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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 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 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

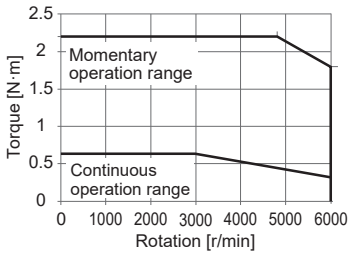
3000 r/min servo motors, 230 V

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)				

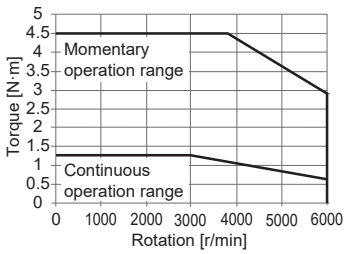
*1 This is a non-excitation brake. It is released when excitation voltage is applied.

Torque-speed characteristics

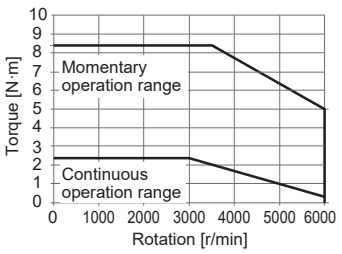
R88M-1AM20030T (230 V, 200 W)



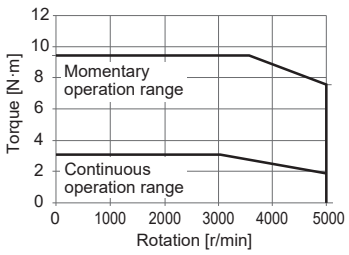
R88M-1AM40030T (230 V, 400 W)



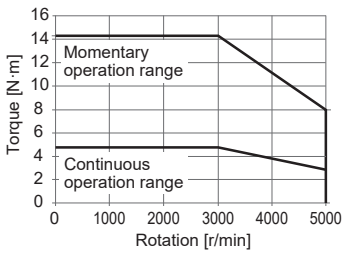
R88M-1AM75030T (230 V, 750 W)



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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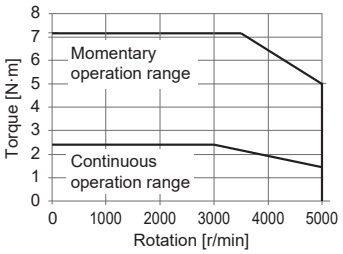
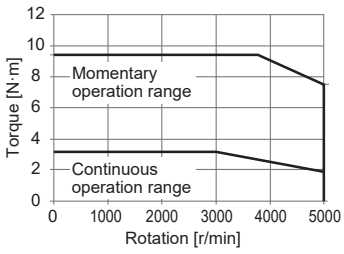
Torque-speed characteristics

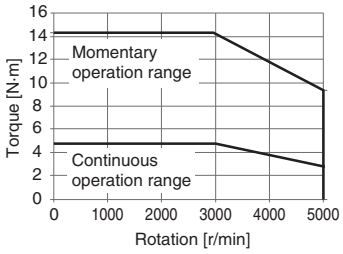
R88M-1AL75030C (400 V, 750 W)



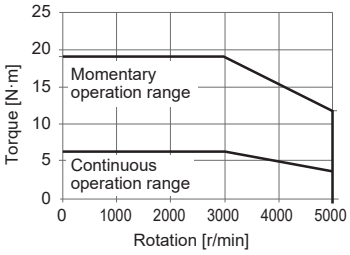
R88M-1AL1K030C (400 V, 1 kW)



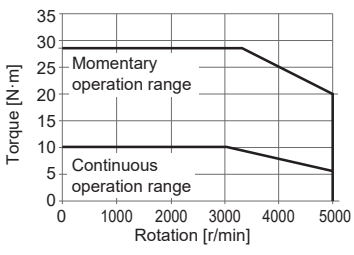
R88M-1AL1K530C (400 V, 1.5 kW)



R88M-1AL2K030C (400 V, 2 kW)



R88M-1AL3K030C (400 V, 3 kW)



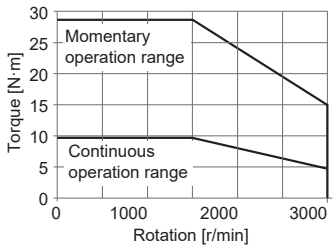
1500 r/min servo motors, 230 V/400 V

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)		

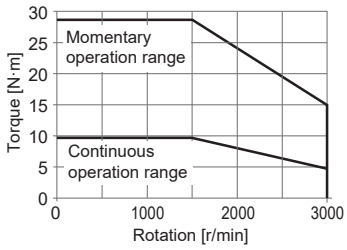
*1 This is a non-excitation brake. It is released when excitation voltage is applied.

Torque-speed characteristics

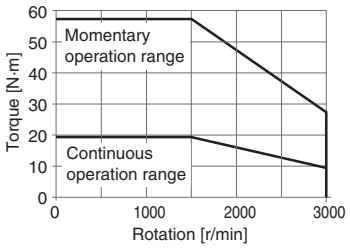
R88M-1AM1K515T (230 V, 1.5 kW)



R88M-1AM1K515C (400 V, 1.5 kW)



R88M-1AM3K015C (400 V, 3 kW)



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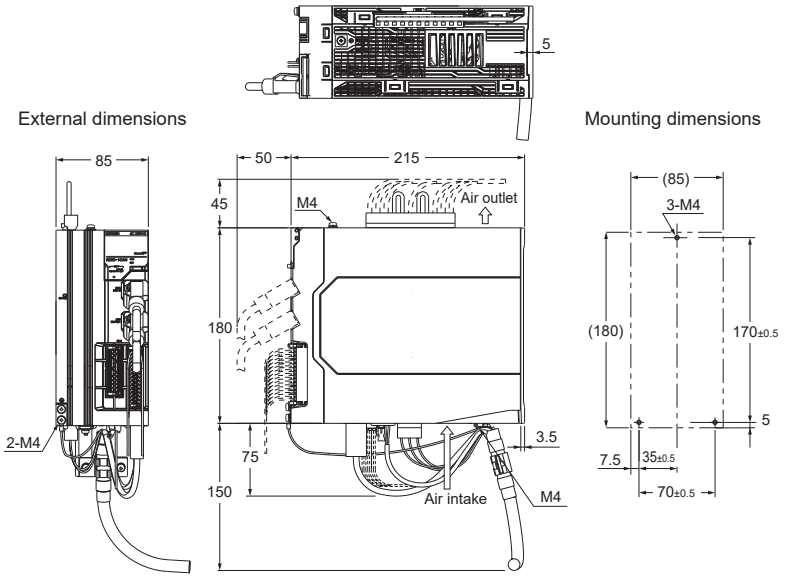
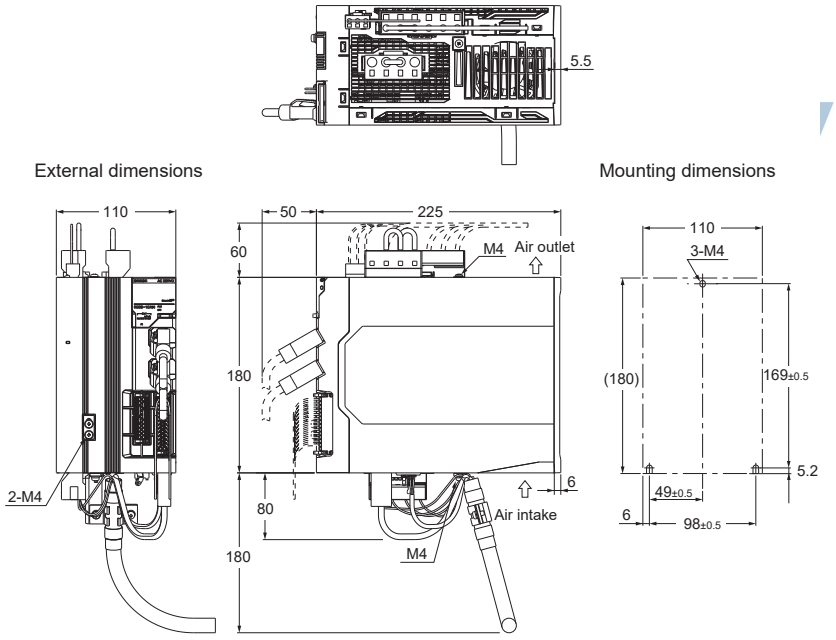
Dimensions

1S servo drive with Motion Safety

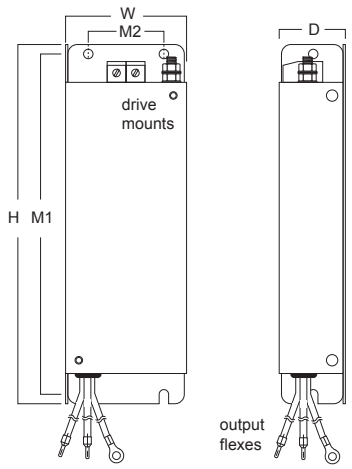
R88D-1SAN02H-ECT/04H-ECT/08H-ECT (230 V, 200 W to 750 W)



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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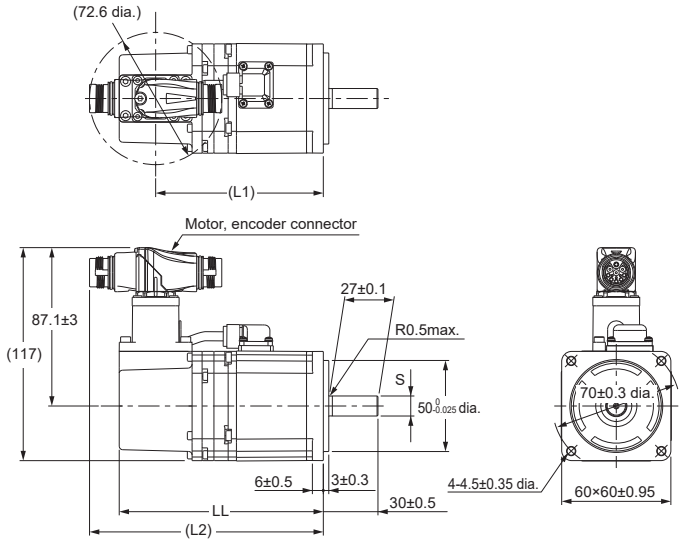
1S servo motor with Motion Safety

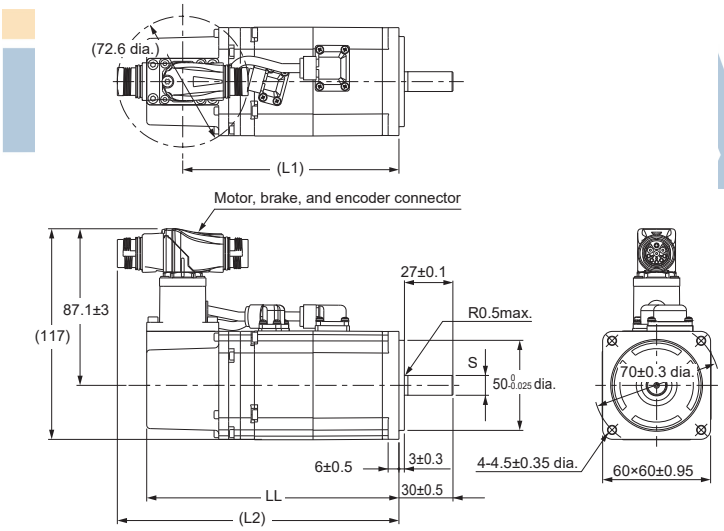
Type 3000 r/min motors (230 V, 200 W to 400 W)

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



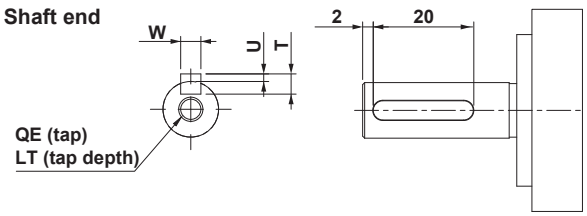
Model	Dimensions [mm]			
	S	LL	L1	L2
R88M-1AM20030T-S2	11 dia. $^{0}_{-0.011}$	112±1	92	128
R88M-1AM40030T-S2	14 dia. $^{0}_{-0.011}$	138±1	118	154

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

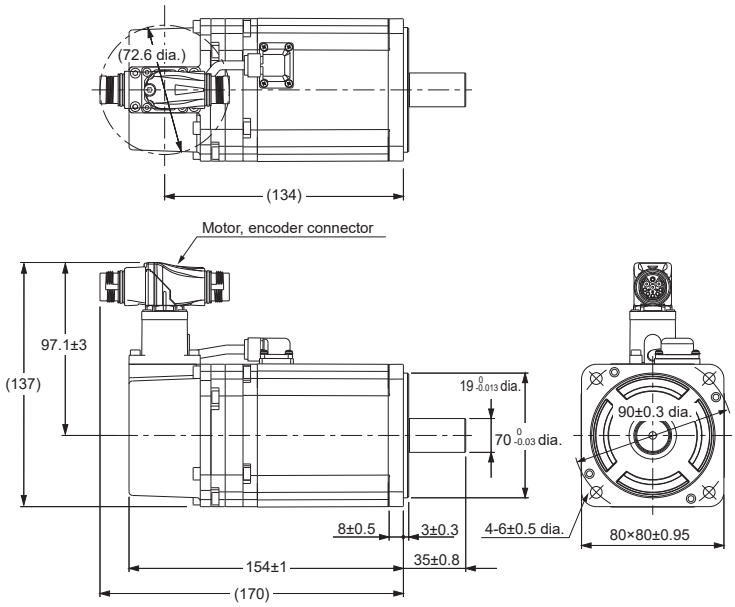
Common dimensions for models with and without brake



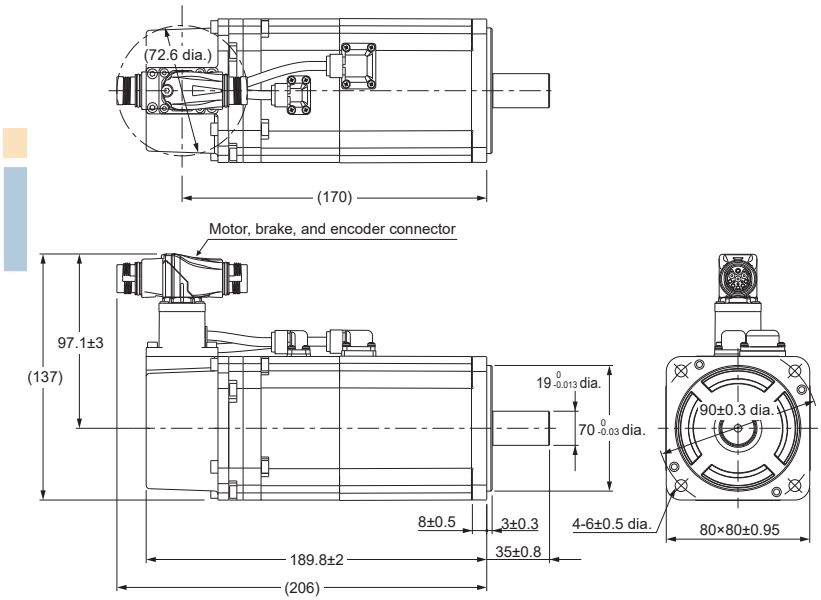
Model	Dimensions [mm]				
	W	T	U	QE	LT
R88M-1AM20030T-□S2	$4^{0}_{-0.03}$	4	$1.5^{0}_{-0.2}$	M4	10
R88M-1AM40030T-□S2	$5^{0}_{-0.03}$	5	$2^{0}_{-0.2}$	M5	12

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

R88M-1AM75030T-S2

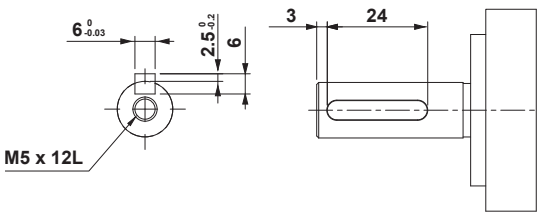


R88M-1AM75030T-BS2



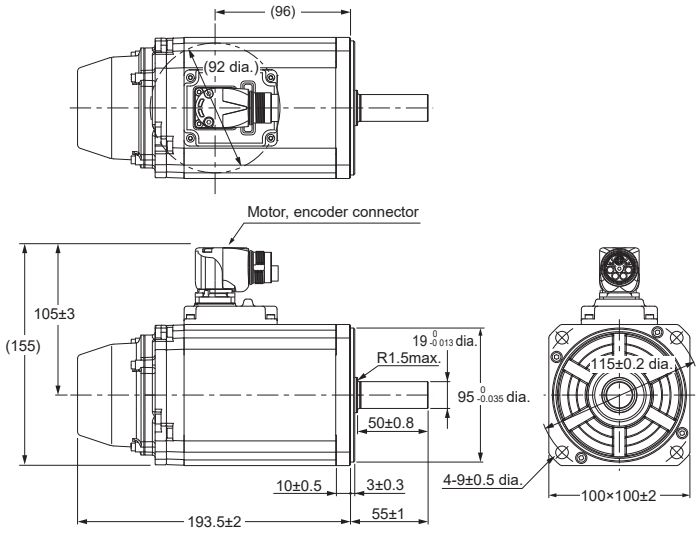
Common dimensions for models with and without brake

Shaft end

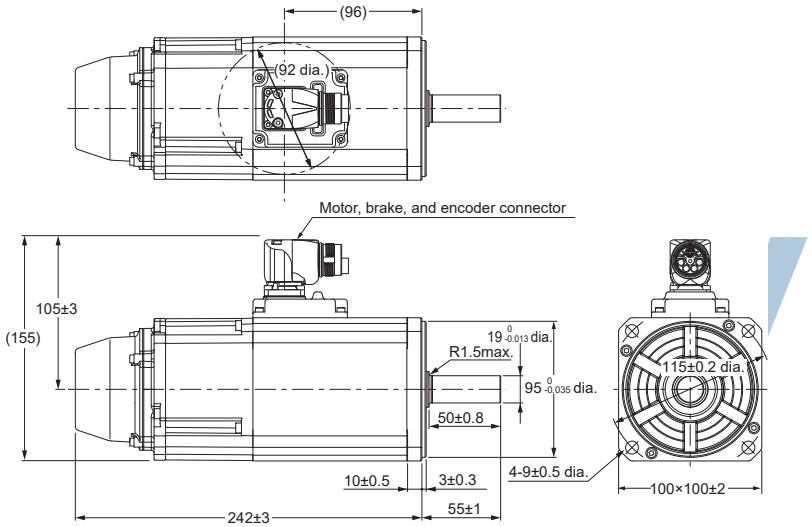


Type 3000 r/min motors (230 V, 1 kW to 1.5 kW)

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

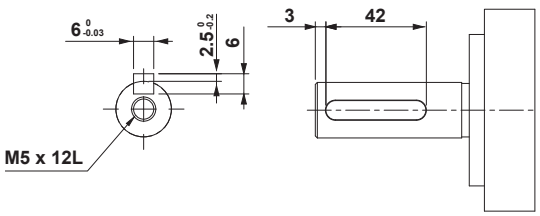


R88M-1AL1K030T-BS2, R88M-1AL1K530T-BS2



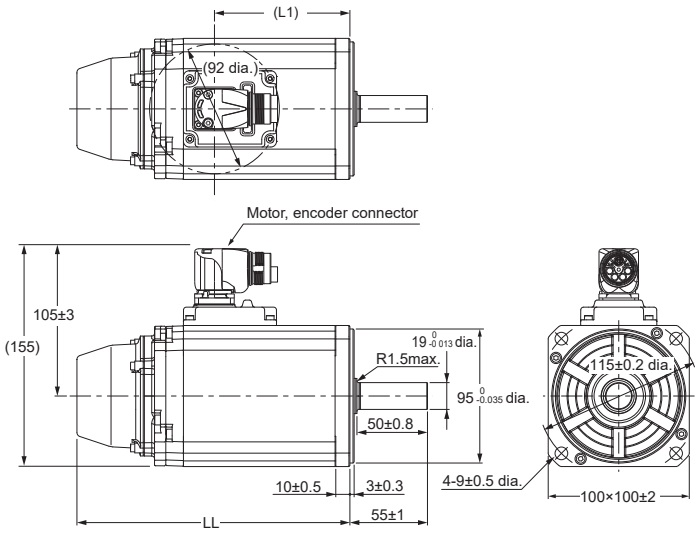
Common dimensions for models with and without brake

Shaft end



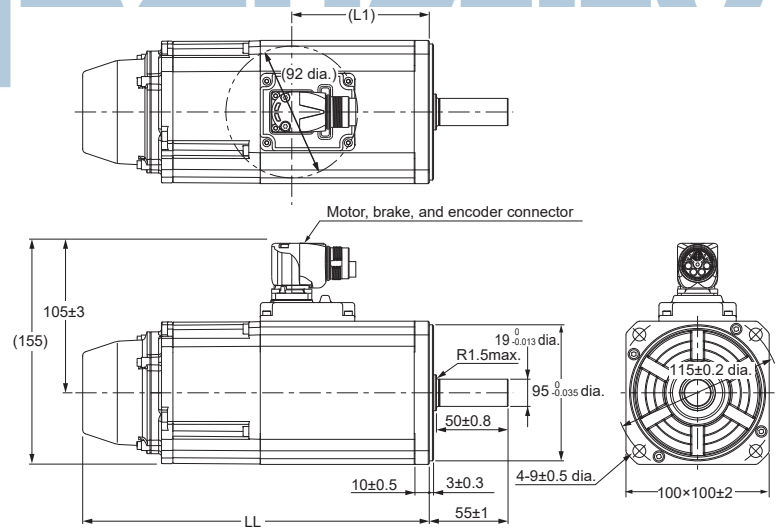
Type 3000 r/min motors (400 V, 750 W to 2 kW)

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

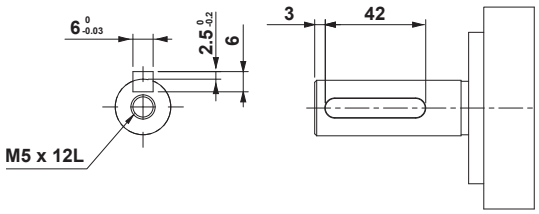
R88M-1AL75030C-BS2, R88M-1AL1K030C-BS2
R88M-1AL1K530C-BS2, R88M-1AL2K030C-BS2



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

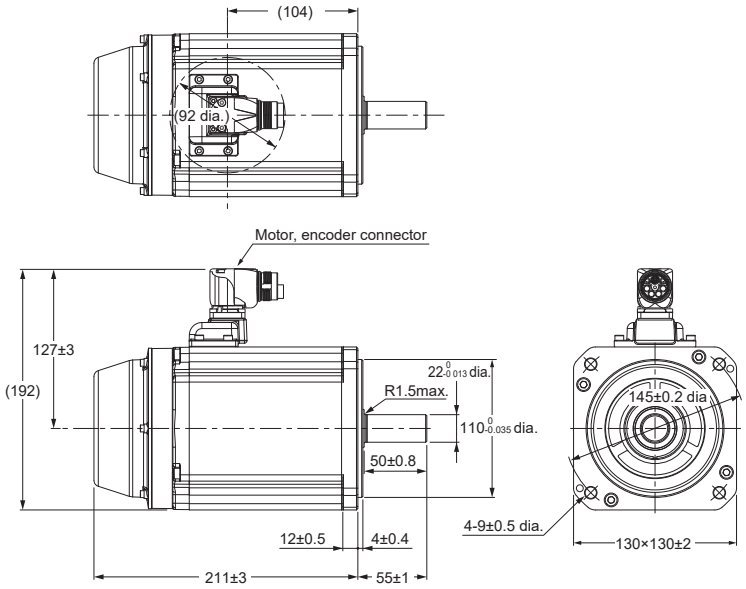
Common dimensions for models with and without brake

Shaft end

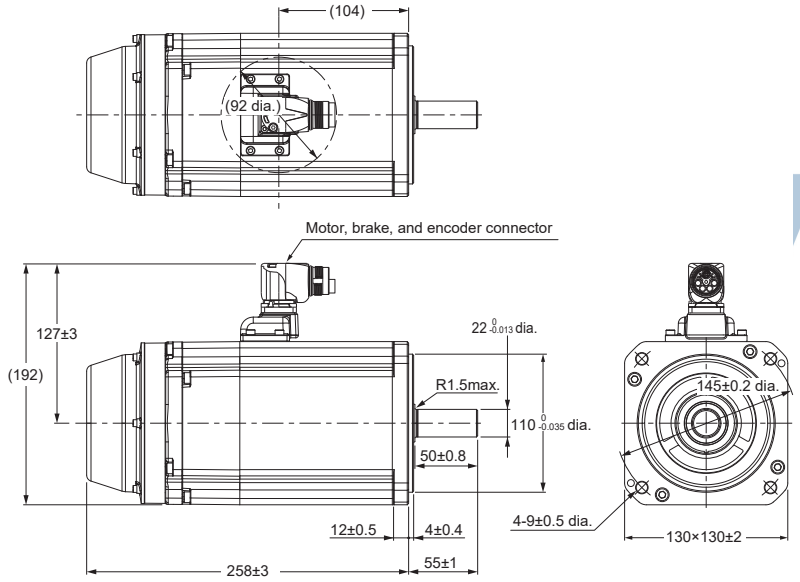


Type 3000 r/min motors (400 V, 3 kW)

R88M-1AL3K030C-S2

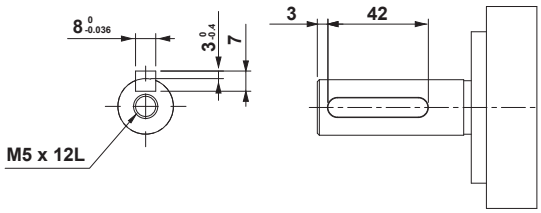


R88M-1AL3K030C-BS2



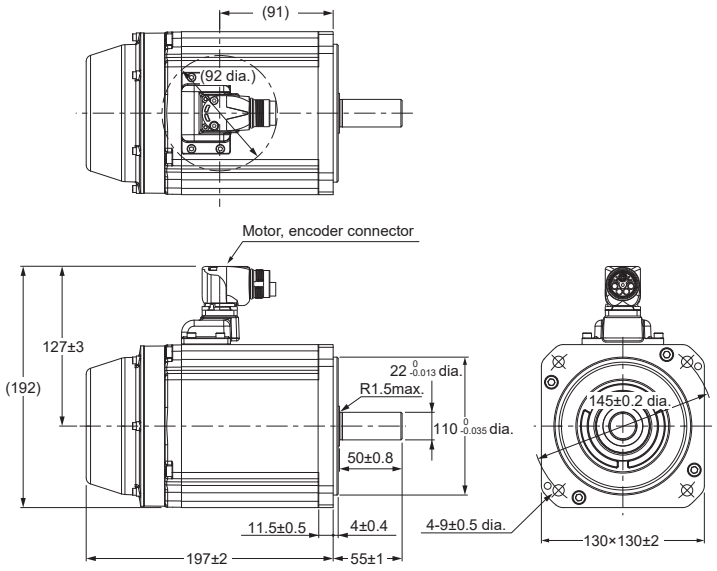
Common dimensions for models with and without brake

Shaft end

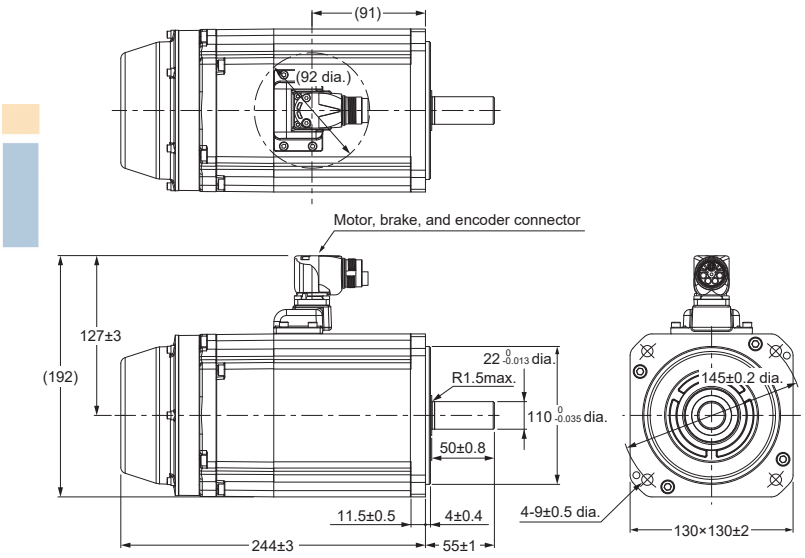


Type 1500 r/min motors (230 V/400 V, 1.5 kW)

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

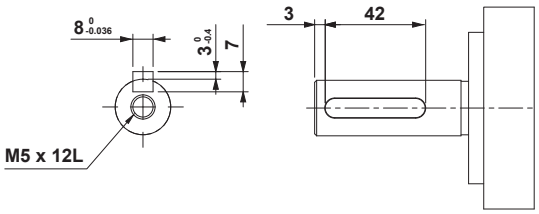


R88M-1AM1K515T-BS2
R88M-1AM1K515C-BS2



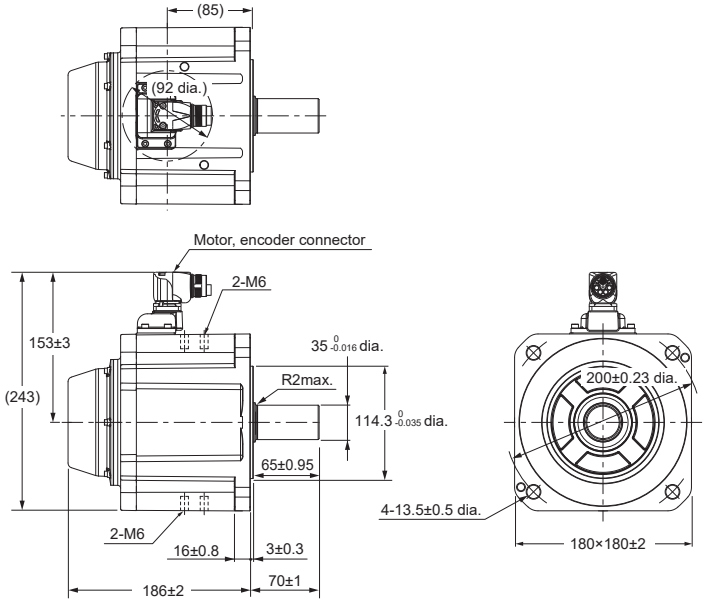
Common dimensions for models with and without brake

Shaft end

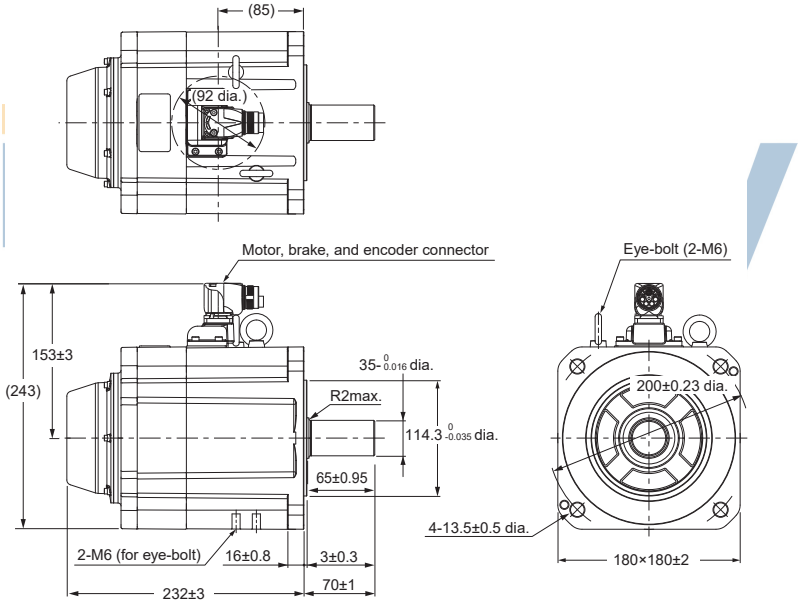


Type 1500 r/min motors (400 V, 3 kW)

R88M-1AM3K015C-S2

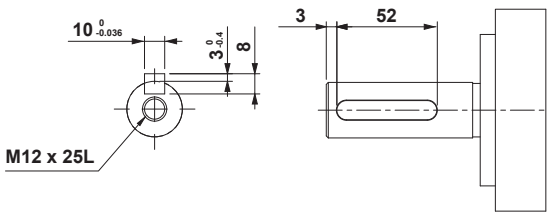


R88M-1AM3K015C-BS2



Common dimensions for models with and without brake

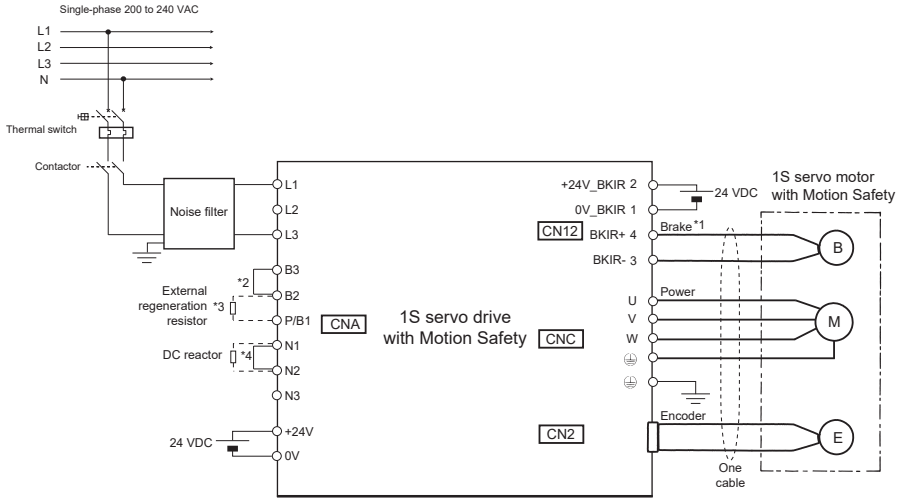
Shaft end



Installation

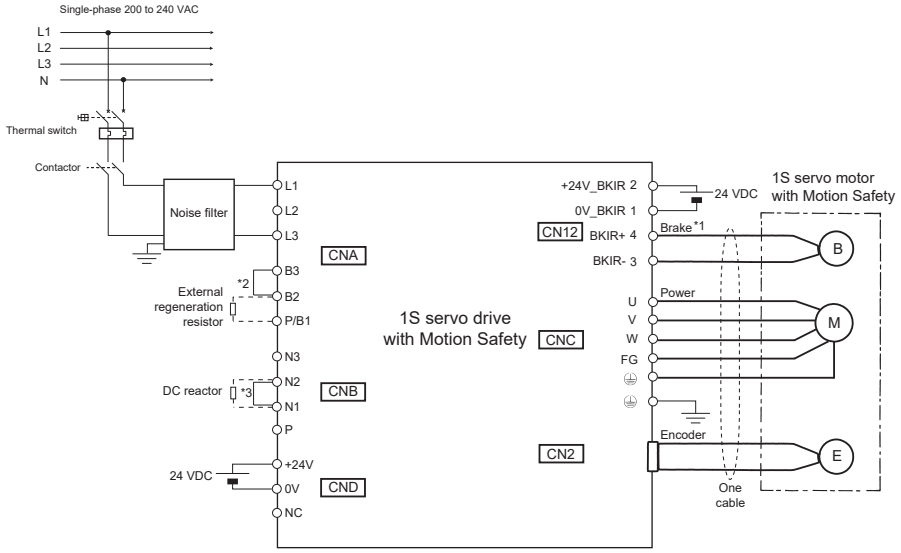
Power and motor connectors

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



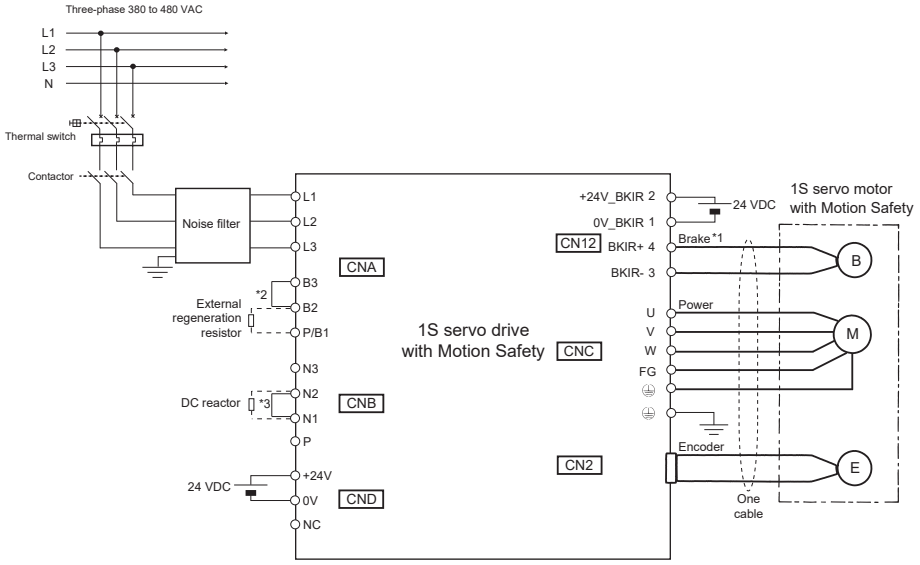
*1 There is no polarity on the brake.
*2 For 750 W servo drive, B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 There is no internal regeneration resistor for 100 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)



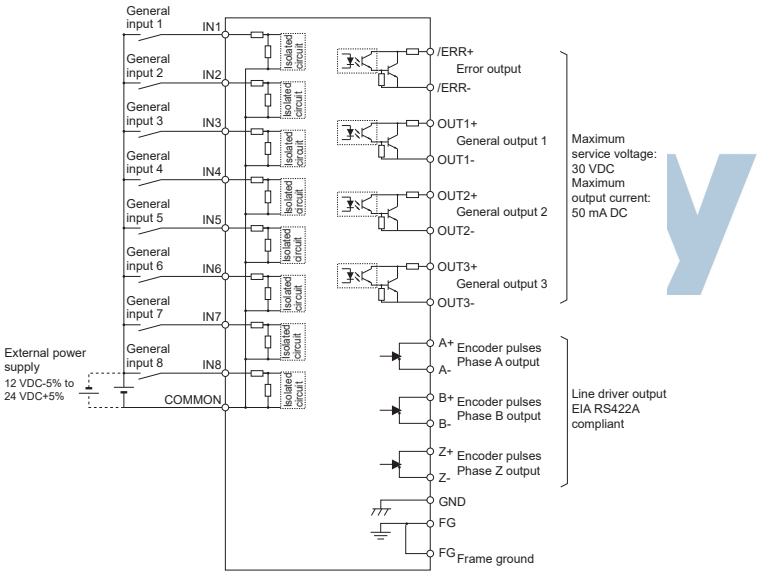
*1 There is no polarity on the brake.
*2 B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 To use a DC reactor, remove the short-circuit wire and connect the DC reactor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

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

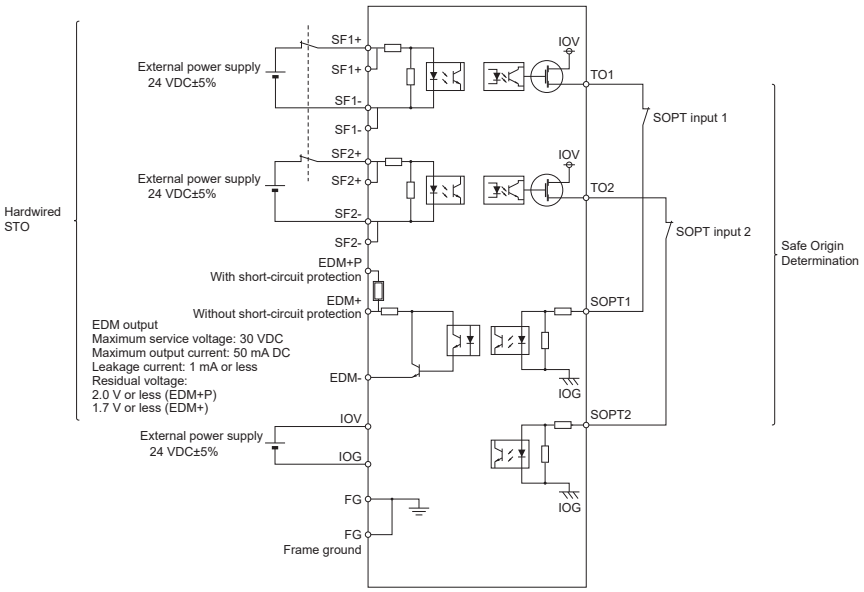


*1 There is no polarity on the brake.
*2 B2 and B3 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.
*3 To use a DC reactor, remove the short-circuit wire and connect the DC reactor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

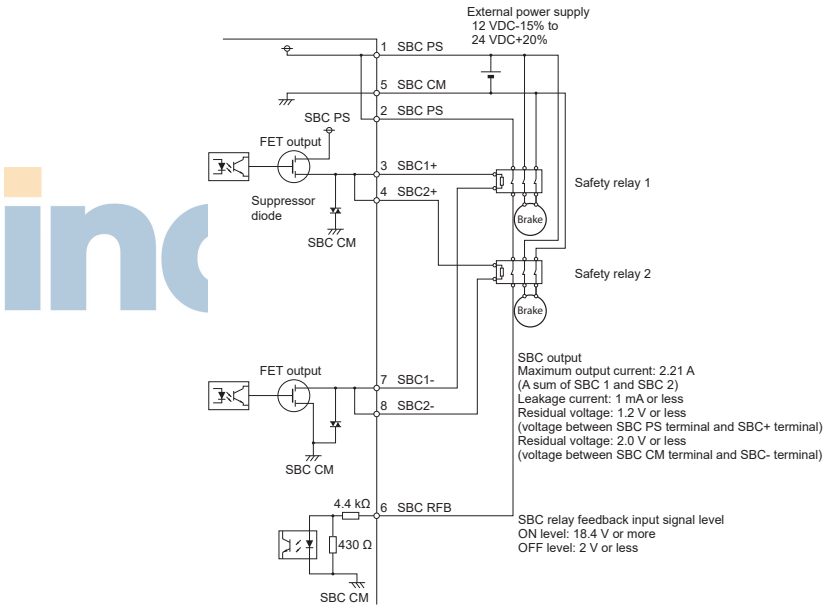
Standard I/O connector (CN1)



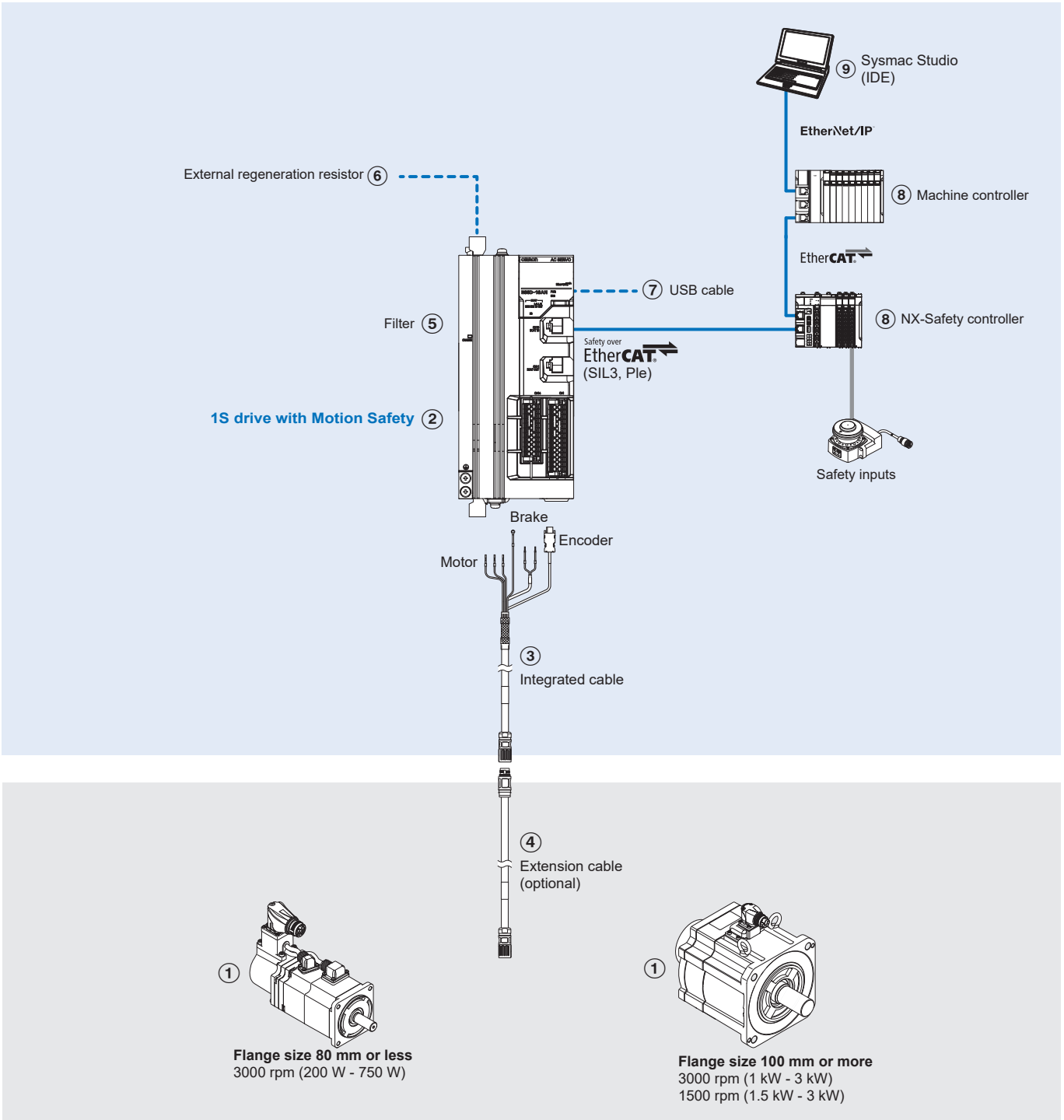
Safety I/O connector (CN14)



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

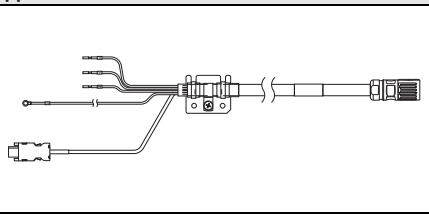
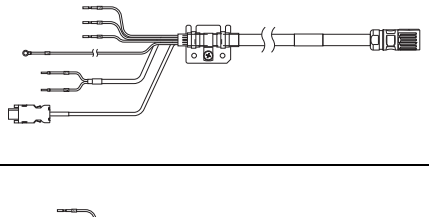
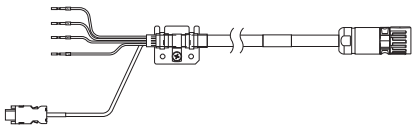
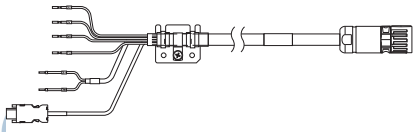
Servo motors 1500 r/min (1.5 kW to 3 kw)

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

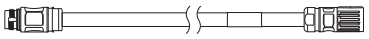
Industry

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-□ R88M-1AM1K515T-□ R88M-1AL(750/1K0/1K5/2K0/3K0)30C-□ 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)

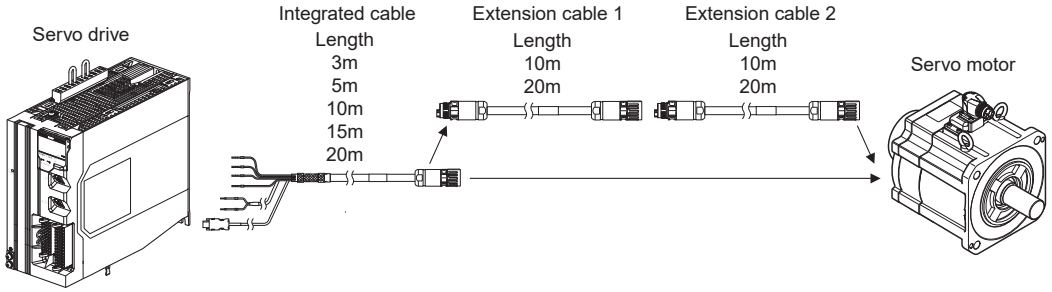
Applicable servo motor		Model	Appearance
R88M-1AM(200/400/750)30T-□	10 m	R88A-CX1AE10BF	
	20 m	R88A-CX1AE20BF	
R88M-1AL(1K0/1K5)30T-□ R88M-1AM1K515T-□ R88M-1AL(750/1K0/1K5/2K0/3K0)30C-□ R88M-1AM(1K5/3K0)15C-□	10 m	R88A-CX1BE10BF*1	
	20 m	R88A-CX1BE20BF*1	

*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 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.