SMARTSTEP

SERVO CONTROL

An Economical, Versatile and Easy-to-Use
System for Precise Positioning

Solve it with the problem solvers.

OMRON®

Available exclusively from Omron

Omron's compact SMARTSTEP servo drives and motors provide affordable motion control for applications with basic speed and position control requirements. SMARTSTEP easily connects to any manufacturer's position controller and responds to standard pulse train commands. The servo drive can be used for simple control right out of the box with a few front panel switch settings. To take advantage of additional control functions, download the free Windows®-based software from Omron's website.

Convenient Front Panel Setup

SMARTSTEP offers simple front panel setup to take advantage of basic capabilities. A combination of rotary and in-line DIP switches handle basic setup without using PC software or a hand-held setting device. Front panel settings include:

- Serial communications unit number setting (rotary)
- Gain adjustment, 0 to F (rotary), sets 10 combinations of values for
  - Position loop gain
  - Speed loop gain
  - Speed loop integral constant
  - Torque command filter time constant
- Adjust gain and constants individually, set to 0; requires software or hand-held setting device
- Online auto-tuning of gain
- Four resolution settings: 500, 1000, 5000 or 10,000 pulses/revolution
- Command pulse input setting (forward/reverse pulses or feed pulses/direction signal)
- Dynamic brake setting
- Alarm diagnostic code display

Streamlined Feature Set for Essential Capabilities

Omron has maximized performance and simplified maintenance of SMARTSTEP by removing infrequently-used features. The cost savings gives you an affordable motion control solution that provides essential capabilities. Some of the extraneous parameters and functions **not found** on SMARTSTEP include:

- Analog torque command control
- Internal preset speeds
- Control mode switching
- A second set of speed and position loop gains
- Brake activation timing
- Gain reduction input
- Current limiting input
- Input pulse disable input
- Speed conforming output
- Rotation detection output
- Servo ready output

Need More Functionality and Capability?

Omron's W-Series servo drives and motors accept pulse and analog signals for position, speed and torque controls from virtually any motion controller. They handle more advanced applications that require more control options or faster servo response times. The built-in keypad and display on W-Series units simplify monitoring and troubleshooting.

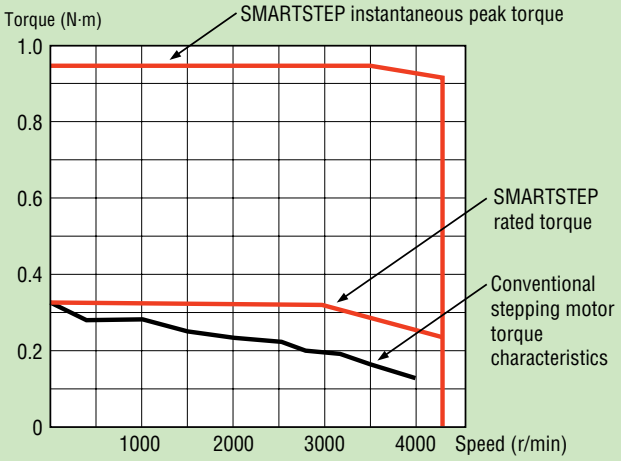
Easy to Configure

Put SMARTSTEP to work right out of the box. For basic operation, standard setup parameters can be set using front panel switches. SMARTSTEP does not require the use of PC configuration software, making setup as easy as using a stepper motor.

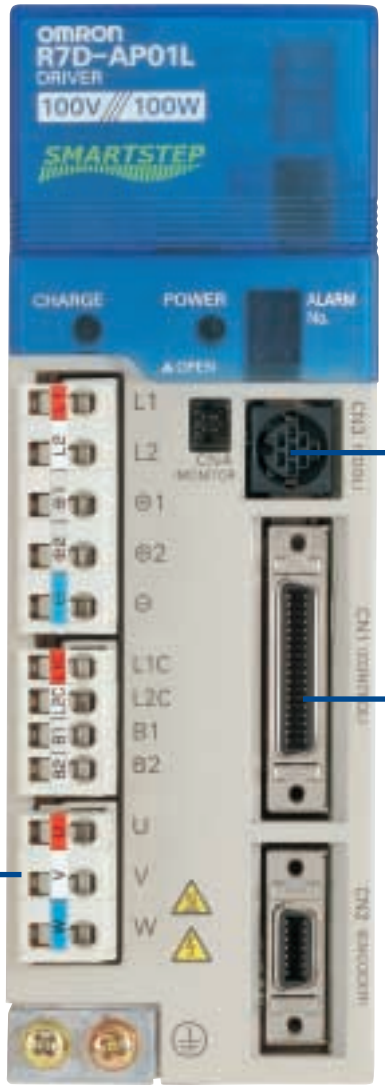
Powerful

The SMARTSTEP servo delivers constant torque throughout its rated speed range. The continuous servo loops provide reliable speed and position control and eliminate motor slippage.

Speed vs. torque comparison for a 100-W motor



Servo with the Fast, Easy Setup of a Stepper

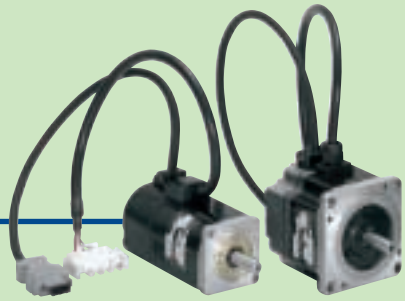


Flexible Setup & Maintenance

A hand-held Parameter Setting Unit or the WMON PC software can be used to configure and monitor the SMARTSTEP drive.

Convenient

SMARTSTEP is designed for quick and easy installation. Control cables directly connect drives and controllers to eliminate installation errors, and are available for all Omron motion control PLC modules. Motors are connected using a single cable for both power and feedback.



Meets International Standards

SMARTSTEP conforms to CE, UL, cUL and other standards for use in machines that can be installed anywhere in the world.

SMARTSTEP Offers Quick Changes in Positioning Parameters to Shorten Setup Time Between Different Applications

Precision Roll Cutting Using X-Y Table

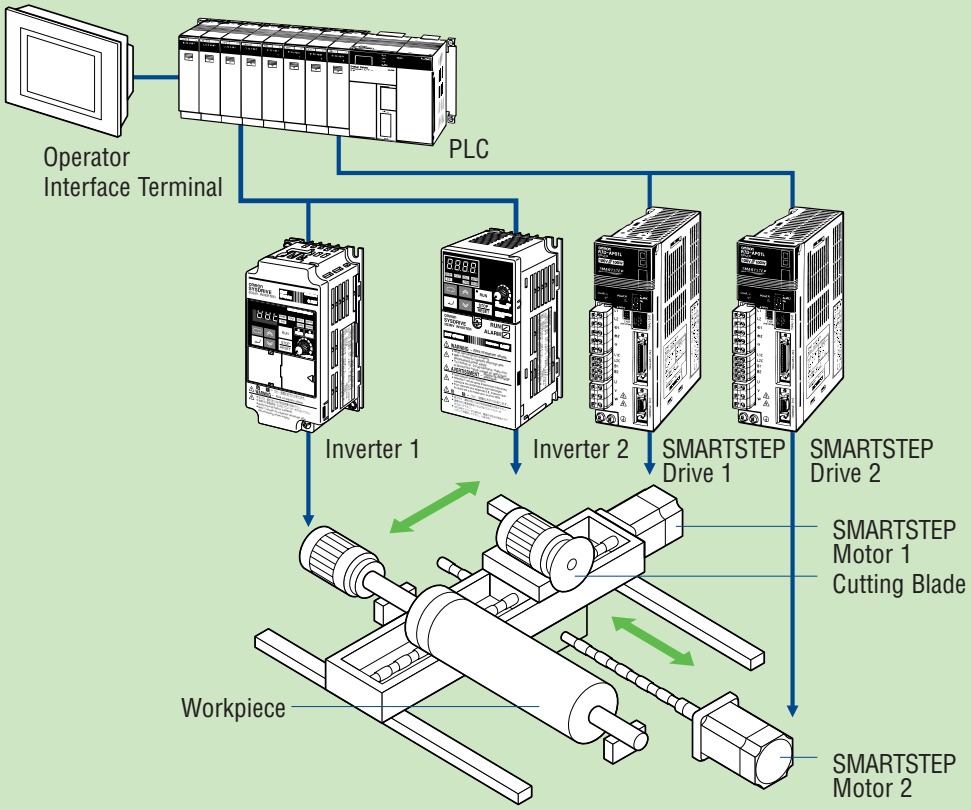
System Overview

Inverters control the work piece width, cutting blade rotational speed and general-purpose motor speed, with settings input from an operator interface terminal. The settings are processed by the PLC then relayed to the inverters controlling the motors. SMARTSTEP servo drives control the X-Y positioning of the cutter relative to the work piece.

Advantages

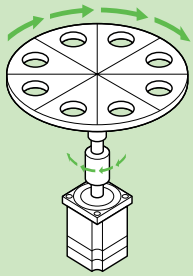
Using a servo system ensures high-precision positioning and provides consistency among products.

By combining the operator interface terminal with a servo system, change over time from one product type to another is dramatically reduced.



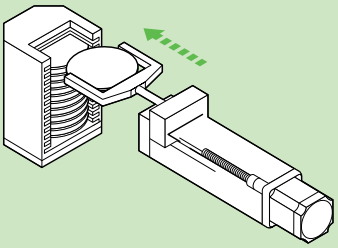
Indexing

High-precision positioning



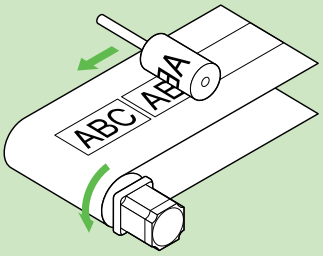
Wafer Handling

Smooth insertion and removal



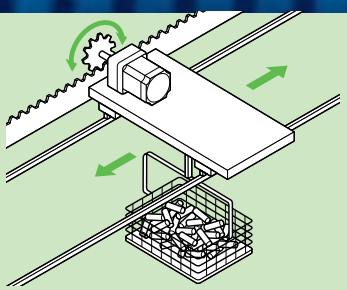
Printing

Stable feed with minimal speed fluctuation



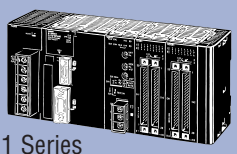
Conveying

Items can be transferred quickly and accurately over long distances

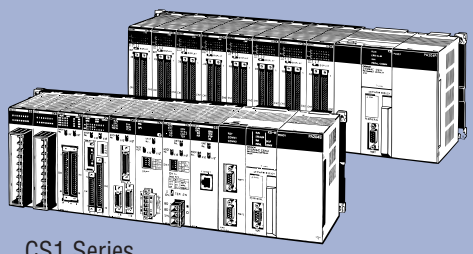


Configure Your System from Omron's Broad Line of Motion and Control System Products and Accessories

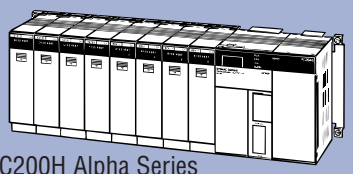
Controllers



CJ1 Series

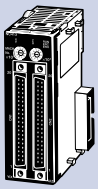


CS1 Series

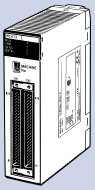


C200H Alpha Series

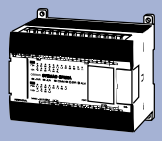
Position Control (NC) Modules



CJ1W-NC113/213/413
CJ1W-NC133/233/433

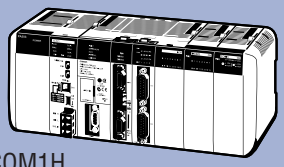


CS1W-NC113/213/413
CS1W-NC133/233/433
C200HW-NC113/213/413



CPM2A
with built-in pulse output
(transistor output models only)

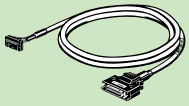
CPM2C
with built-in pulse output
(transistor output models only)



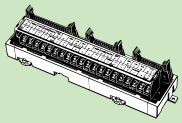
CQM1H
CPU with pulse I/O inner board

Pulse Train Command

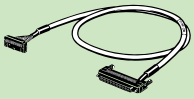
Servo Drive Cable
XW2Z-□□□J-B5



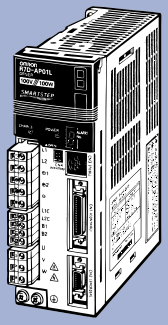
Servo Terminal Block
XW2B-□□J6-□B



Position Control Cable
XW2Z-□□□J-A□



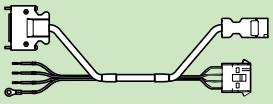
SMARTSTEP Drives



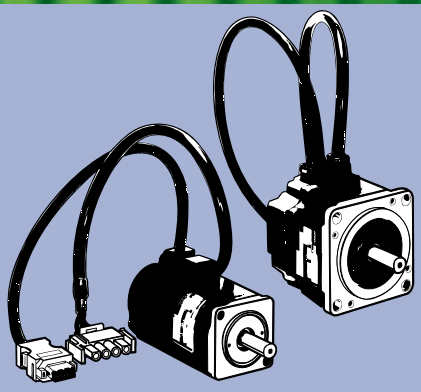
Single Phase: 100/115 VAC
Single Phase: 200/230 VAC
Three Phase: 200/230 VAC (750 W only)

Motor Power Feedback Signal

Motor Cables
R7A-CEA□□□S (without brake)
R7A-CEA□□□B (with brake)

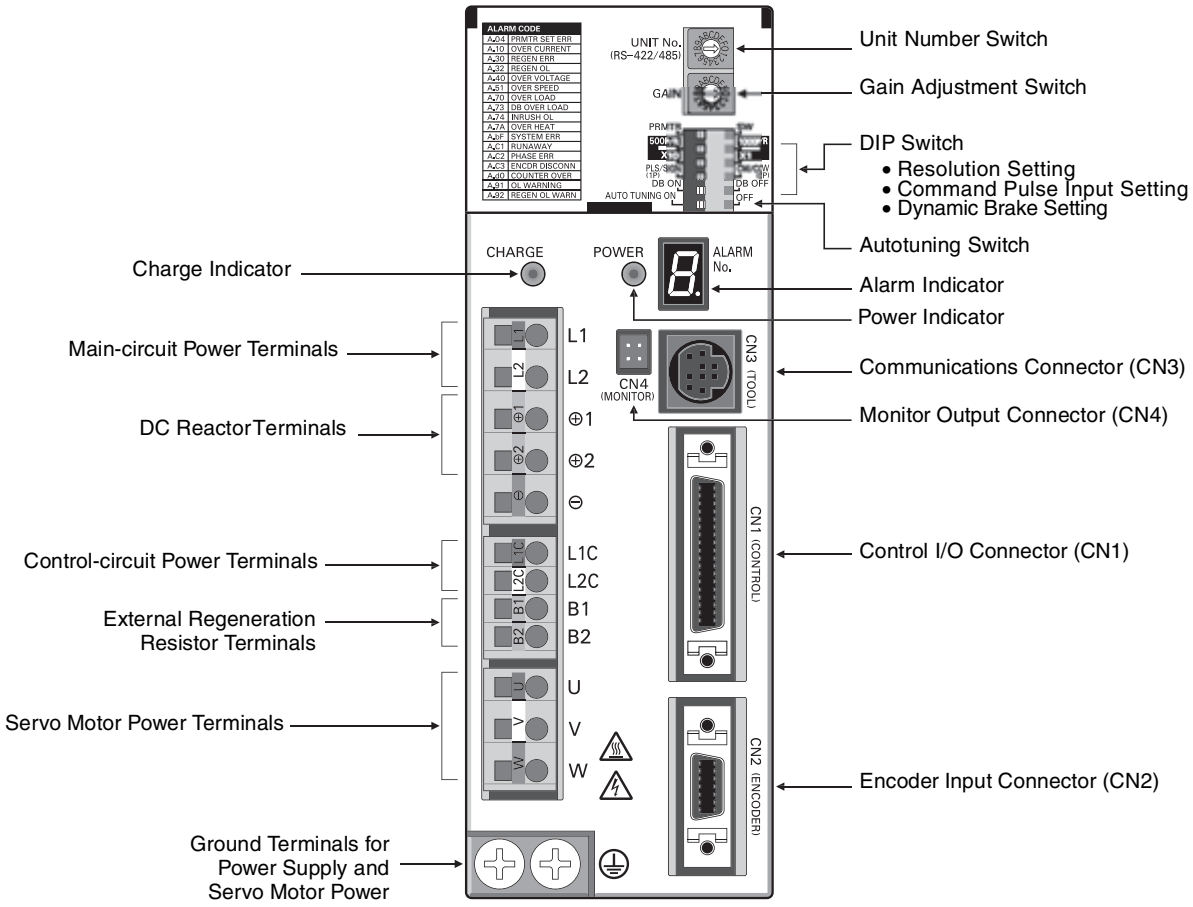


SMARTSTEP Motors



Cylinder style and flat motor styles

■ Components

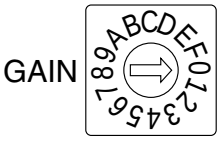


■ Switch Operations

Gain Adjustment Switch Adjusts the Response of the Servo Motor

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

When this switch is set to 1 through F, the Unit will operate according to the setting on the gain adjustment rotary switch.

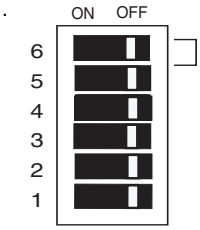


To reduce (slow down) the Servo Motor's response, set the gain adjustment rotary switch to a low value. To increase (speed up) the Servo Motor's response, set this switch to a high value.

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

Enable Switch/Parameter Settings

Switch 6 selects whether the Servo Drive is to be operated according to the DIP switch settings or according to the parameter settings.



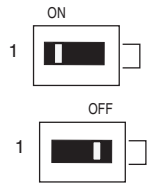
Default setting

Switch 6	Function
OFF	Enables the DIP switch function settings. (enables switches 1 to 5)
ON	Enables the parameter settings.

Note When set to the default setting, all switches are OFF.

Online Autotuning Setting

The Autotuning Switch selects whether the gain will be adjusted automatically during operation.

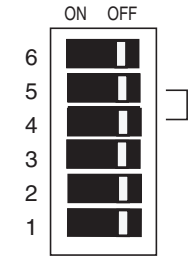


Turn ON Switch 1 to perform online autotuning.

After completing online autotuning, the tuning results are stored in the inertia ratio parameter (Pn103), and the Servo Drive runs.

Resolution Setting

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

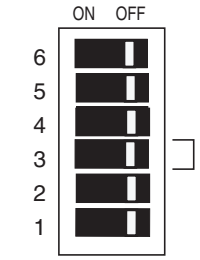


Default setting

Switches		Resolution
5	4	
OFF	OFF	1,000 pulses/revolution (0.36°/step)
OFF	ON	10,000 pulses/revolution (0.036°/step)
ON	OFF	500 pulses/revolution (0.72°/step)
ON	ON	5,000 pulses/revolution (0.072°/step)

Command Pulse Input Setting

Switch 3 selects the command pulse mode. Select: forward pulse/reverse pulse: positive logic, or feed pulses/direction signal: positive logic



Default setting

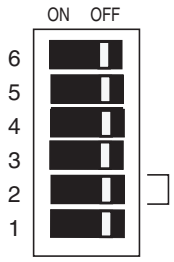
Switch 3	Command Pulse Mode
OFF	Forward pulse/Reverse pulse: positive logic
ON	Feed pulses/Direction signal: positive logic

Note Set according to the pulse output form of the Position Controller.

Dynamic Brake Setting

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

Note However, when the main-circuit power supply or control-circuit power supply is turned OFF, dynamic braking will operate, regardless of the setting.



Default setting

Switch 2	Dynamic Brake Mode
OFF	Dynamic brake disabled.
ON	Dynamic brake enabled.

■ Alarm Table

Display	ALM output	Error detection function
A.04*	OFF	Parameter setting error
A.10*	OFF	Overcurrent
A.30	OFF	Regeneration error
A.32	OFF	Regeneration overload
A.40	OFF	Overvoltage/Undervoltage
A.51	OFF	Overspeed
A.70	OFF	Overload
A.73	OFF	Dynamic brake overload
A.74	OFF	Inrush resistance overload
A.7A	OFF	Overheat
A.bF*	OFF	System error
A.C1	OFF	Runaway detected
A.C2*	OFF	Phase not detected
A.C3*	OFF	Encoder disconnect detected
A.d0	OFF	Deviation counter overflow
CPF00	---	Parameter Unit transmission error 1
CPF01	---	Parameter Unit transmission error 2
A.91	---	Overload warning
A.92	---	Regeneration overload warning

Note The * denotes the errors that are not cleared by resetting the alarm. The power must be cycled OFF and then turned ON again to clear the alarm.

■ General Specifications

Item	Description
Ambient operating temperature	0°C to 55°C (32°F to 131°F)
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	–20 to 85°C (-4°F to 185°F)
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1-mm double amplitude or acceleration of 4.9 m/s^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)

■ Performance Specifications

100 VAC Input Type

Item	100 VAC				
	30 W	50 W	100 W	200 W	400 W
	R7D-APA3L	R7D-APA5L	R7D-AP01L	R7D-AP02L	R7D-AP04L
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□ AP10030□	A20030□ AP20030□	A40030□ AP40030□

200 VAC Input Type

Item	200 VAC					
	30 W	50 W	100 W	200 W	400 W	750 W
	R7D-APA3H	R7D-APA5H	R7D-AP01H	R7D-AP02H	R7D-AP04H	R7D-AP08H
Continuous output current (rms)	0.42	0.6	0.89	2.0	2.6	4.4
Momentary maximum output current (rms)	1.3	1.9	2.8	6.0	8.0	13.9
Control power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz					
Main-circuit power supply	Single-phase 200/230 VAC (170 to 253 V) 50/60 Hz (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)
Compatible motor voltage	200 V					
Compatible motor capacity	30 W	50 W	100 W	200 W	400 W	750 W
Command pulse response	250 kHz					
Applicable Servo Motor (R7M-)	A03030□	A05030□	A10030□ AP10030□	A20030□ AP20030□	A40030□ AP40030□	A75030□ AP75030□

■ I/O Specifications

Terminal Specifications

Symbol	Name	Function	
L1 and L2 or L1, L2, and L3	Main-circuit Power Supply Terminals	These are the input terminals for the main-circuit power supply.	
⊕1	DC Reactor Terminals	Normally short-circuit between +1 and +2. If harmonic control measures are required, connect a DC Reactor between +1 and +2.	
⊕2			
⊖	Main-circuit DC Output	Do not connect anything to this terminal.	
L1C	Control Circuit Power Supply Terminals	These are the input terminals for the control power supply.	
L2C			
B1 and B2 or B1, B2, and B3	External Regeneration Resistance Terminals	Connect an External Regeneration Resistor to these terminals if the regenerative capacity of the internal capacitor is exceeded. (An External Regeneration Resistor cannot be connected to the 30 to 200-W models.)	
U	Servo Motor Terminals	Red	These are the terminals for outputs to the Servo Motor.
V		White	
W		Blue	
⏚	Frame ground	This is the ground terminal.	

Control I/O (CN1) Specifications

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

Compatible Connectors

Receptacle at Servo Drive: 10236-52A2JL (Sumitomo 3M) or equivalent
Cable solder plug: 10136-3000VE (Sumitomo 3M)
Cable case: 10336-52A0-008 (Sumitomo 3M)

Encoder Connector (CN2) Specifications

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

Compatible Connectors

Receptacle at Servo Drive: 10214-52AJL (Sumitomo 3M) or equivalent
Cable plug: 10114-3000VE (Sumitomo 3M)
Cable case: 10314-52A0-008 (Sumitomo 3M)

Communications Connector (CN3) Specifications

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

Compatible Connectors

Receptacle at Servo Drive: HR12-10R-8 SDL (Hirose Electric)
Cable connector: HR212-10P-8P (Hirose Electric)

Monitor Output (CN4) Specifications

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

Compatible Connectors

Receptacle at Servo Drive: DF11-4DP-2DSA (01) (Hirose Electric)
Cable socket: DF11-4DS-2C (Hirose Electric)
Cable case: DF11-2428SCF (Hirose Electric)

■ General Specifications

Item	Specification
Ambient operating temperature	0°C to 40°C (32°F to 104°F)
Ambient operating humidity	20% to 80% (with no condensation)
Ambient storage temperature	–20 to 60°C (-4°F to 140°F)
Ambient storage humidity	20% to 80% (with no condensation)
Storage/operating atmosphere	No corrosive gases
Vibration resistance	10 to 2,500 Hz in X, Y, and Z directions with 0.2-mm double amplitude or acceleration of 24.5 m/s^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 VAC for 1 min at 50/60 Hz
Run position	Any direction
Insulation grade	Type B
Structure	Totally-enclosed self-cooling
Protective structure	IP55 for both the cylindrical and flat servo motors
Vibration grade	V-15
Mounting method	Flange-mounting
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

■ Performance Specifications

Flat Servo Motors

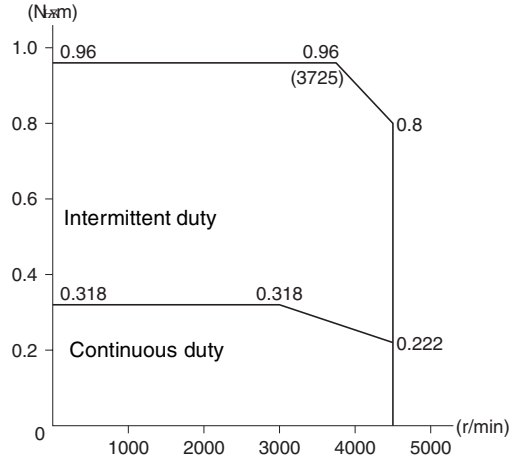
Item		R7M-AP10030	R7M-AP20030	R7M-AP40030	R7M-AP75030
Rated output		100 W	200 W	400 W	750 W
Rated torque [N·m (oz·in)]		0.318 (45.0)	0.637 (90.2)	1.27 (180)	2.39 (339)
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min
Momentary maximum rotation speed		4,500 r/min	4,500 r/min	4,500 r/min	4,500 r/min
Momentary maximum torque [N·m (oz·in)]		0.96 (135)	1.91 (271)	3.82 (541)	7.1 (1014)
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 5.75 x 10^{-5} lb·in·s^2	2.09×10^{-5} kg·m^2 1.85 x 10^{-4} lb·in·s^2	3.47×10^{-5} kg·m^2 3.07 x 10^{-4} lb·in·s^2	2.11×10^{-4} kg·m 1.87 x 10^{-3} lb·in·s^2
Power rate		15.7 kW/s	19.4 kW/s	46.8 kW/s	26.9 kW/s
Allowable radial load [N (lb)]		78 (17)	245 (55)	245 (55)	392 (88)
Allowable thrust load [N (lb)]		49 (11)	68 (15)	68 (15)	147 (33)
Weight	Without brake [kg (lb)]	0.7 (1.54)	1.4 (3.09)	2.1 (4.63)	4.2 (9.26)
	With brake [kg (lb)]	0.9 (1.98)	1.9 (4.2)	2.6 (5.7)	5.7 (12.6)
Encoder resolution		2,000 pulses/revolution for phase-A and phase-B, 1 pulse/revolution for phase-Z			
Radiation shield dimensions		t6 × 250 mm square			t12 × 300 mm square
Brake specifications	Brake inertia	3.1×10^{-6} kg·m^2 2.74 x 10^{-5} lb·in·s^2	1.52×10^{-5} kg·m^2 1.35 x 10^{-4} lb·in·s^2	1.52×10^{-5} kg·m^2 1.35 x 10^{-4} lb·in·s^2	8.75×10^{-5} kg·m^2 7.74 x 10^{-4} lb·in·s^2
	Excitation voltage	24 VDC ±10%			
	Power consumption at 20°C (68°F)	7.5 W	7.6 W	8.2 W	7.5 W
	Current consumption at 20°C (68°F)	0.31 A	0.32 A	0.34 A	0.31 A
	Static friction torque [N·m (oz·in]	0.4 (56.6) min.	0.9 (127.5) min.	1.9 (269.1) min.	3.5 (495.6) min.
	Attraction time	60 ms max.	40 ms max.	60 ms max.	20 ms max.
	Release time	20 ms max.	20 ms max.	20 ms max.	40 ms max.
	Backlash	1°	1°	1°	1°
	Rating	Continuous	Continuous	Continuous	Continuous
	Insulation grade	Type F	Type F	Type F	Type F
Applicable Servo Drive (R7D-)		AP01H AP01L	AP02H AP02L	AP04H AP04L	AP08H

■ Torque and Rotation Speed Characteristics

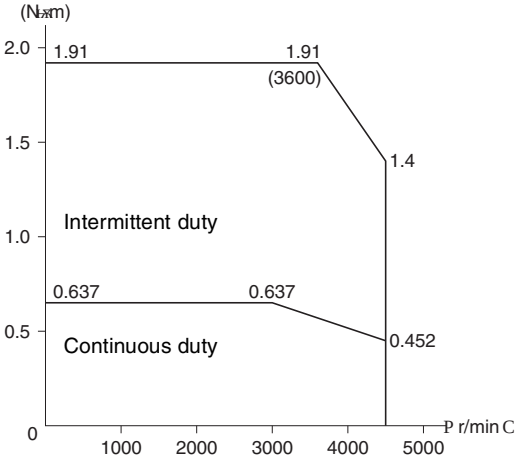
Flat Servo Motors

The following graphs show the characteristics with a 3-m standard cable and an R7D-AP-□L Servo Drive (100 VAC input) or with an R7D-AP-□H Servo Drive (200 VAC input).

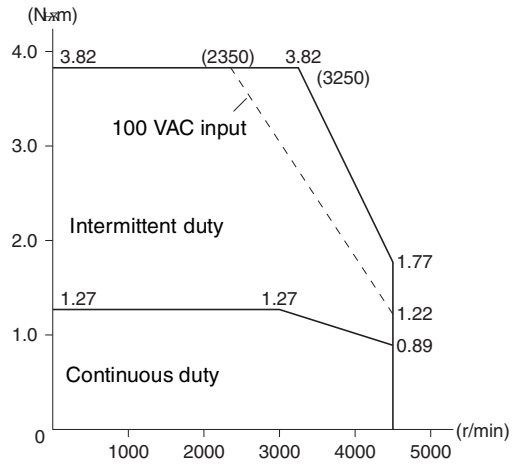
R7M-AP10030 (100 W)



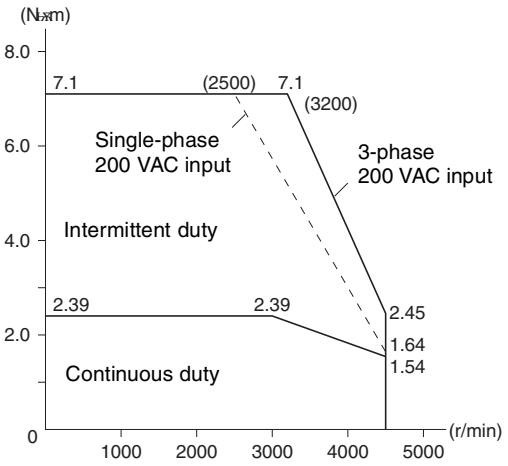
R7M-AP20030 (200 W)



R7M-AP40030 (400 W)



R7M-AP75030 (750 W)



■ Performance Specifications

Cylindrical Servo Motors

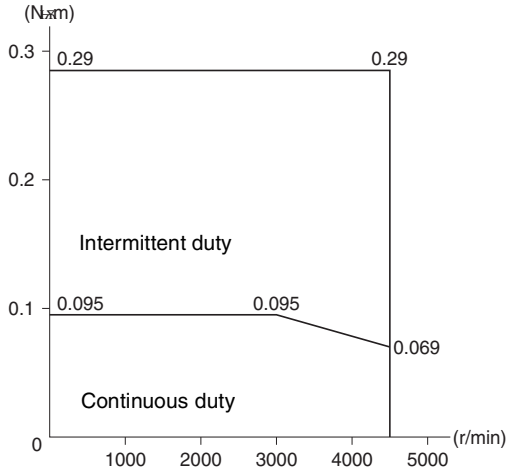
Item		R7M-A03030	R7M-A05030	R7M-A10030	R7M-A20030	R7M-A40030	R7M-A75030
Rated output		30 W	50 W	100 W	200 W	400 W	750 W
Rated torque [N·m (oz·in)]		0.095 (13.5)	0.159 (22.5)	0.318 (45.1)	0.637 (90.2)	1.27 (179.9)	2.39 (338.5)
Rated rotation speed		3,000 r/min	3,000 r/min	3,000 r/min	3,000 r/min	3,000 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 [N·m (oz·in]		0.29 (40.5)	0.48 (67.6)	0.96 (135)	1.91 (271)	3.82 (541)	7.1 (1014)
Rated current		0.42 A (rms)	0.6 A (rms)	0.87 A (rms)	2.0 A (rms)	2.6 A (rms)	4.4 A (rms)
Momentary maximum current		1.3 A (rms)	1.9 A (rms)	2.8 A (rms)	6.0 A (rms)	8.0 A (rms)	13.9 A (rms)
Rotor inertia		1.7×10^{-6} kg·m^2 1.5 x 10^{-5} lb·in·s^2	2.2×10^{-6} kg·m^2 1.9 x 10^{-5} lb·in·s^2	3.6×10^{-6} kg·m^2 3.2 x 10^{-5} lb·in·s^2	1.19×10^{-5} kg·m^2 1.05 x 10^{-4} lb·in·s^2	1.87×10^{-5} kg·m^2 1.65 x 10^{-4} lb·in·s^2	6.67×10^{-5} kg·m^2 5.90 x 10^{-4} lb·in·s^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 [N (lb)]		68 (15)	68 (15)	78 (17)	245 (55)	245 (55)	392 (88)
Allowable thrust load [N (lb)]		54 (12)	54 (12)	54 (12)	74 (16)	74 (16)	147 (33)
Weight	Without brake [kg (lb)]	0.3 (0.66)	0.4 (0.88)	0.5 (1.10)	1.1 (2.43)	1.7 (3.75)	3.4 (7.5)
	With brake [kg (lb)]	0.6 (1.32)	0.7 (1.54)	0.8 (1.76)	1.6 (3.53)	2.2 (4.85)	4.3 (9.48)
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	0.85×10^{-6} kg·m^2 7.52 x 10^{-6} lb·in·s^2	0.85×10^{-6} kg·m^2 7.52 x 10^{-6} lb·in·s^2	0.85×10^{-6} kg·m^2 7.52 x 10^{-6} lb·in·s^2	6.4×10^{-6} kg·m^2 5.66 x 10^{-5} lb·in·s^2	6.4×10^{-6} kg·m^2 5.66 x 10^{-5} lb·in·s^2	1.7×10^{-5} kg·m^2 1.50 x 10^{-4} lb·in·s^2
	Excitation voltage	24 VDC ±10% V					
	Power consumption at 20°C (68°F)	6 W	6 W	6 W	7 W	7 W	7.7 W
	Current consumption at 20°C (68°F)	0.25 A	0.25 A	0.25 A	0.29 A	0.29 A	0.32 A
	Static friction torque [N·m (oz·in)	0.2 (28.3) min.	0.2 (28.3) min.	0.3 (48.2) min.	1.47 (212.4) min.	1.47 (212.4) min.	2.45 (354.0) 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
Applicable servo drive (R7D-)		APA3H APA3L	APA5H APA5L	AP01H AP01L	AP02H AP02L	AP04H AP04L	AP08H

■ Torque and Rotation Speed Characteristics

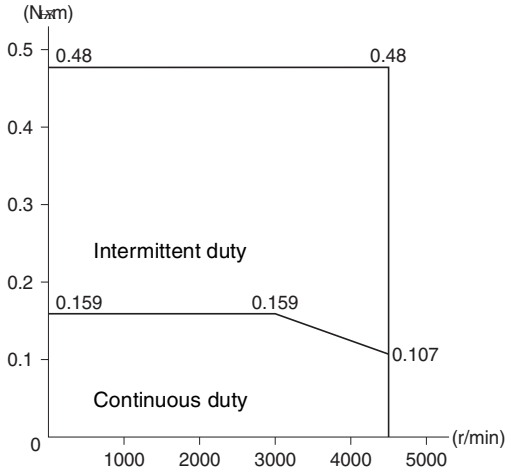
Cylindrical Servo Motors

The following graphs show the characteristics with a 3-m standard cable and an R7D-AP-☐L Servo Drive (100 VAC input) or with an R7D-AP-☐H Servo Drive (200 VAC input).

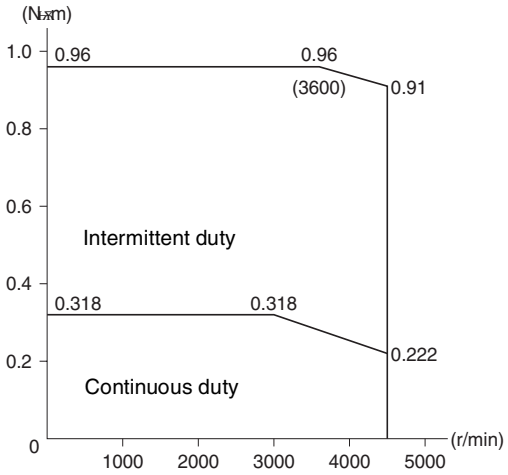
R7M-A03030 (30 W)



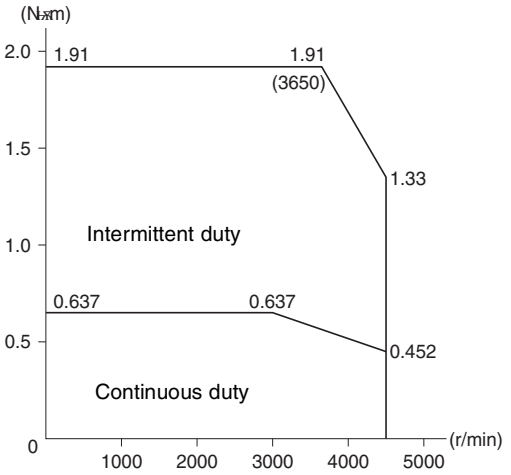
R7M-A05030 (50 W)



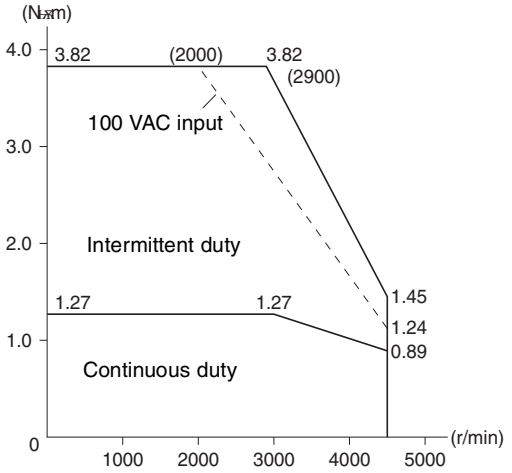
R7M-A10030 (100 W)



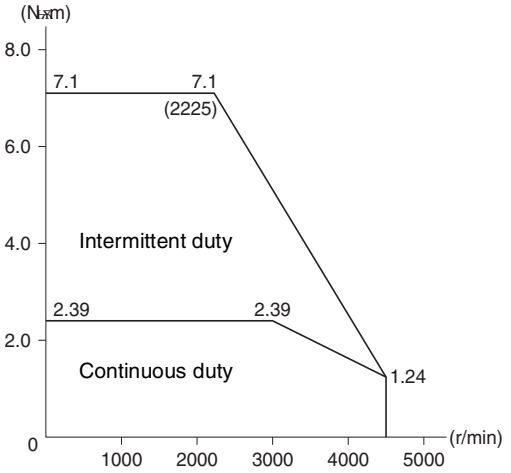
R7M-A20030 (200 W)



R7M-A40030 (400 W)



R7M-A75030 (750 W)

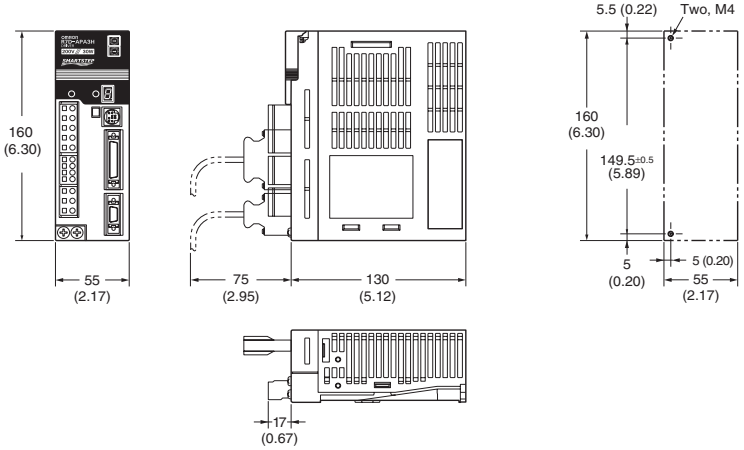


Unit: mm (inch)

■ Servo Drives

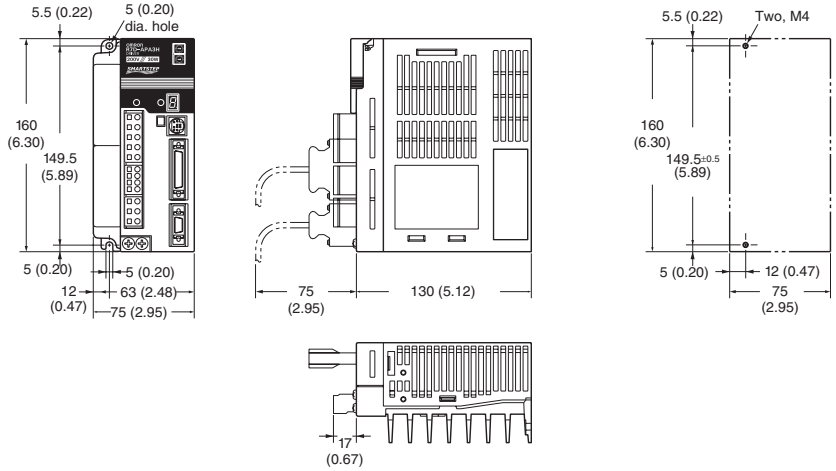
200 VAC: 30 W/50 W/100 W/200 W (R7D-APA3H/APA5H/AP01H/AP02H)
100 VAC: 30 W/50 W/100 W/200 W (R7D-APA3L/APA5L/AP01L/AP02L)

Mounting Dimensions



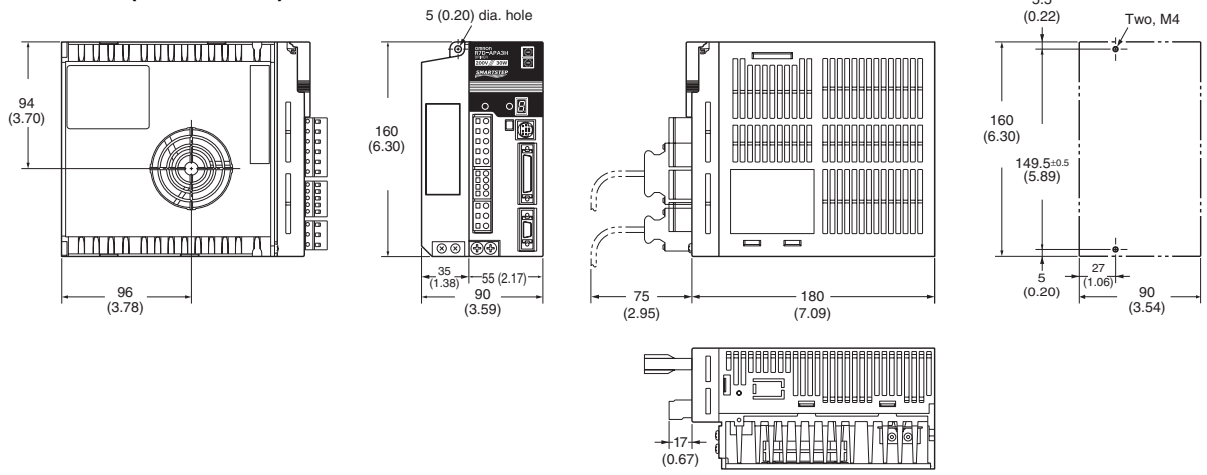
200 VAC: 400 W (R7D-AP04H)
100 VAC: 400 W (R7D-AP04L)

Mounting Dimensions



Unit: mm (inch)

200 VAC: 750 W (R7D-AP08H)



■ Servo Motors

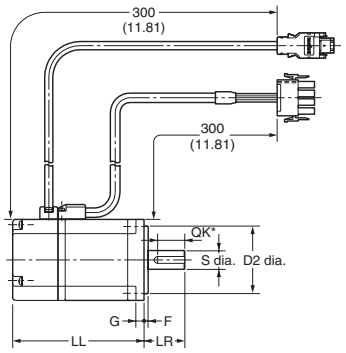
Cylindrical Servo Motors (3,000 RPM) 200 VAC: 30 W/50 W/100 W/200 W/400 W/750 W

Without Brake: R7M-A03030(-S1)/A05030(-S1)/A10030(-S1)/A20030(-S1)/A40030(-S1)/A75030(-S1)
With Brake: R7M-A03030-B(S1)/A05030-B(S1)/A10030-B(S1)/A20030-B(S1)/A40030-B(S1)/A75030-B(S1)

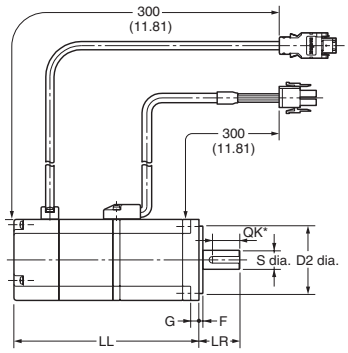
Model	Dimensions [mm (in)]													
	LL		LR	Flange surface						Axis end				
	Without Brake	With Brake		C	D1	D2	F	G	Z	S	QK*	b*	h*	t1*
R7M-A03030□	69.5 (2.74)	101 (3.98)	25 (0.98)	40 (1.57)	46 (1.81)	30h7 (1.18)	2.5 (0.10)	5 (0.20)	Two, 4.3 (0.17) dia.	6h6 (0.24)	14 (0.55)	2 (0.08)	2 (0.08)	1.2 (0.05)
R7M-A05030□	77 (3.03)	108.5 (4.27)												
R7M-A10030□	94.5 (3.72)	135 (5.31)								8h6 (0.31)		3 (0.12)	3 (0.12)	1.8 (0.07)
R7M-A20030□	96.5 (3.80)	136 (5.35)	30 (1.18)	60 (2.36)	70 (2.76)	50h7 (1.97)	3 (0.12)	6 (0.24)	Four, 5.5 (0.22) dia.	14h6 (0.55)	20 (0.79)	5 (0.20)	5 (0.20)	3 (0.12)
R7M-A40030□	124.5 (4.90)	164 (6.46)												
R7M-A75030□	145 (5.71)	189.5 (7.46)	40 (1.57)	80 (3.15)	90 (3.54)	70h7 (2.76)	3 (0.12)	8 (0.31)	Four, 7 dia. (0.28)	16h6 (0.63)	30 (1.18)			

* Dimensions of R7M-A□-□S1 (with key)

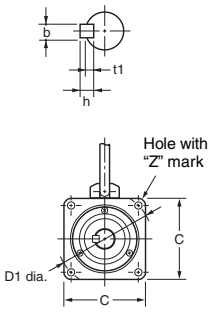
R7M-A□□□30(-S1) (Without Brake)



R7M-A□□□30-B(-S1) (With Brake)



***Axis End Dimensions**



Unit: mm (inch)

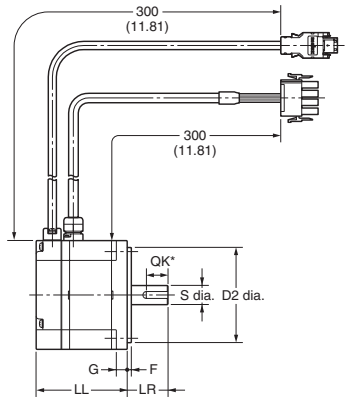
Flat Servo Motors (3,000 RPM) 200 VAC: 100 W/200 W/400 W/750 W

Without Brake: R7M-AP10030(-S1)/AP20030(-S1)/AP40030(-S1)/AP75030(-S1)
With Brake: R7M-AP10030-B(S1)/AP20030-B(S1)/AP40030-B(S1)/AP75030-B(S1)

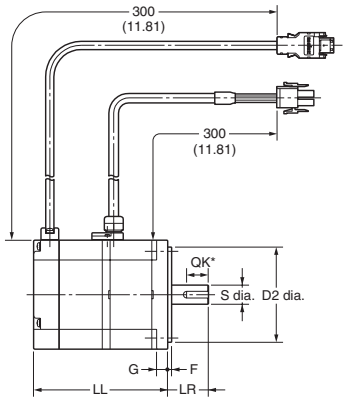
Model	Dimensions [mm (in)]													
	LL		LR	Flange surface						Axis end				
	Without Brake	With Brake		C	D1	D2	F	G	Z	S	QK*	b*	h*	t1*
R7M-AP10030□	62 (2.44)	91 (3.58)	25 (0.98)	60 (2.36)	70 (2.76)	50h7 (1.97)	3 (0.12)	6 (0.24)	5.5 (0.22)	8h6 (0.31)	14 (0.55)	3 (0.12)	3 (0.12)	1.8 (0.07)
R7M-AP20030□	67 (2.64)	98.5 (3.88)	30 (1.18)	80 (3.15)	90 (3.54)	70h7 (2.76)	3 (0.12)	8 (0.31)	7 (0.28)	14h6 (0.55)	16 (0.63)	5 (0.20)	5 (0.20)	3 (0.12)
R7M-AP40030□	87 (3.43)	118.5 (4.67)												
R7M-AP75030□	86.5 (3.41)	120 (4.72)	40 (1.57)	120 (4.72)	145 (5.71)	110h7 (4.33)	3.5 (0.14)	10 (0.39)	10 (0.39)	16h6 (0.63)	22 (0.87)			

* Dimensions of R7M-A□-□S1 (with key)

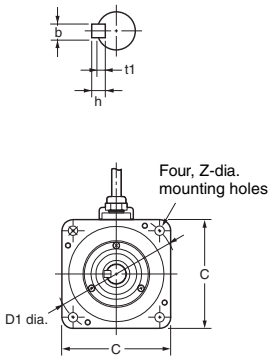
R7M-AP□□□30(-S1) (Without Brake)



R7M-AP□□□30-B(-S1) (With Brake)



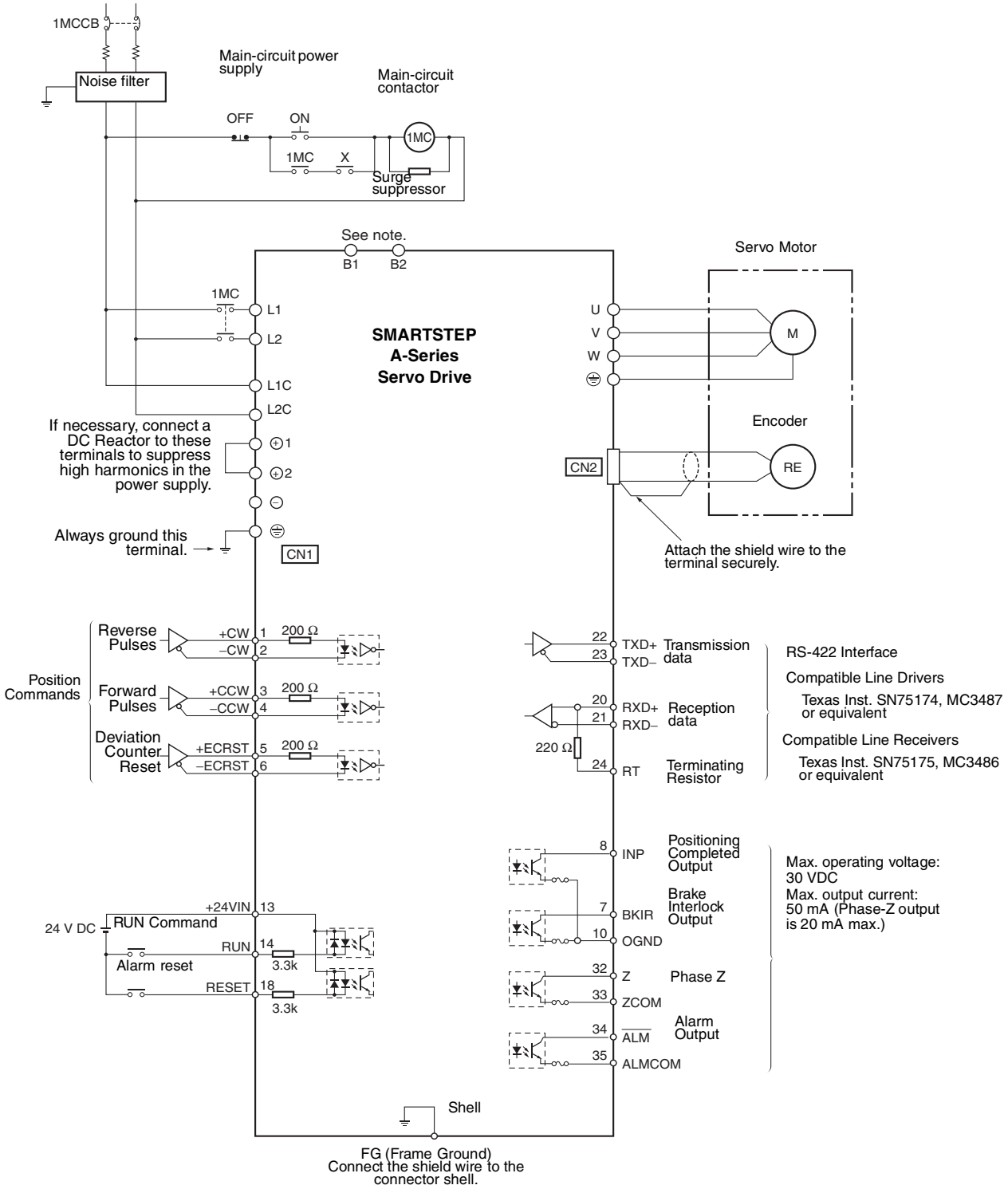
***Axis End Dimensions**



■ Single-Phase Servo Motors

Single-Phase 200 to 230 VAC +10%/–15% (50/60 Hz) or
Single-Phase 100 to 115 VAC +10%/–15% (50/60 Hz)

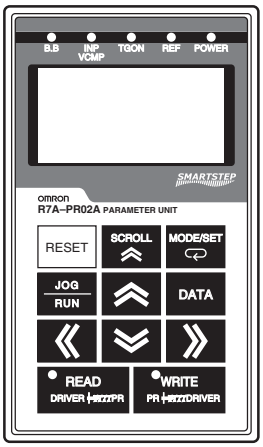
Note The 750-W Servo Drives can input three-phase 200 to 230 VAC.



Note: A Regeneration Resistor can be connected with 400-W and 750-W Servo Drives. When using an external Regeneration Resistor with a 400-W Servo Drive, just connect it across the B1 and B2 terminals (not shown). When using an external Regeneration Resistor with a 750-W Servo Drive, remove the jumper bar from the B2 and B3 terminals (not shown) and then connect the Regeneration Resistor across the B1 and B2 terminals (not shown).

■ General Specifications

Item	Specification
Ambient operating temperature	0°C to 55°C (32°F to 131°F)
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	–20°C to 85°C (–4 to 185°F)
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases
Vibration resistance	10 to 55 Hz in X, Y, and Z directions with 0.1-mm double amplitude or acceleration of 9.8 m/s^2 max., whichever is smaller
Impact resistance	Acceleration 19.6 m/s^2 max., in X, Y, and Z directions, three times



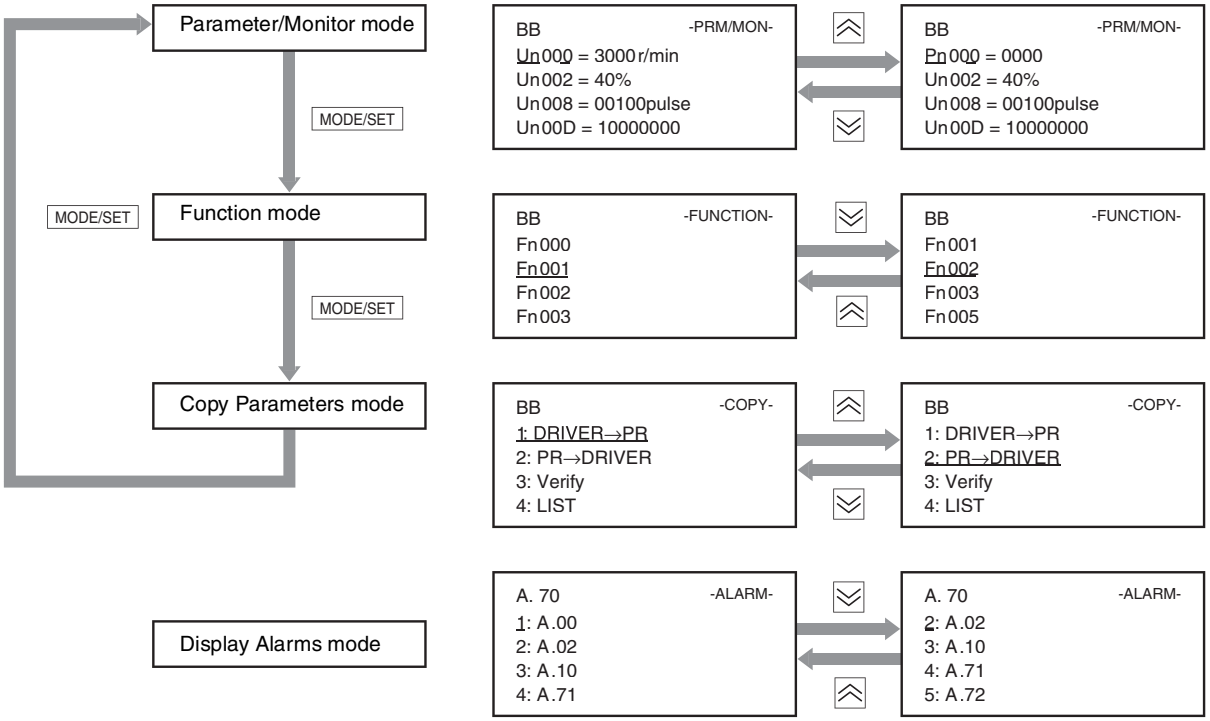
R7A-PR02A

■ Function Specifications

Item	Function
Setting mode	Display or change parameter settings.
Monitor mode	Display monitor values
Execute function mode	Execute each function mode
Display alarms	Display alarms that have occurred
Copy parameters	Read or save parameters from the Servo Drive Write parameters to the Servo Drive Compare parameters in the Servo Drive with parameters in the Parameter Unit

■ Mode Change Specifications

Power ON



■ Parameter Details

Parameter number	Parameter name	Digit	Name	Setting	Explanation	Default setting	Unit	Setting range
Pn000	Function selection basic switch 1 (See note 1.)	0	Reverse rotation	0	CCW direction is taken for positive command	0010	---	---
				1	CW direction is taken for positive command			
		1	Control mode	1	Position control by pulse train command			
		2 to 3	Not used.	---	---			
Pn001	Function selection basic switch 2 (See note 1.)	0	Select stop method if an alarm occurs when servo motor is OFF	0	Servo motor stopped by dynamic brake	1002	---	---
				1	Stop by dynamic brake and release brake after servo motor stops			
				2	Servo motor stopped with free run			
		1 to 3	Not used.	---	---			
Pn100	Speed loop gain	Adjusts speed loop's responsiveness				80	Hz	1 to 2,000
Pn101	Speed loop integral constant	Speed loop integral time constant				2,000	0.01 ms	15 to 51,200
Pn102	Position loop gain	Adjusts position loop's responsiveness				40	1/s	1 to 2,000
Pn103	Inertia ratio	Set using the ratio between the machine system inertia and the servo motor rotor inertia.				300	%	0 to 10,000
Pn109	Feed-forward amount	Position control feed-forward compensation value				0	%	0 to 100
Pn10A	Feed-forward command filter	Sets position control feed-forward command filter				0	0.01 ms	0 to 6,400
Pn110	Online auto-tuning setting (See note 1.)	0	Selects online auto-tuning	0	Auto-tunes initial operations only after power is turned ON	0012	---	---
				1	Always auto-tunes			
				2	No auto-tuning			
		1	Not used.	---	---			
		2	Selects adhesive friction compensation function	0	Friction compensation: OFF			
				1	Friction compensation: rated torque ratio small			
				2	Friction compensation: rated torque ratio large			
		3	Not used.	---	---			

Note: **1.** These parameters are read when the power is turned ON. Parameter Pn110.2 is valid when online.
2. When using a Regeneration Resistor, set the resistor's capacity when the temperature has risen to 120 °C. Set this parameter to 0 if a Regeneration Resistor is not being used.

(This table continues on the following page.)

Parameter Details - Continued from the Previous Page

Parameter number	Parameter name	Digit	Name	Setting	Explanation	Default setting	Unit	Setting range
Pn200	Position control setting 1 (See note 1.)	0	Command pulse mode	0	Feed pulses/Direction signal: Positive logic	1011	---	---
				1	Forward pulse/Reverse pulse: Positive logic			
				2	90° phase difference (A/B phase) signal (x1): Positive logic			
				3	90° phase difference (A/B phase) signal (x2): Positive logic			
				4	90° phase difference (A/B phase) signal (x4): Positive logic			
				5	Feed pulses/Direction signal: Negative logic			
				6	Forward pulse/Reverse pulse: Negative logic			
				7	90° phase difference (A/B phase) signal (x1): Negative logic			
				8	90° phase difference (A/B phase) signal (x2): Negative logic			
				9	90° phase difference (A/B phase) signal (x4): Negative logic			
		1	Deviation counter reset	0	High level signal			
				1	Rising signal (low to high)			
				2	Low level signal			
				3	Falling signal (high to low)			
		2	Deviation counter reset if an alarm occurs when the Servo-motor is OFF	0	Deviation counter reset if an alarm occurs when Servo Motor is OFF			
				1	Deviation counter not reset if an alarm occurs when Servo Motor is OFF			
				2	Deviation counter reset only if alarm occurs			
		3	Not used.	---	---			
Pn202	Electronic gear ratio G1 (numerator) (See note 1.)	Sets the pulse rate for the command pulses and Servo Motor travel distance Setting range: 0.01 ≤ G1/G2 ≤ 100				4	---	1 to 65,535
Pn203	Electronic gear ratio G2 (denominator) (See note 1.)					1	---	1 to 65,535
Pn204	Position command filter time constant 1 (primary filter)	Sets soft start for command pulse (Soft start characteristics are for the primary filter.)				0	0.01 ms	0 to 6,400
Pn207	Position control setting 2 (See note 1.)	0	Selects position command filter.	0	Primary filter (Pn204)	0000	---	---
				1	Linear acceleration and deceleration (Pn208)			
		1 to 3	Not used.	---	---			
Pn208	Position command filter time constant 2 (linear acceleration and deceleration) (See note 1.)	Sets soft start for command pulse (Soft start characteristics are for the linear acceleration and deceleration.)				0	0.01 ms	0 to 6,400
Pn304	Jog speed	Sets rotation speed during jog operation				500	r/min	0 to 10,000
Pn401	Torque command filter time constant	Sets the constant when filtering the internal torque command				40	0.01 ms	0 to 65,535
Pn402	Forward torque limit	Forward rotation output torque limit (percentage of rated torque ratio)				350	%	0 to 800

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

2. When using a Regeneration Resistor, set the resistor's capacity when the temperature has risen to 120°C. Set this parameter to 0 if a Regeneration Resistor is not being used.

(This table continues on the following page.)

Parameter Details - Continued from the Previous Page

Parameter number	Parameter name	Digit	Name	Setting	Explanation	Default setting	Unit	Setting range
Pn403	Reverse torque limit	Reverse rotation output torque limit (percentage of rated torque ratio).				350	%	0 to 800
Pn500	Positioning completion range	Sets the range of positioning completed output signal				3	Command units	0 to 250
Pn505	Deviation counter overflow level	Sets the detection level for the deviation counter over alarm.				1,024	×256 command units	1 to 32767
Pn600	Regeneration resistor capacity (See note 2).	Setting for regeneration resistance load ratio monitoring calculations.				0	10 W	See model specs.

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

2. When using a Regeneration Resistor, set the resistor's capacity when the temperature has risen to 120° C. Set this parameter to 0 if a Regeneration Resistor is not being used.

■ Function Mode Details

Number	Function mode	Explanation
Fn000	Alarm history display	Displays up to 10 alarm entries.
Fn001	Rigidity setting during online auto-tuning	Sets the control target during online auto-tuning.
Fn002	Jog operation	Makes the Servo Motor rotate using key operations from the Parameter Unit.
Fn003	Servo Motor origin search	Makes the Servo Motor rotate using key operations from the Parameter Unit and fixes the position of phase Z after phase Z is detected.
Fn005	User parameter initialization	Restores user parameters to their default settings.
Fn006	Alarm history data clear	Clears the data stored in the alarm history.
Fn007	Store online auto-tuning results	Writes the load data calculated using online auto-tuning to Pn103 (inertia ratio).
Fn00C	Analog monitor output offset manual adjustment	Manually adjusts the analog output monitor offset.
Fn00D	Analog monitor output scaling	Changes the analog monitor output scaling (output voltage adjustment).
Fn00E	Servo Motor current detection offset automatic adjustment	Automatically adjusts the offset for Servo Motor current detection.
Fn00F	Servo Motor current detection offset manual adjustment	Manually adjusts the offset for Servo Motor current detection.
Fn010	Password setting	You can permit or prohibit writing to user parameters.
Fn012	Version check	Check the Servo Drive's version information.

■ Monitor Mode Details

Number	Monitor mode	Units	Explanation
Un000	Speed feedback	r/min	Displays actual rotation speed of Servo Motor.
Un002	Torque command	%	Displays command values to current loop (rated torque = 100%).
Un003	Number of pulses from phase-Z edge	Pulses	Displays rotation position from phase-Z edge (4X calculation).
Un004	Electrical angle	×	Displays the electrical angle of the Servo Motor.
Un005	Input signal monitor	---	Displays the control input signal (CN1) status using ON/OFF bits.
Un006	Output signal monitor	---	Displays the control output signal (CN1) status using ON/OFF bits.
Un007	Command pulse speed display	r/min	Calculates and displays command pulse frequency in r/min.
Un008	Position deviation (deviation counter)	Command units	Displays number of residual pulses in deviation counter (input pulse standard).
Un009	Cumulative load ratio	%	Displays effective torque (rated torque = 100%, 10-s cycle)
Un00A	Regeneration load ratio	%	Displays regeneration absorption power due to regeneration resistance (calculates internal resistance capacity or Pn600 setting as 100% in 0-s cycles).
Un00B	Dynamic brake resistance load ratio	%	Displays power consumption during dynamic brake operation (calculates tolerance power consumption as 100% in 10-s cycles).
Un00C	Input pulse counter	Command units	Counts and displays input pulses (displayed in hexadecimal).
Un00D	Feedback pulse counter	Pulses	Counts and displays feedback pulses (4X calculation, displayed in hexadecimal).

Important Note for Ordering:
Choose normally stocked products whenever possible to ensure availability that matches your schedule. Normally stocked items are shown as shaded in the Ordering Information tables. Non-stocked items are available but may be subject to longer lead times. For the most up-to-date information on stock status, contact your Omron representative.

■ Servo Motors

Cylindrical Servo Motors (3,000-r/min)

Specifications			Part number
Straight shaft without key	Without brake	30 W	**R7M-A03030**
		50 W	**R7M-A05030**
		100 W	**R7M-A10030**
		200 W	**R7M-A20030**
		400 W	**R7M-A40030**
		750 W	**R7M-A75030**
	With brake	30 W	**R7M-A03030-B**
		50 W	**R7M-A05030-B**
		100 W	**R7M-A10030-B**
		200 W	**R7M-A20030-B**
		400 W	**R7M-A40030-B**
		750 W	**R7M-A75030-B**
Straight shaft with key	Without brake	30 W	**R7M-A03030-S1**
		50 W	**R7M-A05030-S1**
		100 W	**R7M-A10030-S1**
		200 W	**R7M-A20030-S1**
		400 W	**R7M-A40030-S1**
		750 W	**R7M-A75030-S1**
	With brake	30 W	**R7M-A03030-BS1**
		50 W	**R7M-A05030-BS1**
		100 W	**R7M-A10030-BS1**
		200 W	**R7M-A20030-BS1**
		400 W	**R7M-A40030-BS1**
		750 W	**R7M-A75030-BS1**

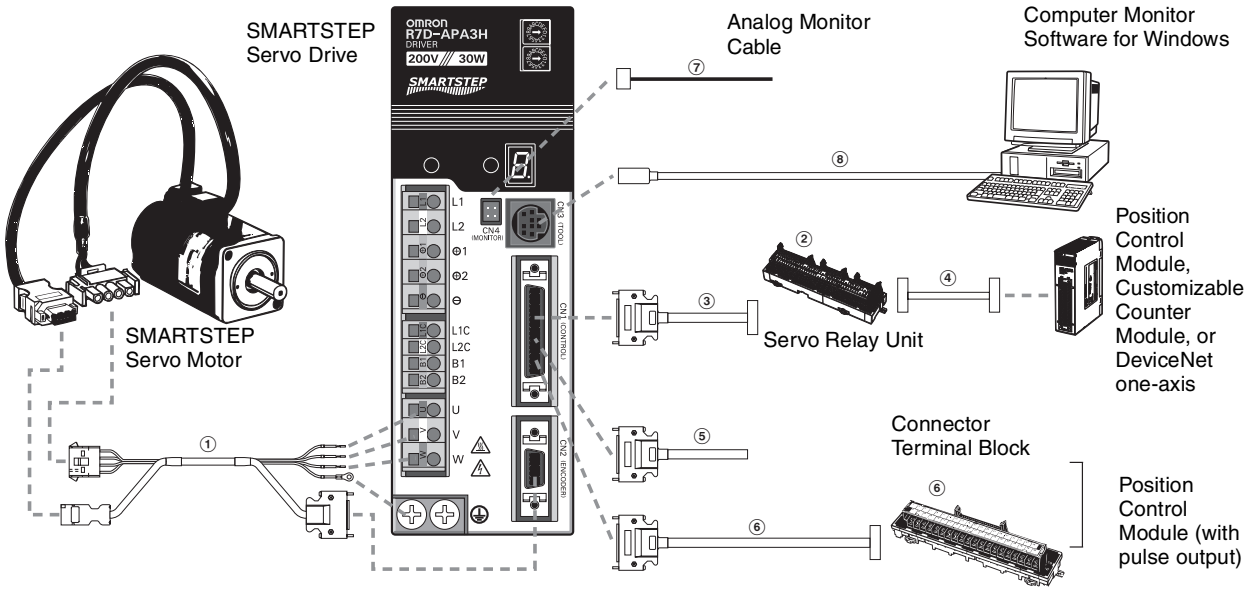
Flat Servo Motors (3,000-r/min)

Specifications			Part number
Straight shaft without key	Without brake	100 W	**R7M-AP10030**
		200 W	**R7M-AP20030**
		400 W	**R7M-AP40030**
		750 W	**R7M-AP75030**
	With brake	100 W	**R7M-AP10030-B**
		200 W	**R7M-AP20030-B**
		400 W	**R7M-AP40030-B**
		750 W	**R7M-AP75030-B**
Straight shaft with key	Without brake	100 W	**R7M-AP10030-S1**
		200 W	**R7M-AP20030-S1**
		400 W	**R7M-AP40030-S1**
		750 W	**R7M-AP75030-S1**
	With brake	100 W	**R7M-AP10030-BS1**
		200 W	**R7M-AP20030-BS1**
		400 W	**R7M-AP40030-BS1**
		750 W	**R7M-AP75030-BS1**

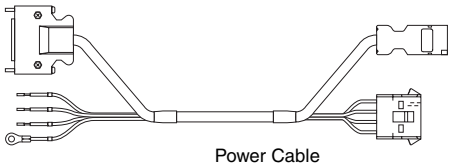
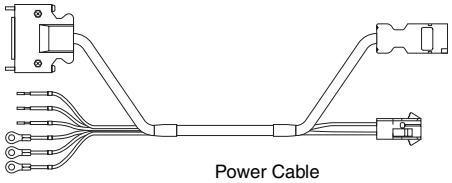
■ Servo Drives

Specifications		Part number
200 VAC	30 W	**R7D-APA3H**
	50 W	**R7D-APA5H**
	100 W	**R7D-AP01H**
	200 W	**R7D-AP02H**
	400 W	**R7D-AP04H**
	750 W	**R7D-AP08H**
100 VAC	30 W	**R7D-APA3L**
	50 W	**R7D-APA5L**
	100 W	**R7D-AP01L**
	200 W	**R7D-AP02L**
	400 W	**R7D-AP04L**

■ Connecting Cables within the Smartstep System



■ Servo Motor Cables (For CN2)

Symbol	Item	Compatible servo motors	Description	Part number
①	Servo Motor Cable (for Servo Motor without brake)	R7M-A□□□30 R7M-A□□□30-S1 R7M-AP□□□30 R7M-AP□□□30-S1	Encoder Cable Drive Connector (Sumitomo 3M) Connector Plug: 10114-3000VE Connector Case: 10314-52A0-008 Motor Connector (Molex) Connector: 54280-0800  Power Cable Servo Motor connector (Taiko Electronics Amp) Connector Cap: 350780-1 Connector Socket: 350689-3	**R7A-CEA□□□S** The boxes in the part number are for the cable length: 003 = 3 m 005 = 5 m 010 = 10 m 015 = 15 m 020 = 20 m
	Servo Motor Cable (for Servo Motor with brake)	R7M-A□□□30-B R7M-A□□□30-BS1 R7M-AP□□□30-B R7M-AP□□□30-BS1	Encoder Cable Drive Connector (Sumitomo 3M) Connector Plug: 10114-3000VE Connector Case: 10314-52A0-008 Motor Connector (Molex) Connector: 54280-0800  Power Cable Servo Motor connector (Taiko Electronics Amp) Connector Cap: 350781-1 Connector Socket: 350689-3	**R7A-CEA□□□B** The boxes in the part number are for the cable length: 003 = 3 m 005 = 5 m 010 = 10 m 015 = 15 m 020 = 20 m

■ Control Cables (For CN1)

Symbol	Item	Compatible units	Available lengths	Part number
②	Servo Relay Unit	Use with Position Control Modules (Doesn't support communications functions.) Modules: CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113, and C200H-NC112	---	**XW2B-20J6-1B**
		Use with Position Control Modules (Doesn't support communications functions.) Modules: CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413, C500-NC113/211, and C200H-NC211		**XW2B-40J6-2B**
		Use with other PLC's position control output (Doesn't support communications functions.) Modules: CQM1H-PLB21, and CQM1-CPU43-V1		**XW2B-20J6-3B**
③	Cable to Servo Drive	Doesn't support communications functions. (For the XW2B-□□J6-□B)	1 m	**XW2Z-100J-B5**
			2 m	**XW2Z-200J-B5**
④	Cable to Position Control Module		0.5 m	**XW2Z-050J-A3**
		CQM1H-PLB21 and CQM1-CPU43-V1	1 m	**XW2Z-100J-A3**
			0.5 m	**XW2Z-050J-A4**
		C200H-NC112	1 m	**XW2Z-100J-A4**
			0.5 m	**XW2Z-050J-A5**
		C200H-NC211 and C500-NC113/211	1 m	**XW2Z-100J-A5**
			0.5 m	**XW2Z-050J-A8**
		CS1W-NC113 and C200HW-NC113	1 m	**XW2Z-100J-A8**
			0.5 m	**XW2Z-050J-A9**
		CS1W-NC213/413 and C200HW-NC213/413	1 m	**XW2Z-100J-A9**
			0.5 m	**XW2Z-050J-A12**
		CS1W-NC133	1 m	**XW2Z-100J-A12**
			0.5 m	**XW2Z-050J-A13**
		CS1W-NC233/433	1 m	**XW2Z-100J-A13**
			0.5 m	**XW2Z-050J-A16**
		CJ1W-NC113	1 m	**XW2Z-100J-A16**
			0.5 m	**XW2Z-050J-A17**
		CJ1W-NC213/413	1 m	**XW2Z-100J-A17**
			0.5 m	**XW2Z-050J-A20**
		CJ1W-NC133	1 m	**XW2Z-100J-A20**
			0.5 m	**XW2Z-050J-A21**
		CJ1W-NC233/433	1 m	**XW2Z-100J-A21**
⑤	Control Cable	For general-purpose Controllers (mating connector for CJ1 on one end, open ended on the other end)	1 m	**R88A-CPU001S**
			2 m	**R88A-CPU002S**
⑥	Cable for Universal Terminal Block	For general-purpose Controllers	1 m	**R88A-CTU001N**
			2 m	**R88A-CTU002N**
	Universal Terminal Block		---	**XW2B-40F5-P**

■ Options for CN3

Symbol	Item	Part number
⑧	Computer Monitor Cable	**R7A-CCA002P2**

■ Other Options

Symbol	Item	Part number
⑦	Analog Monitor Cable	**R88A-CMW001S**

■ Motor Cables

Specifications		Part number
For Motors without brakes	3 m	**R7A-CEA003S**
	5 m	**R7A-CEA005S**
	10 m	**R7A-CEA010S**
	15 m	**R7A-CEA015S**
	20 m	**R7A-CEA020S**
For Motors with brakes	3 m	**R7A-CEA003B**
	5 m	**R7A-CEA005B**
	10 m	**R7A-CEA010B**
	15 m	**R7A-CEA015B**
	20 m	**R7A-CEA020B**

■ Accessories

Connectors

Specifications	Part number
Encoder Connector (Motor side)	**R7A-CNA02R**
Encoder Connector (Driver side)	**R7A-CNA01R**
Control I/O Connector	**R88A-CNU01C**

Parameter Setting Unit

Specifications	Part number
Parameter Unit (with cable)	**R7A-PR02A**

External Regeneration Resistor

Specifications	Part number
Resistor	**R88A-RR22047S**

DC Reactor

Specifications	Part number
For the R7D-APA3L, R7D-APA5L, or R7D-AP01L	**R88A-PX5063**
For the R7D-AP02L	**R88A-PX5062**
For the R7D-APA3H, R7D-APA5H, or R7D-AP01H	**R88A-PX5071**
For the R7D-AP02H	**R88A-PX5070**
For the R7D-AP04H	**R88A-PX5069**
For the R7D-AP04L or R7D-AP08H	**R88A-PX5061**

Front Mounting Bracket

Specifications	Part number
Front Mounting Bracket	**R88A-TK01W**

Computer Monitor Software

Specifications	Part number
WMON Win Version 2.0	**(See note.)**

Note: Free software download available at: www.omron.com/oei
To download this software:
Go to *Support* tab.
Select *Upgrades and Patches*.
Scroll to *Servo Motors and Drives*.
Select the version that lists *SMARTSTEP Servo Motors and Drives*.
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