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R88M-1A□, R88D-1SAN□□□-ECT

# 1S Servo System with Motion Safety

### Safe & Running – 1S Servo System with Motion Safety Functionality

- All safety functions conform to maximum safety performance level PLe (SIL-3)
- Hardwired and FSoE STO (Safe Torque Off)
- FSoE functions: SS1 (Safe Stop 1), SS2 (Safe Stop 2), SOS (Safe Operating Stop), SLS (Safely-Limited Speed), SLP (Safely-Limited Position), SDI (Safe Direction), SBC (Safe Brake Control)
- Battery-free absolute multi-turn encoder
- One cable connection: power, encoder and brake in a pre-assembled cable with IP67 connector
- Fast and secure screw-less push-in in all connectors
- 20-bit high resolution encoder
- Up to 350% momentary maximum torque

### Ratings

- 230 VAC from 200 W to 1.5 kW
  (rated torque from 0.637 to 9.55 Nm)
- 400 VAC from 750 W to 3 kW
  (rated torque from 2.39 to 19.1 Nm)

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## Type designation

### 1S servo drive with Motion Safety

R88D-1S AN 02 H -ECT
(1) (2) (3) (4) (5)

| No | Item | Symbol | Specifications |
|---|---|---|---|
| (1) | 1S Series servo drive | | |
| (2) | Drive type | A | Motion Safety type |
| | | N | Communication (Network) interface |
| (3) | Capacity | 02 | 200 W |
| | | 04 | 400 W |
| | | 08 | 750 W |
| | | 10 | 1 kW |
| | | 15 | 1.5 kW |
| | | 20 | 2 kW |
| | | 30 | 3 kW |
| (4) | Voltage | H | 230 VAC |
| | | F | 400 VAC |
| (5) | Network type | ECT | EtherCAT communications |

### 1S servo motor with Motion Safety

R88M-1 AM 200 30 T -BOS2
(1) (2) (3) (4) (5) (6)

| No | Item | Symbol | Specifications |
|---|---|---|---|
| (1) | 1S Series servo motor | | |
| (2) | Servo motor type | AL | Motion Safety/Low-inertia type |
| | | AM | Motion Safety/Middle-inertia type |
| (3) | Capacity | 200 | 200 W |
| | | 400 | 400 W |
| | | 750 | 750 W |
| | | 1K0 | 1 kW |
| | | 1K5 | 1.5 kW |
| | | 2K0 | 2 kW |
| | | 3K0 | 3 kW |
| (4) | Rated speed | 15 | 1500 rpm |
| | | 30 | 3000 rpm |
| (5) | Voltage and encoder specifications | T | 230 V, absolute encoder |
| | | C | 400 V, absolute encoder |
| (6) | Options | | |
| | Brake | Blank | No brake |
| | | B | Brake |
| | Oil seal | Blank | No oil seal |
| | | O | Oil seal |
| | Shaft end | Blank | Straight shaft, no key |
| | | S2 | Straight, key, tapped (standard) |

# Specifications

## 1S servo drive with Motion Safety

### Single-phase, 230 V

| Servo drive model | | | R88D-1SAN02H-ECT | R88D-1SAN04H-ECT | R88D-1SAN08H-ECT | R88D-1SAN15H-ECT |
|---|---|---|---|---|---|---|
| Applicable servo motor R88M-□ | | 3000 r/min | 1AM20030T | 1AM40030T | 1AM75030T | 1AL1K030T<br>1AL1K530T |
| | | 1500 r/min | – | | | 1AM1K515T |
| Max. applicable motor capacity | | | 200 W | 400 W | 750 W | 1.5 kW |
| Input | Main circuit | Power supply voltage | Single-phase 200 to 240 VAC (170 to 252 V) | | | |
| | | Frequency | 50/60 Hz (47.5 to 63 Hz) | | | |
| | | Rated input current (Single-phase) | 2.7 Arms | 4.6 Arms | 7.3 Arms | 15.7 Arms |
| | Control circuit | Power supply voltage | 24 VDC (21.6 to 26.4 V) | | | |
| | | Current consumption | 700 mA | | | 1000 mA |
| Output | Rated output current | | 1.5 Arms | 2.5 Arms | 4.6 Arms | 9.7 Arms |
| | Max. current | | 5.6 Arms | 9.1 Arms | 16.9 Arms | 28.4 Arms |
| Heating value | | Main circuit | 17.0 W | 25.0 W | 42.0 W | 88.0 W |
| | | Control circuit | 11.9 W | | 14.5 W | 22.4 W |
| Weight | | | 2.6 kg | | | 4.2 kg |

### Three-phase, 400 V

| Servo drive model | | | R88D-1SAN10F-ECT | R88D-1SAN15F-ECT | R88D-1SAN20F-ECT | R88D-1SAN30F-ECT |
|---|---|---|---|---|---|---|
| Applicable servo motor R88M-□ | | 3000 r/min | 1AL75030C<br>1AL1K030C | 1AL1K530C | 1AL2K030C | 1AL3K030C |
| | | 1500 r/min | – | 1AM1K515C | – | 1AM3K015C |
| Max. applicable motor capacity | | | 1 kW | 1.5 kW | 2 kW | 3 kW |
| Input | Main circuit | Power supply voltage | Three-phase 380 to 480 VAC (323 to 504 V) | | | |
| | | Frequency | 50/60 Hz (47.5 to 63 Hz) | | | |
| | | Rated input current (Three-phase) | 3.1 Arms | 4.3 Arms | 6.5 Arms | 8.4 Arms |
| | Control circuit | Power supply voltage | 24 VDC (21.6 to 26.4 V) | | | |
| | | Current consumption | 1 A | | | |
| Output | Rated output current | | 4.1 Arms | 4.7 Arms | 7.8 Arms | 11.3 Arms |
| | Max. current | | 9.6 Arms | 14.1 Arms | 19.8 Arms | 28.3 Arms |
| Heating value | | Main circuit | 56.0 W | 81.0 W | 120.0 W | 150.0 W |
| | | Control circuit | 22.4 W | | | |
| Weight | | | 4.2 kg | | | |

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### Safety functions

| Function | Description |
|---|---|
| Safe torque off (STO) | The function is used to cut off a motor current and stop the motor. |
| Safe stop 1 (SS1) | This function is used to stop a motor by activating STO function at any timing after receiving a command from a safety controller. |
| Safes stop 2 (SS2) | This function is used to monitor a motor's stop by activating SOS function at any timing after receiving a command from a safety controller. |
| Safe operating stop (SOS) | This function is used to monitor that a motor stops at any positions. Both a position and velocity are monitored. Excessive limit value error occurs when the motor operates from a position where it stops. |
| Safely-limited speed (SLS) | This function is used to monitor a safety present motor velocity. When the safety present motor velocity exceeds the velocity limit for monitoring, excessive limit value error occurs. |
| Safely-limited position (SLP) | This function is used to monitor current positions. Excessive limit value error occurs when the positions surpass a range for monitoring. |
| Safe direction (SDI) | This function is used to monitor motor's rotating direction. Excessive limit value error occurs when a motor rotates toward the banned rotating direction. |
| Safe brake control (SBC) | This function is used to provide safety output for a holding brake. The function can be used with STO, SS1 functions and the brake operation. |

**Note:** Safety Servo Drives have two type STO functions. Use either or both functions according to configuration of safety devices.
- STO function by safety input signals
- STO function via EtherCAT communications

**Note:** When you use just STO function by safety input signals, you do not need a setting related EtherCAT network.

## 1S servo motor with Motion Safety

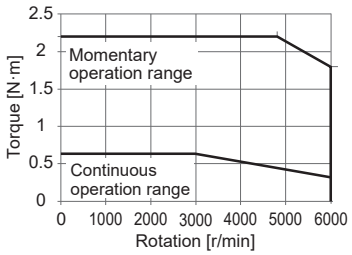
### 3000 r/min servo motors, 230 V

| Voltage | | | 230 V | | | | |
|---|---|---|---|---|---|---|---|
| Servo motor model: R88M-□ | | 20-bit absolute encoder | 1AM20030T | 1AM40030T | 1AM75030T | 1AL1K030T | 1AL1K530T |
| Rated output | | W | 200 | 400 | 750 | 1,000 | 1,500 |
| Rated torque | | N·m | 0.637 | 1.27 | 2.39 | 3.18 | 4.77 |
| Instantaneous peak torque | | N·m | 2.2 | 4.5 | 8.4 | 9.55 | 14.3 |
| Rated speed | | r/min | 3,000 | | | | |
| Max. speed | | r/min | 6,000 | | | 5,000 | |
| Rated current | | A(rms) | 1.5 | 2.5 | 4.6 | 5.2 | 8.8 |
| Instantaneous max. current | | A(rms) | 5.6 | 9.1 | 16.9 | | 28.4 |
| Rotor moment of inertia | Without brake | $\times10^{-4}$ kg·m$^2$ | 0.224 | 0.446 | 1.825 | 2.105 | |
| | With brake | $\times10^{-4}$ kg·m$^2$ | 0.284 | 0.506 | 2.075 | 2.555 | |
| Applicable load inertia | | $\times10^{-4}$ kg·m$^2$ | 4.80 | 8.40 | 19.4 | 35.3 | 47.6 |
| Torque constant | | N·m/A(rms) | 0.48 | 0.56 | 0.59 | 0.67 | 0.58 |
| Power rate | | kW/s | 18.1 | 36.2 | 31.3 | 48 | 108 |
| Mechanical time constant | | ms | 0.79 | 0.58 | 0.66 | 0.58 | |
| Electrical time constant | | ms | 2.4 | 2.6 | 3.3 | 5.9 | 6.1 |
| Allowable radial load | | N | 245 | | 490 | | |
| Allowable thrust load | | N | 88 | | 196 | | |
| Weight | Without brake | kg | 1.3 | 1.8 | 3.2 | 5.8 | |
| | With brake | kg | 1.7 | 2.2 | 4.1 | 7.5 | |
| Radiator plate dimensions (material) | | mm | 250 × 250 × t6 (aluminum) | | | 400 × 400 × t20 (aluminum) | |
| Brake specifications | Excitation voltage*1 | V | 24 DC±10% | | | | |
| | Current consumption (at 20°C) | A | 0.32 | | 0.37 | 0.70 | |
| | Static friction torque | N·m | 1.37 min. | | 2.55 min. | 9.3 min. | |
| Basic specifications | Insulation class | | Class F | | | | |
| | Ambient operating/storage temperature | | 0 to 40ºC/-20 to 65ºC | | | | |
| | Ambient operating/storage humidity | | 20 to 90% (non-condensing) | | | | |
| | Atmosphere | | No corrosive gases | | | | |
| | Insulation resistance | | 10 MΩ min. at 500 VDC between the power terminals and FG terminal | | | | |
| | Vibration resistance | | Vibration acceleration of 49 m/s² | | | | |
| | Impact resistance | | Acceleration of 98 m/s² max. 3 times each in X, Y and Z directions | | | | |
| | Enclosure | | IP67 (except for the through-shaft parts and connector pins) | | | | |

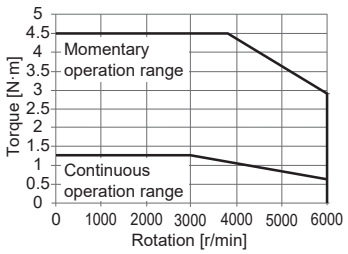
*1 This is a non-excitation brake. It is released when excitation voltage is applied.

### Torque-speed characteristics

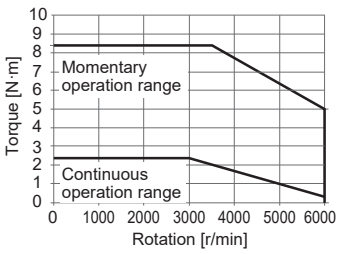
**R88M-1AM20030T (230 V, 200 W)**



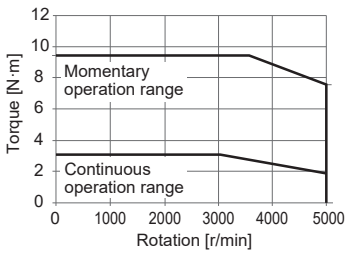

**R88M-1AM40030T (230 V, 400 W)**



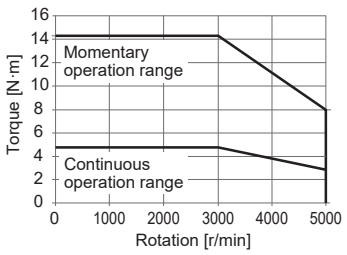

**R88M-1AM75030T (230 V, 750 W)**




**R88M-1AL1K030T (230 V, 1 kW)**




**R88M-1AL1K530T (230 V, 1.5 kW)**



## 3000 r/min servo motors, 400 V

| Voltage | | | 400 V | | | | |
|---|---|---|---|---|---|---|---|
| Servo motor model: R88M-□ | | 20-bit absolute encoder | 1AL75030C | 1AL1K030C | 1AL1K530C | 1AL2K030C | 1AL3K030C |
| Rated output | | W | 750 | 1,000 | 1,500 | 2,000 | 3,000 |
| Rated torque | | N·m | 2.39 | 3.18 | 4.77 | 6.37 | 9.55 |
| Instantaneous peak torque | | N·m | 7.16 | 9.55 | 14.3 | 19.1 | 28.7 |
| Rated speed | | r/min | 3,000 | | | | |
| Max. speed | | r/min | 5,000 | | | | |
| Rated current | | A(rms) | 3.0 | | 4.5 | 6.3 | 8.7 |
| Instantaneous max current | | A(rms) | 9.6 | | 14.1 | 19.8 | 27.7 |
| Rotor moment of inertia | Without brake | $\times10^{-4}$ kg·m$^2$ | 1.305 | 2.105 | | 2.405 | 6.813 |
| | With brake | $\times10^{-4}$ kg·m$^2$ | 1.755 | 2.555 | | 2.855 | 7.313 |
| Applicable load inertia | | $\times10^{-4}$ kg·m$^2$ | 38.6 | 35.3 | 47.6 | 60.2 | 118 |
| Torque constant | | N·m/A(rms) | 0.91 | 1.17 | | 1.15 | 1.23 |
| Power rate | | kW/s | 44 | 48 | 108 | 169 | 134 |
| Mechanical time constant | | ms | 1.1 | 0.58 | | 0.52 | 0.49 |
| Electrical time constant | | ms | 4.3 | 5.9 | | 6.3 | 11 |
| Allowable radial load | | N | 490 | | | | |
| Allowable thrust load | | N | 196 | | | | |
| Weight | Without brake | kg | 4.2 | 5.8 | | 6.5 | 11.5 |
| | With brake | kg | 5.9 | 7.5 | | 8.2 | 13.5 |
| Radiator plate dimensions (material) | | mm | 305 × 305 × t20 (aluminum) | 400 × 400 × t20 (aluminum) | | 470 × 470 × t20 (aluminum) | |
| Brake specifications | Excitation voltage*1 | V | 24 VDC±10% | | | | |
| | Current consumption (at 20°C) | A | 0.70 | | | | 0.66 |
| | Static friction torque | N·m | 9.3 min. | | | | 12 min. |
| Basic specifications | Insulation class | | Class F | | | | |
| | Ambient operating/storage temperature | | 0 to 40ºC/-20 to 65ºC | | | | |
| | Ambient operating/storage humidity | | 20 to 90% (non-condensing) | | | | |
| | Atmosphere | | No corrosive gases | | | | |
| | Insulation resistance | | 10 MΩ min. at 500 VDC between the power terminals and FG terminal | | | | |
| | Vibration resistance | | Vibration acceleration of 49 m/s² | | | | |
| | Impact resistance | | Acceleration of 98 m/s² max. 3 times each in X, Y and Z directions | | | | |
| | Enclosure | | IP67 (except for the through-shaft parts and connector pins) | | | | |

*1 This is a non-excitation brake. It is released when excitation voltage is applied.

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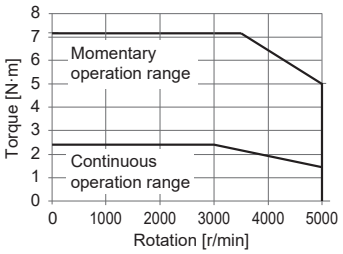
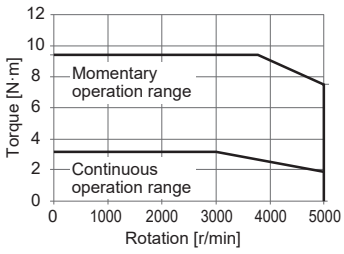
## Torque-speed characteristics

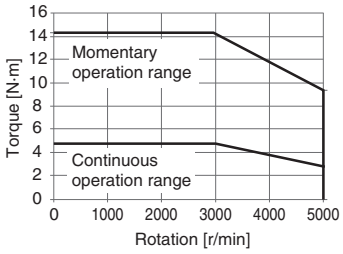
R88M-1AL75030C (400 V, 750 W)



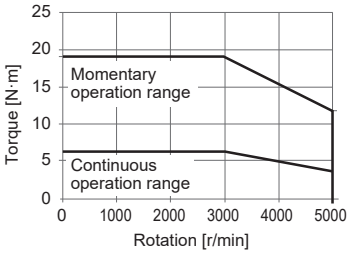

R88M-1AL1K030C (400 V, 1 kW)



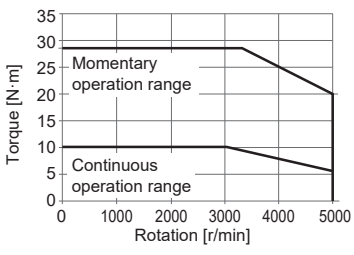

R88M-1AL1K530C (400 V, 1.5 kW)




R88M-1AL2K030C (400 V, 2 kW)




R88M-1AL3K030C (400 V, 3 kW)



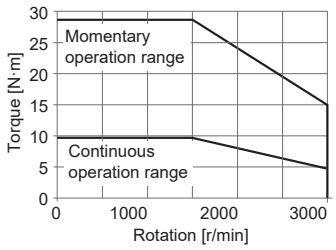
## 1500 r/min servo motors, 230 V/400 V

| Voltage | | | 230 V | 400 V | |
|---|---|---|---|---|---|
| Servo motor model: R88M-□ | | 20-bit absolute encoder | 1AM1K515T | 1AM1K515C | 1AM3K015C |
| Rated output | | W | 1,500 | | 3,000 |
| Rated torque | | N·m | 9.55 | | 19.1 |
| Instantaneous peak torque | | N·m | 28.7 | | 57.3 |
| Rated speed | | r/min | 1,500 | | |
| Max. speed | | r/min | 3,000 | | |
| Rated current | | A(rms) | 8.6 | 4.4 | 8.5 |
| Instantaneous max. current | | A(rms) | 28.4 | 14.1 | 28.3 |
| Rotor moment of inertia | Without brake | $\times 10^{-4}$ kg·m$^2$ | 12.413 | 12.413 | 40.013 |
| | With brake | $\times 10^{-4}$ kg·m$^2$ | 13.013 | | 45.113 |
| Applicable load inertia | | $\times 10^{-4}$ kg·m$^2$ | 127.05 | | 270.63 |
| Torque constant | | N·m/A(rms) | 1.11 | 2.21 | 2.46 |
| Power rate | | kW/s | 73 | | 91 |
| Mechanical time constant | | ms | 0.75 | | 1.2 |
| Electrical time constant | | ms | 17 | | 16 |
| Allowable radial load | | N | 490 | | 1176 |
| Allowable thrust load | | N | 196 | | 490 |
| Weight | Without brake | kg | 11 | | 18 |
| | With brake | kg | 13 | | 22 |
| Radiator plate dimensions (material) | | mm | 470 × 470 × t20 (aluminum) | | |
| Brake specifications | Excitation voltage*1 | V | 24 VDC±10% | | |
| | Current consumption (at 20°C) | A | 0.66 | | 1.20 |
| | Static friction torque | N·m | 12 min. | | 22 min. |
| Basic specifications | Insulation class | | Class F | | |
| | Ambient operating/storage temperature | | 0 to 40ºC/-20 to 65ºC | | |
| | Ambient operating/storage humidity | | 20 to 90% (non-condensing) | | |
| | Atmosphere | | No corrosive gases | | |
| | Insulation resistance | | 10 MΩ min. at 500 VDC between the power terminals and FG terminal | | |
| | Vibration resistance | | Vibration acceleration of 49 m/s² | | |
| | Impact resistance | | Acceleration of 98 m/s² max. 3 times each in X, Y and Z directions | | |
| | Enclosure | | IP67 (except for the through-shaft parts and connector pins) | | |

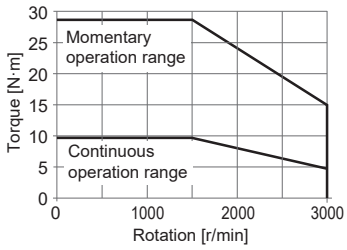
*1 This is a non-excitation brake. It is released when excitation voltage is applied.

## Torque-speed characteristics

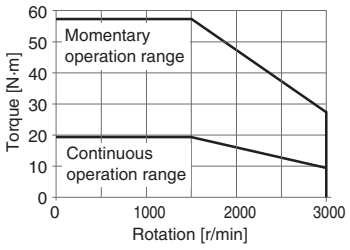
**R88M-1AM1K515T (230 V, 1.5 kW)**




**R88M-1AM1K515C (400 V, 1.5 kW)**




**R88M-1AM3K015C (400 V, 3 kW)**

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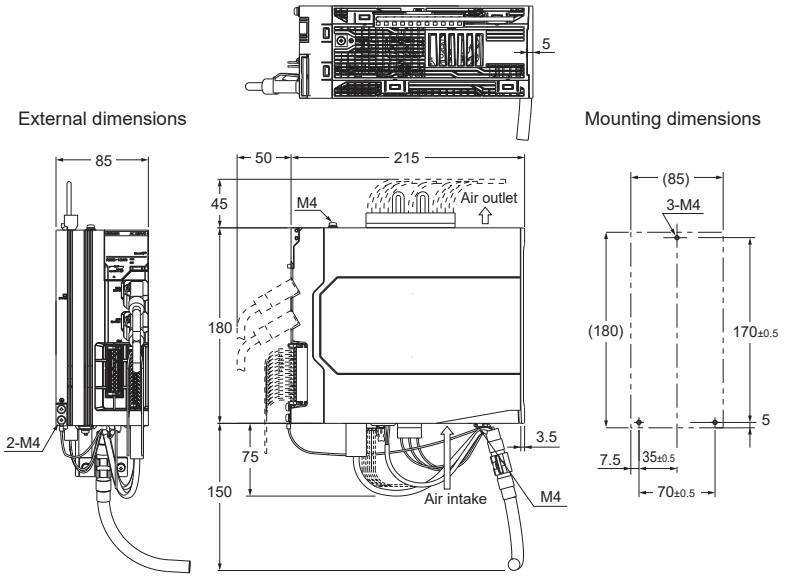
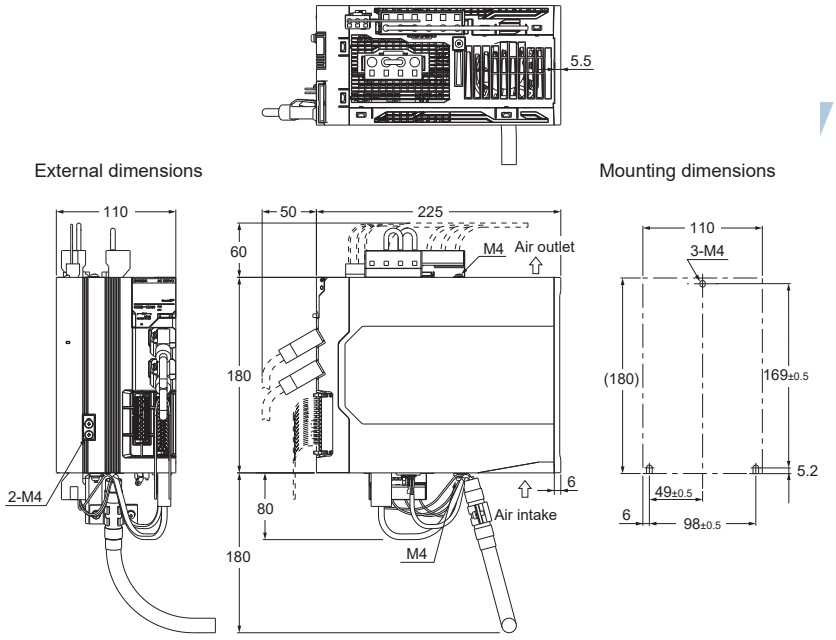
## Dimensions

### 1S servo drive with Motion Safety

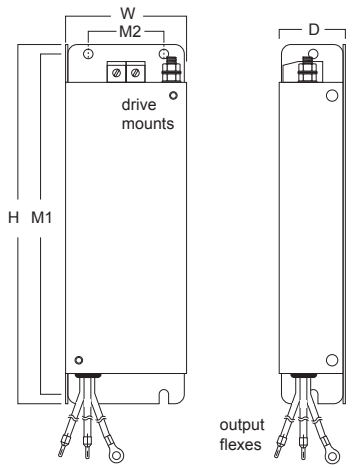
#### R88D-1SAN02H-ECT/04H-ECT/08H-ECT (230 V, 200 W to 750 W)




#### R88D-1SAN15H-ECT (230 V, 1.5 kW)
#### R88D-1SAN10F-ECT/15F-ECT/20F-ECT/30F-ECT (400 V, 1 kW to 3 kW)



## Filters




| Filter model | External dimensions (mm) | | | Mount dimensions (mm) | | Weight (kg) |
|---|---|---|---|---|---|---|
| | H | W | D | M1 | M2 | |
| R88A-FI1SA108-SE | 210 | 85 | 35 | 200 | 65 | 0.98 |
| R88A-FI1SA116-SE | | 114.6 | 45 | | 80 | 1.4 |
| R88A-FI1SA309-SE | | | | | | |

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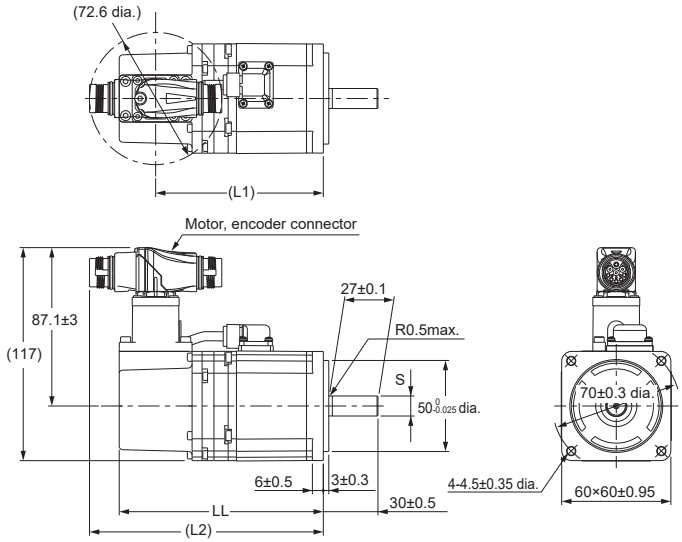
## 1S servo motor with Motion Safety

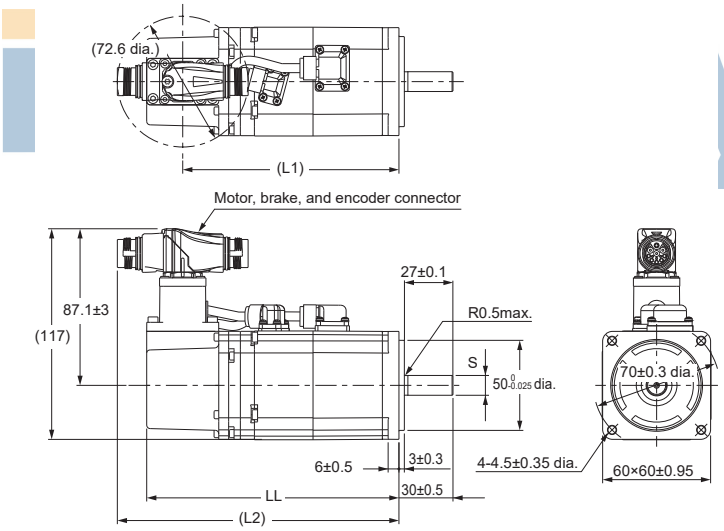
### Type 3000 r/min motors (230 V, 200 W to 400 W)

R88M-1AM20030T-S2, R88M-1AM40030T-S2



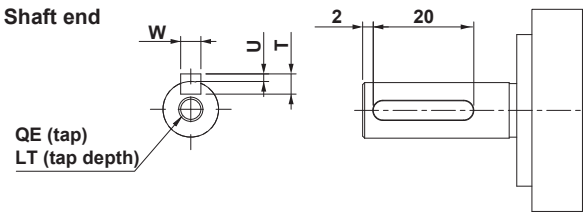

| Model | Dimensions [mm] | | | |
|---|---|---|---|---|
| | S | LL | L1 | L2 |
| R88M-1AM20030T-S2 | 11 dia. $^{0}_{-0.011}$ | 112±1 | 92 | 128 |
| R88M-1AM40030T-S2 | 14 dia. $^{0}_{-0.011}$ | 138±1 | 118 | 154 |

R88M-1AM20030T-BS2, R88M-1AM40030T-BS2




| Model | Dimensions [mm] | | | |
|---|---|---|---|---|
| | S | LL | L1 | L2 |
| R88M-1AM20030T-BS2 | 11 dia. $^{0}_{-0.011}$ | 140±1 | 120 | 156 |
| R88M-1AM40030T-BS2 | 14 dia. $^{0}_{-0.011}$ | 166±1 | 146 | 182 |

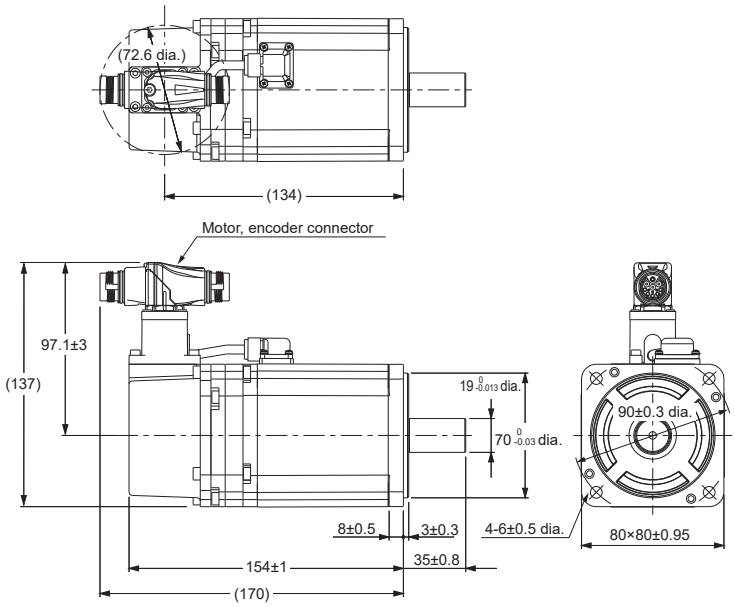
Common dimensions for models with and without brake



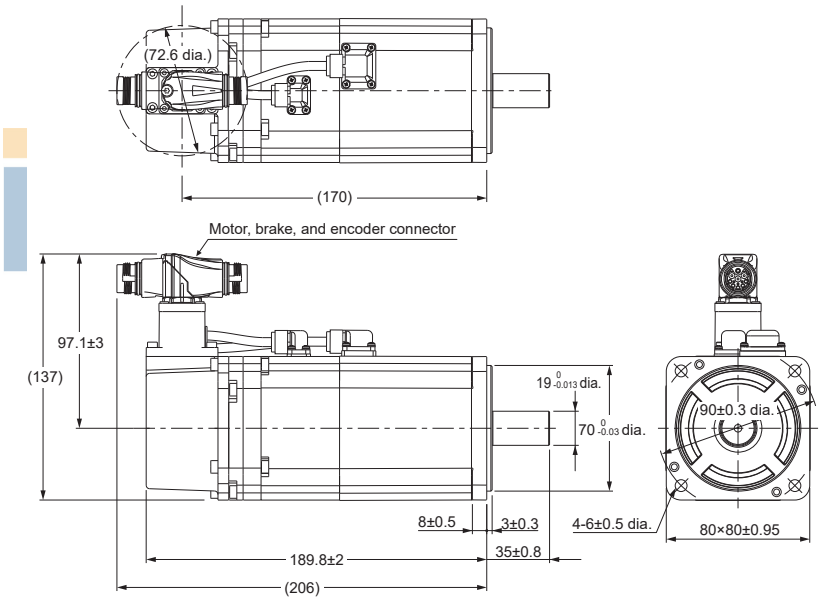

| Model | Dimensions [mm] | | | | |
|---|---|---|---|---|---|
| | W | T | U | QE | LT |
| R88M-1AM20030T-□S2 | $4^{0}_{-0.03}$ | 4 | $1.5^{0}_{-0.2}$ | M4 | 10 |
| R88M-1AM40030T-□S2 | $5^{0}_{-0.03}$ | 5 | $2^{0}_{-0.2}$ | M5 | 12 |

## Type 3000 r/min motors (230 V, 750 W)

R88M-1AM75030T-S2

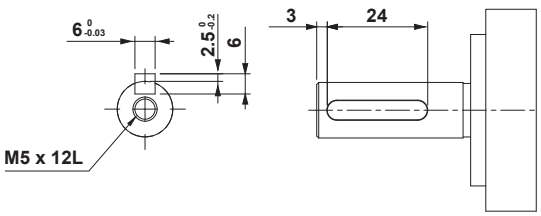



R88M-1AM75030T-BS2



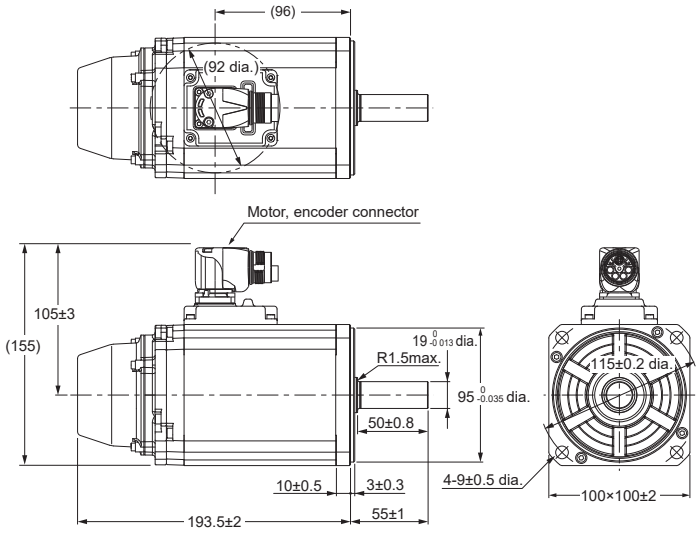

Common dimensions for models with and without brake

**Shaft end**

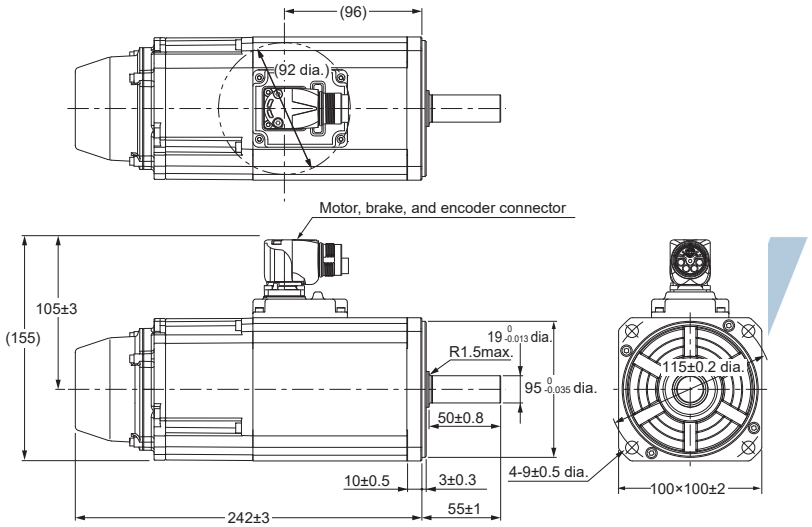


## Type 3000 r/min motors (230 V, 1 kW to 1.5 kW)

R88M-1AL1K030T-S2, R88M-1AL1K530T-S2

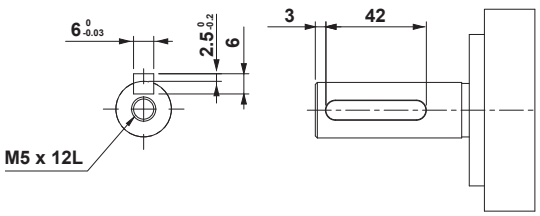



R88M-1AL1K030T-BS2, R88M-1AL1K530T-BS2



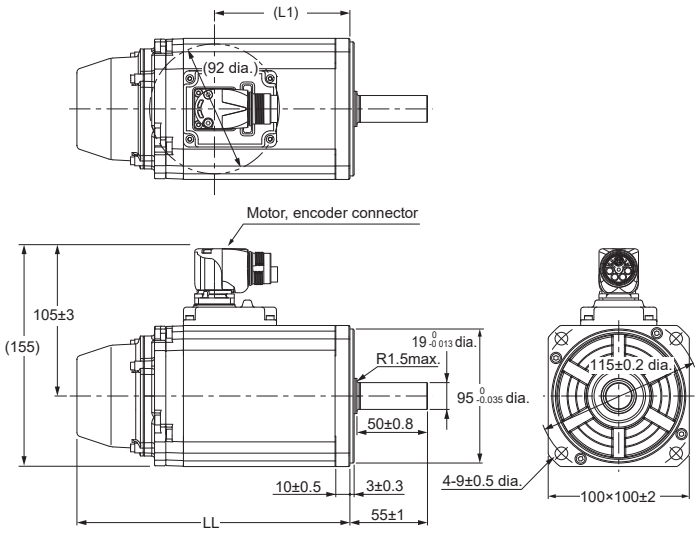

Common dimensions for models with and without brake

**Shaft end**



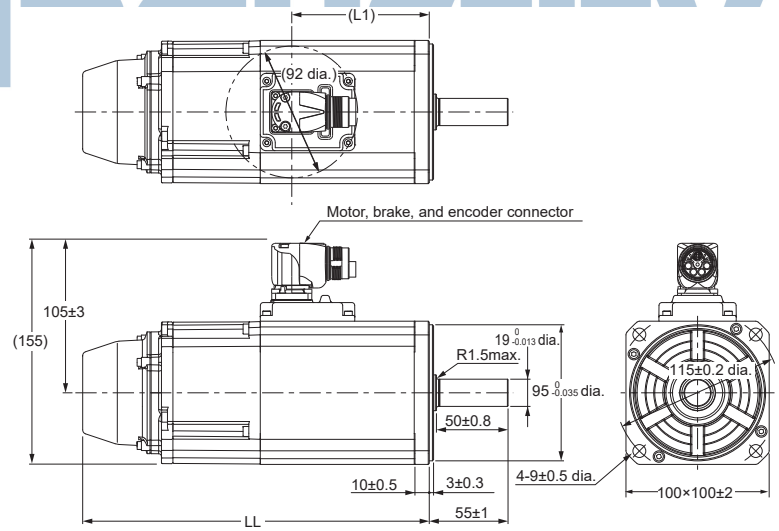
## Type 3000 r/min motors (400 V, 750 W to 2 kW)

R88M-1AL75030C-S2, R88M-1AL1K030C-S2
R88M-1AL1K530C-S2, R88M-1AL2K030C-S2




| Model | Dimensions [mm] | |
|---|---|---|
| | LL | L1 |
| **R88M-1AL75030C-S2** | 164.5±2 | 67 |
| **R88M-1AL1K030C-S2** | 193.5±2 | 96 |
| **R88M-1AL1K530C-S2** | 193.5±2 | 96 |
| **R88M-1AL2K030C-S2** | 204.5±3 | 107 |

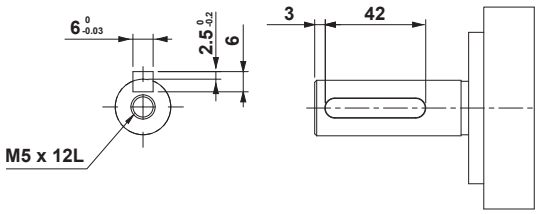
R88M-1AL75030C-BS2, R88M-1AL1K030C-BS2
R88M-1AL1K530C-BS2, R88M-1AL2K030C-BS2




| Model | Dimensions [mm] | |
|---|---|---|
| | LL | L1 |
| **R88M-1AL75030C-BS2** | 213±3 | 67 |
| **R88M-1AL1K030C-BS2** | 242±3 | 96 |
| **R88M-1AL1K530C-BS2** | 242±3 | 96 |
| **R88M-1AL2K030C-BS2** | 253±3 | 107 |

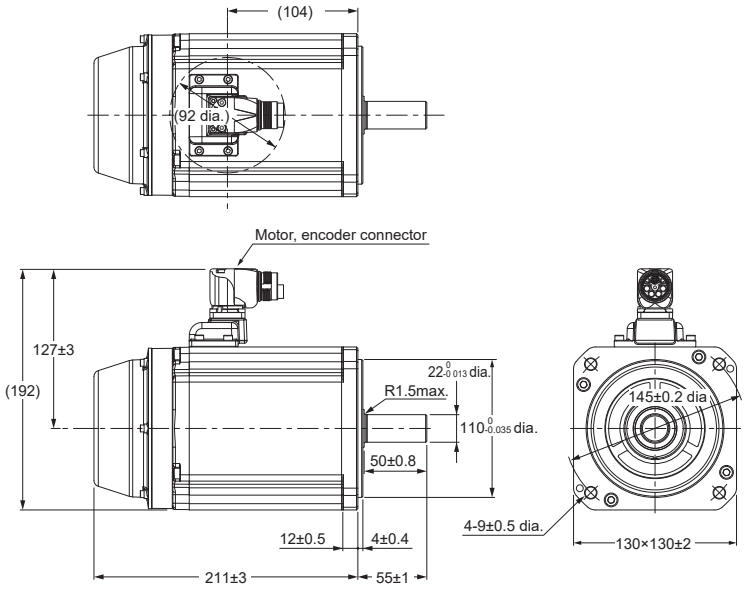
Common dimensions for models with and without brake

**Shaft end**

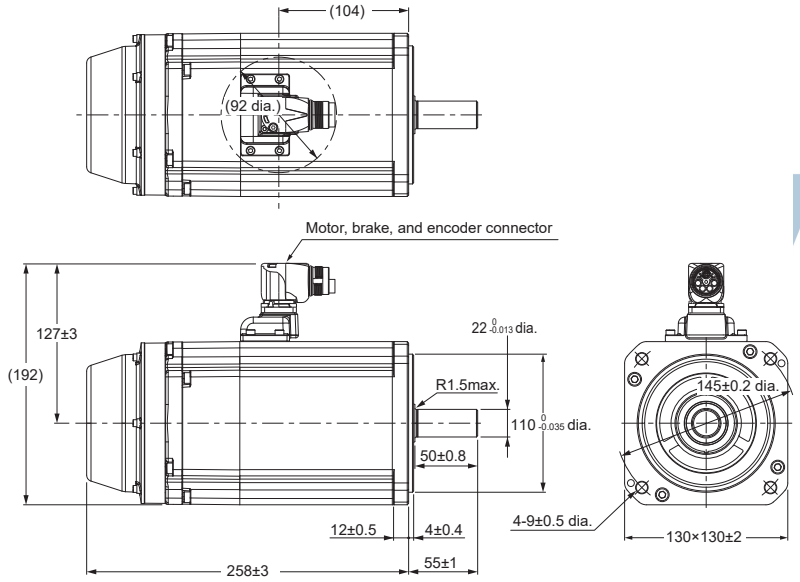


## Type 3000 r/min motors (400 V, 3 kW)

R88M-1AL3K030C-S2

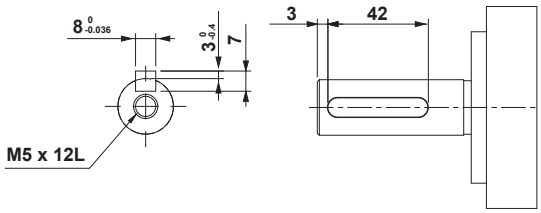



R88M-1AL3K030C-BS2



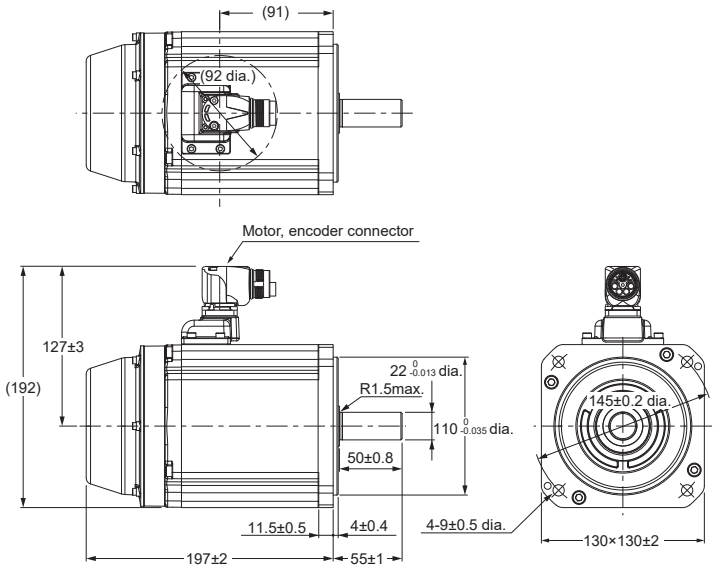

Common dimensions for models with and without brake

**Shaft end**

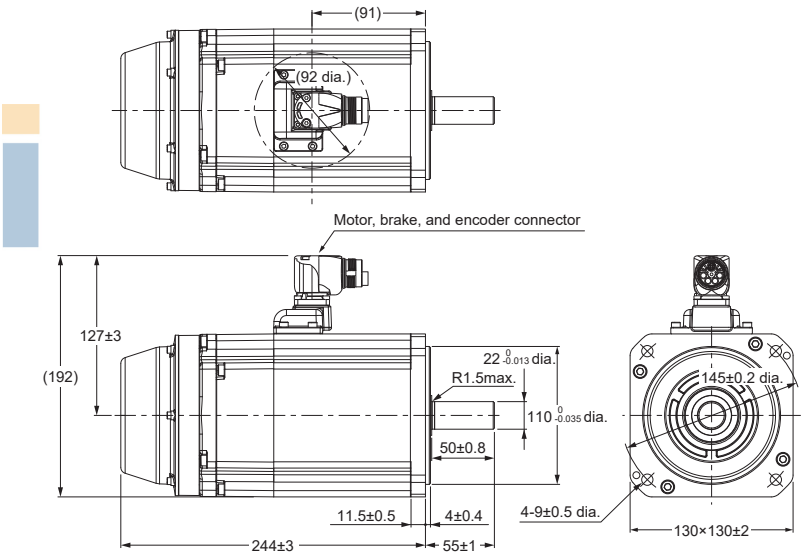


## Type 1500 r/min motors (230 V/400 V, 1.5 kW)

R88M-1AM1K515T-S2
R88M-1AM1K515C-S2

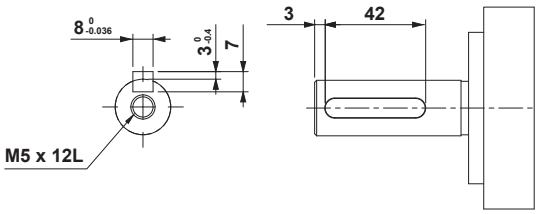



R88M-1AM1K515T-BS2
R88M-1AM1K515C-BS2



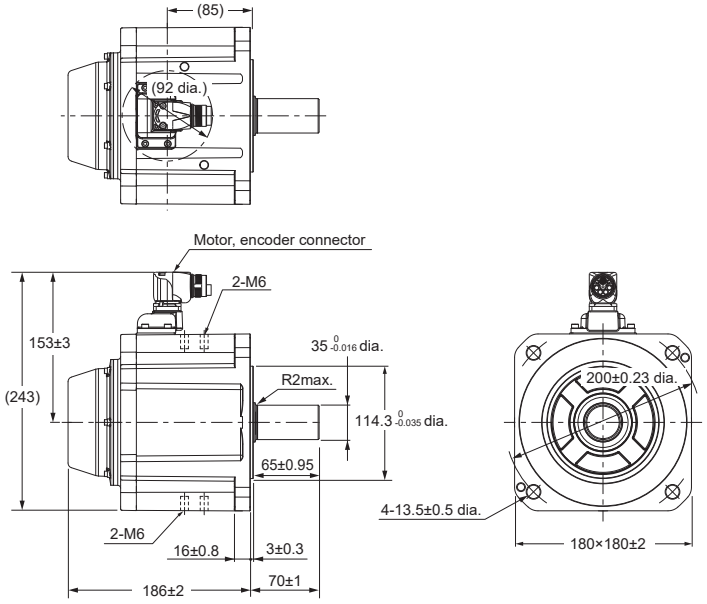

Common dimensions for models with and without brake

**Shaft end**

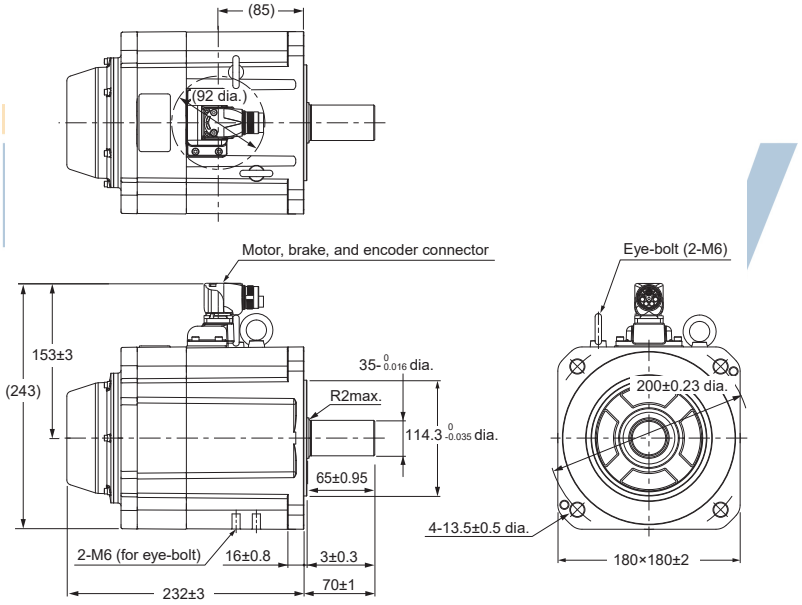


## Type 1500 r/min motors (400 V, 3 kW)

R88M-1AM3K015C-S2

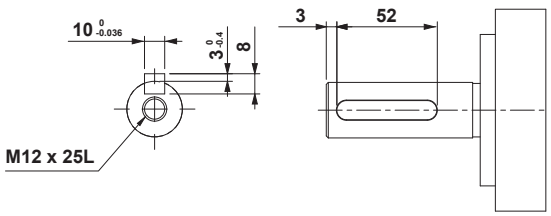



R88M-1AM3K015C-BS2




Common dimensions for models with and without brake

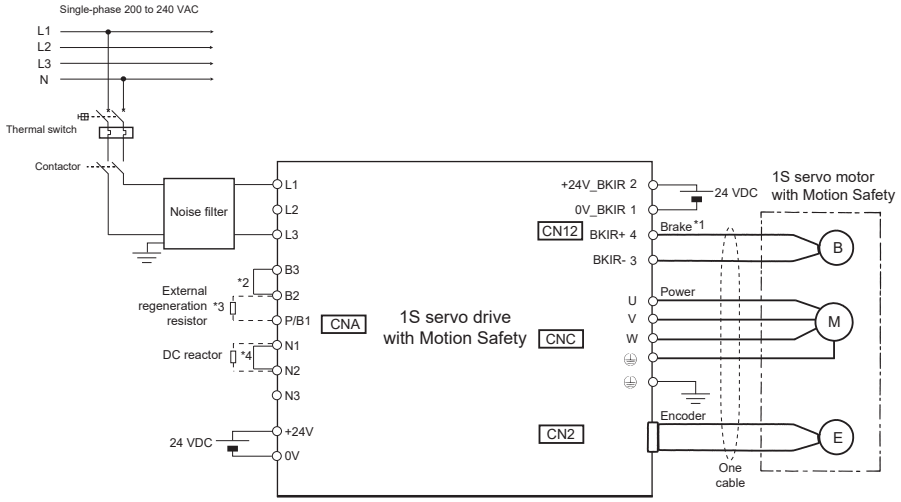
**Shaft end**



# Installation

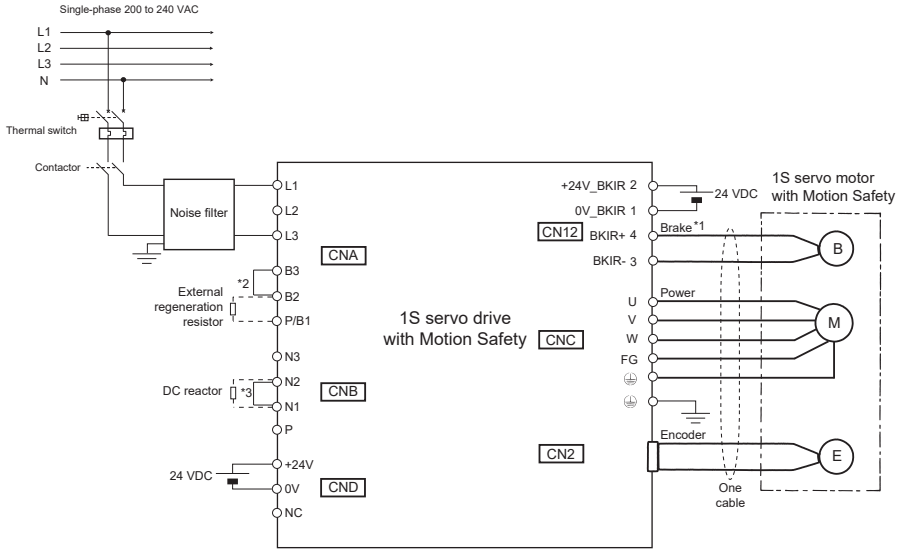
## Power and motor connectors

### Single-phase, 230 VAC (200 W to 750 W models)



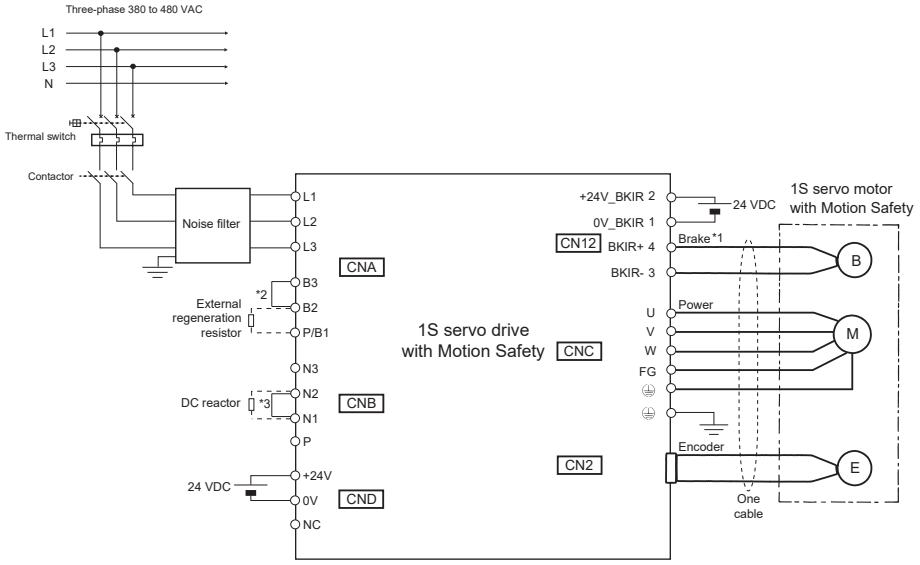

*1 There is no polarity on the brake.
*2 For 750 W servo drive, B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 There is no internal regeneration resistor for 100 W to 400 W models. When the amount of regeneration is large, connect the necessary regeneration resistor between B1 and B2.
*4 To use a DC reactor, remove the short-circuit wire and connect the DC reactor between N1 and N2.

### Single-phase, 230 VAC (1.5 kW model)



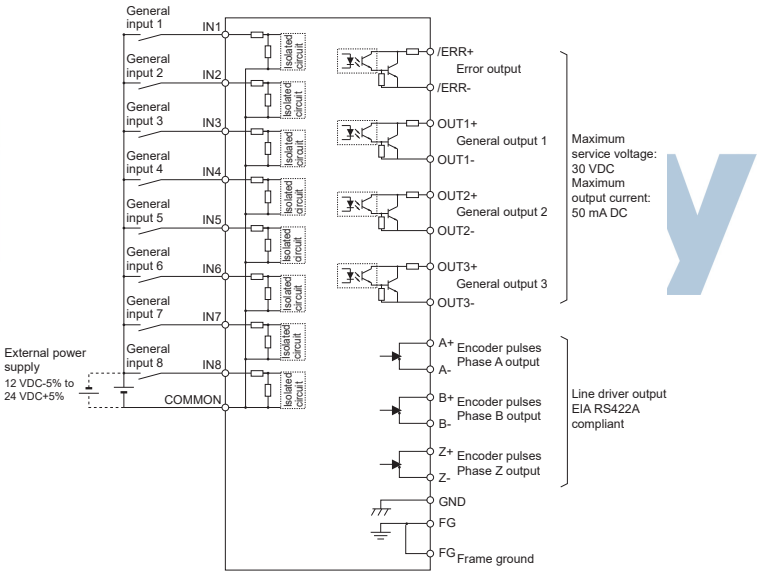

*1 There is no polarity on the brake.
*2 B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 To use a DC reactor, remove the short-circuit wire and connect the DC reactor between N1 and N2.

## Three-phase, 400 VAC (1 kW to 3 kW models)

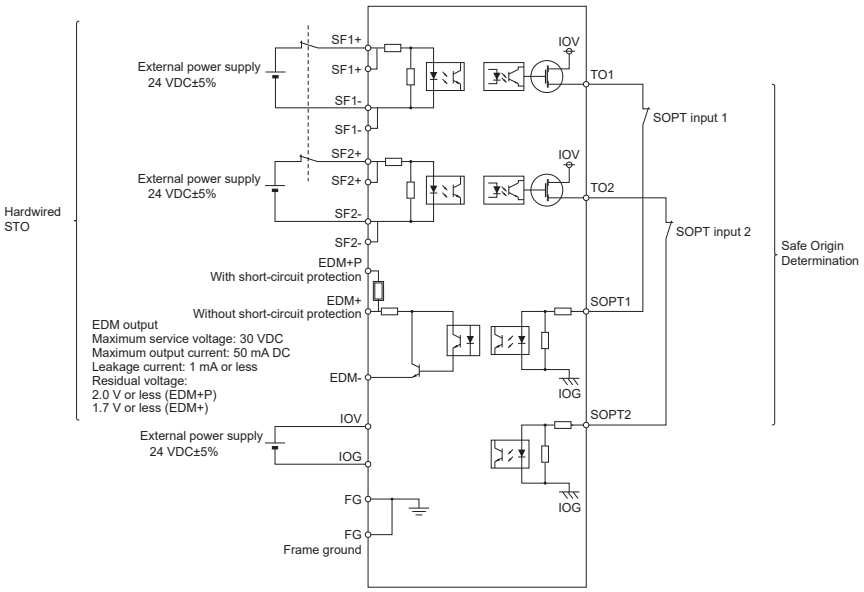



*1 There is no polarity on the brake.
*2 B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 To use a DC reactor, remove the short-circuit wire and connect the DC reactor between N1 and N2.

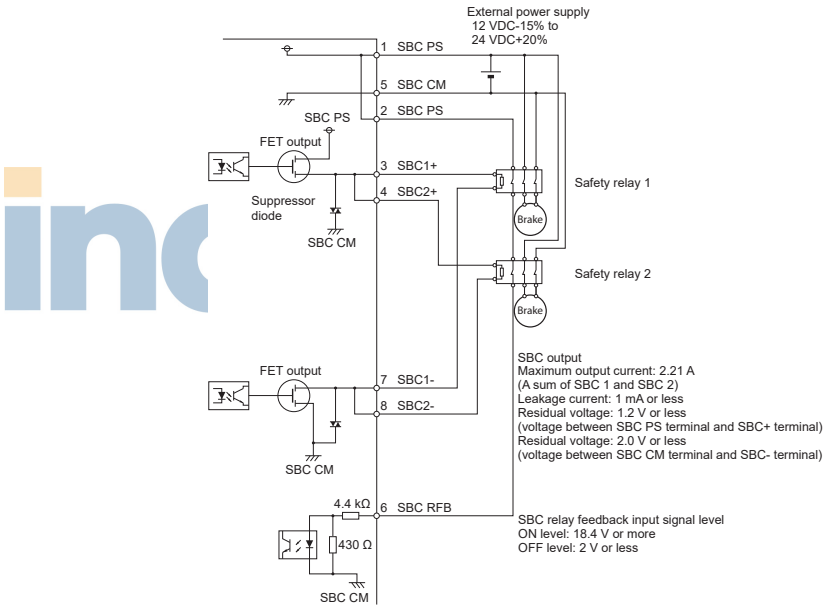
## Standard I/O connector (CN1)



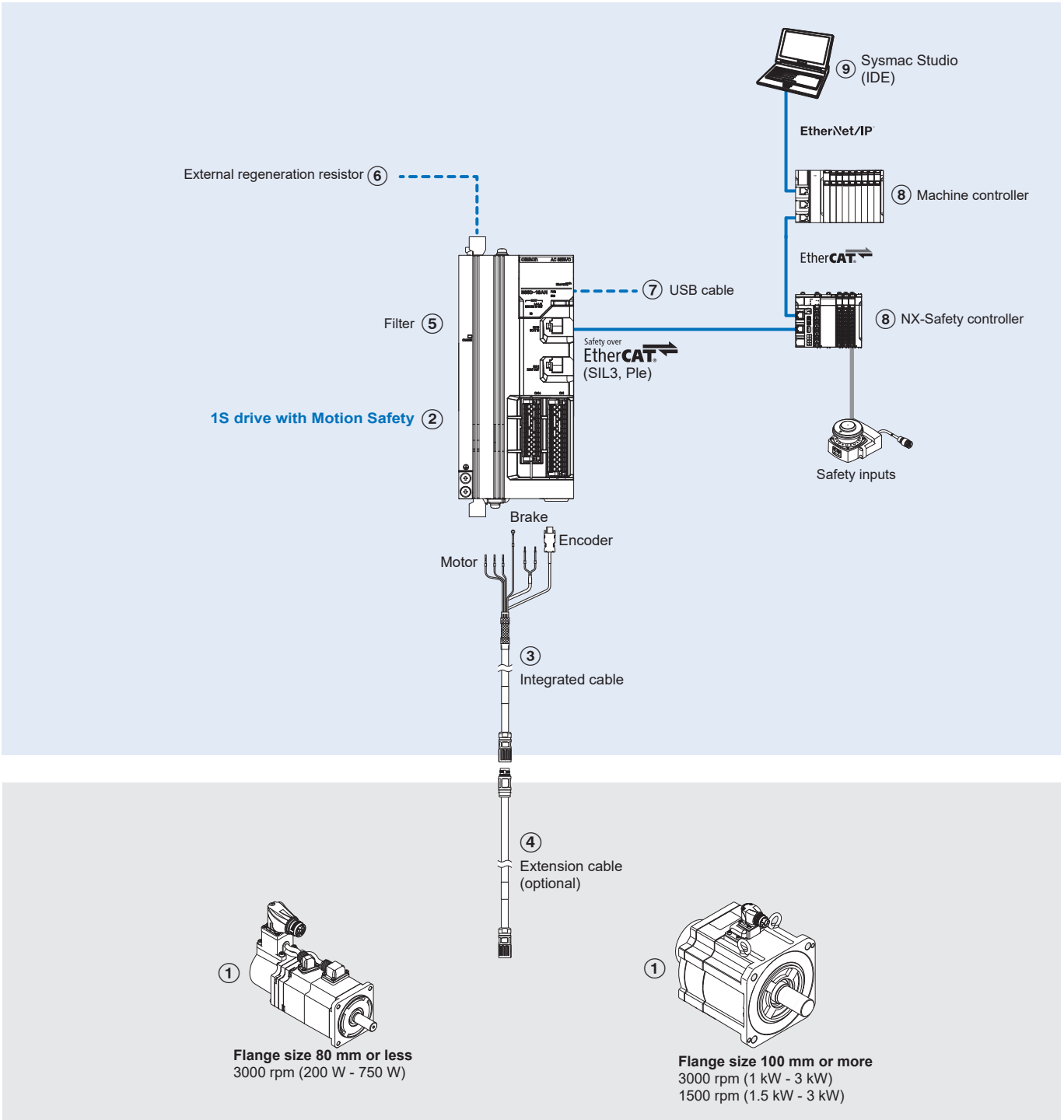
## Safety I/O connector (CN14)




## Safe Brake control connector (CN15)



## Ordering information




### Servo motors

① Select motor from R88M-1A□ family using motor tables in next pages.

### Servo drives

② Select drive from R88D-1SAN□ family according to the selected motor.

## Motor and drive combinations

### Servo motors 3000 r/min (200 W to 3 kW)

| Voltage | Brake option | Rated torque | Capacity | ① Servo motor model | ② Compatible servo drive |
|---|---|---|---|---|---|
| 230 V | Without brake | 0.637 N·m | 200 W | R88M-1AM20030T-S2 | R88D-1SAN02H-ECT |
| | | 1.27 N·m | 400 W | R88M-1AM40030T-S2 | R88D-1SAN04H-ECT |
| | | 2.39 N·m | 750 W | R88M-1AM75030T-S2 | R88D-1SAN08H-ECT |
| | | 3.18 N·m | 1 kW | R88M-1AL1K030T-S2 | R88D-1SAN15H-ECT |
| | | 4.77 N·m | 1.5 kW | R88M-1AL1K530T-S2 | R88D-1SAN15H-ECT |
| | With brake | 0.637 N·m | 200 W | R88M-1AM20030T-BS2 | R88D-1SAN02H-ECT |
| | | 1.27 N·m | 400 W | R88M-1AM40030T-BS2 | R88D-1SAN04H-ECT |
| | | 2.39 N·m | 750 W | R88M-1AM75030T-BS2 | R88D-1SAN08H-ECT |
| | | 3.18 N·m | 1 kW | R88M-1AL1K030T-BS2 | R88D-1SAN15H-ECT |
| | | 4.77 N·m | 1.5 kW | R88M-1AL1K530T-BS2 | R88D-1SAN15H-ECT |
| 400 V | Without brake | 2.39 N·m | 750 W | R88M-1AL75030C-S2 | R88D-1SAN10F-ECT |
| | | 3.18 N·m | 1 kW | R88M-1AL1K030C-S2 | R88D-1SAN10F-ECT |
| | | 4.77 N·m | 1.5 kW | R88M-1AL1K530C-S2 | R88D-1SAN15F-ECT |
| | | 6.37 N·m | 2 kW | R88M-1AL2K030C-S2 | R88D-1SAN20F-ECT |
| | | 9.55 N·m | 3 kW | R88M-1AL3K030C-S2 | R88D-1SAN30F-ECT |
| | With brake | 2.39 N·m | 750 W | R88M-1AL75030C-BS2 | R88D-1SAN10F-ECT |
| | | 3.18 N·m | 1 kW | R88M-1AL1K030C-BS2 | R88D-1SAN10F-ECT |
| | | 4.77 N·m | 1.5 kW | R88M-1AL1K530C-BS2 | R88D-1SAN15F-ECT |
| | | 6.37 N·m | 2 kW | R88M-1AL2K030C-BS2 | R88D-1SAN20F-ECT |
| | | 9.55 N·m | 3 kW | R88M-1AL3K030C-BS2 | R88D-1SAN30F-ECT |

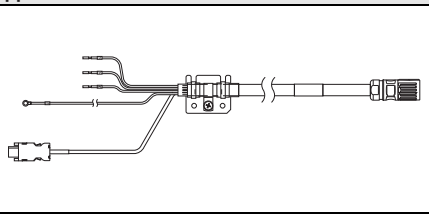
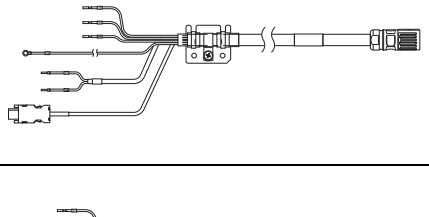
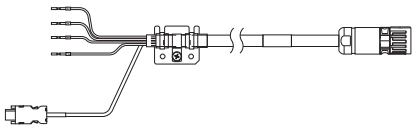
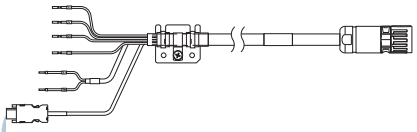
### Servo motors 1500 r/min (1.5 kW to 3 kw)

| Voltage | Brake option | Rated torque | Capacity | ① Servo motor model | ② Compatible servo drive |
|---|---|---|---|---|---|
| 230 V | Without brake | 9.55 N·m | 1.5 kW | R88M-1AM1K515T-S2 | R88D-1SAN15H-ECT |
| | With brake | | | R88M-1AM1K515T-BS2 | R88D-1SAN15H-ECT |
| 400 V | Without brake | 9.55 N·m | 1.5 kW | R88M-1AM1K515C-S2 | R88D-1SAN15F-ECT |
| | | 19.1 N·m | 3 kW | R88M-1AM3K015C-S2 | R88D-1SAN30F-ECT |
| | With brake | 9.55 N·m | 1.5 kW | R88M-1AM1K515C-BS2 | R88D-1SAN15F-ECT |
| | | 19.1 N·m | 3 kW | R88M-1AM3K015C-BS2 | R88D-1SAN30F-ECT |

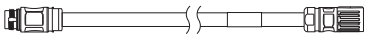
Industry

## Cables

### ③ Integrated cable

| Applicable servo motor | | | Model | Appearance |
|---|---|---|---|---|
| R88M-1AM(200/400/750)30T-□ | Without brake | 3 m | R88A-CX1A003SF |  |
| | | 5 m | R88A-CX1A005SF | |
| | | 10 m | R88A-CX1A010SF | |
| | | 15 m | R88A-CX1A015SF | |
| | | 20 m | R88A-CX1A020SF | |
| | With brake | 3 m | R88A-CX1A003BF |  |
| | | 5 m | R88A-CX1A005BF | |
| | | 10 m | R88A-CX1A010BF | |
| | | 15 m | R88A-CX1A015BF | |
| | | 20 m | R88A-CX1A020BF | |
| R88M-1AL(1K0/1K5)30T-□<br>R88M-1AM1K515T-□<br>R88M-1AL(750/1K0/1K5/2K0/3K0)30C-□<br>R88M-1AM(1K5/3K0)15C-□ | Without brake | 3 m | R88A-CX1C003SF |  |
| | | 5 m | R88A-CX1C005SF | |
| | | 10 m | R88A-CX1C010SF | |
| | | 15 m | R88A-CX1C015SF | |
| | | 20 m | R88A-CX1C020SF | |
| | With brake | 3 m | R88A-CX1C003BF |  |
| | | 5 m | R88A-CX1C005BF | |
| | | 10 m | R88A-CX1C010BF | |
| | | 15 m | R88A-CX1C015BF | |
| | | 20 m | R88A-CX1C020BF | |

### ④ Extension cable (optional)

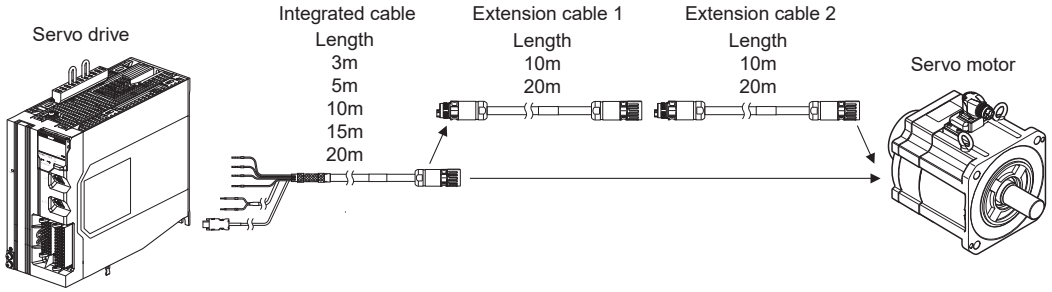
| Applicable servo motor | | Model | Appearance |
|---|---|---|---|
| R88M-1AM(200/400/750)30T-□ | 10 m | R88A-CX1AE10BF |  |
| | 20 m | R88A-CX1AE20BF | |
| R88M-1AL(1K0/1K5)30T-□<br>R88M-1AM1K515T-□<br>R88M-1AL(750/1K0/1K5/2K0/3K0)30C-□<br>R88M-1AM(1K5/3K0)15C-□ | 10 m | R88A-CX1BE10BF*1 | |
| | 20 m | R88A-CX1BE20BF*1 | |

*1 Use R88A-CX1BE□□BF as an extension cable for R88A-CX1C□□BF.

industry

## Combinations of integrated cables and extension cables

The table below lists the combinations of cables that can be used to extend the integrated cable to more than 20 m.




| Length (m) | | | | Combination |
|---|---|---|---|---|
| Total | Integrated cable | Extension cable 1 | Extension cable 2 | |
| 3 | 3 | – | – | Integrated cable only |
| 5 | 5 | – | – | Integrated cable only |
| 10 | 10 | – | – | Integrated cable only |
| 15 | 15 | – | – | Integrated cable only |
| 20 | 20 | – | – | Integrated cable only |
| 30 | 20 | 10 | – | Integrated cable + extension cable 1 |
| 40 | 20 | 20 | – | Integrated cable + extension cable 1 |
| 50 | 20 | 10 | 20 | Integrated cable + extension cable 1 + extension cable 2*1 |

*1 A 20 m extension cable 1 and a 10 m extension cable 2 can also be used.

### ⑤ Filters

| Applicable servo drive | Rated current | Leakage current | Rated voltage | Model |
|---|---|---|---|---|
| R88D-1SAN(02H/04H/08H)-ECT | 8 A | 7.9 mA | 250 VAC | R88A-FI1SA108-SE |
| R88D-1SAN15H-ECT | 16 A | 7.4 mA | | R88A-FI1SA116-SE |
| R88D-1SAN(10F/15F/20F/30F)-ECT | 9 A | 2.3 mA | 400 VAC | R88A-FI1SA309-SE |

### ⑥ External regeneration resistor

| Applicable servo drive | Regeneration process capacity | Model |
|---|---|---|
| R88D-1SAN02H-ECT | 24 W, 25 Ω | R88A-RR12025 |
| R88D-1SAN15H-ECT | 60 W, 14 Ω | R88A-RR30014 |
| R88D-1SAN08H-ECT/-1SAN20F-ECT*1 | 60 W, 20 Ω | R88A-RR30020 |
| R88D-1SAN02H-ECT/-1SAN04H-ECT | 60 W, 25 Ω | R88A-RR30025 |
| R88D-1SAN30F-ECT | 60 W, 32 Ω | R88A-RR30032 |
| R88D-1SAN10F-ECT*1 | 60 W, 33 Ω | R88A-RR30033 |
| R88D-1SAN15F-ECT | 60 W, 54 Ω | R88A-RR30054 |

*1 Use two series-connected external regeneration resistors for this model.

### ⑦ USB cable

Use a commercially available USB that is double-shielded, gold-plated and supports USB 2.0. The Micro B type USB cable can be used.

### ⑧ Machine and Safety controller

| Type | Name | | Model |
|---|---|---|---|
| Machine controller | Industrial PC | Box PC type | NY512-□ |
| | | Panel PC type (Box PC + Monitor integrated) | NY532-□ |
| | Modular controller | NX7 series | NX701-□ |
| | | NJ series | NJ□01-□ |
| | | NX1 series | NX102-□ |
| | Compact controller | NX1P series | NX1P2-□ |
| Safety controller | CIP-Safety and FSoE protocols | 254 Safety master connections, 2,032 Safety I/O points | NX-SL5700 |
| | | 128 Safety master connections, 1,024 Safety I/O points | NX-SL5500 |
| | FSoE protocol | 128 Safety master connections, 1,024 Safety I/O points | NX-SL3500 |
| | | 32 Safety master connections, 256 Safety I/O points | NX-SL3300 |

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### Servo drive connectors (spare parts)

| Applicable servo drive | Name | Model |
|---|---|---|
| R88D-1SAN(02H/04H/08H)-ECT | Main circuit connector (CNA)*1 | R88A-CN102P*2 |
| | Motor connector (CNC) | R88A-CN101A*2 |
| R88D-1SAN15H-ECT<br>R88D-1SAN(10F/15F/20F/30F)-ECT | Main circuit connector A (CNA)*3 | R88A-CN103P*2 |
| | Main circuit connector B (CNB)*3 | R88A-CN104P*2 |
| | Motor connector (CNC) | R88A-CN102A*2 |
| | Control power supply connector (CND) | R88A-CN101P*2 |
| Common to all models | Control I/O connector (CN1) | R88A-CN102C |
| | Encoder connector (CN2) | R88A-CN101R |
| | Brake interlock connector (CN12) | R88A-CN101B |
| | Safety signal connector (CN14)*4 | R88A-CN101S |
| | Safe brake control connector (CN15) | R88A-CN102S |

*1 Two short-circuit wires are connected to the connector.
*2 One opener is included.
*3 One short-circuit wire is connected to the connector.
*4 Four short-circuit wires are connected to the connector. One pin to prevent improper wiring are included

### Cable shield clamp (spare parts)

| Description | Model |
|---|---|
| A shield clamp is used to fix the integrated cable and to connect the shield of the integrated cable to FG of the servo drive | R88A-SC10CX-PE |

### ⑨ Computer software

| Specifications | Model |
|---|---|
| Sysmac Studio version 1.27 or higher | SYSMAC-SE2□□□ |
| Sysmac Studio Drive Edition | SYSMAC-DE001L |

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

Cat. No. I220E-EN-01D In the interest of product improvement, specifications are subject to change without notice.