

R88M-1□

1S servo motor

Simplified machine design and maintenance

- 23-bit resolution encoder
- Compact and small motor size
- Multi-turn encoder design without mechanics: 16-bit, 65536 turns
- Battery-free absolute multi-turn encoder or incremental encoder
- Pre-assembled motor cables
- Designed for easy EMC compliance

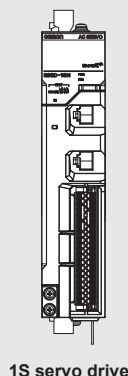
Ratings

- 230 VAC from 50 W to 1.5 kW
(rated torque from 0.159 to 8.59 Nm)
- 400 VAC from 400 W to 15 kW
(rated torque from 1.91 to 95.5 Nm)



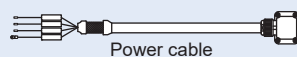
System configuration

(Refer to servo drive chapter)

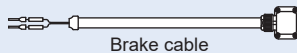


1S servo drive

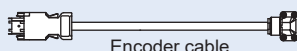
1S servo motor (Flange size 80 mm or less)



Power cable

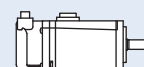


Brake cable



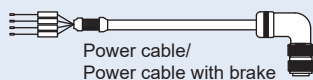
Encoder cable

SYNMAC
always in control

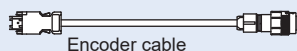


3000 rpm (50 W - 750 W)

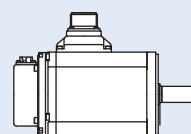
1S servo motor (Flange size 100 mm or more)



Power cable/
Power cable with brake



Encoder cable

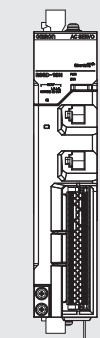


3000 rpm (1 kW - 5 kW)
2000 rpm (400 W - 3 kW)
1500 rpm (4 kW - 15 kW)
1000 rpm (900 W - 3 kW)

Ordering information

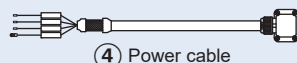
(Refer to servo drive chapter)

②
Drive options

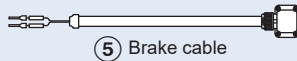


1S servo drive

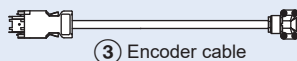
1S servo motor (Flange size 80 mm or less)



④ Power cable



⑤ Brake cable

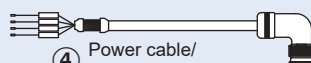


③ Encoder cable

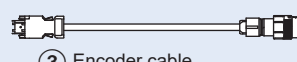


3000 rpm (50 W - 750 W)

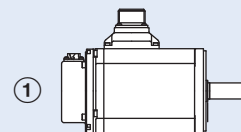
1S servo motor (Flange size 100 mm or more)



④ Power cable/
Power cable with brake



③ Encoder cable



3000 rpm (1 kW - 5 kW)
2000 rpm (400 W - 3 kW)
1500 rpm (4 kW - 15 kW)
1000 rpm (900 W - 3 kW)

Servo motors

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

Servo drives

② Refer to the 1S servo drive chapter for detailed drive specifications and selection of drive accessories.

Servo motors

Servo motors 3000 r/min (100 W to 5 kW)

Symbol	Specifications						Model	Compatible 1S servo drive
	Voltage	Encoder and design		Rated torque	Capacity	Flange size		
①	230 V	Incremental encoder (23-bit)	Without brake	0.318 Nm	100 W	40 mm	R88M-1M10030H-S2	R88D-1SN01H-ECT
				0.637 Nm	200 W	60 mm	R88M-1M20030H-S2	R88D-1SN02H-ECT
				1.27 Nm	400 W		R88M-1M40030H-S2	R88D-1SN04H-ECT
				2.39 Nm	750 W	80 mm	R88M-1M75030H-S2	R88D-1SN08H-ECT
				3.18 Nm	1 kW	100 mm	R88M-1L1K030H-S2	R88D-1SN15H-ECT
				4.77 Nm	1.5 kW		R88M-1L1K530H-S2	R88D-1SN15H-ECT
			With brake	0.318 Nm	100 W	40 mm	R88M-1M10030H-BS2	R88D-1SN01H-ECT
				0.637 Nm	200 W	60 mm	R88M-1M20030H-BS2	R88D-1SN02H-ECT
				1.27 Nm	400 W		R88M-1M40030H-BS2	R88D-1SN04H-ECT
				2.39 Nm	750 W	80 mm	R88M-1M75030H-BS2	R88D-1SN08H-ECT
				3.18 Nm	1 kW	100 mm	R88M-1L1K030H-BS2	R88D-1SN15H-ECT
				4.77 Nm	1.5 kW		R88M-1L1K530H-BS2	R88D-1SN15H-ECT
		Absolute encoder (23-bit)	Without brake	0.159 Nm	50 W	40 mm	R88M-1M05030T-S2	R88D-1SN01H-ECT
				0.318 Nm	100 W		R88M-1M10030T-S2	R88D-1SN01H-ECT
				0.637 Nm	200 W	60 mm	R88M-1M20030T-S2	R88D-1SN02H-ECT
				1.27 Nm	400 W		R88M-1M40030T-S2	R88D-1SN04H-ECT
				2.39 Nm	750 W	80 mm	R88M-1M75030T-S2	R88D-1SN08H-ECT
				3.18 Nm	1 kW	100 mm	R88M-1L1K030T-S2	R88D-1SN15H-ECT
				4.77 Nm	1.5 kW		R88M-1L1K530T-S2	R88D-1SN15H-ECT
			With brake	0.159 Nm	50 W	40 mm	R88M-1M05030T-BS2	R88D-1SN01H-ECT
				0.318 Nm	100 W		R88M-1M10030T-BS2	R88D-1SN01H-ECT
				0.637 Nm	200 W	60 mm	R88M-1M20030T-BS2	R88D-1SN02H-ECT
				1.27 Nm	400 W		R88M-1M40030T-BS2	R88D-1SN04H-ECT
				2.39 Nm	750 W	80 mm	R88M-1M75030T-BS2	R88D-1SN08H-ECT
				3.18 Nm	1 kW	100 mm	R88M-1L1K030T-BS2	R88D-1SN15H-ECT
				4.77 Nm	1.5 kW		R88M-1L1K530T-BS2	R88D-1SN15H-ECT

Symbol	Specifications					Model	Compatible 1S servo drive		
	Voltage	Encoder and design		Rated torque	Capacity			Flange size	
①	400 V	Absolute encoder (23-bit)	Without brake	2.39 Nm	750 W	100 mm	R88M-1L75030C-S2	R88D-1SN10F-ECT	
				3.18 Nm	1 kW		R88M-1L1K030C-S2	R88D-1SN10F-ECT	
		Straight shaft with key and tap		4.77 Nm	1.5 kW		130 mm	R88M-1L1K530C-S2	R88D-1SN15F-ECT
				6.37 Nm	2 kW			R88M-1L2K030C-S2	R88D-1SN20F-ECT
				9.55 Nm	3 kW	R88M-1L3K030C-S2		R88D-1SN30F-ECT	
				12.7 Nm	4 kW	R88M-1L4K030C-S2		R88D-1SN55F-ECT	
				15.9 Nm	5 kW	R88M-1L5K030C-S2		R88D-1SN55F-ECT	
		With brake	2.39 Nm	750 W	100 mm	R88M-1L75030C-BS2	R88D-1SN10F-ECT		
			3.18 Nm	1 kW		R88M-1L1K030C-BS2	R88D-1SN10F-ECT		
			4.77 Nm	1.5 kW		R88M-1L1K530C-BS2	R88D-1SN15F-ECT		
			6.37 Nm	2 kW		R88M-1L2K030C-BS2	R88D-1SN20F-ECT		
			9.55 Nm	3 kW	130 mm	R88M-1L3K030C-BS2	R88D-1SN30F-ECT		
			12.7 Nm	4 kW		R88M-1L4K030C-BS2	R88D-1SN55F-ECT		
			15.9 Nm	5 kW		R88M-1L5K030C-BS2	R88D-1SN55F-ECT		

Servo motors 2000 r/min (400 W to 3 kW)

Symbol	Specifications						Model	Compatible 1S servo drive		
	Voltage	Encoder and design		Rated torque	Capacity	Flange size				
①	230 V	Incremental encoder (23-bit)	Without brake	4.77 Nm	1 kW	130 mm	R88M-1M1K020H-S2	R88D-1SN15H-ECT		
				7.16 Nm	1.5 kW		R88M-1M1K520H-S2	R88D-1SN15H-ECT		
		Straight shaft with key and tap	With brake	4.77 Nm	1 kW		R88M-1M1K020H-BS2	R88D-1SN15H-ECT		
				7.16 Nm	1.5 kW		R88M-1M1K520H-BS2	R88D-1SN15H-ECT		
		Absolute encoder (23-bit)	Without brake	4.77 Nm	1 kW		R88M-1M1K020T-S2	R88D-1SN15H-ECT		
				7.16 Nm	1.5 kW		R88M-1M1K520T-S2	R88D-1SN15H-ECT		
		Straight shaft with key and tap	With brake	4.77 Nm	1 kW		R88M-1M1K020T-BS2	R88D-1SN15H-ECT		
				7.16 Nm	1.5 kW		R88M-1M1K520T-BS2	R88D-1SN15H-ECT		
		400 V	Straight shaft with key and tap	Without brake	1.91 Nm		400 W	100 mm	R88M-1M40020C-S2	R88D-1SN06F-ECT
					2.86 Nm		600 W		R88M-1M60020C-S2	R88D-1SN06F-ECT
					130 mm		4.77 Nm	1 kW	R88M-1M1K020C-S2	R88D-1SN10F-ECT
							7.16 Nm	1.5 kW	R88M-1M1K520C-S2	R88D-1SN15F-ECT
	9.55 Nm			2 kW		R88M-1M2K020C-S2	R88D-1SN20F-ECT			
	14.3 Nm			3 kW		R88M-1M3K020C-S2	R88D-1SN30F-ECT			
	With brake			1.91 Nm	400 W	100 mm	R88M-1M40020C-BS2	R88D-1SN06F-ECT		
				2.86 Nm	600 W		R88M-1M60020C-BS2	R88D-1SN06F-ECT		
		130 mm		4.77 Nm	1 kW	R88M-1M1K020C-BS2	R88D-1SN10F-ECT			
				7.16 Nm	1.5 kW	R88M-1M1K520C-BS2	R88D-1SN15F-ECT			
	9.55 Nm			2 kW	R88M-1M2K020C-BS2	R88D-1SN20F-ECT				
	14.3 Nm			3 kW	R88M-1M3K020C-BS2	R88D-1SN30F-ECT				

Servo motors 1500 r/min (4 kW to 15 kW)

Symbol	Specifications						Model	Compatible 1S servo drive
	Voltage	Encoder and design		Rated torque	Capacity	Flange size		
①	400 V	Absolute encoder (23-bit)	Without brake	25.5 Nm	4 kW	180 mm	R88M-1M4K015C-S2	R88D-1SN55F-ECT
				35 Nm	5.5 kW		R88M-1M5K515C-S2	R88D-1SN55F-ECT
		Straight shaft with key and tap		47.8 Nm	7.5 kW		220 mm	R88M-1M7K515C-S2
				70 Nm	11 kW	R88M-1M11K015C-S2		R88D-1SN150F-ECT
				95.5 Nm	15 kW	R88M-1M15K015C-S2		R88D-1SN150F-ECT
			With brake	25.5 Nm	4 kW	180 mm	R88M-1M4K015C-BS2	R88D-1SN55F-ECT
				35 Nm	5.5 kW		R88M-1M5K515C-BS2	R88D-1SN55F-ECT
		47.8 Nm		7.5 kW	R88M-1M7K515C-BS2		R88D-1SN75F-ECT	
		70 Nm		11 kW	220 mm	R88M-1M11K015C-BS2	R88D-1SN150F-ECT	
		95.5 Nm		15 kW		R88M-1M15K015C-BS2	R88D-1SN150F-ECT	

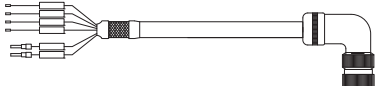
Servo motors 1000 r/min (900 W to 3 kW)

Symbol	Specifications					Model	Compatible 1S servo drive		
	Voltage	Encoder and design		Rated torque	Capacity			Flange size	
①	230 V	Absolute encoder (23-bit)	Without brake	8.59 Nm	900 W	130 mm	R88M-1M90010T-S2	R88D-1SN15H-ECT	
			With brake	8.59 Nm	900 W		R88M-1M90010T-BS2	R88D-1SN15H-ECT	
	400 V	Straight shaft with key and tap	Without brake	8.59 Nm	900 W	180 mm	R88M-1M90010C-S2	R88D-1SN10F-ECT	
				19.1 Nm	2 kW		R88M-1M2K010C-S2	R88D-1SN20F-ECT	
				28.7 Nm	3 kW		R88M-1M3K010C-S2	R88D-1SN30F-ECT	
			With brake	8.59 Nm	900 W	130 mm	R88M-1M90010C-BS2	R88D-1SN10F-ECT	
				19.1 Nm	2 kW		180 mm	R88M-1M2K010C-BS2	R88D-1SN20F-ECT
				28.7 Nm	3 kW			R88M-1M3K010C-BS2	R88D-1SN30F-ECT

Encoder cables

Symbol	Specifications	Model	Appearance
③	Encoder cable for servo motors R88M-1M05030T-□ R88M-1M(100/200/400/750)30(H/T)-□	1.5 m R88A-CR1A001-5CF-E	
		3 m R88A-CR1A003CF-E	
		5 m R88A-CR1A005CF-E	
		10 m R88A-CR1A010CF-E	
		15 m R88A-CR1A015CF-E	
		20 m R88A-CR1A020CF-E	
	Encoder cable for servo motors R88M-1L(1K0/1K5)30(H/T)-□ R88M-1L(750/1K0/1K5/2K0/3K0/4K0/5K0)30C-□ R88M-1M(1K0/1K5)20(H/T)-□ R88M-1M(400/600/1K0/1K5/2K0/3K0)20C-□ R88M-1M(4K0/5K5/7K5/11K0/15K0)15C-□ R88M-1M90010T-□ R88M-1M(900/2K0/3K0)10C-□	1.5 m R88A-CR1B001-5NF-E	
		3 m R88A-CR1B003NF-E	
		5 m R88A-CR1B005NF-E	
		10 m R88A-CR1B010NF-E	
		15 m R88A-CR1B015NF-E	
		20 m R88A-CR1B020NF-E	

Power cables

Symbol	Specifications			Model	Appearance
④	For 230 V servo motors R88M-1M05030T-□S2 Note: For servo motors with brake R88M-1M05030T-BS2, the separate brake cable R88A-CA1A□□□BFR is needed.	Without brake	3 m	R88A-CA1A003SFR	
			5 m	R88A-CA1A005SFR	
			10 m	R88A-CA1A010SFR	
			15 m	R88A-CA1A015SFR	
			20 m	R88A-CA1A020SFR	
	For 230 V servo motors R88M-1M(100/200/400/750)30(H/T)-□S2 Note: For servo motors with brake R88M-1M(100/200/400/750)30(H/T)-BS2, the separate brake cable R88A-CA1A□□□BF-E is needed.	Without brake	1.5 m	R88A-CA1A001-5SF-E	
			3 m	R88A-CA1A003SF-E	
			5 m	R88A-CA1A005SF-E	
			10 m	R88A-CA1A010SF-E	
			15 m	R88A-CA1A015SF-E	
			20 m	R88A-CA1A020SF-E	
	For 230 V servo motors R88M-1L(1K0/1K5)30(H/T)-□S2 R88M-1M(1K0/1K5)20(H/T)-□S2 R88M-1M90010T-□S2	Without brake	1.5 m	R88A-CA1C001-5SF-E	
			3 m	R88A-CA1C003SF-E	
			5 m	R88A-CA1C005SF-E	
			10 m	R88A-CA1C010SF-E	
			15 m	R88A-CA1C015SF-E	
			20 m	R88A-CA1C020SF-E	
		With brake	1.5 m	R88A-CA1C001-5BF-E	
			3 m	R88A-CA1C003BF-E	
			5 m	R88A-CA1C005BF-E	
			10 m	R88A-CA1C010BF-E	
			15 m	R88A-CA1C015BF-E	
			20 m	R88A-CA1C020BF-E	
	For 400 V servo motors R88M-1L(750/1K0/1K5/2K0)30C-□S2 R88M-1M(400/600/1K0/1K5/2K0)20C-□S2 R88M-1M90010C-□S2	Without brake	1.5 m	R88A-CA1C001-5SF-E	
			3 m	R88A-CA1C003SF-E	
			5 m	R88A-CA1C005SF-E	
			10 m	R88A-CA1C010SF-E	
			15 m	R88A-CA1C015SF-E	
			20 m	R88A-CA1C020SF-E	
		With brake	1.5 m	R88A-CA1E001-5BF-E	
			3 m	R88A-CA1E003BF-E	
			5 m	R88A-CA1E005BF-E	
			10 m	R88A-CA1E010BF-E	
			15 m	R88A-CA1E015BF-E	
			20 m	R88A-CA1E020BF-E	

Symbol	Specifications		Model	Appearance
④	For 400 V servo motors R88M-1L3K030C-□S2 R88M-1M3K020C-□S2 R88M-1M(2K0/3K0)10C-□S2	Without brake	1.5 m R88A-CA1E001-5SF-E	
			3 m R88A-CA1E003SF-E	
			5 m R88A-CA1E005SF-E	
			10 m R88A-CA1E010SF-E	
			15 m R88A-CA1E015SF-E	
			20 m R88A-CA1E020SF-E	
		With brake	1.5 m R88A-CA1E001-5BF-E	
			3 m R88A-CA1E003BF-E	
			5 m R88A-CA1E005BF-E	
			10 m R88A-CA1E010BF-E	
			15 m R88A-CA1E015BF-E	
			20 m R88A-CA1E020BF-E	
	For 400 V servo motors ^{*1} R88M-1L(4K0/5K0)30C-□S2 R88M-1M(4K0/5K5)15C-□S2	Without brake	3 m R88A-CA1G003SF	
			5 m R88A-CA1G005SF	
			10 m R88A-CA1G010SF	
			15 m R88A-CA1G015SF	
			20 m R88A-CA1G020SF	
		With brake	3 m R88A-CA1G003BF	
			5 m R88A-CA1G005BF	
			10 m R88A-CA1G010BF	
			15 m R88A-CA1G015BF	
			20 m R88A-CA1G020BF	
	For 400 V servo motors R88M-1M7K515C-□S2	Without brake	3 m R88A-CA1H003SF	
			5 m R88A-CA1H005SF	
			10 m R88A-CA1H010SF	
			15 m R88A-CA1H015SF	
			20 m R88A-CA1H020SF	
		With brake	3 m R88A-CA1H003BF	
			5 m R88A-CA1H005BF	
			10 m R88A-CA1H010BF	
			15 m R88A-CA1H015BF	
			20 m R88A-CA1H020BF	
	For 400 V servo motors R88M-1M(11K0/15K0)15C-□S2	Without brake	3 m R88A-CA1J003SF	
			5 m R88A-CA1J005SF	
			10 m R88A-CA1J010SF	
			15 m R88A-CA1J015SF	
			20 m R88A-CA1J020SF	
		With brake	3 m R88A-CA1J003BF	
			5 m R88A-CA1J005BF	
			10 m R88A-CA1J010BF	
			15 m R88A-CA1J015BF	
			20 m R88A-CA1J020BF	

^{*1} Refer to the "Using R88A-CA1G power cables" technical note when using multiple cables in the same duct.

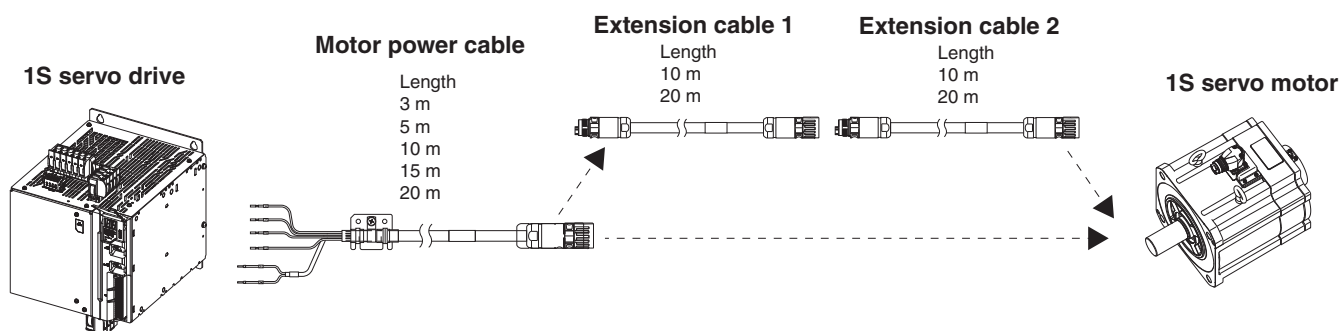
Extension power cables (for 400 V, 4 kW to 15 kW servo motors)

Symbol	Specifications		Model	Appearance
④	R88M-1L(4K0/5K0)30C-□S2 R88M-1M(4K0/5K5)15C-□S2	10 m	R88A-CA1GE10BF	
		20 m	R88A-CA1GE20BF	
	R88M-1M7K515C-□S2	10 m	R88A-CA1HE10BF	
		20 m	R88A-CA1HE20BF	
	R88M-1M(11K0/15K0)15C-□S2	10 m	R88A-CA1JE10BF	
		20 m	R88A-CA1JE20BF	

Combinations of Motor power cables and Extension power cables

The table below lists the combinations of cables that can be used to extend the motor power cable for a servomotor of 4 kW or more to more than 20 m.

Use the motor power cable and extension power cable in a specified combination. Not doing so may cause fire, equipment damage, or operation failure.



Length				Combination
Total	Motor power cable	Extension cable 1	Extension cable 2	
3	3	—	—	Motor power cable only
5	5	—	—	Motor power cable only
10	10	—	—	Motor power cable only
15	15	—	—	Motor power cable only
20	20	—	—	Motor power cable only
30	20	10	—	Motor power cable + extension cable 1
40	20	20	—	Motor power cable + extension cable 1
50	20	10	20	Motor power 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.

Brake cables (for 230 V, 50 W to 750 W servo motors)

Symbol	Specifications	Model	Appearance
⑤	Brake cable only For 230 V servo motors with brake R88M-1M05030T-BS2	3 m	R88A-CA1A003BFR
		5 m	R88A-CA1A005BFR
		10 m	R88A-CA1A010BFR
		15 m	R88A-CA1A015BFR
		20 m	R88A-CA1A020BFR
	Brake cable only For 230 V servo motors with brake R88M-1M(100/200/400/750)30(H/T)-BS2	1.5 m	R88A-CA1A001-5BF-E
		3 m	R88A-CA1A003BF-E
		5 m	R88A-CA1A005BF-E
		10 m	R88A-CA1A010BF-E
		15 m	R88A-CA1A015BF-E
		20 m	R88A-CA1A020BF-E

Connectors for encoder, power and brake cables

Specifications		Applicable servo motor	Model
Connectors for encoder cables	Drive side (CN2)	All models	R88A-CN101R
	Motor side	R88M-1M05030T-□ R88M-1M(100/200/400/750)30(H/T)-□ R88M-1L(1K0/1K5)30(H/T)-□ R88M-1L(750/1K0/1K5/2K0/3K0/4K0/5K0)30C-□ R88M-1M(1K0/1K5)20(H/T)-□ R88M-1M(400/600/1K0/1K5/2K0/3K0)20C-□ R88M-1M(4K0/5K5/7K5/11K0/15K0)15C-□ R88M-1M90010T-□ R88M-1M(900/2K0/3K0)10C-□	R88A-CN104R
Connectors for power cables	Motor side	R88M-1M(100/200/400/750)30(H/T)-_S2	R88A-CN111A
		R88M-1L(1K0/1K5)30(H/T)-S2 R88M-1M(1K0/1K5)20(H/T)-S2 R88M-1M90010T-S2 R88M-1L(750/1K0/1K5/2K0)30C-S2 R88M-1M(400/600/1K0/1K5/2K0)20C-S2 R88M-1M90010C-S2	MS3108E20-4S
		R88M-1L(1K0/1K5)30(H/T)-BS2 R88M-1M(1K0/1K5)20(H/T)-BS2 R88M-1M90010T-BS2	MS3108E20-18S
		R88M-1L3K030C-S2 R88M-1M3K020C-S2 R88M-1M(2K0/3K0)10C-S2	MS3108E22-22S
		R88M-1L(750/1K0/1K5/2K0/3K0)30C-BS2 R88M-1M(400/600/1K0/1K5/2K0/3K0)20C-BS2 R88M-1M(900/2K0/3K0)10C-BS2	MS3108E24-11S
Connectors for brake cables	Motor side	R88M-1M(100/200/400/750)30(H/T)-BS2	R88A-CN111B

Cable shield clamp (spare parts)

Applicable 1S power cable	Model
230 V, 100 W to 750 W models	R88A-SC011S-E
230 V, 1.5 kW model 400 V, 600 W to 3 kW models	R88A-SC021S-E
400 V, 5.5 kW to 15 kW models	R88A-SC10CA-PE

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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