Authorised Distributors:-
ASH & ALAIN INDIA PVT LTD
S-100, F.I.E.E., Okhla Industrial Area, Phase-ii, New Delhi-110020(India)
Tel : 011-43797575 Fax : 011-43797574 E-mail : sales@ashalain.com

New!

OMRON

SMARTSTEP

SMARTSTEP Junior

R7D-ZP □H
R7M-Z □□□-S1/BS1

New from OMRON:
A Compact, Smart, New-generation Servo!

Actual Size

realizing

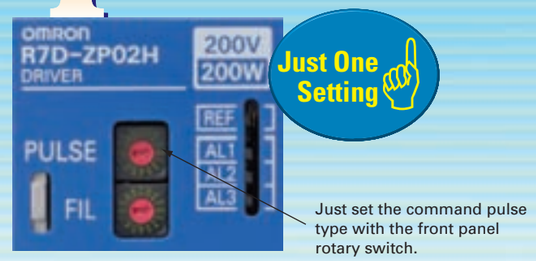
An Exceptionally Easy-to-Use Servo T hat is Also Easy to Set Up, Compact, and Supports a Wide Variet y of Applications!

Easy Setup

This Servo's Definitive Feature!
"Just Connect and Run"

Reduced Startup Time!

Just wire the Servo, set the command pulse type, and turn ON the power to complete the setup. An automatic control function is built-in to provide stable control without difficult settings. The Servo can operate immediately.



Just set the command pulse type with the front panel rotary switch.

SMARTSTEP Junior

SMARTSTEP

Actual Size
35 x 120 x 105 mm (W x H x D)
(200 W Servo Driver)
(Excluding mounting)

Compact

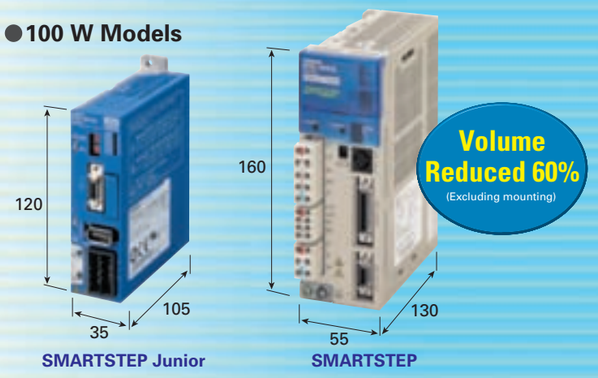
Smallest* in the Industry! Use Control Panel Space More Efficiently.

* Single-phase 200-VAC Units, as of May 2006.

Orderly Control Panels!

Requires less than 1/2 of the volume of the SMARTSTEP Series. Saves space in the control panel.

●100 W Models



Variety

Excels in High-speed, High-precision Applications.

Can be used easily in a variety of applications, such as conveyors, constant-length feeders, and other feeders.

●For example, in a board-inspector…

■Process Image

You can take advantage of all of the SMARTSTEP Junior's capabilities by combining the Servo Driver with a CP1H-Y PLC. Maximum response frequency (command pulse response):

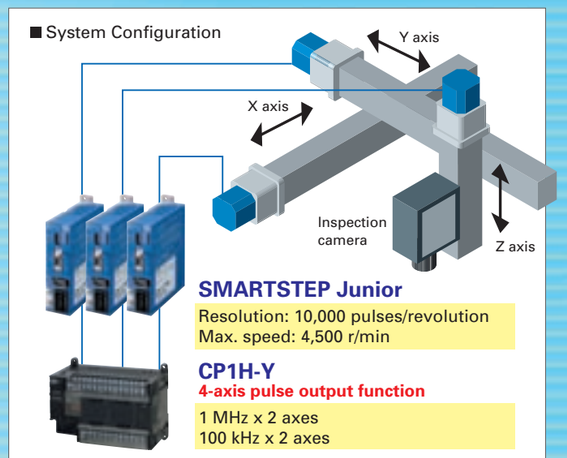
CP1H-Y

SMARTSTEP: 250 kpps

↓

SMARTSTEP Junior: 750 kpps

■System Configuration



SMARTSTEP Junior
Resolution: 10,000 pulses/revolution
Max. speed: 4,500 r/min

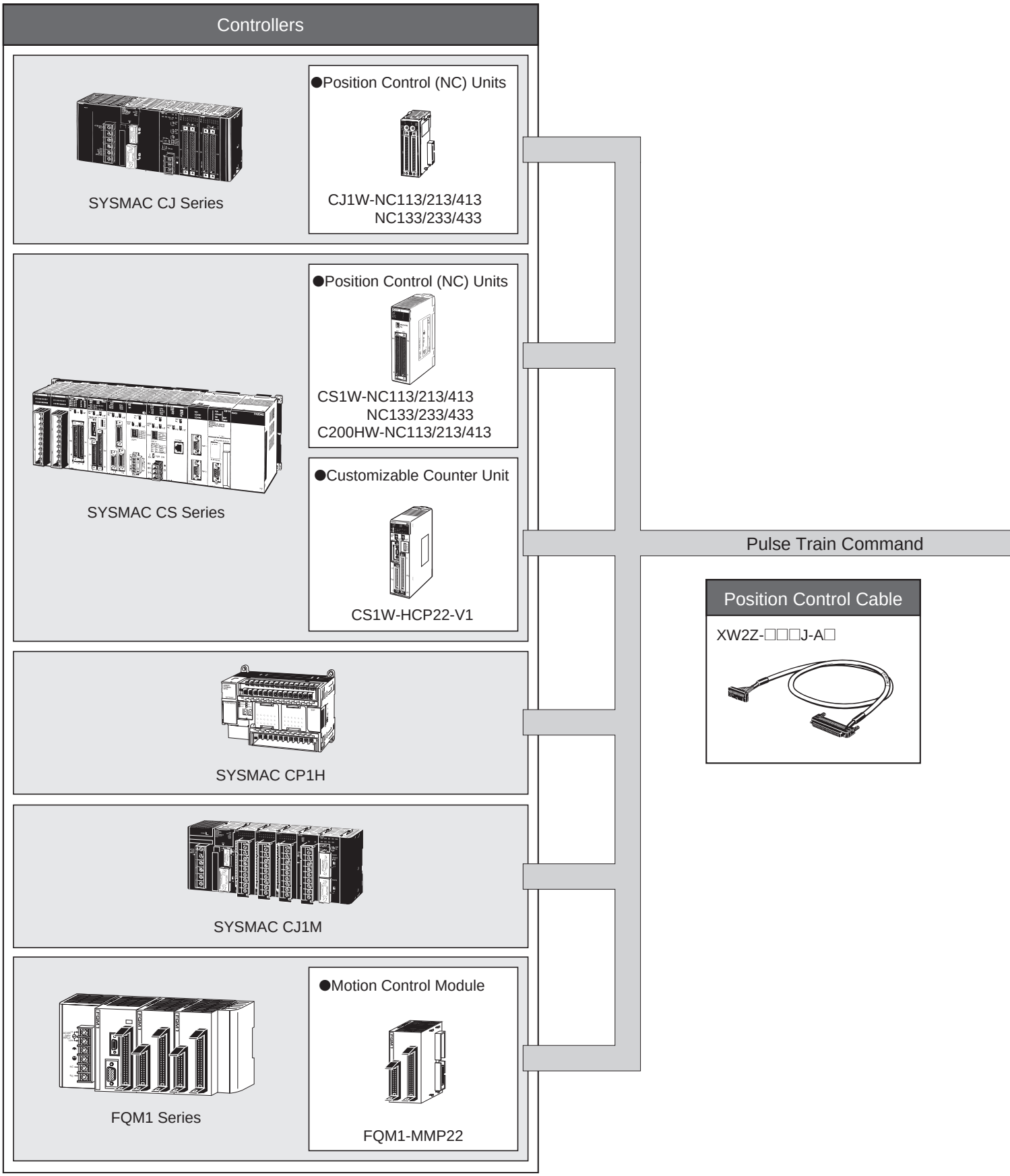
CP1H-Y
4-axis pulse output function
1 MHz x 2 axes
100 kHz x 2 axes

This application can be achieved under specialized conditions. Verify the conditions again for any specific application.

●**Select the Servomotor with the Motor Selection Program.**
Servomotor selection is easy using the Motor Selection Program.

Contents

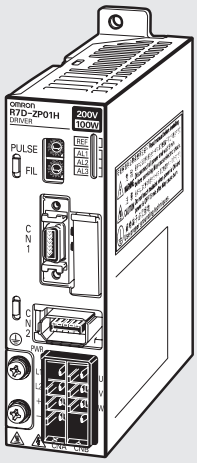
Flexible System Configurations for a Variety of Applications



Main Circuit Connector

R7A-CNZ01P

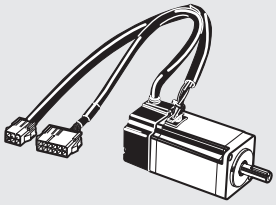
AC Servo Driver



R7D-ZP□

Motor power feedback signal

AC Servomotor



R7M-Z□

Power Cables

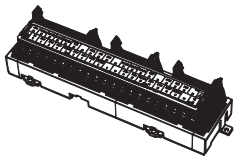
●Motor Power Cables
R7A-CAZ0□□S
(without brake)
R7A-CAZ0□□B
(with brake)

Encoder Cable

R7A-CRZ0□□C

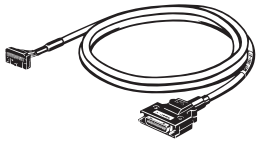
Servo Relay Unit

XW2B-□□J6-□B



Servo Driver Cable

XW2Z-□□□J-B□

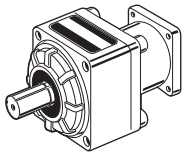


AC Reactor

R88A-PX5□□□

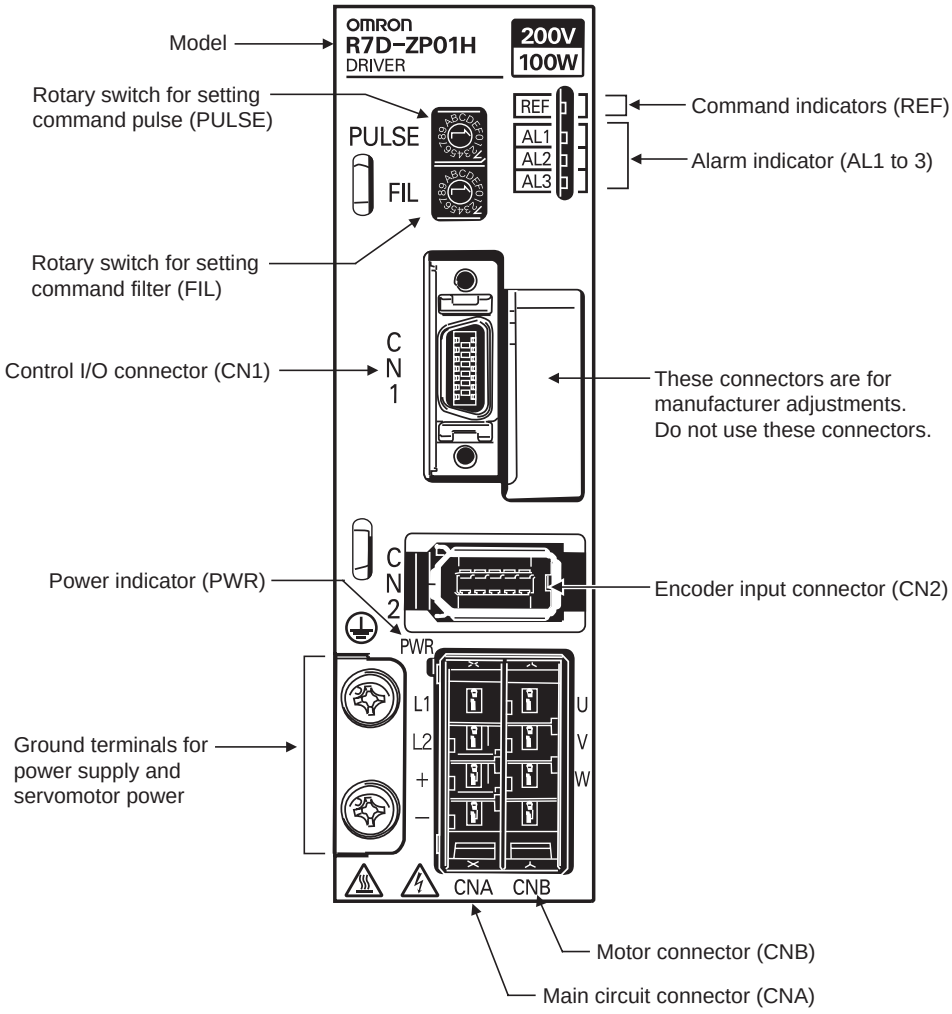
Decelerator

●Backlash within 3 minutes
R7G-VRSFPB□□□□□□
●Backlash within 45 minutes
R7G-RGSF□□□□□□



Components and Functions

●Components



●Rotary Switch for Setting Command Pulse (PULSE)

Always turn OFF the power supply before setting the rotary switch. (The switch is factory-set to 0.)

Setting	Command pulse resolution	Command pulse connection method	Command pulse type
0	1000	Open collector or line driver	CW + CCW, positive logic CW CCW
1	2500		
2	5000	Line driver	
3	10000		
4	1000	Open collector or line driver	CW + CCW, negative logic CW CCW
5	2500		
6	5000	Line driver	
7	10000		
8	1000	Open collector or line driver	Sign + pulse string, positive logic PULS SIGN
9	2500		
A	5000	Line driver	
B	10000		
C	1000	Open collector or line driver	Sign + pulse string, negative logic PULS SIGN
D	2500		
E	5000	Line driver	
F	10000		

●Rotary Switch for Setting Command Filter (FIL)

This switch does not need to be set if the machine is not subject to vibration. (The switch is factory-set to 0.)

Filter setting (See note 1.)	Acceleration/ deceleration time for STEP command (See note 3.)	Approx. time from end of command to end of positioning (settling time) (See note 2.)	Description
0	45 ms	100 to 200 ms	↑ Smaller filter time constant (short positioning time)
1	50 ms	110 to 220 ms	
2	60 ms	130 to 260 ms	
3	65 ms	150 to 300 ms	
4	70 ms	170 to 340 ms	
5	80 ms	20 to 400 ms	
6	85 ms	250 to 500 ms	
7	170 ms	500 to 1,000 ms	↓ Larger filter time constant (longer positioning time with little vibration)
8 to F	Do not set this switch to 8 to F.		

Note 1. Increase the value of the filter setting if there is vibration when starting or stopping.
Note 2. The settling time depends on the commanded acceleration/deceleration, the rigidity of the machine motor drive, the encoder resolution, and other factors.
Note 3. Use the acceleration/deceleration times as a guideline for determining the Servomotor capacity that can be driven when using STEP commands without commanded acceleration/deceleration.

●Command Indicators (REF)

Indicator (See note.)	Power to motor	Command pulse
Lit orange.	OFF	None
Flashing orange.	OFF	Pulse being input.
Lit green.	ON	None
Flashing green.	ON	Pulse being input.

Note: The indicator stays lit (yellow) for 1 s when there is a deviation counter reset input.

●Alarm Indicators (AL1/AL2/AL3)

Indicator status	Alarm	Indicator	Alarm
AL1 ■ AL2 ■ AL3 ■	Normal	AL1 □ AL2 ■ AL3 □	Overcurrent
AL1 □ AL2 ■ AL3 ■	Overspeed	AL1 ■ AL2 □ AL3 □	Servo Driver built-in fan is stopped
AL1 ■ AL2 □ AL3 ■	Overload	AL1 □ AL2 □ AL3 □	System error
AL1 □ AL2 □ AL3 ■	Encoder error	AL1 ◪ AL2 ◪ AL3 ◪ Flashes at a set cycle	Rotary switch for setting command pulse (PULSE) has been changed.
AL1 ■ AL2 ■ AL3 □	Voltage error		

Lit: □ Not lit: ■ Flashing: ◪

AC Servo Driver Specifications (R7D-ZP)

●General Specifications

Item			Specification
Ambient operating temperature			0 to 55°C
Ambient operating humidity			90% max. (with no condensation)
Ambient storage temperature			–20 to 70°C
Ambient storage humidity			90% max. (with no condensation)
Storage/operating atmosphere			No corrosive gases, dust, iron powder, water drops, or cutting oil
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
Shock resistance			Acceleration 19.6 m/s^2 max., in X, Y, and Z directions, three times
Insulation resistance			Between power line terminals and FG: 0.5 MΩ min. (at 500 V DC)
Dielectric strength			Between power line terminals and FG: 1,500 V AC for 1 min at 50/60 Hz Between each control signal and FG: 500 V AC for 1 min
Degree of protection			Built into panel (IP10)
International standards	**EC Directive**	**EMC Directive**	EN 55011 Class A Group 1 EN 61000-6-2
		Low voltage Directive	EN 50178
	UL Standards		UL 508C
	cUL Standards		cUL C22.2 No.14

●Control Specifications

Motor capacity	**100 W**	**200 W**	**400 W**	**750 W**
Servo Driver (R7D-)	**ZP01H**	**ZP02H**	**ZP04H**	**ZP08H**
Item Applicable Servomotor (R7M-)	**Z10030-S1**	**Z20030-S1**	**Z40030-S1**	**Z75030-S1**
Continuous output current (rms)	0.84 A	1.1 A	2.0 A	3.7 A
Momentary maximum output current (rms)	2.5 A	3.3 A	6.0 A	11.1 A
Input power supply (for main circuit and control circuits)	Single-phase 200 to 230 V AC (170 to 253 V), 50/60 Hz			
Control method	All-digital servo			
Inverter method	PWM method based on IGBT			
Maximum response frequency (command pulse response)	750 kpps			
Weight	0.5 kg			1.0 kg

AC Servomotor Specifications (R7M-Z)

●General Specifications

Item			Specification
Ambient operating temperature			0 to 40°C
Ambient operating humidity			20% to 80% (with no condensation)
Ambient storage temperature			–20 to 60°C
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/s² max., whichever is smaller
Shock resistance			Acceleration 98 m/s² max., in a vertical direction, two times
Insulation resistance			Between power line terminals and FG: 10 MΩ min. (at 500 V DC)
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
Degree of protection			IP55 (except for through-shaft section)
Vibration grade			V-15
Mounting method			Flange-mounting
International standards	EC Directive	EMC Directive	EN 55011 Class A Group 1 EN 61000-6-2
		Low voltage Directive	IEC 60034-1, -5, -8, -9 EN 60034-1, -9
	UL Standards		UL 1004
	cUL Standards		cUL C22.2 No.100

●Performance Specifications

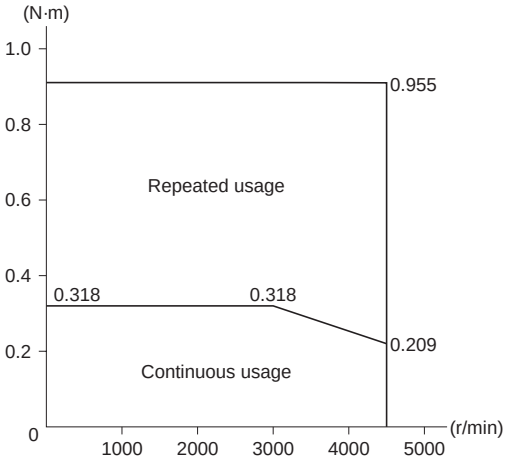
Item / Applicable Servomotor (R7M-)			Z10030-S1	Z20030-S1	Z40030-S1	Z75030-S1
Item / Applicable Servo Driver (R7D-) Pulse train models			ZP01H	ZP02H	ZP04H	ZP08H
Rated output		W	100	200	400	750
Rated torque		N·m	0.318	0.637	1.27	2.39
Rated rotation speed		r/min	3000			
Momentary maximum rotation speed		r/min	4500			
Momentary maximum torque		N·m	0.955	1.91	3.82	7.16
Rated current		A (irms)	0.84	1.1	2.0	3.7
Momentary maximum current		A (irms)	2.5	3.3	6.0	11.1
Rotor inertia		kg·m² ($GD^2/4$)	6.34×10^{-6}	3.30×10^{-5}	6.03×10^{-5}	1.50×10^{-4}
Power rate		kW/s	16.0	12.3	26.7	38.1
Allowable radial load		N	78	245	245	392
Allowable thrust load		N	54	74	74	147
Weight	Without brake	kg	0.5	0.9	1.3	2.6
	With brake	kg	0.7	1.5	1.9	3.5
Radiator dimensions (material)			t6 × □250 (Al)			
Applicable load inertia (See note.)		kg·m²	6.0×10^{-5} (9.5 ×)	3.0×10^{-4} (9.1 ×)	5.0×0^{-4} (8.3 ×)	1.0×10^{-3} (6.7 ×)
Brake Specifications	Brake inertia	kg·m² ($GD^2/4$)	7.54×10^{-7}	6.4×10^{-6}	6.4×10^{-6}	1.71×10^{-5}
	Excitation voltage	V	24 VDC ±10%			
	Power consumption (at 20°C)	W	6	7	7	7.7
	Current consumption (at 20°C)	A	0.25	0.29	0.29	0.32
	Static friction torque	N·m	0.318 min.	0.637 min.	1.27 min.	2.45 min.
	Attraction time	ms	60 max.			80 max.
	Release time	ms	30 max.	20 max.		
	Backlash		1° max.			
	Rating		Continuous			

Note: Use within the applicable load inertia range. Operation may not be stable outside of this range.

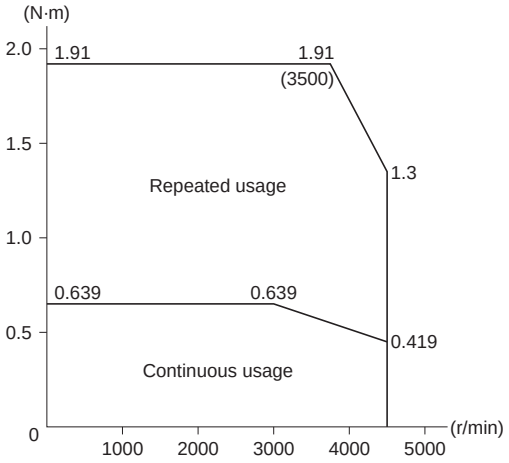
Torque and Rotation Speed Characteristics

The following graphs show the characteristics with a 3-m standard cable and 200-V AC input.

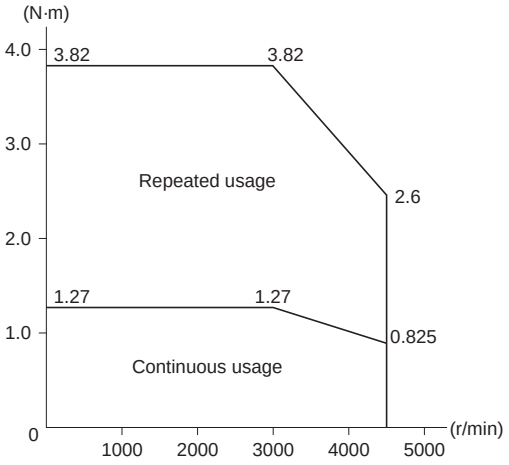
R7M-Z10030-S1 (100W)



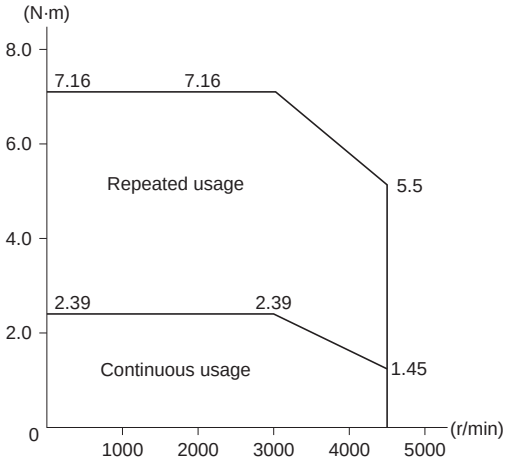
R7M-Z20030-S1 (200W)



R7M-Z40030-S1 (400W)



R7M-Z75030-S1 (750W)



Reduction Gear Specifications

●Performance Specifications

Backlash within 3 Minutes

Motor capacity	Decelera-tion ratio	Model (R7G-)	Rated rotation speed	Rated torque	Efficiency	Instanta-neous peak rotation speed	Instanta-neous peak torque	Decelerator inertia	Allowable radial load (shaft center)	Allowable thrust load
			r/min	N·m	%	r/min	N·m	kg·m²	N	N
100W	1/5	**VRSFPB05B100**	600	1.19	75	900	3.60	4.08×10^{-6}	392	196
	1/9	**VRSFPB09B100**	333	2.29	80	500	6.91	3.43×10^{-6}	441	220
	1/15	**VRSFPB15B100**	200	3.82	80	300	11.5	3.62×10^{-6}	588	294
	1/25	**VRSFPB25C100**	120	6.36	80	180	19.2	3.92×10^{-6}	1323	661
200W	1/5	**VRSFPB05B200**	600	2.71	85	900	8.12	1.53×10^{-5}	392	196
	1/9	**VRSFPB09C400**	333	3.78	66	500	11.3	2.68×10^{-5}	931	465
	1/15	**VRSFPB15C400**	200	6.31	66	300	18.9	2.71×10^{-5}	1176	588
	1/25	**VRSFPB25C200**	120	11.1	70	180	33.4	2.67×10^{-5}	1323	661
400W	1/5	**VRSFPB05C400**	600	5.40	85	900	16.2	3.22×10^{-5}	784	392
	1/9	**VRSFPB09C400**	333	9.49	83	500	28.5	2.68×10^{-5}	931	465
	1/15	**VRSFPB15C400**	200	15.8	83	300	47.6	2.71×10^{-5}	1176	588
	1/25	**VRSFPB25D400**	120	26.4	83	180	79.3	2.79×10^{-5}	1617	808
750W	1/5	**VRSFPB05C750**	600	10.8	90	900	32.0	7.17×10^{-5}	784	392
	1/9	**VRSFPB09D750**	333	18.3	85	500	54.3	6.50×10^{-5}	1176	588
	1/15	**VRSFPB15D750**	200	30.5	85	300	90.5	7.09×10^{-5}	1372	686
	1/25	**VRSFPB25E750**	120	50.8	85	180	151	7.05×10^{-5}	2058	1029

Backlash within 45 Minutes

Motor capacity	Decelera-tion ratio	Model (R7G-)	Rated rotation speed	Rated torque	Efficiency	Instanta-neous peak rotation speed	Instanta-neous peak torque	Decelerator inertia	Allowable radial load (shaft center)	Allowable thrust load
			r/min	N·m	%	r/min	N·m	kg·m²	N	N
100W	1/5	**RGSF05B100**	600	1.19	75	900	3.60	4.08×10^{-6}	392	196
	1/9	**RGSF09B100**	333	2.29	80	500	6.91	3.43×10^{-6}	441	220
	1/15	**RGSF15B100**	200	3.82	80	300	11.5	3.62×10^{-6}	588	294
200W	1/5	**RGSF05B200**	600	2.71	85	900	8.12	1.53×10^{-5}	392	196
	1/9	**RGSF09C400**	333	3.78	66	500	11.3	2.68×10^{-5}	931	465
	1/15	**RGSF15C400**	200	6.31	66	300	18.9	2.71×10^{-5}	1176	588
400W	1/5	**RGSF05C400**	600	5.4	85	900	16.2	3.22×10^{-5}	784	392
	1/9	**RGSF09C400**	333	9.49	83	500	28.5	2.68×10^{-5}	931	465
	1/15	**RGSF15C400**	200	15.8	83	300	47.6	2.71×10^{-5}	1176	588

Dimensions

(Unit: mm)

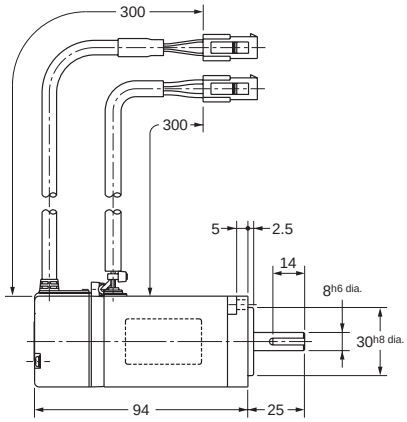
●AC Servomotors

• 100W

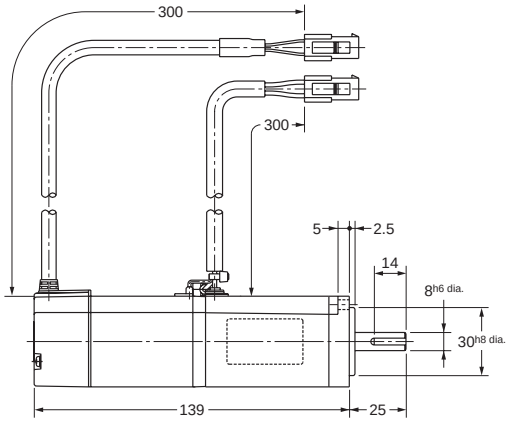
Without Brake **R7M-Z10030-S1**

With Brake **R7M-Z10030-BS1**

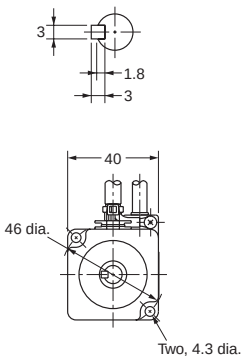
R7M-Z10030-S1 Without Brake



R7M-Z10030-BS1 With Brake



Shaft end dimensions



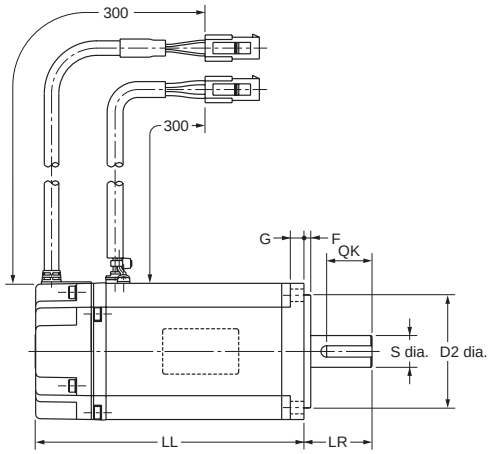
• 200W/400W/750W

Without Brake **R7M-Z20030-S1/Z40030-S1/Z75030-S1**

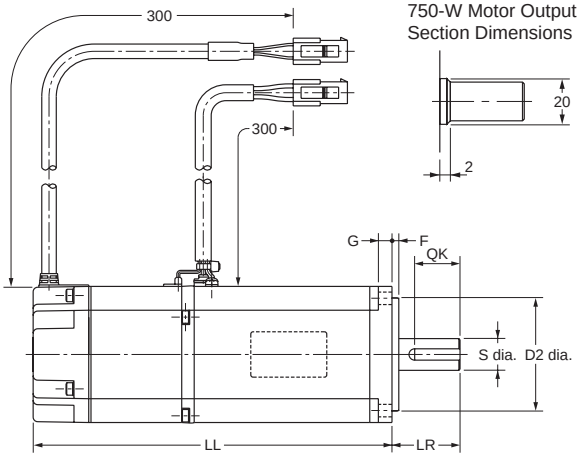
With Brake **R7M-Z20030-BS1/Z40030-BS1/Z75030-BS1**

Dimensions (mm) / Model	LL		LR	Flange surface						Shaft end	
	Without B	With B		C	D1	D2	F	G	Z	S	QK
R7M-Z20030-□S1	95.5	135.5	30	60	70	50h8	3	6	Four, 5.5 dia.	14h6	20
R7M-Z40030-□S1	118.5	158.5									
R7M-Z75030-□S1	133	176	40	80	90	70h8		8	Four, 7 dia.	16h6	30

R7M-Z□□□30-S1 Without Brake

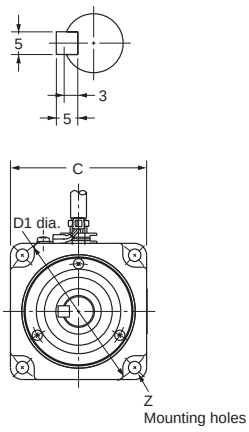


R7M-Z□□□30-BS1 With Brake



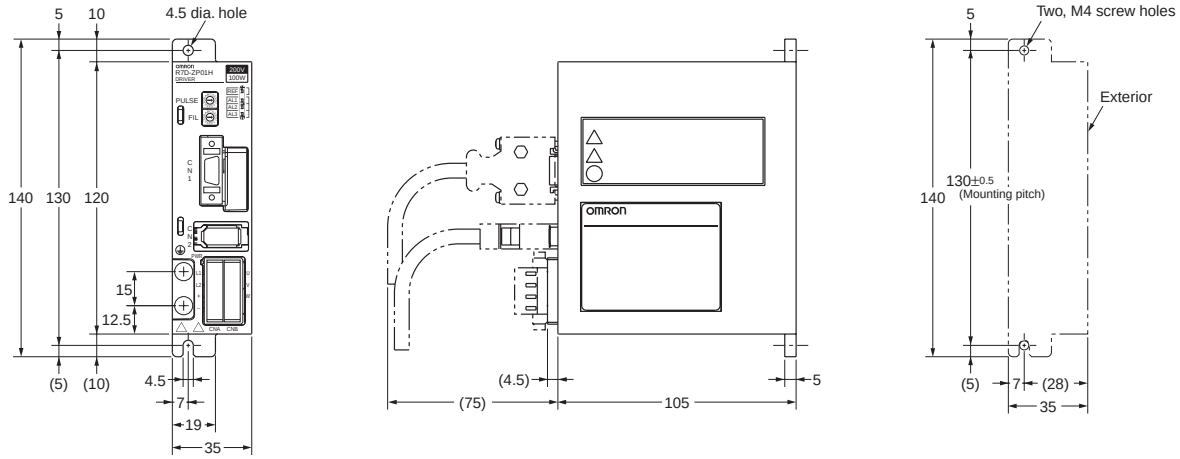
750-W Motor Output Section Dimensions

Shaft end dimensions

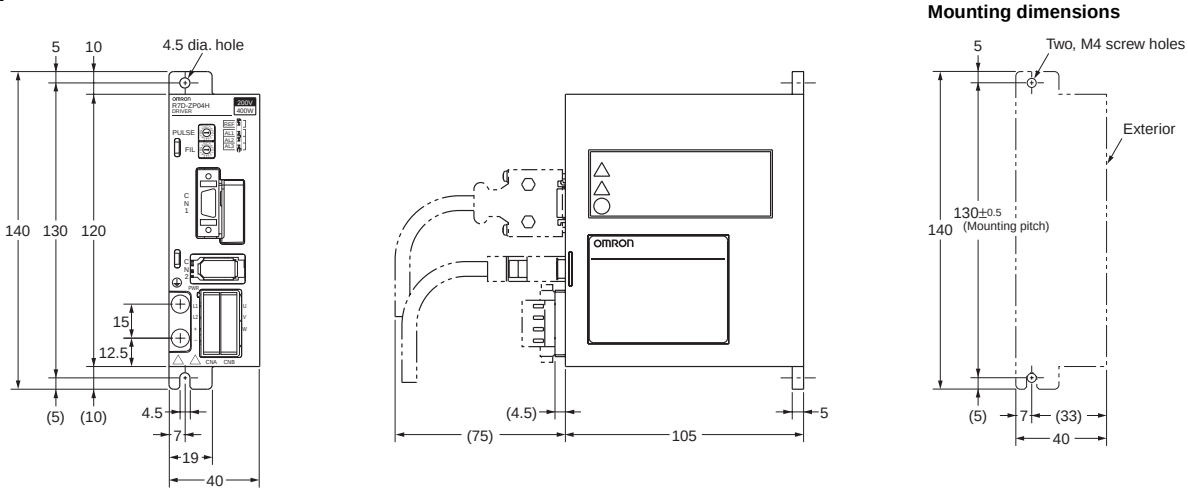


●AC Servo Drivers

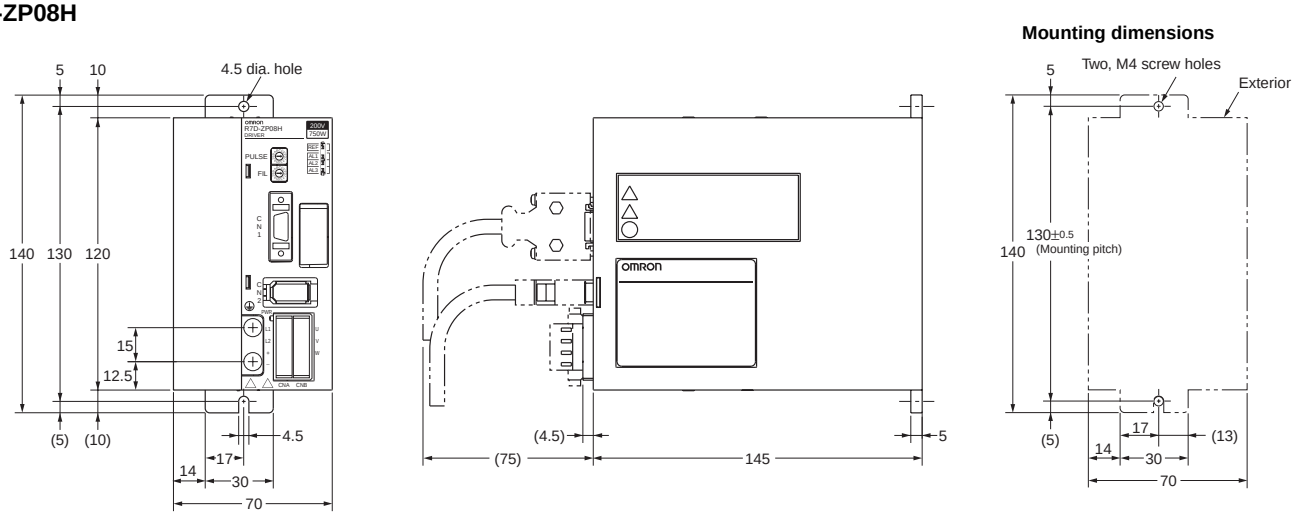
• 200 VAC: 100 W/200 W
R7D-ZP01H/ZP02H



• 200 VAC: 400 W
R7D-ZP04H



• 200 VAC: 750 W
R7D-ZP08H

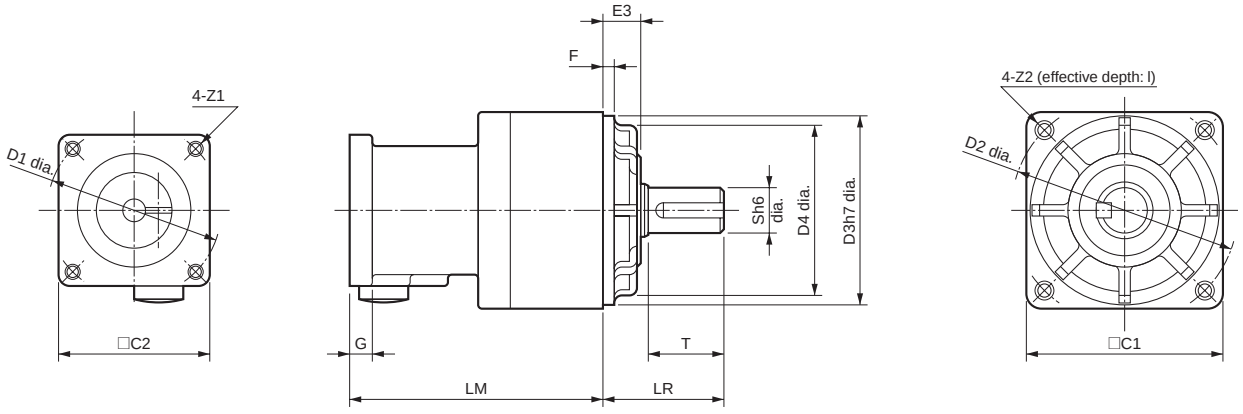


●Reduction Gear

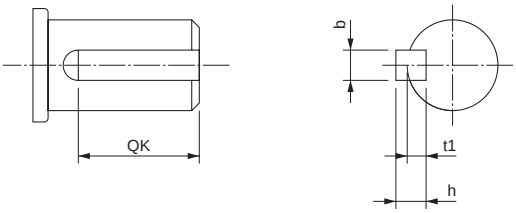
Cylindrical Servomotor (Backlash within 3 Minutes)

Model			Dimensions (mm)																				Weight (kg)
			LM	LR	C1	C2	D1	D2	D3	D4	E3	F	G	S	T	Z1	Z2	l	Key slot dimensions				
																			QK	b	h	t1	
100W	1/5	R7G-VRSFPB05B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/9	R7G-VRSFPB09B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/15	R7G-VRSFPB15B100	78	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.7
	1/25	R7G-VRSFPB25C100	92	50	78	40	46	90	70	62	17	3	6	19	30	M4	M6	20	22	6	6	3.5	1.7
200W	1/5	R7G-VRSFPB05B200	72.5	32	52	60	70	60	50	45	10	3	10	12	20	M5	M5	12	16	4	4	2.5	0.72
	1/9	R7G-VRSFPB09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-VRSFPB15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
	1/25	R7G-VRSFPB25C200	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
400W	1/5	R7G-VRSFPB05C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/9	R7G-VRSFPB09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-VRSFPB15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
	1/25	R7G-VRSFPB25D400	104	61	98	60	70	115	90	75	18	5	8	24	40	M5	M8	20	30	8	7	4	3.2
750W	1/5	R7G-VRSFPB05C750	93.5	50	78	80	90	90	70	62	17	3	10	19	30	M6	M6	20	22	6	6	3.5	2.1
	1/9	R7G-VRSFPB09D750	97.5	61	98	80	90	115	90	75	18	5	10	24	40	M6	M8	20	30	8	7	4	3.4
	1/15	R7G-VRSFPB15D750	110	61	98	80	90	115	90	75	18	5	10	24	40	M6	M8	20	30	8	7	4	3.8
	1/25	R7G-VRSFPB25E750	135	75	125	80	90	135	110	98	17	5	10	32	55	M6	M10	20	45	10	8	5	7.2

Dimensions



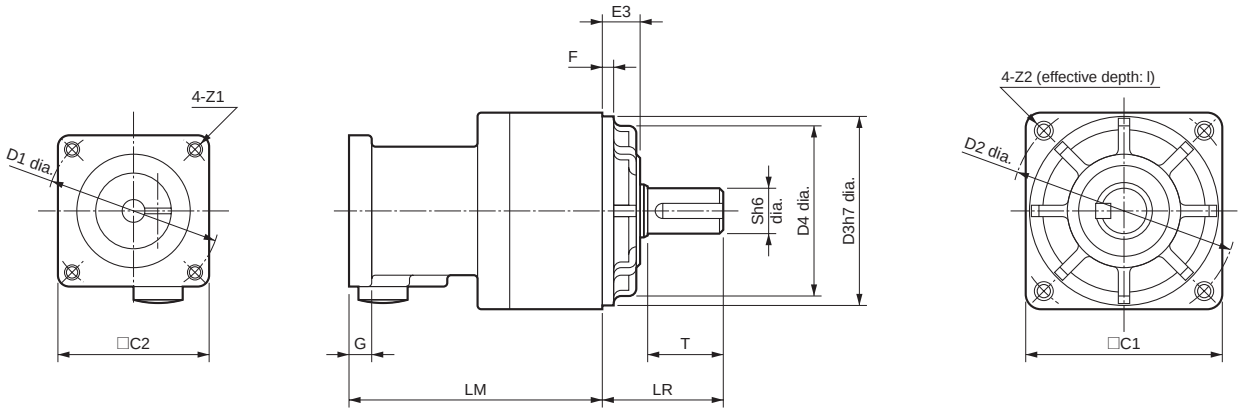
Key dimensions



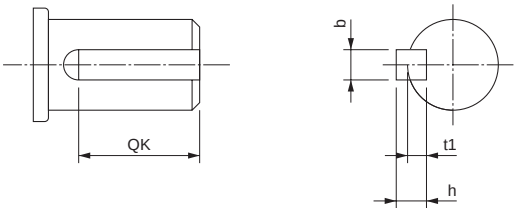
Cylindrical Servomotor (Backlash within 45 Minutes)

Model			Dimensions (mm)																Key slot dimensions				Weight (kg)
			LM	LR	C1	C2	D1	D2	D3	D4	E3	F	G	S	T	Z1	Z2	I	QK	b	h	t1	
100W	1/5	R7G-RGSF05B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/9	R7G-RGSF09B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/15	R7G-RGSF15B100	78	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.70
200W	1/5	R7G-RGSF05B200	72.5	32	52	60	70	60	50	45	10	3	10	12	20	M5	M5	12	16	4	4	2.5	0.72
	1/9	R7G-RGSF09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-RGSF15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
400W	1/5	R7G-RGSF05C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/9	R7G-RGSF09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-RGSF15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1

Dimensions

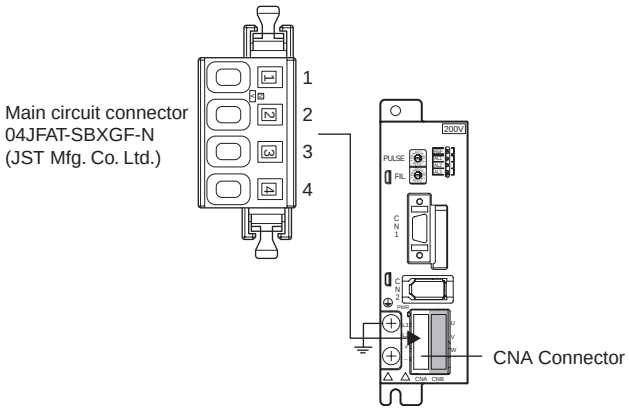


Key dimensions



I/O Specifications

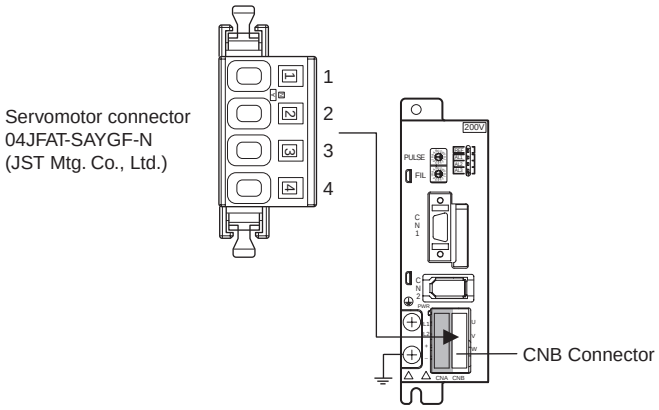
■Main Circuit Connector Specifications (CNA) R7A-CNZ01P



●Main Circuit Connector (CNA) Pin Arrangement

Pin	Symbol	Name	Function
1	L1	Main-circuit Power Supply Terminals	Single-phase 200/230 V AC (170 to 253 V AC) 50/60 Hz
2	L2		
3	+	External Regeneration Resistance Unit connection terminals	If regenerative energy is high, connect an External Regeneration Unit between P and N.
4	–		
⏚	⏚	Frame ground	This is the ground terminal. Ground it to a minimum of 100 Ω (Japanese class D, class 3).

■Servomotor Connector Specifications (CNB) R7A-CNZ01A



●Main Circuit Connector (CNB) Pin Arrangement

Pin	Symbol	Name	Function	
1	U	Servomotor Terminals	Red	These are the terminals for outputs to the Servomotor. Be careful to wire them correctly.
2	V		White	
3	W		Blue	
4	–	---	Do not connect anything to this terminal.	
⏚	⏚	Frame ground	Green/Yellow	Connect the Servomotor FG terminal.

■Control I/O Signals

●CN1 Control Inputs

Pin No.	Signal name	Function	Function/interface
1	+CW/PULS	Reverse pulses, feed pulses	Pulse string input terminals for position commands. Line-driver input: 7 mA at 3 V Maximum response frequency: 750 kpps Open-collector input: 7 to 15 mA Maximum response frequency: 187.5 kpps **Note:** Either forward and reverse pulses (CW/CCW), or feed pulses and direction signal (PULS/SIGN) can be selected using the rotary switch for setting command pulses, located on the front of the Unit.
2	–CW/PULS		
3	+CCW/SIGN	Forward pulses, phase difference signals	
4	–CCW/SIGN		
5	+24VIN	+24-V power supply input for control DC	Power supply input terminal (+24 V DC) for sequence inputs (pin 6).
6	RUN	RUN command input	ON: Servo ON (Starts power to Servomotor.)
8	+ECRST	Deviation counter reset	ON: Pulse commands prohibited and deviation counter cleared. Line-driver input: 7 mA at 3 V Open-collector input: 7 to 15 mA **Note:** Input for at least 20 μs.
9	–ECRST		

●CN1 Control Outputs

Pin No.	Signal name	Function	Function/interface
10	Z	Phase Z output	Outputs the Encoder's phase Z. (1 pulse/revolution) **Note:** Use the rising edge of the ON signal.
11	ZCOM		
12	$\overline{\text{ALM}}$	Alarm output	When the Servo Driver generates an alarm, the output turns OFF. **Note:** OFF for approx. 2 s after the power is turned ON.
13	BKIR	Brake interlock output	Outputs the holding brake timing signals. Release the holding brake when this signal is ON.
14	INP	Positioning completed output	ON when the position deviation is within ±10 pulses.
7	0GND	Output ground common	Ground common for sequence outputs (pins 12, 13 and 14).

Note: An open-collector output interface is used for sequence outputs (maximum operating voltage: 30 V DC; maximum output current: 50 mA).

■CN1 Connectors (14P)

●Soldered Connectors

Name	Model	Manufacturer
Cable solder plug	10114-3000VE	Sumitomo 3M
Cable case (shell kit)	10314-52A0-008	

■CN2 Encoder Connector Specifications

Pin	Symbol	Name
1	E5V	Encoder power supply +5 V
2	E0V	Encoder power supply GND
3	A + Phase A	Encoder + phase-A input
4	A – Phase A	Encoder – phase-A input
5	+ Phase B	Encoder + phase-B input
6	– Phase B	Encoder – phase-B input
7	Phase Z	Encoder phase-Z input
8	Phase U	Poll sensor phase U
9	Phase V	Poll sensor phase V
10	Phase W	Poll sensor phase W
Shell	FG	Cable shield ground

■CN2 Connectors (10P)

●Crimped Connectors

Name	Model	Manufacturer
Plug, Cable, and Cover Set	54559-1005	Molex
Plug Housing	51209-1001	
Crimp Terminal	59351-8187 (Loose wires)	
Crimping Tool	57401-5300	

●Soldered Connectors

Name	Model	Manufacturer
Plug, Cable, and Cover Set	54599-1005	Molex
Plug Connector	51593-1011	

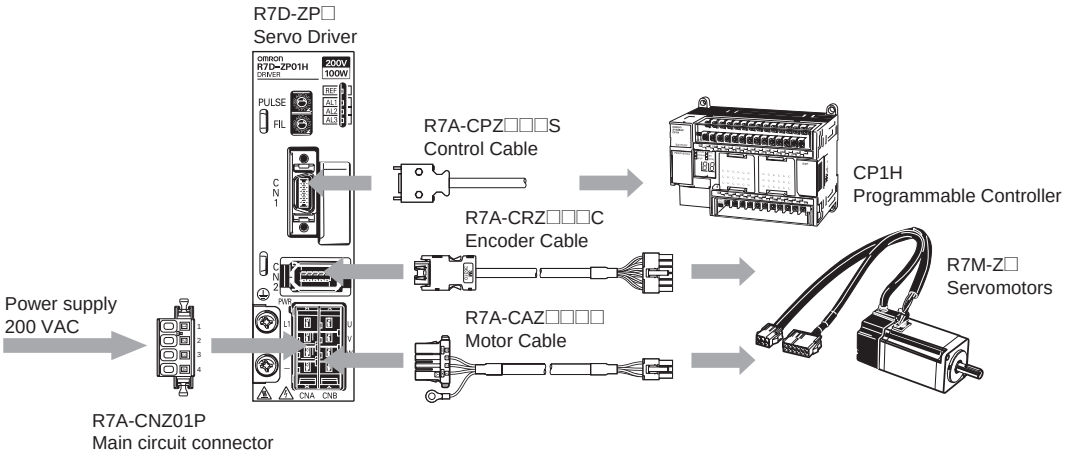
Startup Operation Example

This section presents an example of the SMARTSTEP Junior startup procedure.
In this example a package-type CP1H Programmable Controller is connected.
The no-load operation must always be checked before the Servomotor is connected to the mechanical system.

■Startup Flow

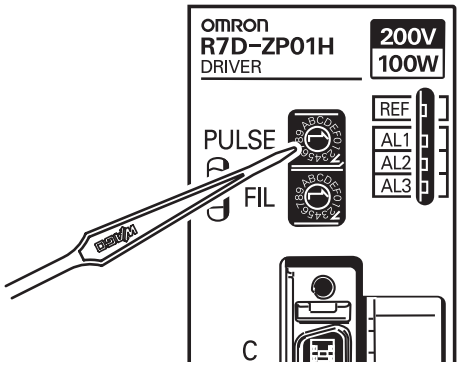
(1) Wiring

Connect the power supply, Encoder Cable, Power Cable, and Control Cable.
An example of connecting the Control Cable to the CP1H is shown below.



(2) Setting Command Pulses

Set the rotary switch for setting command pulse (PULSE) according to the Controller.
For example, set 3 for a command pulse resolution of 10,000 pulses/rotation and a command pulse type of CW + CCW positive logic. (Turn OFF the power before setting the rotary switch.)



(3) Completing the Setup

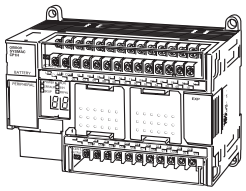
To complete the setup, recheck the power supply voltage and the wiring, and then turn ON the power.
Check the LED indicators to confirm that no alarms have occurred.

Wiring and Operation Examples

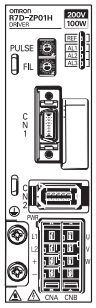
In these examples, the SMARTSTEP Junior is operated using the CP1H PLC.
The wiring and operations are shown below.

■Example: Connecting to the CP1H

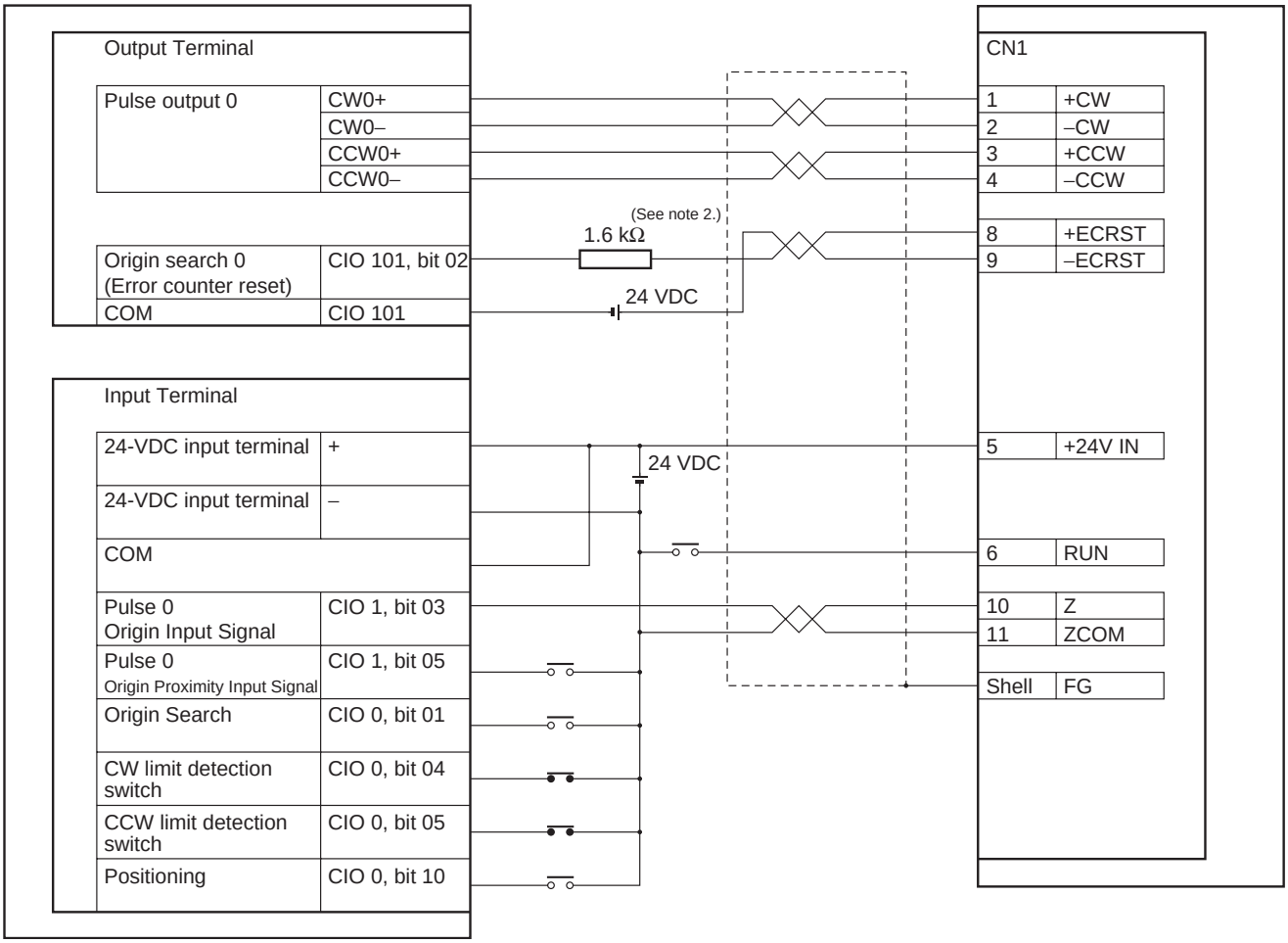
This example shows the Control Cable connection between the SMARTSTEP Junior and the CP1H PLC.



CP1H-Y20DT-D



R7D-ZP□

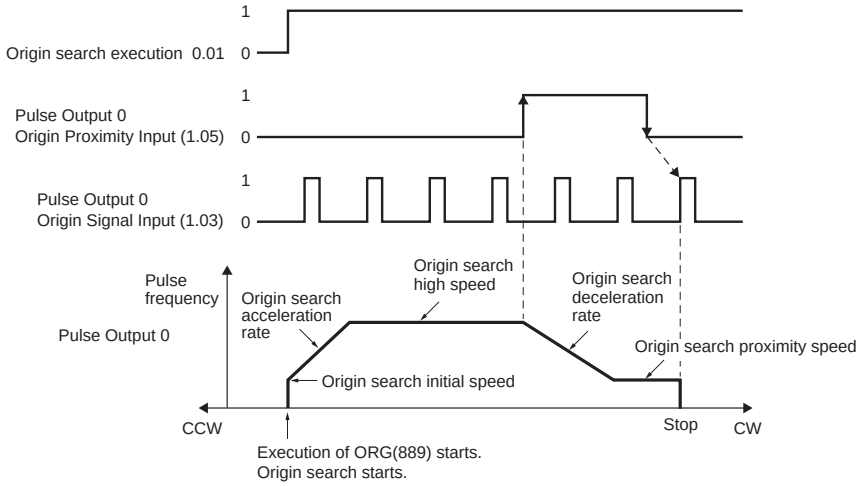


Note 1. This is only a wiring example. Refer to the specific user's manuals for the actual wiring and PLC allocations for your system.
Note 2. Insert a resistance of 1.6 to 2.2 kΩ so that the ECRST input current will be 7 to 15 mA.

■(1) Operation Example Using the CP1H: Origin Search

An origin search can be easily executed using the ORG command.

●Operation



●PLC Setup

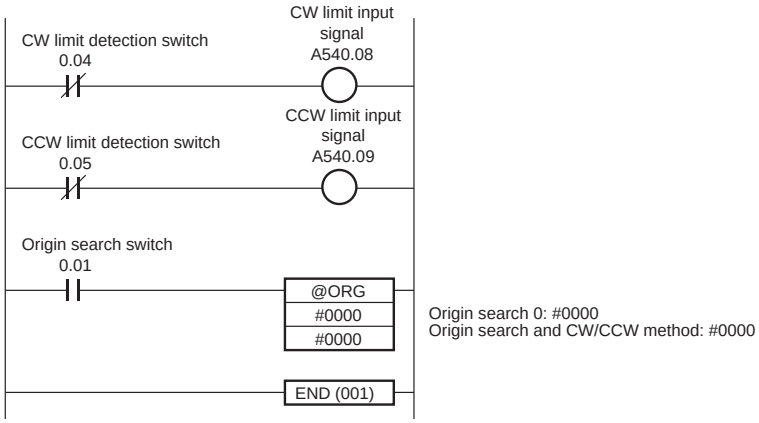
The settings for the CP1H PLC Setup are made using the CX-Programmer.

To make new settings, start the CX-Programmer and select File - New and then specify the device name and the device type.

Double-click Setting Icon in the new project to display the PLC Settings Dialog Box. The illustration below shows example settings.

Note: The settings for using origin search and the origin input signal type are read when the power is turned ON.

●Ladder Program



When the origin search switch CIO 0.01 is turned ON, an origin search is started and the origin search is executed at high speed.

When the origin proximity input signal turns ON, the origin proximity speed is used.

When the origin proximity input signal turns OFF, the origin search stops at the next origin signal input and the origin search is completed.

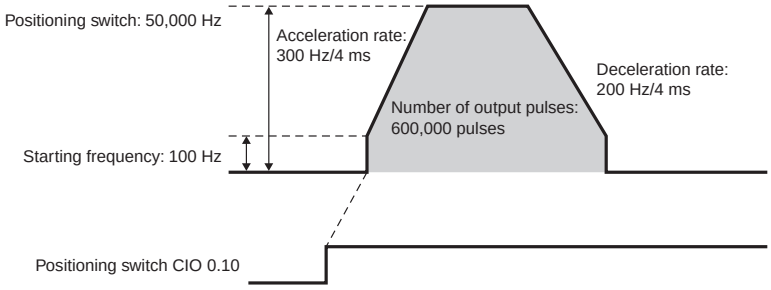
Note: This is only an operation example. Refer to the specific user's manuals for the actual wiring and PLC allocations for your system. For instructions and sample programs, refer to the CP1H Operation Manual (Cat. No. W450).

■(2) Operation Example Using the CP1H: Positioning

Trapezoidal control can be easily executed by using the PLS2 instruction.

●Operation

When positioning switch CIO 0.10 is turned ON, the number of output pulses increases from 0 to 600,000 and the motor turns.



●PLC Setup

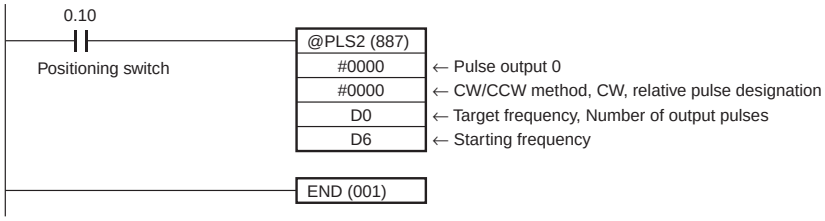
There are no settings that need to be made in the PLC Setup.

●DM Area Settings

PLS2 Instruction Settings (D0 to D7)

Setting details	Address	Data
Acceleration rate: 300 Hz/4ms	D0	#012C
Deceleration rate: 200 Hz/4ms	D1	#00C8
Target frequency: 50,000 Hz	D2	#C350
	D3	#0000
Number of output pulses: 600,000 pulses	D4	#27C0
	D5	#0009
Starting frequency: 100 Hz	D6	#0064
	D7	#0000

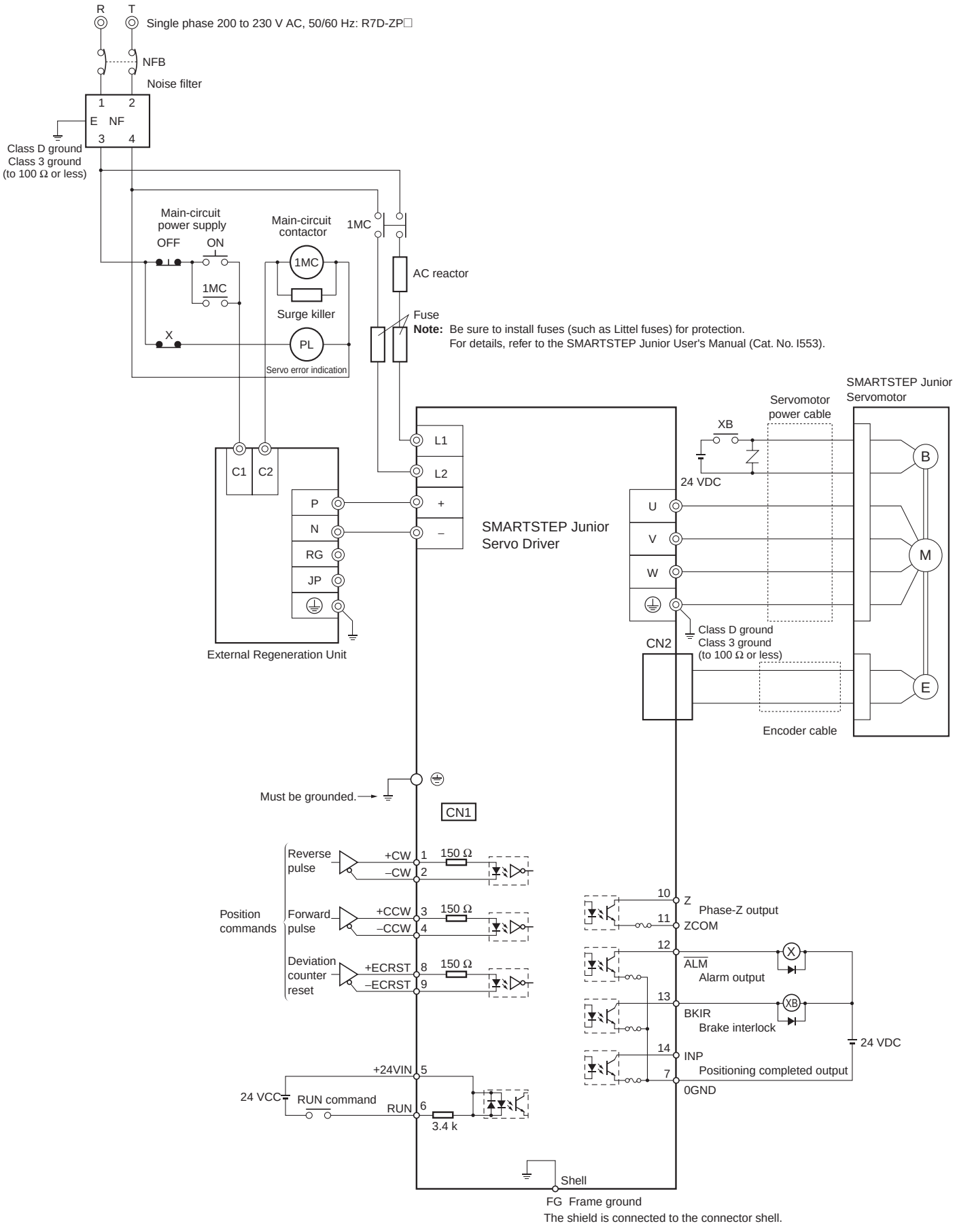
●Ladder Program



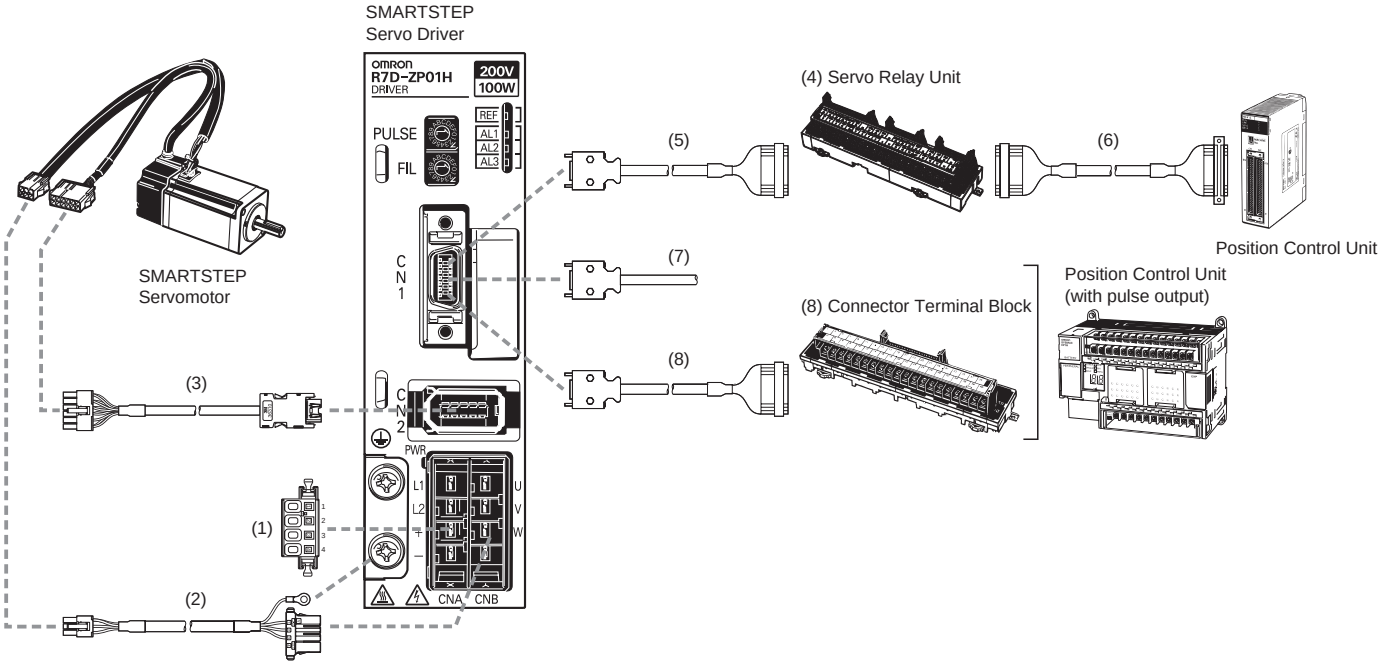
When positioning switch CIO 0.10 turns ON, positioning is executed using trapezoidal control.

Note: This is only an operation example. Refer to the specific user's manuals for the actual wiring and PLC allocations for your system. For instructions and sample programs, refer to the CP1H Operation Manual (Cat. No. W450).

Standard Wiring



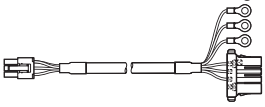
Connecting Cables



●Main Circuit Connector (for CNA)

Symbol	Name	Connects to	Model	Description
(1)	Main Circuit Connector	R7D-ZP Connector	R7A-CNZ01P	Model: 04JFAT-SBXGF-N (JST Mfg. Co. Ltd.) 

●Power Cables (for CNB)

Symbol	Name	Connects to	Model	Description
(2)	Power Cable without brake line	Motor without Brake R7M-Z□□□30-S1	R7A-CAZ□□□S The boxes in the model number are for the cable length: 3 m, 5 m or 10 m (See note.)	Motor Connector (Molex) Connector Plug: 5557-06R-210 Connector Case: 5556TL Driver Connector (JST Mfg. Co. Ltd.) Connector Plug: 04JFAT-SAYGF-N 
	Power Cable with brake line	Motor with Brake R7M-Z□□□30-BS1	R7A-CAZ□□□B The boxes in the model number are for the cable length: 3 m, 5 m or 10 m (See note.)	Motor Connector (Molex) Connector Plug: 5557-06R-210 Connector Case: 5556TL Driver Connector (JST Mfg. Co. Ltd.) Connector Plug: 04JFAT-SAYGF-N 

●Encoder Cables (For CN2)

Symbol	Name	Connects to	Model	Description
(3)	Encoder Cable	R7M-Z□□□30-□S1	R7A-CRZ□□□C The boxes in the model number are for the cable length:3 m, 5 m or 10 m (See note.)	Motor Connector (Molex) Connector Plug: 5557-12R-210 Connector Case: 5556T2L Driver Connector (Sumitomo 3M) Connector Plug: 36210-0100FD Connector Case: 36310-3200-008 

Note: The maximum cable length that can be used between the Servo Driver and Servomotor is 20 m. Cable over 10 m must be prepared by the user.

●Control Cables (For CN1)

Symbol	Name	Connects to		Model
(4)	Servo Relay Unit	Position Control Units (CS1W-NC113/133, CJ1W-NC113/133, C200HW-NC113)		XW2B-20J6-1B
		Position Control Units (CS1W-NC213/233/413/433, CJ1W-NC213/233/413/433, C200HW-NC213/413)		XW2B-40J6-2B
		FQM1 Series (FQM1-MMP22) Customizable Counter Unit (CS1W-HCP22-V1)		XW2B-80J7-1A
		One-axis Servo Relay Unit for CJ1M-CPU21/22/23 CPU Unit		XW2B-20J6-8A
		Two-axis Servo Relay Unit for CJ1M-CPU21/22/23 CPU Unit		XW2B-40J6-9A
(5)	Cable to Servo Driver	XW2B-□□J6-□B (Position Control Unit)		XW2Z-□□□J-B17 The boxes in the model number are for the cable length: 1 m or 2 m.
		XW2B-20J6-8A/-40J6-9A (CJ1M-CPU)		XW2Z-□□□J-B17 The boxes in the model number are for the cable length: 1 m or 2 m.
		XW2B-80J7-1A (FQM1)		XW2Z-□□□J-B20 The boxes in the model number are for the cable length: 1 m or 2 m.
		XW2B-80J7-1A (Customizable Counter Unit)		XW2Z-□□□J-B18 The boxes in the model number are for the cable length: 1 m or 2 m.
(6)	Cable to Position Control Unit	CS1W-NC113 and C200HW-NC113		XW2Z-□□□J-A8 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CS1W-NC213/413 and C200HW-NC213/413		XW2Z-□□□J-A9 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CS1W-NC133		XW2Z-□□□J-A12 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CS1W-NC233/433		XW2Z-□□□J-A13 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CJ1W-NC113		XW2Z-□□□J-A16 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CJ1W-NC213/413		XW2Z-□□□J-A17 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CJ1W-NC133		XW2Z-□□□J-A20 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CJ1W-NC233/433		XW2Z-□□□J-A21 The boxes in the model number are for the cable length: 0.5 m or 1 m
		FQM1-MMP22	General-purpose I/O Cables	XW2Z-□□□J-A28 The boxes in the model number are for the cable length: 0.5 m or 1 m
			Special I/O Cables	XW2Z-□□□J-A30 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CS1W-HCP22-V1	General-purpose I/O Cables	XW2Z□□□J-A29 The boxes in the model number are for the cable length: 0.5 m or 1 m
			Special I/O Cables	XW2Z-□□□J-A32 The boxes in the model number are for the cable length: 0.5 m or 1 m
		CJ1M-CPU21/22/23 for 2 axes		XW2Z-100J-A26 Cable length: 1 m
(7)	Control Cable	For general-purpose Controllers		R7A-CPZ□□□S The boxes in the model number are for the cable length: 1 m or 2 m.
(8)	Connector-Terminal Block Cable	For general-purpose Controllers		XW2Z-□□□J-B19 The boxes in the model number are for the cable length: 1 m or 2 m.
	Connector-Terminal Block Conversion Unit			XW2B-20G5

Model Number Legends

●AC Servomotors

R7M-Z□□□□□-□□□

(1) (2) (3) (4) (5) (6)

No.	Item	Code	Specification
(1)	Indicates a Servomotor		
(2)	Series	Z	SMARTSTEP Junior
(3)	Motor capacity	100	100 W
		200	200 W
		400	400 W
		750	750 W
(4)	Speed	30	3000 r/min
(5)	Brake	Blank	No brake
		B	24-V DC brake
(6)	Shaft	S1	Straight shaft with key

●AC Servo Drivers

R7D-ZP□□□

(1) (2) (3) (4)

No.	Item	Code	Specification
(1)	Indicates a Servo Driver		
(2)	Series	Z	SMARTSTEP Junior
	Input signal designation	P	Pulse train input
(3)	Maximum output capacity	01	100 W
		02	200 W
		04	400 W
		08	750 W
(4)	Power supply specification	H	200 VAC

●Servomotor and Servo Driver Combinations

Rated output	Servomotor		Servo Driver
	Without brake	With Brake	Pulse train input
100 W	R7M-Z10030-S1	R7M-Z10030-BS1	R7D-ZP01H
200 W	R7M-Z20030-S1	R7M-Z20030-BS1	R7D-ZP02H
400 W	R7M-Z40030-S1	R7M-Z40030-BS1	R7D-ZP04H
750 W	R7M-Z75030-S1	R7M-Z75030-BS1	R7D-ZP08H

Ordering Guide

●AC Servomotors

Cylindrical Servomotors (3000-r/min)

Specifications			Model
Straight shaft with key	Without brake	100 W	R7M-Z10030-S1
		200 W	R7M-Z20030-S1
		400 W	R7M-Z40030-S1
		750 W	R7M-Z75030-S1
	With brake	100 W	R7M-Z10030-BS1
		200 W	R7M-Z20030-BS1
		400 W	R7M-Z40030-BS1
		750 W	R7M-Z75030-BS1

●AC Servo Drivers

Specifications		Model
200 V AC	100 W	R7D-ZP01H
	200 W	R7D-ZP02H
	400 W	R7D-ZP04H
	750 W	R7D-ZP08H

Note: The Main Circuit Connector is not included and must be obtained separately.

●Main Circuit Connector

Specification	Model
Main Circuit Connector (for CNA)	R7A-CNZ01P

●Reduction Gear (Straight Shaft with Key)

Cylindrical Servomotor (Backlash within 45 Minutes)

Motor capacity	Model	Deceleration (deceleration ratio)		
		1/5	1/9	1/15
100 W	R7G-RGSF05B100	❍		
	R7G-RGSF09B100		❍	
	R7G-RGSF15B100			❍
200 W	R7G-RGSF05B200	❍		
	R7G-RGSF09C400		❍	
	R7G-RGSF15C400			❍
400 W	R7G-RGSF05C400	❍		
	R7G-RGSF09C400		❍	
	R7G-RGSF15C400			❍

Cylindrical Servomotor (Backlash within 3 Minutes)

Motor capacity	Model	Deceleration (deceleration ratio)			
		1/5	1/9	1/15	1/25
100 W	R7G-VRSFPB05B100	❍			
	R7G-VRSFPB09B100		❍		
	R7G-VRSFPB15B100			❍	
	R7G-VRSFPB25C100				❍
200 W	R7G-VRSFPB05B200	❍			
	R7G-VRSFPB09C400		❍		
	R7G-VRSFPB15C400			❍	
	R7G-VRSFPB25C200				❍
400 W	R7G-VRSFPB05C400	❍			
	R7G-VRSFPB09C400		❍		
	R7G-VRSFPB15C400			❍	
	R7G-VRSFPB25D400				❍
750 W	R7G-VRSFPB05C750	❍			
	R7G-VRSFPB09D750		❍		
	R7G-VRSFPB15D750			❍	
	R7G-VRSFPB25E750				❍

●Control Cables for CN1

Specifications			Model
Control Cable for General-purpose Controllers		1 m	R7A-CPZ001S
		2 m	R7A-CPZ002S
For General-purpose Controllers	Cable for Connector terminal blocks	1 m	XW2Z-100J-B19
		2 m	XW2Z-200J-B19
	Connector-Terminal Block Conversion Unit		XW2B-20G5

Note: For details on "*Servo Relay Units*" and "*Connecting Cable*", refer to pages 23 and 24.

●Power Cables

Specifications			Model
Power Cables	For Motors without brakes	3 m	R7A-CAZ003S
		5 m	R7A-CAZ005S
		10 m	R7A-CAZ010S
	For Motors with brakes	3 m	R7A-CAZ003B
		5 m	R7A-CAZ005B
		10 m	R7A-CAZ010B

●Encoder Cables

Specifications		Model
Encoder Cables	3 m	R7A-CRZ003C
	5 m	R7A-CRZ005C
	10m	R7A-CRZ010C

●Connectors

Specifications	Model
Control I/O Connector	R7A-CNA01R
Motor Connector (CNB)	R7A-CNZ01A
Encoder Input Connector (CN2)	R7A-CNZ01R
Encoder Connector (Motor side)	R7A-CNZ02R
Servomotor Connector for Servomotor Power Cable	R7A-CNZ02A

●External Regeneration Unit

Specifications	Model
Regeneration current: 8 A Built-in resistance: 50 Ω, 12 W	R88A-RG08UA

●External Regeneration Resistor

Specifications	Model
Regeneration capacity: 70 W, 47 Ω	R88A-RR22047S

●AC Reactor

Specifications	Model
For the R7D-ZP01H	R88A-PX5052
For the R7D-ZP02H	R88A-PX5053
For the R7D-ZP04H	R88A-PX5054
For the R7D-ZP08H	R88A-PX5056

Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user’s programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON’s test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

Printed on 100% Recycled Paper

PRINTED WITH SOY INK
Trademark of American Soybean Association
TM

Note: Do not use this document to operate the Unit.

OMRON Corporation
Industrial Automation Company
Control Devices Division H.Q.
Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel: (81)75-344-7109
Fax: (81)75-344-7149

Regional Headquarters

OMRON EUROPE B.V.
Wegalaan 67-69, NL-2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300
Fax: (31)2356-81-388

OMRON ELECTRONICS LLC
1 East Commerce Drive, Schaumburg,
IL 60173 U.S.A.
Tel: (1)847-843-7900/Fax: (1)847-843-8568

OMRON ASIA PACIFIC PTE. LTD.
83 Clemenceau Avenue,
#11-01, UE Square,
Singapore 239920
Tel: (65)6835-3011/Fax: (65)6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120 China
Tel: (86)21-5037-2222/Fax: (86)21-5037-2200

Authorized Distributor:

Note: Specifications subject to change without notice.

Cat. No. I812-E1-01A

0107

SMARTSTEP Junior AC Servomotors and Servo Drives with Built-in MECHATROLINK-II Communications

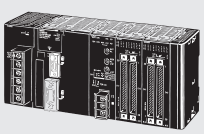
R7M-Z/R7D-ZN□-ML2

Easily Implement Positioning with Compact Servo Drives using Built-in MECHATROLINK-II Communications.

- Data Communications with MECHATROLINK-II
  Data communications are used to transfer all control information between the Servo Drive and Controller. This enables using the performance of the Servo Motor to the limit because there are no restrictions imposed by the transmission performance of control signals.
- Easy to Use
  This “Plug-and-Play” Servo System reduces system startup time. To achieve stable control, automatic control and adjustment functions are provided. Operation can be started quickly without any difficult settings.

System Configuration

Controller



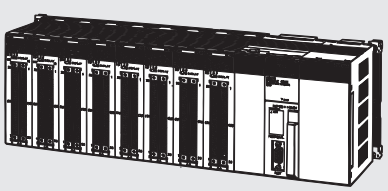
SYSMAC CJ-series PLC

● Motion Control Unit

CJ1W-MCH71

● Position Control Unit

CJ1W-NC□71



SYSMAC CS-series PLC

● Motion Control Unit

CS1W-MCH71

● Position Control Unit

CS1W-NC□71

***2** Use unit version 3.1 or later of the CJ1W/CS1W-MCH71.

***1** Use unit version 2.0 or later of the CJ1W/CS1W-NC□71.

Support Software

CX-One Integrated Tool Package (version 2.03 or higher)
(Including CX-Motion-MCH and CX-Motion-NCF)

Main Circuit Connector

R7A-CNZ01P

MECHATROLINK-II Cable

MECHATROLINK-II Cable

(With ring core and USB connector on both ends)
FNY-W6003-□□ (OMRON model number)

MECHATROLINK-II Repeater

Using the CJ1W-MCH71 or CS1W-MCH71

		Maximum transmission distance	
		0 to 30 m	30 to 50 m
Number of connected devices	1 to 15	Repeater not required.	Repeater not required.
	16	Repeater not required.	Repeater required.
	17 to 30	Repeater required.	Repeater required.

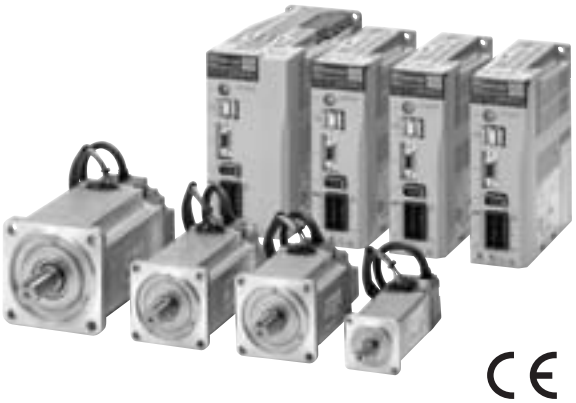
Using the CJ1W-NCF71 or CS1W-NCF71

		Maximum transmission distance		
		0 to 30 m	30 to 50 m	50 to 100 m
Number of connected devices	1 to 15	Repeater not required.	Repeater not required.	Repeater required.
	16	Repeater not required.	—	Repeater required.

Application Restrictions

Do not use the CJ1W-MCH71 or CS1W-MCH71 Motion Control Unit.

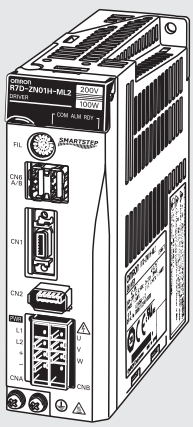
CS1W-NCF71/CJ1W-NCF71 functions		Applicability
Position control	Absolute movements	OK
	Relative movements	OK
	Interrupt feeding	OK
Speed control		Cannot be used.
Torque control		Cannot be used.
Other functions	Origin search	OK
	Jogging	OK
	Overrides	OK
	Present value preset	OK
	Stop functions	OK
	Backlash compensation	Cannot be used.



- Compact to Increase Control Panel Space Efficiency
  The volume of the SMARTSTEP Junior is only 80% of the volume of the R7D-AP. And communications can be connected with a single cable. It all adds up to saving space in the control panel.

Note: MECHATROLINK-II is a registered trademark of the MECHATROLINK Members Association.

AC Servo Driver



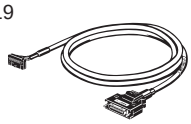
R7D-ZN□-ML2

I/O signals

Terminal Block Conversion Unit and Cable

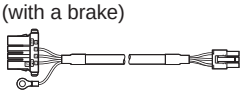
XW2□-20G□

XW2Z-□□□J-B19



Power Cables

- Servomotor Power Cables
  R7A-CAZ0□□S
  (without a brake)
  R7A-CAZ0□□B
  (with a brake)

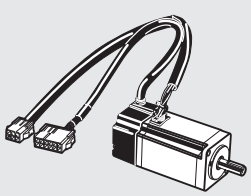


Motor power and feedback signals

Encoder Cable

R7A-CRZ0□□C

AC Servomotor



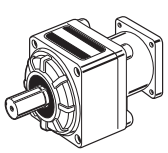
R7M-Z

Peripheral Devices

- AC Reactor
  R88A-PX5
- External Regeneration Resistor
  R88A-RG08UA

Decelerators

- Backlash: 3 arcminutes max.
  R7G-VRSFPB
- Backlash: 45 arcminutes max.
  R7G-RGSF



Interpreting Model Numbers

● AC Servomotors

R7M-Z□□□□□-□□□

1 2 3 4 5 6

No.	Item	Symbol	Specifications
1	Indicates a Servomotor.		
2	Series	Z	SMARTSTEP Junior
3	Motor capacity	100	100 W
		200	200 W
		400	400 W
		750	750 W
4	Speed	30	3000 r/min
5	Brake	Blank	Without a brake
		B	With 24-VDC brake
6	Shaft form	S1	Straight shaft with key

● AC Servo Drives

R7D-ZN□□□-ML2

1 2 3 4 5

No.	Item	Symbol	Specifications
1	Indicates a Servo Drive.		
2	Series	Z	SMARTSTEP Junior
	Input signal specification	N	Communications type
3	Maximum output capacity	01	100 W
		02	200 W
		04	400 W
		08	750 W
4	Power supply voltage	H	200 VAC
5	Communications type	-ML2	MECHATROLINKII communications

● Servo Drive and Servomotor Combinations

Rated output	Servomotor		Servo Drive
	Without brake	With brake	MECHATROLINK-II communications
100 W	R7M-Z10030-S1	R7M-Z10030-BS1	R7D-ZN01H-ML2
200 W	R7M-Z20030-S1	R7M-Z20030-BS1	R7D-ZN02H-ML2
400 W	R7M-Z40030-S1	R7M-Z40030-BS1	R7D-ZN04H-ML2
750 W	R7M-Z75030-S1	R7M-Z75030-BS1	R7D-ZN08H-ML2

Ordering Information

● AC Servomotors

Cylinder-type Motors (3000 r/min)

Specifications			Model
Straight shaft with key	Without brake	100 W	R7M-Z10030-S1
		200 W	R7M-Z20030-S1
		400 W	R7M-Z40030-S1
		750 W	R7M-Z75030-S1
	With brake	100 W	R7M-Z10030-BS1
		200 W	R7M-Z20030-BS1
		400 W	R7M-Z40030-BS1
		750 W	R7M-Z75030-BS1

● AC Servo Drives

Specifications		Model
200 VAC	100 W	R7D-ZN01H-ML2
	200 W	R7D-ZN02H-ML2
	400 W	R7D-ZN04H-ML2
	750 W	R7D-ZN08H-ML2

Note: The Main Circuit Connector is not provided. Order it separately.

● Main Circuit Connector

Specifications	Model
Main Circuit Connector (CNA)	R7A-CNZ01P

● Decelerators (Straight Shaft with Key)

For Cylinder-type Motors (Backlash: 45 Arcminutes Max.)

Motor capacity	Model	Gear ratio		
		1/5	1/9	1/15
100 W	R7G-RGSF05B100	OK		
	R7G-RGSF09B100		OK	
	R7G-RGSF15B100			OK
200 W	R7G-RGSF05B200	OK		
	R7G-RGSF09C400		OK	
	R7G-RGSF15C400			OK
400 W	R7G-RGSF05C400	OK		
	R7G-RGSF09C400		OK	
	R7G-RGSF15C400			OK

For Cylinder-type Motors (Backlash: 3 Arcminutes Max.)

Motor capacity	Model	Gear ratio			
		1/5	1/9	1/15	1/25
100 W	R7G-VRSFPB05B100	OK			
	R7G-VRSFPB09B100		OK		
	R7G-VRSFPB15B100			OK	
	R7G-VRSFPB25C100				OK
200 W	R7G-VRSFPB05B200	OK			
	R7G-VRSFPB09C400		OK		
	R7G-VRSFPB15C400			OK	
	R7G-VRSFPB25C200				OK
40 0W	R7G-VRSFPB05C400	OK			
	R7G-VRSFPB09C400		OK		
	R7G-VRSFPB15C400			OK	
	R7G-VRSFPB25D400				OK
750 W	R7G-VRSFPB05C750	OK			
	R7G-VRSFPB09D750		OK		
	R7G-VRSFPB15D750			OK	
	R7G-VRSFPB25E750				OK

● Control Cables (for CN1)

Specifications		Model
General-purpose Control Cables	1 m	R7A-CPZ001S
	2 m	R7A-CPZ002S
Cables for Connector Terminal Blocks	1 m	XW2Z-100J-B19
	2 m	XW2Z-200J-B19
Terminal Block Conversion Unit		XW2B-20G5

● Servomotor Power Cables

Specifications			Model
Power Cables	Power Cables for Servomotors without Brakes	3 m	R7A-CAZ003S
		5 m	R7A-CAZ005S
		10 m	R7A-CAZ010S
		15 m	R7A-CAZ015S
		20 m	R7A-CAZ020S
	Power Cables for Servomotors with Brakes	3 m	R7A-CAZ003B
		5 m	R7A-CAZ005B
		10 m	R7A-CAZ010B
		15 m	R7A-CAZ015B
		20 m	R7A-CAZ020B

● Encoder Cables

Specifications		Model
Encoder Cables	3 m	R7A-CRZ003C
	5 m	R7A-CRZ005C
	10 m	R7A-CRZ010C
	15 m	R7A-CRZ015C
	20 m	R7A-CRZ020C

● Connectors

Specifications	Model
Control I/O Connector	R7A-CNA01R
Servomotor Connector (CNB)	R7A-CNZ01A
Encoder Input Connector (CN2)	R7A-CNZ01R
Servomotor Connector for Encoder Cable	R7A-CNZ02R
Servomotor Connector for Servomotor Power Cable	R7A-CNZ02A

● Regeneration Resistance Unit

Specifications	Model
Regeneration current: 8 A Internal resistance: 50 Ω, 12 W	R88A-RG08UA

● External Regeneration Resistor

Specifications	Model
Regeneration capacity: 70 W, 47 Ω	R88A-RR22047S

● AC Reactors

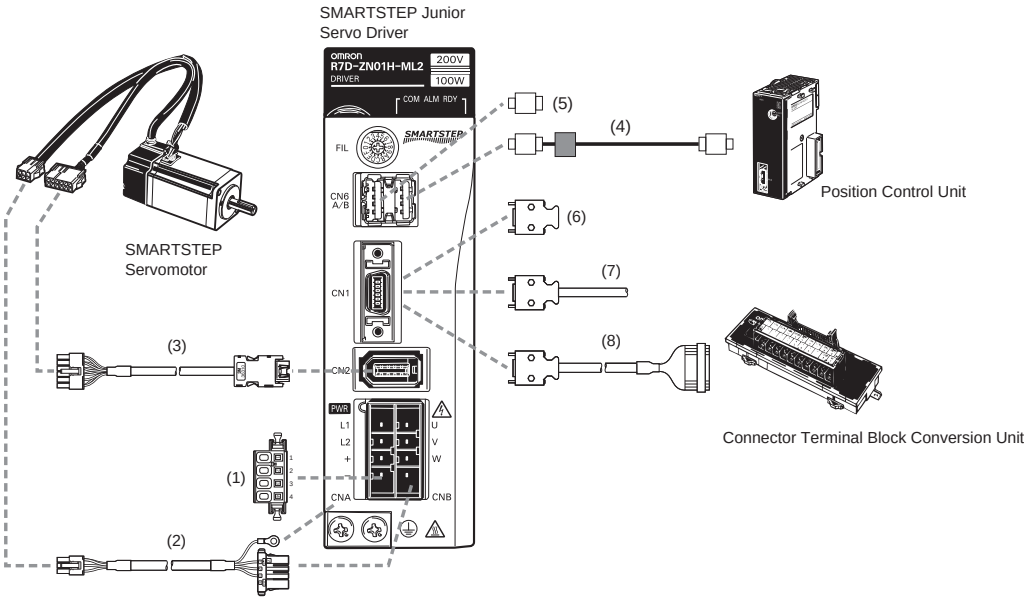
Specifications	Model
R7D-ZN01H-ML2	R88A-PX5052
R7D-ZN02H-ML2	R88A-PX5053
R7D-ZN04H-ML2	R88A-PX5054
R7D-ZN08H-ML2	R88A-PX5056

● MECHATROLINK-related Devices and Cables (Manufactured by Yaskawa Corporation)

Name		OMRON model number	Yaskawa model number
MECHATROLINK-II Cables (with ring core and USB connector on both ends)	0.5 m	FNY-W6003-A5	JEPMC-W6003-A5
	1.0 m	FNY-W6003-01	JEPMC-W6003-01
	3.0 m	FNY-W6003-03	JEPMC-W6003-03
	5.0 m	FNY-W6003-05	JEPMC-W6003-05
	10.0 m	FNY-W6003-10	JEPMC-W6003-10
	20.0 m	FNY-W6003-20	JEPMC-W6003-20
	30.0 m	FNY-W6003-30	JEPMC-W6003-30
MECHATROLINK-II Terminating Resistor	Terminating resistance	FNY-W6022	JEPMC-W6022
MECHATROLINK-II Repeater	Communications Repeater	FNY-REP2000	JEPMC-REP2000

Note: MECHATROLINK-related Devices and Cables are manufactured by Yaskawa Corporation, but they can be ordered directly from OMRON using the OMRON model numbers. (Yaskawa-brand products will be delivered even when they are ordered from OMRON.)

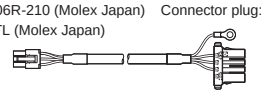
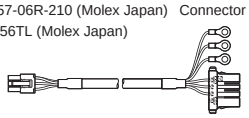
Cable Combinations



● Main Circuit Connector (CNA)

No.	Name	Connected to	Model number	Description
1	Main Circuit Connector	R7D-ZN Connector	R7A-CNZ01P	Model: 04JFAT-SBXGF-N (JST Mfg. Co., Ltd.) 

● Servomotor Power Cables (CNB)

No.	Name	Connected to	Model number	Description
2	For a Servomotor without brake	Servomotor without brake R7M-Z□□□30-S1	R7A-CAZ□□□S The □□□ digits in the model number indicate the cable length (3 m, 5 m, 10 m, 15 m, or 20 m).	Servomotor Connector Connector plug: 5557-06R-210 (Molex Japan) Connector case: 5556TL (Molex Japan) Servo Driver Connector Connector plug: 04JFAT-SAYGF-N (JST Mfg. Co., Ltd.) 
	For a Servomotor with brake	Servomotor with brake R7M-Z□□□30-BS1	R7A-CAZ□□□B The □□□ digits in the model number indicate the cable length (3 m, 5 m, 10 m, 15 m, or 20 m).	Servomotor Connector Connector plug: 5557-06R-210 (Molex Japan) Connector case: 5556TL (Molex Japan) Servo Driver Connector Connector plug: 04JFAT-SAYGF-N (JST Mfg. Co., Ltd.) 

● Encoder Cables (CN2)

No.	Name	Connected to	Model number	Description
3	Encoder Cable	R7M-Z□□□30-□S1	R7A-CRZ□□□C The □□□ digits in the model number indicate the cable length (3 m, 5 m, 10 m, 15 m, or 20 m).	Servomotor Connector Connector plug: 5557-12R-210 (Molex Japan) Connector case: 5556T (Molex Japan) Servo Driver Connector Connector plug: 36210-0100FD (Sumitomo 3M) Connector case: 36310-3200-008 (Sumitomo 3M) 

● MECHATROLINK-II Cables (CN6)

No.	Name	Specifications	OMRON model number (See note.)	Yaskawa model number
4	MECHATROLINK-II Cables (manufactured by Yaskawa Corporation)	0.5 m	FNY-W6003-A5	JEPMC-W6003-A5
		1.0 m	FNY-W6003-01	JEPMC-W6003-01
		3.0 m	FNY-W6003-03	JEPMC-W6003-03
		5.0 m	FNY-W6003-05	JEPMC-W6003-05
		10 m	FNY-W6003-10	JEPMC-W6003-10
		20 m	FNY-W6003-20	JEPMC-W6003-20
		30 m	FNY-W6003-30	JEPMC-W6003-30
5	MECHATROLINK-II Terminating Resistor (manufactured by Yaskawa Corporation)	---	FNY-W6022	JEPMC-W6022

Note: These MECHATROLINK-II products can be ordered directly from OMRON using the OMRON model numbers. Only the Yaskawa model number will appear on the products that will be delivered.)

● CN1 Options

No.	Name	Description	Model number
6	Control I/O Connector (CN1)	Driver side	R7A-CNA01R
7	General-purpose Control Cable	1 m	R7A-CPZ001S
		2 m	R7A-CPZ002S
8	Connector Terminal Block Cable	1 m	XW2Z-100J-B19
		2 m	XW2Z-200J-B19
	Connector Terminal Block Conversion Unit	M3-screw Terminal Block	XW2B-20G4
		M3.5-screw Terminal Block	XW2B-20G5
		M3-screw Terminal Block	XW2D-20G6

AC Servo Drive Specifications (R7D-ZN□-ML2)

● General Specifications

Item			Specifications
Ambient operating temperature			0 to 55°C
Ambient operating humidity			90% max. (with no condensation)
Ambient storage temperature			–20 to 70°C
Ambient storage humidity			90% max. (with no condensation)
Storage and operating atmosphere			No corrosive gasses, no dust, no iron dust, no exposure to moisture or cutting oil
Vibration resistance			10 to 55 Hz in X, Y, and Z directions with 0.1-mm double amplitude; acceleration: 4.9 m/s² max.
Shock resistance			Acceleration 19.6 m/s² max., in X, Y, and Z directions, three times
Insulation resistance			Between power supply/power line terminals and frame ground: 0.5 MΩ min. (at 500 V DC)
Dielectric strength			Between power supply/power line terminals and frame ground:1,500 V AC for 1 min at 50/60 Hz Between each control signal and frame ground: 500 V AC for 1 min
Degree of protection			Built into panel (IP10).
International standards	**EC Directives**	**EMC Directive**	EN 55011 Class A Group 1 EN61000-6-2
		Low Voltage Directive	EN50178
	UL standards		UL508C
	cUL standards		cUL C22.2 No.14

● Control Specifications

Item \ Applicable motor capacity	**100 W**	**200 W**	**400 W**	**750 W**
Servo Drive model (R7D-)	**ZN01H-ML2**	**ZN02H-ML2**	**ZN04H-ML2**	**ZN08H-ML2**
Applicable Servomotors (R7M-)	**Z10030-S1**	**Z20030-S1**	**Z40030-S1**	**Z75030-S1**
Continuous output current (rms)	0.84 A	1.1 A	2.0 A	3.7 A
Momentary maximum output current (rms)	2.5 A	3.3 A	6.0 A	11.1 A
Input power supply (for main circuit and control circuit)	Single-phase 200 to 230 VAC (170 to 253 V), 50/60 Hz			
Control method	All-digital servo			
Inverter method	IGBT-driven PWM method			
Weight	1.0 kg			1.4 kg

AC Servomotor Specifications (R7M-Z)

● General Specifications

Item			Specifications
Ambient operating temperature			0 to 40°C
Ambient operating humidity			20% to 80% (with no condensation)
Ambient storage temperature			–20 to 60°C
Ambient storage humidity			20% to 80% (with no condensation)
Storage and operating atmosphere			No corrosive gases
Vibration resistance			10 to 2,500 Hz, with a 0.2-mm double amplitude or acceleration of 24.5 m/s² (whichever is smaller) in the X, Y, and Z directions
Shock resistance			98 m/s² max. (twice in vertical direction)
Insulation resistance			10 MΩ min. at 500 VDC between the power terminals and FG terminal
Dielectric strength			1,500 VAC (50 or 60 Hz) for 1 minute between the power terminals and FG terminal
Operating position			Any direction
Insulation class			Type B
Construction			Totally-enclosed, self-cooling
Degree of protection			IP55 (excluding the through-shaft portion)
Vibration class			V-15
Mounting method			Flange-mounting
International standards	EC Directives	EMC Directive	EN 55011 Class A, Group1 EN61000-6-2
		Low Voltage Directive	IIEC 60034-1, -5, -8, and -9 EN 60034-1 and -9
	UL standards		UL1004
	cUL standards		cUL C22.2 No.100

● Characteristics

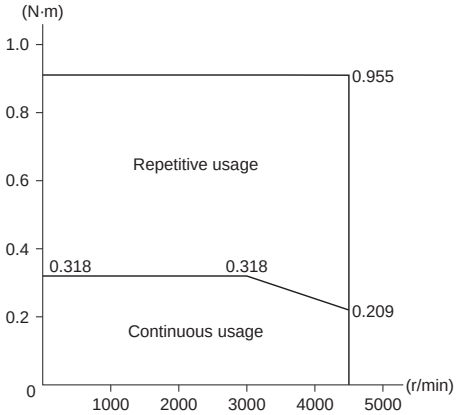
Item		Servomotor model / Applicable Servo Drives (R7D-)	Z10030-S1 ZN01H-ML2	Z20030-S1 ZN02H-ML2	Z40030-S1 ZN04H-ML2	Z75030-S1 ZN08H-ML2
Rated output		W	100	200	400	750
Rated torque		N·m	0.318	0.637	1.27	2.39
Rated rotation speed		r/min	3000			
Max. momentary speed		r/min	4500			
Max. momentary torque		N·m	0.955	1.91	3.82	7.16
Rated current		A (rms)	0.84	1.1	2.0	3.7
Max. momentary current		A (rms)	2.5	3.3	6.0	11.1
Rotor inertia		kg·m² (GD²/4)	6.34×10^{-6}	3.30×10^{-5}	6.03×10^{-5}	1.50×10^{-4}
Power rate		kW/s	16.0	12.3	26.7	38.1
Allowable radial load		N	78	245	245	392
Allowable thrust load		N	54	74	74	147
Weight	Without brake	kg	0.5	0.9	1.3	2.6
	With brake	kg	0.7	1.5	1.9	3.5
Radiation shield dimensions (material)			t6 × 250 × 250 (Al)			
Applicable load inertia (See note.)		kg·m²	6.0×10^{-5} (9.5×)	3.0×10^{-4} (9.1×)	5.0×10^{-4} (8.3×)	1.0×10^{-3} (6.7×)
Brake specifications	Brake inertia	kg·m² (GD²/4)	7.54×10^{-7}	6.4×10^{-6}	6.4×10^{-6}	1.71×10^{-5}
	Excitation voltage	V	24 VDC±10%			
	Power consumption (at 20°C)	W	6	7	7	7.7
	Current consumption (at 20°C)	A	0.25	0.29	0.29	0.32
	Static friction torque	N·m	0.318 min.	0.637 min.	1.27 min.	2.45 min.
	Attraction time	ms	60 max.			80 max.
	Release time	ms	30 max.	20 max.		
	Backlash		1° max.			
	Rating		Continuous			

Note: Use within the applicable load inertia range. Operation may not be stable ouside of this range.

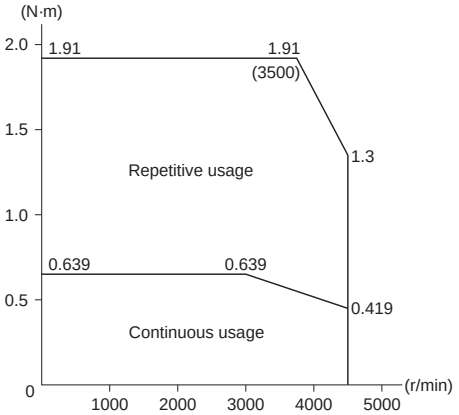
Torque and Rotation Speed Characteristics

The following graphs show the characteristics with a 3-m standard cable and a 200-V AC input.

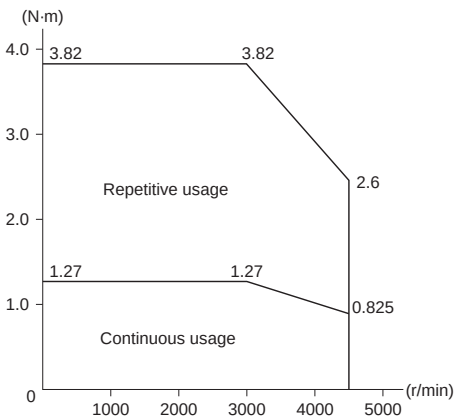
R7M-Z10030-S1 (100 W)



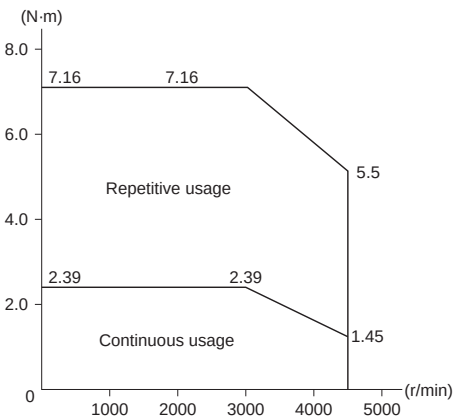
R7M-Z20030-S1 (200 W)



R7M-Z40030-S1 (400 W)



R7M-Z75030-S1 (750 W)



Decelerator Specifications (R7G-VRSF)

● Standard Models and Specifications

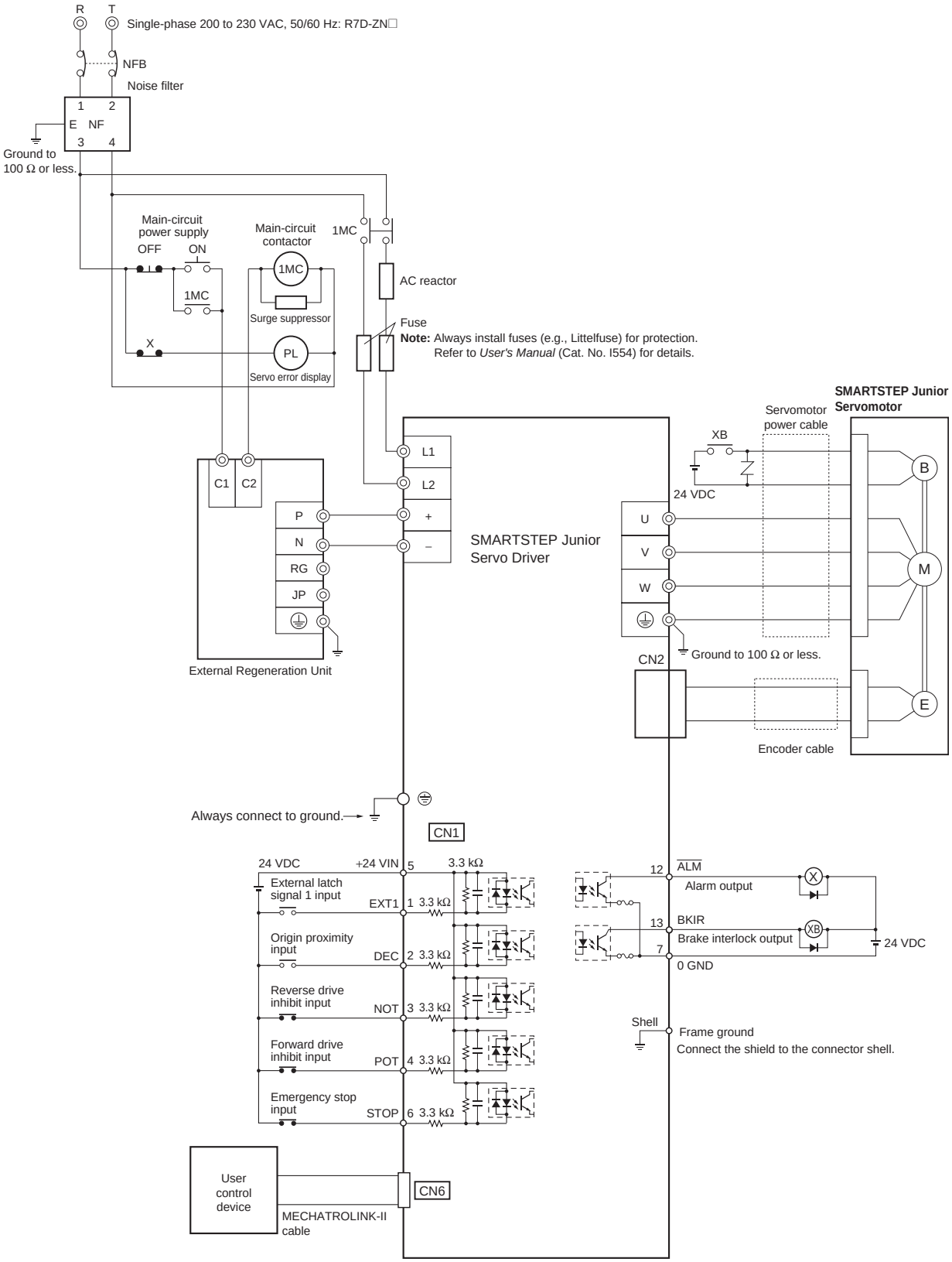
Backlash: 3 Arcminutes Max.

Motor capacity	Gear ratio	Model (R7G-)	Rated speed	Rated torque	Ratio	Maximum momentary speed	Maximum momentary torque	Decelerator inertia	Allowable radial load	Allowable thrust load
			r/min	N·m	%	r/min	N·m	kg·m²	N	N
100 W	1/5	VRSFPB05B100	600	1.19	75	900	3.60	4.08×10^{-6}	392	196
	1/9	VRSFPB09B100	333	2.29	80	500	6.91	3.43×10^{-6}	441	220
	1/15	VRSFPB15B100	200	3.82	80	300	11.5	3.62×10^{-6}	588	294
	1/25	VRSFPB25C100	120	6.36	80	180	19.2	3.92×10^{-6}	1323	661
200 W	1/5	VRSFPB05B200	600	2.71	85	900	8.12	1.53×10^{-5}	392	196
	1/9	VRSFPB09C400	333	3.78	66	500	11.3	2.68×10^{-5}	931	465
	1/15	VRSFPB15C400	200	6.31	66	300	18.9	2.71×10^{-5}	1176	588
	1/25	VRSFPB25C200	120	11.1	70	180	33.4	2.67×10^{-5}	1323	661
400 W	1/5	VRSFPB05C400	600	5.40	85	900	16.2	3.22×10^{-5}	784	392
	1/9	VRSFPB09C400	333	9.49	83	500	28.5	2.68×10^{-5}	931	465
	1/15	VRSFPB15C400	200	15.8	83	300	47.6	2.71×10^{-5}	1176	588
	1/25	VRSFPB25D400	120	26.4	83	180	79.3	2.79×10^{-5}	1617	808
750 W	1/5	VRSFPB05C750	600	10.8	90	900	32.0	7.17×10^{-5}	784	392
	1/9	VRSFPB09D750	333	18.3	85	500	54.3	6.50×10^{-5}	1176	588
	1/15	VRSFPB15D750	200	30.5	85	300	90.5	7.09×10^{-5}	1372	686
	1/25	VRSFPB25E750	120	50.8	85	180	151	7.05×10^{-5}	2058	1029

Backlash: 45 Arcminutes Max.

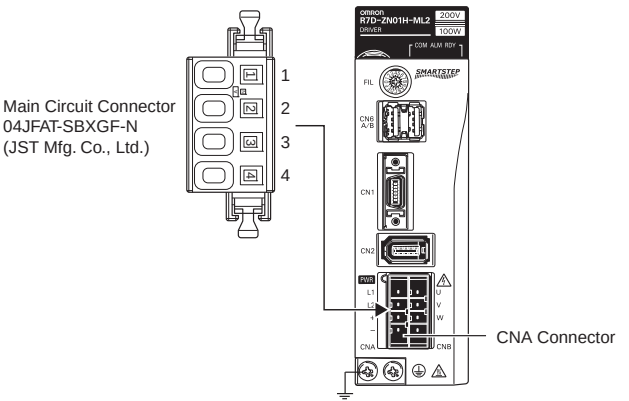
Motor capacity	Gear ratio	Model (R7G-)	Rated speed	Rated torque	Ratio	Maximum momentary speed	Maximum momentary torque	Decelerator inertia	Allowable radial load	Allowable thrust load
			r/min	N·m	%	r/min	N·m	kg·m²	N	N
100 W	1/5	RGSF05B100	600	1.19	75	900	3.60	4.08×10^{-6}	392	196
	1/9	RGSF09B100	333	2.29	80	500	6.91	3.43×10^{-6}	441	220
	1/15	RGSF15B100	200	3.82	80	300	11.5	3.62×10^{-6}	588	294
200 W	1/5	RGSF05B200	600	2.71	85	900	8.12	1.53×10^{-5}	392	196
	1/9	RGSF09C400	333	3.78	66	500	11.3	2.68×10^{-5}	931	465
	1/15	RGSF15C400	200	6.31	66	300	18.9	2.71×10^{-5}	1176	588
400 W	1/5	RGSF05C400	600	5.4	85	900	16.2	3.22×10^{-5}	784	392
	1/9	RGSF09C400	333	9.49	83	500	28.5	2.68×10^{-5}	931	465
	1/15	RGSF15C400	200	15.8	83	300	47.6	2.71×10^{-5}	1176	588

Connections



I/O Circuit Diagrams

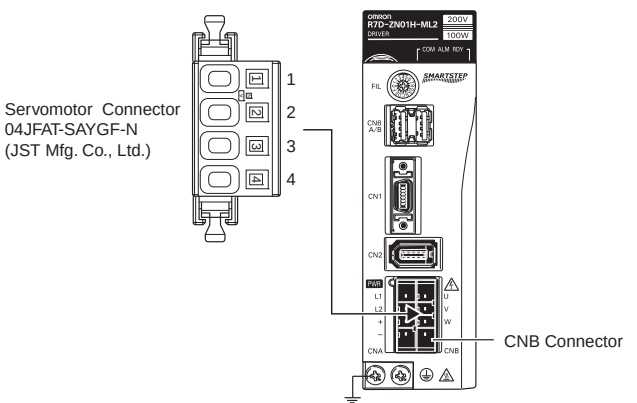
■ R7A-CNZ01P Main Circuit and Servomotor Connector Specifications (CNA)



● Main Circuit Connector (CNA) Pin Arrangement

Signal No.	Signal	Name	Function
1	L1	Main circuits power supply input	Single-phase 200/230 V AC (170 to 253 V AC) 50/60 Hz
2	L2		
3	+	External Regeneration Unit connection terminals	If regenerative energy is high, connect an External Regeneration Unit
4	–		
⏚	⏚	Frame ground	This is the ground terminal. Ground to a minimum of 100 Ω (class D, class 3).

■ R7A-CNZ01A (CNB) Servomotor Connector Specifications



● Servomotor Connector (CNB) Pin Arrangement

Signal No.	Signal	Name	Function	
1	U	Servomotor connection Terminals	Red	These are the output terminals to the Servomotor. Be careful to wire them correctly.
2	V		White	
3	W		Blue	
4	–	---	Do not connect anything to this terminal.	
⏚	⏚	Frame ground	Green/Yellow	Connect the Servomotor FG terminal.

■ Control I/O Signals

● CN1 Control Inputs

Pin No.	Signal name	Name	Function/Interface
1	EXT1	External latch signal 1 input	Functions as an origin signal during origin search, and as an interrupt signal during interrupt feeding.
2	DEC	Origin proximity input	Deceleration input during origin search
3	NOT	Reverse drive inhibit input	Reverse rotation overtravel input
4	POT	Forward drive inhibit input	Forward rotation overtravel input
5	+24 VIN	+24-V power supply input for control DC	24-VDC power supply input terminal for sequence inputs (pin 6)
6	STOP	Emergency stop input	ON: Servo OFF (Stops power to Servomotor.)

● CN1 Control Outputs

Pin No.	Signal name	Name	Function/Interface
12	$\overline{\text{ALM}}$	Alarm output	When the Servo Drive generates an alarm, the output turns OFF. **Note:** OFF for approx. 2 s after the power is turned ON.
13	BKIR	Brake interlock output	Outputs the holding brake timing signals. Release the holding brake when this signal is ON.
7	0GND	Output ground common	Ground common for sequence outputs (pins 12 and 13).

Note: An open-collector output interface is used for sequence outputs (maximum operating voltage: 30 V DC; maximum output current: 50 mA).

■ CN1 Connectors (14P)

● Soldered Connectors

Name	Model	Manufacturer
Cable plug	10114-3000VE	Sumitomo 3M
Cable case (shell kit)	10314-52A0-008	

■ Encoder Connector Specifications (CN2)

Pin No.	Signal	Name
1	E5V	Encoder power supply, +5 V
2	E0V	Encoder power supply, GND
3	Phase A+	Encoder phase +A input
4	Phase A–	Encoder phase –A input
5	Phase B+	Encoder phase +B input
6	Phase B–	Encoder phase –B input
7	Phase Z	Encoder phase Z input
8	Phase U	Pole sensor phase U input
9	Phase V	Pole sensor phase V input
10	Phase W	Pole sensor phase W input
Shell	FG	Shield ground

■ Connectors for CN2 (10-pin)

● Crimped Connector

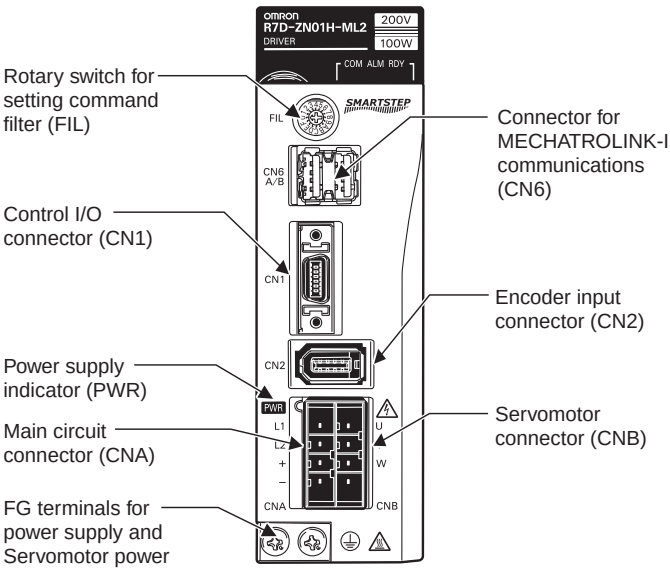
Name	Model	Manufacturer
Plug, Cable, and Cover Set	54559-1005	Molex Japan Co.
Plug Housing	51209-1001	
Crimp Terminal	59351-8187 (Loose wire)	
Crimping Tool	57401-5300	

● Soldered Connector

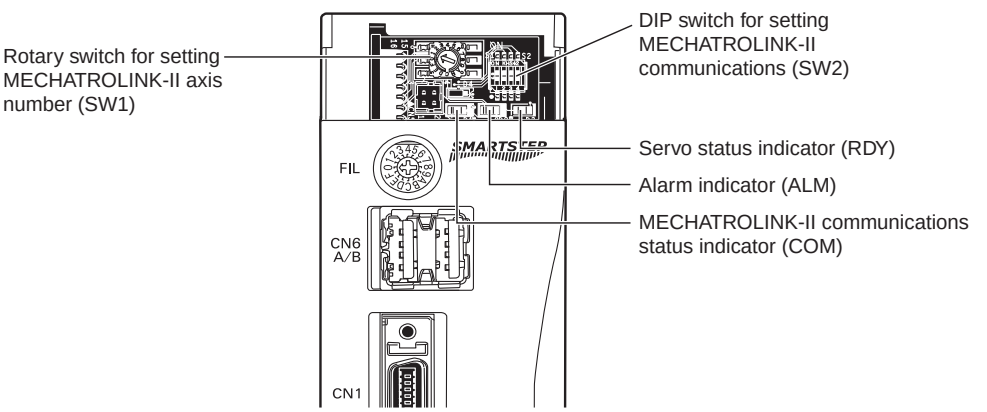
Name	Model	Manufacturer
Plug, Cable, and Cover Set	54599-1019	Molex Japan Co.
Plug Connector	51593-1019	

Components and Functions

● Servo Drive Nomenclature



With Top Cover Open



● Rotary Switch for Setting Command Filter (FIL)

This switch does not need to be set if the machine is not subject to vibration.
It can be set as a troubleshooting method if overshooting or other problems occur. (The switch is factory-set to 0.)

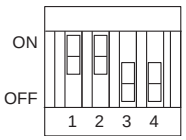
Filter setting (See note 1.)	Acceleration/deceleration time for STEP command (See note 2.)	Approx. time from end of command to end of positioning (settling time) (See note 3.)	Description
0	45 ms	100 to 200 ms	↑ Smaller filter time constant (short positioning time)
1	50 ms	110 to 220 ms	
2	60 ms	130 to 260 ms	
3	65 ms	150 to 300 ms	
4	70 ms	170 to 340 ms	
5	80 ms	200 to 400 ms	
6	85 ms	250 to 500 ms	
7	170 ms	500 to 1000 ms	↓ Larger filter time constant (longer positioning time with little vibration)
8 to F	Do not set this switch to 8 to F.		

Note: 1. Increase the value of the filter setting if there is vibration when starting or stopping.
2. Use the acceleration/deceleration times as a guideline for determining the Servomotor capacity that can be driven when using STEP commands without commanded acceleration/ deceleration.
3. The settling time depends on the commanded acceleration/deceleration, the rigidity of the machine motor drive, the encoder resolution, and other factors.

● DIP Switch (SW2) for MECHATROLINK-II Communications Settings

MECHATROLINK-II communications specifications are set using the DIP switch (SW2) for MECHATROLINK-II communications settings. The settings are shown in the following table. Changes to the settings go into effect after the power is turned ON.

Bit	Name	Setting	Contents	Factory setting
Bit 1	Reserved for system	ON	---	ON
Bit 2	Reserved for system	ON	---	ON
Bit 3	Axis No. setting	OFF	Axis No. 15 max.	OFF
		ON	Axis No. 16 min.	
Bit 4	Filter setting selection	OFF	Enables or disables the rotary switch for setting the command filter (FIL).	OFF



SW2 (factory settings)

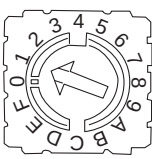
● Filter Setting Selection

There are two methods for setting the command filter, as shown below. The selection is made using SW2 bit 4.

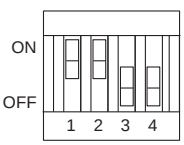
SW2, bit 4	Specifications
OFF	Set using the rotary switch for setting the command filter (FIL). (Factory setting)
ON	Set using Pn00A. (Disables the rotary switch for setting the command filter.)

● MECHATROLINK-II Axis Number Rotary Switch (SW1)

The axis number is set as shown below, using the rotary switch for setting the MECHATROLINK-II axis number (SW1) and the DIP switch for setting MECHATROLINK-II communications (SW2, bit 3).



SW1 (factory setting)



SW2 (factory settings)

SW2, bit 3	SW1	Axis No.	SW2, bit 3	SW1	Axis No.
OFF	0	Not valid	ON	0	16
	1	1		1	17
	2	2		2	18
	3	3		3	19
	4	4		4	20
	5	5		5	21
	6	6		6	22
	7	7		7	23
	8	8		8	24
	9	9		9	25
	A	10		A	26
	B	11		B	27
	C	12		C	28
	D	13		D	29
	E	14		E	30
	F	15		F	31

Parameter

● Function Selection Parameters (from Pn000)

Parameter name	Description
Function selection basic switches	Reverse rotation
Command filter setting (See note.)	Set when there is a problem such as overshooting.

Note: The setting method is the same as with the command filter setting rotary switch (FIL).

● Position Control Parameters (from Pn200)

Parameter name	Description
Electronic gear ratio G1 (Numerator)	Sets the pulse rate for the command pulses and Servomotor travel distance. 0.01 ≤ Pn20E/Pn210 ≤ 100
Electronic gear ratio G2 (Denominator)	

● Speed Control Parameters (from Pn300)

Parameter name	Description
Jog speed	Sets the rotation speed for jog operation.

● Sequence Parameters (from Pn500)

Parameter name	Description
Input signal selection 1	POT signal allocation
Input signal selection 2	NOT signal allocation
Input signal selection 7	STOP signal allocation
Positioning completion width 1	Sets the positioning completion output 1 width.
Positioning completion width 2	Sets the positioning completion output 2 width.

● Other Parameters (from Pn800)

Parameter name	Description
	Digit No.
Communications control	Warning check mask
Function selection application 6 (Software LS)	Software limit function
Zero point width	Sets the origin position output range.
Forward software limit	Sets the software limit in the forward direction.
Reverse software limit	Sets the software limit in the reverse direction.
Linear acceleration constant	Sets the acceleration.
Linear deceleration constant	Sets the deceleration.
Final travel distance for external positioning	Sets the distance from the interrupt signal (EXT1) input position during interrupt feeding. (See note 1.)
Zero point return mode settings	Zero point return direction
Zero point return approach speed 1	Sets the speed for after the origin proximity input signal turns ON during an origin search.
Zero point return approach speed 2	Sets the speed for finding the origin after the origin proximity input signal turns ON and OFF during an origin search.
Final travel distance to return to zero point	Sets the distance from the phase-Z signal or external latch signal 1 (EXT1) input position to the origin during an origin search. (See note 2.)

Note: 1. In the negative direction, or when the distance is short, the rotation is reversed after decelerating to a stop.

2. In the origin search or reverse direction, or when the distance is short, the rotation is reversed after decelerating to a stop.

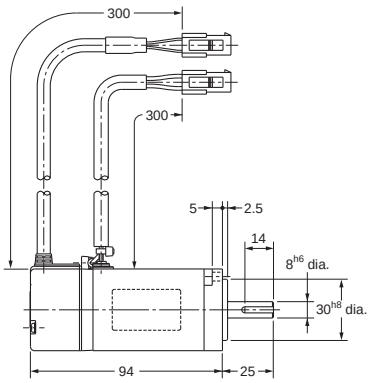
Dimensions

(Unit: mm)

● AC Servomotors

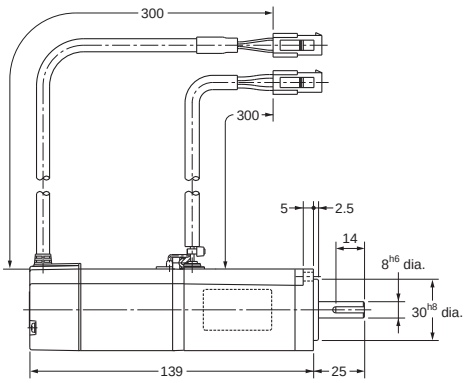
• 100-W Servomotor without Brake
R7M-Z10030-S1

R7M-Z10030-S1 Without brake

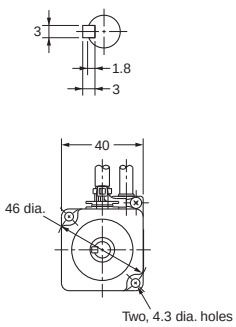


• 100-W Servomotor with Brake
R7M-Z10030-BS1

R7M-Z10030-BS1 With brake



Shaft End Dimensions

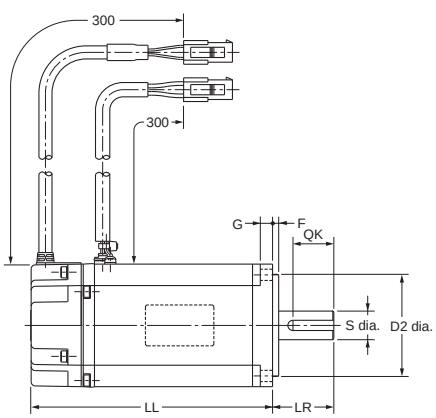


• 200-W/400-W/750-W Servomotors without Brakes
R7M-Z20030-S1/-Z40030-S1/-Z75030-S1

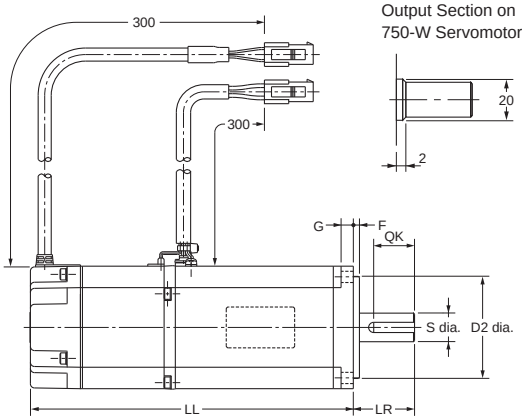
• 200-W/400-W/750-W Servomotors with Brakes
R7M-Z20030-BS1/-Z40030-BS1/-Z75030-BS1

Dimensions (mm)	LL		LR	Flange						Shaft end	
Model	Without brake	With brake		C	D1	D2	F	G	Z	S	QK
R7M-Z20030-□S1	95.5	135.5	30	60	70	50h8	3	6	Four, 5.5 dia.	14h6	20
R7M-Z40030-□S1	118.5	158.5									
R7M-Z75030-□S1	133	176	40	80	90	70h8		8	Four, 7 dia.	16h6	30

R7M-Z□□□30-S1 Without brake

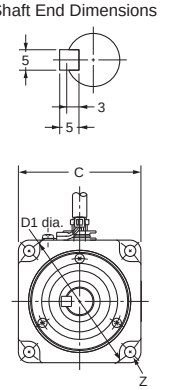


R7M-Z□□□30-BS1 With brake



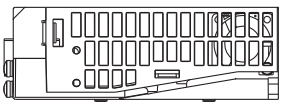
Output Section on 750-W Servomotor

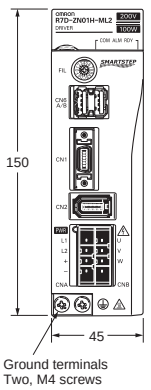
Shaft End Dimensions

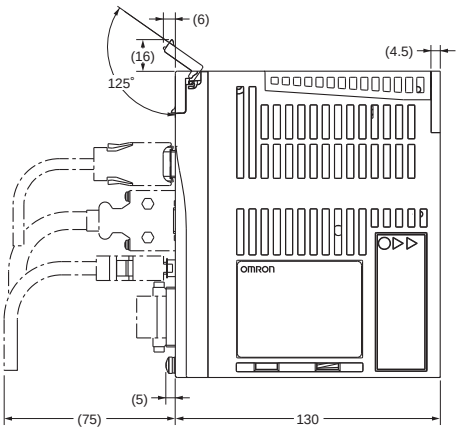


● AC Servo Drives

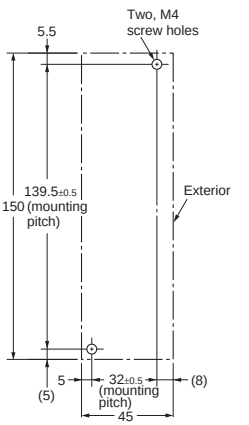
• 200 VAC: 100 W/200 W/400 W
R7D-ZN01H-ML2/-ZN02H-ML2/-ZN04H-ML2



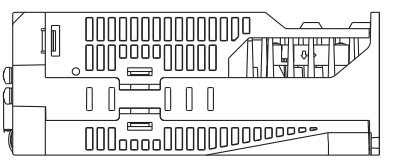


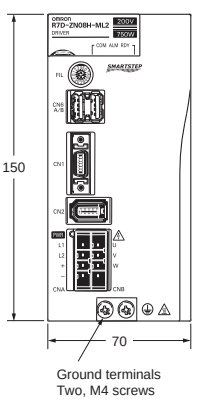


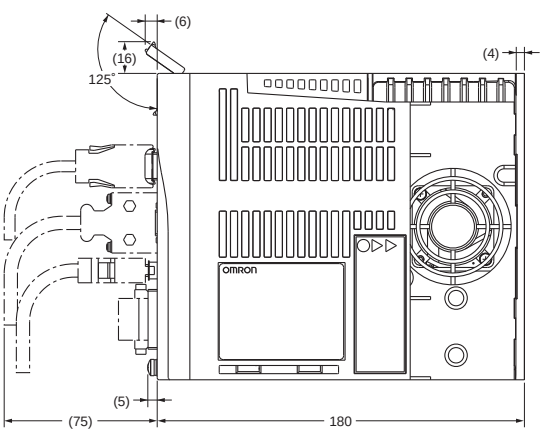
Mounting Hole Dimensions



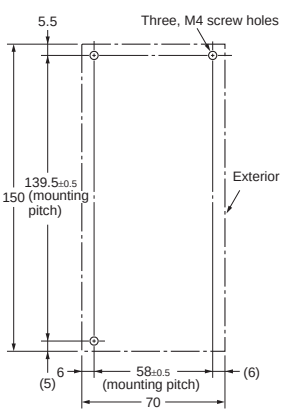
• 200 VAC: 750 W
R7D-ZN08H-ML2







Mounting Hole Dimensions

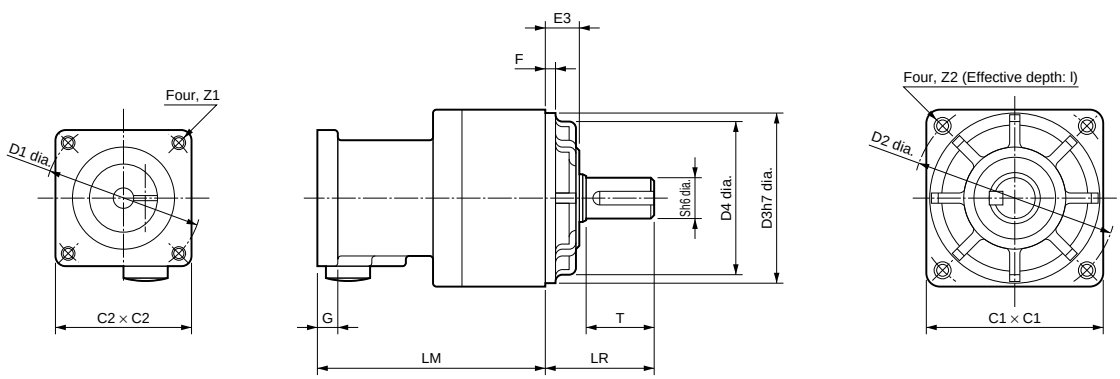


● **Decelerators**

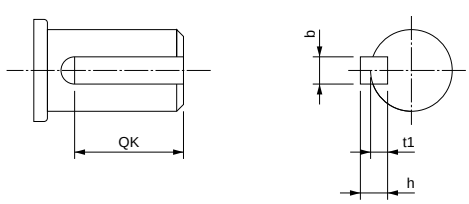
For Cylinder-type Motors (Backlash: 3 Arcminutes Max.)

Model			Dimensions (mm)																Key dimensions				Weight (kg)
			LM	LR	C1	C2	D1	D2	D3	D4	E3	F	G	S	T	Z1	Z2	l	QK	b	h	t1	
100 W	1/5	R7G-VRSFPB05B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/9	R7G-VRSFPB09B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/15	R7G-VRSFPB15B100	78	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.7
	1/25	R7G-VRSFPB25C100	92	50	78	40	46	90	70	62	17	3	6	19	30	M4	M6	20	22	6	6	3.5	1.7
200 W	1/5	R7G-VRSFPB05B200	72.5	32	52	60	70	60	50	45	10	3	10	12	20	M5	M5	12	16	4	4	2.5	0.72
	1/9	R7G-VRSFPB09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-VRSFPB15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
	1/25	R7G-VRSFPB25C200	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
400 W	1/5	R7G-VRSFPB05C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/9	R7G-VRSFPB09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-VRSFPB15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
	1/25	R7G-VRSFPB25D400	104	61	98	60	70	115	90	75	18	5	8	24	40	M5	M8	20	30	8	7	4	3.2
750 W	1/5	R7G-VRSFPB05C750	93.5	50	78	80	90	90	70	62	17	3	10	19	30	M6	M6	20	22	6	6	3.5	2.1
	1/9	R7G-VRSFPB09D750	97.5	61	98	80	90	115	90	75	18	5	10	24	40	M6	M8	20	30	8	7	4	3.4
	1/15	R7G-VRSFPB15D750	110	61	98	80	90	115	90	75	18	5	10	24	40	M6	M8	20	30	8	7	4	3.8
	1/25	R7G-VRSFPB25E750	135	75	125	80	90	135	110	98	17	5	10	32	55	M6	M10	20	45	10	8	5	7.2

Dimensions



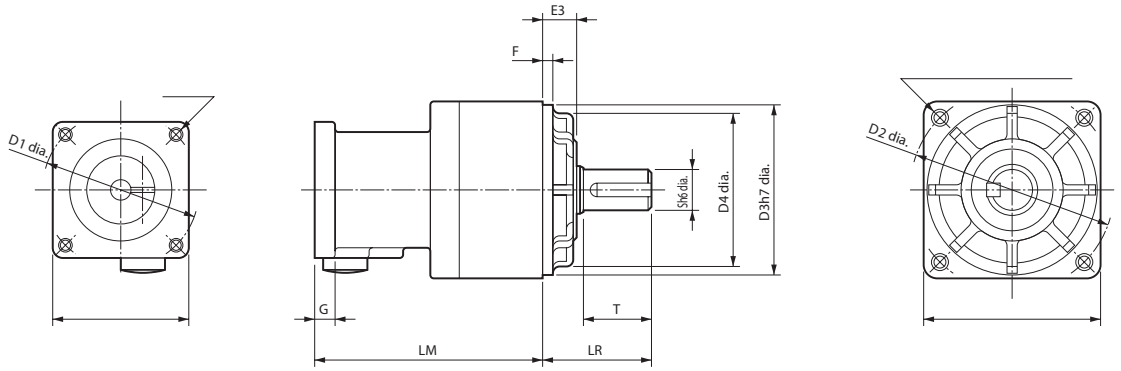
Key dimensions

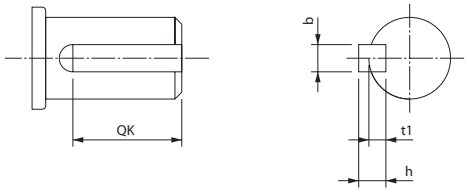


For Cylinder-type Motors (Backlash: 45 Arcminutes Max.)

Model			Dimensions (mm)																			Weight (kg)
			LM	LR	C1	C2	D1	D2	D3	D4	E3	F	G	S	T	Z1	Z2	I	Key dimensions				
																			QK	b	h	t1	
100 W	1/5	R7G-RGSF05B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/9	R7G-RGSF09B100	67.5	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.55
	1/15	R7G-RGSF15B100	78	32	52	40	46	60	50	45	10	3	6	12	20	M4	M5	12	16	4	4	2.5	0.70
200 W	1/5	R7G-RGSF05B200	72.5	32	52	60	70	60	50	45	10	3	10	12	20	M5	M5	12	16	4	4	2.5	0.72
	1/9	R7G-RGSF09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-RGSF15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1
400 W	1/5	R7G-RGSF05C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/9	R7G-RGSF09C400	89.5	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	1.7
	1/15	R7G-RGSF15C400	100	50	78	60	70	90	70	62	17	3	8	19	30	M5	M6	20	22	6	6	3.5	2.1

Dimensions





Related Manuals

English Cat. No.	Japanese Cat. No.	Type	Name
I544	SBCE-344	R7M-Z/R7D-ZN □-ML2	AC Servomotors/Drive SMARTSTEP Junior
—	SBCE-053	R7D-BP/R88M-GT/R7D-Z/ R7D-A/R88D- W	Moter Selection Program OMNUC G/W series SMARTSTEP2/Junior/A series CD-ROM