled by pulses

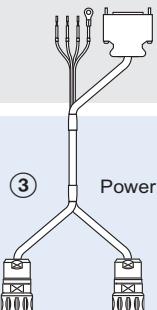
② SmartStep Servo Drive



Intelligent Servo Drive

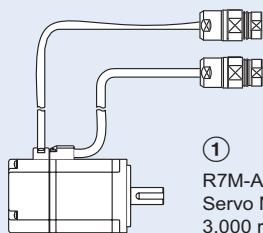
② XtraDrive

Drive options



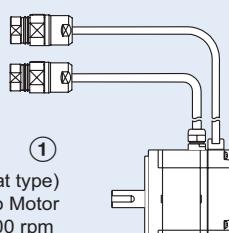
③

Power and encoder cables



①

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



①

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

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

### Servo motor

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

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

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

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

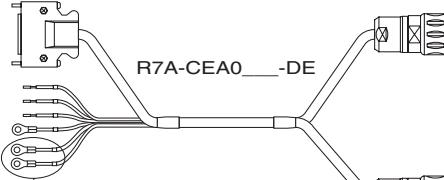
### Servo drive

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

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

## Servo motor cables for SmartStep drive

### Standard cable (power + encoder)

| Symbol | Drive     | Specifications                                       | Power cable model | Encoder cable model | Appearance   |
|--------|-----------|--|-------------------|---------------------|--|
| (3)    | SmartStep | For servo motors without brake<br>R7M-A(P)□□□30-S1-D | 3 m               | R7A-CEA003S-DE      | <br>R7A-CEA0____-DE       |
|        |           |  | 5 m               | R7A-CEA005S-DE      |  |
|        |           |  | 10 m              | R7A-CEA010S-DE      |  |
|        |           |  | 15 m              | R7A-CEA015S-DE      |  |
|        |           |  | 20 m              | R7A-CEA020S-DE      |  |
|        |           | For servo motors with brake<br>R7M-A(P)□□□30-BS1-D   | 3 m               | R7A-CEA003B-DE      | <br>Only for Brake models |
|        |           |  | 5 m               | R7A-CEA005B-DE      |  |
|        |           |  | 10 m              | R7A-CEA010B-DE      |  |
|        |           |  | 15 m              | R7A-CEA015B-DE      |  |
|        |           |  | 20 m              | R7A-CEA020B-DE      |  |

### Flexible cables (power + encoder)

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

## Servo motor cables for XtraDrive Drive

### Flexible cables (power + encoder)

| Symbol | Drive     | Specifications                                       | Power cable model | Encoder cable model | Appearance   |
|--------|-----------|--|-------------------|---------------------|--|
| (3)    | XtraDrive | For servo motors without brake<br>R7M-A(P)□□□30-S1-D | 3 m               | R88A-CAWA003S-DE    | XD-CRA003-DE   |
|        |           |  | 5 m               | R88A-CAWA005S-DE    | XD-CRA005-DE   |
|        |           |  | 10 m              | R88A-CAWA010S-DE    | XD-CRA010-DE   |
|        |           |  | 15 m              | R88A-CAWA015S-DE    | XD-CRA015-DE   |
|        |           |  | 20 m              | R88A-CAWA020S-DE    | XD-CRA020-DE   |
|        |           | For servo motors with brake<br>R7M-A(P)□□□30-BS1-D   | 3 m               | R88A-CAWA003B-DE    | R88A-CAWA0____-DE  |
|        |           |  | 5 m               | R88A-CAWA005B-DE    | <br>Only for brake models |
|        |           |  | 10 m              | R88A-CAWA010B-DE    |  |
|        |           |  | 15 m              | R88A-CAWA015B-DE    |  |
|        |           |  | 20 m              | R88A-CAWA020B-DE    |  |

## Connectors

| Specifications                                      | Model            |
|---|------------------|
| SmartStep connectors kit                            | R7A-CNA00K-DE    |
| SmartStep encoder connector (for CN2)               |                  |
| Hypertac power connector female                     |                  |
| Hypertac encoder connector female                   |                  |
| Hypertac power connector male (used in the motor)   | SRUC-06J-MSCN236 |
| Hypertac encoder connector male (used in the motor) | SRUC-17G-MRWN087 |

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

SJME-□-OY

# Junma servo motors

**A new concept in drive simplicity**  
**Medium inertia compact motor**

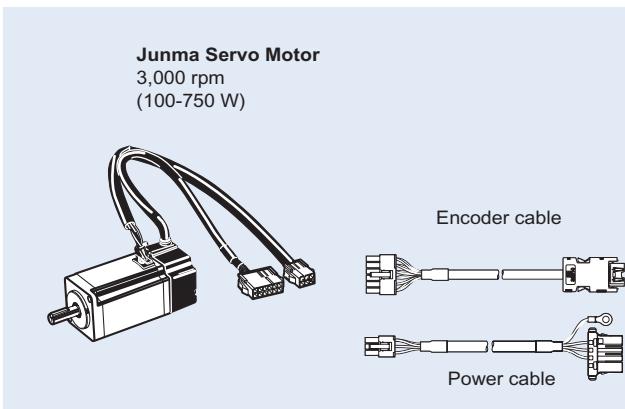
- Peak torque up to three times continuous torque for 3 seconds
- Easy to install with prebuilt cables
- Motors with brakes are available
- No motor settings required, just plug and run

## Ratings

- 230 VAC Single-phase 100 W to 750 W  
 (0.318 Nm to 2.39 Nm)

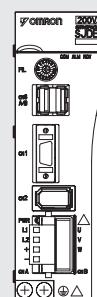


## System Configuration

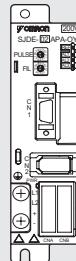


(Refer to servo drive chapter)

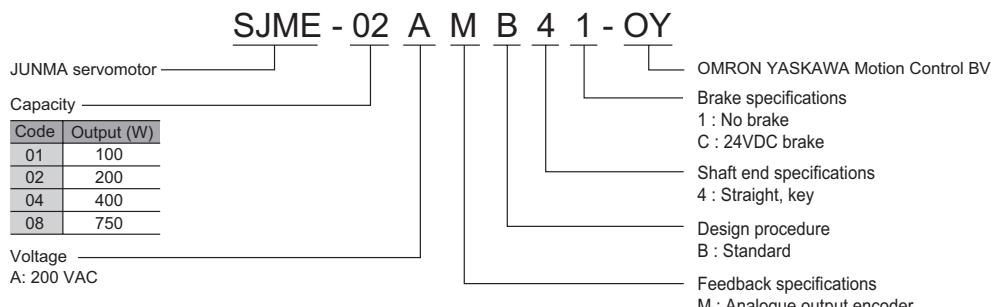
**Junma MECHATROLINK-II Servo Drive**



**Junma Pulse Servo Drive**



## Motor Type Designation



## Servomotor Specifications

|   |                                     | 230 V  |        |       |       |
|---|-------------------------------------|--|--------|-------|-------|
|   |                                     | 01A  | 02A    | 04A   | 08A   |
| Rated Output <sup>1</sup>               | W                                   | 100  | 200    | 400   | 750   |
| Rated Torque <sup>1, *2</sup>           | N·m                                 | 0.318  | 0.637  | 1.27  | 2.39  |
| Instantaneous Peak Torque <sup>1</sup>  | N·m                                 | 0.955  | 1.91   | 3.82  | 7.16  |
| Rated Current <sup>1</sup>              | Arms                                | 0.84   | 1.1    | 2.0   | 3.7   |
| Instantaneous Max. Current <sup>1</sup> | Arms                                | 2.5  | 3.3    | 6.0   | 11.1  |
| Rated Speed <sup>1</sup>                | min <sup>-1</sup>                   |  | 3000   |       |       |
| Max. Speed <sup>1</sup>                 | min <sup>-1</sup>                   |  | 4500   |       |       |
| Torque Constant                         | N·m/Arms                            | 0.413  | 0.645  | 0.682 | 0.699 |
| Rotor Moment of Inertia (JM)            | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 0.0634   | 0.330  | 0.603 | 1.50  |
| Allowable load inertia <sup>3</sup>     | kg·m <sup>2</sup> ×10 <sup>-4</sup> | 0.6  | 3.0    | 5.0   | 10.0  |
| Rated Power Rate                        | kW/s                                | 16.0   | 12.3   | 26.7  | 38.1  |
| Rated Angular Acceleration              | rad/s <sup>2</sup>                  | 50200  | 19300  | 21100 | 15900 |
| Encoder                                 | Standard                            | Analogue output encoder  |        |       |       |
| Allowable radial load                   |                                     | 78   | 245    | 245   | 392   |
| Allowable thrust load                   |                                     | 54   | 74     | 74    | 147   |
| Approx. mass                            | kg (without brake)                  | 0.5  | 0.9    | 1.3   | 2.6   |
|   | kg (with brake)                     | 0.8  | 1.5    | 1.9   | 3.5   |
| Brake specifications                    | Rated voltage                       | 24 VDC ±10%  |        |       |       |
|   | Holding Brake Moment of Inertia     | kg·m <sup>2</sup> ×10 <sup>-4</sup>  | 0.0075 | 0.064 | 0.171 |
|   | Power consumption (at 20°C)         | W  | 6      | 6.9   | 7.7   |
|   | Current consumption (at 20°C)       | A  | 0.25   | 0.29  | 0.32  |
|   | Static friction torque              | N·m (minimum)  | 0.318  | 1.27  | 2.39  |
|   | Rise time for holding torque        | ms (max)   |        | 100   |       |
| Basic Specifications                    | Release time                        | ms (max)   |        | 80    |       |
|   | Time Rating                         | Continuous   |        |       |       |
|   | Thermal Class                       | Class B  |        |       |       |
|   | Vibration Class                     | 15 μm or below   |        |       |       |
|   | Withstand Voltage                   | 1500 VAC for one minute  |        |       |       |
|   | Insulation resistance               | 500 VDC, 10 MΩ min.  |        |       |       |
|   | Enclosure                           | Totally-enclosed, self-cooled, IP55 (excluding shaft opening and connectors) |        |       |       |
|   | Vibration Resistance                | Vibration acceleration 49 m/s <sup>2</sup>                                   |        |       |       |
|   | Usage / storage temperature         | 0 to +40° C / -20 to 60° C without freezing                                  |        |       |       |
|   | Usage / storage humidity            | 20 to 80% RH (non-condensing)  |        |       |       |
|   | Altitude                            | 1000 m or less above sea level   |        |       |       |
|   | Mounting                            | Flange-mounted   |        |       |       |

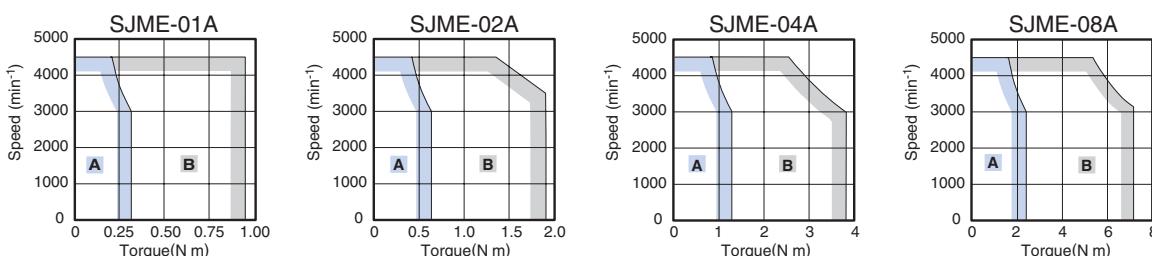
**Note:** \*1. These items and speed/torque characteristics quoted in combination with an SJDE servo drive are at an armature winding temperature of 100°C.  
Other values quoted at 20°C.

\*2: The rated torques listed here are the values for the continuous allowable torque at 40°C with an aluminium heatsink (250 mm x 250 mm x 6 mm) attached.

\*3. Value using the appropriate SJDE drive without of external regeneration unit

### Torque-Speed Characteristics

(A : Continuous Duty Zone B : Intermittent Duty Zone)

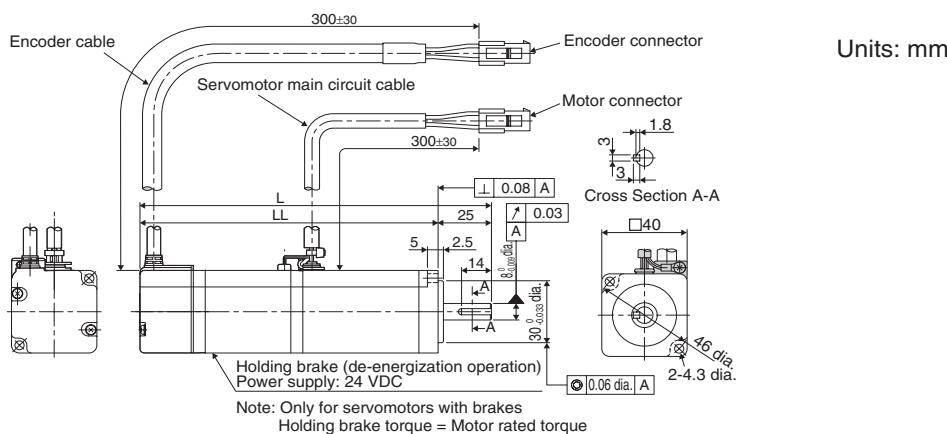


## Dimensions

### Junma servomotors

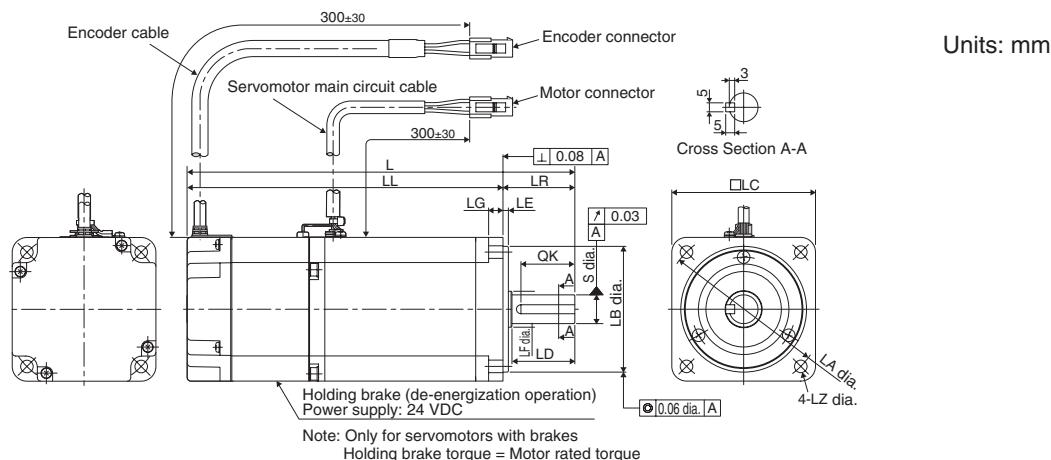
#### SJME-01 (200V, 100W)

| Model           | L   | LL  | Approx. Mass (kg) |
|-----------------|-----|-----|-------------------|
| SJME-01AMB41-OY | 119 | 94  | 0.5               |
| SJME-01AMB4C-OY | 164 | 139 | 0.8               |



#### SJME-02, 04, 08 (200V, 200 to 750W)

| Model           | L     | LL    | LR | LG | LE | S                      | LB                     | LC | LD | LF | LA | LZ  | QK | Approx. Mass (kg) |
|-----------------|-------|-------|----|----|----|------------------------|------------------------|----|----|----|----|-----|----|-------------------|
| SJME-02AMB41-OY | 125.5 | 95.5  | 30 |    |    | 14 <sup>0</sup> -0.011 | 50 <sup>0</sup> -0.039 | 60 | -  | -  | 70 | 5.5 | 20 | 0.9               |
| SJME-02AMB4C-OY | 165.5 | 135.5 |    |    |    |                        |                        |    |    |    |    |     |    | 1.5               |
| SJME-04AMB41-OY | 148.5 | 118.5 |    |    |    |                        |                        |    |    |    |    |     |    | 1.3               |
| SJME-04AMB4C-OY | 188.5 | 158.5 |    |    |    |                        |                        |    |    |    |    |     |    | 1.9               |
| SJME-08AMB41-OY | 173   | 133   | 40 | 8  | 3  | 16 <sup>0</sup> -0.011 | 70 <sup>0</sup> -0.046 | 80 | 35 | 20 | 90 | 7   | 30 | 2.6               |
| SJME-08AMB4C-OY | 216   | 176   |    |    |    |                        |                        |    |    |    |    |     |    | 3.5               |



### Servomotor connectors

#### Encoder Connector Specifications

Plug:  
5559-12P-210  
Terminal:  
5558T2(chained) or  
5558T2L(detached)  
(Manufacturer: Molex Japan Co., Ltd)

|    |           |              |
|----|-----------|--------------|
| 1  | PG5V      | Red          |
| 2  | PG0V(GND) | Black        |
| 3  | Phase A+  | Blue         |
| 4  | Phase A-  | Blue/White   |
| 5  | Phase B+  | Yellow       |
| 6  | Phase B-  | Yellow/White |
| 7  | Phase Z   | Purple       |
| 8  | Phase U   | Gray         |
| 9  | Phase V   | Green        |
| 10 | Phase W   | Orange       |
| 11 | -         | -            |
| 12 | FG        | Shield       |

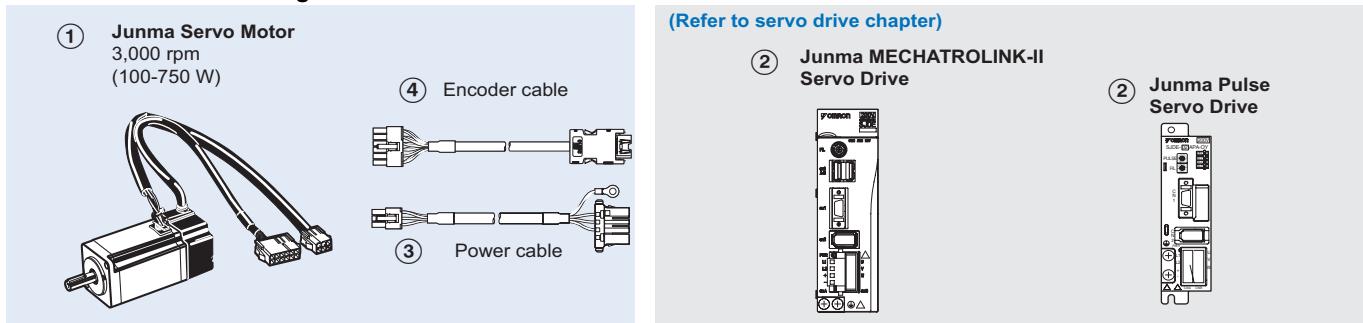
#### Motor Connector Specifications

Plug:  
5559-06P-210  
Terminal (No.1 to 3, 5, 6):  
5558T(chained) or 5558TL(detached)  
Grounding Pin (No.4):  
30490-2002(chained) or  
30490-2012 (detached)  
(Manufacturer: Molex Japan Co., Ltd)

| No brake |         | With brake   |         |              |
|----------|---------|--------------|---------|--------------|
| 1        | Phase U | Red          | Phase U | Red          |
| 2        | Phase V | White        | Phase V | White        |
| 3        | Phase W | Blue         | Phase W | Blue         |
| 4        | F G     | Green/Yellow | F G     | Green/Yellow |
| 5        | -       | -            | Brake   | Red          |
| 6        | -       | -            | Brake   | Black        |

## Ordering Information

### Junma Servo motor configuration



### Servomotors and Servo drives

| Symbol | Specifications     |                                 |               |              | (1) Servomotor model | (2) Servo drive model |               |  |  |
|--------|--------------------|---------------------------------|---------------|--------------|----------------------|-----------------------|---------------|--|--|
|        | Voltage            | Encoder and Design              |               | Rated Torque |                      | MECHATROLINK-II       | Pulse Control |  |  |
| (1)(2) | 1 Phase<br>200 VAC | Analogue Incremental<br>Encoder | Without brake | 0.318 Nm     | 100 W                | SJME-01AMB41-OY       | SJDE-01ANA-OY |  |  |
|        |                    |                                 |               | 0.637 Nm     | 200 W                | SJME-02AMB41-OY       | SJDE-02ANA-OY |  |  |
|        |                    |                                 |               | 1.27 Nm      | 400 W                | SJME-04AMB41-OY       | SJDE-04ANA-OY |  |  |
|        |                    |                                 |               | 2.39 Nm      | 750 W                | SJME-08AMB41-OY       | SJDE-08ANA-OY |  |  |
|        |                    | Straight shaft with key         | With brake    | 0.318 Nm     | 100 W                | SJME-01AMB4C-OY       | SJDE-01APA-OY |  |  |
|        |                    |                                 |               | 0.637 Nm     | 200 W                | SJME-02AMB4C-OY       | SJDE-02APA-OY |  |  |
|        |                    |                                 |               | 1.27 Nm      | 400 W                | SJME-04AMB4C-OY       | SJDE-04APA-OY |  |  |
|        | 2 Phase<br>200 VAC |                                 |               | 2.39 Nm      | 750 W                | SJME-08AMB4C-OY       | SJDE-08APA-OY |  |  |
|        |                    |                                 |               | 0.318 Nm     | 100 W                | SJME-01AMB4C-OY       | SJDE-01APA-OY |  |  |
|        |                    |                                 |               | 0.637 Nm     | 200 W                | SJME-02AMB4C-OY       | SJDE-02APA-OY |  |  |
|        |                    |                                 |               | 1.27 Nm      | 400 W                | SJME-04AMB4C-OY       | SJDE-04APA-OY |  |  |
|        |                    |                                 |               | 2.39 Nm      | 750 W                | SJME-08AMB4C-OY       | SJDE-08APA-OY |  |  |

### Power cables

| Symbol   | Specifications   | Model  | Appearance   |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|--|--|--|--|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| (3)  | Power cable for Junma servomotors without brake SJME-0□AMB41-OY  | Flexible cables (Standard)<br>Shielded Cable<br>Bending radius (Dynamic) > 10xDiameter<br>Bending cycles > 5 Million   | <table border="1"> <tr><td>1.5 m</td><td>JZSP-CHM000-01-5E</td></tr> <tr><td>3 m</td><td>JZSP-CHM000-03-E</td></tr> <tr><td>5 m</td><td>JZSP-CHM000-05-E</td></tr> <tr><td>10 m</td><td>JZSP-CHM000-10-E</td></tr> <tr><td>15 m</td><td>JZSP-CHM000-15-E</td></tr> <tr><td>20 m</td><td>JZSP-CHM000-20-E</td></tr> <tr><td>3 m</td><td>R7A-CAZ003S</td></tr> <tr><td>5 m</td><td>R7A-CAZ005S</td></tr> <tr><td>10 m</td><td>R7A-CAZ010S</td></tr> </table> | 1.5 m             | JZSP-CHM000-01-5E | 3 m              | JZSP-CHM000-03-E | 5 m              | JZSP-CHM000-05-E | 10 m             | JZSP-CHM000-10-E | 15 m             | JZSP-CHM000-15-E | 20 m             | JZSP-CHM000-20-E | 3 m         | R7A-CAZ003S | 5 m         | R7A-CAZ005S | 10 m        | R7A-CAZ010S |
| 1.5 m  | JZSP-CHM000-01-5E  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m  | JZSP-CHM000-03-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m  | JZSP-CHM000-05-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m   | JZSP-CHM000-10-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 15 m   | JZSP-CHM000-15-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 20 m   | JZSP-CHM000-20-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m  | R7A-CAZ003S  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m  | R7A-CAZ005S  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m   | R7A-CAZ010S  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Non flexible cables  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Power cable for Junma servomotors with brake SJME-0□AMB4C-OY | Flexible cables (Standard)<br>Shielded Cable<br>Bending radius (Dynamic) > 10xDiameter<br>Bending cycles > 5 Million | <table border="1"> <tr><td>1.5 m</td><td>JZSP-CHM030-01-5E</td></tr> <tr><td>3 m</td><td>JZSP-CHM030-03-E</td></tr> <tr><td>5 m</td><td>JZSP-CHM030-05-E</td></tr> <tr><td>10 m</td><td>JZSP-CHM030-10-E</td></tr> <tr><td>15 m</td><td>JZSP-CHM030-15-E</td></tr> <tr><td>20 m</td><td>JZSP-CHM030-20-E</td></tr> <tr><td>3 m</td><td>R7A-CAZ003B</td></tr> <tr><td>5 m</td><td>R7A-CAZ005B</td></tr> <tr><td>10 m</td><td>R7A-CAZ010B</td></tr> </table> | 1.5 m  | JZSP-CHM030-01-5E | 3 m               | JZSP-CHM030-03-E | 5 m              | JZSP-CHM030-05-E | 10 m             | JZSP-CHM030-10-E | 15 m             | JZSP-CHM030-15-E | 20 m             | JZSP-CHM030-20-E | 3 m              | R7A-CAZ003B | 5 m         | R7A-CAZ005B | 10 m        | R7A-CAZ010B |             |
| 1.5 m  | JZSP-CHM030-01-5E  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m  | JZSP-CHM030-03-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m  | JZSP-CHM030-05-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m   | JZSP-CHM030-10-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 15 m   | JZSP-CHM030-15-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 20 m   | JZSP-CHM030-20-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m  | R7A-CAZ003B  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m  | R7A-CAZ005B  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m   | R7A-CAZ010B  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Non flexible cables  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|  |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |

### Encoder cables

| Symbol  | Specifications   | Model (Flexible)   | Appearance   |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|---|--|--|--|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| (4)   | Encoder cable for Junma servomotors SJME-0□AMB4□-OY  | Flexible cables (Standard)<br>Shielded Cable<br>Bending radius (Dynamic) > 10xDiameter<br>Bending cycles > 5 Million   | <table border="1"> <tr><td>1.5 m</td><td>JZSP-CHP800-01-5E</td></tr> <tr><td>3 m</td><td>JZSP-CHP800-03-E</td></tr> <tr><td>5 m</td><td>JZSP-CHP800-05-E</td></tr> <tr><td>10 m</td><td>JZSP-CHP800-10-E</td></tr> <tr><td>15 m</td><td>JZSP-CHP800-15-E</td></tr> <tr><td>20 m</td><td>JZSP-CHP800-20-E</td></tr> <tr><td>3 m</td><td>R7A-CRZ003C</td></tr> <tr><td>5 m</td><td>R7A-CRZ005C</td></tr> <tr><td>10 m</td><td>R7A-CRZ010C</td></tr> </table> | 1.5 m             | JZSP-CHP800-01-5E | 3 m              | JZSP-CHP800-03-E | 5 m              | JZSP-CHP800-05-E | 10 m             | JZSP-CHP800-10-E | 15 m             | JZSP-CHP800-15-E | 20 m             | JZSP-CHP800-20-E | 3 m         | R7A-CRZ003C | 5 m         | R7A-CRZ005C | 10 m        | R7A-CRZ010C |
| 1.5 m   | JZSP-CHP800-01-5E  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m   | JZSP-CHP800-03-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m   | JZSP-CHP800-05-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m  | JZSP-CHP800-10-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 15 m  | JZSP-CHP800-15-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 20 m  | JZSP-CHP800-20-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m   | R7A-CRZ003C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m   | R7A-CRZ005C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m  | R7A-CRZ010C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Non flexible cables                                 |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Encoder cable for Junma servomotors SJME-0□AMB4C-OY | Flexible cables (Standard)<br>Shielded Cable<br>Bending radius (Dynamic) > 10xDiameter<br>Bending cycles > 5 Million | <table border="1"> <tr><td>1.5 m</td><td>JZSP-CHP800-01-5E</td></tr> <tr><td>3 m</td><td>JZSP-CHP800-03-E</td></tr> <tr><td>5 m</td><td>JZSP-CHP800-05-E</td></tr> <tr><td>10 m</td><td>JZSP-CHP800-10-E</td></tr> <tr><td>15 m</td><td>JZSP-CHP800-15-E</td></tr> <tr><td>20 m</td><td>JZSP-CHP800-20-E</td></tr> <tr><td>3 m</td><td>R7A-CRZ003C</td></tr> <tr><td>5 m</td><td>R7A-CRZ005C</td></tr> <tr><td>10 m</td><td>R7A-CRZ010C</td></tr> </table> | 1.5 m  | JZSP-CHP800-01-5E | 3 m               | JZSP-CHP800-03-E | 5 m              | JZSP-CHP800-05-E | 10 m             | JZSP-CHP800-10-E | 15 m             | JZSP-CHP800-15-E | 20 m             | JZSP-CHP800-20-E | 3 m              | R7A-CRZ003C | 5 m         | R7A-CRZ005C | 10 m        | R7A-CRZ010C |             |
| 1.5 m   | JZSP-CHP800-01-5E  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m   | JZSP-CHP800-03-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m   | JZSP-CHP800-05-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m  | JZSP-CHP800-10-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 15 m  | JZSP-CHP800-15-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 20 m  | JZSP-CHP800-20-E   |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 3 m   | R7A-CRZ003C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 5 m   | R7A-CRZ005C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| 10 m  | R7A-CRZ010C  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
| Non flexible cables                                 |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |
|   |  |  |  |                   |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |             |             |             |             |             |             |

### Connectors for power and encoder cables

| Specifications                       | Model (Omron)    | Model (Yaskawa)                    |
|--------------------------------------|------------------|------------------------------------|
| Connectors for making power cables   | Drive side (CNB) | Manufacturer: JST (04JFAT-SAYGF-N) |
|                                      | Motor side       | Manufacturer: Molex (5557-06R-210) |
| Connectors for making encoder cables | Drive side (CN2) | Manufacturers 3M and Molex         |
|                                      | Motor side       | Manufacturer: Molex (57026-5000)   |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

SGMCS-□

# Sigma direct drive motors

## High torque motor for direct coupling to load

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

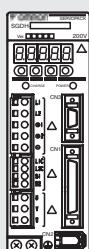


## Ratings

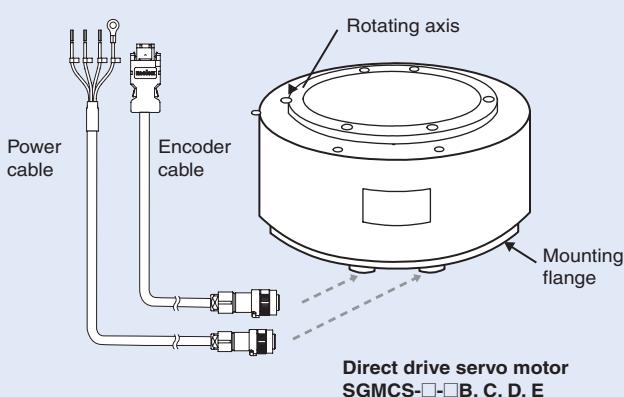
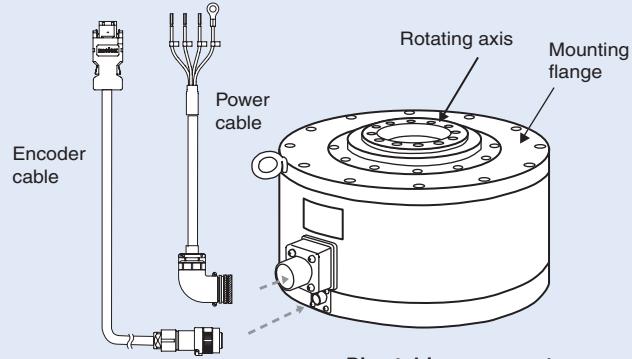
- 230 VAC from 42 W to 1260 W  
(Rated torque from 2.00 to 80 Nm)

## System configuration

(Refer to Servo Drive chapter)



Sigma-II Servo Drive

Direct drive servo motor  
SGMCS-□-□B, C, D, EDirect drive servo motor  
SGMCS-□-□M, N

## Servomotor / servo drive combination

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

## Type designation

## Servo motor

SGMCS—02 B 3 B 1 1

Σ Series SGMCS servo motor

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

| Brake specifications |                |
|----------------------|----------------|
| Code                 | Specifications |
| 1                    | Without brake  |

| Flange specifications |                |
|-----------------------|----------------|
| Code                  | Specifications |
| 1                     | C face         |

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

| Serial encoder specifications |  |          |
|-------------------------------|--|----------|
| Code                          | Specifications                             | Remarks  |
| 3                             | 20-bit absolute<br>(without multturn data) | Standard |
| D                             | 20-bit incremental                         | Option   |

## Specifications

### Ratings and specifications

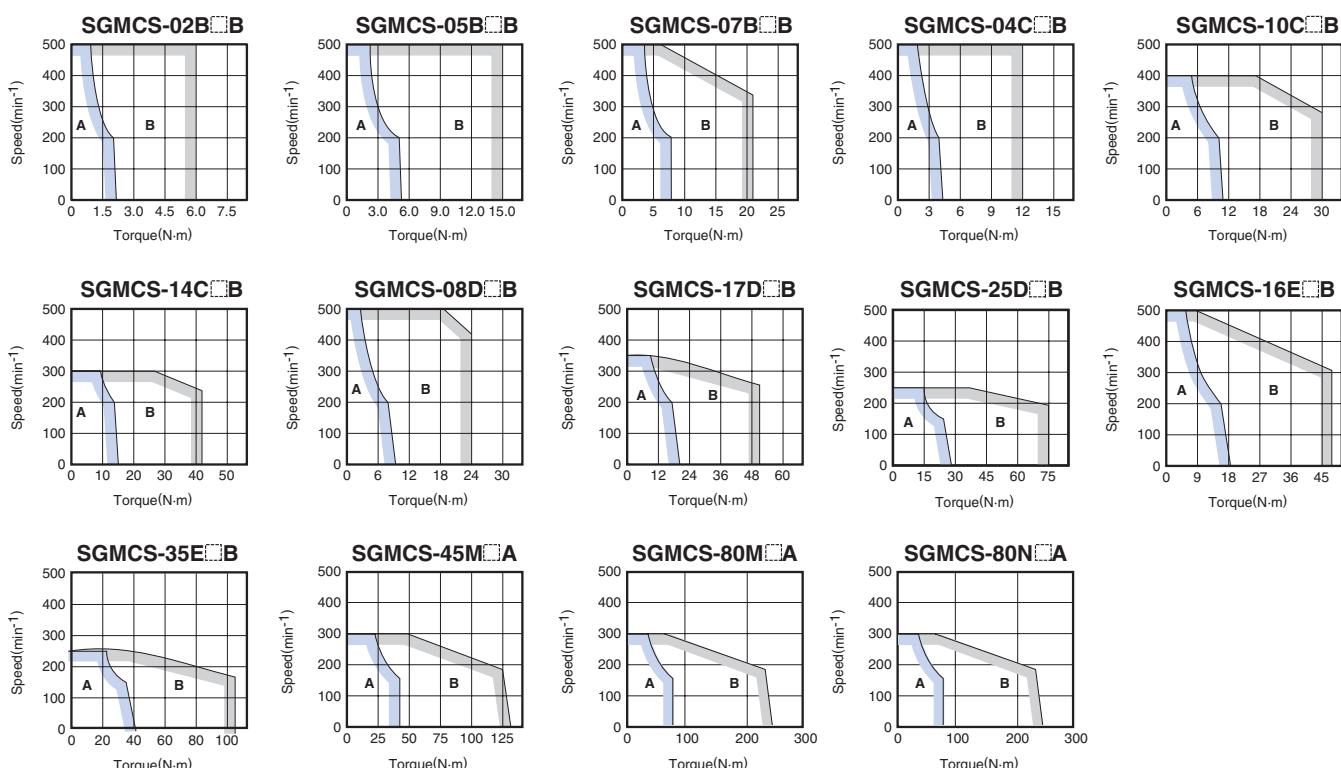
| Applied voltage                          |                                     | 230 V                         |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------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

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

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

### Torque-speed characteristics

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

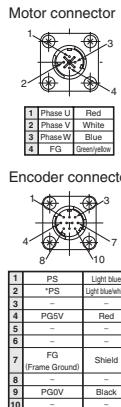
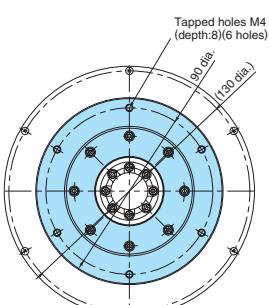
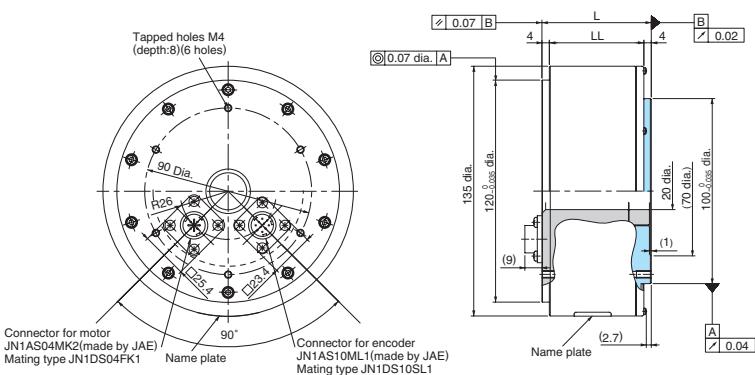


## Dimensions

SGMCS-02/05/07B□B11 (Ø135 models)

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

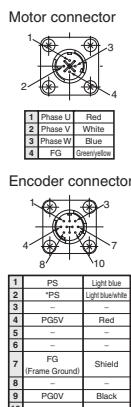
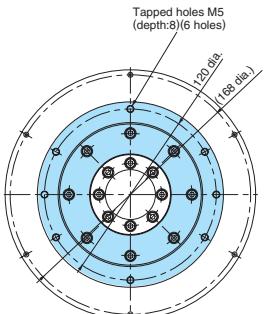
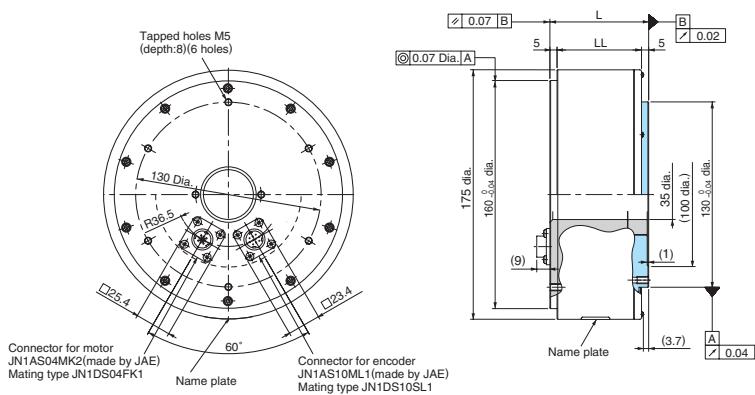
Rotating part:  Non rotating part: 



SGMCS-04/10/14C □ B11 (Ø175 models)

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

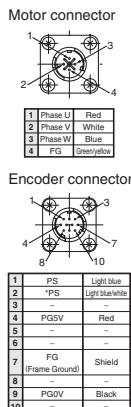
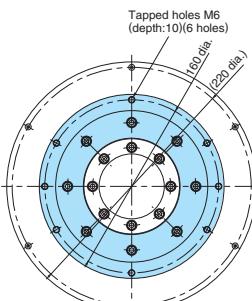
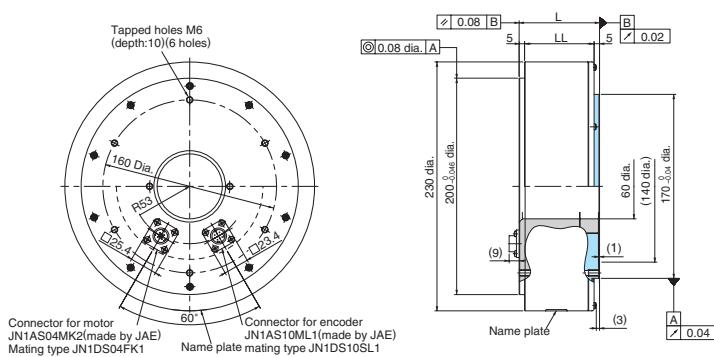
Rotating part:  Non rotating part: 



SGMCS-08/17/25D□B11 (Ø230 models)

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

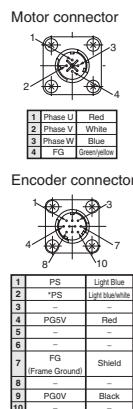
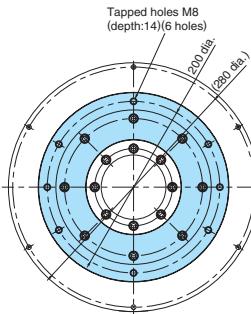
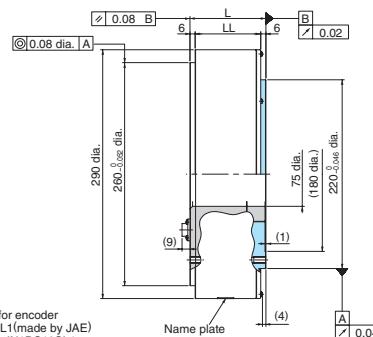
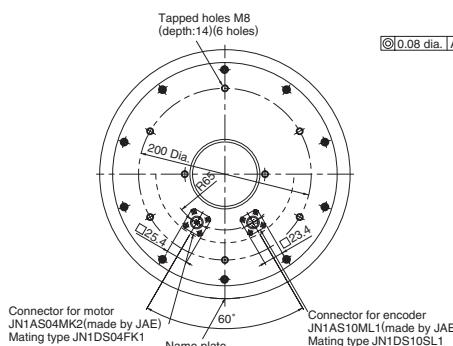
Rotating part:  Non rotating part: 



**SGMCS-16/35E□B11 (Ø290 models)**

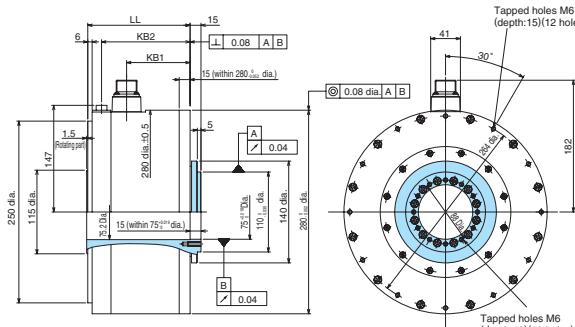
| Model         | Dimensions (mm) |     | Approx. mass<br>(kg) |
|---------------|-----------------|-----|----------------------|
|               | L               | LL  |                      |
| SGMCS-16E□B11 | 88              | 76  | 26.0                 |
| SGMCS-35E□B11 | 112             | 100 |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

Rotating part: Non rotating part:

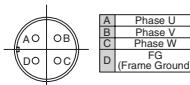
**SGMCS-45/80M□A11 (Ø280 models)**

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

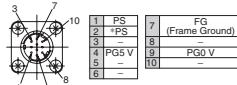
Rotating part:



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

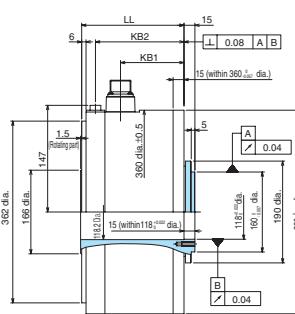


**Encoder connector**  
Model: JN1AS10ML1  
(made by Japan Aviation Electronics Industry, Ltd.)

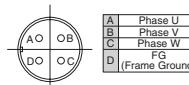
**SGMCS-80N□A11 (Ø360 models)**

| Model         | Dimensions (mm) |     | Approx. mass<br>(kg) |
|---------------|-----------------|-----|----------------------|
|               | L               | KB1 |                      |
| SGMCS-80N□A11 | 151             | 98  | 132                  |

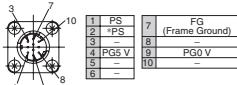
Rotating part:



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

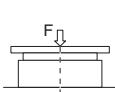


**Encoder connector**  
Model: JN1AS10ML1  
(made by Japan Aviation Electronics Industry, Ltd.)

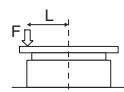
**Load capacity**

The following figures show the load capacity during motor operation.

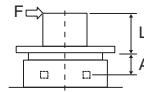
Design motors so as not to exceed the values in the table for thrust and moment loading.



Force: F  
Thrust loading:  $F_a = F + \text{Load's mass}$   
Moment loading:  $M = 0$



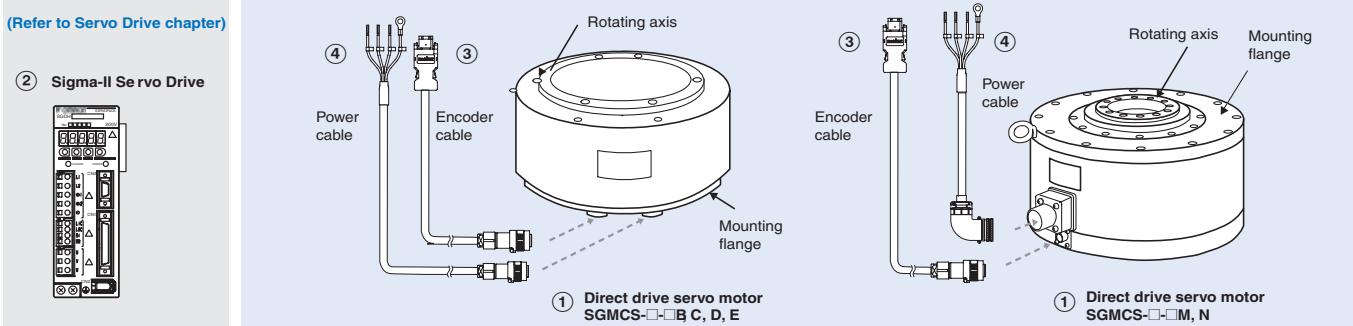
Force: F  
Thrust loading:  $F_a = F + \text{Load's mass}$   
Moment loading:  $M = F \times L$



Force: F  
Thrust loading:  $F_a = \text{Load's mass}$   
Moment loading:  $M = F \times (L+A)$

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

## Ordering information



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

## Encoder cables

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

## Servo drive

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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

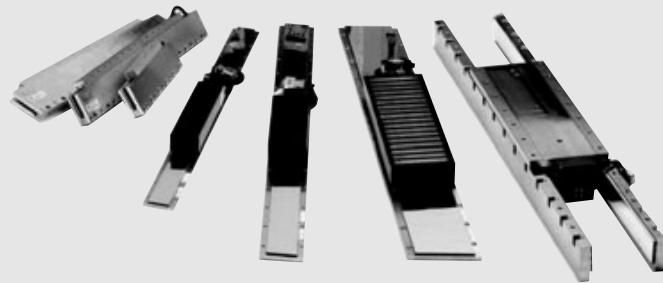
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

SGLG□, SGLF□, SGLT□

# Sigma linear motors

## Direct drive linear servo motors for faster machine cycles

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

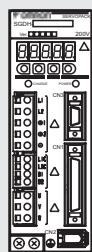


## Ratings

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

## System configuration

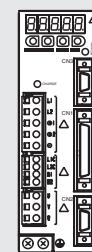
(Refer to servo drive chapter)



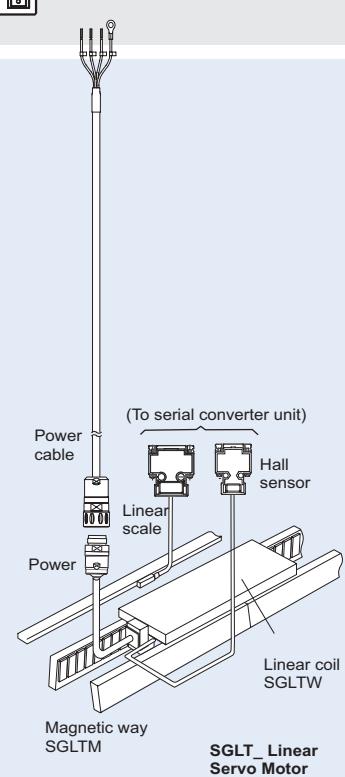
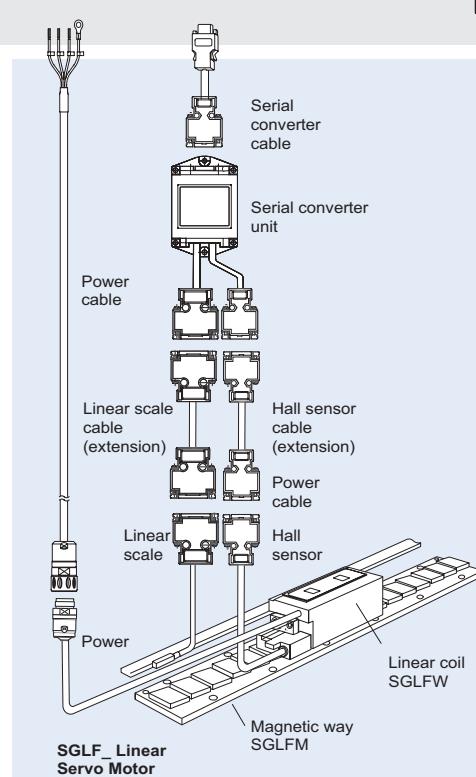
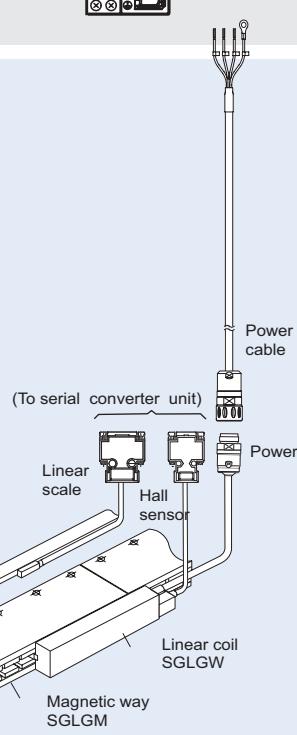
Servo Drive with option boards for flexible system configuration

**Sigma-II  
Servo Drive**

Drive options



Intelligent Servo Drive  
**XtraDrive**



## Servo Motor / Servo Drive Combination

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

## Motor coil

SGL F W - 35 D 120 A P D

Linear Σ series  
Linear servo motor

| Servo motor model |                  |
|-------------------|------------------|
| Code              | Specifications   |
| G                 | Coreless         |
| F                 | F-type iron core |
| T                 | T-type iron core |

W : Coil assembly

Magnet height

Voltage  
A : 200 VAC  
D : 400 VAC

| Cable connector for main circuit cable |   |
|--|---|
| Code                                   | Specifications  |
| -                                      | MS connector or connector made by Tyco Electronics AMP K.K. |
| D                                      | Connector made by Interconnectron                           |

| Options |                                     |
|---------|-------------------------------------|
| Code    | Specifications                      |
| P       | With hall sensor (standard)         |
| C       | Forced cooling                      |
| H       | With hall sensor and forced cooling |

Design revision order

A,B,C ...

Length of coil assembly

**Magnetic way****SGL F M - 35 324 A C**

Linear Σ series  
Linear servo motor

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

M : Magnetic way

Magnet width

Length of magnetic way

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

Design revision order

A,B,C ...

**Serial converter unit****JZDP - D008 - 001**

Design revision order  
A,B,C ...

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

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

| Applicable linear servo motor                 |         |       |         |                   |
|---|---------|-------|---------|-------------------|
| Servo motor model                             | Symbol  | Model | Symbol  | Servo motor model |
| SGLGW-<br>(coreless)                          | 30A050B | 158   | 30A050C | 250               |
|   | 30A080B | 156   | 30A080C | 251               |
|   | 40A140B | 001   | 40A140C | 252               |
|   | 40A253B | 002   | 40A253C | 253               |
|   | 40A365B | 003   | 40A365C | 254               |
|   | 60A140B | 004   | 60A140C | 258               |
|   | 60A253B | 005   | 60A253C | 259               |
|   | 60A365B | 006   | 60A365C | 260               |
|   | 90A200A | 101   | 90A200C | 264               |
|   | 90A370A | 102   | 90A370C | 265               |
| SGLGW-<br>+<br>SGLGM-<br>[ ] -M<br>(coreless) | 90A535A | 103   | 90A535C | 266               |
|   | 40A140B | 059   | 40A140C | 255               |
|   | 40A253B | 060   | 40A253C | 256               |
|   | 40A365B | 061   | 40A365C | 257               |
|   | 60A140B | 062   | 60A140C | 261               |
|   | 60A253B | 063   | 60A253C | 262               |
|   | 60A365B | 047   | 60A365C | 263               |
| SGLFW-<br>(Iron core,<br>F-type)              | 20A090A | 017   |         |                   |
|   | 20A120A | 018   |         |                   |
|   | 35A120A | 019   |         |                   |
|   | 35A230A | 020   |         |                   |
|   | 50A200B | 181   |         |                   |
|   | 50A380B | 182   |         |                   |
|   | 1ZA200B | 183   |         |                   |
|   | 1ZA380B | 184   |         |                   |
|   | 35D120A | 211   |         |                   |
|   | 35D230A | 212   |         |                   |
|   | 50D200B | 189   |         |                   |
|   | 50D380B | 190   |         |                   |
|   | 1ZD200B | 191   |         |                   |
|   | 1ZD380B | 192   |         |                   |
|   | 1ED380B | 333   |         |                   |
|   | 1ED560B | 334   |         |                   |
| SGLTW-<br>(Iron core,<br>T-type)              | 20A170A | 011   |         |                   |
|   | 20A320A | 012   |         |                   |
|   | 20A460A | 013   |         |                   |
|   | 35A170A | 014   |         |                   |
|   | 35A320A | 015   |         |                   |
|   | 35A460A | 016   |         |                   |
|   | 35A170H | 105   |         |                   |
|   | 35A320H | 106   |         |                   |
|   | 50A170H | 108   |         |                   |
|   | 50A320H | 109   |         |                   |

## Servo motor specifications

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

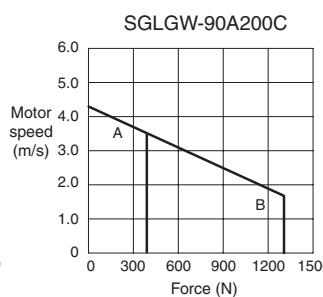
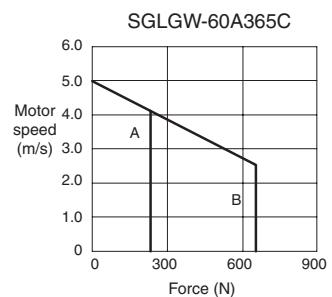
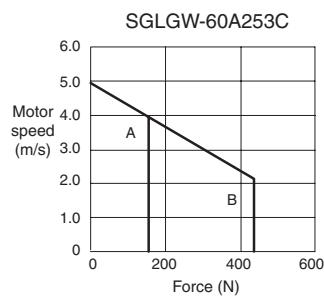
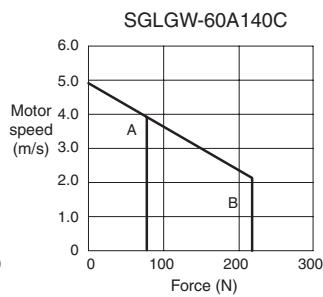
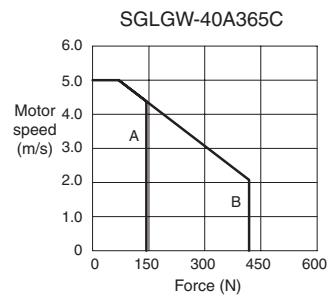
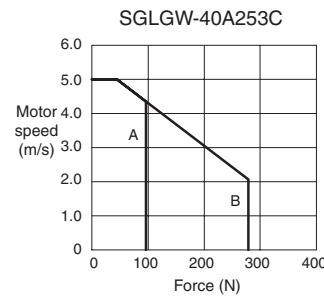
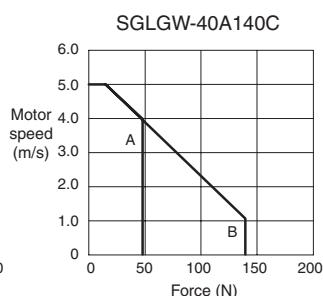
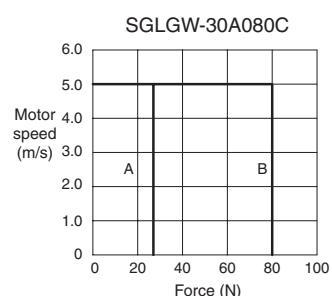
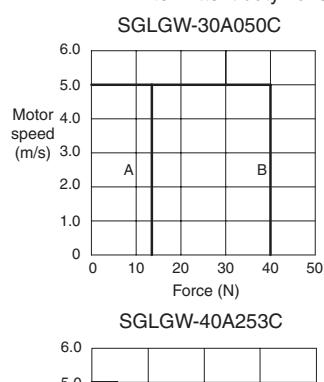
| Voltage                                |                               | 230 V                      |      |                      |                      |                      |                      |                      |                      |                      |
|--|-------------------------------|----------------------------|------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|  |                               | 30A                        |      | 40A                  |                      |                      | 60A                  |                      | 90A                  |                      |
|  |                               | 050C                       | 080C | 140C                 | 253C                 | 365C                 | 140C                 | 253C                 | 365C                 |                      |
| Rated force*                           | N                             | 12.5                       | 25   | 47                   | 93                   | 140                  | 70                   | 140                  | 210                  | 325                  |
| Rated current*                         | Arms                          | 0,51                       | 0,79 | 0,8                  | 1,6                  | 2,4                  | 1,16                 | 2,2                  | 3,3                  | 4,4                  |
| Instantaneous peak force*              | N                             | 40                         | 80   | 140                  | 280                  | 420                  | 220                  | 440                  | 660                  | 1300                 |
| Instantaneous peak current*            | Arms                          | 1,62                       | 2,53 | 2,4                  | 4,9                  | 7,3                  | 3,5                  | 7,0                  | 10,5                 | 17,6                 |
| Coil assembly weight                   | kg                            | 0,14                       | 0,19 | 0,40                 | 0,66                 | 0,93                 | 0,48                 | 0,82                 | 1,16                 | 2,2                  |
| Force constant                         | N / Arms                      | 26,4                       | 33,9 | 61,5                 | 61,5                 | 61,5                 | 66,6                 | 66,6                 | 66,6                 | 78                   |
| BEMF constant                          | V / I (m / s)                 | 8,8                        | 11,3 | 20,5                 | 20,5                 | 20,5                 | 22,2                 | 22,2                 | 22,2                 | 26,0                 |
| Motor constant                         | N ∙ √W                        | 3,7                        | 5,6  | 7,8                  | 11,0                 | 13,5                 | 11,1                 | 15,7                 | 19,2                 | 26,0                 |
| Electrical time constant               | ms                            | 0,2                        | 0,4  | 0,4                  | 0,4                  | 0,4                  | 0,5                  | 0,5                  | 0,5                  | 1,4                  |
| Mechanical time constant               | ms                            | 7,30                       | 4,78 | 5,59                 | 4,96                 | 4,77                 | 3,41                 | 3,08                 | 2,98                 | 3,18                 |
| Thermal resistance (with heat sink)    | K / W                         | 5,19                       | 3,11 | 1,67                 | 0,87                 | 0,58                 | 1,56                 | 0,77                 | 0,51                 | 0,39                 |
| Thermal resistance (without heat sink) | K / W                         | -                          | -    | 3,02                 | 1,80                 | 1,23                 | 2,59                 | 1,48                 | 1,15                 | 1,09                 |
| Magnetic attraction                    | N                             | 0                          | 0    | 0                    | 0                    | 0                    | 0                    | 0                    | 0                    | 0                    |
| Heat sink size                         | mm                            |                            |      | 200 x<br>300 x<br>12 | 300 x<br>400 x<br>12 | 400 x<br>500 x<br>12 | 200 x<br>300 x<br>12 | 300 x<br>400 x<br>12 | 400 x<br>500 x<br>12 | 800 x<br>900 x<br>12 |
| Basic specifications                   | Time rating                   | Continuous                 |      |                      |                      |                      |                      |                      |                      |                      |
|  | Insulation class              | Class B                    |      |                      |                      |                      |                      |                      |                      |                      |
|  | Ambient temperature           | 0 to +40 °C                |      |                      |                      |                      |                      |                      |                      |                      |
|  | Ambient humidity              | 20 to 80% (non-condensing) |      |                      |                      |                      |                      |                      |                      |                      |
|  | Insulation resistance         | 500 VDC, 10 MΩ min.        |      |                      |                      |                      |                      |                      |                      |                      |
|  | Excitation                    | Permanent magnet           |      |                      |                      |                      |                      |                      |                      |                      |
|  | Dielectric strength           | 1500 VAC for 1 minute      |      |                      |                      |                      |                      |                      |                      |                      |
|  | Protection methods            | Self-cooled, air-cooling   |      |                      |                      |                      |                      |                      |                      |                      |
|  | Allowable winding temperature | 130 °C                     |      |                      |                      |                      |                      |                      |                      |                      |

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

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

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

A: Continuous duty zone  
B: Intermittent duty zone



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

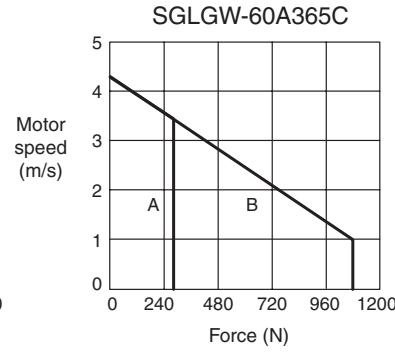
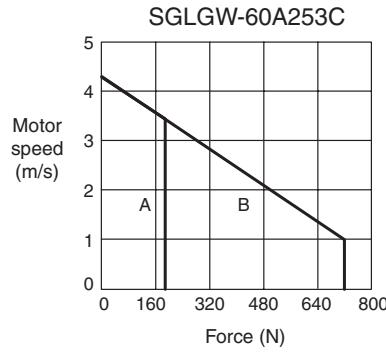
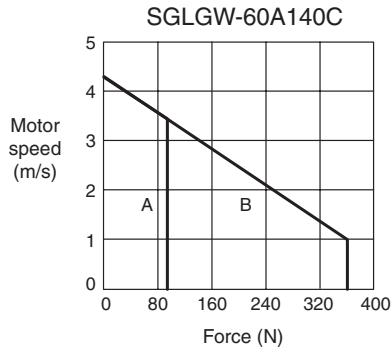
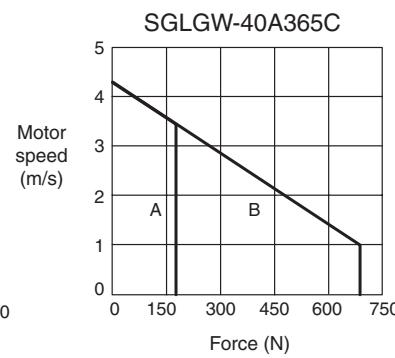
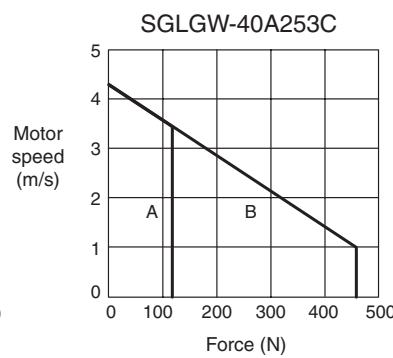
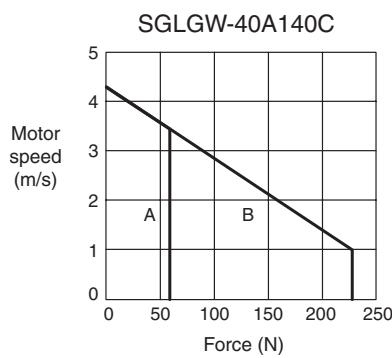
| Voltage                                |                               | 230 V                      |                      |                      |                      |                      |                      |
|--|-------------------------------|----------------------------|----------------------|----------------------|----------------------|-----------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

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

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

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

- A: Continuous duty zone  
 B: Intermittent duty zone



## Iron-core SGLFW/SGLFM (200 V)

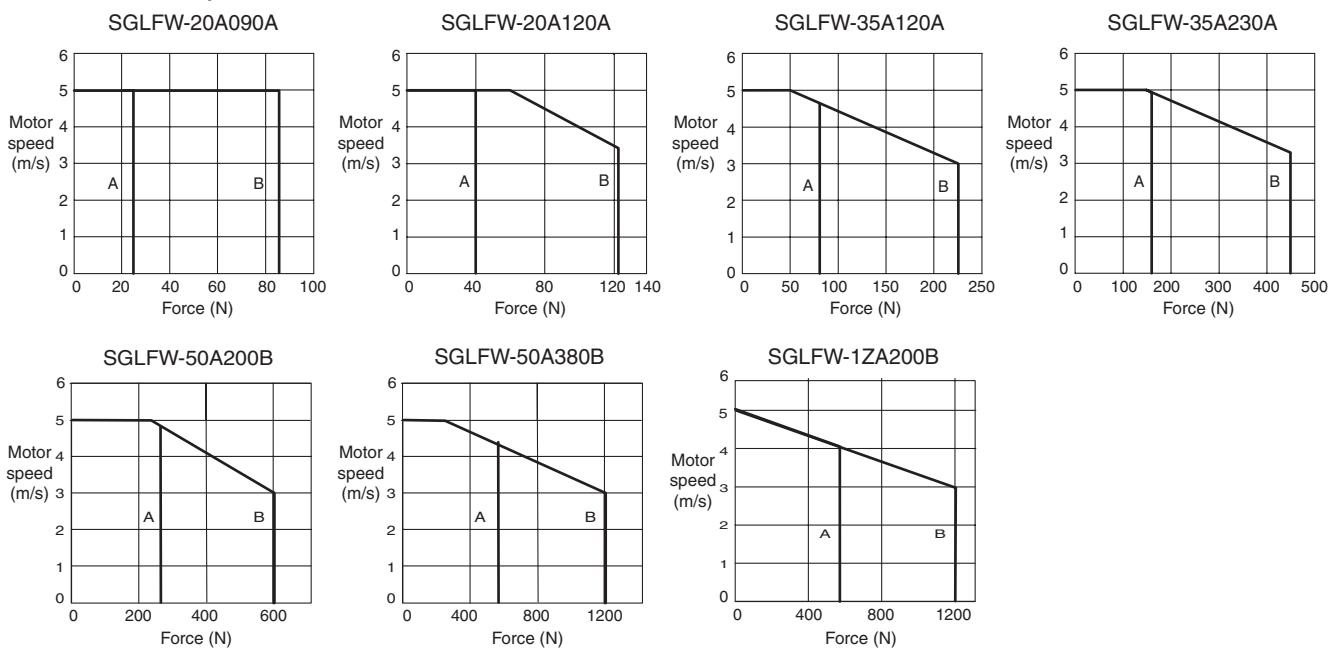
| Voltage                                | Linear servo motor<br>model SGLFW- | 230 V                      |      |                |      |      |                |                |  |  |  |
|--|------------------------------------|----------------------------|------|----------------|------|------|----------------|----------------|--|--|--|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

- Note:** 1. The items marked with an \* and “force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).  
 2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

## Force-speed characteristics (200 V)

A: Continuous duty zone

B: Intermittent duty zone



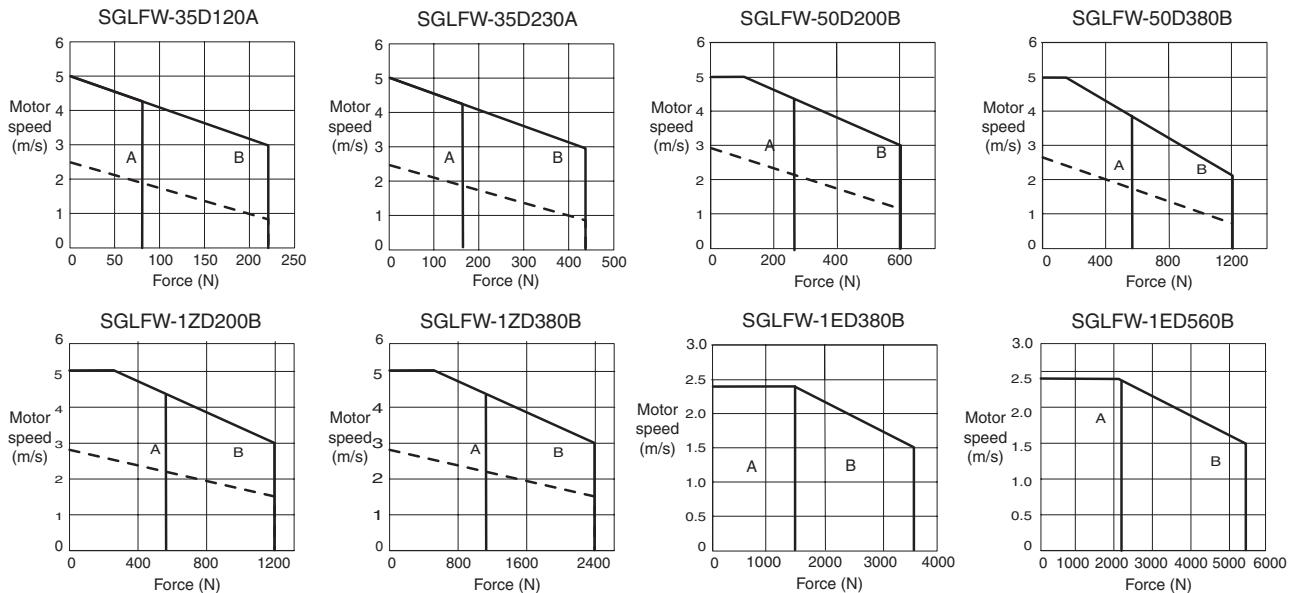
**Iron-core SGLFW/SGLFM (400 V)**

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

- Note:** 1. The items marked with an \* and “force and speed characteristics” are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68°F).  
 2. The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the coil assembly.

**Force-speed characteristics (400 V)**

A: Continuous duty zone  
 B: Intermittent duty zone



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

## Iron-core SGLTW/SGLTM (400 V)

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

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

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

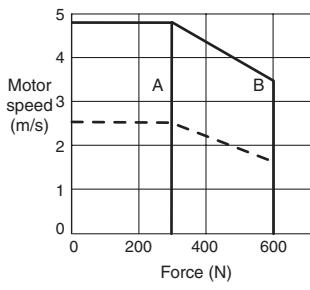
**Note:** 1. The items marked with an \* and "force and speed characteristics" are the values at a motor winding temperature of 100 °C during operation in combination with a servo drive. The others are at 20 °C (68 °F).

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

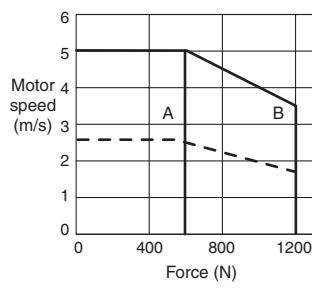
## Force-speed characteristics (400 V)

A: Continuous duty zone  
B: Intermittent duty zone

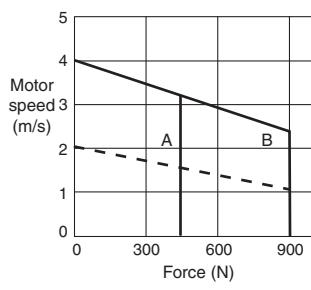
SGLTW-35D170H



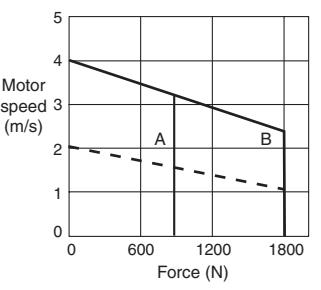
SGLTW-35D320H



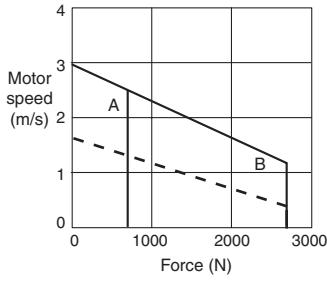
SGLTW-50D170H



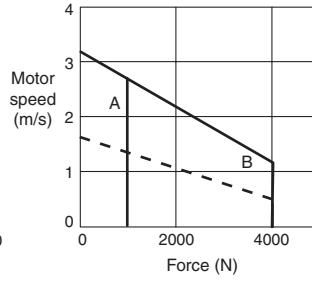
SGLTW-50D320H



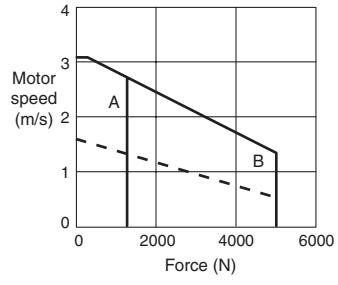
SGLTW-40D400B



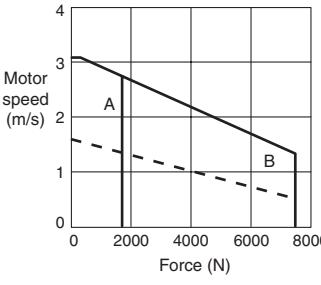
SGLTW-40D600B



SGLTW-80D400B



SGLTW-80D600B



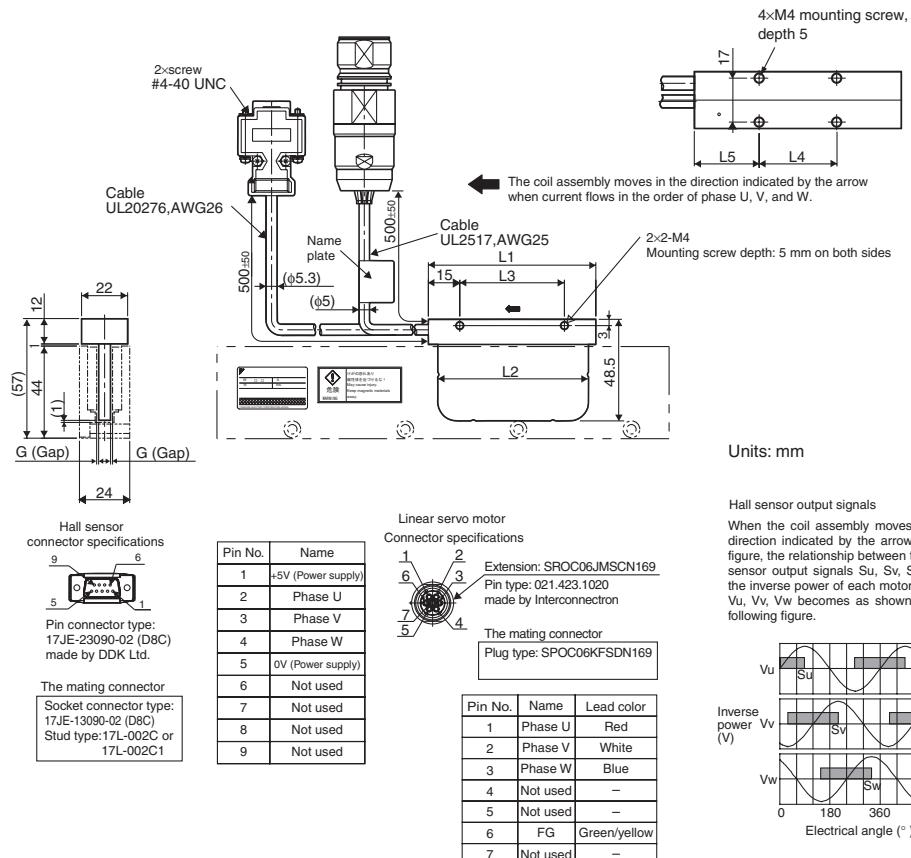
**Note:** The dotted line indicates characteristics when the linear servo motor for 400 VAC is used with an input power supply for 200 VAC. In this case, the serial converter should be changed. Contact your OMRON Yaskawa representatives.

## Dimensions

### Coreless SGLG□-30

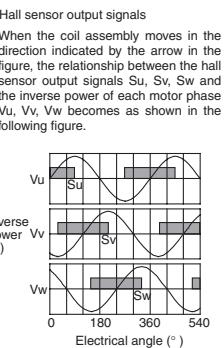
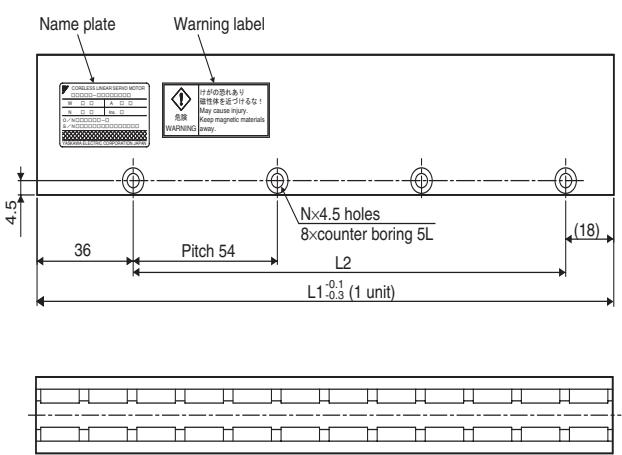
#### Coil assembly: SGLGW-30A□□□□□D

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



#### Magnetic way: SGLGM-30□□□A

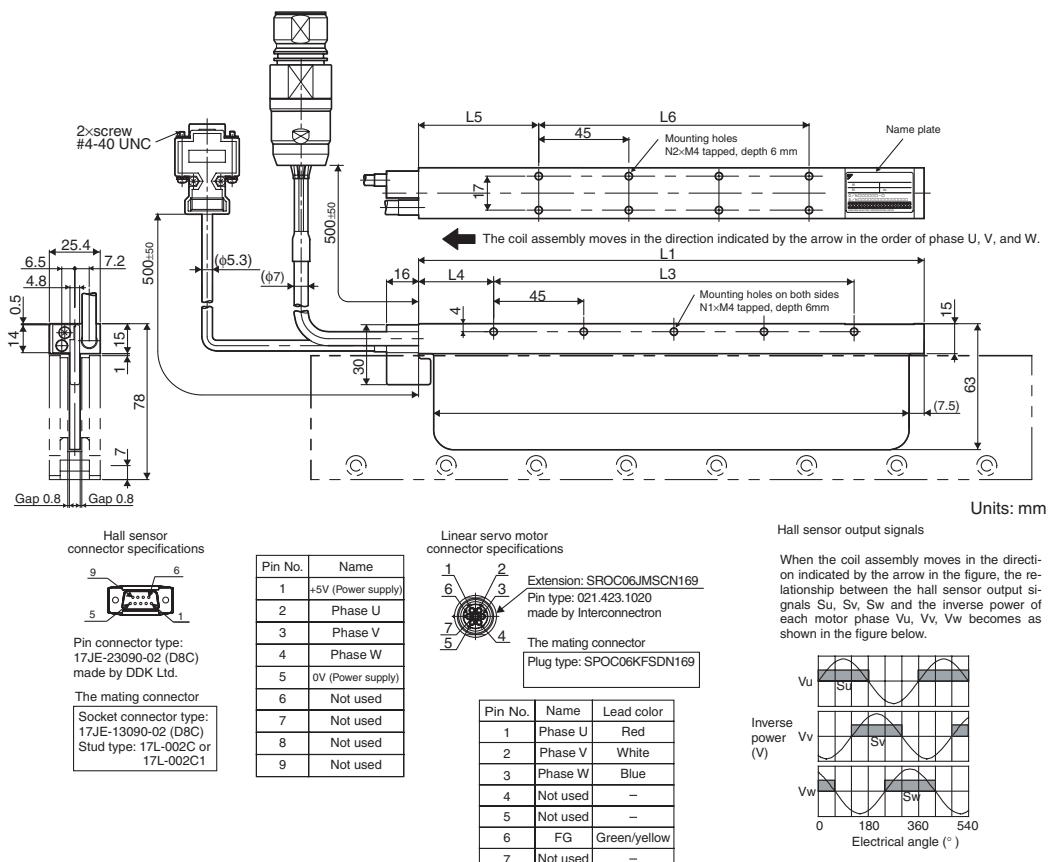
| Magnetic way model<br>SGLGM- | L1<br>mm | L2<br>mm | N | Approx. weight<br>kg |
|------------------------------|----------|----------|---|----------------------|
| 30108A                       | 108      | 54       | 2 | 0.6                  |
| 30216A                       | 216      | 162      |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



## Coreless SGLG□-40

### Coil assembly: SGLGW-40A□□□□□D

| Coil assembly model<br>SGLGW- | L1    | L2    | L3  | L4   | L5   | L6  | N1 | N2 | Approx.<br>weight*<br>kg |   |
|-------------------------------|-------|-------|-----|------|------|-----|----|----|--------------------------|---|
| 40A140□□D                     | 140   | 125   | 90  | 30   | 52.5 | 45  | 3  | 4  | 0.40                     | *The value indicates the weight of coil assembly with a hall sensor unit. |
| 40A252.5□□D                   | 252.5 | 237.5 | 180 | 37.5 | 60   | 135 | 5  | 8  | 0.66                     |   |
| 40A365□□D                     | 365   | 350   | 315 | 30   | 52.5 | 270 | 8  | 14 | 0.93                     |   |

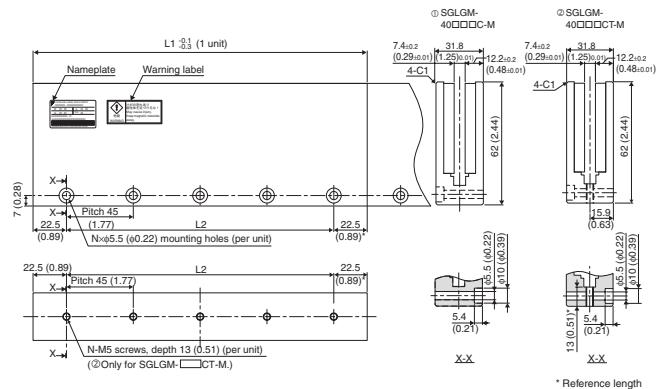
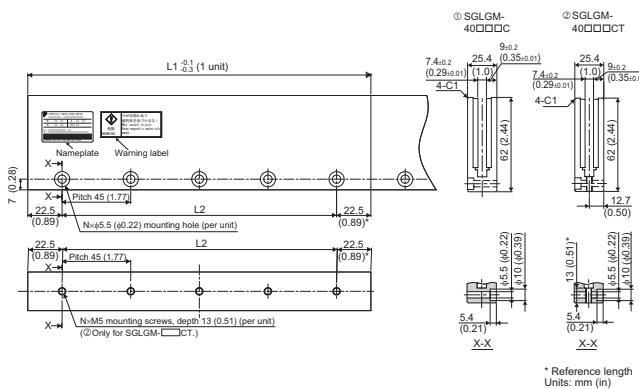


### Standard-force magnetic way: SGLGM-40□□□C□

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

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

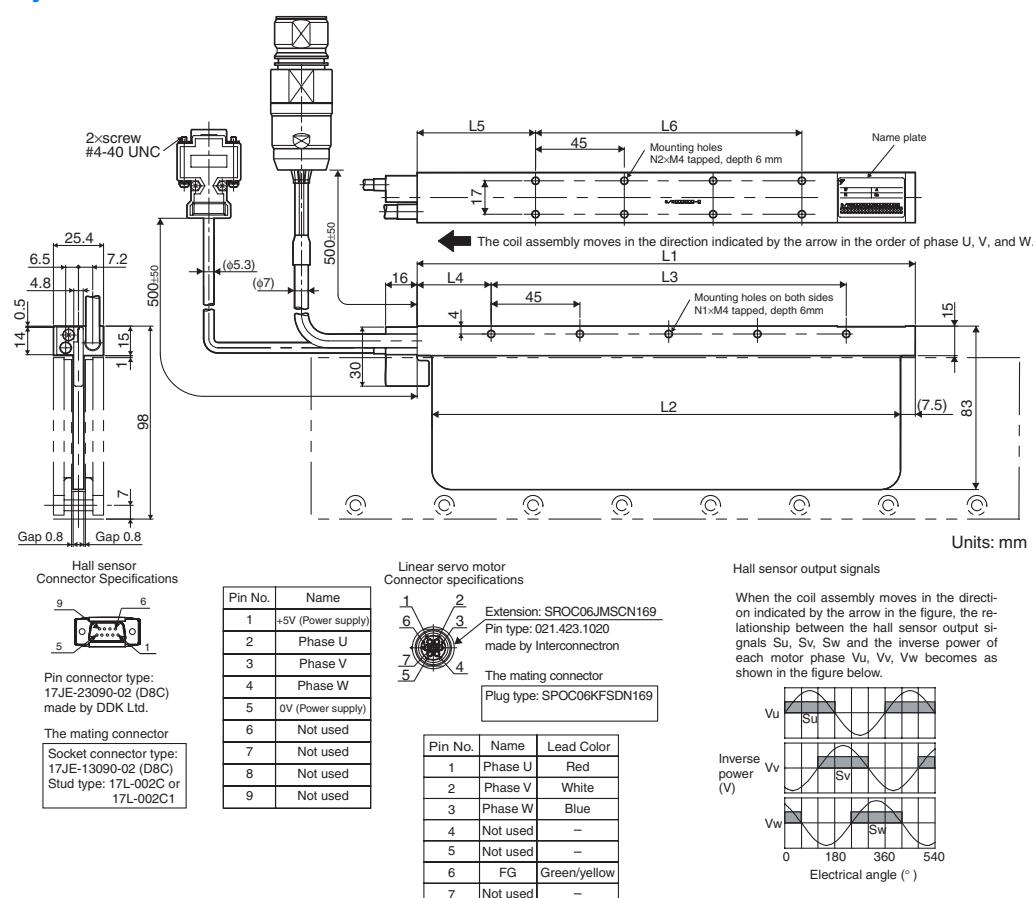
| High-force magnetic way model SGLGM- |                 | L1 mm | L2 mm | N  | Approx. weight kg |
|--------------------------------------|-----------------|-------|-------|----|-------------------|
| Mounting type 1                      | Mounting type 2 |       |       |    |                   |
|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



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

## Coreless SGLG□-60

## Coil assembly: SGLGW-60A□□□□□D



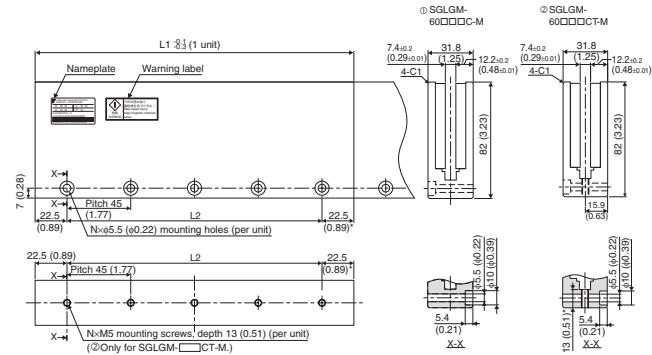
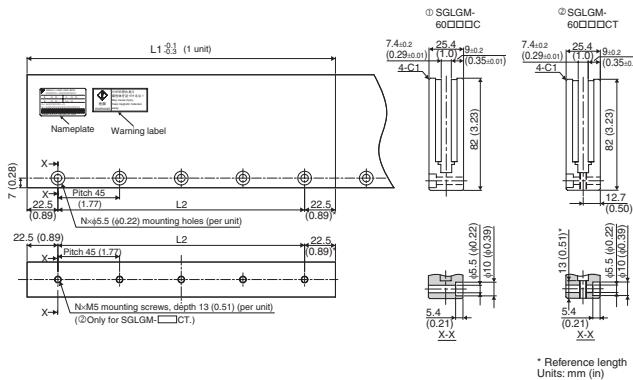
| Coil assembly model<br>SGLGW- | L1    | L2    | L3  | L4   | L5   | L6  | N1 | N2 | Approx.<br>weight*<br>kg |   |
|-------------------------------|-------|-------|-----|------|------|-----|----|----|--------------------------|---|
| 60A140□□D                     | 140   | 125   | 90  | 30   | 52.5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

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

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

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

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



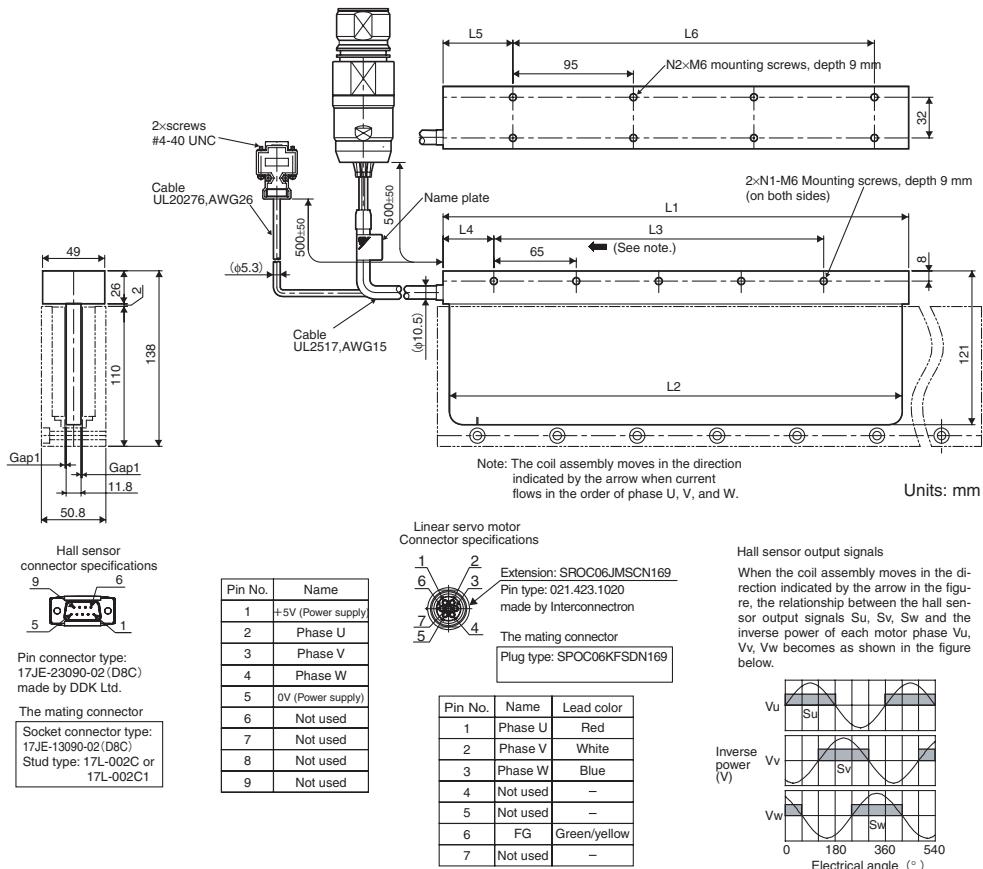
Note: Mounting dimensions of magnets revision B are equivalent to magnets revision C mounting type 2.

## **Coreless SGLG□-90**

## Coil assembly: SGLGW-90A200□□D

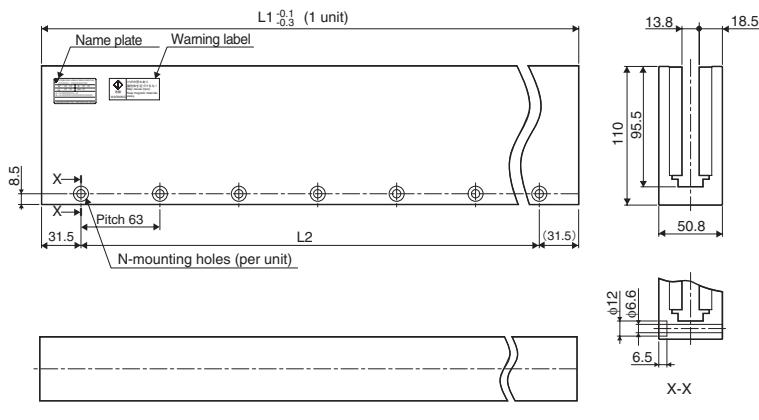
| Coil assembly model<br>SGLGW- | L1  | L2  | L3  | L4 | L5 | L6 | N1 | N2 | Approx.<br>weight* kg |   |
|-------------------------------|-----|-----|-----|----|----|----|----|----|-----------------------|---|
| 90A200□□D                     | 199 | 189 | 130 | 40 | 60 | 95 | 3  | 4  | 2.2          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

\*The value indicates the weight of coil assembly with a hall sensor unit.



## Magnetic way: SGLGM-90□□□A

| Magnetic way model<br>SGLM- | L1<br>mm | L2<br>mm | N | Approx.<br>weight kg |
|-----------------------------|----------|----------|---|----------------------|
| 90252A                      | 252      | 189      | 4 | 7.3                  |
| 90504A                      | 504      | 441      | 8 | 14.7                 |

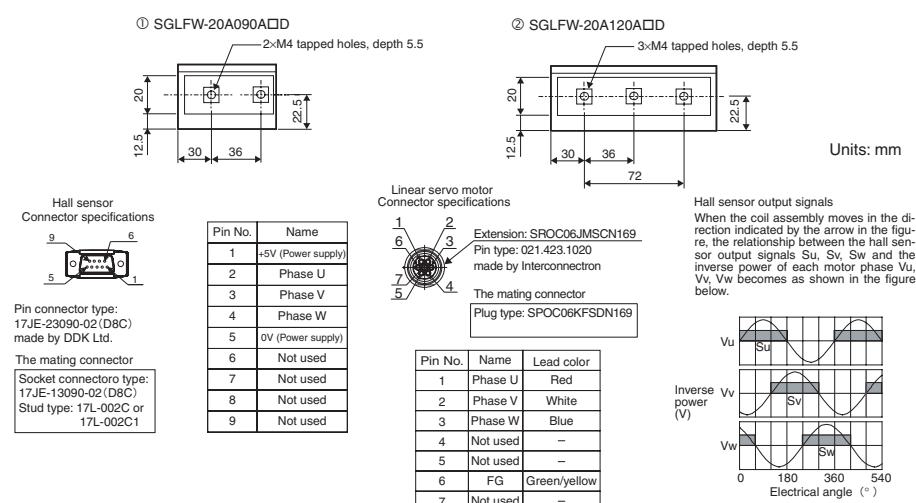
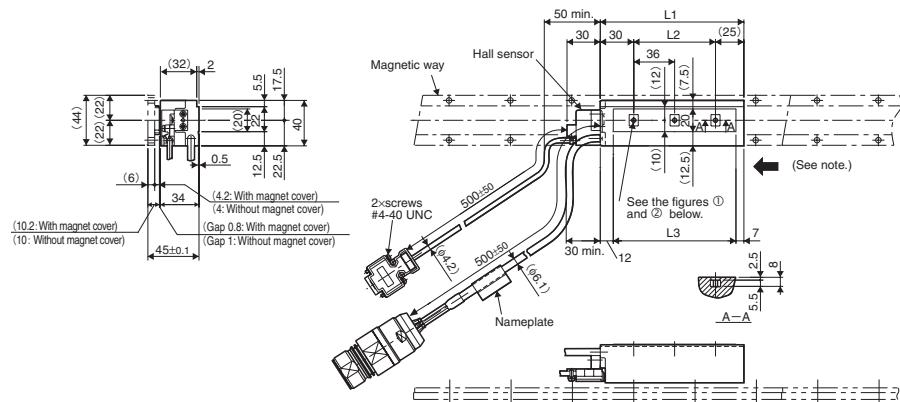


Units: mm

## Iron-core SGLF□-20

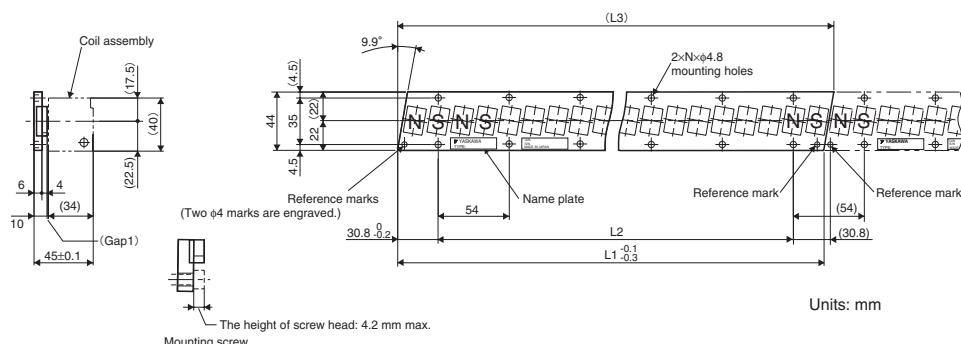
## Coil assembly: SGLFW-20A□□□A□D

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



## Magnetic way: SGLFM-20□□□A□

| Magnetic way model<br>SGLFM- | L1 <sup>-0.1</sup><br>-0.3 | L2            | (L3)    | N  | Approx.<br>weight kg |
|------------------------------|----------------------------|---------------|---------|----|----------------------|
| 2034A□                       | 324                        | 270 (54 × 5)  | (331.6) | 6  | 0.9                  |
| 20540A□                      | 540                        | 486 (54 × 9)  | (547.6) | 10 | 1.4                  |
| 20756A□                      | 756                        | 702 (54 × 13) | (763.6) | 14 | 2                    |



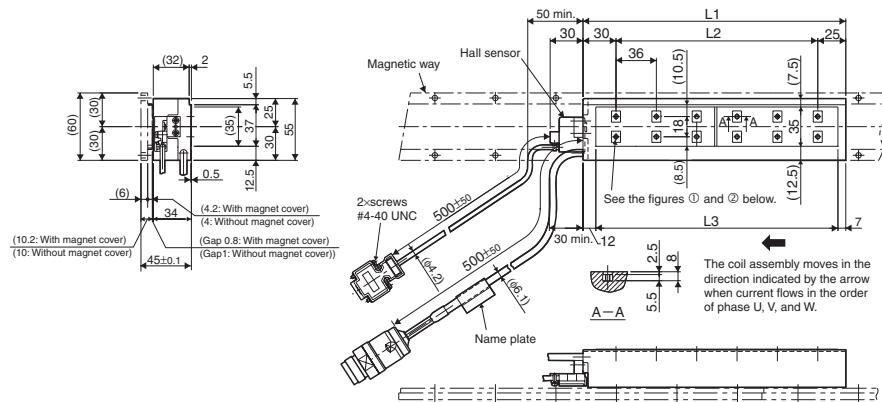
**Note:** 1. Multiple SGLFM-20□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

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

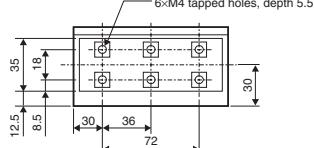
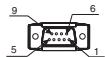
## Iron-core SGLF□-35

## Coil assembly: SGLFW-35□□□A□D

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



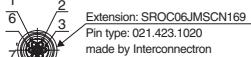
① SGLFW-35□120A□D

Hall sensor  
Connector specifications

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

The mating connector

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

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

The mating connector  
Plug type: SPOC06KFSDN169

Extension: SROCO6JMSCN169

Pin type: 021.423.1020  
made by Interconnecton

The mating connector

Plug type: LPRAO6BFRBN170

Extension: LRRAO6AMRPN182

Pin type: 021.279.1020  
made by Interconnecton

The mating connector

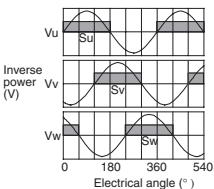
Plug type: LPRAO6BFRBN170

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

Units: mm

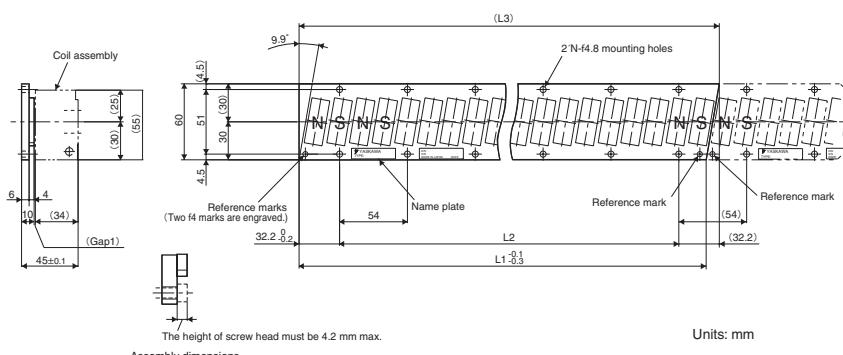
## Hall sensor output signals

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



## Magnetic way: SGLFM-35□□□A□

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



Assembly dimensions

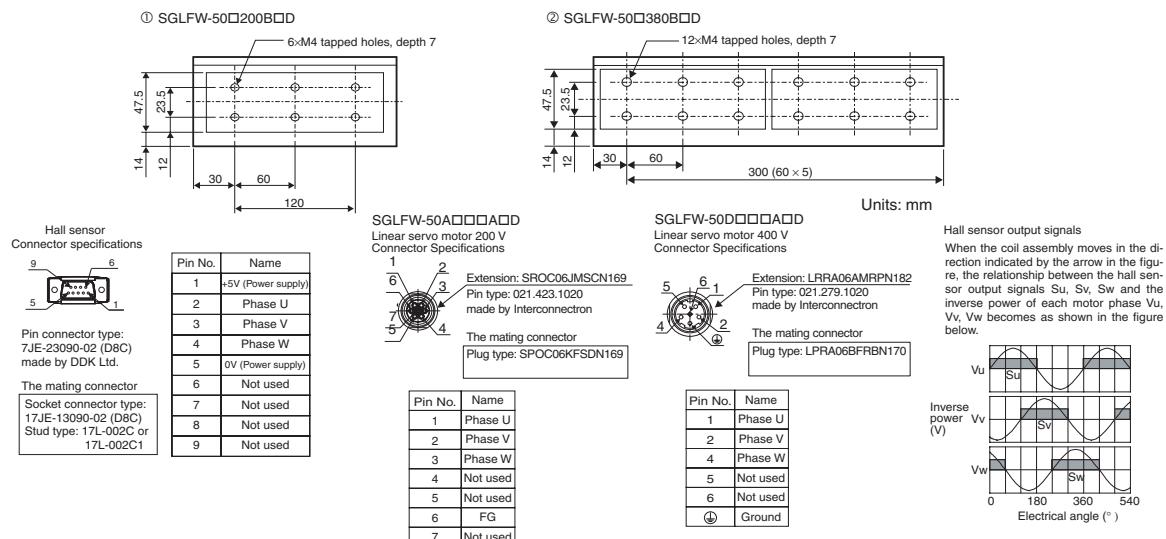
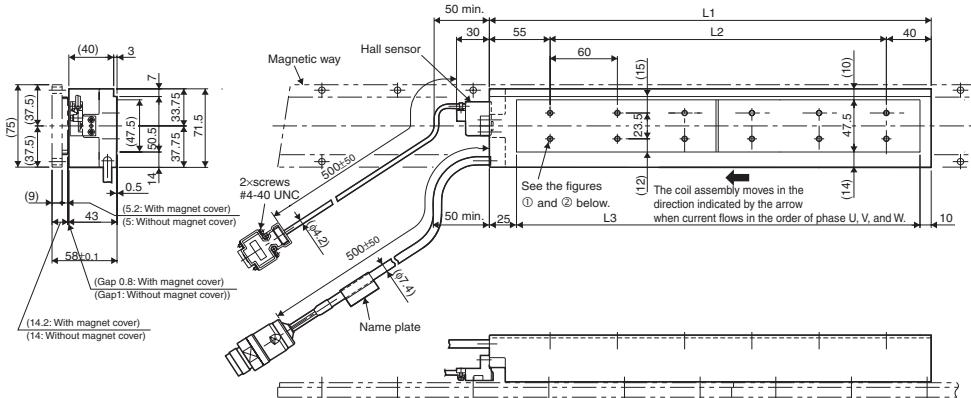
Units: mm

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

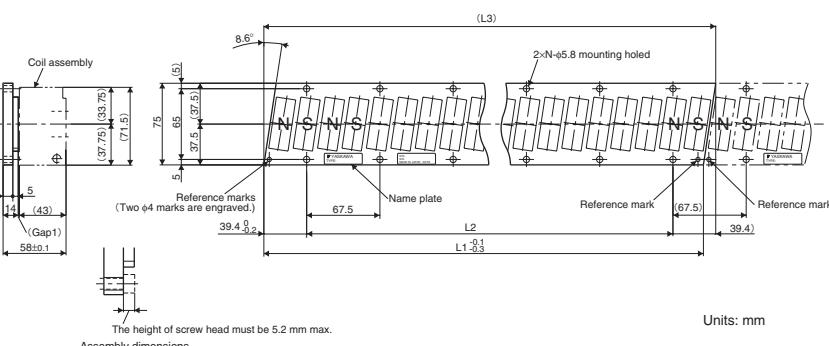
2. The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.

**Iron-core SGLF□-50****Coil assembly: SGLFW-50□□□□B□D**

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

**Magnetic way: SGLFM-50□□□A□**

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



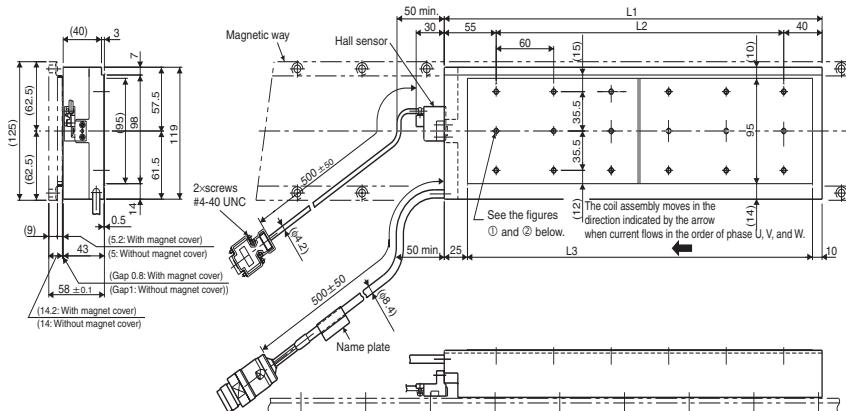
**Note:** 1. Multiple SGLFM-50□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

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

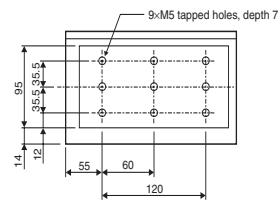
## Iron-core SGLF□-1Z

Coil assembly: SGLFW-1Z□□□□B□D

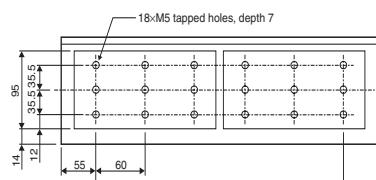
| Coil assembly model<br>SGLFW- | L1  | L2  | L3  | N  | Approx.<br>weight kg |
|-------------------------------|-----|-----|-----|----|----------------------|
| 1Z□200B□D                     | 215 | 120 | 180 | 8  | 6.4                  |
| 1ZD380B□D                     | 395 | 300 | 360 | 18 | 11.5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



① SGLFW-1Z□200B□D



② SGLFW-1ZD380B□D



Units: mm

Hall sensor  
Connector specifications

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

The mating connector

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

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

Extension: SROC06JMSCN169  
Pin type: 021.423.1020  
made by Interconnecton

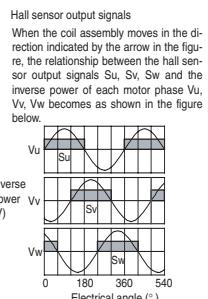
The mating connector  
Plug type: SPOC06KFSDN169

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

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

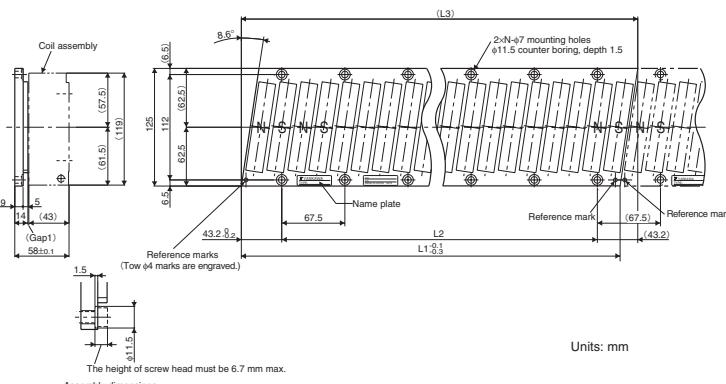
Extension: LRRA06AMRPN182  
Pin type: 021.279.1020  
made by Interconnecton

The mating connector  
Plug type: LPRA06BFBRBN170



## Magnetic way: SGLFM-1Z□□□A□

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



Units: mm

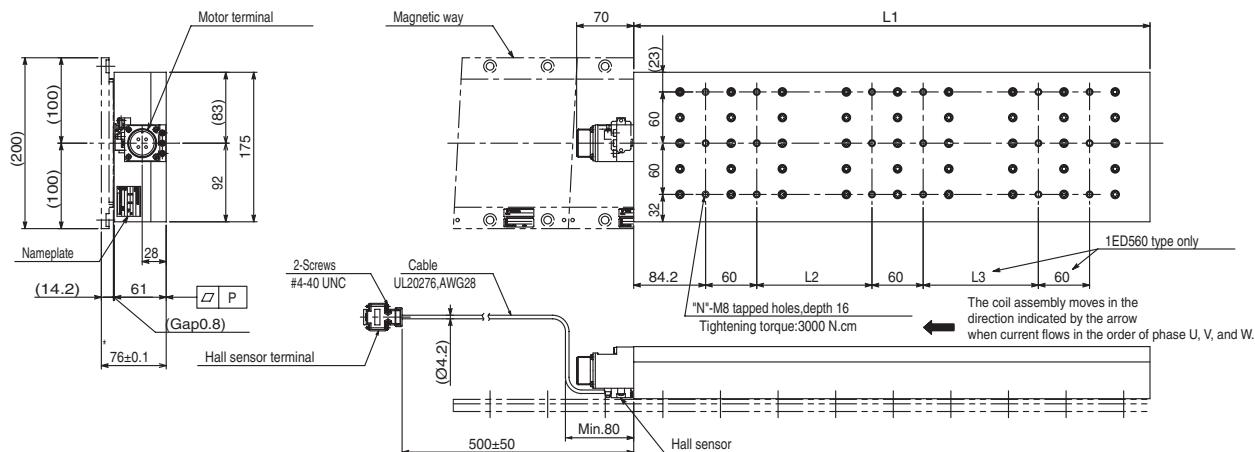
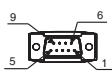
Note: 1. Multiple SGLFM-1Z□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

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

## Iron-core SGLF□-1E

## Coil assembly: SGLFW-1ED□□□B□

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

Hall sensor  
Connector specifications

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

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

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

Linear servo motor  
Connector Specifications

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

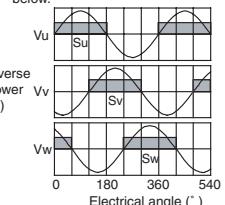
The mating connector

L-shaped plug type: MS3108E22-22S

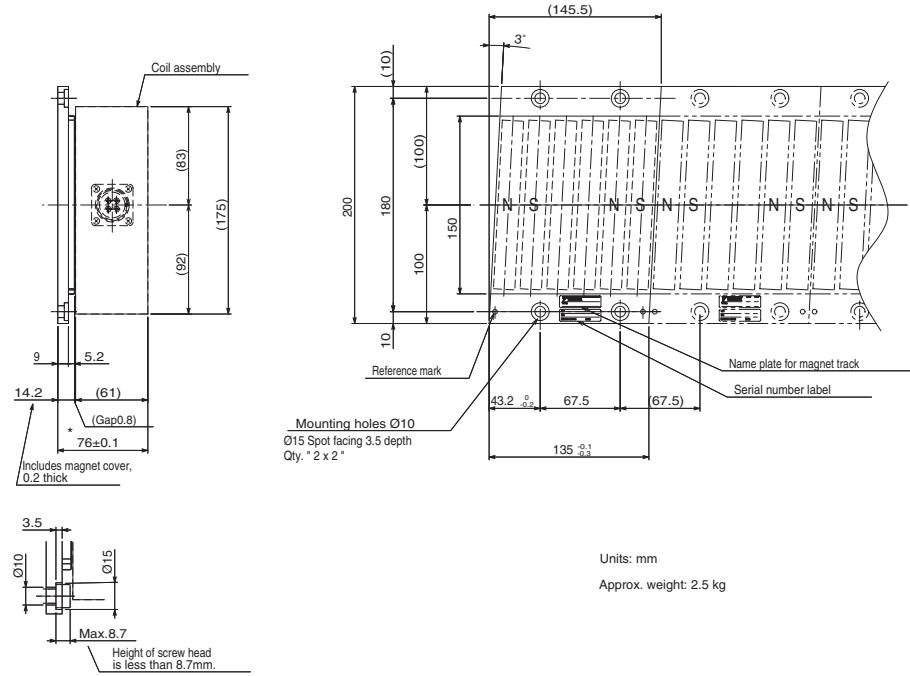
Units: mm

Hall sensor output signals

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



## Magnetic way: SGLFM-1E135A□

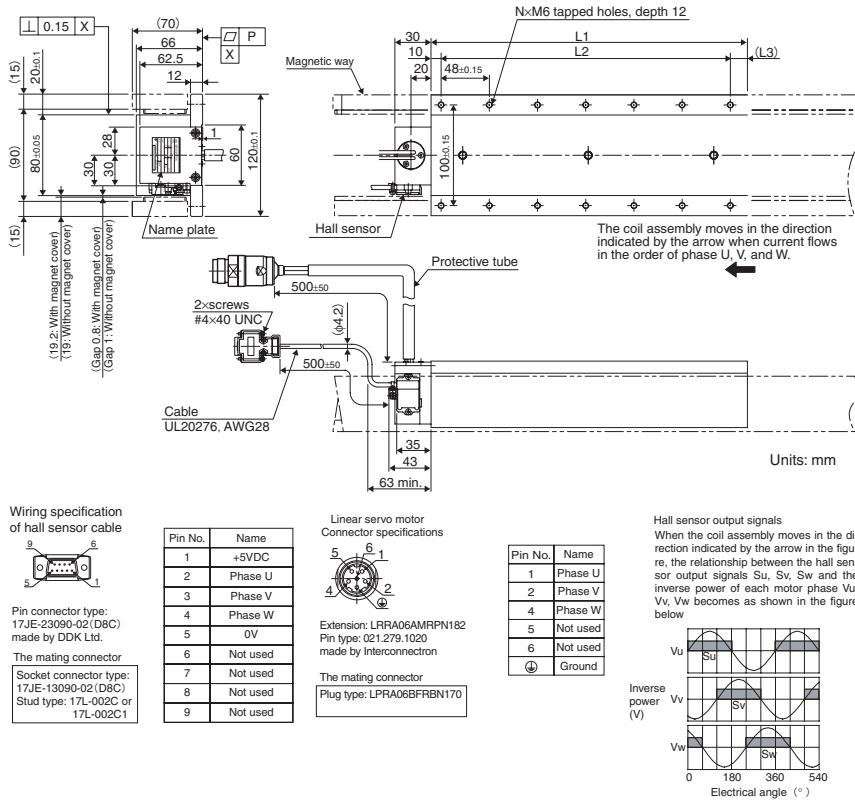


- Note:**
- Multiple SGLFM-1E□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.
  - The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from the magnetic way.

## Iron-core SGLT□-35

## Coil assembly: SGLTW-35D□□□H□D

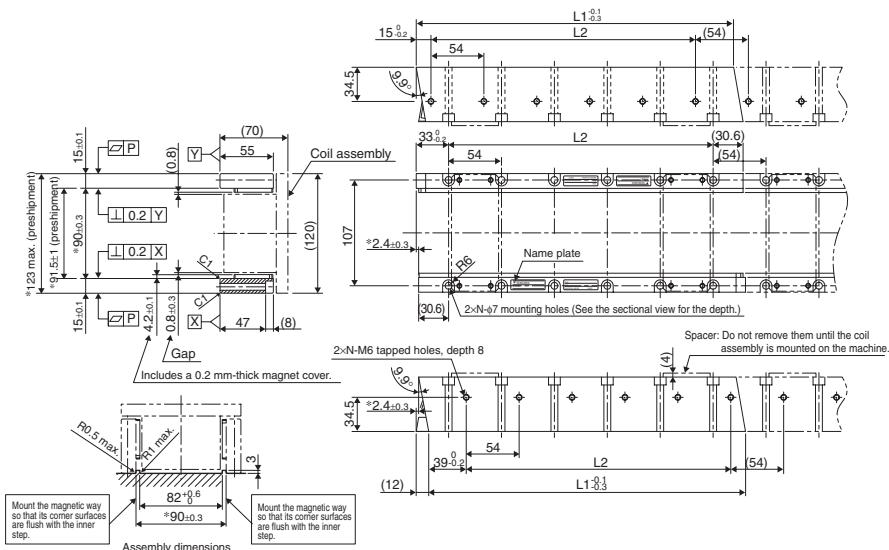
| Coil assembly model<br>SGLTW- | L1  | L2           | (L3) | N  | Approx.<br>weight kg |
|-------------------------------|-----|--------------|------|----|----------------------|
| 35D320H□D                     | 315 | 288 (48 × 6) | (17) | 14 | 8.8                  |



## Magnetic way: SGLTM-35□□□H

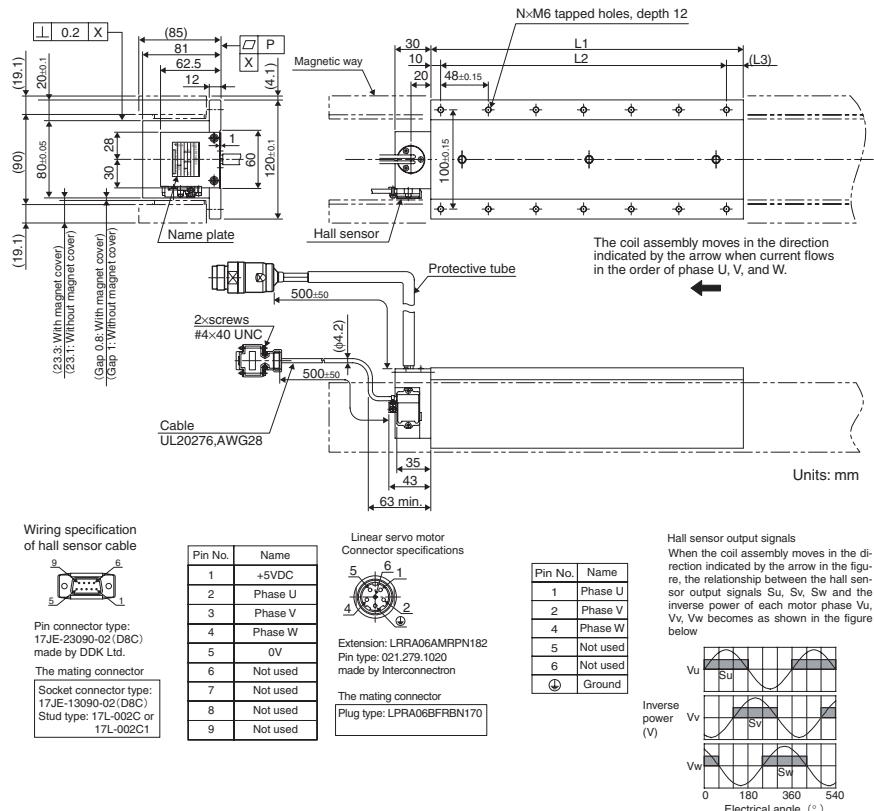
| Magnetic way model<br>SGLTM- | L1 <sup>-0.1</sup><br>-0.3 | L2            | N  | Approx.<br>weight kg |
|------------------------------|----------------------------|---------------|----|----------------------|
| 35324H                       | 324                        | 270 (54 × 5)  | 6  | 4.8                  |
| 35540H                       | 540                        | 486 (54 × 9)  | 10 | 8                    |
| 35756H                       | 756                        | 702 (54 × 13) | 14 | 11                   |

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



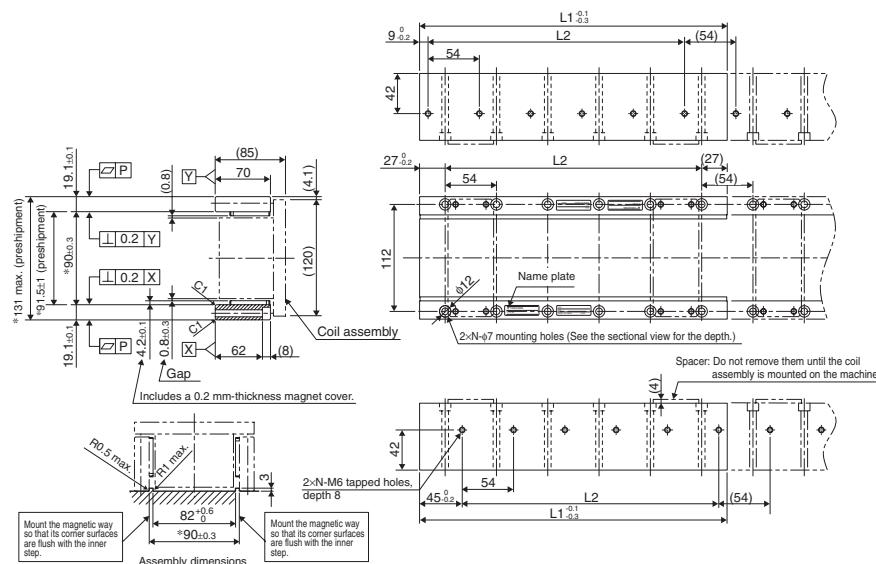
**Iron-core SGLT□-50****Coil assembly: SGLTW-50D□□□H□D**

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

**Magnetic way: SGLTM-50□□□H**

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

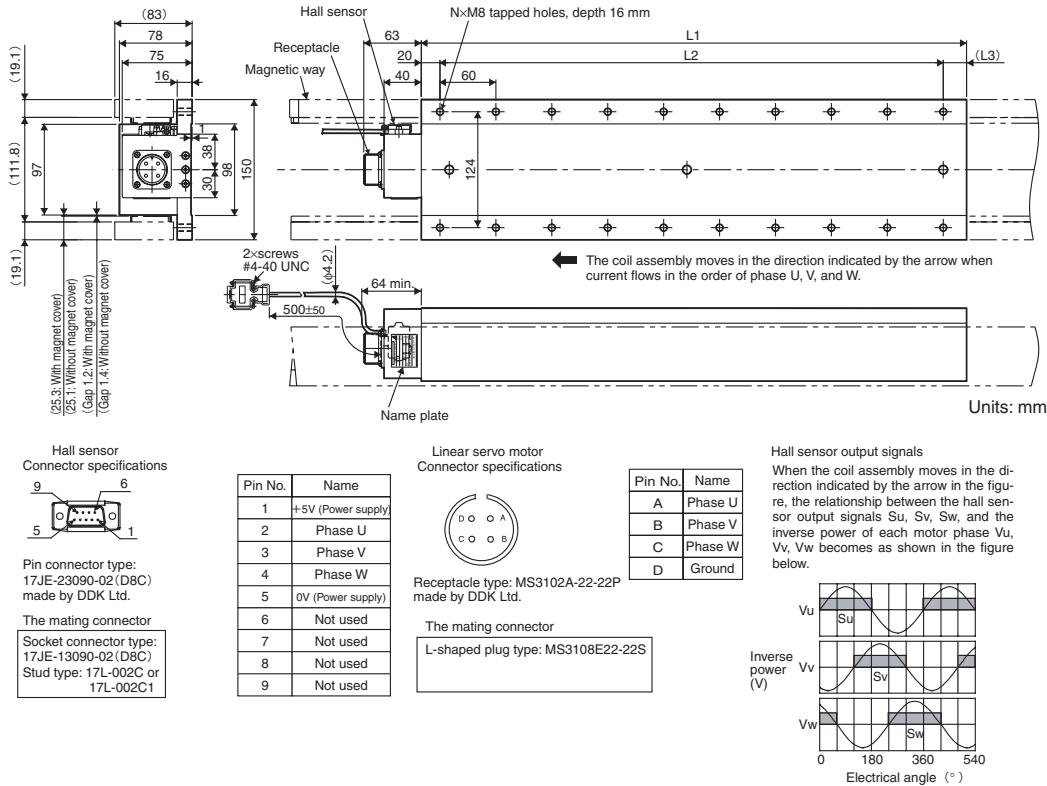
- Note:**
- Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.
  - The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm from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



## Iron-core SGLT□-40

## Coil assembly: SGLTW-40D□□□B□

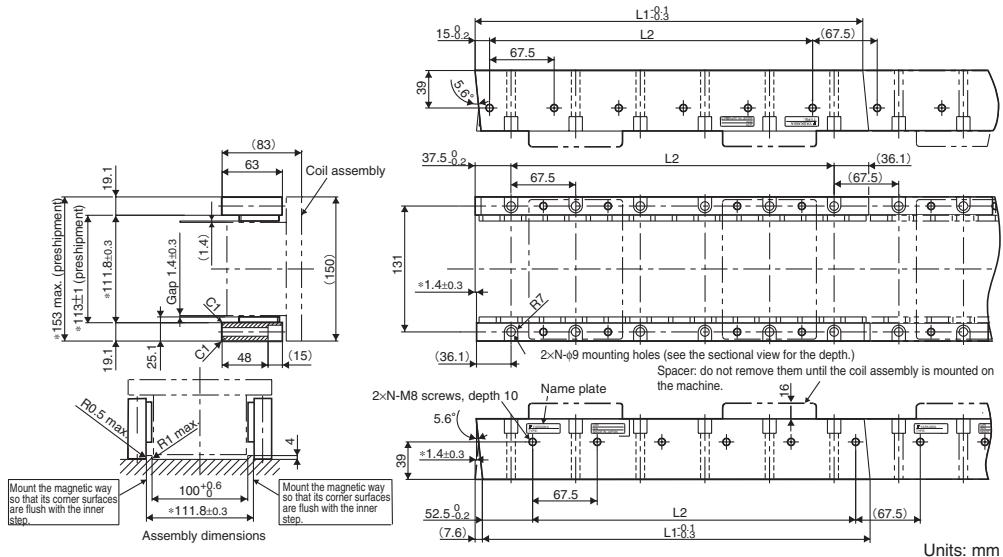
| Coil assembly model<br>SGLTW- | L1  | L2           | (L3) | N  | Approx.<br>weight kg |
|-------------------------------|-----|--------------|------|----|----------------------|
| 40D400B□                      | 395 | 360 (60 × 6) | (15) | 14 | 15                   |
| 40D600B□                    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



## Magnetic way: SGLTM-40□□□A

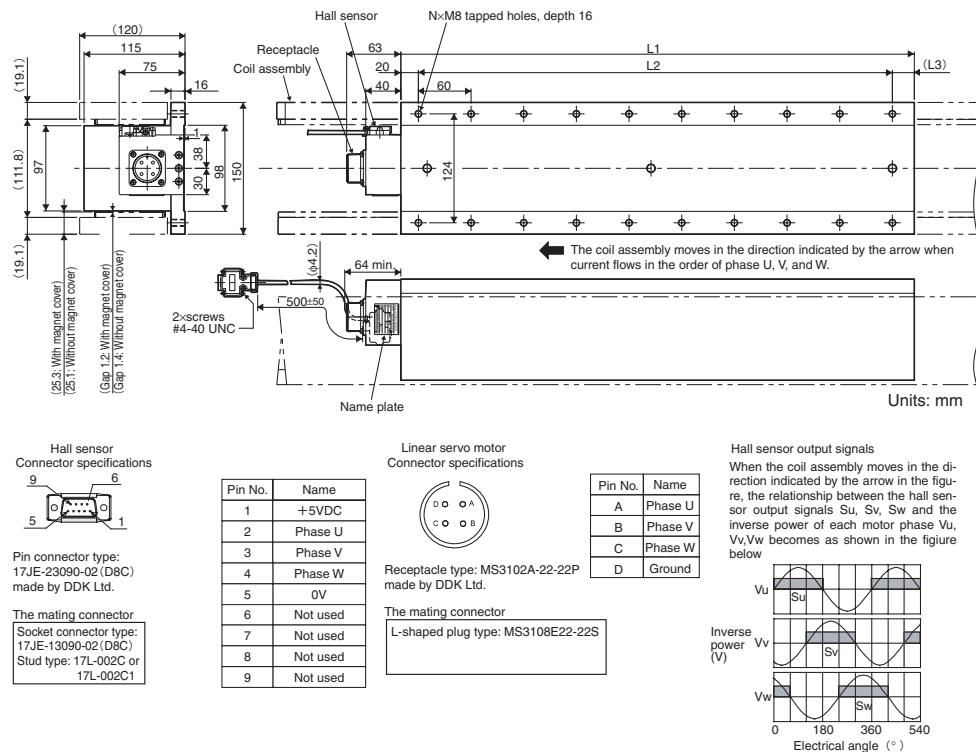
| Magnetic way model<br>SGLTM- | L1 -0.1<br>-0.3 | L2                | N  | Approx.<br>weight kg |
|------------------------------|-----------------|-------------------|----|----------------------|
| 40405A                       | 405             | 337.5 (67.5 × 5)  | 6  | 9                    |
| 40675A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

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



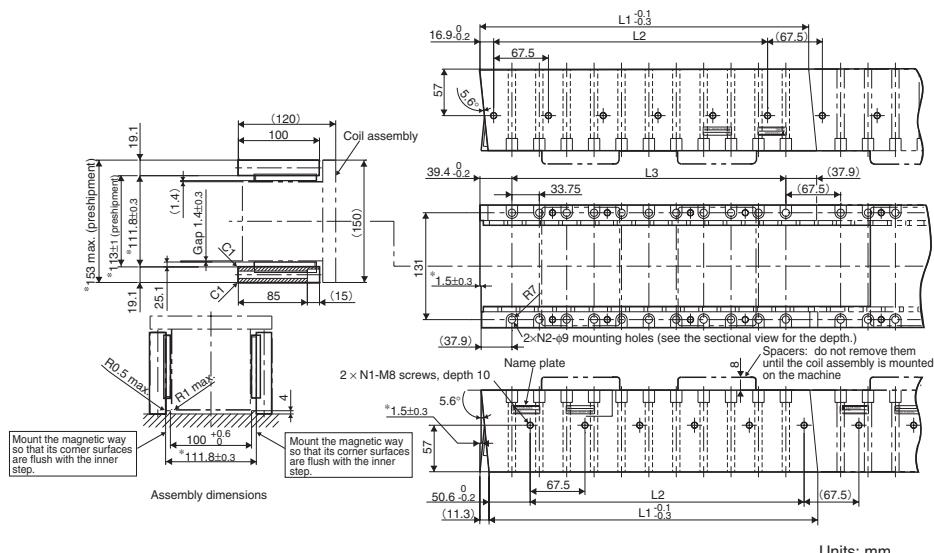
**Iron-core SGLT□-80****Coil assembly: SGLTW-80D□□□B□**

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

**Magnetic way: SGLTM-80□□□A**

| Magnetic way<br>model SGLTM- | L1 <sup>0.1</sup><br><sub>0.3</sub> | L2                   | L3                    | N1 | N2 | Approx.<br>weight kg |
|------------------------------|-------------------------------------|----------------------|-----------------------|----|----|----------------------|
| 80405A                       | 405                                 | 337.5<br>(67.5 × 5)  | 337.5<br>(33.75 × 10) | 6  | 11 | 14                   |
| 80675A                       | 675                                 | 607.5<br>(67.5 × 9)  | 607.5<br>(33.75 × 18) | 10 | 19 | 24                   |
| 80945A                       | 945                                 | 877.5<br>(67.5 × 13) | 887.5<br>(33.75 × 26) | 14 | 27 | 34                   |

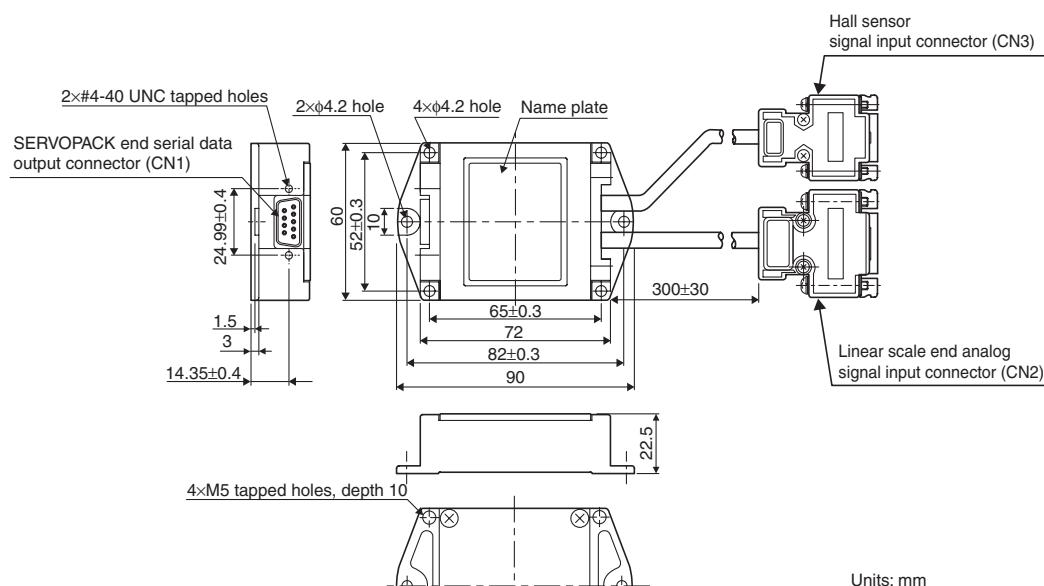
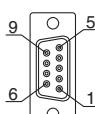
- Note: 1.** Two magnetic ways for both ends of coil assembly make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the coil assembly is mounted on a machine.
- 2.** The magnetic way may affect pacemakers. Keep a minimum distance of 200 mm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



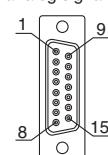
## Serial converter unit

JZDP-[A/D]008-□□□

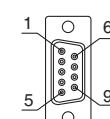
| Items                      | Specifications   |
|----------------------------|--|
| Electrical characteristics | Power supply voltage +5.0 V ±5%, ripple content 5% max.  |
|                            | Current consumption 120 mA Typ. 350 mA max.  |
|                            | Signal resolution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

[CN1]  
SERVOPACK end  
serial data output

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

[CN2]  
Linear scale end  
analog signal input

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

[CN3]  
Hall sensor signal input

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

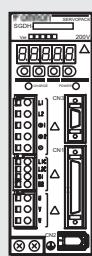
**Note:** 1. Do not use empty pins.

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

3. Use the linear scale end connector to change the zero point specifications of the linear scale.

## Ordering information

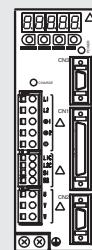
(Refer to servo drive chapter)



Servo drive with option boards for flexible system configuration

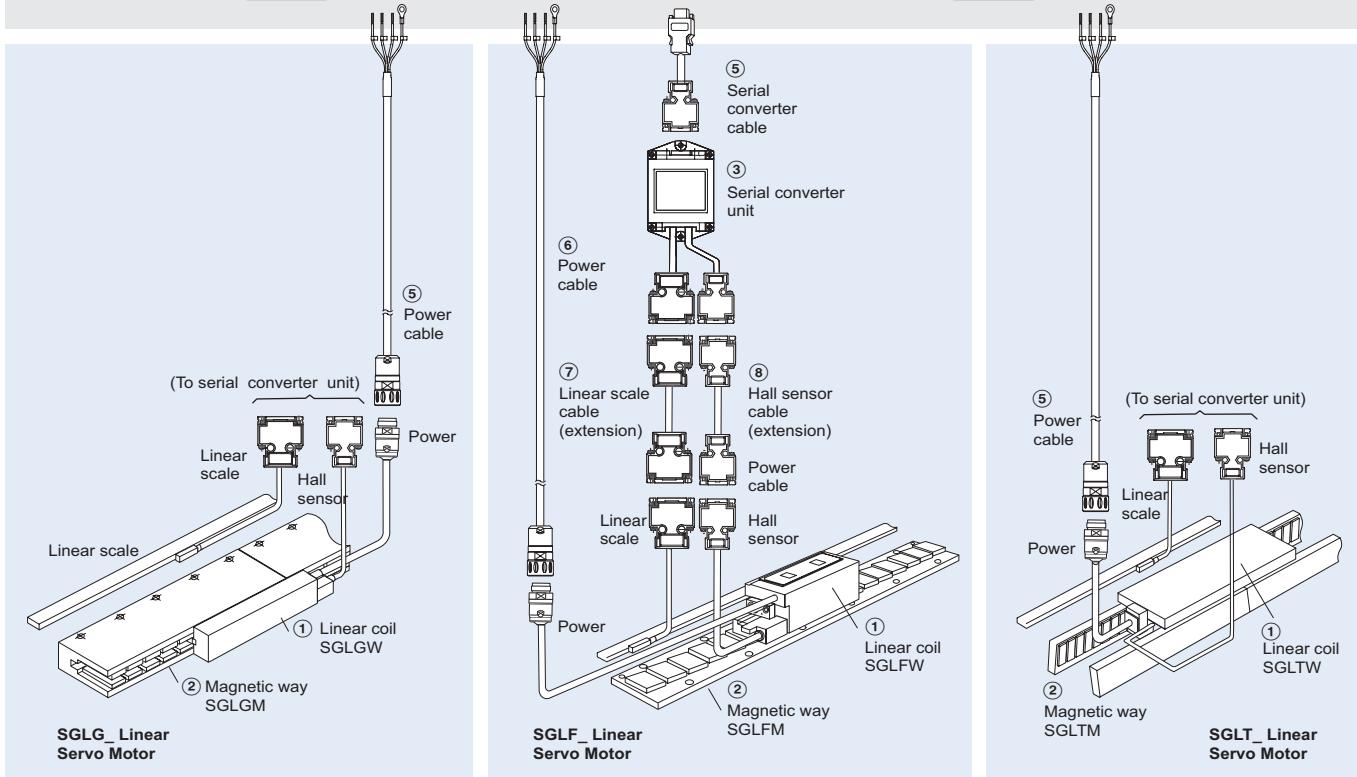
④ Sigma-II Servo Drive

Drive options



Intelligent Servo Drive

④ XtraDrive



**Note:** The symbols ①②③... show the recommended sequence to select the servo motor, cables and serial converter for a linear motor system

### Servo motor

#### SGLGW / SGLGM coreless type (200 V)

With standard-force magnetic ways - 230 VAC single phase

| Symbol | Specifications |            | Model           |   |                    |                |            |
|--------|----------------|------------|-----------------|---|--------------------|----------------|------------|
|        | Rated force    | Peak force | ① Linear coil   | ② Magnetic way  | ③ Serial converter | ④ Servo drive  |            |
|        | 12.5 N         | 40 N       | SGLGW-30A050CPD | SGLGM-30108A<br>SGLGM-30216A<br>SGLGM-30432A                                      | JZDP-D008-250      | SGDH-A5AE-OY   | XD-P5-MN01 |
|        | 25 N           | 80 N       | SGLGW-30A080CPD |   | JZDP-D008-251      | SGDH-01AE-OY   | XD-01-MN01 |
|        | 47 N           | 140 N      | SGLGW-40A140CPD |   | JZDP-D008-252      | SGDH-01AE-OY   | XD-01-MN01 |
|        | 93 N           | 280 N      | SGLGW-40A253CPD | SGLGM-40090CT<br>SGLGM-40225CT<br>SGLGM-40360CT<br>SGLGM-40405CT<br>SGLGM-40450CT | JZDP-D008-253      | SGDH-02AE-OY   | XD-02-MN01 |
|        | 140 N          | 420 N      | SGLGW-40A365CPD |   | JZDP-D008-254      | SGDH-04AE-OY   | XD-04-MN01 |
|        | 70 N           | 220 N      | SGLGW-60A140CPD |   | JZDP-D008-258      | SGDH-02AE-OY   | XD-02-MN01 |
|        | 140 N          | 440 N      | SGLGW-60A253CPD |   | JZDP-D008-259      | SGDH-04AE-OY   | XD-04-MN01 |
|        | 210 N          | 660 N      | SGLGW-60A365CPD |   | JZDP-D008-260      | SGDH-08AE-S-OY | XD-08-MN   |
|        | 325 N          | 1300 N     | SGLGW-90A200CPD | SGLGM-90252A<br>SGLGM-90504A  | JZDP-D008-264      | SGDH-15AE-S-OY | XD-15-MN   |

**Note:** 1. Linear coils with design revision C replace the previous versions A and B. The serial converter required for revision C coil has changed from previous version, select it according to the table above

2. Magnetic ways with design revision CT and revision B can be combined

### With high-force magnetic ways - 230 VAC single phase

| Symbol   | Specifications |            | Model           |   |                    |                |            |
|--|----------------|------------|-----------------|---|--------------------|----------------|------------|
|  | Rated force    | Peak force | ① Linear coil   | ② Magnetic way  | ③ Serial converter | ④ Servo drive  |            |
|  | 57 N           | 230 N      | SGLGW-40A140CPD | SGLGM-40090CT-M                                       | JZDP-D008-255      | SGDH-02AE-OY   | XD-02-MN01 |
|  | 114 N          | 460 N      | SGLGW-40A253CPD | SGLGM-40225CT-M                                       | JZDP-D008-256      | SGDH-04AE-OY   | XD-04-MN01 |
|  | 171 N          | 690 N      | SGLGW-40A365CPD | SGLGM-40360CT-M<br>SGLGM-40405CT-M<br>SGLGM-40450CT-M | JZDP-D008-257      | SGDH-08AE-S-OY | XD-08-MN   |
|  | 85 N           | 360 N      | SGLGW-60A140CPD | SGLGM-60090CT-M                                       | JZDP-D008-261      | SGDH-02AE-OY   | XD-02-MN01 |
|  | 170 N          | 720 N      | SGLGW-60A253CPD | SGLGM-60225CT-M                                       | JZDP-D008-262      | SGDH-08AE-S-OY | XD-08-MN   |
|  | 255 N          | 1080 N     | SGLGW-60A365CPD | SGLGM-60360CT-M<br>SGLGM-60405CT-M<br>SGLGM-60450CT-M | JZDP-D008-263      | SGDH-15AE-S-OY | XD-15-MN   |

**Note:** 1. Linear coils with design revision C replace the previous versions A and B. The serial converter required for revision C coil has changed from previous version, select it according to the table above

2. Magnetic ways with design revision CT and revision B can be combined

### SGLFW / SGLFM iron-core type

#### 230 VAC single phase

| Symbol  | Specifications |            | Model           |  |                    |                |            |
|---|----------------|------------|-----------------|--|--------------------|----------------|------------|
|   | Rated force    | Peak force | ① Linear coil   | ② Magnetic way   | ③ Serial converter | ④ Servo drive  |            |
|  | 25 N           | 86 N       | SGLFW-20A090APD | SGLFM-20324AC  | JZDP-A008-017      | SGDH-02AE-OY   | XD-02-MN01 |
|   | 40 N           | 125 N      | SGLFW-20A120APD | SGLFM-20540AC<br>SGLFM-20756AC                                   | JZDP-A008-018      | SGDH-02AE-OY   | XD-02-MN01 |
|   | 80 N           | 220 N      | SGLFW-35A120APD | SGLFM-35324AC  | JZDP-A008-019      | SGDH-02AE-OY   | XD-02-MN01 |
|   | 160 N          | 440 N      | SGLFW-35A230APD | SGLFM-35540AC<br>SGLFM-35756AC                                   | JZDP-A008-020      | SGDH-08AE-S-OY | XD-08-MN01 |
|   | 280 N          | 600 N      | SGLFW-50A200BPD | SGLFM-50135AC  | JZDP-A008-181      | SGDH-08AE-S-OY | XD-08-MN   |
|   | 560 N          | 1200 N     | SGLFW-50A380BPD | SGLFM-50405AC<br>SGLFM-50675AC<br>SGLFM-50945AC                  | JZDP-A008-182      | SGDH-15AE-S-OY | XD-15-MN   |
|   | 560 N          | 1200 N     | SGLFW-1ZA200BPD | SGLFM-1Z135AC<br>SGLFM-1Z405AC<br>SGLFM-1Z675AC<br>SGLFM-1Z945AC | JZDP-A008-183      | SGDH-15AE-S-OY | XD-15-MN   |

**Note:** Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible

#### 400 VAC three phase

| Symbol  | Specifications |            | Model           |   |                    |               |          |
|---|----------------|------------|-----------------|---|--------------------|---------------|----------|
|   | Rated force    | Peak force | ① Linear coil   | ② Magnetic way                                  | ③ Serial converter | ④ Servo drive |          |
|  | 80 N           | 220 N      | SGLFW-35D120APD | SGLFM-35324AC                                   | JZDP-A008-211      | SGDH-05DE-OY  | XD-05-TN |
|   | 160 N          | 440 N      | SGLFW-35D230APD | SGLFM-35540AC<br>SGLFM-35756AC                  | JZDP-A008-212      | SGDH-05DE-OY  | XD-05-TN |
|   | 280 N          | 600 N      | SGLFW-50D200BPD | SGLFM-50135AC                                   | JZDP-A008-189      | SGDH-10DE-OY  | XD-10-TN |
|   | 560 N          | 1200 N     | SGLFW-50D380BPD | SGLFM-50405AC<br>SGLFM-50675AC<br>SGLFM-50945AC | JZDP-A008-190      | SGDH-15DE-OY  | XD-15-TN |
|   | 560 N          | 1200 N     | SGLFW-1ZD200BPD | SGLFM-1Z135AC                                   | JZDP-A008-191      | SGDH-15DE-OY  | XD-15-TN |
|   | 1120 N         | 2400 N     | SGLFW-1ZD380BPD | SGLFM-1Z405AC<br>SGLFM-1Z675AC<br>SGLFM-1Z945AC | JZDP-A008-192      | SGDH-30DE-OY  | XD-30-TN |
|   | 1500 N         | 3600 N     | SGLFW-1ED380BP  | SGLFM-1E135AC                                   | JZDP-D008-333      | SGDH-20DE-OY  | XD-20-TN |
|   | 2250 N         | 5400 N     | SGLFW-1ED560BP  |   | JZDP-D008-334      | SGDH-30DE-OY  | XD-30-TN |

**Note:** Serial converters with design revision A (JZDP-A008-xxx) will be replaced by revision D (JZDP-D008-xxx), both models are fully compatible

### SGLTW / SGLTM iron-core type

#### 400 VAC three phase

| Symbol   | Specifications |            | Model           |                                |                    |               |          |
|--|----------------|------------|-----------------|--------------------------------|--------------------|---------------|----------|
|  | Rated force    | Peak force | ① Linear coil   | ② Magnetic way                 | ③ Serial converter | ④ Servo drive |          |
|  | 300 N          | 600 N      | SGLTW-35D170HPD | SGLTM-35324HC                  | JZDP-D008-193      | SGDH-10DE-OY  | XD-10-TN |
|  | 600 N          | 1200 N     | SGLTW-35D320HPD | SGLTM-35540HC<br>SGLTM-35756HC | JZDP-D008-194      | SGDH-20DE-OY  | XD-20-TN |
|  | 450 N          | 900 N      | SGLTW-50D170HPD | SGLTM-50324HC                  | JZDP-D008-195      | SGDH-10DE-OY  | XD-10-TN |
|  | 900 N          | 1800 N     | SGLTW-50D320HPD | SGLTM-50540HC<br>SGLTM-50756HC | JZDP-D008-196      | SGDH-20DE-OY  | XD-20-TN |
|  | 670 N          | 2600 N     | SGLTW-40D400BP  | SGLTM-40405AC                  | JZDP-D008-197      | SGDH-30DE-OY  | XD-30-TN |
|  | 1000 N         | 4000 N     | SGLTW-40D600BP  | SGLTM-40675AC<br>SGLTM-40945AC | JZDP-D008-198      | SGDH-50DE-OY  | XD-50-TN |
|  | 1300 N         | 5000 N     | SGLTW-80D400BP  | SGLTM-80405AC                  | JZDP-D008-199      | SGDH-50DE-OY  | XD-50-TN |
|  | 2000 N         | 7500 N     | SGLTW-80D600BP  | SGLTM-80675AC<br>SGLTM-80945AC | JZDP-D008-200      | SGDH-75DE-OY  | -        |

## Servo drive

**Note:** Choosing Sigma-II drive or XtraDrive affects to the serial converter cable needed.

- ④ Refer to Sigma-II servo drive or XtraDrive chapter for detailed drive specifications and selection of drive accessories.

## Serial converter cable to servo drive

| Symbol | Specifications                            | Model                | Appearance |
|--------|---|----------------------|------------|
| (5)    | Sigma-II drive to serial converter cable  | 3 m JZSP-CLP70-03-E  |            |
|        |   | 5 m JZSP-CLP70-05-E  |            |
|        |   | 10 m JZSP-CLP70-10-E |            |
|        |   | 15 m JZSP-CLP70-15-E |            |
|        |   | 20 m JZSP-CLP70-20-E |            |
|        | XtraDrive drive to serial converter cable | 3 m XD-CLP70-03-E    |            |
|        |   | 5 m XD-CLP70-05-E    |            |
|        |   | 10 m XD-CLP70-10-E   |            |
|        |   | 15 m XD-CLP70-15-E   |            |
|        |   | 20 m XD-CLP70-20-E   |            |

## Power cables

| Symbol | Specifications   | Model                 | Appearance |
|--------|--|-----------------------|------------|
| (6)    | For 200 V servo motors<br>SGLGW-30A□□□□D<br>SGLGW-40A□□□□D<br>SGLGW-60A□□□□D<br>SGLFW-20A□□□A□D<br>SGLFW-35A□□□A□D | 3 m R88A-CAWA003S-DE  |            |
|        |  | 5 m R88A-CAWA005S-DE  |            |
|        |  | 10 m R88A-CAWA010S-DE |            |
|        |  | 15 m R88A-CAWA015S-DE |            |
|        |  | 20 m R88A-CAWA020S-DE |            |
|        |  | 3 m R88A-CAWB003S-DE  |            |
|        | For 200 V servo motors<br>SGLGW-90A200□□D<br>SGLFW-50A□□□B□D<br>SGLFW-1ZA200B□D                                    | 5 m R88A-CAWB005S-DE  |            |
|        |  | 10 m R88A-CAWB010S-DE |            |
|        |  | 15 m R88A-CAWB015S-DE |            |
|        |  | 20 m R88A-CAWB020S-DE |            |
|        | For 400 V servo motors<br>SGLFW-35D□□□A□D<br>SGLFW-50D200□D<br>SGLTW-35D170H□D<br>SGLTW-50D170H□D                  | 3 m R88A-CAWK003S-DE  |            |
|        |  | 5 m R88A-CAWK005S-DE  |            |
|        |  | 10 m R88A-CAWK010S-DE |            |
|        |  | 15 m R88A-CAWK015S-DE |            |
|        |  | 20 m R88A-CAWK020S-DE |            |
|        | For 400 V servo motors<br>SGLFW-50D380□D<br>SGLFW-1ZD□□□B□D<br>SGLTW-35D320H□D<br>SGLTW-50D320H□D                  | 3 m R88A-CAWL003S-DE  |            |
|        |  | 5 m R88A-CAWL005S-DE  |            |
|        |  | 10 m R88A-CAWL010S-DE |            |
|        |  | 15 m R88A-CAWL015S-DE |            |
|        |  | 20 m R88A-CAWL020S-DE |            |
|        | For 400 V servo motors<br>SGLFW-1ED□□□B□<br>SGLTW-40D□□□B□<br>SGLTW-80D□□□B□                                       | 3 m R88A-CAWD003S-E   |            |
|        |  | 5 m R88A-CAWD005S-E   |            |
|        |  | 10 m R88A-CAWD010S-E  |            |
|        |  | 15 m R88A-CAWD015S-E  |            |
|        |  | 20 m R88A-CAWD020S-E  |            |

**Linear scale cable to serial converter**

| Symbol | Specifications   | Model                | Appearance |
|--------|--|----------------------|------------|
| (7)    | Extension cable for <b>Renishaw</b> linear scale to serial converter.<br>(Connector DB-15)<br>(the extension cable is optional)                                  | 1 m JZSP-CLL00-01-E  |            |
|        |  | 3 m JZSP-CLL00-03-E  |            |
|        |  | 5 m JZSP-CLL00-05-E  |            |
|        |  | 10 m JZSP-CLL00-10-E |            |
|        |  | 15 m JZSP-CLL00-15-E |            |
|        | Extension cable for <b>Heidenhain</b> linear scale to serial converter<br>(Connector DB-15)<br>(when a Heidenhain scale is used the extension cable is required) | 1 m JZSP-CLL20-01-E  |            |
|        |  | 3 m JZSP-CLL20-03-E  |            |
|        |  | 5 m JZSP-CLL20-05-E  |            |
|        |  | 10 m JZSP-CLL20-10-E |            |
|        |  | 15 m JZSP-CLL20-15-E |            |

**Hall sensor cable to serial converter**

| Symbol | Specifications  | Model                | Appearance |
|--------|---|----------------------|------------|
| (8)    | Extension cable for linear scale to serial converter<br>(The extension cable is optional) | 1 m JZSP-CLL10-01-E  |            |
|        |   | 3 m JZSP-CLL10-03-E  |            |
|        |   | 5 m JZSP-CLL10-05-E  |            |
|        |   | 10 m JZSP-CLL10-10-E |            |
|        |   | 15 m JZSP-CLL10-15-E |            |

**Connectors**

| Specification  | Model            |
|--|------------------|
| Hypertac power connector IP67 (for 200 V motor coils SGL□W-□□A□□□□D)         | SPOC-06K-FSDN169 |
| Hypertac power connector IP67 (for 400 V motor coils SGL□W-□□D□□□□D)         | LPRA-06B-FRBN170 |
| Military power connector IP67 (for motor coils SGLTW-40□/80□ and SGLFW-1ED□) | MS3108E22-22S    |

**Dimensioning software**

| Specifications | Model           |
|----------------|-----------------|
| SigmaSize      | MOTION TOOLS CD |

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

LETLA-□-F□

# Sigma linear axis

## Linear servo axis ready to use

- Highly enclosed construction avoids falling parts into the magnets and bearings area
- Plug and drive, shorten start-up time
- Long durability, reliable and constant performance after years of use
- Designed for an easy servicing
- Direct control of the axis using XtraDrive and Sigma-II drives
- Extremely energy efficient, due to its optimised magnetic circuitry design and high-density winding
- For special lengths, special specifications and XY systems contact your OMRON sales office

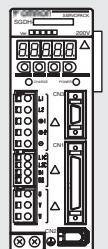


## Ratings

- 230 VAC Single-phase 80 to 560 N (1200 N peak)
- 400 VAC Three-phase 80 to 1200 N (2400 N peak)

## System configuration

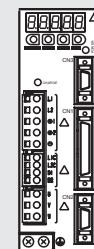
(Refer to Servo Drive chapter)



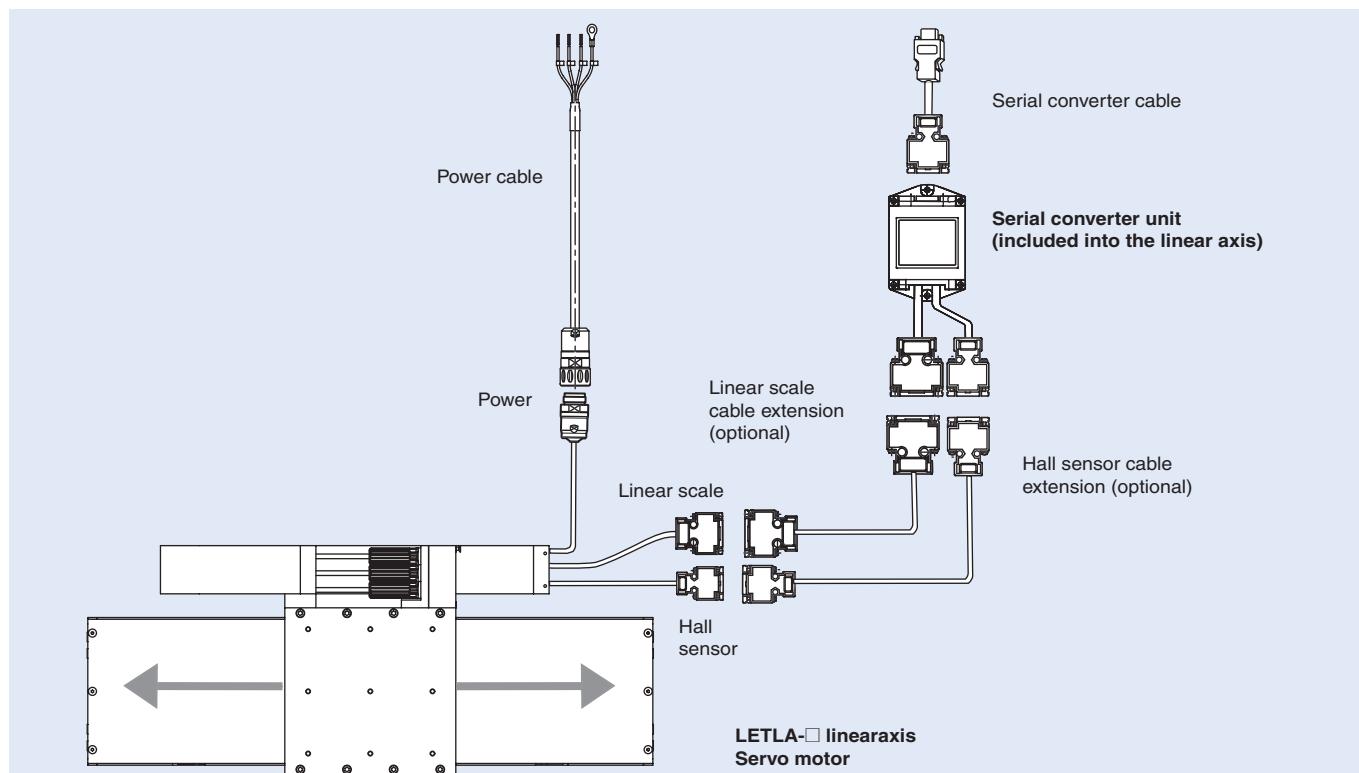
**Servo Drive with option boards for flexible system configuration**

Sigma-II  
Servo Drive

Drive options



**Intelligent Servo Drive**

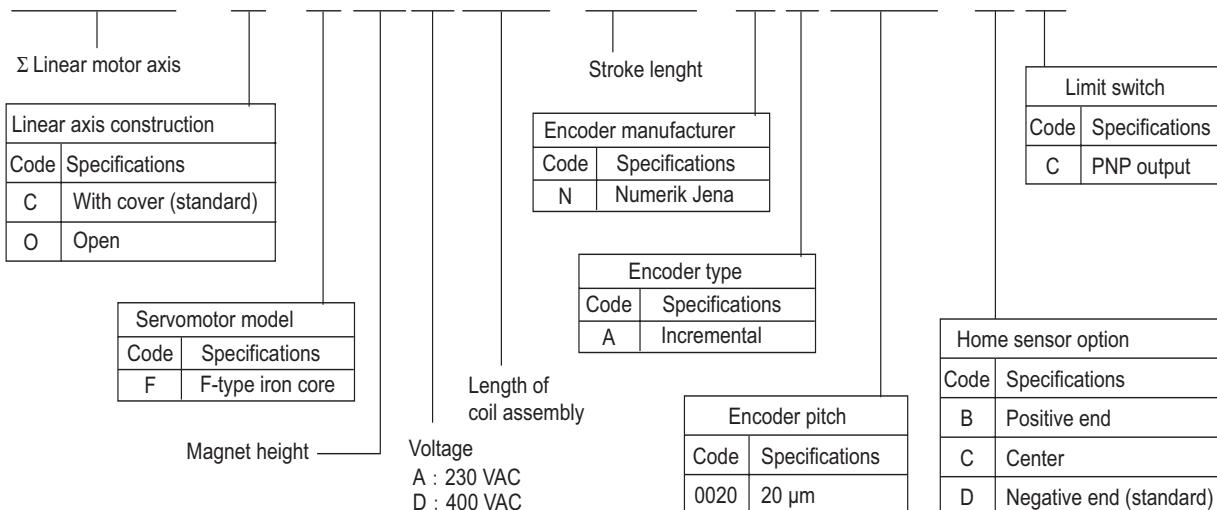


| Sigma series linear axis       |         |             |            |                    | Serial converter<br>(included in LETLA) | Servo drive<br>Sigma-II series |                    | XtraDrive          |                    |
|--------------------------------|---------|-------------|------------|--------------------|---|--------------------------------|--------------------|--------------------|--------------------|
| Type                           | Voltage | Rated force | Peak force | Model              | Model<br>JZDP-□008-                     | 230 V<br>(1-phase)             | 400 V<br>(3-phase) | 230 V<br>(1-phase) | 400 V<br>(3-phase) |
| LET LA-□-<br>Linear motor axes | 230 V   | 80 N        | 220 N      | LET LA-□-F35A120-□ | 019                                     | SGDH-02AE-OY                   | -                  | XD-02-MN01         | -                  |
|                                |         | 160 N       | 440 N      | LET LA-□-F35A230-□ | 020                                     | SGDH-08AE-S-OY                 | -                  | XD-08-MN           | -                  |
|                                |         | 280 N       | 600 N      | LET LA-□-F50A200-□ | 181                                     | SGDH-08AE-S-OY                 | -                  | XD-08-MN           | -                  |
|                                |         | 560 N       | 1200 N     | LET LA-□-F50A380-□ | 182                                     | SGDH-15AE-S-OY                 | -                  | XD-15-MN           | -                  |
|                                |         | 560 N       | 1200 N     | LET LA-□-F1ZA200-□ | 183                                     | SGDH-15AE-S-OY                 | -                  | XD-15-MN           | -                  |
|                                | 400 V   | 80 N        | 220 N      | LET LA-□-F35D120-□ | 211                                     | -                              | SGDH-05DE-OY       | -                  | XD-05-TN           |
|                                |         | 160 N       | 440 N      | LET LA-□-F35D230-□ | 212                                     | -                              | SGDH-05DE-OY       | -                  | XD-05-TN           |
|                                |         | 280 N       | 600 N      | LET LA-□-F50D200-□ | 189                                     | -                              | SGDH-10DE-OY       | -                  | XD-10-TN           |
|                                |         | 560 N       | 1200 N     | LET LA-□-F50D380-□ | 190                                     | -                              | SGDH-15DE-OY       | -                  | XD-15-TN           |
|                                |         | 560 N       | 1200 N     | LET LA-□-F1ZD200-□ | 191                                     | -                              | SGDH-15DE-OY       | -                  | XD-15-TN           |
|                                |         | 1120 N      | 2400 N     | LET LA-□-F1ZD380-□ | 192                                     | -                              | SGDH-30DE-OY       | -                  | XD-30-TN           |

## Type designation

### Linear axis

LET LA - C- F50 A 200-0549- NA0020 - D C



## Servomotor specifications

### Linear axis LETLA-□-F□□A (200 V)

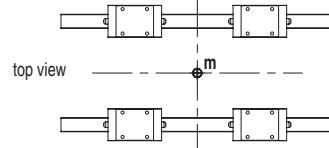
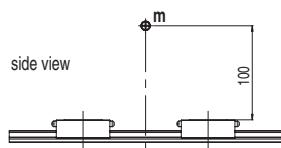
| Voltage                       |   |                  |                  |                  |   |                  |
|-------------------------------|---|------------------|------------------|------------------|---|------------------|
| Linear axis model             |   | F35A120-□-NA0020 | F35A230-□-NA0020 | F50A200-□-NA0020 | F50A380-□-NA0020  | F1ZA200-□-NA0020 |
| Motor coil specifications     | Linear servo motor coil used                  | SGLFW-           | 35A120A          | 35A230A          | 50A200B   | 50A380B          |
|                               | Rated force <sup>*1</sup>                     | N                | 80               | 160              | 280   | 560              |
|                               | Instantaneous peak force <sup>*1</sup>        | N                | 220              | 440              | 600   | 1200             |
|                               | Rated current <sup>*1</sup>                   | Arms             | 1.4              | 2.8              | 5.0   | 10.0             |
|                               | Instantaneous peak current <sup>*1</sup>      | Arms             | 4.4              | 8.8              | 12.4  | 25.0             |
|                               | Force constant                                | N / Arms         | 62.4             | 62.4             | 60.2  | 60.2             |
|                               | BEMF constant                                 | V / (m / s)      | 20.8             | 20.8             | 20.1  | 20.1             |
|                               | Motor constant                                | N / √W           | 14.4             | 20.4             | 34.3  | 48.5             |
|                               | Electrical time constant                      | ms               | 3.6              | 3.6              | 15.9  | 15.8             |
|                               | Mechanical time constant                      | ms               | 6.2              | 5.5              | 3.0   | 2.9              |
| Axis specifications           | Position accuracy repeatability <sup>*2</sup> | μm               |                  |                  | +/-1  |                  |
|                               | Absolute position accuracy <sup>*2</sup>      | μm/100mm         |                  |                  | +/-5  |                  |
|                               | Linear encoder resolution                     | μm               |                  |                  | 0.078 μm = 20 μm / 256 (8bit)   |                  |
|                               | Static friction of the axis <sup>*3</sup>     | N                | 20               | 25               | 30  | 35               |
|                               | Maximum load <sup>*3</sup>                    | kg               | 60               | 60               | 80  | 80               |
|                               | Bearings model used                           | THK              | SSR 15           | SSR 15           | SSR 15  | SSR 15           |
| Basic specifications          | Linear measuring head used                    | Numerik Jena     |                  |                  | LIA20-C001-KZ   |                  |
|                               | Linear measuring scale used                   |                  |                  |                  | MV5340  | □□□□             |
|                               | Available lengths                             | m                |                  |                  | Standard lenght up to 2.5 m(see dimensions section) / for lengths up to 5 m contact your OMRON sales office |                  |
|                               | Time rating                                   |                  |                  |                  | Continuous  |                  |
| Insulation class              |   |                  |                  |                  | Class B   |                  |
| Ambient temperature           |   |                  |                  |                  | 0 to +40 °C   |                  |
| Ambient humidity              |   |                  |                  |                  | 20 to 80% (non-condensing)  |                  |
| Insulation resistance         |   |                  |                  |                  | 500 VDC, 10 MΩ min.   |                  |
| Excitation                    |   |                  |                  |                  | Permanent magnet  |                  |
| Dielectric strength           |   |                  |                  |                  | 1500 VAC for 1 minute   |                  |
| Protection methods            |   |                  |                  |                  | Self-cooled   |                  |
| Allowable winding temperature |   |                  |                  |                  | 130 °C  |                  |

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

\*2. With stable environmental conditions and motor temperature unchanged.

\*3. Items calculated with load position like in figure below.

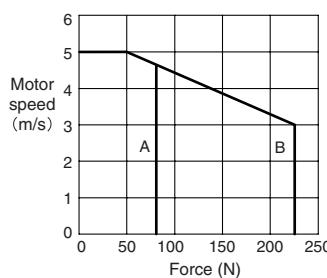
Centre of mass position



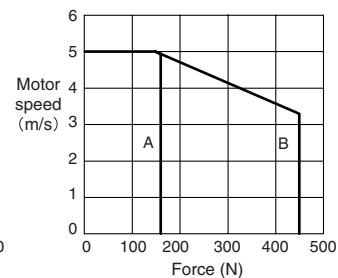
### Force-speed characteristics (200 V)

A: Continuous duty zone    B: Intermittent duty zone

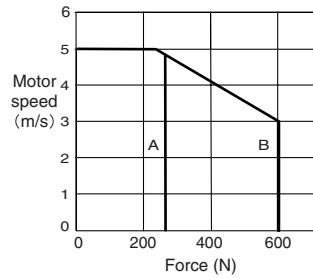
SGLFW-35A120A



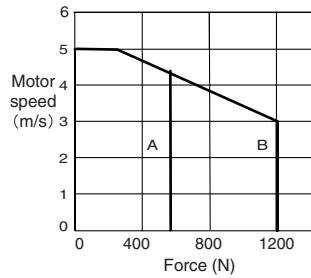
SGLFW-35A230A



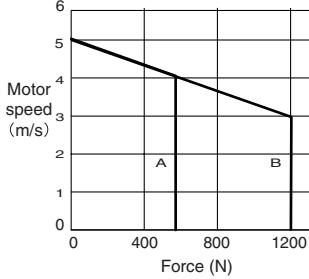
SGLFW-50A200B



SGLFW-50A380B



SGLFW-1ZA200B



## Linear axis LETLA-□-F□□D(400V)

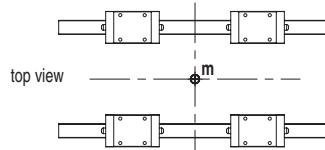
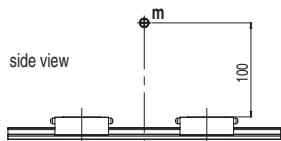
| Voltage                   |   | 400V                 |  |                  |                 |                  |                  |                  |
|---------------------------|---|----------------------|--|------------------|-----------------|------------------|------------------|------------------|
| Linear axis model         |   | LETLA-□-             | F35D120-□-NA0020   | F35D230-□-NA0020 | F50D20-□-NA0020 | F50D380-□-NA0020 | F1ZD200-□-NA0020 | F1ZD380-□-NA0020 |
| Motor coil specifications | Linear Servomotor coil used                   | SGLFW-               | 35D120A  | 35D230A          | 50D200B         | 50D380B          | 1ZD200B          | 1ZD380B          |
|                           | Rated force <sup>*1</sup>                     | N                    | 80   | 160              | 280             | 560              | 560              | 1120             |
|                           | Instantaneous peak force <sup>*1</sup>        | N                    | 220  | 440              | 600             | 1200             | 1200             | 2400             |
|                           | Rated current <sup>*1</sup>                   | A <sub>rms</sub>     | 0.7  | 1.4              | 2.3             | 4.5              | 4.9              | 9.8              |
|                           | Instantaneous peak current <sup>*1</sup>      | A <sub>rms</sub>     | 2.3  | 4.6              | 5.6             | 11.0             | 12.3             | 24.6             |
|                           | Force constant                                | N / A <sub>rms</sub> | 120.2  | 120.2            | 134.7           | 134.7            | 122.6            | 122.6            |
|                           | BEMF constant                                 | V / (m / s)          | 40.1   | 40.1             | 44.9            | 44.9             | 40.9             | 40.9             |
|                           | Motor constant                                | N / ∙W               | 13.8   | 19.5             | 33.4            | 47.2             | 51.0             | 72.1             |
|                           | Electrical time constant                      | ms                   | 3.5  | 3.5              | 15.0            | 15.0             | 17.4             | 17.2             |
|                           | Mechanical time constant                      | ms                   | 5.5  | 5.5              | 3.2             | 3.2              | 2.5              | 2.2              |
| Axis specifications       | Position accuracy repeatability <sup>*2</sup> | μm                   | +/-1   |                  |                 |                  |                  |                  |
|                           | Absolute position accuracy <sup>*2</sup>      | μm/100mm             | +/-5   |                  |                 |                  |                  |                  |
|                           | Linear encoder resolution                     | μm                   | 0.078 μm = 20 μm / 256 (8 bit)   |                  |                 |                  |                  |                  |
|                           | Static friction of the axis <sup>*3</sup>     | N                    | 20   | 25               | 30              | 35               | 50               | 60               |
|                           | Maximum load <sup>*3</sup>                    | kg                   | 60   | 60               | 80              | 80               | 150              | 150              |
|                           | Bearings model used                           | THK                  | SSR 15   | SSR 15           | SSR 15          | SSR 15           | SSR 25           | SSR 25           |
|                           | Linear measuring head used                    | Numerik Jena         | LIA20-C001-KZ  |                  |                 |                  |                  |                  |
|                           | Linear measuring scale used                   |                      | MV5340□□□□   |                  |                 |                  |                  |                  |
|                           | Available lengths                             | m                    | Standard lenght up to 2.5 m (see dimensions section) / for lengths up to 5m contact you OMRON sales office |                  |                 |                  |                  |                  |
|                           | Time rating                                   |                      | Continuous   |                  |                 |                  |                  |                  |
| Basic specifications      | Insulation class                              |                      | Class B  |                  |                 |                  |                  |                  |
|                           | Ambient temperature                           |                      | 0 to +40° C  |                  |                 |                  |                  |                  |
|                           | Ambient humidity                              |                      | 20 to 80% (non-condensing)   |                  |                 |                  |                  |                  |
|                           | Insulation resistance                         |                      | 500 VDC, 10 MΩ min.  |                  |                 |                  |                  |                  |
|                           | Excitation                                    |                      | Permanent magnet   |                  |                 |                  |                  |                  |
|                           | Dielectric strength                           |                      | 1500 VAC for 1 minute  |                  |                 |                  |                  |                  |
|                           | Protection methods                            |                      | Self-cooled  |                  |                 |                  |                  |                  |
|                           | Allowable winding temperature                 |                      | 130 °C   |                  |                 |                  |                  |                  |

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

\*2. With stable environmental conditions and motor temperature unchanged

\*3. Items calculated with load position like in figure below

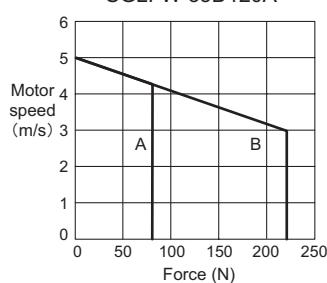
Centre of mass position



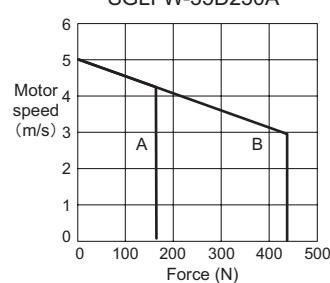
### Force-speed characteristics (400 V)

A: Continuous duty zone    B: Intermittent duty zone

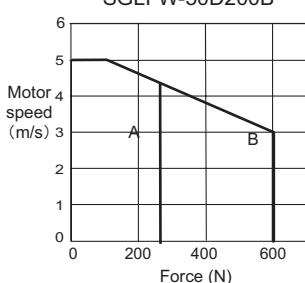
SGLFW-35D120A



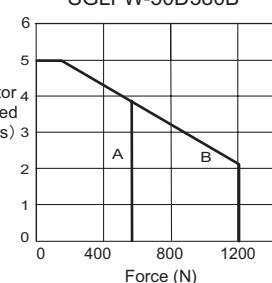
SGLFW-35D230A



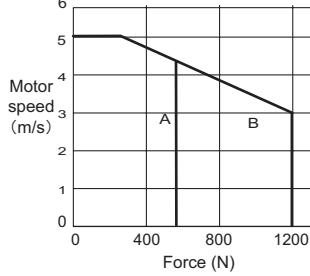
SGLFW-50D200B



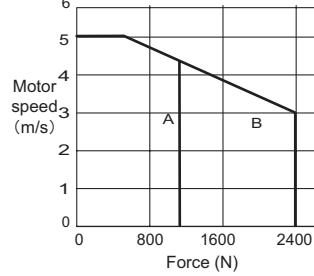
SGLFW-50D380B



SGLFW-1ZD200B



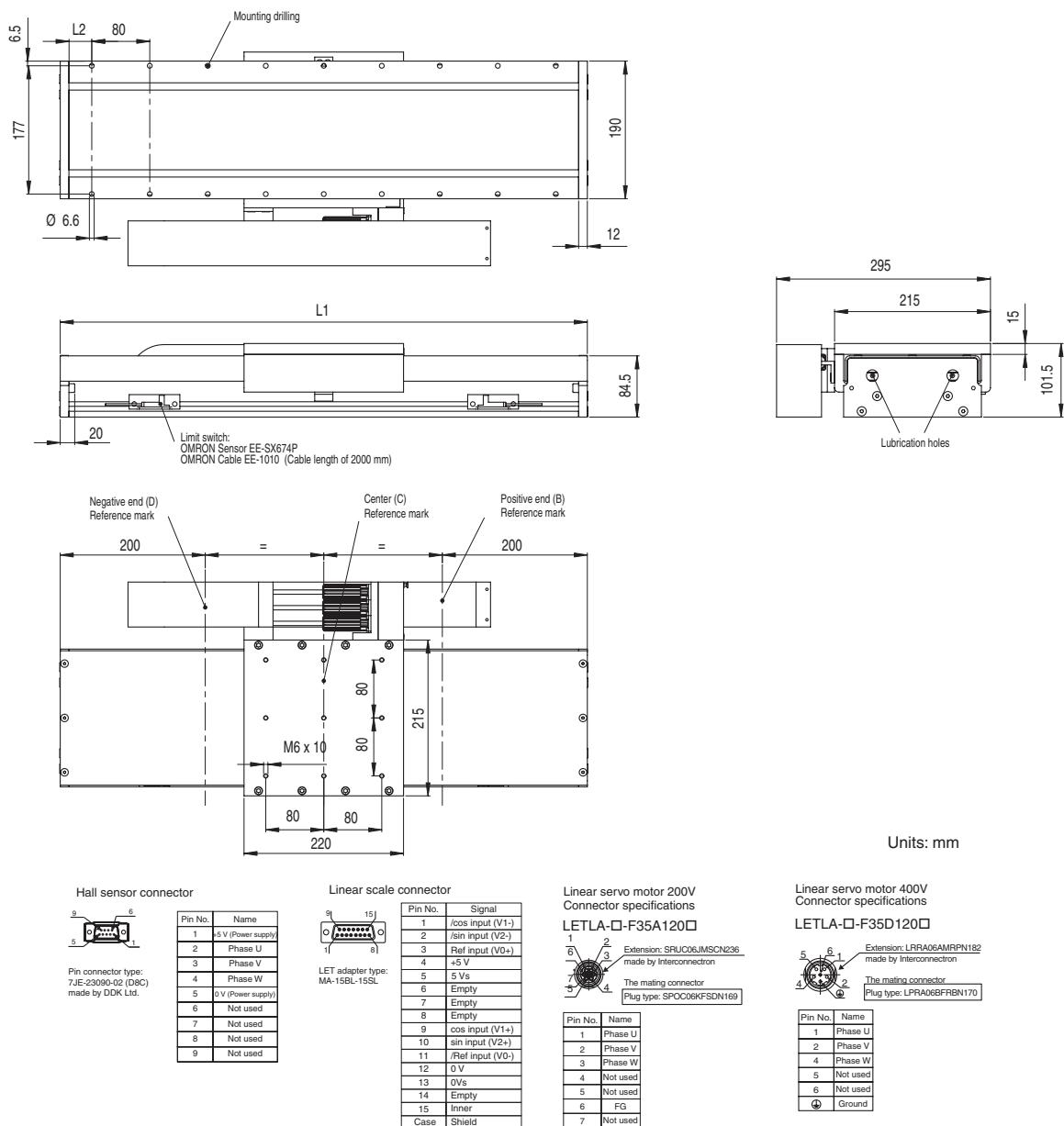
SGLFW-1ZD380B



## Dimensions

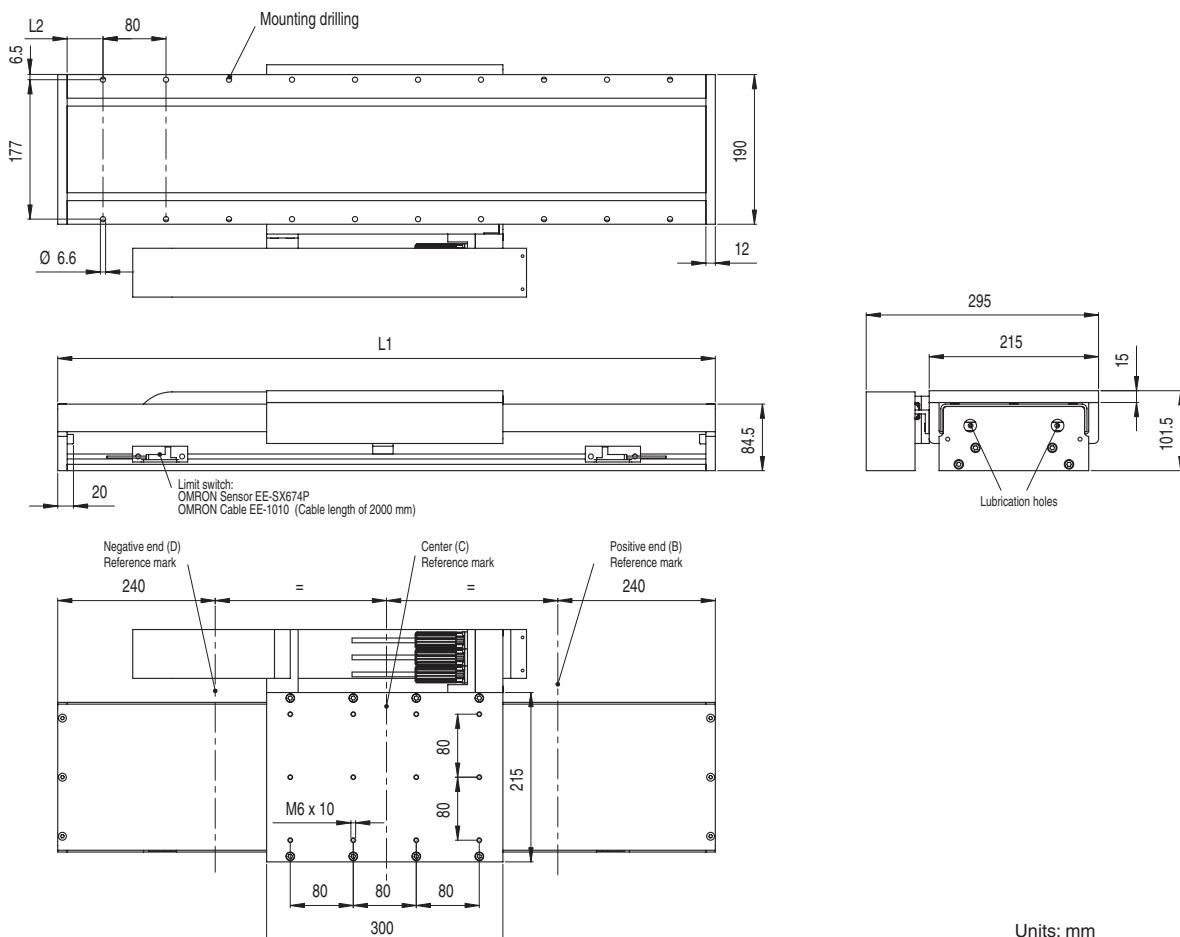
### LETLA-C-F35□120-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weight of moving table<br>including motor coil (kg) | Weight of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F35□120-0103-NA0020-□C | 103                       | 403         | 29.5        | 7.6   | 16                                  |
| LETLA-C-F35□120-0319-NA0020-□C | 319                       | 619         | 17.5        | 7.6   | 19                                  |
| LETLA-C-F35□120-0427-NA0020-□C | 427                       | 727         | 31.5        | 7.6   | 21                                  |
| LETLA-C-F35□120-0535-NA0020-□C | 535                       | 835         | 45.5        | 7.6   | 23                                  |
| LETLA-C-F35□120-0643-NA0020-□C | 643                       | 943         | 19.5        | 7.6   | 25                                  |
| LETLA-C-F35□120-0751-NA0020-□C | 751                       | 1051        | 33.5        | 7.6   | 27                                  |
| LETLA-C-F35□120-0859-NA0020-□C | 859                       | 1159        | 47.5        | 7.6   | 29                                  |
| LETLA-C-F35□120-0967-NA0020-□C | 967                       | 1267        | 21.5        | 7.6   | 31                                  |
| LETLA-C-F35□120-1075-NA0020-□C | 1075                      | 1375        | 35.5        | 7.6   | 33                                  |
| LETLA-C-F35□120-1183-NA0020-□C | 1183                      | 1483        | 49.5        | 7.6   | 35                                  |
| LETLA-C-F35□120-1291-NA0020-□C | 1291                      | 1591        | 23.5        | 7.6   | 36                                  |
| LETLA-C-F35□120-1399-NA0020-□C | 1399                      | 1699        | 37.5        | 7.6   | 38                                  |
| LETLA-C-F35□120-1507-NA0020-□C | 1507                      | 1807        | 13.5        | 7.6   | 40                                  |
| LETLA-C-F35□120-1615-NA0020-□C | 1615                      | 1915        | 25.5        | 7.6   | 42                                  |
| LETLA-C-F35□120-1723-NA0020-□C | 1723                      | 2023        | 41.5        | 7.6   | 44                                  |
| LETLA-C-F35□120-1831-NA0020-□C | 1831                      | 2131        | 13.5        | 7.6   | 46                                  |
| LETLA-C-F35□120-1939-NA0020-□C | 1939                      | 2239        | 29.5        | 7.6   | 48                                  |
| LETLA-C-F35□120-2047-NA0020-□C | 2047                      | 2347        | 41.5        | 7.6   | 50                                  |
| LETLA-C-F35□120-2155-NA0020-□C | 2155                      | 2455        | 17.5        | 7.6   | 52                                  |



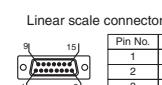
## LETLA-C-F35□230-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weight of moving table<br>including motor coil (kg) | Weight of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F35□230-0239-NA0020-□C | 239                       | 619         | 17.5        | 11.5  | 23                                  |
| LETLA-C-F35□230-0347-NA0020-□C | 347                       | 727         | 31.5        | 11.5  | 25                                  |
| LETLA-C-F35□230-0455-NA0020-□C | 455                       | 835         | 45.5        | 11.5  | 27                                  |
| LETLA-C-F35□230-0563-NA0020-□C | 563                       | 943         | 19.5        | 11.5  | 28                                  |
| LETLA-C-F35□230-0671-NA0020-□C | 671                       | 1051        | 33.5        | 11.5  | 30                                  |
| LETLA-C-F35□230-0779-NA0020-□C | 779                       | 1159        | 47.5        | 11.5  | 32                                  |
| LETLA-C-F35□230-0887-NA0020-□C | 887                       | 1267        | 21.5        | 11.5  | 34                                  |
| LETLA-C-F35□230-0995-NA0020-□C | 995                       | 1375        | 35.5        | 11.5  | 36                                  |
| LETLA-C-F35□230-1103-NA0020-□C | 1103                      | 1483        | 49.5        | 11.5  | 38                                  |
| LETLA-C-F35□230-1211-NA0020-□C | 1211                      | 1591        | 23.5        | 11.5  | 40                                  |
| LETLA-C-F35□230-1319-NA0020-□C | 1319                      | 1699        | 37.5        | 11.5  | 42                                  |
| LETLA-C-F35□230-1427-NA0020-□C | 1427                      | 1807        | 13.5        | 11.5  | 44                                  |
| LETLA-C-F35□230-1535-NA0020-□C | 1535                      | 1915        | 25.5        | 11.5  | 45                                  |
| LETLA-C-F35□230-1643-NA0020-□C | 1643                      | 2023        | 41.5        | 11.5  | 47                                  |
| LETLA-C-F35□230-1751-NA0020-□C | 1751                      | 2131        | 13.5        | 11.5  | 49                                  |
| LETLA-C-F35□230-1859-NA0020-□C | 1859                      | 2239        | 29.5        | 11.5  | 51                                  |
| LETLA-C-F35□230-1967-NA0020-□C | 1967                      | 2347        | 41.5        | 11.5  | 53                                  |
| LETLA-C-F35□230-2075-NA0020-□C | 2075                      | 2455        | 17.5        | 11.5  | 55                                  |
| LETLA-C-F35□230-2183-NA0020-□C | 2183                      | 2563        | 29.5        | 11.5  | 57                                  |



Pin connector type:  
7JE-23060-02 (D8C)  
made by DDK Ltd.

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



LET adapter type:  
MA-15BL-15SL

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

Linear servo motor 200 V  
Connector specifications

LETLA-□-F35A230□  
Extension: SRUJ06AMSCN236  
made by Interconnection  
The mating connector  
Plug type: SPC0GK6FSDN169

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

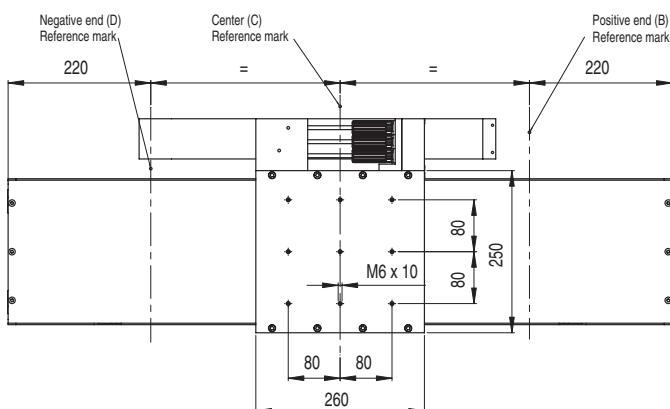
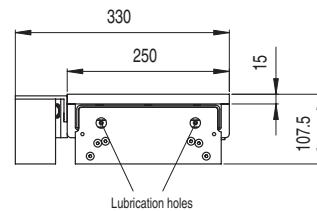
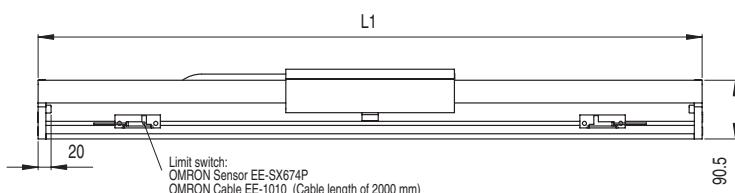
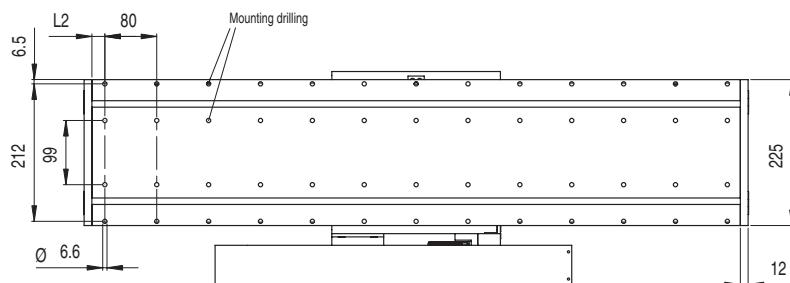
Linear servo motor 400 V  
Connector specifications

LETLA-□-F35D230□  
Extension: LRRA06AMRPN182  
made by Interconnection  
The mating connector  
Plug type: LPR406BFRBN170

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

## LETLA-C-F50□200-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weight of moving table<br>including motor coil (kg) | Weight of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F50□200-0144-NA0020-□C | 144                       | 484         | 30.0        | 11.2  | 25                                  |
| LETLA-C-F50□200-0414-NA0020-□C | 414                       | 754         | 45.0        | 11.2  | 31                                  |
| LETLA-C-F50□200-0549-NA0020-□C | 549                       | 889         | 32.5        | 11.2  | 34                                  |
| LETLA-C-F50□200-0684-NA0020-□C | 684                       | 1024        | 20.0        | 11.2  | 37                                  |
| LETLA-C-F50□200-0819-NA0020-□C | 819                       | 1159        | 47.5        | 11.2  | 40                                  |
| LETLA-C-F50□200-0954-NA0020-□C | 954                       | 1294        | 35.0        | 11.2  | 43                                  |
| LETLA-C-F50□200-1089-NA0020-□C | 1089                      | 1429        | 22.5        | 11.2  | 46                                  |
| LETLA-C-F50□200-1224-NA0020-□C | 1224                      | 1564        | 50.0        | 11.2  | 49                                  |
| LETLA-C-F50□200-1359-NA0020-□C | 1359                      | 1699        | 37.5        | 11.2  | 52                                  |
| LETLA-C-F50□200-1494-NA0020-□C | 1494                      | 1834        | 25.0        | 11.2  | 55                                  |
| LETLA-C-F50□200-1629-NA0020-□C | 1629                      | 1969        | 12.5        | 11.2  | 58                                  |
| LETLA-C-F50□200-1764-NA0020-□C | 1764                      | 2104        | 40.0        | 11.2  | 61                                  |
| LETLA-C-F50□200-1899-NA0020-□C | 1899                      | 2239        | 27.5        | 11.2  | 64                                  |
| LETLA-C-F50□200-2034-NA0020-□C | 2034                      | 2374        | 15.0        | 11.2  | 67                                  |
| LETLA-C-F50□200-2169-NA0020-□C | 2169                      | 2509        | 42.5        | 11.2  | 70                                  |



Units: mm

Hall sensor connector

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

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

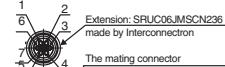
Linear scale connector

LET adapter type:  
MA-15BL-1SSL

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

Linear servo motor 200 V  
Connector specifications

LETLA-□-F50A200□

Extension: SRUC06AMRPN182  
made by Interconnectron

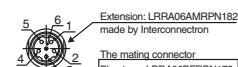
The mating connector

Plug type: SPOC06KFSDN169

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

Linear servo motor 400 V  
Connector specifications

LETLA-□-F50D200□

Extension: LRPA06AMRPN182  
made by Interconnectron

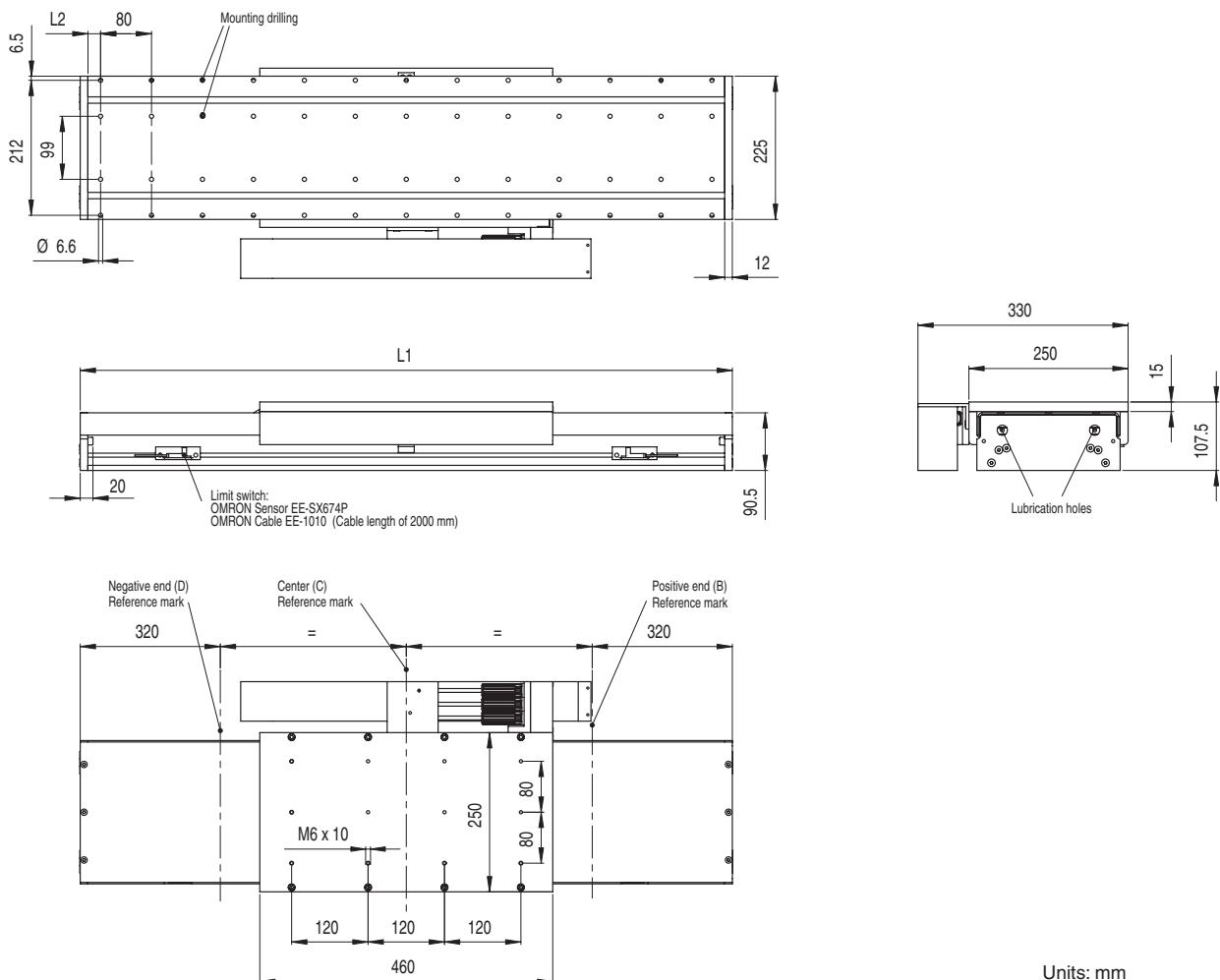
The mating connector

Plug type: LPRA06BFBRN170

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

## LETLA-C-F50□380-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weigth of moving table<br>including motor coil (kg) | Weigth of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F50□380-0214-NA0020-□C | 214                       | 754         | 45.0        | 22.5  | 40                                  |
| LETLA-C-F50□380-0349-NA0020-□C | 349                       | 889         | 32.5        | 22.5  | 43                                  |
| LETLA-C-F50□380-0484-NA0020-□C | 484                       | 1024        | 20.0        | 22.5  | 46                                  |
| LETLA-C-F50□380-0619-NA0020-□C | 619                       | 1159        | 47.5        | 22.5  | 49                                  |
| LETLA-C-F50□380-0754-NA0020-□C | 754                       | 1294        | 35.0        | 22.5  | 52                                  |
| LETLA-C-F50□380-0889-NA0020-□C | 889                       | 1429        | 22.5        | 22.5  | 55                                  |
| LETLA-C-F50□380-1024-NA0020-□C | 1024                      | 1564        | 50.0        | 22.5  | 58                                  |
| LETLA-C-F50□380-1159-NA0020-□C | 1159                      | 1699        | 37.5        | 22.5  | 61                                  |
| LETLA-C-F50□380-1294-NA0020-□C | 1294                      | 1834        | 25.0        | 22.5  | 64                                  |
| LETLA-C-F50□380-1429-NA0020-□C | 1429                      | 1969        | 12.5        | 22.5  | 67                                  |
| LETLA-C-F50□380-1564-NA0020-□C | 1564                      | 2104        | 40.0        | 22.5  | 70                                  |
| LETLA-C-F50□380-1699-NA0020-□C | 1699                      | 2239        | 27.5        | 22.5  | 74                                  |
| LETLA-C-F50□380-1834-NA0020-□C | 1834                      | 2374        | 15.0        | 22.5  | 77                                  |
| LETLA-C-F50□380-1969-NA0020-□C | 1969                      | 2509        | 42.5        | 22.5  | 80                                  |
| LETLA-C-F50□380-2104-NA0020-□C | 2104                      | 2644        | 30.0        | 22.5  | 83                                  |



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

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



LET adapter type:  
MA-15BL-15SL

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

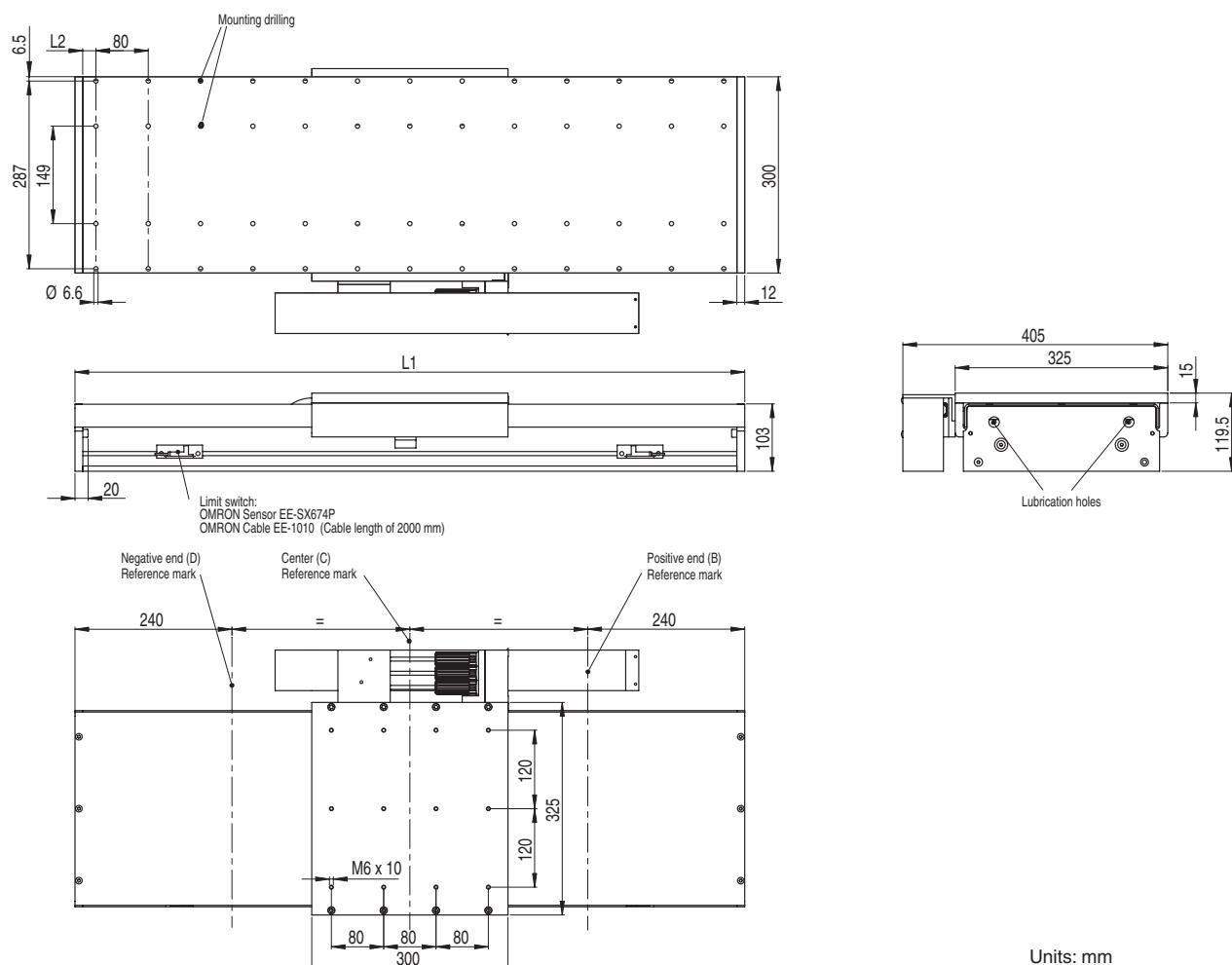
|   |          |
|---|----------|
| 1 | Phase U  |
| 2 | Phase V  |
| 3 | Phase W  |
| 4 | Not used |
| 5 | Not used |
| 6 | Not used |
| 7 | Not used |

|   |          |
|---|----------|
| 1 | Phase U  |
| 2 | Phase V  |
| 3 | Phase W  |
| 4 | Not used |
| 5 | Not used |
| 6 | Not used |
| 7 | Not used |

|   |          |
|---|----------|
| 1 | Phase U  |
| 2 | Phase V  |
| 3 | Phase W  |
| 4 | Not used |
| 5 | Not used |
| 6 | Not used |
| 7 | Ground   |

## LETLA-C-F1Z□200-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weight of moving table<br>including motor coil (kg) | Weight of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F1Z□200-0104-NA0020-□C | 104                       | 484         | 30.0        | 18  | 37                                  |
| LETLA-C-F1Z□200-0374-NA0020-□C | 374                       | 754         | 45.0        | 18  | 47                                  |
| LETLA-C-F1Z□200-0509-NA0020-□C | 509                       | 889         | 32.5        | 18  | 52                                  |
| LETLA-C-F1Z□200-0644-NA0020-□C | 644                       | 1024        | 20.0        | 18  | 57                                  |
| LETLA-C-F1Z□200-0779-NA0020-□C | 779                       | 1159        | 47.5        | 18  | 62                                  |
| LETLA-C-F1Z□200-0914-NA0020-□C | 914                       | 1294        | 35.0        | 18  | 67                                  |
| LETLA-C-F1Z□200-1049-NA0020-□C | 1049                      | 1429        | 22.5        | 18  | 72                                  |
| LETLA-C-F1Z□200-1184-NA0020-□C | 1184                      | 1564        | 50.0        | 18  | 77                                  |
| LETLA-C-F1Z□200-1319-NA0020-□C | 1319                      | 1699        | 37.5        | 18  | 82                                  |
| LETLA-C-F1Z□200-1454-NA0020-□C | 1454                      | 1834        | 25.0        | 18  | 87                                  |
| LETLA-C-F1Z□200-1589-NA0020-□C | 1589                      | 1969        | 12.5        | 18  | 92                                  |
| LETLA-C-F1Z□200-1724-NA0020-□C | 1724                      | 2104        | 40.0        | 18  | 97                                  |
| LETLA-C-F1Z□200-1859-NA0020-□C | 1859                      | 2239        | 27.5        | 18  | 102                                 |
| LETLA-C-F1Z□200-1994-NA0020-□C | 1994                      | 2374        | 15.0        | 18  | 107                                 |
| LETLA-C-F1Z□200-2129-NA0020-□C | 2129                      | 2509        | 42.5        | 18  | 111                                 |



Hall sensor connector



Pin connector type:  
7JE-2309-02 (D/C)  
made by DDK Ltd.

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

Linear scale connector

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

LET adapter type:  
MA-15BL-1SSLLinear servo motor 200 V  
Connector specifications

|   |  |
|---|--|
| 1 | Extension: SRUC06JMSCN236<br>made by Interconnectron |
| 2 | The mating connector<br>Plug type: SPOCC06KFSDN169   |

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

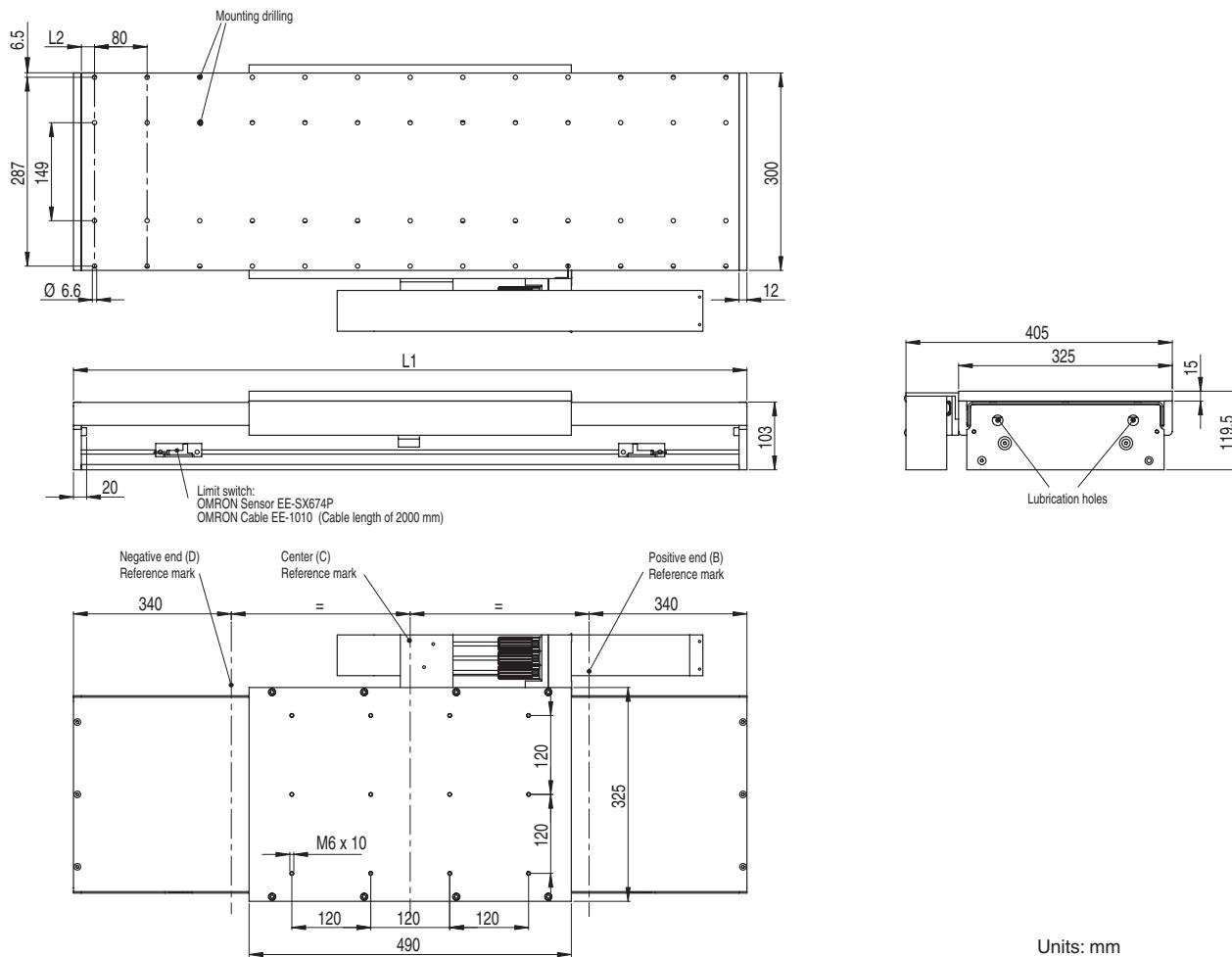
Linear servo motor 400 V  
Connector specifications

LETLA-C-F1ZD200

|   |          |
|---|----------|
| 1 | Phase U  |
| 2 | Phase V  |
| 3 | Phase W  |
| 4 | Not used |
| 5 | Not used |
| 6 | Not used |
| 7 | Ground   |

## LETLA-C-F1ZD380-□

| Linear axis model              | Effective stroke<br>in mm | L1<br>in mm | L2<br>in mm | Weigth of moving table<br>including motor coil (kg) | Weigth of the<br>complete axis (kg) |
|--------------------------------|---------------------------|-------------|-------------|---|-------------------------------------|
| LETLA-C-F1ZD380-0184-NA0020-□C | 184                       | 754         | 45.0        | 31  | 60                                  |
| LETLA-C-F1ZD380-0319-NA0020-□C | 319                       | 889         | 32.5        | 31  | 65                                  |
| LETLA-C-F1ZD380-0454-NA0020-□C | 454                       | 1024        | 20.0        | 31  | 70                                  |
| LETLA-C-F1ZD380-0589-NA0020-□C | 589                       | 1159        | 47.5        | 31  | 75                                  |
| LETLA-C-F1ZD380-0724-NA0020-□C | 724                       | 1294        | 35.0        | 31  | 80                                  |
| LETLA-C-F1ZD380-0859-NA0020-□C | 859                       | 1429        | 22.5        | 31  | 84                                  |
| LETLA-C-F1ZD380-0994-NA0020-□C | 994                       | 1564        | 50.0        | 31  | 89                                  |
| LETLA-C-F1ZD380-1129-NA0020-□C | 1129                      | 1699        | 37.5        | 31  | 94                                  |
| LETLA-C-F1ZD380-1264-NA0020-□C | 1264                      | 1834        | 25.0        | 31  | 99                                  |
| LETLA-C-F1ZD380-1399-NA0020-□C | 1399                      | 1969        | 12.5        | 31  | 104                                 |
| LETLA-C-F1ZD380-1534-NA0020-□C | 1534                      | 2104        | 40.0        | 31  | 109                                 |
| LETLA-C-F1ZD380-1669-NA0020-□C | 1669                      | 2239        | 27.5        | 31  | 114                                 |
| LETLA-C-F1ZD380-1804-NA0020-□C | 1804                      | 2374        | 15.0        | 31  | 119                                 |
| LETLA-C-F1ZD380-1939-NA0020-□C | 1939                      | 2509        | 42.5        | 31  | 124                                 |
| LETLA-C-F1ZD380-2074-NA0020-□C | 2074                      | 2644        | 30.0        | 31  | 129                                 |



Hall sensor connector



Pin connector type:  
7JE-23050-02 (DB6C)  
made by DDK Ltd.

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

Linear scale connector

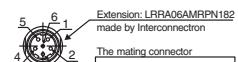


LET adapter type:  
MA-15BL-15SL

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

Linear servo motor 400 V  
Connector specifications

LETLA-□-F1ZD380□

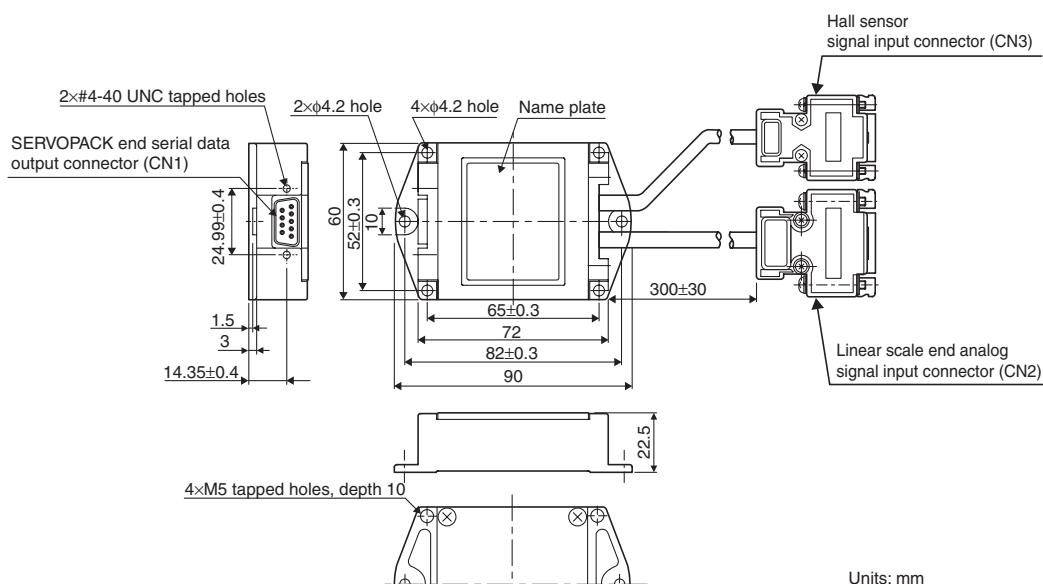


| Pin No. | Name     |
|---------|----------|
| 1       | Phase U  |
| 2       | Phase V  |
| 4       | Phase W  |
| 5       | Not used |
| 6       | Not used |
| ⊕       | Ground   |

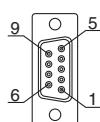
## Serial converter unit

JZDP-[A/D]008-□□□

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

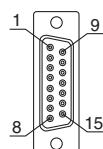


[CN1]  
SERVOPACK end  
serial data output



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

[CN2]  
Linear scale end  
Analog signal input

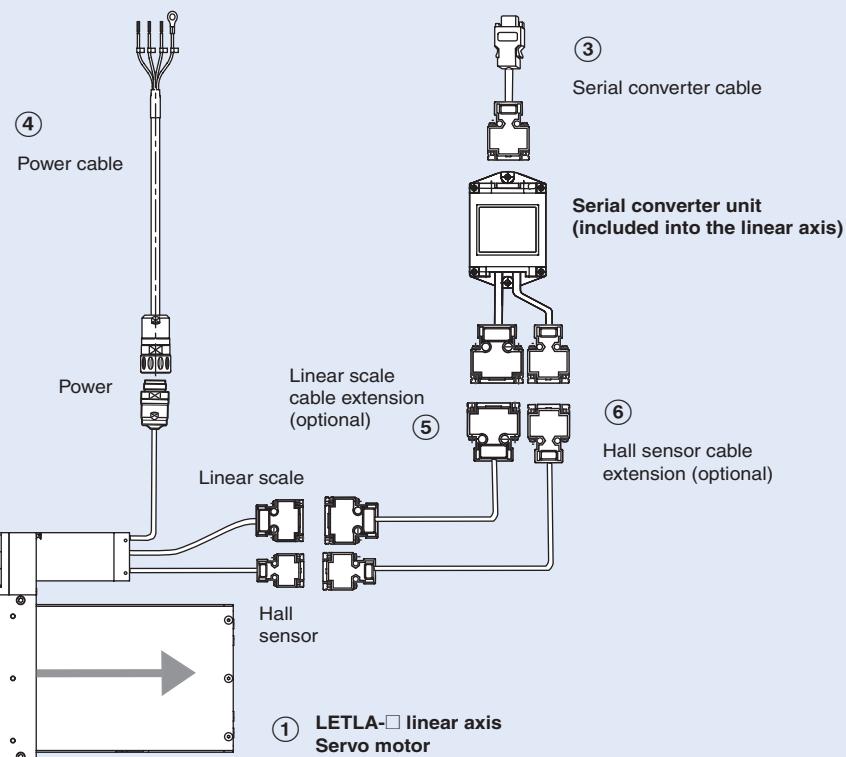
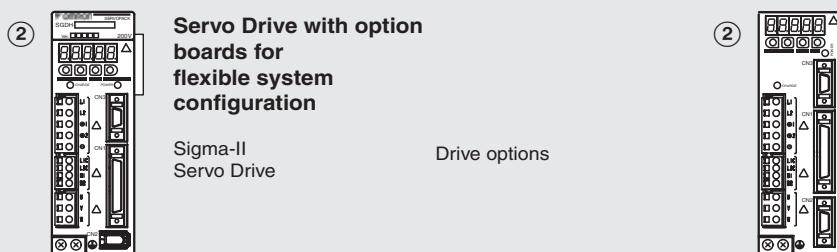


[CN3]  
Hall sensor signal input

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

## Ordering information

(Refer to Servo Drive chapter)



**Note:** The symbols ①②③... show the recommended sequence to select the servomotor, cables and serial converter for a linear motors system.

### Linear motor axis

#### LETLA-C-F□

#### 230 VAC single phase

| Symbol | Specifications |            | Model                              |                 |            |
|--------|----------------|------------|------------------------------------|-----------------|------------|
|        | Rated force    | Peak force | ① Linear axis model                | ② Servo drive   |            |
|        |                |            |                                    | Sigma-II series | XtraDrive  |
| ①②     | 80 N           | 220 N      | LETLA-C-F35A120-[stroke]-NA0020-DC | SGDH-02AE-OY    | XD-02-MN01 |
|        | 160 N          | 440 N      | LETLA-C-F35A230-[stroke]-NA0020-DC | SGDH-08AE-S-OY  | XD-08-MN   |
|        | 280 N          | 600 N      | LETLA-C-F50A200-[stroke]-NA0020-DC | SGDH-08AE-S-OY  | XD-08-MN   |
|        | 560 N          | 1200 N     | LETLA-C-F50A380-[stroke]-NA0020-DC | SGDH-15AE-S-OY  | XD-15-MN   |
|        | 560 N          | 1200 N     | LETLA-C-F1ZA200-[stroke]-NA0020-DC | SGDH-15AE-S-OY  | XD-15-MN   |

**Note:** For effective stroke distances available see dimensions section.

## 400 VAC three phase

| Symbol | Specifications |            | Model                               |                 |               |
|--------|----------------|------------|-------------------------------------|-----------------|---------------|
|        | Rated force    | Peak force | ① Linear axis model                 |                 | ② Servo drive |
| ①②     | 80 N           | 220 N      | LET LA-C-F35D120-[stroke]-NA0020-DC | Sigma-II series | XtraDrive     |
|        | 160 N          | 440 N      | LET LA-C-F35D230-[stroke]-NA0020-DC | SGDH-05DE-OY    | XD-05-TN      |
|        | 280 N          | 600 N      | LET LA-C-F50D200-[stroke]-NA0020-DC | SGDH-10DE-OY    | XD-10-TN      |
|        | 560 N          | 1200 N     | LET LA-C-F50D380-[stroke]-NA0020-DC | SGDH-15DE-OY    | XD-15-TN      |
|        | 560 N          | 1200 N     | LET LA-C-F1ZD200-[stroke]-NA0020-DC | SGDH-15DE-OY    | XD-15-TN      |
|        | 1120 N         | 2400 N     | LET LA-C-F1ZD380-[stroke]-NA0020-DC | SGDH-30DE-OY    | XD-30-TN      |

Note: For effective stroke distances available see dimensions section.

### Servo drive

Note: Choosing sigma-II drive or XtraDrive affects to the serial converter cable needed.

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

### Serial converter cable to servo drive

| Symbol | Specifications                            | Model                | Appearance |
|--------|---|----------------------|------------|
| ③      | Sigma-II drive to serial converter cable  | 3 m JZSP-CLP70-03-E  |            |
|        |   | 5 m JZSP-CLP70-05-E  |            |
|        |   | 10 m JZSP-CLP70-10-E |            |
|        |   | 15 m JZSP-CLP70-15-E |            |
|        |   | 20 m JZSP-CLP70-20-E |            |
|        | XtraDrive drive to serial converter cable | 3 m XD-CLP70-03-E    |            |
|        |   | 5 m XD-CLP70-05-E    |            |
|        |   | 10 m XD-CLP70-10-E   |            |
|        |   | 15 m XD-CLP70-15-E   |            |
|        |   | 20 m XD-CLP70-20-E   |            |

### Power cables

| Symbol | Specifications   | Model                 | Appearance |
|--------|--|-----------------------|------------|
| ④      | For 200 V servo motors<br>LET LA-□-F35A□                       | 3 m R88A-CAWA003S-DE  |            |
|        |  | 5 m R88A-CAWA005S-DE  |            |
|        |  | 10 m R88A-CAWA010S-DE |            |
|        |  | 15 m R88A-CAWA015S-DE |            |
|        |  | 20 m R88A-CAWA020S-DE |            |
|        | For 200 V servo motors<br>LET LA-□-F50A□<br>LET LA-□-F1ZA200□  | 3 m R88A-CAWB003S-DE  |            |
|        |  | 5 m R88A-CAWB005S-DE  |            |
|        |  | 10 m R88A-CAWB010S-DE |            |
|        |  | 15 m R88A-CAWB015S-DE |            |
|        |  | 20 m R88A-CAWB020S-DE |            |
|        | For 400 V servo motors<br>LET LA-□-F35D□<br>LET LA-□-F50D200D□ | 3 m R88A-CAWK003S-DE  |            |
|        |  | 5 m R88A-CAWK005S-DE  |            |
|        |  | 10 m R88A-CAWK010S-DE |            |
|        |  | 15 m R88A-CAWK015S-DE |            |
|        |  | 20 m R88A-CAWK020S-DE |            |
|        | For 400 V servo motors<br>LET LA-□-F50D380□<br>LET LA-□-F1ZD□  | 3 m R88A-CAWL003S-DE  |            |
|        |  | 5 m R88A-CAWL005S-DE  |            |
|        |  | 10 m R88A-CAWL010S-DE |            |
|        |  | 15 m R88A-CAWL015S-DE |            |
|        |  | 20 m R88A-CAWL020S-DE |            |

### Linear scale cable to serial converter

| Symbol | Specifications  | Model                | Appearance |
|--------|---|----------------------|------------|
| ⑤      | Extension cable linear scale to serial converter.<br>(Connector DB-15)<br>(The extension cable is optional) | 1 m JZSP-CLL00-01-E  |            |
|        |   | 3 m JZSP-CLL00-03-E  |            |
|        |   | 5 m JZSP-CLL00-05-E  |            |
|        |   | 10 m JZSP-CLL00-10-E |            |
|        |   | 15 m JZSP-CLL00-15-E |            |

### Hall sensor cable to serial converter

| Symbol | Specifications   | Model                | Appearance |
|--------|--|----------------------|------------|
| ⑥      | Extension cable for linear scale to serial converter.<br>(The extension cable is optional) | 1 m JZSP-CLL10-01-E  |            |
|        |  | 3 m JZSP-CLL10-03-E  |            |
|        |  | 5 m JZSP-CLL10-05-E  |            |
|        |  | 10 m JZSP-CLL10-10-E |            |
|        |  | 15 m JZSP-CLL10-15-E |            |

### Connectors

| Specification                                    | Model            |
|--|------------------|
| Hypertac power connector IP67 (for 200 V motors) | SPOC-06K-FSDN169 |
| Hypertac power connector IP67 (for 400 V motors) | LPRA-06B-FRBN170 |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

SGTMM01-□, SGTMM03-□

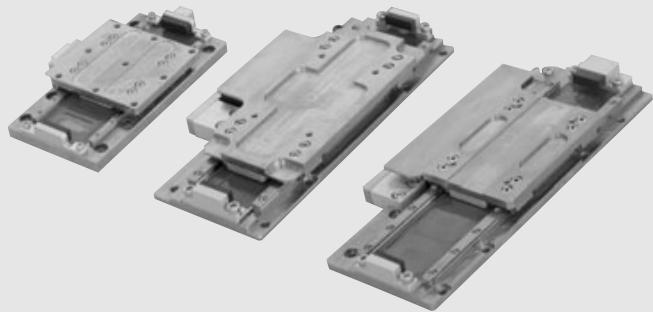
# Linear sigma trac-micro

## Direct drive linear servomotor axis for mounting at narrow spaces

- Compact, high-thrust and high-speed movement
- Flat construction for mounting at narrow spaces
- Plug and drive, shorten start-up time
- Easy operation and high reliability
- Moving magnet construction avoids moving cables
- Resolution of 78 nm
- Direct control of the axis using XtraDrive and Sigma-II drives

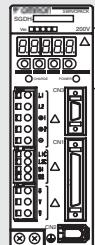
## Ratings

- 230 VAC single-phase 3.5 N and 7 N (25 N peak)



## System configuration

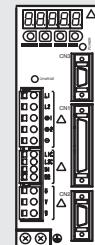
(Refer to servo drive chapter)



**Servo drive with option boards for flexible system configuration**

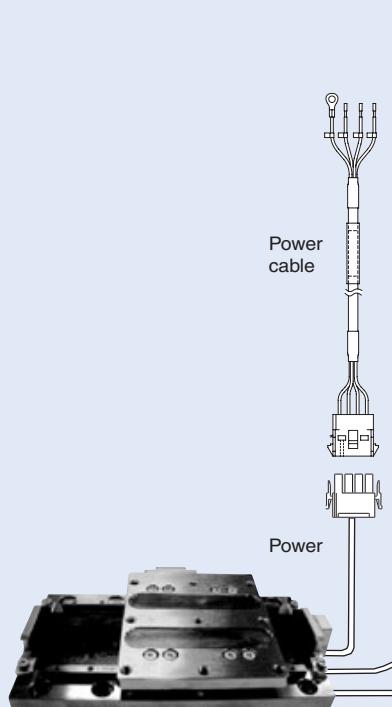
Sigma-II  
servo drive

Drive options

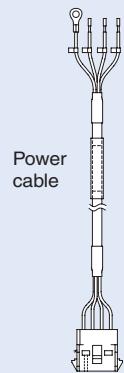


**Intelligent servo drive**

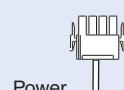
XtraDrive



**SGTMM□ LINEAR SIGMA Trac-μ**



Power cable

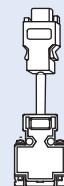


Linear scale

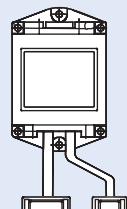


Linear scale  
cable extension  
(optional)

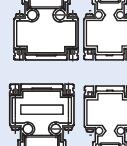
Hall sensor  
(not in all models)



Serial converter cable

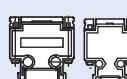


Serial converter unit



Linear scale

Hall sensor  
(not in all models)



Hall sensor  
cable extension  
(optional)

## Servo motor / servo drive combination

Sigma trac- $\mu$ 

SGTMM 03 – 065 A H 20 A P

 $\Sigma$  Trac linear axis

| Maximum thrust |                |
|----------------|----------------|
| Code           | Specifications |
| 01             | 10 N           |
| 03             | 25 N           |

Effective stroke length

| Code | Specifications |
|------|----------------|
| 010  | 10 mm          |
| 025  | 25 mm          |
| 030  | 30 mm          |
| 065  | 65 mm          |

Linear scale manufacturer

| Code | Specifications |
|------|----------------|
| H    | Heidenhain     |
| M    | MicronE        |

Output from linear scale

| Code | Specifications    |
|------|-------------------|
| A    | Analogue (1 Vp-p) |

| Hall sensor |                |
|-------------|----------------|
| Code        | Specifications |
| -           | None           |
| P           | Provided       |

Design revision

| Linear scale pitch |                  |
|--------------------|------------------|
| Code               | Specifications   |
| 20                 | 20 $\mu\text{m}$ |

## Servomotor specifications

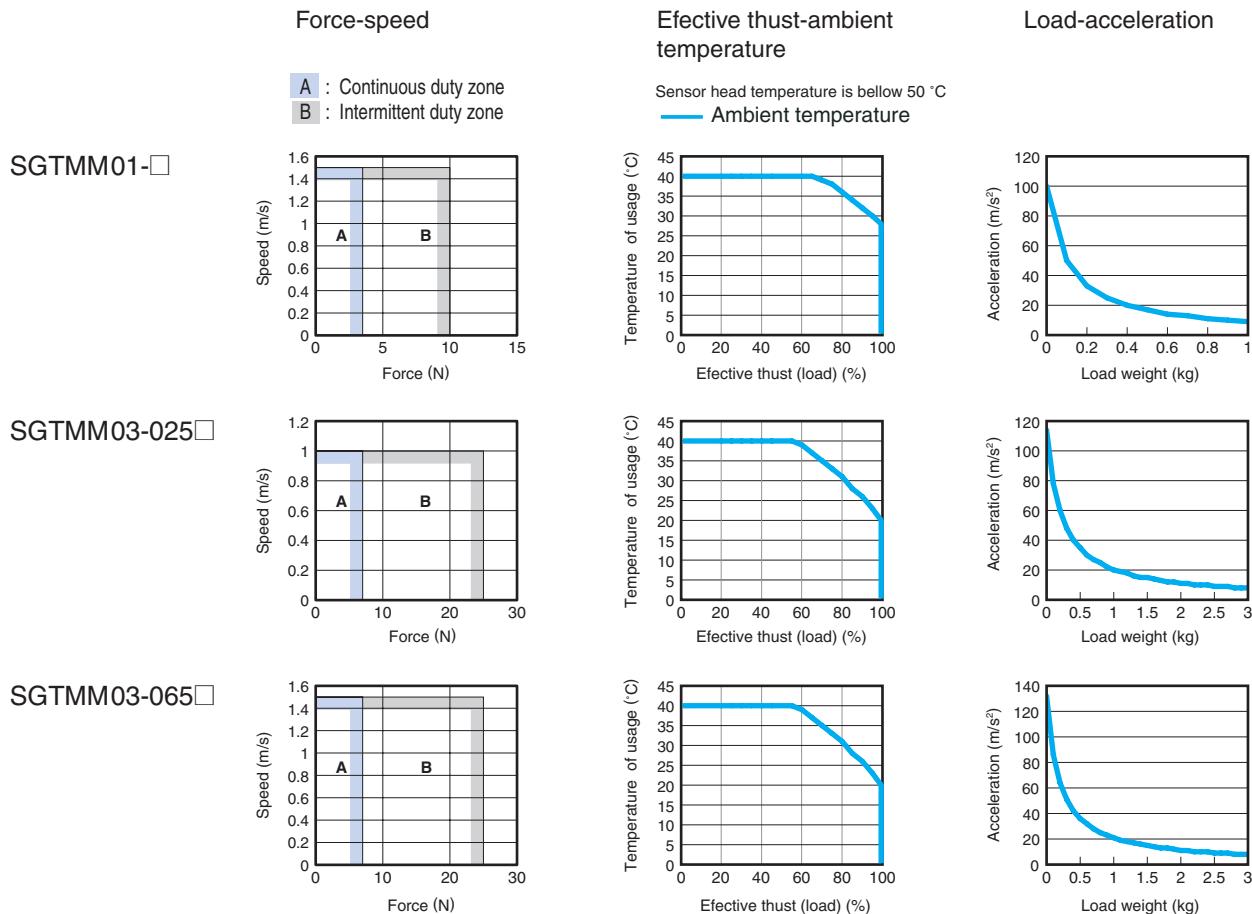
### Sigma trac- $\mu$

|                                    |                               |                               |                             |                   |         |
|------------------------------------|-------------------------------|-------------------------------|-----------------------------|-------------------|---------|
| Voltage                            | 230V                          |                               |                             |                   |         |
| Linear axis model                  | SGTMM01-010AM20A              | SGTMM01-030AM20A              | SGTMM03-025AH20AP           | SGTMM03-065AH20AP |         |
| Rated force                        | N                             | 3.5                           | 3.5                         | 7.5               | 7.5     |
| Instantaneous peak force           | N                             | 10                            | 10                          | 25                | 25      |
| Force constant                     | N / A <sub>rms</sub>          | 9                             | 9                           | 13.2              | 12.3    |
| Motor constant                     | N / $\sqrt{W}$                | 1.2                           | 1.2                         | 2.29              | 1.58    |
| Maximum load *1                    | kg                            | 1                             | 1                           | 3                 | 3       |
| Effective stroke length            | mm                            | 10                            | 30                          | 25                | 65      |
| Linear scale resolution            | μm                            | 0.078 μm = 20 μm / 256 (8bit) |                             |                   |         |
| Linear scale model number          | M1020 (MicroE)                |                               | LIDA487/LIF181 (Heidenhain) |                   |         |
| Hall sensor                        |                               | None                          | None                        | Yes               | Yes     |
| Weight of moving part              | kg                            | 0.1                           | 0.1                         | 0.215             | 0.24    |
| Total weight of micro trac         | kg                            | 0.31                          | 0.35                        | 0.62              | 0.71    |
| Position accuracy repeatability *2 | μm                            | +/- 0.5                       | +/- 0.5                     | +/- 0.5           | +/- 0.5 |
| Basic specifications               | Time rating                   | Continuous                    |                             |                   |         |
|                                    | Insulation class              | Class B                       |                             |                   |         |
|                                    | Ambient temperature           | 0 to +40 °C                   |                             |                   |         |
|                                    | Ambient humidity              | 20 to 80% (non-condensing)    |                             |                   |         |
|                                    | Insulation resistance         | 500 VDC, 10 MΩ min.           |                             |                   |         |
|                                    | Excitation                    | Permanent magnet              |                             |                   |         |
|                                    | Dielectric strength           | 1500 VAC for 1 minute         |                             |                   |         |
|                                    | Protection methods            | Self-cooled                   |                             |                   |         |
|                                    | Allowable winding temperature | 130 °C                        |                             |                   |         |

Note: \*1 The maximum load is calculated for an acceleration of 4.9 m/s<sup>2</sup>.

\*2 With stable environmental conditions and motor temperature unchanged.

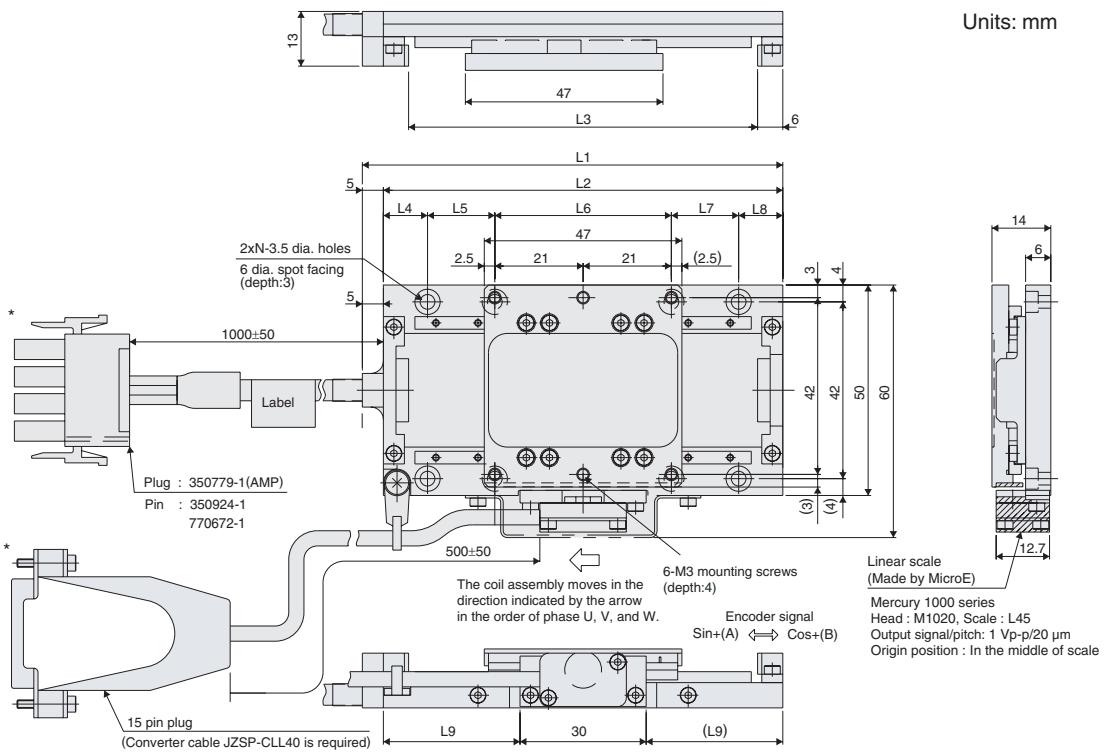
### Characteristics



## Dimensions

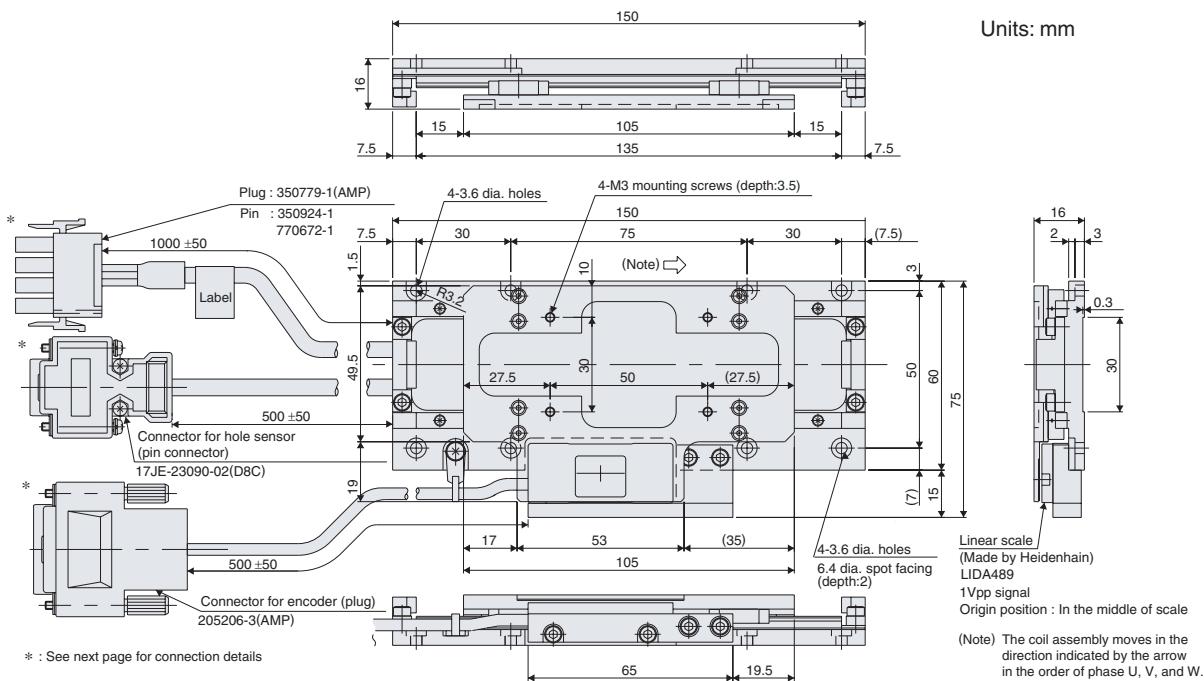
SGTMM01-□

| Micro trac model | L1 mm | L2 mm | L3 mm | L4 mm | L5 mm | L6 mm | L7 mm | L8 mm | L9 mm | N |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| SGTMM01-010AM20A | 80    | 75    | 63    | 14    | 42    | 8     | -     | 11    | 22.5  | 3 |
| SGTMM01-030AM20A | 100   | 95    | 83    | 10.5  | 16    | 42    | 16    | 10.5  | 32.5  | 4 |



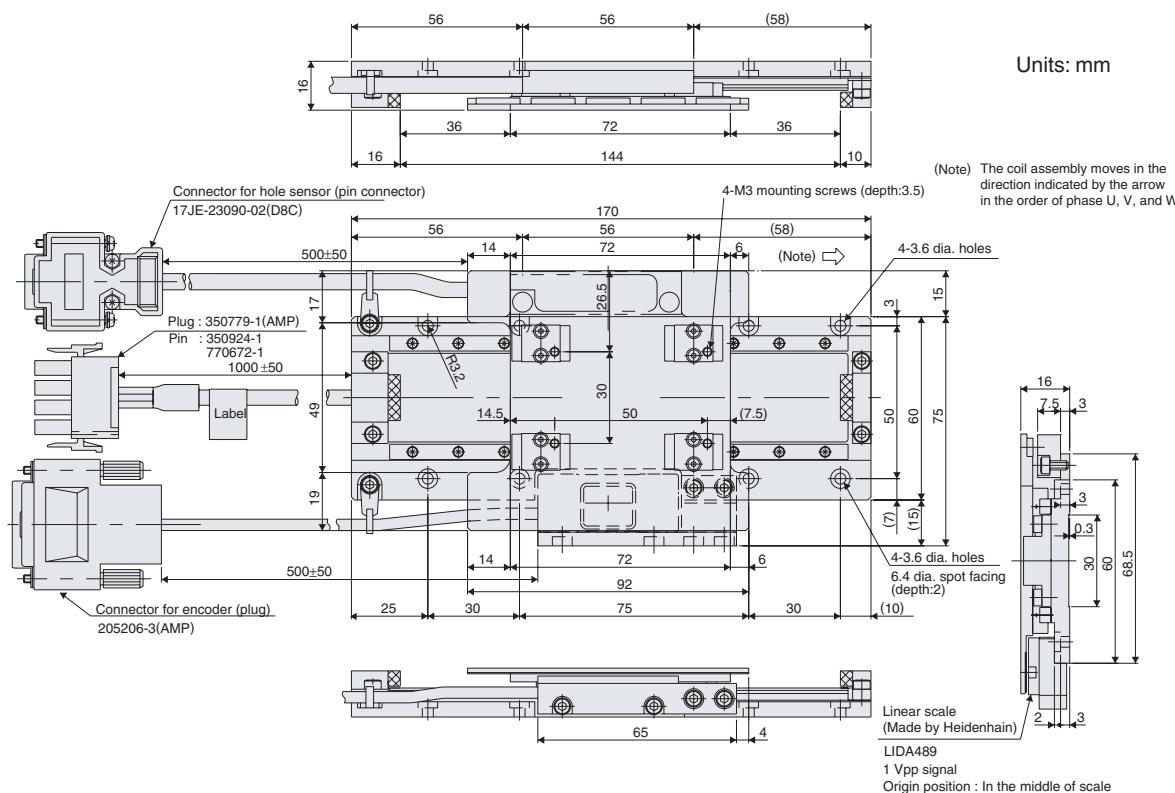
\* : See next page for connection details

**SGTMM03-025AH20AP**



\* : See next page for connection details

## SGTMM03-065AH20AP

Sigma trac- $\mu$  connections

SGTMM01-□

Linear servo motor  
Power connector

| Pin No. | Name    |
|---------|---------|
| 1       | Phase U |
| 2       | Phase V |
| 3       | Phase W |
| 4       | FG      |

Linear scale connector  
(Signal converter cable JZSP-CLL40 is required)

| Pin No. | Signal   |
|---------|----------|
| 1       | IW-      |
| 2       | IW+      |
| 3       | RESERVED |
| 4       | RESERVED |
| 5       | RESERVED |
| 6       | RESERVED |
| 7       | COS+     |
| 8       | SIN+     |
| 9       | N/C      |
| 10      | N/C      |
| 11      | N/C      |
| 12      | +5 V     |
| 13      | GND      |
| 14      | COS-     |
| 15      | SIN-     |
| Case    | Shield   |

SGTMM03-□

Linear servo motor  
Power connector

| Pin No. | Name    |
|---------|---------|
| 1       | Phase U |
| 2       | Phase V |
| 3       | Phase W |
| 4       | FG      |

Linear scale connector

Power connector

| Pin No. | Signal     |
|---------|------------|
| 1       | cos (A+)   |
| 2       | 0 V        |
| 3       | sin (B+)   |
| 4       | +5V        |
| 5       | Empty      |
| 6       | Empty      |
| 7       | /Ref (R-)  |
| 8       | Empty      |
| 9       | /cos (A-)  |
| 10      | 0V sensor  |
| 11      | /sin (B-)  |
| 12      | 5 V sensor |
| 13      | Empty      |
| 14      | Ref (R+)   |
| 15      | Empty      |
| Case    | Shield     |

Hall sensor connector

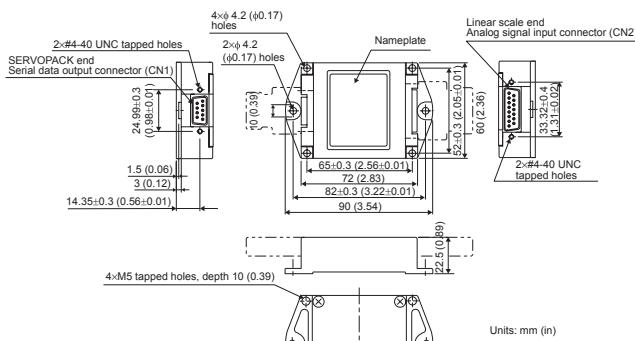
| Pin No. | Name                |
|---------|---------------------|
| 1       | +5 V (Power supply) |
| 2       | Phase U             |
| 3       | Phase V             |
| 4       | Phase W             |
| 5       | 0 V (Power supply)  |
| 6       | Not used            |
| 7       | Not used        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

## Serial converter unit

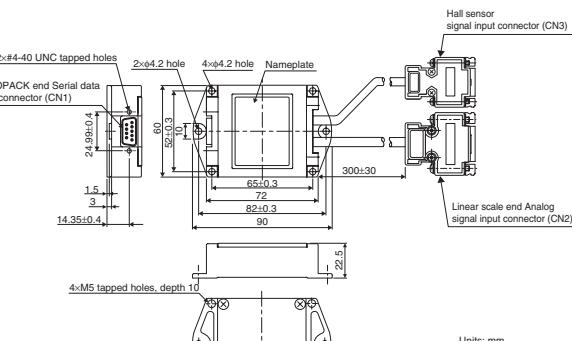
JZDP-D00□-□□□

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

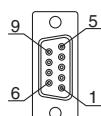
JZDP-D003-□□□



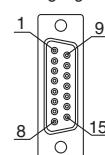
JZDP-D006-□□□

JZDP-D003-□□□  
JZDP-D006-□□□JZDP-D003-□□□  
JZDP-D006-□□□

JZDP-D006-□□□

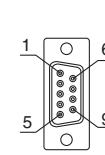
CN1  
SERVOPACK end serial data output

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

CN2  
Linear scale end Analog signal input

Pin No. Signal

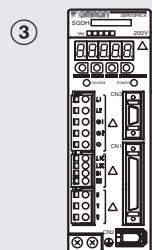
|      |                 |
|------|-----------------|
| 1    | cos input (A+)  |
| 2    | 0 V             |
| 3    | sin input (B+)  |
| 4    | +5 V            |
| 5    | Empty           |
| 6    | Empty           |
| 7    | /Ref input (R-) |
| 8    | Empty           |
| 9    | /cos input (A-) |
| 10   | 0 V sensor      |
| 11   | /sin input (B-) |
| 12   | 5 V sensor      |
| 13   | Empty           |
| 14   | Ref input (R+)  |
| 15   | Empty           |
| Case | Shield          |

CN3  
Hall sensor signal input

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

## Ordering Information

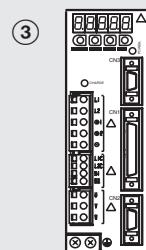
(Refer to servo drive chapter)



**Servo drive with option boards for flexible system configuration**

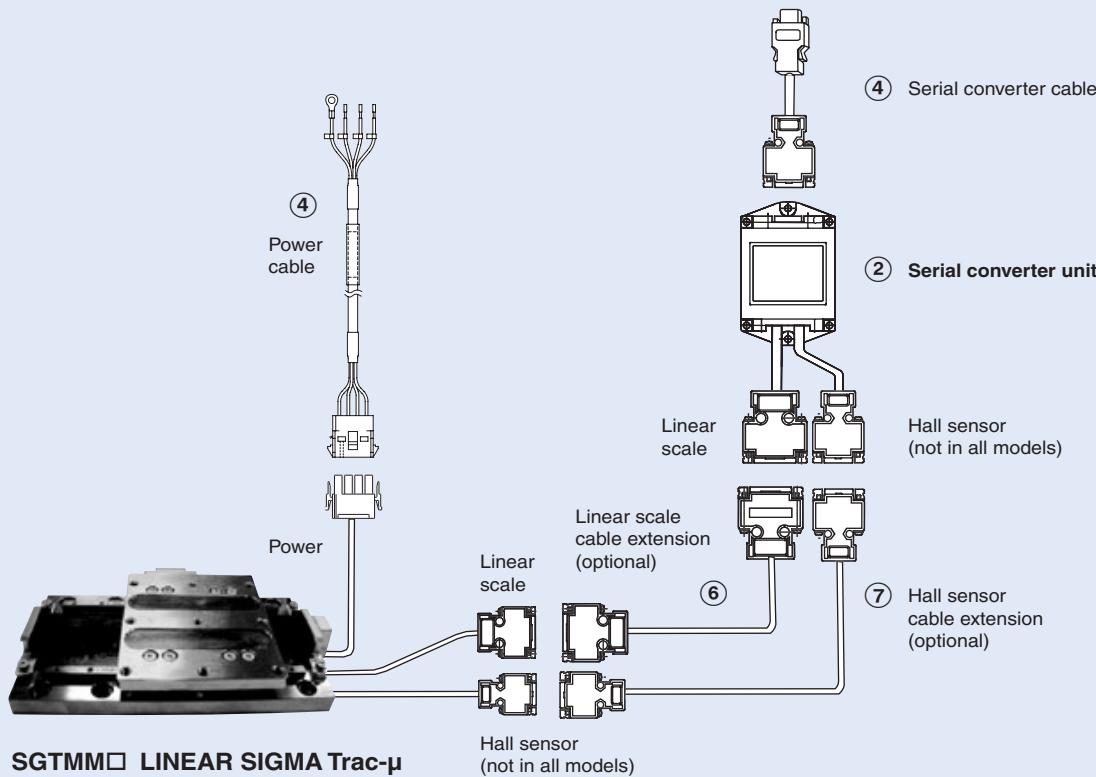
Sigma-II  
servo drive

Drive options



**Intelligent servo drive**

XtraDrive



**Note:** The symbols ①②③... show the recommended sequence to select the servo motor, cables and serial converter for a linear motors system

### Sigma trac- $\mu$

| Symbol | Specifications |            | Model               |                             |               |           |
|--------|----------------|------------|---------------------|-----------------------------|---------------|-----------|
|        | Rated force    | Peak force | ① Linear axis model | ② Serial converter          | ③ Servo drive |           |
| ①②③    | 3.5 N          | 10 N       | SGTMM01-010AM20A    | JZDP-D003-242 <sup>*1</sup> | SGDH-A5AE-OY  | XD-P5MN01 |
|        | 3.5 N          | 10 N       | SGTMM01-030AM20A    | JZDP-D003-242 <sup>*1</sup> | SGDH-A5AE-OY  | XD-P5MN01 |
|        | 7 N            | 25 N       | SGTMM03-025AH20AP   | JZDP-D006-221               | SGDH-01AE-OY  | XD-01MN01 |
|        | 7 N            | 25 N       | SGTMM03-065AH20AP   | JZDP-D006-220               | SGDH-01AE-OY  | XD-01MN01 |

**Note:** \*1. For the SGTMM01-□ motor the signal converter cable **JZSP-CLL40** (0.2 m length) is required.

### Servo drive

**Note:** Choosing Sigma-II drive or XtraDrive affects to the serial converter cable needed

③ Refer to Sigma-II or XtraDrive servo drive chapter for detailed drive specifications and selection of drive accessories

#### Serial converter cable to servo drive

| Symbol | Specifications                           | Model                | Appearance |
|--------|--|----------------------|------------|
| (4)    | Sigma-II drive to serial converter cable | 3 m JZSP-CLP70-03-E  |            |
|        |  | 5 m JZSP-CLP70-05-E  |            |
|        |  | 10 m JZSP-CLP70-10-E |            |
|        |  | 15 m JZSP-CLP70-15-E |            |
|        |  | 20 m JZSP-CLP70-20-E |            |
|        | XtraDrive to serial converter cable      | 3 m XD-CLP70-03-E    |            |
|        |  | 5 m XD-CLP70-05-E    |            |
|        |  | 10 m XD-CLP70-10-E   |            |
|        |  | 15 m XD-CLP70-15-E   |            |
|        |  | 20 m XD-CLP70-20-E   |            |

#### Power cables

| Symbol | Specifications                   | Model               | Appearance |
|--------|----------------------------------|---------------------|------------|
| (5)    | Power cable for sigma trac micro | 3 m R7A-CAA003S-FE  |            |
|        |                                  | 5 m R7A-CAA005S-FE  |            |
|        |                                  | 10 m R7A-CAA010S-FE |            |
|        |                                  | 15 m R7A-CAA015S-FE |            |
|        |                                  | 20 m R7A-CAA020S-FE |            |

#### Linear scale cable to serial converter

| Symbol | Specifications   | Model                | Appearance |
|--------|--|----------------------|------------|
| (6)    | Extension cable linear scale to serial converter (the extension cable is optional) | 1 m JZSP-CLL00-01-E  |            |
|        |  | 3 m JZSP-CLL00-03-E  |            |
|        |  | 5 m JZSP-CLL00-05-E  |            |
|        |  | 10 m JZSP-CLL00-10-E |            |
|        |  | 15 m JZSP-CLL00-15-E |            |

#### Hall sensor cable to serial converter

| Symbol | Specifications   | Model                | Appearance |
|--------|--|----------------------|------------|
| (7)    | Extension cable for linear scale to serial converter (the extension cable is optional) | 1 m JZSP-CLL10-01-E  |            |
|        |  | 3 m JZSP-CLL10-03-E  |            |
|        |  | 5 m JZSP-CLL10-05-E  |            |
|        |  | 10 m JZSP-CLL10-10-E |            |
|        |  | 15 m JZSP-CLL10-15-E |            |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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