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Motion and Motor Control Solutions



Reliable, accurate positioning and motion control for seamless industrial automation

- » Stand-alone open platform motion controller
- » Servo drives and motors
 - » Energy-saving AC inverters
- » PLC-based motion and position controllers
 - » Cam positioners and rotary encoders

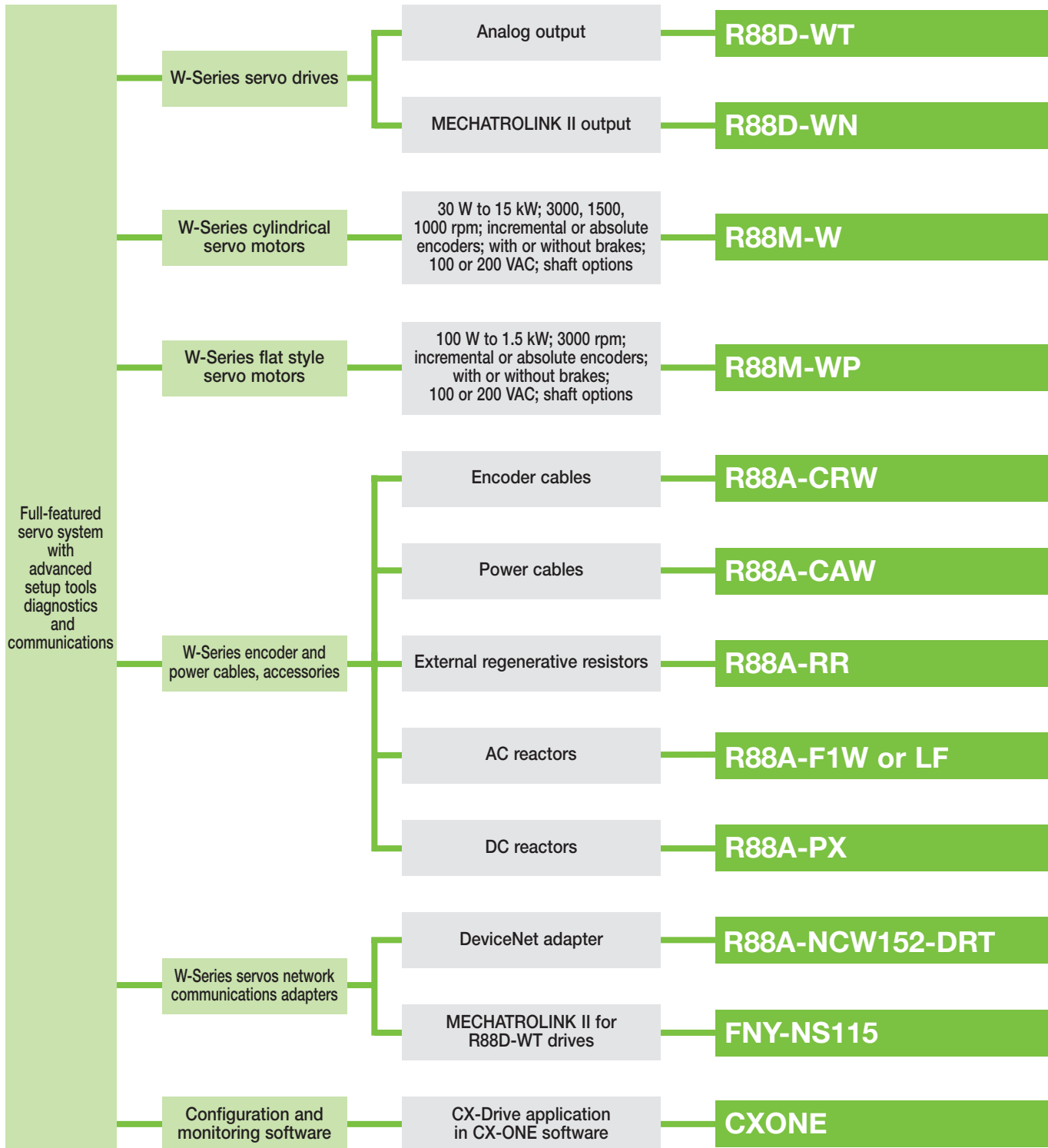
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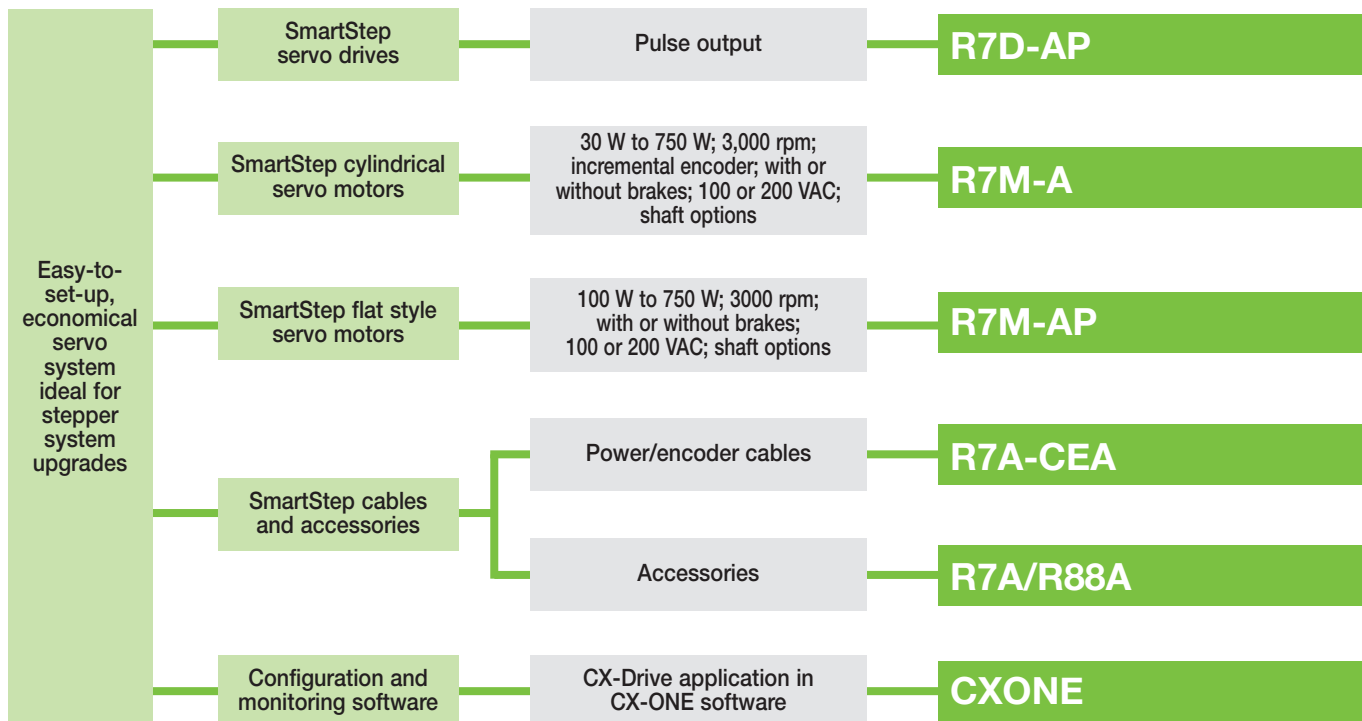
Selection Guide

Servo Drives and Motors

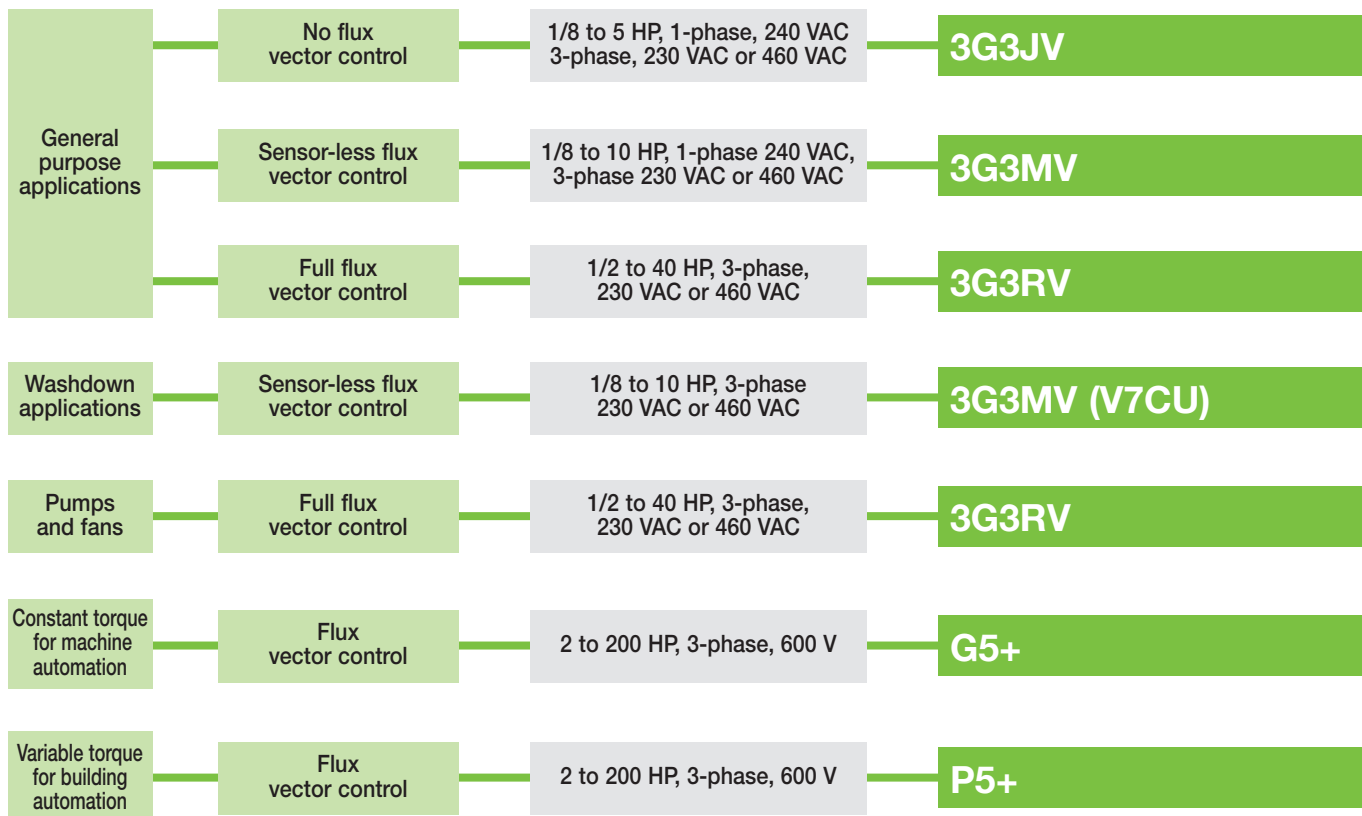


Selection Guide

Servo Drives and Motors

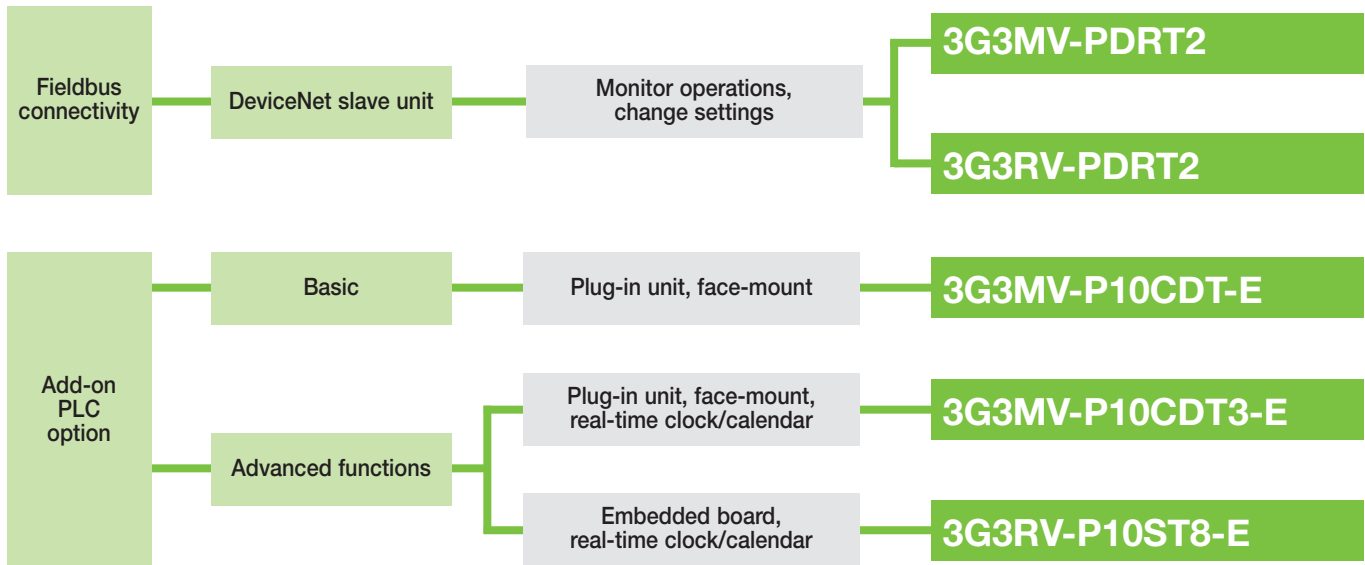


Inverters

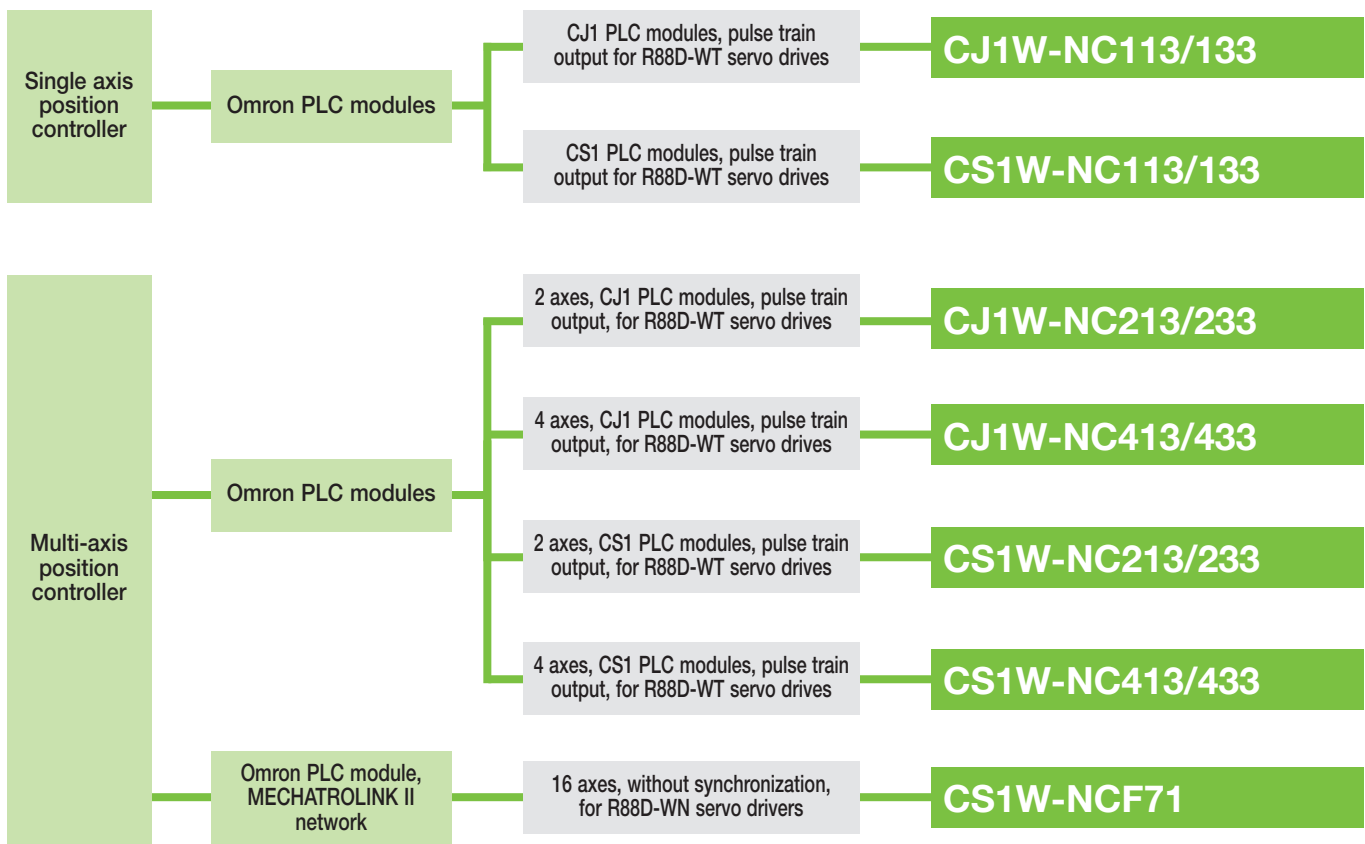


Selection Guide

Inverters

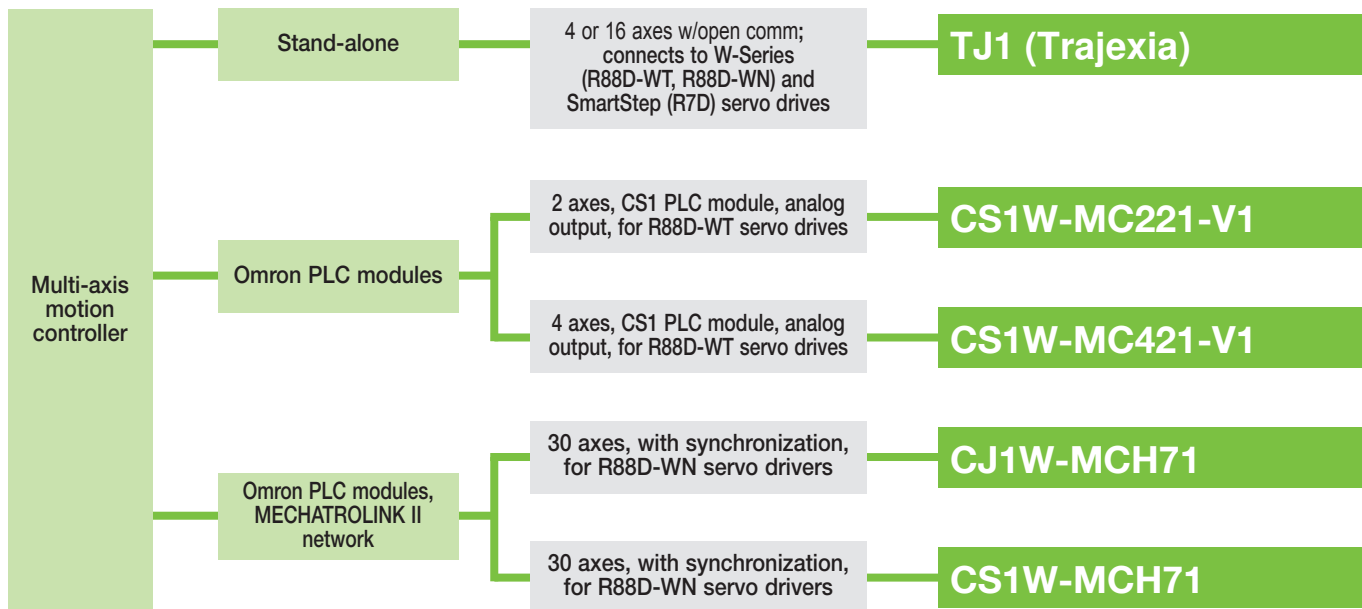


Position Controllers



Selection Guide

Motion Controllers

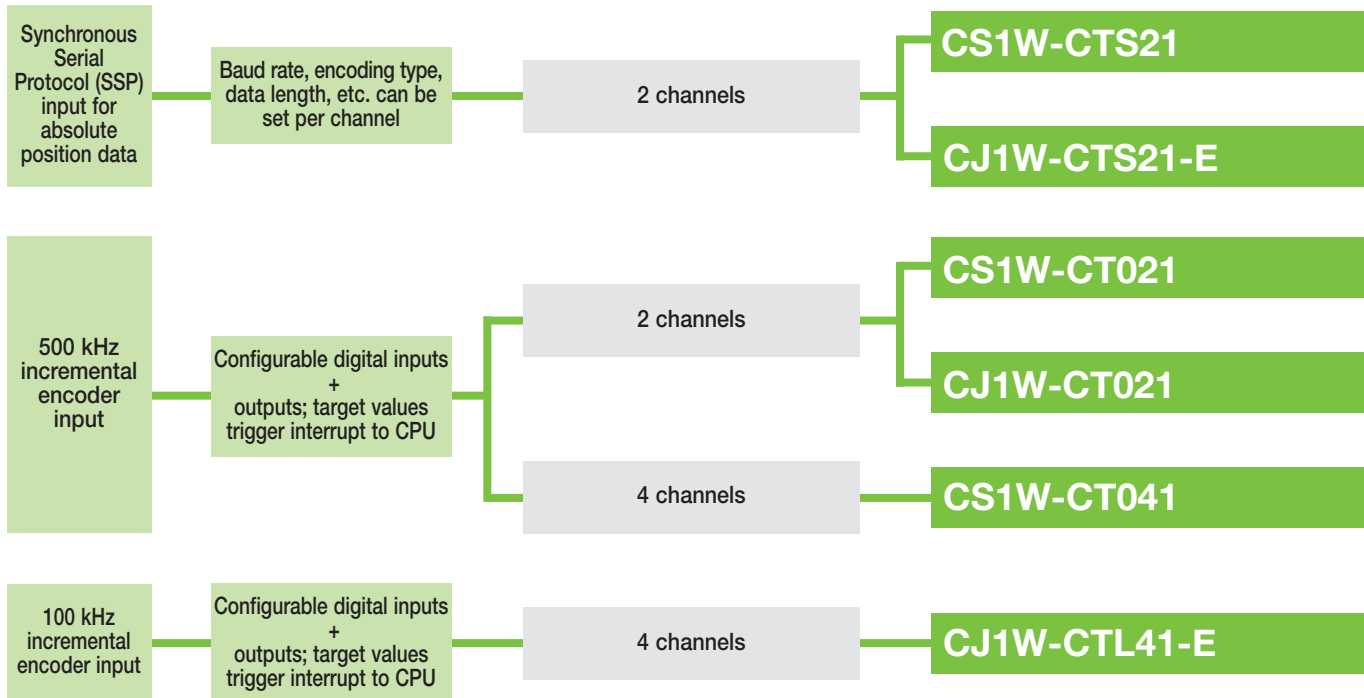


Motion Controllers Used with Servos and Inverters

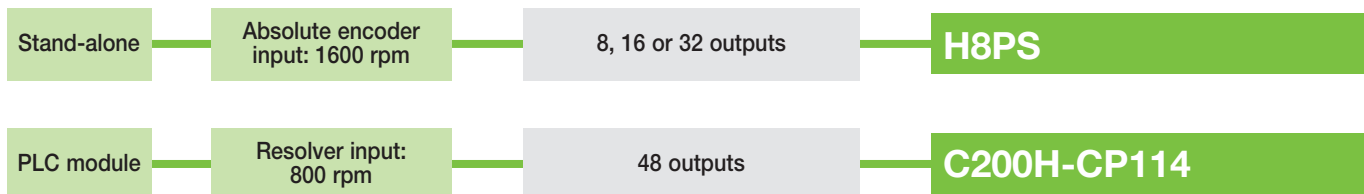
Type	Controller	Servo	Inverter
Stand-alone	TJ1 (Trajexia)	W-Series: R88D-WT servo drives	3G3MV/3G3RV
PLC module	“-NC” modules or other controller with pulse train	W-Series: R88D-WT servo drives SmartStep: R7D servo drives	—
	“-MC” modules or other controller with analog output	W-Series: R88D-WT servo drives	3G3MV/3G3RV
PLC module with control over MECHATROLINK II	CJ1W-NCF71 module	W-Series: R88D-WN servo drives	—
	“-MCH71” modules	W-Series: R88D-WN servo drives	3G3MV/3G3RV

Selection Guide

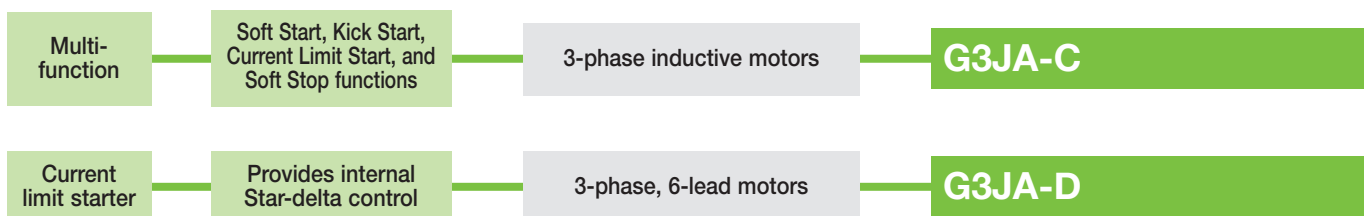
High-Speed Counter PLC Modules



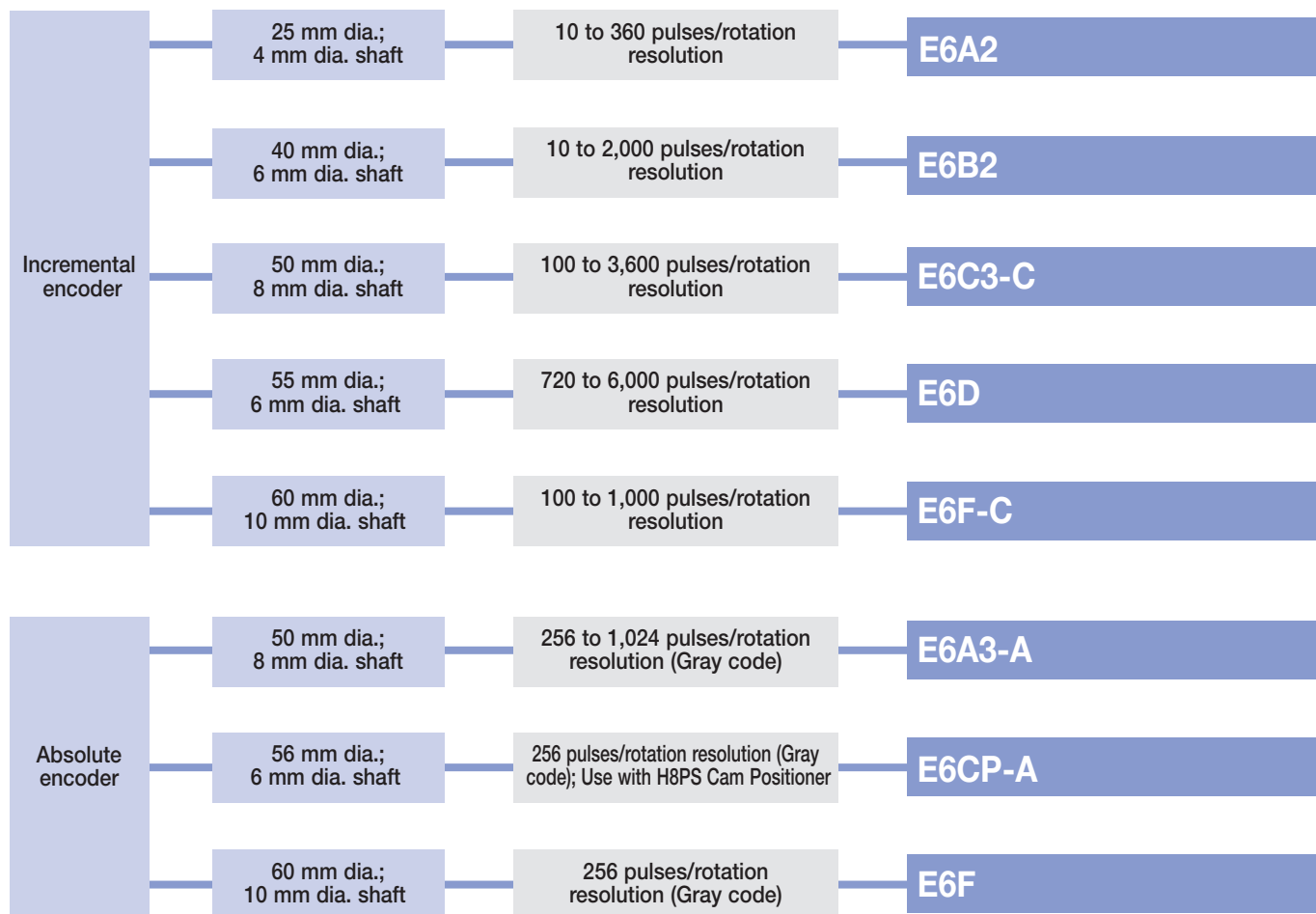
Cam Positioners Emulate Mechanical Cam Switches



Soft Starters



Selection Guide



Trajexia Motion Controller TJ1-□

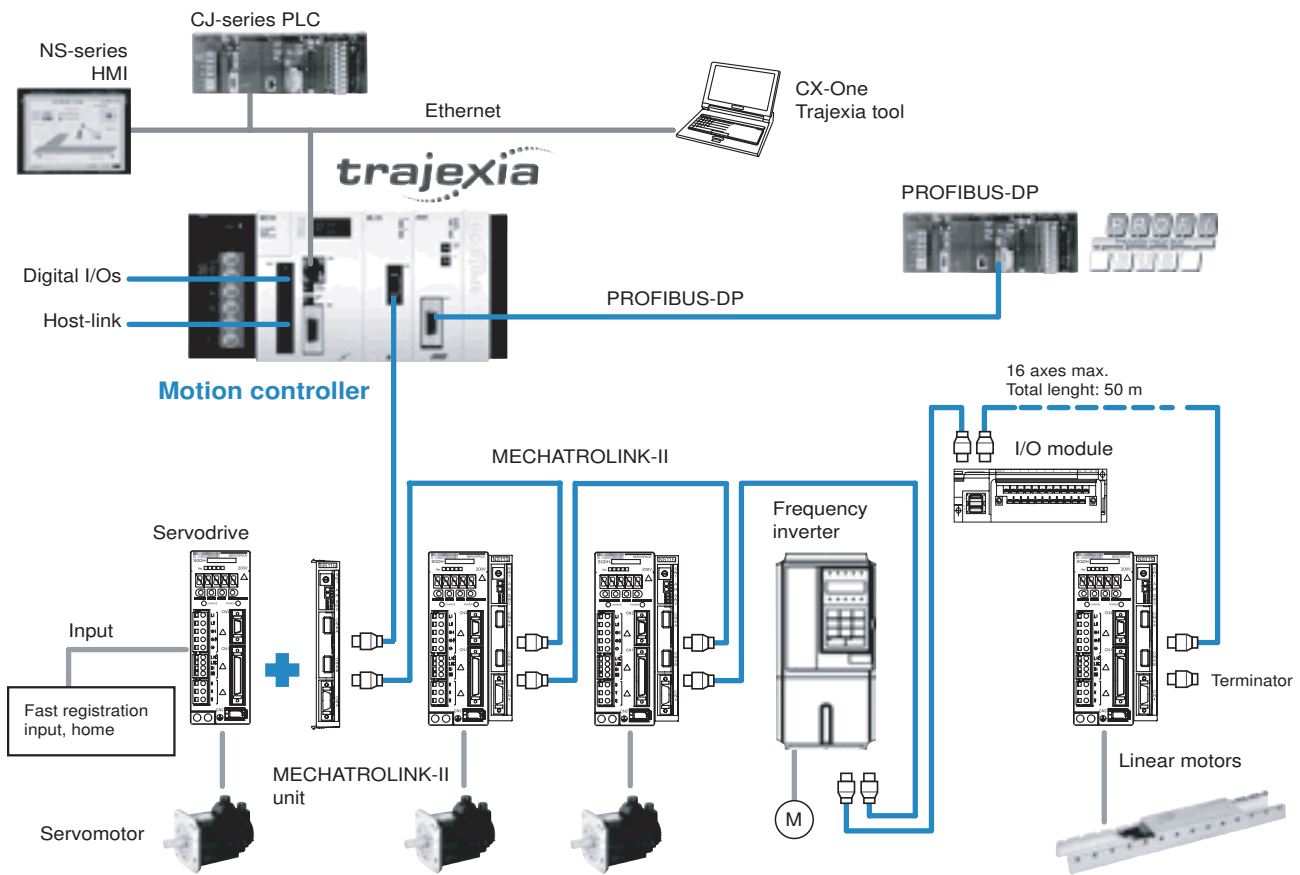


Stand-Alone Advanced Motion Controller Using Mechatrolink-II Motion Bus

- 16 axes advanced motion coordination over a robust and fast motion link MECHATROLINK-II
- Supports position, speed and torque control
- Each axis can run complex interpolation moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions
- Hardware registration input for each servo axis
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 14 tasks simultaneously
- Open communication - Ethernet built-in, PROFIBUS-DP and DeviceNet as options



System Configuration



Specifications

General Specifications

Item	Details
Model	TJ1-□
Ambient operating temperature	0 to 55°C
Ambient operating humidity	10 to 90% RH
Ambient storage temperature	-20 to 70°C
Ambient storage humidity	90% max. (with no condensation)
Atmosphere	No corrosive gases
Vibration resistance	10 to 57 Hz: (0.075 mm amplitude) 57 to 100 Hz Acceleration: 9.8 m/s ² , in X, Y and Z directions for 80 minutes
Shock resistance	143 m/s ² , 3 times each X, Y and Z directions
Insulation resistance	20 MOhm
Dielectric strength	500 Volt
Protective structure	IP20
International standards	cULus, CE, EN 61131-2 and RoHS

Motion Control Unit

Item	Details		
Model	TJ1-MC16		
Number of axes	16		
Number of inverters and I/O modules	8 maximum		
Number of Mechatrolink-II master units	Up to 4 Mechatrolink-II master units (TJ1-ML16, see below) can be connected		
Cycle time	Selectable 0.5 ms, 1 ms or 2 ms		
Programming language	BASIC-like Motion language		
Multi-tasking	Up to 14 tasks running simultaneously		
Digital I/O	16 Inputs and 8 Outputs freely configurable		
Measurement units	User definable		
Available memory for user programs	500 kb		
Data storage capacity	Up to 2 MB flash data storage		
Saving program data, motion controller	SRAM with battery backup and Flash-ROM		
Saving program data, personal computer	Trajexia Motion Perfect software manages a backup on the hard disk of the personal computer		
Communication ports	1 Ethernet port and 2 serial ports		
Firmware update	Via Trajexia software tool		
Ethernet port	Electrical characteristics	Conform to IEEE 802.3 (100BaseT)	
	Connector	RJ45 Ethernet connector	
Serial port	Electrical characteristics	Conform 1 port to RS-232C and 1 port to RS-485/RS-422A (selectable by switch)	
	Connector	SUB-D9 connector (Counterpart included in the package)	
	Synchronization	Start-stop synchronization (asynchronous)	
	Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps	
	Transmission format	Databit Length	7 or 8 bit
		Stop bit	1 or 3 bit
		Parity Bit	Even/Odd/None
	Transmission mode	Point-to-multipoint (1:N)	
	Transmission protocol	RS-232C (1:1)	Host Link master protocol, Host Link slave protocol, ASCII general-purpose
		RS-422A (1:N)	Host Link master protocol, Host Link slave protocol, ASCII general-purpose
		RS-485 (1:N)	ASCII general-purpose
Galvanic isolation	RS-422A port		
Communication buffers	254 bytes		
Flow control	None		
Terminator	Yes, selectable by switch		
Cable length	15 m for RS-232 and 500 m for RS-422/RS-485		

Mechatrolink-II Master Unit

Item	Specifications
Model	TJ1-ML16
Controlled devices with Mechatrolink-II interface	Servo drives, various I/O units and Frequency inverters
Electrical characteristics	Conform to MECHATROLINK standard
Communication ports	1 MECHATROLINK-II master
Transmission speed	10 Mbps
Communication cycle	0.5 ms, 1 ms or 2 ms
Stations slave types	Axes or Servo drives
	Frequency inverters
	I/O Modules
Number of stations per master / Cycle time	Max. 16 Stations / 2 ms
	Max. 8 Stations / 1 ms
	Max. 4 Stations / 0.5 ms
Transmission distance	Max. 50 meters without using repeater

Profibus Slave Unit

Items	Specifications
Model	TJ1-PRT
PROFIBUS standard	Conform to PROFIBUS-DP standard EN50170 (DP-V0)
Communication ports	1 PROFIBUS-DP slave
Transmission speed	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000 and 12000 kbits/s
Node numbers	0 to 99
I/O size	For both directions a configurable size of 0 to 122 words (16-bit)
Galvanic isolation	Yes

DeviceNet Slave Unit

Items	Specifications
Model	TJ1-DRT
DeviceNet standard	Conforms to DeviceNet standard of CIP edition 1
Communication ports	1 DeviceNet slave connector
Transmission speed	125, 250 and 500 Kbps, auto-detected
Node numbers	0 to 63
I/O size	0 to 32 words (16-bit), configurable, for both directions
Galvanic isolation	Yes

Flexible Axis Unit

Items	Specifications	
Model	TJ1-FL02	
Number of axes	2	
Control method	±10 V Analog Output in closed loop or pulse train output in open loop	
Encoder	Position/speed feedback	2 Incremental and Absolute encoders
	Absolute encoder standards supported	SSI, EnDat and Tamagawa
	Encoder Input maximum frequency	6 MHz
	Encoder/Pulse Output max. frequency	2 MHz
Auxiliary I/Os	2 Fast registration inputs, 2 definable inputs, 2 Enable output, 4 position switch outputs or axes reset	
Galvanic isolation	Yes	

Ordering Information

Trajexia Motion Controller

Name	Model
Trajexia Motion Controller Unit, 16 axes (Trajexia end cover unit TJ1-TER is included)	TJ1-MC16
Trajexia Motion Controller Unit, 4 axes (Trajexia end cover unit TJ1-TER is included)	TJ1-MC04
Power Supply for Trajexia system, 100-240V AC	CJ1W-PA202
Power Supply for Trajexia system, 24V DC	CJ1W-PD022

Trajexia — Axes Control Modules

Name	Model
Trajexia MECHATROLINK-II Master Unit (up to 16 axes)	TJ1-ML16
Trajexia MECHATROLINK-II Master Unit (up to 4 axes)	TJ1-ML04
Trajexia Flexible Axis Unit (for 2 axes)	TJ1-FL02

Trajexia — Communication Modules

Name	Model
Trajexia DeviceNet Slave Unit	TJ1-PRT
Trajexia PROFIBUS-DP Slave Unit	TJ1-PRT

Mechatrolink-II — Related Devices

Name	Remarks	Model
Distributed I/O modules	64-point digital input and 64-point digital output (24 VDC)	FNY-IO2310
	Analog input: -10 V to +10 V, 4 channels	FNY-AN2900
	Analog output: -10 V to +10 V, 2 channels	FNY-AN2910
Mechatrolink-II cables	0.5 meter	FNY-W6003-A5
	1 meter	FNY-W6003-01
	3 meters	FNY-W6003-03
	5 meters	FNY-W6003-05
	10 meters	FNY-W6003-10
	20 meters	FNY-W6003-20
	30 meters	FNY-W6003-30
Mechatrolink-II terminator	Terminating resistor	FNY-W6022
Mechatrolink-II interface unit	For W-series Servo drives (Firmware version 39 or later)	FNY-NS115
	For Inverter (For Inverter's version supported contact your Omron sales office)	SI-TV7
	For Inverter (For Inverter's version supported contact your Omron sales office)	SI-T

I/O Cables

Name	Remarks	Length	Model
I/O Cable for FNY-IO2310	With connector on the Distributed I/O module side (FNY-IO2310)	0.5 m	FNY-W5410-05
		1.0 m	FNY-W5410-10
		3.0 m	FNY-W5410-30

Servo System and Inverters

Note: Contact your Omron sales office for detailed specs and ordering information

Software

Specifications	Model
Trajexia Motion Perfect and CX-Drive V1.2 or higher	TJ1-Tools

Servos W-Series

Quick Link
L100

High-Precision Positioning with Advanced Communications

Omron's compact W-Series servos were designed with zero compromise on quality reliability or performance. The servo amplifiers are ultra-compact with pulse and analog inputs as standard, plus an auto-tuning function. Plug-in option cards offer enhanced functionality such as indexing and complex motions such as cams, gears and linked axes.

MECHATROLINK-II high-speed bus provides instant communications between Omron's W-Series servo drives and PLC-based motion controllers and simplifies coordination of up to 30 axes.

Servo Driver Features

- 300% peak current for 3 seconds
- Automatic motor recognition with auto-tuning function
- Analog and pulse inputs for speed, torque and position control
- MECHATROLINK-II communications bus available built-in (WN-drives) or as an option unit (WT-drives)
- Field bus option units include DeviceNet and Profibus
- Special function option units available for motion controller and indexer
- Trace function allows oscilloscope function for monitoring

Servo Motor Features

- 6 different designs provide a complete range of servo motors to meet the power, speed and performance required for each application
- Peak torque 300% of nominal during 3 seconds
- Slim profile and standard cylindrical motor types
- High resolution incremental encoders standard, absolute encoders available
- Built-in 24V brake available
- Shaft options include straight, with keyway, and with keyway and tap
- IP67 and shaft oil seal available

MECHATROLINK-II is a registered trademark of Yaskawa Corporation.



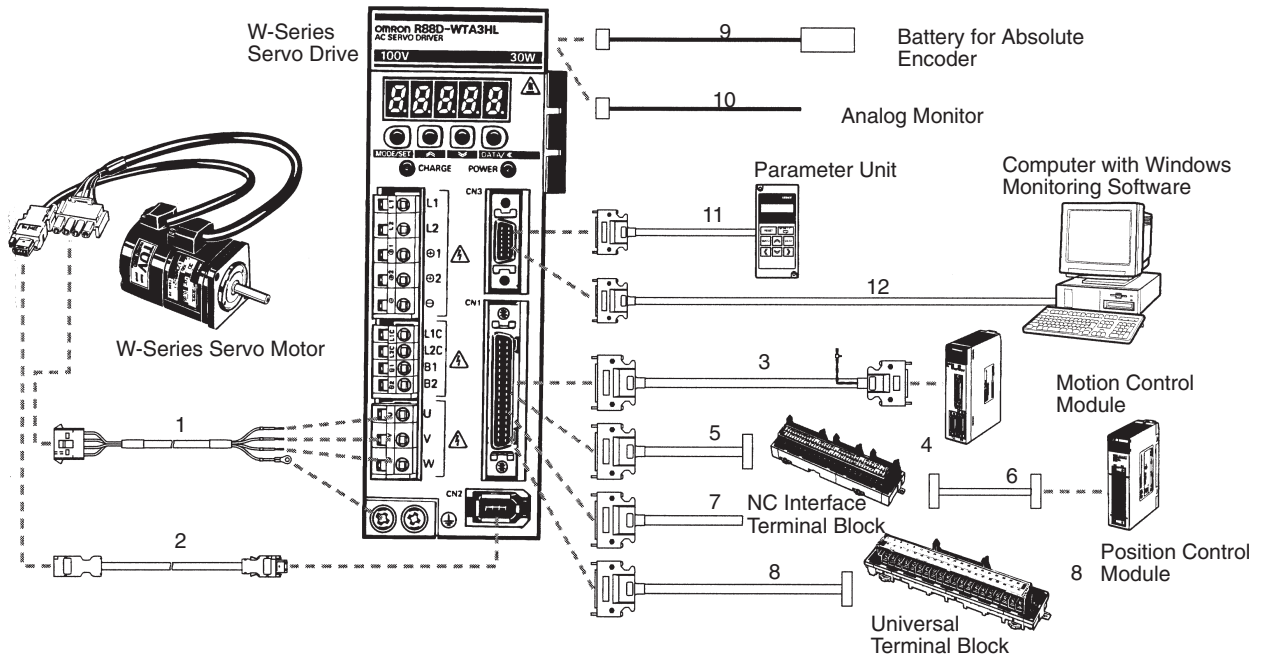
Servo Motor and Servo Drive Combinations

Servo motors with absolute encoders are available but not shown below.

Servo Motor (R88M-W□□□□□□-□□□)				Servo drive model with MECHATROLINK-II communications (R88D-WN□□□-ML2)			Servo drive model (R88D-WT□□□□)		
Description	Capacity	Model (-W□□□□□□)	Brake and Shaft end options (-□□□)	100 V	200 V, 1-phase	200 V, 3-phase	100 V	200 V, 1-phase	200 V, 2-phase
Cylindrical 3000 rpm, incremental encoder, IP55 (excluding shaft opening)	30 W	03030H	Without brake (blank)	—	—	—	A3HL	A3H	—
	50 W	05030H	With brake (-B)	A5L	A5H	—	A5HL	A5H	—
	100 W	10030H	Straight shaft (blank)	01L	01H	—	01HL	01H	—
	200 W	20030H	Shaft with key (-S1)	02L	02H	—	02HL	02H	—
	400 W	40030H	Shaft with key and tap (-S2)	04L	04H	—	—	04H	—
	750 W	75030H		—	08H	—	—	08H	08H
Cylindrical 3000 rpm, incremental encoder, IP67 (excluding shaft opening)	1 KW	1K030H	Without brake (blank)	—	—	10H	—	—	10H
	1.5 KW	1K530H	With brake (-B)	—	—	15H	—	—	15H
	2 KW	2K030H	Straight shaft (blank)	—	—	20H	—	—	20H
	3 KW	3K030H	Shaft with key and tap (-S2)	—	—	30H	—	—	30H
	4 KW	4K030H		—	—	—	—	—	50H
	5 KW	5K030H		—	—	—	—	—	50H
Cylindrical 1500 rpm, incremental encoder, IP67 (excluding shaft opening)	450 W	45015H	Without brake (blank)	—	—	05H	—	—	05H
	850 W	85015H	With brake (-B)	—	—	10H	—	—	10H
	1.3 KW	1K315H	Straight shaft (blank)	—	—	15H	—	—	15H
	1.8 KW	1K815H	Shaft with key and tap (-S2)	—	—	20H	—	—	20H
	2.9 KW	2K915H		—	—	—	—	—	30H
	4.4 KW	4K415H		—	—	—	—	—	50H
	5.5 KW	5K515H		—	—	—	—	—	60H*
	7.5 KW	7K515H		—	—	—	—	—	75H*
	11 KW	11K015H		—	—	—	—	—	150H*
	15 KW	15K015H		—	—	—	—	—	150H*
Cylindrical 1000 rpm, incremental encoder, IP67 (excluding shaft opening)	300 W	30010H	Without brake (blank)	—	—	05H	—	—	05H
	600 W	60010H	With brake (-B)	—	—	10H	—	—	08H
	900 W	90010H	Straight shaft (blank)	—	—	10H	—	—	10H
	1.2 KW	1K210H	Shaft with key and tap (-S2)	—	—	15H	—	—	15H
	2 KW	2K010H		—	—	20H	—	—	20H
	3 KW	3K010H		—	—	—	—	—	30H
	4 KW	4K010H		—	—	—	—	—	50H
	5 KW	5K010H		—	—	—	—	—	60H*
Flat style, 3000 rpm, incremental encoder, IP55 (excluding shaft opening) or IP67 (including shaft opening)	100 W	P10030H	Without brake (blank)	01L	01H	—	01HL	01H	—
	200 W	P20030H	With brake (-B)	02L	02H	—	02HL	02H	—
	400 W	P40030H	Straight shaft (blank)	04L	04H	—	—	04H	—
	750 W	P75030H	Shaft with key (-S1)	—	08H	—	—	08H	08H
	1.5 KW	P1K530H	Shaft with key and tap (-S2)	—	—	15H	—	—	15H
				—	—	—	—	—	—

Note: *A regenerative resistor (model R88A-RR8806) must be ordered with these servo drivers.

Ordering Information



Servo Drives (R88D)

Watts	Voltage	Phase	Model	
			Standard	With MECHATROLINK-II
30	100	1	R88D-WTA3HL	—
50	100	1	R88D-WTA5HL	R88D-WNA5L-ML2
100	100	1	R88D-WT01HL	R88D-WN01L-ML2
200	100	1	R88D-WT02HL	R88D-WN02L-ML2
400	100	1	—	R88D-WN04L-ML2
30	200	1	R88D-WTA3H	—
50	200	1	R88D-WTA5H	R88D-WNA5H-ML2
100	200	1	R88D-WT01H	R88D-WN01H-ML2
200	200	1	R88D-WT02H	R88D-WN02H-ML2
400	200	1	R88D-WT04H	R88D-WN04H-ML2
750	200	1	—	R88D-WN08H-ML2
500	200	3	R88D-WT05H	R88D-WN05H-ML2
750	200	3	R88D-WT08H	—
1000	200	3	R88D-WT10H	R88D-WN10H-ML2
1500	200	3	R88D-WT15H	R88D-WN15H-ML2
2000	200	3	R88D-WT20H	R88D-WN20H-ML2
3000	200	3	R88D-WT30H	R88D-WN30H-ML2
4000	200	3	R88D-WT50H	—
5000	200	3	R88D-WT50H	—
5500	200	3	R88D-WT60H	—
7500	200	3	R88D-WT75H	—
15,000	200	3	R88D-WT150H	—

Cylindrical Style Servo Motors

R88M-W□□□ □□ □- □ □ □□
4 5 6 7 8 9

Build a part number as follows:

R88M-W75030T-BS2 = 750 W, 3000 RPM, 200 VAC motor with absolute encoder, brakes, and shaft with key and tap

4	5	Basic model	6				7		8			9			
Capacity	Rotation speed	Cylindrical style	Motor power supply and encoder type H = 200 VAC, incremental L = 100 VAC, incremental T = 200 VAC, absolute S = 100 VAC absolute				With/without brakes		Oil seal options Blank = none O = oil seal			Shaft shape Blank: straight S1 = with key S2 = with key and tap S3 = straight with tap			
W	RPM	R88M-W	H	L	T	S	Blank	B	Blank	O	W	Blank	S1	S2	S3
30	3,000	R88M-W03030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
50		R88M-W05030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
100		R88M-W10030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
200		R88M-W20030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
400		R88M-W40030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
750		R88M-W75030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes
1 kW		R88M-W1K030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
1.5 kW		R88M-W1K530	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
2 kW		R88M-W2K030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
3 kW		R88M-W3K030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
4 kW	R88M-W4K030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—	
5 kW	R88M-W5K030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—	
450	1,500	R88M-W45015	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
850		R88M-W85015	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
1.3 kW		R88M-W1K315	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
1.8 kW		R88M-W1K815	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
2.9 kW		R88M-W2K915	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
4.4 kW		R88M-W4K415	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
5.5 kW		R88M-W5K515	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
7.5 kW		R88M-W7K515	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
11 kW		R88M-W11K015	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
15 kW		R88M-W15K015	—	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
300	1,000	R88M-W30010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
600		R88M-W60010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
900		R88M-W90010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
1.2 kW		R88M-W1K210	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
2 kW		R88M-W2K010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
3 kW		R88M-W3K010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
4 kW		R88M-W4K010	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—
5.5 kW		R88M-W5K510	Yes	—	Yes	—	Yes	Yes	Yes	Yes	—	Yes	—	Yes	—

Flat Style Servo Motors

R88M-WP□□□ □□ □- □ □ □□
4 5 6 7 8 9

Build a part number as follows:

R88M-WP20030H-BWS1 = 200 W, 3000 RPM, 200 VAC motor with absolute encoder, brakes, waterproof seal (IP67), and shaft with key

4	5	Basic model	6				7		8			9			
Capacity	Rotation speed	Flat style	Motor power supply and encoder type H = 200 VAC, incremental L = 100 VAC, incremental T = 200 VAC, absolute S = 100 VAC absolute				With/without brakes		Waterproof (IP67) /oil seal options Blank = none O = oil seal W = waterproof			Shaft shape Blank: straight S1 = with key S2 = with key and tap S3 = straight with tap			
W	RPM	R88M-WP	H	L	T	S	Blank	B	Blank	O	W	Blank	S1	S2	S3
100 W	3,000	R88M-WP10030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
200 W		R88M-WP20030	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
400 W		R88M-WP40030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
750 W		R88M-WP75030	Yes	—	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.5 kW		R88M-WP1K530	Yes	—	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Circled numbers refer to the configuration diagram on page I-3.

① Servo Motor Power Cables

Applicable servo motors	Length	Model	
		For motors without brakes	For motors with brakes
30-W to 750-W Cylindrical style motors (3,000 RPM) 100-W to 750-W Flat style motors (3,000 RPM)	3 m	R88A-CAWA003S	R88A-CAWA003B
	5 m	R88A-CAWA005S	R88A-CAWA005B
	10 m	R88A-CAWA010S	R88A-CAWA010B
	15 m	R88A-CAWA015S	R88A-CAWA015B
	20 m	R88A-CAWA020S	R88A-CAWA020B
	30 m	R88A-CAWA030S	R88A-CAWA030B
	40 m	R88A-CAWA040S	R88A-CAWA040B
	50 m	R88A-CAWA050S	R88A-CAWA050B
1.5-kW Flat style motors	3 m	R88A-CAWB003S	R88A-CAWB003B
	5 m	R88A-CAWB005S	R88A-CAWB005B
	10 m	R88A-CAWB010S	R88A-CAWB010B
	15 m	R88A-CAWB015S	R88A-CAWB015B
	20 m	R88A-CAWB020S	R88A-CAWB020B
	30 m	R88A-CAWB030S	R88A-CAWB030B
	40 m	R88A-CAWB040S	R88A-CAWB040B
	50 m	R88A-CAWB050S	R88A-CAWB050B
300-W to 900-W Cylindrical style motors (1,000 RPM) 1-kW to 2-kW Cylindrical style motors (3,000 RPM)	3 m	R88A-CAWC003S	R88A-CAWC003B
	5 m	R88A-CAWC005S	R88A-CAWC005B
	10 m	R88A-CAWC010S	R88A-CAWC010B
	15 m	R88A-CAWC015S	R88A-CAWC015B
	20 m	R88A-CAWC020S	R88A-CAWC020B
	30 m	R88A-CAWC030S	R88A-CAWC030B
	40 m	R88A-CAWC040S	R88A-CAWC040B
	50 m	R88A-CAWC050S	R88A-CAWC050B
1.2-kW to 3-kW Cylindrical style servo motors (1,000 RPM) 3-kW to 5-kW Cylindrical style servo motors (3,000 RPM) 1.8 kW to 4.4 kW Cylindrical style servo motors (1,500 RPM)	3 m	R88A-CAWD003S	R88A-CAWD003B
	5 m	R88A-CAWD005S	R88A-CAWD005B
	10 m	R88A-CAWD010S	R88A-CAWD010B
	15 m	R88A-CAWD015S	R88A-CAWD015B
	20 m	R88A-CAWD020S	R88A-CAWD020B
	30 m	R88A-CAWD030S	R88A-CAWD030B
	40 m	R88A-CAWD040S	R88A-CAWD040B
	50 m	R88A-CAWD050S	R88A-CAWD050B
5.5 kW Cylindrical style servo motors (1,500 RPM) 4 kW Cylindrical style servo motors (1,000 RPM)	3 m	R88A-CAWE003S	R88A-CAWE003B §
	5 m	R88A-CAWE005S	R88A-CAWE005B §
	10 m	R88A-CAWE010S	R88A-CAWE010B §
	15 m	R88A-CAWE015S	R88A-CAWE015B §
	20 m	R88A-CAWE020S	R88A-CAWE020B §
	30 m	R88A-CAWE030S	R88A-CAWE030B §
	40 m	R88A-CAWE040S	R88A-CAWE040B §
	50 m	R88A-CAWE050S	R88A-CAWE050B §
7.5 to 11 kW Cylindrical style servo motors (1,500 RPM) 5.5 kW Cylindrical style servo motors (1,000RPM)	3 m	R88A-CAWF003S	R88A-CAWF003B §
	5 m	R88A-CAWF005S	R88A-CAWF005B §
	10 m	R88A-CAWF010S	R88A-CAWF010B §
	15 m	R88A-CAWF015S	R88A-CAWF015B §
	20 m	R88A-CAWF020S	R88A-CAWF020B §
	30 m	R88A-CAWF030S	R88A-CAWF030B §
	40 m	R88A-CAWF040S	R88A-CAWF040B §
	50 m	R88A-CAWF050S	R88A-CAWF050B §

§ For these motors with brake, a cable for power is required in addition to the brake cable. (Example, for servo motor model R88M-W5K515T-BS2, order both R88A-CAWE015S power cable and R88A-CAWE015B brake cable.)

Note: For 15kW Cylindrical style servomotors (1,500 RPM) use cable AWG4 x 4C UL62, with max. length 50 m and connectors plug MS3108B32-17S with cable plug MS3102A32-17P.

② Encoder Cables

Applicable servo motors	Length	Model
30-W to 750-W Cylindrical-style motors (3,000 RPM) 100-W to 1.5-kW Flat style Motors (3,000 RPM)	3 m	R88A-CRWA003C
	5 m	R88A-CRWA005C
	10 m	R88A-CRWA010C
	15 m	R88A-CRWA015C
	20 m	R88A-CRWA020C
	30 m	R88A-CRWA030C
	40 m	R88A-CRWA040C
	50 m	R88A-CRWA050C
1-kW to 5-kW Cylindrical-style motors (3,000 RPM) 300-W to 5.5-kW Cylindrical-style motors (1,000 RPM) 450-W to 15.0-kW Cylindrical-style motors (1,500 RPM)	3 m	R88A-CRWB003N
	5 m	R88A-CRWB005N
	10 m	R88A-CRWB010N
	15 m	R88A-CRWB015N
	20 m	R88A-CRWB020N
	30 m	R88A-CRWB030N
	40 m	R88A-CRWB040N
	50 m	R88A-CRWB050N

Cables and Accessories

Application	Description	Length	Model
③ Cables for Motion Control modules	Control cables for 1 axis (common to CS1, C200H, and CV-Series Controllers)	1 m	R88A-CPW001M1
		2 m	R88A-CPW002M1
		3 m	R88A-CPW003M1
		5 m	R88A-CPW005M1
	Control cables for 2 axes (common to SYSMAC CS1, C200H, and CV-Series controllers)	1 m	R88A-CPW001M2
		2 m	R88A-CPW002M2
		3 m	R88A-CPW003M2
		5 m	R88A-CPW005M2
④ Servo relay units connect cables from PLC position controller and servo drive	1-axis Position Control Unit (CS1W-NC113/133, CJ1W-NC113/133); does not support communications functions	—	XW2B-20J6-1B
	2-axis Position Control Unit (CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433); does not support communications functions	—	XW2B-40J6-2B
	1-axis CQM1H-PLB21 and CQM1-CPU43-V1; does not support communications functions	—	XW2B-20J6-3B
	1-axis CJ1M-CPU22/23; does not support communications functions	—	XW2B-20J6-8A
	2-axis CJ1M-CPU22/23; does not support communications functions	—	XW2B-40J6-9A
⑤ Servo drive connecting cable	Connects Servo Relay Units XW2B-20J6-1B, XW2B-40J6-2B, XW2B-20J6-3B, XW2B-20J6-8A, or XW2B-40J6-9A	1 m	XW2Z-100J-B4
		2 m	XW2Z-200J-B4
	Connects Servo Relay Unit XW2B-40J6-4A	1 m	XW2Z-100J-B8
		2 m	XW2Z-200J-B8
⑥ Position controller PLC module cable	CQM1H-PLB21 and CQM1-CPU43-V1 to XW2B-20J6-3B servo relay unit	1 m	XW2Z-100J-A3
	CJ1W-NC113 to XW2B-20J6-1B servo relay unit	1 m	XW2Z-100J-A16
	CJ1W-NC213 or CJ1W-NC413 to XW2B-20J6-2B servo relay unit	1 m	XW2Z-100J-A17
	CJ1W-NC133 to XW2B-20J6-1B servo relay unit	1 m	XW2Z-100J-A20
	CJ1W-NC233 or CJ1W-NC433 to XW2B-40J6-2B servo relay unit	1 m	XW2Z-100J-A21
	CJ1M-CPU22 or CJ1M-CPU23 to XW2B-20J6-8A (1 axis) or XW2B-40J6-9A (2 axes) servo relay unit	1 m	XW2Z-100J-A26
	CS1W-NC113 to XW2B-20J6-1B servo relay unit	1 m	XW2Z-100J-A8
	CS1W-NC213 or CS1W-NC413 to XW2B-40J6-2B servo relay unit	1 m	XW2Z-100J-A9
	CS1W-NC133 to XW2B-20J6-B1 servo relay unit	1 m	XW2Z-100J-A12
CS1W-NC233 or CS1W-NC433 to XW2B-40J6-2B servo relay unit	1 m	XW2Z-100J-A13	
⑦ General purpose controller cables	Control cables with connector at one end	1 m	R88A-CPW001S
		2 m	R88A-CPW002S

Cables and Accessories (Continued)

Application	Description	Length	Model
⑧ Universal terminal block cable	Cables for universal terminal block XW2B-50G5	1 m	R88A-CTW001N
		2 m	R88A-CTW002N
	Control I/O connector; fits port CN1 (WT-series only)	—	R88A-CNU11C
	Control I/O connector; fits port CN1 (WN-series only)	—	R88A-CNW01C
	Universal terminal block	—	XW2B-50G5
	Cable from relay terminal block XW2B-20G4/XW2B-20G5/XW2D-20G6 to WN-series servo drive CN1	1 m	XW2Z-100J-B16
		2 m	XW2Z-200J-B16
	Cable from relay terminal block XW2B-20G4/XW2B-20G5/XW2D-20G6 to WT-series servo drive CN1	1 m	XW2Z-100J-B15
	2 m	XW2Z-200J-B15	
⑨ Battery backup	Servo drives R88D-WT50H or less	—	R88A-BAT01W
	Servo drives R88D-WT60H/75H/150H	—	R88A-BAT02W
	Servo drives R88D-WN, all models (connected in series with encoder cables in ②)	0.3 m	R88A-CRWC0R3C
⑩ Analog monitor cable	Peripheral cable for analog monitoring; servo drive to PC; connects to port CN4	1 m	R88A-CMW001S
⑪ Parameter unit	Panel mount unit sets and displays servo drive parameters; includes cable	1 m	R88A-PR02W
⑫ Personal computer cable	Connects a personal computer for monitoring; servo drive to PC; connects to port CN3	2 m	R88A-CCW002P2

External Regenerative Resistors

Rating	Model
220 W 47 Ω	R88A-RR22047S
880 W 6.25 Ω	R88A-RR88006*

* Resistor required for use with Servo Driver models R88D-WT60H/WT75H/WT150H.

DC Reactors

Applicable servo drive	Model
For R88D-WT30H	R88A-PX5059
For R88D-WT15H/WT20H	R88A-PX5060
For R88D-WT05H/WT08H/WT10H	R88A-PX5061
For R88D-WT02HL	R88A-PX5062
For R88D-WTA3HL/WTA5HL/WT01HL	R88A-PX5063
For R88D-WT50H	R88A-PX5068
For R88D-WT04H	R88A-PX5069
For R88D-WT02H	R88A-PX5070
For R88D-WTA3H/WTA5H/WT01H	R88A-PX5071

AC Reactors

Applicable servo drive	Model
For R88D-WTA3HL to WT01HL/WD30H to WD02H	R88A-F1W104-E
For R88D-WT02HL/WT04H	R88A-F1W107-E
For R88D-WT05H/WT08H	R88A-F1W115-E
For R88D-WT10H	R88A-F1W125-E
For R88D-WT15H/WT20H	LF-315K
For R88D-WT30H	LF-325K
For R88D-WT50H	LF-335K
For R88D-WT60H	LF-380K

Network Communication Adapters

DeviceNet Option Unit mounts to a W-Series AC Servo drives and performs both DeviceNet communications functions and Position Control Unit functions. Parameters can be set, the operating status can be monitored, and faults can be predicted from a PLC up to 500 m away.

- **Trace Function:** When trigger conditions are satisfied, up to two analog elements and two ON/OFF elements can be recorded in the DeviceNet Option Unit and read from the PLC.
- **Monitor Item Reading Function:** The contents of AC Servo drive monitor display can be read from the PLC.
- **Batch Handling of Operating Information** for Servo Systems Information that can be displayed at W-series AC Servo Drivers using monitor functions (e.g., speed commands and speed feedback) can be read by a PLC using remote I/O functions.

Description	Model
DeviceNet Option Unit	R88A-NCW152-DRT
External I/O Connector	R88A-CNU01R
Cable for Setup Tool (IBM PC/AT or compatible; 2 m length)	R88A-CCW002P4

MECHATROLINK-II Interface Unit for WT-Series Drives

Description	Cable length	Model
MECHATROLINK-II Interface Unit	—	FNY-NS115
MECHATROLINK-II cable	0.5 m	FNY-W6003-A5
	1 m	FNY-W6003-01
	3 m	FNY-W6003-03
	5 m	FNY-W6003-05
	10 m	FNY-W6003-10
	20 m	FNY-W6003-20
	30 m	FNY-W6003-30
MECHATROLINK-II terminating resistor	—	FNY-W6022

Servos SmartStep



Cost-Effective Servo Capability with Stepper Simplicity

Easily migrate from steppers to the higher precision of servos in minutes with Omron's SmartStep servo drivers and ultra-compact 3-phase servo motors. They accept pulse-train input that can be configured quickly via simple DIP switches and have an on-line auto-tuning function. SmartStep offers all the simplicity and cost-effectiveness of a stepper with the added advantages of the servo drive capability.

Motor Features

- Sizes 30 W to 750 W, rated speed 3,000 rpm
- Accepts incremental encoder input at 2,000 p/r
- Cylindrical and flat type servo motors available
- Peak torque up to three times continuous torque during 3 seconds
- Easy to install with pre-built cables
- Motors with brake are available

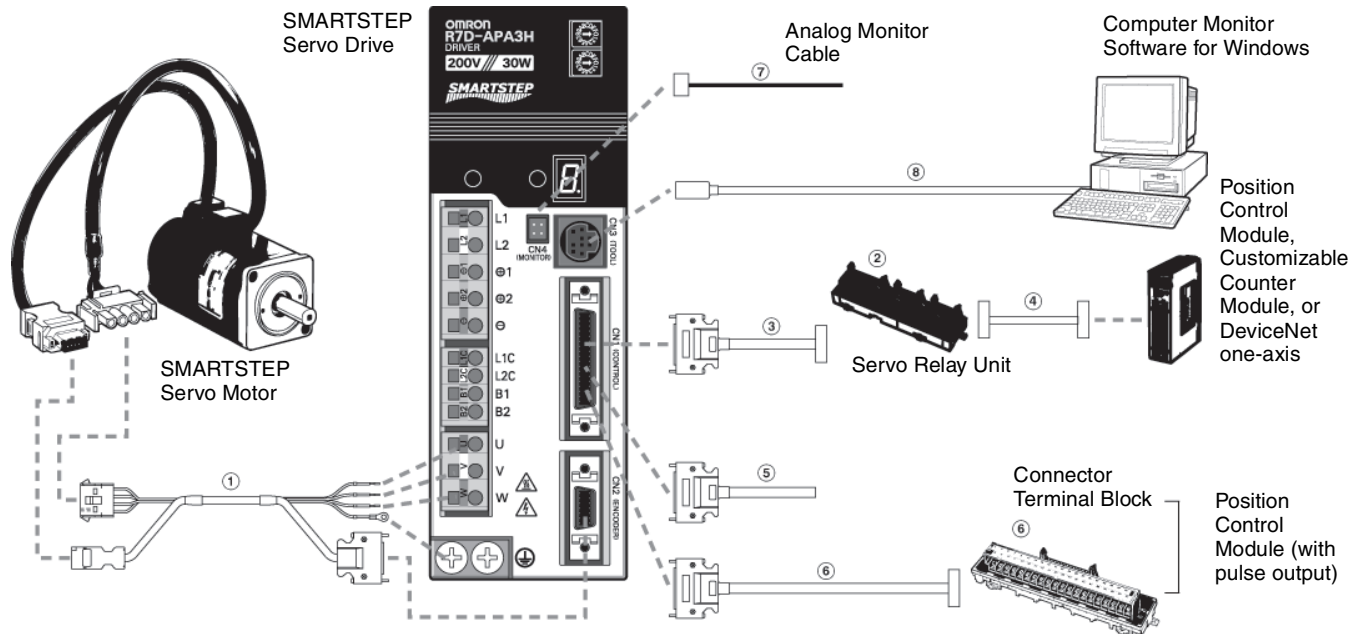
Driver Features

- Output range from 30 W to 750 W
- 300% peak current over nominal
- Control via pulse train (speed and position)



- Four position resolution settings:
 - 500 pulses/rotation (0.72°/step)
 - 1,000 pulses/rotation (0.36°/step)
 - 5,000 pulses/rotation (0.072°/step)
 - 10,000 pulses/rotation (0.036°/step)
- SmartStep does not require the use of PC configuration software, making setup as easy as using a stepper motor for basic capabilities
- To optimize performance, use PC software for on-line auto-tuning of values and monitoring

Ordering Information



Add cable length to the part number in place of □□□: 003 for 3 m cable, 005 for 5 m, 010 for 10 m, 015 for 15 m and 020 for 20 m.

Note: Circled numbers refer to the configuration diagram on page I-8.

SmartStep Servos

Wattage	Servo motor model	Servo drive model	① Power cable/Encoder cable model (Add cable length for □□□)
Cylindrical Servo Motors 100 VAC Without Brake, Shaft Without Keyway			
30 W	R7M-A03030-S1	R7D-APA3L	R7A-CEA□□□S
50 W	R7M-A05030-S1	R7D-APA5L	R7A-CEA□□□S
100 W	R7M-A10030-S1	R7D-AP01L	R7A-CEA□□□S
200 W	R7M-A20030-S1	R7D-AP02L	R7A-CEA□□□S
400 W	R7M-A40030-S1	R7D-AP04L	R7A-CEA□□□S
Cylindrical Servo Motors 100 VAC With Brake, Shaft With Keyway			
30 W	R7M-A03030-BS1	R7D-APA3L	R7A-CEA□□□B
50 W	R7M-A05030-BS1	R7D-APA5L	R7A-CEA□□□B
100 W	R7M-A10030-BS1	R7D-AP01L	R7A-CEA□□□B
200 W	R7M-A20030-BS1	R7D-AP02L	R7A-CEA□□□B
400 W	R7M-A40030-BS1	R7D-AP04L	R7A-CEA□□□B
Cylindrical Servo Motors 200 VAC Without Brake, Shaft With Keyway			
30 W	R7M-A03030-S1	R7D-APA3H	R7A-CEA□□□S
50 W	R7M-A05030-S1	R7D-APA5H	R7A-CEA□□□S
100 W	R7M-A10030-S1	R7D-AP01H	R7A-CEA□□□S
200 W	R7M-A20030-S1	R7D-AP02H	R7A-CEA□□□S
400 W	R7M-A40030-S1	R7D-AP04H	R7A-CEA□□□S
750 W	R7M-A75030-S1	R7D-AP08H	R7A-CEA□□□S
Cylindrical Servo Motors 200 VAC With Brake, Shaft With Keyway			
30 W	R7M-A03030-BS1	R7D-APA3H	R7A-CEA□□□B
50 W	R7M-A05030-BS1	R7D-APA5H	R7A-CEA□□□B
100 W	R7M-A10030-BS1	R7D-AP01H	R7A-CEA□□□B
200 W	R7M-A20030-BS1	R7D-AP02H	R7A-CEA□□□B
400 W	R7M-A40030-BS1	R7D-AP04H	R7A-CEA□□□B
750 W	R7M-A75030-BS1	R7D-AP08H	R7A-CEA□□□B
Flat Servo Motors 100 VAC Without Brake, Shaft With Keyway			
100 W	R7M-AP10030-S1	R7D-AP01L	R7A-CEA□□□S
200 W	R7M-AP20030-S1	R7D-AP02L	R7A-CEA□□□S
400 W	R7M-AP40030-S1	R7D-AP04L	R7A-CEA□□□S
Flat Servo Motors 100 VAC With Brake, Shaft With Keyway			
100 W	R7M-AP10030-BS1	R7D-AP01L	R7A-CEA□□□B
200 W	R7M-AP20030-BS1	R7D-AP02L	R7A-CEA□□□B
400 W	R7M-AP40030-BS1	R7D-AP04L	R7A-CEA□□□B
Flat Servo Motors 200 VAC Without Brake, Shaft With Keyway			
100 W	R7M-AP10030-S1	R7D-AP01H	R7A-CEA□□□S
200 W	R7M-AP20030-S1	R7D-AP02H	R7A-CEA□□□S
400 W	R7M-AP40030-S1	R7D-AP04H	R7A-CEA□□□S
750 W	R7M-AP75030-S1	R7D-AP08H	R7A-CEA□□□S
Flat Servo Motors 200 VAC With Brake, Shaft With Keyway			
100 W	R7M-AP10030-BS1	R7D-AP01H	R7A-CEA□□□B
200 W	R7M-AP20030-BS1	R7D-AP02H	R7A-CEA□□□B
400 W	R7M-AP40030-BS1	R7D-AP04H	R7A-CEA□□□B
750 W	R7M-AP75030-BS1	R7D-AP08H	R7A-CEA□□□B

Cables and Accessories

Description	Devices connected	Specification	Model
② Servo relay units connect cables from PLC position controller and servo drive	CS1W-NC113/133, CJ1W-NC113/133; 1 axis; does not support communications functions	—	XW2B-20J6-1B
	CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433; 2 axes; does not support communications functions	—	XW2B-40J6-2B
	CQM1H-PLB21 and CQM1-CPU43-V1; 1 axis; does not support communications functions	—	XW2B-20J6-3B
	CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433; 2 axes; supports communications functions	—	XW2B-40J6-4A
	CJ1M-CPU22/23; 1 axis; does not support communications functions	—	XW2B-20J6-8A
	CJ1M-CPU22/23; 2 axes; does not support communications functions	—	XW2B-40J6-9A
③ Universal terminal block cable to servo drive	Doesn't support communications functions. (For the XW2B-□□J6-□B)	1 m length	XW2Z-100J-B5
		2 m length	XW2Z-200J-B5
④ Position controller PLC module cable	CQM1H-PLB21 and CQM1-CPU43-V1 to XW2B-20J6-3B servo relay unit	1 m length	XW2Z-100J-A3
	CJ1W-NC113 to XW2B-20J6-1B servo relay unit	1 m length	XW2Z-100J-A16
	CJ1W-NC213 or CJ1W-NC413 to XW2B-20J6-2B servo relay unit	1 m length	XW2Z-100J-A17
	CJ1W-NC133 to XW2B-20J6-1B servo relay unit	1 m length	XW2Z-100J-A20
	CJ1W-NC233 or CJ1W-NC433 to XW2B-40J6-2B servo relay unit	1 m length	XW2Z-100J-A21
	CJ1M-CPU22 or CJ1M-CPU23 to XW2B-20J6-8A (1 axis) or XW2B-40J6-9A (2 axes) servo relay unit	1 m length	XW2Z-100J-A26
	CS1W-NC113 to XW2B-20J6-1B servo relay unit	1 m length	XW2Z-100J-A8
	CS1W-NC213 or CS1W-NC413 to XW2B-40J6-2B servo relay unit	1 m length	XW2Z-100J-A9
	CS1W-NC133 to XW2B-20J6-B1 servo relay unit	1 m length	XW2Z-100J-A12
	CS1W-NC233 or CS1W-NC433 to XW2B-40J6-2B servo relay unit	1 m length	XW2Z-100J-A13
⑤ Control cable	For general-purpose Controllers (mating connector for CJ1 on one end, open ended on the other end)	1 m length	R88A-CPU001S
		2 m length	R88A-CPU002S
⑥ Universal terminal block	For position control modules with pulse output and general-purpose controllers	—	XW2B-40F5-P
	Connector cable between terminal block and servo driver	1 m length	R88A-CTU001N
		2 m length	R88A-CTU002N
⑦ Analog monitor cable (port CN4)	Servo drive to PC	1 m length	R88A-CMW001S
⑧ Computer monitor cable (port CN3)	Servo drive to PC	2 m length	R7A-CCA002P2
Filters	For servo drive R7D-APA3H, APA5H, AP01H, AP02H; R7D-APA3L, APA5L, AP01L, AP02L	4 A, 250 VAC single phase	R88A-FIW104-E
	For servo drive R7D-AP04H, AP04L	7 A, 250 VAC single phase	R88A-FIW107-E
	For servo drive R7D-AP08H	15 A, 250 VAC single phase	R88A-FIW115-E
Control I/O connector (CN1)	—	—	R88A-CNU01C
SmartStep encoder connector (CN2)	—	—	R7A-CNA01R
External regeneration resistor	—	200 W, 47 Ω	R88A-RR22047S
Parameter copy unit with cable	—	—	R7A-PR02A
Configuration and monitoring software	For servo drives and inverters	Version 1.11 or higher	CX-DRIVE
Complete OMRON software suite	Includes CX-Drive	—	CX-ONE

Specifications

Servo Drives General Specifications

Item	Specification
Operating ambient	0° to 55° C (32° F to 131° F), 90% RH max. (with no condensation)
Storage ambient	-20° to 85° C (-4° F to 185° F), 90% RH max. (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1-mm double amplitude or acceleration of 4.9 m/s ² max., whichever is smaller
Impact resistance	Acceleration 19.6 m/s ² max., in X, Y, and Z directions, three times
Insulation resistance	Between power line terminals and case: 0.5 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and case: 1,500 VAC for 1 min. at 50/60 Hz between each control signal and case: 500 VAC for 1 min.
Protective structure	Built into panel (IP10).
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Servo Drives Performance Specifications

100 VAC Input Models

Item	Specification				
Model	R7D-APA3L	R7D-APA5L	R7D-AP01L	R7D-AP02L	R7D-AP04L
Rated output	30 W	50 W	100 W	200 W	400 W
Continuous output current (rms)	0.42	0.6	0.89	2.0	2.6
Momentary maximum output current (rms)	1.3	1.9	2.8	6.0	8.0
Control power supply	Single-phase 100/115 VAC (85 to 127 V) 50/60 Hz				
Main-circuit power supply	Single-phase 100/115 VAC (85 to 127 V) 50/60 Hz (Voltage doubler method)				
Control method	All-digital servo				
Speed feedback	2,000 pulses/revolution Incremental Encoder				
Inverter method	PWM method based on IGBT				
PWM frequency	11.7 kHz				
Weight [kg (lb)]	0.8 (1.76)	0.8 (1.76)	0.8 (1.76)	0.8 (1.76)	1.1 (2.43)
Compatible motor voltage	200 V				
Compatible motor capacity	30 W	50 W	100 W	200 W	400 W
Command pulse response	250 kHz				
Applicable servo motor (R7M-)	A03030_	A05030_	A10030_	A20030_	A40030_
	—	—	AP10030_	AP20030_	AP40030_

200 VAC Input Models

Item	Specification					
Model	R7D-APA3H	R7D-APA5H	R7D-AP01H	R7D-AP02H	R7D-AP04H	R7D-AP08H
Rated output	30 W	50 W	100 W	200 W	400 W	750 W
Continuous output current (rms)	0.42	0.6	0.89	2.0	2.6	4.4
Momentary maximum output current (rms)	1.3	1.9	2.8	6.0	8.0	13.9
Control power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz					
Main-circuit power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz (Three-phase 200/230 VAC can be used with the 750 W model)					
Control method	All-digital servo					
Speed feedback	2,000 pulses/revolution incremental encoder					
Inverter method	PWM method based on IGBT					
PWM frequency	11.7 kHz					
Weight [kg (lb)]	0.8 (1.76)	0.8 (1.76)	0.8 (1.76)	0.8 (1.76)	1.1 (2.43)	1.7 (3.75)
Servo motor voltage	200 V					
Servo motor capacity	30 W	50 W	100 W	200 W	400 W	750 W
Command pulse response	250 kHz					
Applicable servo motor (R7M-)	A03030	A05030	A10030	A20030	A40030	A75030
	—	—	AP10030	AP20030	AP40030	AP75030

Servo Motor General Specifications

Item	Specification
Operating ambient	0°C to 40°C (32°F to 104°F), 20% to 80% RH (with no condensation)
Storage ambient	-20°C to 60°C (-4°F to 140°F), 20% to 80% RH (with no condensation)
Storage/operating atmosphere	No corrosive gases
Vibration resistance	10 to 2,500 Hz in X, Y, and Z directions with 0.2 mm double amplitude or acceleration of 24.5 m/s ² max., whichever is smaller
Impact resistance	Acceleration 98 m/s ² max., in a vertical direction, two times
Insulation resistance	Between power line terminals and FG: 10 MΩ min. (at 500 VDC)
Dielectric strength	Between power line terminals and FG: 1,500 V AC for 1 min at 50/60 Hz
Run position	Any direction
Insulation grade	Type B
Structure	Totally-enclosed self-cooling
Protective structure	IP55 for both the cylindrical and flat servo motors
Vibration grade	V-15
Mounting method	Flange-mounting
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Servo Motor Performance Specifications

Flat Servo Motors without Brakes

Item	R7M-AP10030-S1	R7M-AP20030-S1	R7M-AP40030-S1	R7M-AP75030-S1
Rated output	100 W	200 W	400 W	750 W
Rated torque	0.318 N•m	0.637 N•m	1.27 N•m	2.39 N•m
Rated rotation speed	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.
Momentary maximum rotation speed	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.
Momentary maximum torque	0.96 N•m	1.91 N•m	3.82 N•m	7.1 N•m
Rated current	0.89 A (rms)	2.0 A (rms)	2.6 A (rms)	4.1 A (rms)
Momentary maximum current	2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia	6.5 × 10 ⁻⁶ kg•m ²	2.09 × 10 ⁻⁵ kg•m ²	3.47 × 10 ⁻⁵ kg•m ²	2.11 × 10 ⁻⁴ kg•m ²
Power rate	15.7 kW/s	19.4 kW/s	46.8 kW/s	26.9 kW/s
Allowable radial load	78 N	245 N	245 N	392 N
Allowable thrust load	49 N	68 N	68 N	147 N
Weight (without brake -S1)	0.7 kg	1.4 kg	2.1 kg	4.2 kg
Applicable servo driver	R7D-AP01H/L	R7D-AP02H/L	R7D-AP04H/L	R7D-AP08H
Encoder resolution	2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z			
Radiation shield dimensions	t6 x250 mm square			t12 x300 mm square

Flat Servo Motors with Brakes

Item	R7M-AP10030-BS1	R7M-AP20030-BS1	R7M-AP40030-BS1	R7M-AP75030-BS1	
Rated output	100 W	200 W	400 W	750 W	
Rated torque	0.318 N•m	0.637 N•m	1.27 N•m	2.39 N•m	
Rated rotation speed	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	
Momentary maximum rotation speed	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	
Momentary maximum torque	0.96 N•m	1.91 N•m	3.82 N•m	7.1 N•m	
Rated current	0.89 A (rms)	2.0 A (rms)	2.6 A (rms)	4.1 A (rms)	
Momentary maximum current	2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)	
Rotor inertia	6.5 × 10 ⁻⁶ kg•m ²	2.09 × 10 ⁻⁵ kg•m ²	3.47 × 10 ⁻⁵ kg•m ²	2.11 × 10 ⁻⁴ kg•m ²	
Power rate	15.7 kW/s	19.4 kW/s	46.8 kW/s	26.9 kW/s	
Allowable radial load	78 N	245 N	245 N	392 N	
Allowable thrust load	49 N	68 N	68 N	147 N	
Weight (with brake -BS1)	0.9 kg	1.9 kg	2.6 kg	5.7 kg	
Applicable servo driver	R7D-AP01H/L	R7D-AP02H/L	R7D-AP04H/L	R7D-AP08H	
Encoder resolution	2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z				
Radiation shield dimensions	t6 x250 mm square			t12 x300 mm square	
Brake specifications	Brake inertia	3.1 × 10 ⁻⁶ kg•m ²	1.52 × 10 ⁻⁵ kg•m ²	1.52 × 10 ⁻⁵ kg•m ²	8.75 × 10 ⁻⁵ kg•m ²
	Excitation voltage	24 V DC ±10%			
	Power consumption (at 20°C)	6 W	5 W	7.6 W	7.5 W
	Current consumption (at 20°C)	0.25 A	0.21 A	0.32 A	0.31 A
	Static friction torque	0.4 N•m min.	0.9 N•m min.	1.9 N•m min.	3.5 N•m min.
	Attraction time	40 ms max.	40 ms max.	40 ms max.	40 ms max.
	Release time	20 ms max.	20 ms max.	20 ms max.	20 ms max.
	Backlash	1°	1°	1°	1°
Rating	Continuous	Continuous	Continuous	Continuous	
Insulation grade	Type F	Type F	Type F	Type F	

Cylindrical Servo Motors without Brakes

Item	R7M-A03030-S1	R7M-A05030-S1	R7M-A10030-S1	R7M-A20030-S1	R7M-A40030-S1	R7M-A75030-S1
Rated output	30 W	50 W	100 W	200 W	400 W	750 W
Rated torque	0.095 N•m	0.159 N•m	0.318 N•m	0.637 N•m	1.27 N•m	2.39 N•m
Rated rotation speed	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.
Momentary maximum rotation speed	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.
Momentary maximum torque	0.29 N•m	0.48 N•m	0.96 N•m	1.91 N•m	3.82 N•m	7.1 N•m
Rated current (rms)	0.42 A	0.6 A	0.87 A	2.0 A	2.6 A	4.4 A
Momentary maximum current (rms)	1.3 A	1.9 A	2.8 A	6.0 A	8.0 A	13.9 A
Rotor inertia	$1.7 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$2.2 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$3.6 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$1.19 \times 10^{-5} \text{ kg}\cdot\text{m}^2$	$1.87 \times 10^{-5} \text{ kg}\cdot\text{m}^2$	$6.67 \times 10^{-5} \text{ kg}\cdot\text{m}^2$
Power rate	5.31 kW/s	11.5 kW/s	28.1 kW/s	34.1 kW/s	86.3 kW/s	85.6 kW/s
Allowable radial load	68 N	68 N	78 N	245 N	245 N	392 N
Allowable thrust load	54 N	54 N	54 N	74 N	74 N	147 N
Weight without brake	0.3 kg	0.4 kg	0.5 kg	1.1 kg	1.7 kg	3.4 kg
Applicable servo driver	R7D-APA3H	R7D-APA5H	R7D-AP01H	R7D-AP02H	R7D-AP04H	R7D-AP08H
Encoder resolution	2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z					
Radiation shield dimensions	t6× 250 mm square					

Cylindrical Servo Motors with Brakes

Item	R7M-A03030-BS1	R7M-A05030-BS1	R7M-A10030-BS1	R7M-A20030-BS1	R7M-A40030-BS1	R7M-A75030-BS1	
Rated output	30 W	50 W	100 W	200 W	400 W	750 W	
Rated torque	0.095 N•m	0.159 N•m	0.318 N•m	0.637 N•m	1.27 N•m	2.39 N•m	
Rated rotation speed	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	3,000 r/min.	
Momentary maximum rotation speed	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	4,500 r/min.	
Momentary maximum torque	0.29 N•m	0.48 N•m	0.96 N•m	1.91 N•m	3.82 N•m	7.1 N•m	
Rated current (rms)	0.42 A	0.6 A	0.87 A	2.0 A	2.6 A	4.4 A	
Momentary maximum current (rms)	1.3 A	1.9 A	2.8 A	6.0 A	8.0 A	13.9 A	
Rotor inertia	$1.7 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$2.2 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$3.6 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$1.19 \times 10^{-5} \text{ kg}\cdot\text{m}^2$	$1.87 \times 10^{-5} \text{ kg}\cdot\text{m}^2$	$6.67 \times 10^{-5} \text{ kg}\cdot\text{m}^2$	
Power rate	5.31 kW/s	11.5 kW/s	28.1 kW/s	34.1 kW/s	86.3 kW/s	85.6 kW/s	
Allowable radial load	68 N	68 N	78 N	245 N	245 N	392 N	
Allowable thrust load	54 N	54 N	54 N	74 N	74 N	147 N	
Weight with brake	0.6 kg	0.7 kg	0.8 kg	1.6 kg	2.2 kg	4.3 kg	
Applicable servo driver	R7D-APA3H	R7D-APA5H	R7D-AP01H	R7D-AP02H	R7D-AP04H	R7D-AP08H	
Encoder resolution	2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z						
Radiation shield dimensions	t6× 250 mm square						
Brake specifications	Brake inertia	$0.85 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$0.85 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$0.85 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$6.4 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$6.4 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	$1.7 \times 10^{-5} \text{ kg}\cdot\text{m}^2$
	Excitation voltage	24 V DC $\pm 10\%$ V					
	Power consumption (at 20°C)	6 W	6 W	6 W	7 W	7 W	7.7 W
	Current consumption (at 20°C)	0.25 A	0.25 A	0.25 A	0.29 A	0.29 A	0.32 A
	Static friction torque	0.2 N•m min.	0.2 N•m min.	0.34 N•m min.	1.47 N•m min.	1.47 N•m min.	2.45 N•m min.
	Attraction time	30 ms max.	30 ms max.	30 ms max.	60 ms max.	60 ms max.	60 ms max.
	Release time	60 ms max.	60 ms max.	60 ms max.	20 ms max.	20 ms max.	20 ms max.
	Backlash	1°	1°	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Insulation grade	Type F	Type F	Type F	Type F	Type F	Type F	