

R7D-BP□, R88D-GP08H

SmartStep 2 servo drive

AC Servo systems

Another step forward in drive simplicity

- On-line Auto-tuning and Easy set up
- Ultra-compact size. The footprint is only 48% that of the SmartStep series
- Two torque limits
- Electronic gear, four internal speed settings and wide range of pulse settings
- Adaptive filters for suppression of vibration and resonance
- Configuration and commissioning using CX Drive-software

Ratings

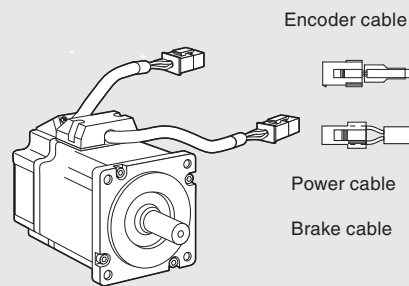
- 230 VAC single-phase 50 W to 750 W (0.16 to 2.4 Nm)



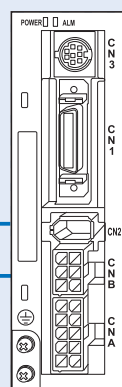
System configuration

(Refer to G-Series servomotors chapter)

G-Series servo motor



SmartStep 2 servo drive



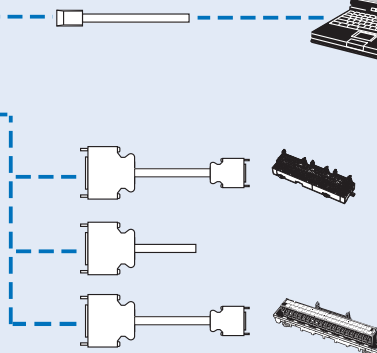
Personal computer software: CX-One





Position control unit



Connector terminal block
General purpose controller
(with pulse output)



Servo motor / servo drive combination

		Servo motor					SmartStep2 servo drive
Family		Voltage	Speed	Rated torque	Capacity	Model	
Cylindric	50 -750 W 	230 V	3000 min ⁻¹	0.16 Nm	50 W	R88M-G05030H-□S2	R7D-BP01H
				0.32 Nm	100 W	R88M-G10030H-□S2	R7D-BP01H
				0.64 Nm	200 W	R88M-G20030H-□S2	R7D-BP02HH
				1.3 Nm	400 W	R88M-G40030H-□S2	R7D-BP04H
				2.4 Nm	750 W	R88M-G75030H-□S2	R88D-GP08H
Flat	100-400 W 			0.32 Nm	100 W	R88M-GP10030H-□S2	R7D-BP01H
				0.64 Nm	200 W	R88M-GP20030H-□S2	R7D-BP02HH
				1.3 Nm	400 W	R88M-GP40030H-□S2	R7D-BP04H

Servo drive type designation

R7D-BP01H

SmartStep 2
Servo Drive

Drive Type

P: Pulse input control

Capacity

01	100 W
02	200 W
04	400 W

Source voltage

- H: Single-phase
230 VAC for 100/400 W
- HH: Single-phase
230 VAC for 200 W

R88D-GP08H

SmartStep 2
Servo Drive (750 W)

Drive Type

P: Pulse input control

Capacity

08	750 W
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Source voltage

- H: 230 V

Servo drive specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 55°C
Ambient operating humidity	90% max. (with no condensation)
Ambient storage temperature	-20 to 65°C
Ambient storage humidity	90% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases.
Vibration resistance	10 to 60 Hz; acceleration : 5.9 m/s ² (0.6G) max.
Impact resistance	Acceleration 19.6 m/s ² max., 3 times each in X, Y, and Z directions,
Insulation resistance	Between power supply/power line terminals and frame ground: 0.5 MΩ min. (at 500 VDC)
Dielectric strength	Between power supply/power terminals and frame ground: 1,500 VAC for 1 min at 50/60 Hz Between each control signal and frame ground: 500 VAC for 1 min
Protective structure	Built into panel (IP10).
International standards	Approval obtained for UL: UL 508C; cUL: cUL C22.2 No 14 Approval EC : EMC EN55011 class A Group 1, EN 61000-6-2, low voltage EN50178

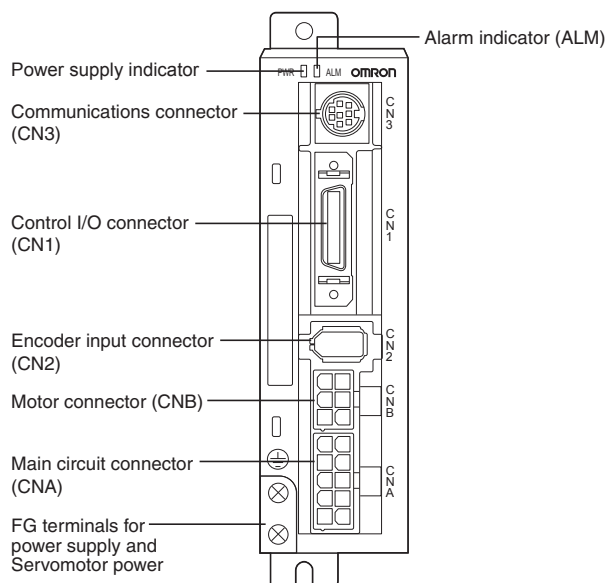
AC Servo systems

Performance specifications

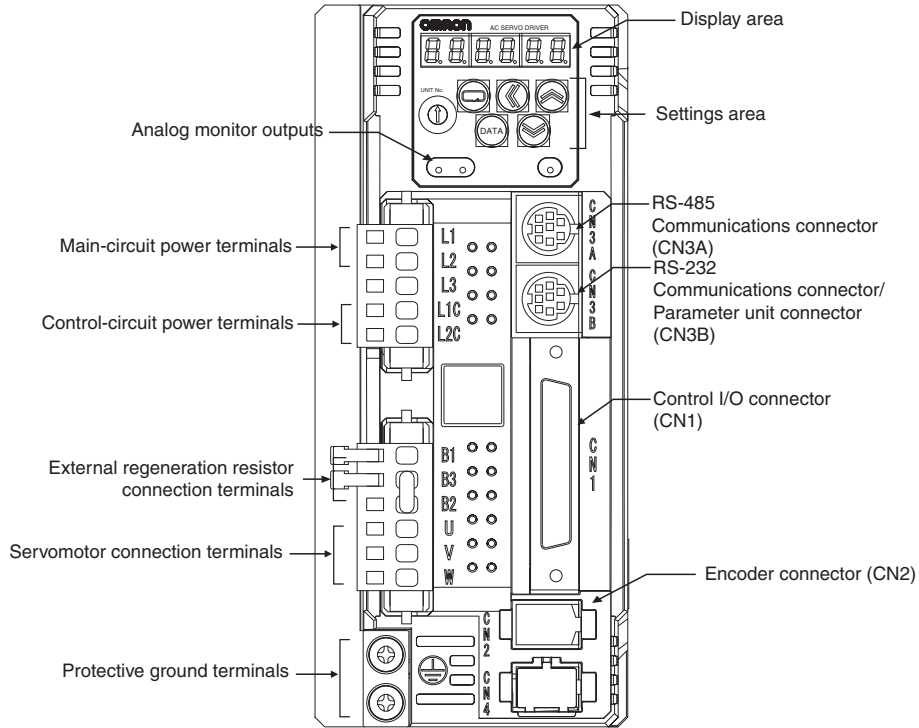
Item	200 VAC input type			
	100 W R7D-BP01H	200 W R7D-BP02HH	400 W R7D-BP04H	750 W R88D-GP08H
Continuous output current (rms)	1.0 A	1.6 A	2.5 A	4 A
Momentary maximum output current (rms)	3.3 A	4.9 A	7.8 A	14.1 A
Main-circuit power supply	Single-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz			Single-phase/three-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz
Control circuit input power	-			Single-phase 200 to 240 VAC (170 to 264 V)
Control method	All-digital method			
Feedback	10,000 pulses/revolution incremental encoder			
Inverter method	PWM method based on IGBT			
PWM frequency	12 kHz		6 kHz	
Weight	0.35 kg	0.42 kg	0.42 kg	1.5 kg
Compatible motor voltage	200 V			
Command pulse response	Line drive: 500 kpps			
Compatible motor capacity	50 W 100 W	200 W	400 W	750 W
Applicable servo motor (R88M-)	G05030H G10030H GP10030H	G020030H GP20030H	G40030H GP40030H	G75030H

Servodrive part names

SmartStep2 Servo Drive (100 - 400 W models)



SmartStep2 Servo Drive (750 W model)

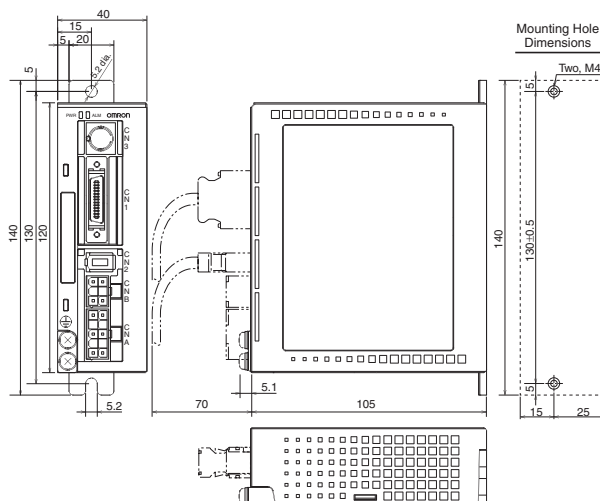
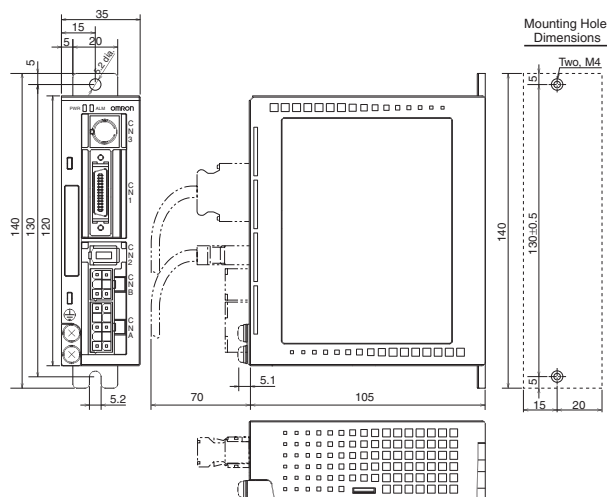


Dimensions

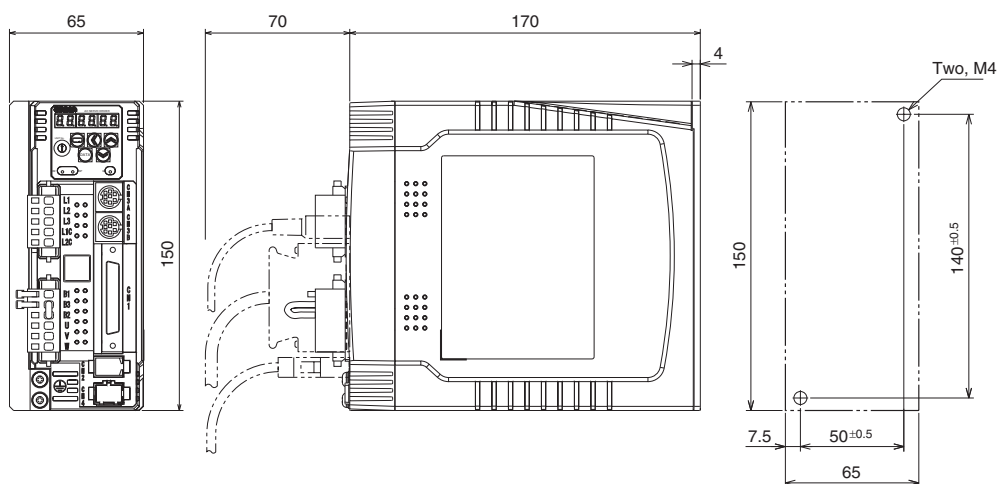
Servo drives

R7D-BP01H (230 V, 100 W)

R7D-BP02HH/04H (230 V, 200-400 W)



R88D-GP08H (230 V, 750 W)

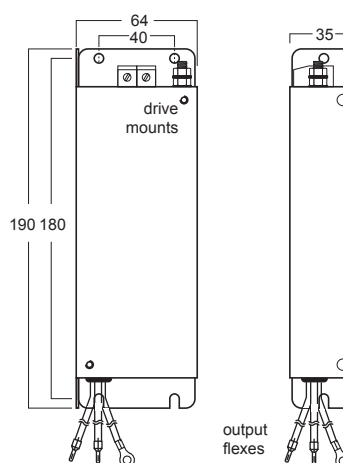
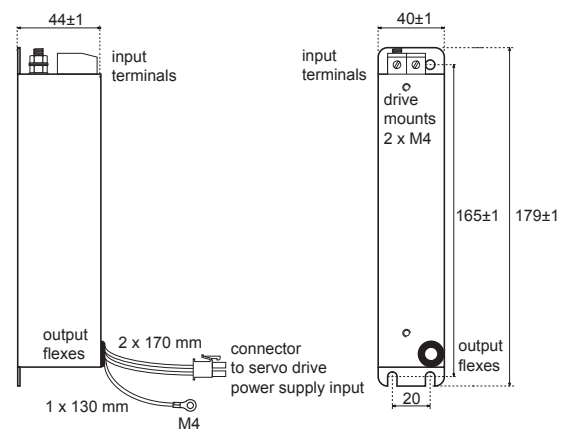


AC Servo systems

Filters

R7A-FIB104-RE

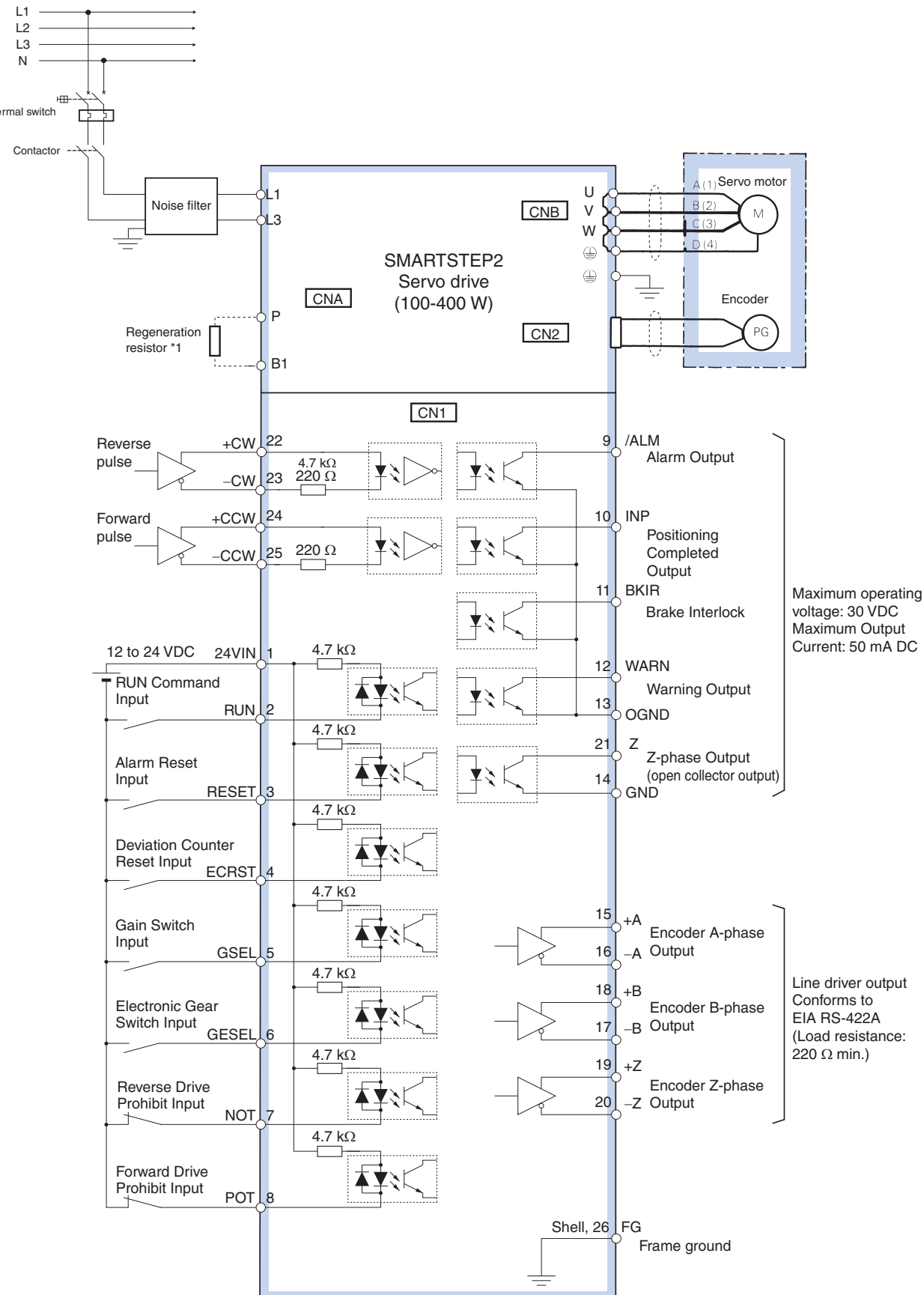
R88A-FIK107-RE



Filter model	Rated current	Leakage current	Rated voltage
R7A-FIB104-RE	4 A	3.5 mA	250 VAC single-phase
R88A-FIK107-RE	6.6 A	3.5 mA	250 VAC single-phase

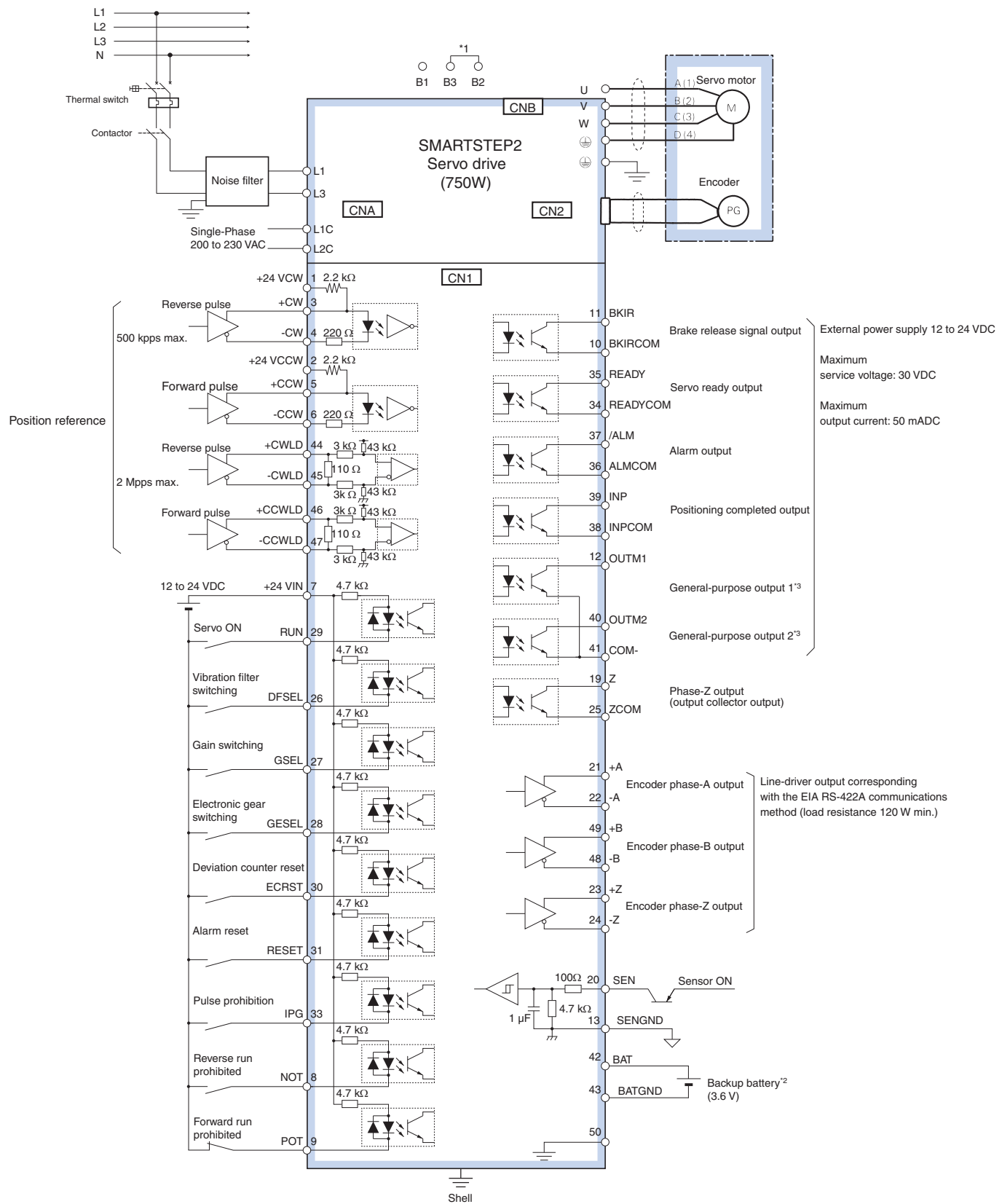
Installation

Single-phase, 230 VAC



An External Regeneration Resistor can be connected. Connect this resistor if the regenerative energy exceeds regeneration absorption capacity in the Servo Drive.

- 1. The dynamic brake operates when the main circuit power supply or the control circuit power supply is turned OFF.
- 2. When turning OFF the main circuit power supply, turn OFF the RUN Command Input (RUN) signal at the same time.



*1 B3-B2 are short-circuited. If the internal regenerative resistor is insufficient, remove the wire between B2 and B3 and connect an external regenerative resistor between B1 and B2.

*2 Use only when an absolute encoder. If a backup battery is connected, an encoder cable with a battery is not required.

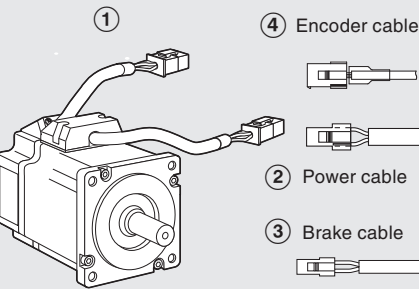
*3 The default values are ZSP (zero-speed detection) for OUTM1 and T-LIMIT (at torque limit) for OUTM2.

Ordering information

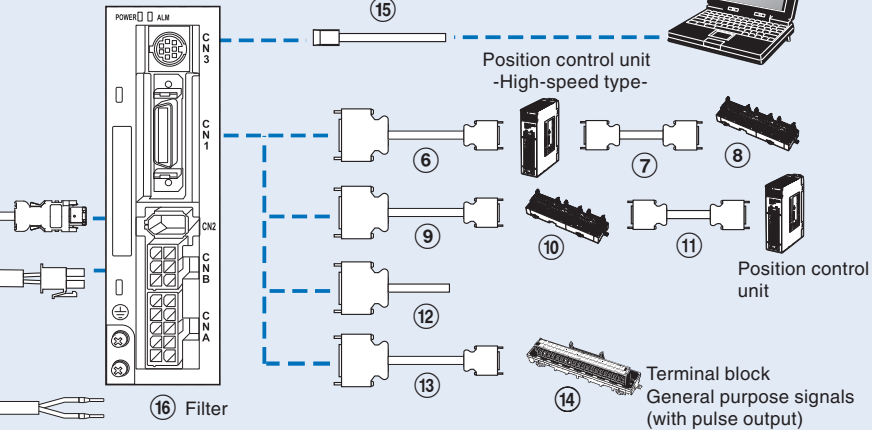
SmartStep2 Servo Drive Configuration (100-400 W)

Refer to G-Series servo motors chapter

G-Series Servo motor



⑤ SmartStep 2 Servo drive (100-400W models)



Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a SmartStep 2 servo system

Servo motor

Note: ①②③④ refer to G-Series motor chapter for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		SmartStep 2 drive model	Compatible servo motors ①	
				Cylindrical type	Flat type
)	200 VAC	100 W	R7D-BP01H	R88M-G05030H-□	-
		200 W	R7D-BP02HH	R88M-G10030H-□	R88M-GP10030H-□
		400 W	R7D-BP04H	R88M-G20030H-□	R88M-GP20030H-□
				R88M-G40030H-□	R88M-GP40030H-□

Power Supply cables (for CNA)

Symbol	Specifications	Model	Appearance
)	Power Supply Input Cable for Single-Phase Power (connectors attached)	R7A-CLB002S2	

Control cables (for CN1)

Symbol	Description	Connect to		Model
)	Control cable (line-driver output for 1 axis)	Position control unit (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G12
			5 m	XW2Z-500J-G12
			10 m	XW2Z-10MJ-G12
	Control cable (open-collector output for 1 axis)	Position control unit (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G16
			3 m	XW2Z-300J-G16
	Control cable (line-driver output for 2 axis)	Position control unit (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G4
			5 m	XW2Z-500J-G4
			10 m	XW2Z-10MJ-G4
	Control cable (open-collector output for 2 axis)	Position control unit (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G8
			3 m	XW2Z-300J-G8
)	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m	XW2Z-C50X
			1 m	XW2Z-100X
			2 m	XW2Z-200X
			3 m	XW2Z-300X
			5 m	XW2Z-500X
			10 m	XW2Z-010X
)	Terminal block for external signals (with M3 screw and for pin terminals)		-	XW2B-20G4
	Terminal block ext. signals (with M3.5 screw and for fork/round terminals)		-	XW2B-20G5
	Terminal block ext. signals (with M3 screw and fork/round pin terminals)		-	XW2D-20G6

Symbol	Description	Connect to	Length	Model
⑨	Cable from servo relay unit to servo drive	CS1W-NC1□3, CJ1W-NC1□3, C200HW-NC113, CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3, C200HW-NC213/413, CQM1H-PLB21 or CQM1-CPU43-V1	1 m	XW2Z-100J-B29
			2 m	XW2Z-200J-B29
		CJ1M-CPU21/22/23	1 m	XW2Z-100J-B32
			2 m	XW2Z-200J-B32
⑩	Servo relay unit	CS1W-NC1□3, CJ1W-NC1□3 or C200HW-NC113 position control unit	-	XW2B-20J6-1B (1 axis)
			-	XW2B-40J6-2B (2 axes)
		CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3 or C200HW-NC213/413 position control unit	-	XW2B-20J6-3B (1 axis)
			-	XW2B-20J6-8A (1 axis)
		CJ1M-CPU21/22/23	-	XW2B-40J6-9A (2 axes)
⑪	Position control unit connecting cable	CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CS1W-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
		CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
⑫	General purpose cable	For general purpose controllers	1 m	R7A-CPB001S
			2 m	R7A-CPB002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B28
			2 m	XW2Z-200J-B28
⑭	Terminal block (with M3 screw and for pin terminals)	-	XW2B-34G4	
	Terminal block (with M3.5 screw and for fork/round terminals)	-	XW2B-34G5	
	Terminal block (with M3 screw and fork/round pin terminals)	-	XW2D-34G6	

Cable for CN3

Symbol	Name	Length	Model
⑮	Personal Computer Monitor Cable	2 m	R88A-CCG002P2

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Filter model
⑯	R7D-BP01H/ 02HH/ 04H	4 A	1 pH, 230 V	R7A-FIB104-RE

Connectors

Specifications	Model
Main Circuit Connector (CNA)	R7A-CNB01P
Servomotor Connector (CNB)	R7A-CNB01A
Control I/O Connector (CN1)	R88A-CNW01C
Encoder Input Connector (CN2)	R88A-CNW01R
Servomotor Connector for Encoder Cable	R88A-CNG02R
Servomotor Connector for Servomotor Power Cable	R88A-CNG01A
Brake Cable Connector	R88A-CNG01B

External regeneration resistor cable

Specifications	Model
External Regenerative Resistor Connection Cable, 2 meters	R7A-CLB002RG

Parameter unit & computer software

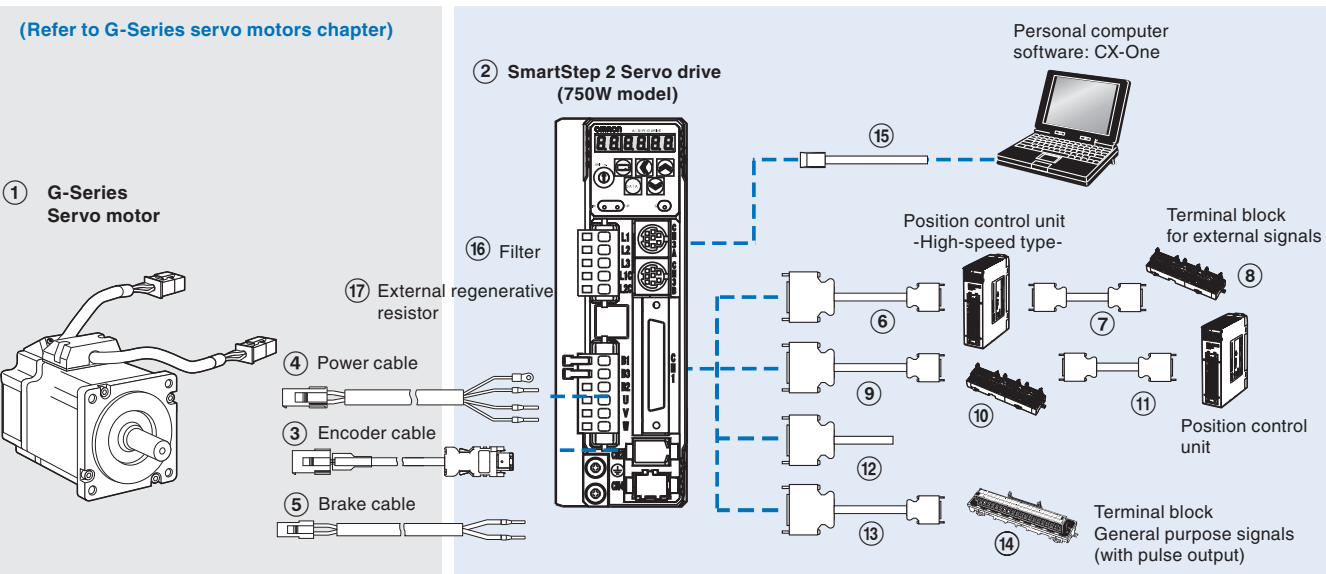
Specifications	Model
Parameter copy unit (with cable)	R88A-PR02G
Configuration and monitoring software tool for servo drives and inverters. (CX-drive version 1.8 or higher)	CX-drive

External regeneration resistor

Specification	Model
80 W, 50 Ω	R88A-RR08050S
80 W, 100 Ω	R88A-RR080100S
220 W, 47 Ω	R88A-RR22047S

SmartStep2 Servo Drive Configuration (750W)

(Refer to G-Series servo motors chapter)



Note: The symbols ①②③④⑤... show the recommended sequence to select the components in a SmartStep 2 servo system.

Servo motor

Note: ①③④⑤ refer to G-Series motor chapter for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		Servo drive model	① Compatible rotary servo motors
				Cylindric type
○	1 phase 200 VAC	750 W	R88D-GP08H	R88M-G75030H-□

Control cables (for CN1)

Symbol	Description	Connect to	Model
○	Control cable (line-driver output for 1 axis)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m XW2Z-100J-G9
			5 m XW2Z-500J-G9
			10 m XW2Z-10MJ-G9
			1 m XW2Z-100J-G13
○	Control cable (open-collector output for 1 axis)	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	3 m XW2Z-300J-G13
			1 m XW2Z-100J-G1
○	Control cable (line-driver output for 2 axis)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	5 m XW2Z-500J-G1
			10 m XW2Z-10MJ-G1
			1 m XW2Z-100J-G5
○	Control cable (open-collector output for 2 axis)	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	3 m XW2Z-300J-G5
			0.5 m XW2Z-C50X
○	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	1 m XW2Z-100X
			2 m XW2Z-200X
			3 m XW2Z-300X
			5 m XW2Z-500X
			10 m XW2Z-010X
			- XW2B-20G4
○	Terminal block for external signals (M3 screw, pin terminals)	-	XW2B-20G5
	Terminal block ext. signals(M3.5 screw, fork/round terminals)	-	XW2D-20G6
	Terminal block ext. signals(M3 screw, fork/round terminals)	-	
○	Cable from servo relay unit to servo drive	CS1W-NC1□3, CJ1W-NC1□3, C200HW-NC113/213/413, CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3 or CQM1H-PLB21	1 m XW2Z-100J-B25
			2 m XW2Z-200J-B25
			1 m XW2Z-100J-B31
			2 m XW2Z-200J-B31
○	Servo relay unit	CS1W-NC1□3, CJ1W-NC1□3 or C200HW-NC113 position control unit	- XW2B-20J6-1B (1 axis)
			- XW2B-40J6-2B (2 axes)
			- XW2B-20J6-3B (1 axis)
			- XW2B-20J6-8A (1 axis)
			- XW2B-40J6-9A (2 axes)

Symbol	Description	Connect to		Model
⑪	Position control unit connecting cable	CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 or C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 or C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
CJ1W-NC233/433	0.5 m	XW2Z-050J-A19		
	1 m	XW2Z-100J-A19		
CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33		
	1 m	XW2Z-100J-A33		
⑫	General purpose cable	For general purpose controllers	1 m	R88A-CPG001S
			2 m	R88A-CPG002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B24
			2 m	XW2Z-200J-B24
⑭	Terminal block (M3 screw and for pin terminals)	-	-	XW2B-50G4
	Terminal block (M3.5 screw and for fork/round terminals)	-	-	XW2B-50G5
	Terminal block (M3 screw and for fork/round terminals)	-	-	XW2D-50G6

Computer cable (for CN3)

Symbol	Name		Model
⑮	Computer cable RS232	2 m	R88A-CCG002P2

Filter

Symbol	Applicable servodrive	Filter model	Rated current	Leakage current	Rated voltage
⑯	R88D-GP08H	R88A-FIK107-RE	6.6 A	3.5 mA	250 VAC single-phase

External regenerative resistor

Symbol	Regenerative resistor unit model	Specifications
⑰	R88A-RR08050S	50 Ω, 80 W
	R88A-RR080100S	100 Ω, 80 W
	R88A-RR22047S	47 Ω, 220 W
	R88A-RR50020S	20 Ω, 500 W

Connectors

Specifications	Model
I/O connector kit -50 pins- (for CN1)	R88A-CNU11C
Power cable connector (motor side)	R88A-CNG01A
Encoder connector (Servo drive side CN2)	R88A-CNW01R
Incremental encoder cable connector (motor side)	R88A-CNG02R

Computer software

Specifications	Model
Configuration and monitoring software tool for servo drives and inverters (CX-drive version 1.91 or higher).	CX-Drive

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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