

SANMOTION

CLOSED LOOP STEPPING SYSTEMS

Model No.PB



SANYO DENKI

Ver.6

Hybrid system combining the ease-of-use of stepping motors with the reliability of servomotors.

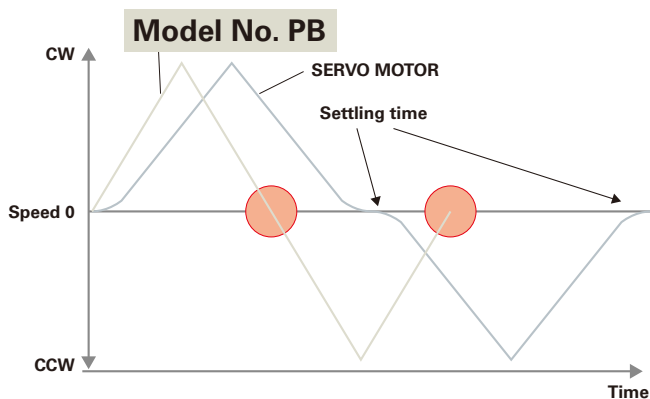


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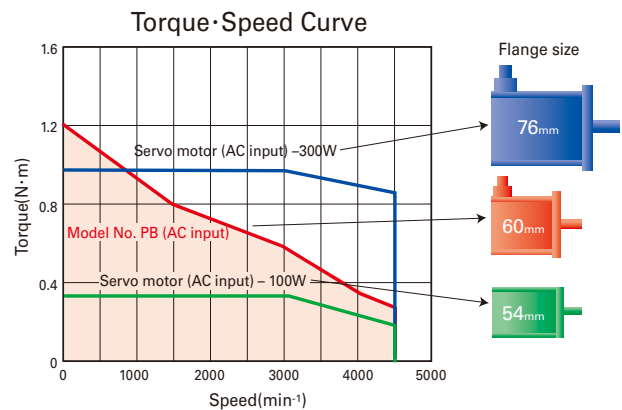
Increased System Speed and Smaller System Size

High Speed Positioning



High torque performance in the low speed range delivers shorter positioning time for short stroke at high hit rate applications.

Smaller System Size



Smaller system size is achievable for low speed applications due to the availability of higher torque performance in the low speed range as compared to conventional servomotors. With the AC power input type, motor torque has been increased by 50% compared with our conventional product.

AC Power Input

AC	Type R	General Purpose I/O Input Type (RS-485 + Parallel IO)
AC	Type P	Pulse-Train Input Type

DC Power Input

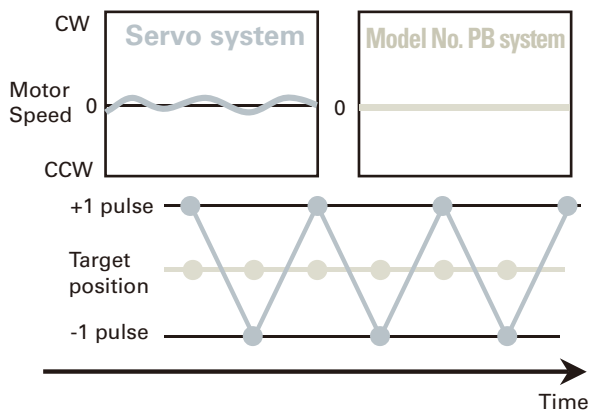
DC	Type M	Multiple Input Type (General Purpose I/O Input + Pulse-Train Input)
DC	Type R Multi Axis	General Purpose I/O Input Type (RS-485 + Parallel IO)

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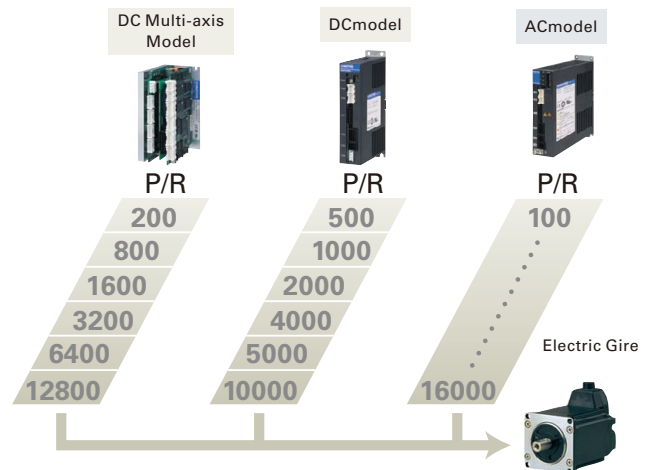
Stable Stand-Still

Stable Stand-Still



Complete stand-still motion is possible due to the availability of holding torque, a typical characteristic of stepping motors. With the AC power input type, a compensator function is built in to prevent position aberration from occurring due to load variation.

High Resolution



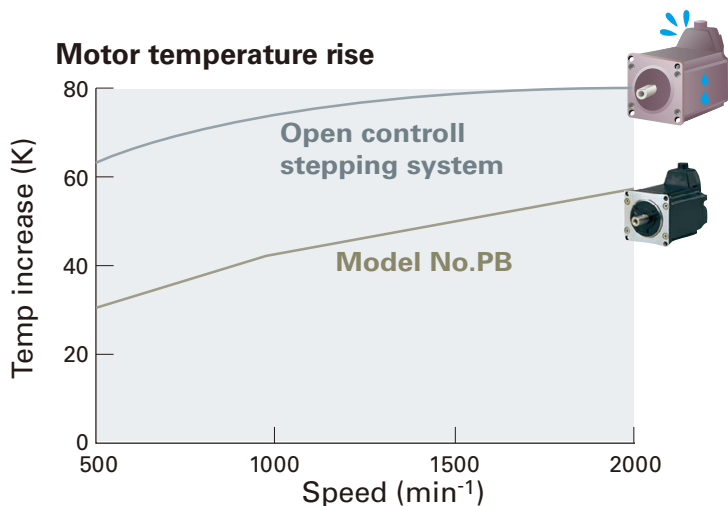
Able to set high resolutions. The AC model comes with electronic gear and enables users to set any resolution, according to the device.

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Energy-Saving

Improved Efficiency from Current Control



Higher efficiency from low heat generation is achieved by controlling the current flow to motor according to motor load. With the AC power input type, motor heat generation has been reduced for 60% compared with our conventional product.

Features and Functions
Type R
Type P
Type M
Type R Multi-Axis
Standard Model
Low-backlash Gear Model
Harmonic Gear Model
Electromagnetic Brake Model
Spur Gear Model
Motor Dimensional Drawings
Options

SANMOTION Model No.PB

CLOSED LOOP STEPPING SYSTEMS

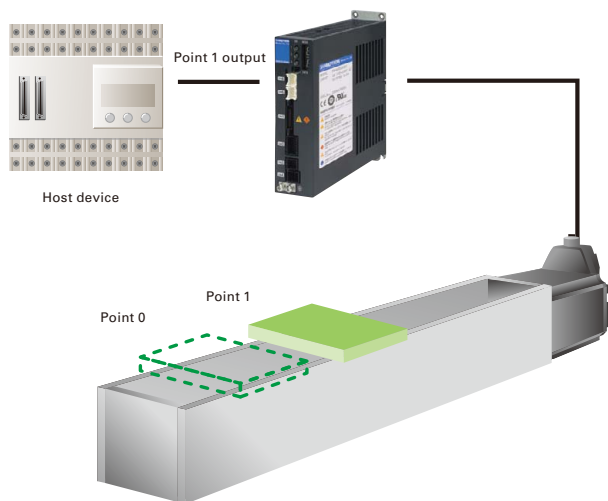
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Simplified Control

General Purpose I/O Input

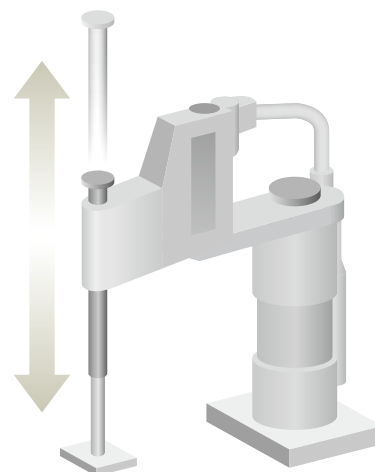
A	Type	D	Type	D	Type
C	R	C	M	C	R Multi Axis



System can be easily controlled by using the general purpose I/O to designate preset point or program numbers. (AC Type R, DC Type M: 128 point DC Type R Multi-axis: 256 point)

Support For Various Operations

A	Type	D	Type	D	Type
C	R	C	M	C	R Multi Axis



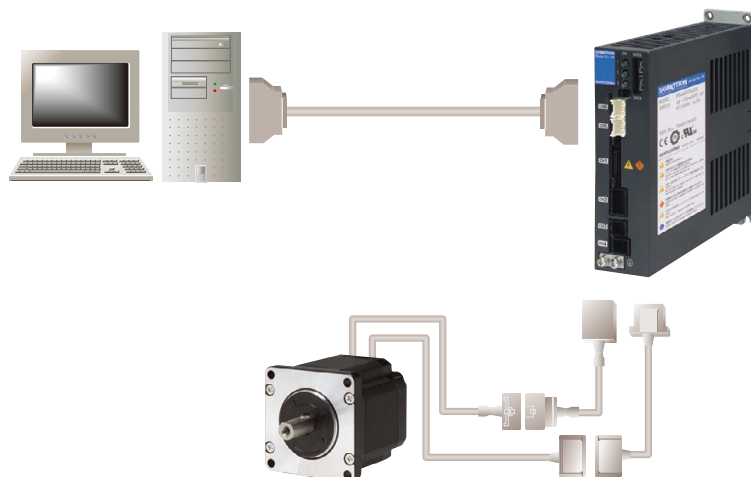
Comprehensive built-in amplifier functionality includes thrust control, point designation, programming, homing, holding brake control and sensor limit input.

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Reduced System Design Cost and Time

Wide Availability of Optional Cables and Connectors



Cables and connectors for controller/amplifier and amplifier/motor connection are available for hassle-free setup.

AC Power Input

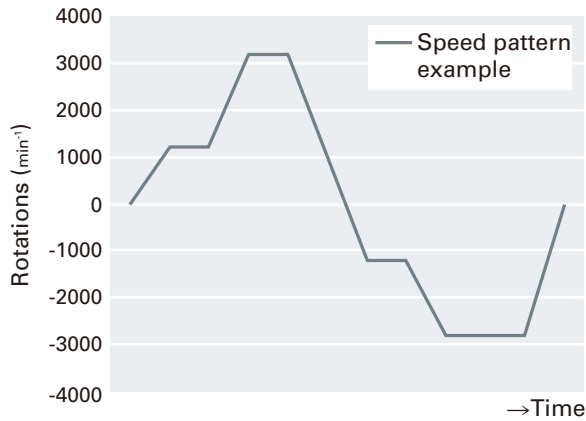
A C	Type	R	General Purpose I/O Input Type (RS-485 + Parallel IO)
	Type		
A C	Type	P	Pulse-Train Input Type
	Type		

DC Power Input

D C	Type	M	Multiple Input Type (General Purpose I/O Input + Pulse-Train Input)
	Type		
D C	Type	R Multi Axis	General Purpose I/O Input Type (RS-485 + Parallel IO)
	Type		

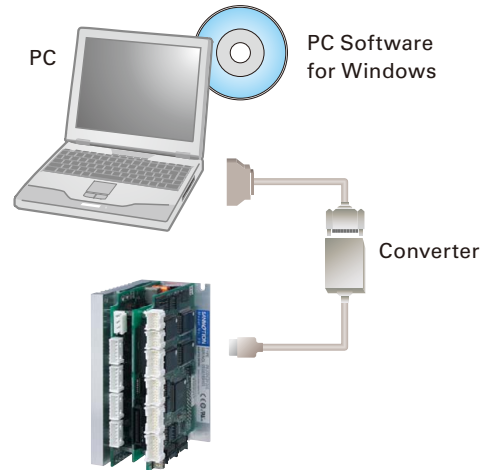
Built-in Pulse Generation Function

A C	Type	R	D C	Type	M	D C	Type	R Multi Axis
	Type			Type			Type	



A built-in pulse generation function is included in the Model No. PB Types R and M. The amplifier receives speed, acceleration/deceleration and distance as numeric data from the upper-level device, and automatically generates an optimal speed pattern according to the commands internally. Since no separate pulse generator is required, this contributes to lower system cost.

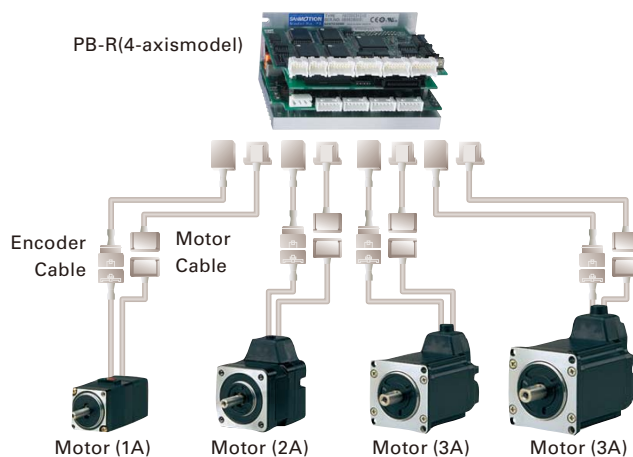
PC Interface



Parameter setting, data editing and monitoring of position and speed can be done on a PC using the bundled setup software.

Multi-Axis Type (DC Power Input)

D C	Type	R Multi Axis
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Multi-axis systems can be reduced in size and weight using the PB-R 4-axis type.

*1,2,3A can be selected using software switches.

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Complies with International Safety Standards



*UL·CE compliant motors have model numbers ending with "M".

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

Options

Extensive Closed-Loop Stepping System Lineup

Wide Variety of Amplifiers Available

Point command control
with upper level device
such as PLC

Network control with serial
communication
(RS-485 standard)

Control with pulse generator

AC Power
Source

Type R

► P13



- **Startup via I/O**
Startup preset points or programs in the amplifier memory using the I/O.
- **Startup via Serial Communication**
Control by transmitting speed, acceleration/deceleration and distance data via serial communication.

Type P

► P19



- **With pulse control:**
Motion is generated by responding to pulse input commands from a host device.

DC Power
Source

Type M

► P25



- **Startup via I/O**
Startup preset points or programs in the amplifier memory using the I/O.
- **Startup via Serial Communication**
Control by transmitting speed, acceleration/deceleration and distance data via serial communication.
- **With pulse control:**
Motion is generated by responding to pulse input commands from a host device.

Type R Multi-Axis

► P31



- **Startup via I/O**
Startup preset points or programs in the amplifier memory using the I/O.
- **Startup via Serial Communication**
Control by transmitting speed, acceleration/deceleration and distance data via serial communication.

Set Models with a Wide Range of Motors and Amplifiers

AC Power Source

DC Power Source

00 The values inside the illustration indicate the motor's flange angle size (unit: mm)



Standard Model ▶ P37

The standard model includes an amplifier and a motor

AC 42 60 86 ▶ P37

DC 28 42 60 ▶ P39



Low-backlash Gear Model ▶ P41

This model includes a low-backlash gear that engages the final stage with a tapered gear.

AC 42 60 ▶ P41, 43

DC 42 60 ▶ P45, 47

REDUCTION
GEAR
RATIO

1/3.6

1/7.2

1/10

1/20

1/30



Harmonic Gear Model ▶ P49

The reduction harmonic gear provides high torque and eliminates backlash.

AC 42 60 ▶ P49

DC 28 42 60 ▶ P51, 53

REDUCTION
GEAR
RATIO

1/30

1/50

1/100



Electromagnetic Brake Model ▶ P54

This model uses a non-excitation electromagnetic brake, capable of maintaining position and supporting a load in vertical operation, even when power is off

AC 42 60 ▶ P54

DC 28 42 60 ▶ P55

DC Power Source



Spur Gear Model ▶ P57

This model utilizes a spur gear design for gear reduction.

DC 28 ▶ P57

REDUCTION
GEAR
RATIO

1/3.6

1/7.2

1/10

1/20

1/30

1/60

Features and
Functions

Type R

Type P

Type M

Type R Multi-
Axis

Standard
Model

Low-backlash
Gear Model

Harmonic Gear
Model

Electromagnetic
Brake Model

Spur Gear
Model

Motor Dimensional
Drawings

Options

Model Nomenclature

System Model Nomenclature



Note 1: No symbol indicates no options.

* Power (1m) and I/O (1m) cables are included in the set models.

PB B R 60 3 - C 3.6 B

Motor Option 3: Holding Brake (B: included) ^{Note1}

Motor Option 2: Gear Ratio ^{Note1}

Motor Option 1: Gear Specifications ^{Note1}

Motor Length

Motor Flange Size (mm)

Interface Type R: RS-485 + parallel I/O P: Pulse Stream M: Multi

Power Input B: Single-phase AC100V to 115V

C: Single-phase, 3-phase shared use AC200V to 230V

D: DC Power Source

System Name PB: Model No.PB System

Amplifier Model Nomenclature



PB3 D 003 M 2 00

Specification Identification 00: Standard

Encoder Type 1: 200P/R INC 2: 500P/R INC 3: 4000P/R INC

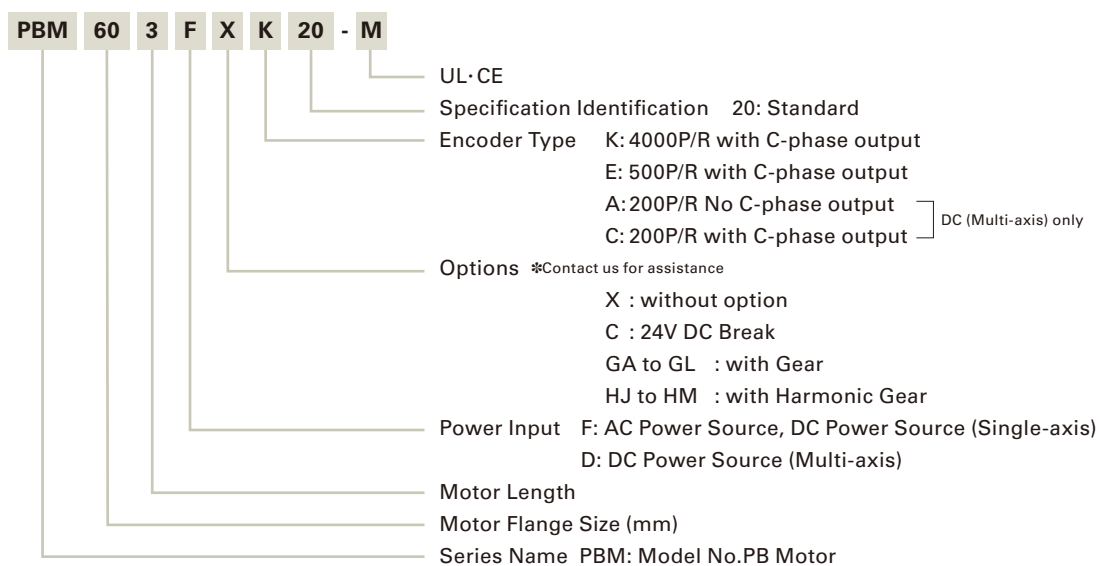
Interface Type R: RS-485 + parallel I/O P: Pulse Stream M: Multi

Motor Excitation Current 001: 1A 002: 2A 003: 3A

Power Input A: AC Power Source D: DC Power Source

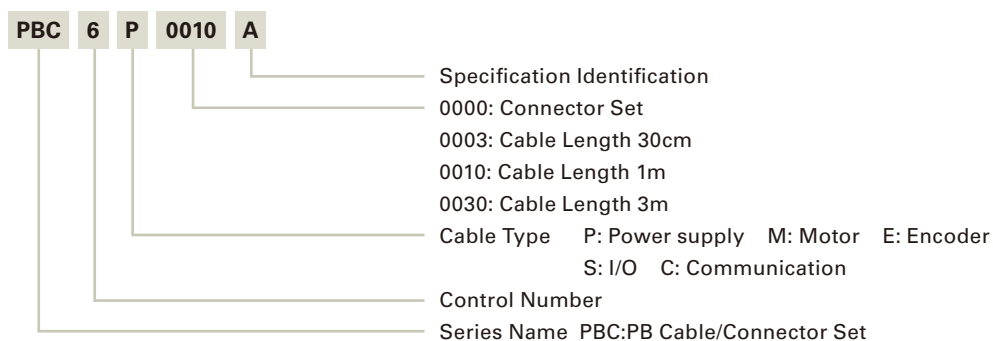
Series Name PB□: Model No.PB Amplifier

Motor Model Nomenclature



*Please enquire separately for the sizes of PBM503 and PBM565.

Cable Model Nomenclature



List of Amplifier/Motor Combinations and Optional Products

Motor Size	Amplifier Model No.		PB4A002R300 PB4A002R301	PB4A002P300 PB4A002P301	PB3D003M200 PB3D003M201	PB2D003R1U0 PB2D003R1U1 PB2D003R1U2 PB2D003R1U3	
	Interface Type		RS-485 (Type R)	Pulse-Train (Type P)	RS-485 and Pulse-Train (Type M)	RS-485 (Type R)	
	Encoder Resolution		4000x4 Subdivisions=16000P/R	4000x4 Subdivisions=16000P/R	500x4 Subdivisions=2000P/R	200x4Subdivisions=800P/R	
□28mm	Standard				PBM282FXE20	PBM282DXA20	
					PBM284FXE20	PBM284DXA20	
	Spur Gear	1/3.6			PBM282FGAE20	PBM282DGAA20	
		1/7.2			PBM282FGBE20	PBM282DGBA20	
		1/10			PBM282FGEE20	PBM282DGEA20	
		1/20			PBM282FGGE20	PBM282DGGA20	
		1/30			PBM282FGJE20	PBM282DGJA20	
		1/50			PBM282FGLE20	PBM282DGLA20	
	Harmonic Gear	1/50			PBM282FHLE20	PBM282DHLE20	
		1/100			PBM282FHME20	PBM282DHMA20	
	Electromagnetic Brake				PBM282FCE20	PBM282DCA20	
					PBM284FCE20	PBM284DCA20	
□42mm	Standard		PBM423FXK20-M		PBM423FXE20	PBM423DXA20	
	Low-backlash Gear	1/3.6	PBM423FGAK20-M		PBM423FGAE20	PBM423DGAA20	
		1/7.2	PBM423FGBK20-M		PBM423FGBE20	PBM423DGBA20	
		1/10	PBM423FGEK20-M		PBM423FGEE20	PBM423DGEA20	
		1/20	PBM423FGGK20-M		PBM423FGGE20	PBM423DGGA20	
		1/30	PBM423FGJK20-M		PBM423FGJE20	PBM423DGJA20	
	Harmonic Gear	1/30	PBM423FHJK20-M		PBM423FHJE20	PBM423DHJA20	
		1/50	PBM423FHLK20-M		PBM423FHLE20	PBM423DHLE20	
		1/100	PBM423FHMK20-M		PBM423FHME20	PBM423DHMA20	
	Electromagnetic Brake		PBM423FCK20-M		PBM423FCE20	PBM423DCA20	
	□60mm	Standard		PBM603FXK20-M PBM604FXK20-M		PBM603FXE20 PBM604FXE20	PBM603DXA20 PBM604DXA20
		Low-backlash Gear	1/3.6	PBM603FGAK20-M		PBM603FGAE20	PBM603DGAA20
1/7.2			PBM603FGBK20-M		PBM603FGBE20	PBM603DGBA20	
1/10			PBM603FGEK20-M		PBM603FGEE20	PBM603DGEA20	
1/20			PBM603FGGK20-M		PBM603FGGE20	PBM603DGGA20	
1/30			PBM603FGJK20-M		PBM603FGJE20	PBM603DGJA20	
Harmonic Gear		1/50	PBM603FHLK20-M		PBM603FHLE20	PBM603DHLE20	
		1/100	PBM603FHMK20-M		PBM603FHME20	PBM603DHMA20	
Electromagnetic Brake		PBM603FCK20-M PBM604FCK20-M		PBM603FCE20 PBM604FCE20	PBM603DCA20 PBM604DCA20		
□86mm		Standard		PBM861FXK20-M PBM862FXK20-M			
		Options	Power Cable		PBC8P0010A		PBC6P0010A
Motor Ext. Cable			PBC7M0030A		PBC6M0030A		
Encoder Ext. Cable			PBC7E0030A		PBC6E0030A		
I/O Cable			PBC5S0010A (un shielded) PBC5S0010C (shield)		PBC5S0010A (un shielded) PBC5S0010C (shield)		
Communication Cable ^{Note 1)}			PBC6C0003A	Not required	PBC6C0003A		
PC I/F Software			SPBALL-01		SPBA1W-01		
USB / RS-485 Converter Unit					PBFM-U6		
Regenerative Unit					PBFE-01		

Note 1) Used when amplifiers with several axes are connected via a daisy chain connection by telecommunication.

Motor Option Combination Table

Motor Option Combination Table			
Motor No	Gear Box	Harmonic Gear	Electromagnetic Brake
PBM282F□E20 / PBM282D□A20	✓	✓	✓
PBM284F□E20 / PBM284D□A20	-	-	✓
PBM423F□E20 / PBM423F□K20 / PBM423D□A20	✓	✓	✓
PBM603F□E20 / PBM603F□K20 / PBM603D□A20	✓	✓	✓
PBM604F□E20 / PBM604F□K20 / PBM604D□A20	-	-	✓

Motor Standard Specifications (common to all models)

Motor No.	PBM423F, PBM603F, PBM604F, PBM861F, PBM862F	PBM282D, PBM282F, PBM284D, PBM284F, PBM423D, PBM603D, PBM604D
Insulation class	Class B (130°C). UL compliant products are certified with Class A (105°C).	
Withstand Voltage *	AC1500V 50/60Hz 1minute	AC500V 50/60Hz 1minute
Insulation resistance *	DC500V 100MΩMIN.	
Degrees of protection	IP40	
Vibration resistance	15G(Frequency range 10 to 70Hz amplitude 1.52mm 70 to 2000 acceleration 15G) The x, y, and z are each tested 12 times with a sweep time of 15 minutes/cycle	
Impact resistance	30G(half sine wave with 11 ms duration) The x, y and z are each tested three times for each direction for a total of 18 tests.	
Ambient temperature	-10°C to +40°C (Harmonic Gear Model 0°C to +40°C)	
Ambient humidity	20 to 90%RH (No Condensation)	
Elevation	Maximum 1000m above sea level	

* The user should not test the insulation resistance or insulation withstand voltage, because a capacitor has been inserted between the encoder output groundline and the frame to prevent noise.

Set Model Configurations

AC Power Source Universal Input Type RS-485 + Parallel I/O (Type R)

Model	Motor Flange Size	Reduction Gear Ratio	Power Source	Set Model No.	Set Accessories		
					Amplifier Model No.	Motor Model No.	Power Cable・I/O Cable
Standard Model	□42mm	-	Single-phase AC 100 to 115V	PBBR423	PB4A002R300	PBM423FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423	PB4A002R301	PBM423FXK20-M	
	□60mm	-	Single-phase AC 100 to 115V	PBBR603	PB4A002R300	PBM603FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603	PB4A002R301	PBM603FXK20-M	
			Single-phase AC 100 to 115V	PBBR604	PB4A002R300	PBM604FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR604	PB4A002R301	PBM604FXK20-M	
	□86mm	-	Single-phase AC 100 to 115V	PBBR861	PB4A002R300	PBM861FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR861	PB4A002R301	PBM861FXK20-M	
			Single-phase AC 100 to 115V	PBBR862	PB4A002R300	PBM862FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR862	PB4A002R301	PBM862FXK20-M	
Low-backlash Gear Model	□42mm	1/3.6	Single-phase AC 100 to 115V	PBBR423-C3.6	PB4A002R300	PBM423FGAK20-M	Power Cable (1m): PBC8P0010A I/O Cable (1m): PBC5S0010A
			Single-phase/three-phase AC 200 to 230V	PBCR423-C3.6	PB4A002R301	PBM423FGAK20-M	
		1/7.2	Single-phase AC 100 to 115V	PBBR423-C7.2	PB4A002R300	PBM423FGBK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-C7.2	PB4A002R301	PBM423FGBK20-M	
		1/10	Single-phase AC 100 to 115V	PBBR423-C10	PB4A002R300	PBM423FGEK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-C10	PB4A002R301	PBM423FGEK20-M	
		1/20	Single-phase AC 100 to 115V	PBBR423-C20	PB4A002R300	PBM423FGGK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-C20	PB4A002R301	PBM423FGGK20-M	
		1/30	Single-phase AC 100 to 115V	PBBR423-C30	PB4A002R300	PBM423FGJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-C30	PB4A002R301	PBM423FGJK20-M	
	□60mm	1/3.6	Single-phase AC 100 to 115V	PBBR603-C3.6	PB4A002R300	PBM603FGAK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-C3.6	PB4A002R301	PBM603FGAK20-M	
		1/7.2	Single-phase AC 100 to 115V	PBBR603-C7.2	PB4A002R300	PBM603FGBK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-C7.2	PB4A002R301	PBM603FGBK20-M	
		1/10	Single-phase AC 100 to 115V	PBBR603-C10	PB4A002R300	PBM603FGEK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-C10	PB4A002R301	PBM603FGEK20-M	
		1/20	Single-phase AC 100 to 115V	PBBR603-C20	PB4A002R300	PBM603FGGK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-C20	PB4A002R301	PBM603FGGK20-M	
		1/30	Single-phase AC 100 to 115V	PBBR603-C30	PB4A002R300	PBM603FGJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-C30	PB4A002R301	PBM603FGJK20-M	
Harmonic Gear Model	□42mm	1/30	Single-phase AC 100 to 115V	PBBR423-H30	PB4A002R300	PBM423FHJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-H30	PB4A002R301	PBM423FHJK20-M	
		1/50	Single-phase AC 100 to 115V	PBBR423-H50	PB4A002R300	PBM423FHLK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-H50	PB4A002R301	PBM423FHLK20-M	
		1/100	Single-phase AC 100 to 115V	PBBR423-H100	PB4A002R300	PBM423FHMK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-H100	PB4A002R301	PBM423FHMK20-M	
	□60mm	1/50	Single-phase AC 100 to 115V	PBBR603-H50	PB4A002R300	PBM603FHLK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-H50	PB4A002R301	PBM603FHLK20-M	
		1/100	Single-phase AC 100 to 115V	PBBR603-H100	PB4A002R300	PBM603FHMK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-H100	PB4A002R301	PBM603FHMK20-M	
Electromagnetic Brake Model	□42mm	-	Single-phase AC 100 to 115V	PBBR423-B	PB4A002R300	PBM423FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR423-B	PB4A002R301	PBM423FCK20-M	
	□60mm	-	Single-phase AC 100 to 115V	PBBR603-B	PB4A002R300	PBM603FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR603-B	PB4A002R301	PBM603FCK20-M	
			Single-phase AC 100 to 115V	PBBR604-B	PB4A002R300	PBM604FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCR604-B	PB4A002R301	PBM604FCK20-M	

Option Product Model Numbers (Not Included in Set Models)

Motor Ext. Cable	PBC7M0030A
Encoder Ext. Cable	PBC7E0030A
Communication Cable	PBC6C0003A
PC I/F Software	SPBALL-01
USB / RS-485 Converter Unit	PBFM-U6

AC Power Source Pulse Train Input Type (Type P)

Model	Motor Flange Size	Reduction Gear Ratio	Power Source	Set Model No.	Set Accessories		
					Amplifier Model No.	Motor Model No.	Power Cable · I/O Cable
Standard Model	□42mm	—	Single-phase AC 100 to 115V	PBBP423	PB4A002P300	PBM423FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423	PB4A002P301	PBM423FXK20-M	
	□60mm	—	Single-phase AC 100 to 115V	PBBP603	PB4A002P300	PBM603FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603	PB4A002P301	PBM603FXK20-M	
			Single-phase AC 100 to 115V	PBBP604	PB4A002P300	PBM604FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP604	PB4A002P301	PBM604FXK20-M	
	□86mm	—	Single-phase AC 100 to 115V	PBBP861	PB4A002P300	PBM861FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP861	PB4A002P301	PBM861FXK20-M	
			Single-phase AC 100 to 115V	PBBP862	PB4A002P300	PBM862FXK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP862	PB4A002P301	PBM862FXK20-M	
Low-backlash Gear Model	□42mm	1/3.6	Single-phase AC 100 to 115V	PBBP423-C3.6	PB4A002P300	PBM423FGAK20-M	Power Cable (1m): PBC8P0010A I/O Cable (1m): PBC5S0010C
			Single-phase/three-phase AC 200 to 230V	PBCP423-C3.6	PB4A002P301	PBM423FGAK20-M	
		1/7.2	Single-phase AC 100 to 115V	PBBP423-C7.2	PB4A002P300	PBM423FGBK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-C7.2	PB4A002P301	PBM423FGBK20-M	
		1/10	Single-phase AC 100 to 115V	PBBP423-C10	PB4A002P300	PBM423FGEK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-C10	PB4A002P301	PBM423FGEK20-M	
		1/20	Single-phase AC 100 to 115V	PBBP423-C20	PB4A002P300	PBM423FGGK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-C20	PB4A002P301	PBM423FGGK20-M	
		1/30	Single-phase AC 100 to 115V	PBBP423-C30	PB4A002P300	PBM423FGJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-C30	PB4A002P301	PBM423FGJK20-M	
	□60mm	1/3.6	Single-phase AC 100 to 115V	PBBP603-C3.6	PB4A002P300	PBM603FGAK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-C3.6	PB4A002P301	PBM603FGAK20-M	
		1/7.2	Single-phase AC 100 to 115V	PBBP603-C7.2	PB4A002P300	PBM603FGBK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-C7.2	PB4A002P301	PBM603FGBK20-M	
		1/10	Single-phase AC 100 to 115V	PBBP603-C10	PB4A002P300	PBM603FGEK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-C10	PB4A002P301	PBM603FGEK20-M	
		1/20	Single-phase AC 100 to 115V	PBBP603-C20	PB4A002P300	PBM603FGGK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-C20	PB4A002P301	PBM603FGGK20-M	
		1/30	Single-phase AC 100 to 115V	PBBP603-C30	PB4A002P300	PBM603FGJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-C30	PB4A002P301	PBM603FGJK20-M	
Harmonic Gear Model	□42mm	1/30	Single-phase AC 100 to 115V	PBBP423-H30	PB4A002P300	PBM423FHJK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-H30	PB4A002P301	PBM423FHJK20-M	
		1/50	Single-phase AC 100 to 115V	PBBP423-H50	PB4A002P300	PBM423FHLK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-H50	PB4A002P301	PBM423FHLK20-M	
		1/100	Single-phase AC 100 to 115V	PBBP423-H100	PB4A002P300	PBM423FHMK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-H100	PB4A002P301	PBM423FHMK20-M	
	□60mm	1/50	Single-phase AC 100 to 115V	PBBP603-H50	PB4A002P300	PBM603FHLK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-H50	PB4A002P301	PBM603FHLK20-M	
		1/100	Single-phase AC 100 to 115V	PBBP603-H100	PB4A002P300	PBM603FHMK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-H100	PB4A002P301	PBM603FHMK20-M	
Electromagnetic Brake Model	□42mm	—	Single-phase AC 100 to 115V	PBBP423-B	PB4A002P300	PBM423FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP423-B	PB4A002P301	PBM423FCK20-M	
	□60mm	—	Single-phase AC 100 to 115V	PBBP603-B	PB4A002P300	PBM603FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP603-B	PB4A002P301	PBM603FCK20-M	
			Single-phase AC 100 to 115V	PBBP604-B	PB4A002P300	PBM604FCK20-M	
			Single-phase/three-phase AC 200 to 230V	PBCP604-B	PB4A002P301	PBM604FCK20-M	

Option Product Model Numbers (Not Included in Set Models)

Motor Ext. Cable	PBC7M0030A
Encoder Ext. Cable	PBC7E0030A
PC I/F Software	SPBALL-01
USB / RS-485 Converter Unit	PBFM-U6

DC Power Source Multi Input Type (Universal Input + Pulse Train Input) (Type M)

Model	Motor Flange Size	Reduction Gear Ratio	Set Model No.	Set Accessories		
				Amplifier Model No.	Motor Model No.	Power Cable · I/O Cable
Standard Model	□28mm	–	PBDM282	PB3D003M200	PBM282FXE20	Power Cable (1m): PBC6P0010A I/O Cable (1m): PBC5S0010C
			PBDM284	PB3D003M200	PBM284FXE20	
	□42mm	–	PBDM423	PB3D003M200	PBM423FXE20	
			PBDM603	PB3D003M200	PBM603FXE20	
Low-backlash Gear Model	□42mm	–	PBDM604	PB3D003M200	PBM604FXE20	
			PBDM423-C3.6	PB3D003M200	PBM423FGAE20	
			PBDM423-C7.2	PB3D003M200	PBM423FGBE20	
			PBDM423-C10	PB3D003M200	PBM423FGEE20	
			PBDM423-C20	PB3D003M200	PBM423FGGE20	
			PBDM423-C30	PB3D003M200	PBM423FGJE20	
	□60mm	–	PBDM603-C3.6	PB3D003M200	PBM603FGAE20	
			PBDM603-C7.2	PB3D003M200	PBM603FGBE20	
			PBDM603-C10	PB3D003M200	PBM603FGEE20	
			PBDM603-C20	PB3D003M200	PBM603FGGE20	
			PBDM603-C30	PB3D003M200	PBM603FGJE20	
Spur Gear Model	□28mm	1/3.6	PBDM282-G3.6	PB3D003M200	PBM282FGAE20	
		1/7.2	PBDM282-G7.2	PB3D003M200	PBM282FGBE20	
		1/10	PBDM282-G10	PB3D003M200	PBM282FGEE20	
		1/20	PBDM282-G20	PB3D003M200	PBM282FGGE20	
		1/30	PBDM282-G30	PB3D003M200	PBM282FGJE20	
		1/50	PBDM282-G50	PB3D003M200	PBM282FGLE20	
Harmonic Gear Model	□28mm	1/50	PBDM282-H50	PB3D003M200	PBM282FHLE20	
		1/100	PBDM282-H100	PB3D003M200	PBM282FHME20	
	□42mm	1/30	PBDM423-H30	PB3D003M200	PBM423FHJE20	
		1/50	PBDM423-H50	PB3D003M200	PBM423FHLE20	
		1/100	PBDM423-H100	PB3D003M200	PBM423FHME20	
	□60mm	1/50	PBDM603-H50	PB3D003M200	PBM603FHLE20	
		1/100	PBDM603-H100	PB3D003M200	PBM603FHME20	
Electromagnetic Brake Model	□28mm	–	PBDM282-B	PB3D003M200	PBM282FCE20	
			PBDM284-B	PB3D003M200	PBM284FCE20	
	□42mm	–	PBDM423-B	PB3D003M200	PBM423FCE20	
			PBDM603-B	PB3D003M200	PBM603FCE20	
	□60mm	–	PBDM604-B	PB3D003M200	PBM604FCE20	

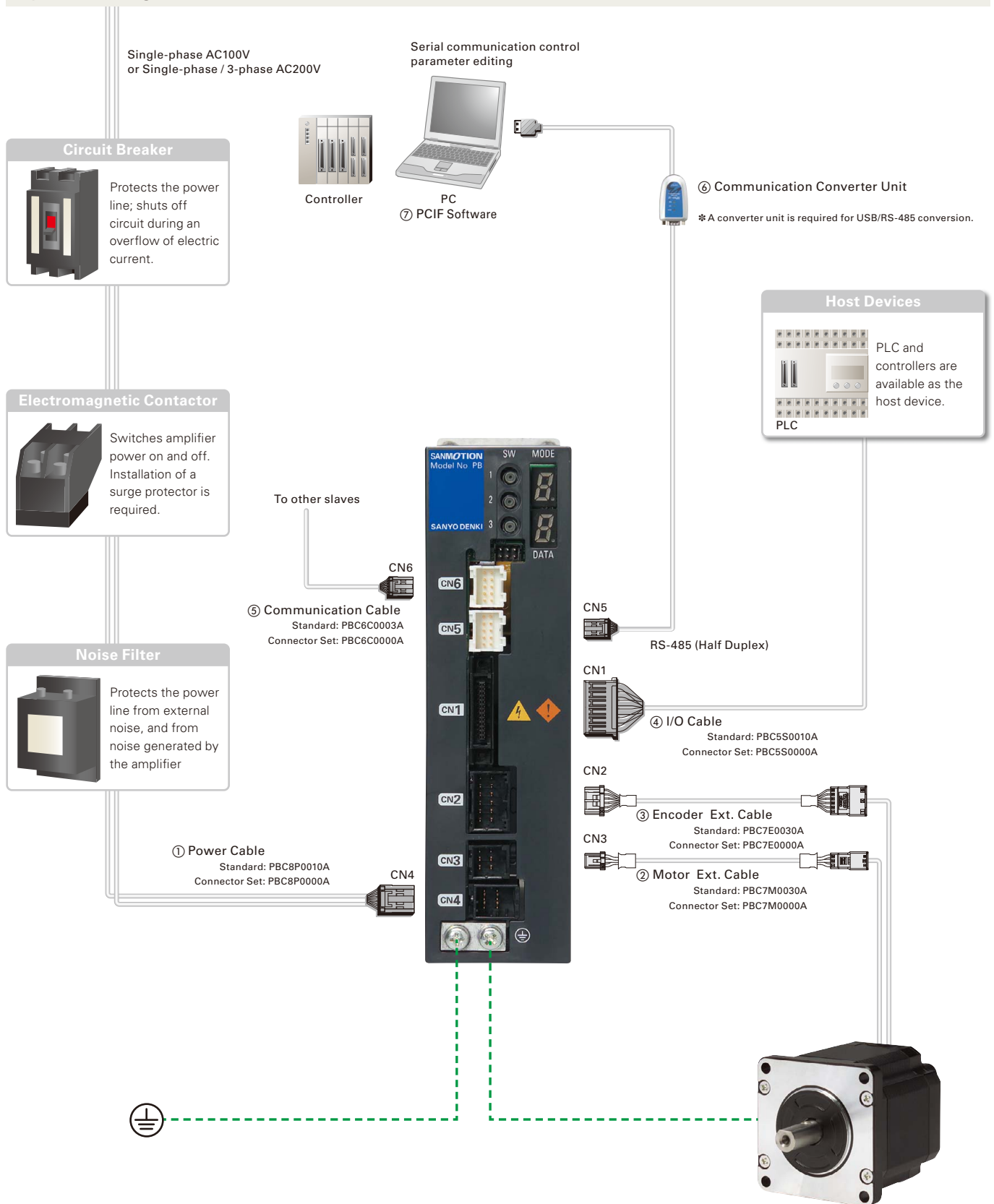
Option Product Model Numbers (Not Included in Set Models)

Motor Ext. Cable	PBC6M0030A
Encoder Ext. Cable	PBC6E0030A
Communication Cable	PBC6C0003A
PC I/F Software	SPBA1W-01
USB / RS-485 Converter Unit	PBFM-U6

Model No. PB Type R Single-Axis Type

AC Power Input Type

System Configuration



Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
① Power Cable	PBC8P0010A (1m)	PBC8P0000A	3m	—
② Motor Ext. Cable	PBC7M0030A (3m)	PBC7M0000A	20m	Use when an extension of 50cm or more is required.
③ Encoder Ext. Cable	PBC7E0030A (3m)	PBC7E0000A	20m	Use when an extension of 50cm or more is required.
④ I/O Cable (unshielded)	PBC5S0010A (1m)	PBC5S0000A	2m	Please select depending on the noise environment.
④ I/O Cable (shielded)	PBC5S0010C (1m)	PBC5S0000A	2m	Please select depending on the noise environment.
⑤ Communication Cable (to Amp.)	PBC6C0003A (30cm)	PBC6C0000A	100m	Use when multiple axes are connected in a daisy-chain configuration for communication.
⑥ Communication Converter Unit	PBFM-U6	—		USB/RS-485 Converter Unit Converter unit and cable set model
⑦ PC I/F Software	SPBALL-01	—	—	Software for operational check and parameter setting

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

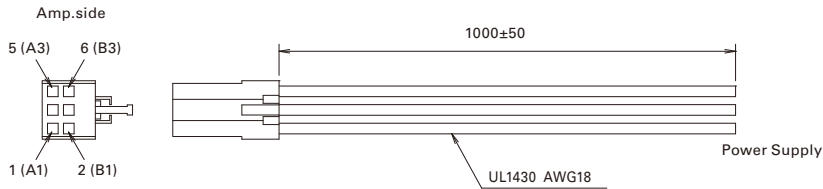
Options

Model No. PB Type R Single-Axis Type

AC Power Input Type

Optional Cable

① Power Cable



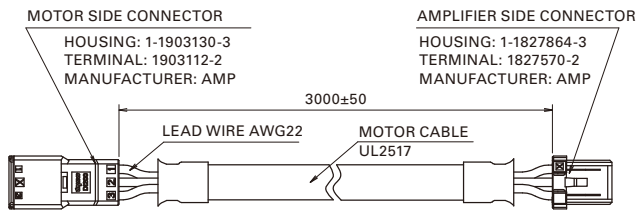
Connector Connection

PIN No.	LEAD COLR	Signal Name
A1	—	—
B1	Black	R
A2	—	—
B2	Black	S
A3	—	—
B3	Black	T

Connector Set: PBC8P0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1318119-3	1
	Contact: 1318107-1	6

② Motor Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	White	Brake Lead Wire
B3	Black	Brake Lead Wire

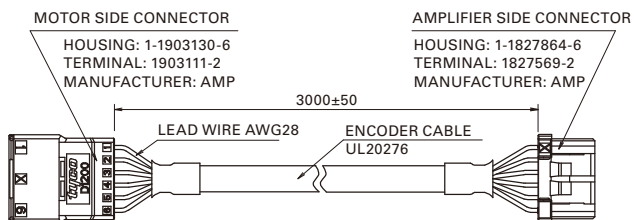
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	Motor Lead Wire
2(B1)	Orange	Motor Lead Wire
3(A2)	Red	Motor Lead Wire
4(B2)	Yellow	Motor Lead Wire
5(A3)	White	Brake Lead Wire
6(B3)	Black	Brake Lead Wire

Connector Set: PBC7M0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1903130-3	1
	Terminal: 1903112-2	6
	Housing: 1-1827864-3	1
	Terminal: 1827570-2	6

③ Encoder Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Connector Connection Of Amplifier Side

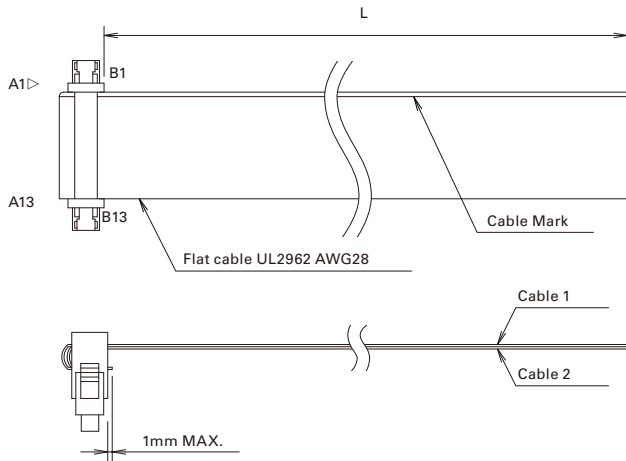
PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Connector Set: PBC7E0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1903130-6	1
	Terminal: 1903112-2	10
	Housing: 1-1827864-6	1
	Terminal: 1827570-2	10

Optional Cable

④ I/O Cable (unshielded)



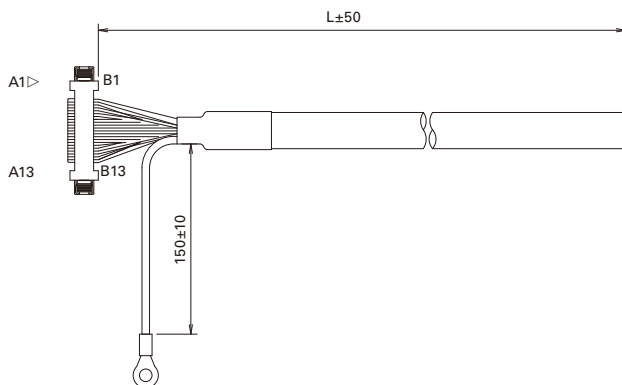
Cable Connection

Cable 1	Cable 2
A1-No.1	B1-No.14
A2-No.2	B2-No.15
A3-No.3	B3-No.16
A4-No.4	B4-No.17
A5-No.5	B5-No.18
A6-No.6	B6-No.19
A7-No.7	B7-No.20
A8-No.8	B8-No.21
A9-No.9	B9-No.22
A10-No.10	B10-No.23
A11-No.11	B11-No.24
A12-No.12	B12-No.25
A13-No.13	B13-No.26

Connector Set: PBC5S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-026-171D-F	1

④ I/O Cable (shielded)



CN Wiring

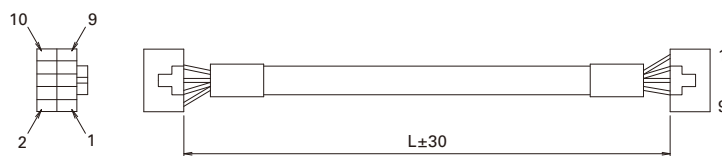
CN1 Pin.No.	Mark Display	Mark	LINE COLOR
A1		Red	Orange
A2		Black	
A3		Red	
A4		Black	Gray
A5		Red	
A6		Black	White
A7		Red	
A8		Black	Yellow
A9		Red	
A10		Black	Pink
A11		Red	
A12		Black	Orange
A13		Red	Gray

CN1 Pin.No.	Mark Display	Mark	LINE COLOR
B1		Black	Gray
B2		Red	
B3		Black	White
B4		Red	
B5		Black	Yellow
B6		Red	
B7		Black	Pink
B8		Red	
B9		Black	Orange
B10		Red	
B11		Black	Gray
B12		Red	
B13		Black	White

Connector Set: PBC5S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-026-171D-F	1

⑤ Communication Cable



Connector relay cable

Signal Name	CNA Pin.No.	Color	CNB Pin.No.	Signal Name
A	1	Yellow	1	A
B	2	White	2	B
(Y)	3	Brown	3	(Y)
(Z)	4	Blue	4	(Z)
GND	5	Black	5	GND
Vcc	6		6	Vcc
PCA	7	Purple	7	PCA
PCB	8	Green	8	PCB
24V	9	Drain	9	24V
GND	10		10	GND

Connector Set: PBC6C0000A

Manufacturer	Type	Qty.
JST	Housing: PADP-10V-1-S Contact: SPH-002T-P0.5L	1 10

Model No. PB Type R Single-Axis Type

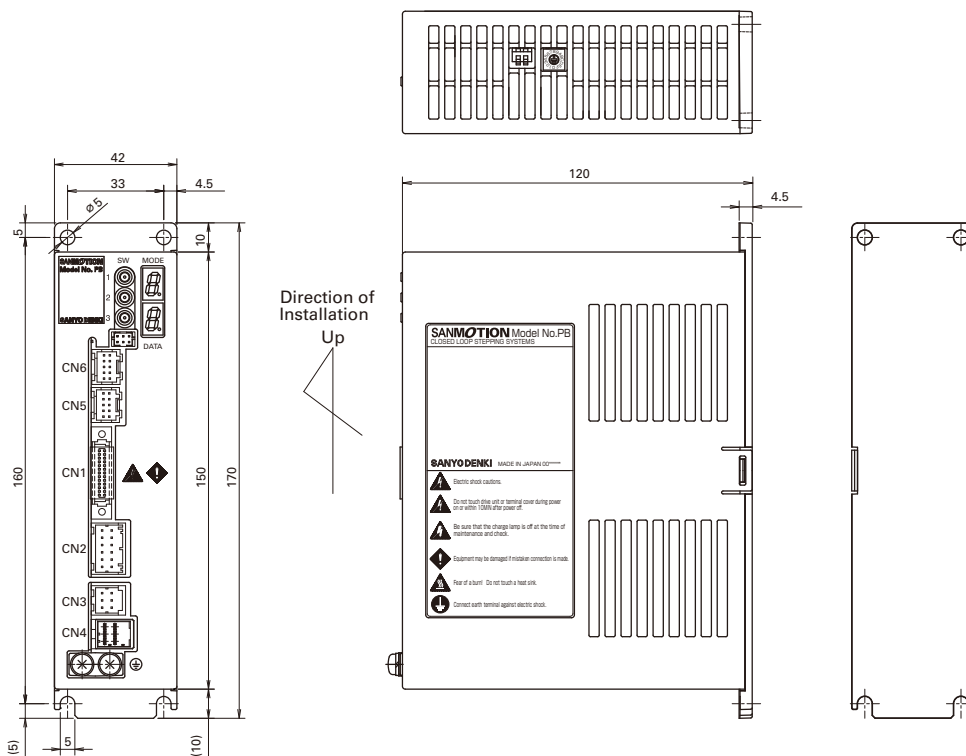
AC Power Input Type

General Specifications

Amplifier Model			PB4A002R300	PB4A002R301
Power Supply			Single phase AC100V to 115V −15% +10% 50/60Hz	Single phase / 3-phase AC200V to 230V −15% +10% 50/60Hz
Control Mode			PWM Control SIN drive method	
Environment	Ambient temp.	Operating	0 to 55°C	
		Storage	−20 to 65°C	
	Operating/Storage Humidity		90%RH (non-condensing)	
	Vibration Resistance		0.5G (tested with frequency range 10 to 55 Hz, X, Y, Z each direction 2H)	
Structure			Tray structure Rear mounting type	
Mass			Approx. 0.65kg	
Dimensions			W42×H150×D120	
Functions	Rotation Speed		0 to 4500min ^{−1} (□86mm: 0 to 4000min ^{−1})	
	Resolution (P/R)		Electronic gear 100 to 16000	
	Regeneration Process		Internal (Software processing)	
	Holding brake control function		Internal	
	Protective Functions		Power Voltage Error, Regeneration Voltage Error, Over-speed, Encoder Disconnection, CPU Error, Overload stop, Servo Error, Zero-return Error, Nonvolatile Memory Error, Initialization Error, Over-current, Amplifier Overheat, Motor Overheat, Counter Overflow	
	Display		7SEG LED Display (2 pieces)	
	Digital operator		Resolution, Related motor, Positive direction definition, Gain, Node Adress, Trans. Speed, Holding brake control, Jog driving	
	Operation Functions		Auto Zero-return / Push Operation (Current limit)	
	Communication specifications (PCIF)		RS-485 Start-Stop Synchronization, Half Duplex Communication, Trans. Speed: 9600, 38400, 115200, 307200bps	
Input/Output Signals	Input Signals	Functions	ALMCLR General-purpose input ×8 (Point, STOP, EXE, SELECT, HOME sensor, Limit, Deviation CLR, Pause, Jog, Inter lock)	
		Electric	General-purpose input: Interactive input photo coupler DC5V to 24V	
	Output Signals	Functions	ALMCLR General-purpose output×7 (Point No, Ack, Busy, HOME END, Push END, ZONE, Input Monitor, In-Position, Bit Out)	
		Electric	General-purpose output: Open collector, DC30V/15mA max	

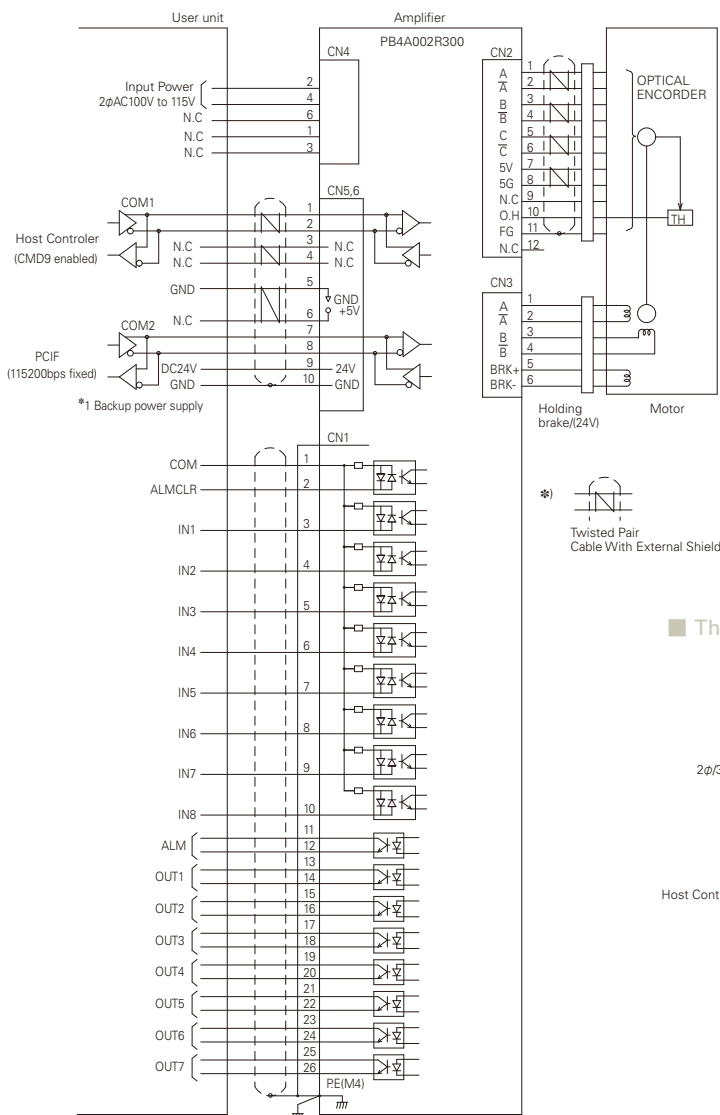
Amplifier Dimensional Drawing

(Unit:mm)

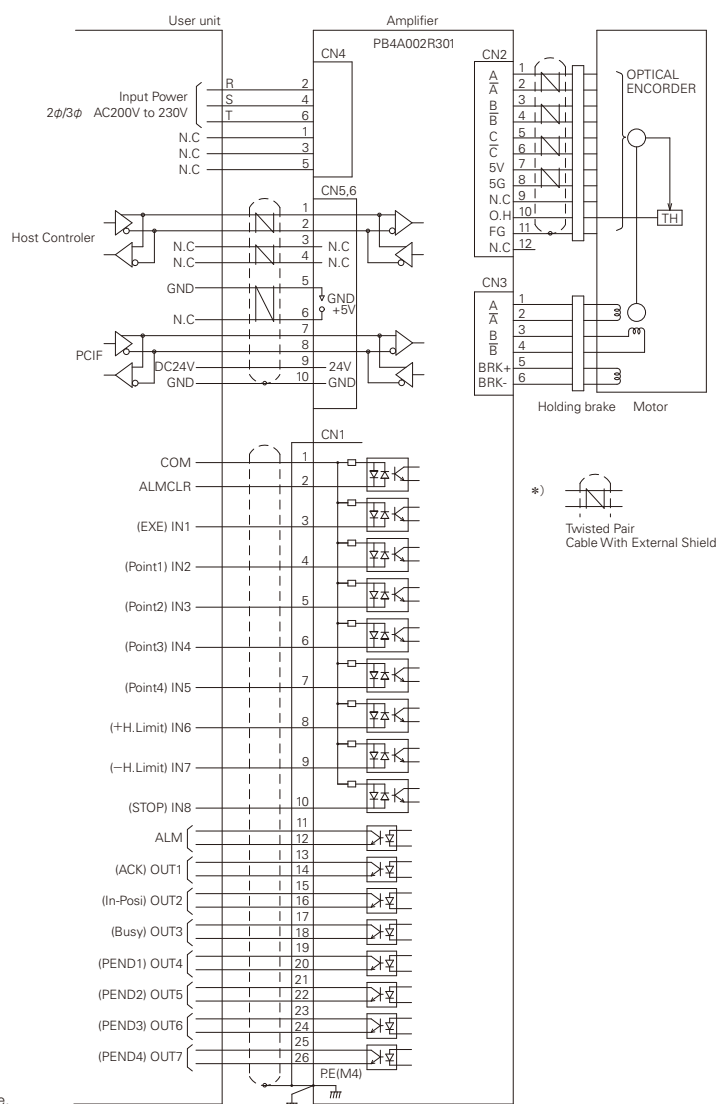


External Wiring Diagram

Single-phase AC100V to 115V Amplifier Model No.: PB4A002R300



Three-phase AC 200 to 230V Amplifier Model No.: PB4A002R301

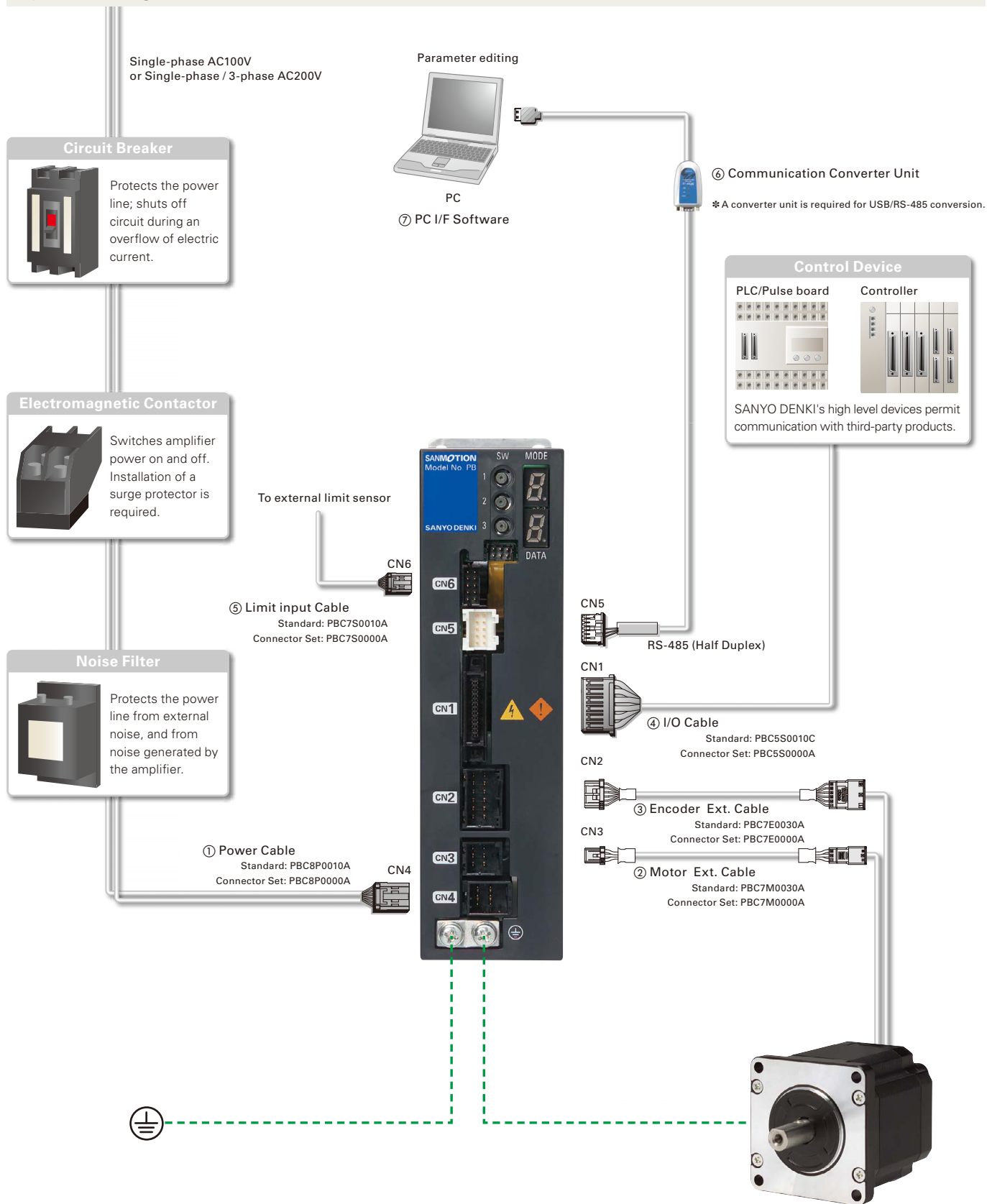


- * In the case of AC200V input.
- * The I/O signal name in () shows an initial value.

Model No. PB Type P

AC Power Input Type

System Configuration



Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
① Power Cable	PBC8P0010A (1m)	PBC8P0000A	3m	—
② Motor Ext. Cable	PBC7M0030A (3m)	PBC7M0000A	20m	Use when an extension of 50cm or more is required.
③ Encoder Ext. Cable	PBC7E0030A (3m)	PBC7E0000A	20m	Use when an extension of 50cm or more is required.
④ I/O Cable (shielded)	PBC5S0010C (1m)	PBC5S0000A	2m	—
⑤ Limit Input Cable	PBC7S0010A (1m)	PBC7S0000A	2m	External limit sensor input
⑥ Communication Converter Unit	PBFM-U6	—	—	USB/RS-485 Converter Unit Converter unit and cable set model
⑦ PC I/F Software	SPBALL-01	—	—	Software for operational check and parameter setting

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

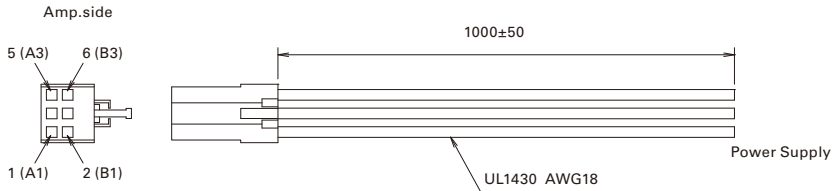
Options

Model No. PB Type P

AC Power Input Type

Optional Cable

① Power Cable



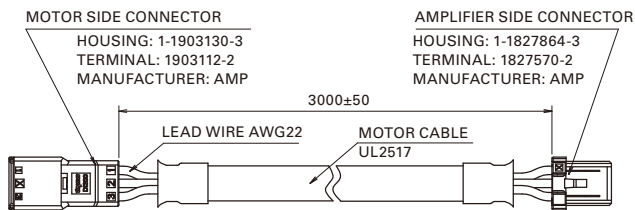
Connector Connection

PIN No.	LEAD COLR	Signal Name
A1	—	—
B1	Black	R
A2	—	—
B2	Black	S
A3	—	—
B3	Black	T

Connector Set: PBC8P0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1318119-3	1
	Contact: 1318107-1	6

② Motor Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	White	Brake Lead Wire
B3	Black	Brake Lead Wire

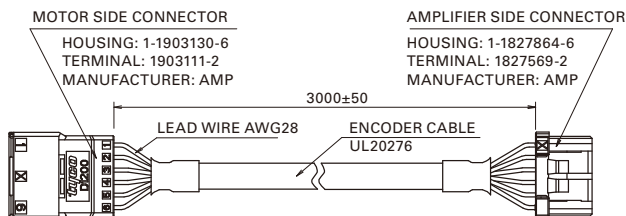
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	Motor Lead Wire
2(B1)	Orange	Motor Lead Wire
3(A2)	Red	Motor Lead Wire
4(B2)	Yellow	Motor Lead Wire
5(A3)	White	Brake Lead Wire
6(B3)	Black	Brake Lead Wire

Connector Set: PBC7M0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1903130-3	1
	Terminal: 1903112-2	6
	Housing: 1-1827864-3	1
	Terminal: 1827570-2	6

③ Encoder Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Connector Connection Of Amplifier Side

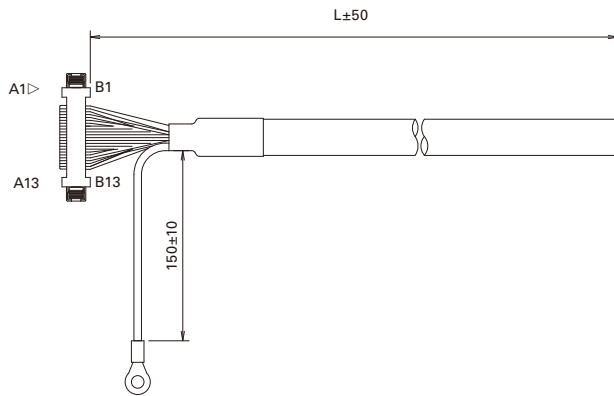
PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Connector Set: PBC7E0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1827864-6	1
	Terminal: 1903112-2	10
	Housing: 1-1903130-6	1
	Terminal: 1827570-2	10

Optional Cable

④ I/O Cable (shielded)



CN Wiring

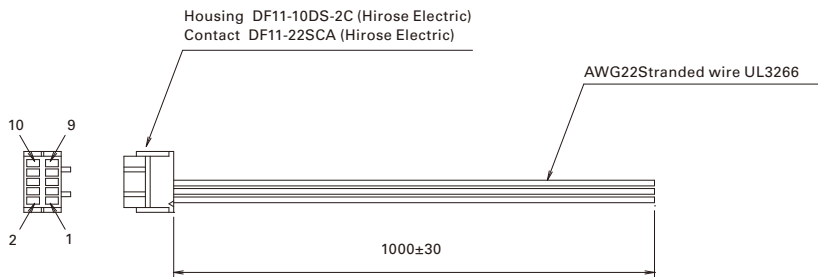
CN1 Pin.No.	Mark Display	Mark	LINE COLR
A1		Red	Orange
A2		Black	
A3		Red	Gray
A4		Black	
A5		Red	White
A6		Black	
A7		Red	Yellow
A8		Black	
A9		Red	Pink
A10		Black	
A11		Red	Orange
A12		Black	
A13		Red	Gray

CN1 Pin.No.	Mark Display	Mark	LINE COLR
B1		Black	Gray
B2		Red	White
B3		Black	
B4		Red	Yellow
B5		Black	
B6		Red	Pink
B7		Black	
B8		Red	Orange
B9		Black	
B10		Red	Gray
B11		Black	
B12		Red	White
B13		Black	

Connector Set:PBC5S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-026-171D-F	1

⑤ Limit Input Cable



Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1	Red	—
2	Blue	—
3	Black	Positive Limit +
4	Black	Positive Limit +
5	Black	Negative Limit —
6	Black	Negative Limit —
7	N.C.	—
8	N.C.	—
9	N.C.	—
10	N.C.	—

Connector Set: PBC7S0000A

Manufacturer	Type	Qty.
Hirose	Housing: DF11-10DS-2C	1
Electric	Contact: DF11-2428SCA	10

Model No. PB Type P

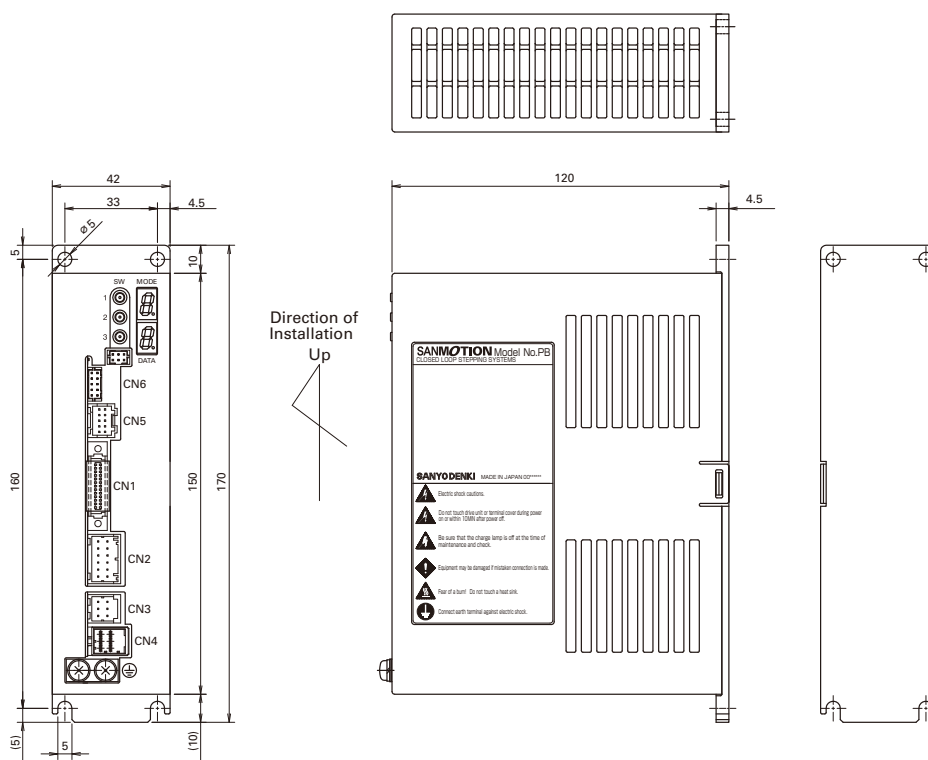
AC Power Input Type

General Specifications

Amplifier Model			PB4A002P300	PB4A002P301
Power Supply			Single phase AC100V to 115V −15% +10% 50/60Hz	Single phase / 3-phase AC200V to 230V −15% +10% 50/60Hz
Control Mode			PWM Control SIN drive method	
Environment	Ambient temp.	Operating	0 to 55°C	
		Storage	−20 to 65°C	
	Operating/Storage Humidity		90%RH (non-condensing)	
	Vibration Resistance		0.5G (tested with frequency range 10 to 55 Hz, X, Y, Z each direction 2H)	
Structure			Tray structure Rear mounting type	
Mass			Approx. 0.65kg	
Dimensions			W42×H150×D120	
Functions	Rotation Speed		0 to 4500min ^{−1} (□86mm: 0 to 4000min ^{−1})	
	Resolution (P/R)		Electronic gear 100 to 16000	
	Regeneration Process		Internal (Software processing)	
	Holding brake control function		Internal	
	Protective Functions		Power Voltage Error, Regeneration Voltage Error, Over-speed, Encoder Disconnection, Instruction Pulse Error, CPU Error, Overload stop, Servo Error, Zero-return Error, Nonvolatile Memory Error, Initialization Error, Over-current, Amplifier Overheat, Motor Overheat, Counter Overflow	
	Display		7SEG LED Display (2 pieces)	
	Digital operator		Resolution, Pulse input method, Related motor, Positive direction definition, Gain, FF gain, S-Shape filter, Jog driving	
	Operation Functions		Auto Zero-return / Push Operation (Current limit) / S-Shape Operation function	
	Communication specifications (PCIF)		RS-485 Start-Stop Synchronization, Half Duplex Communication, Trans. Speed: 115200bps	
Input/ Output Signals	Input Signals	Functions	Pulse Input, STOP, ALMCLR General-purpose input×2 (Deviation CLR, HOME, Push, Brake control, Counter reset)	
		Electric	Pulse Input: Line receiver (1or2 input mode) General-purpose input: Interactive input photo coupler DC5V to 24V	
	Output Signals	Functions	Encoder Signal (A / B / C) ALM, In-Position General-purpose output×2 (HOME END, Push END, ZONE, Input Monitor)	
		Electric	Encoder Signal Output: Line Amplifier 4000P/R *C-phase / phase origin signal outputs will not be emitted at velocities over 200min ^{−1} . General-purpose output: Open collector DC30V / 15mA max	

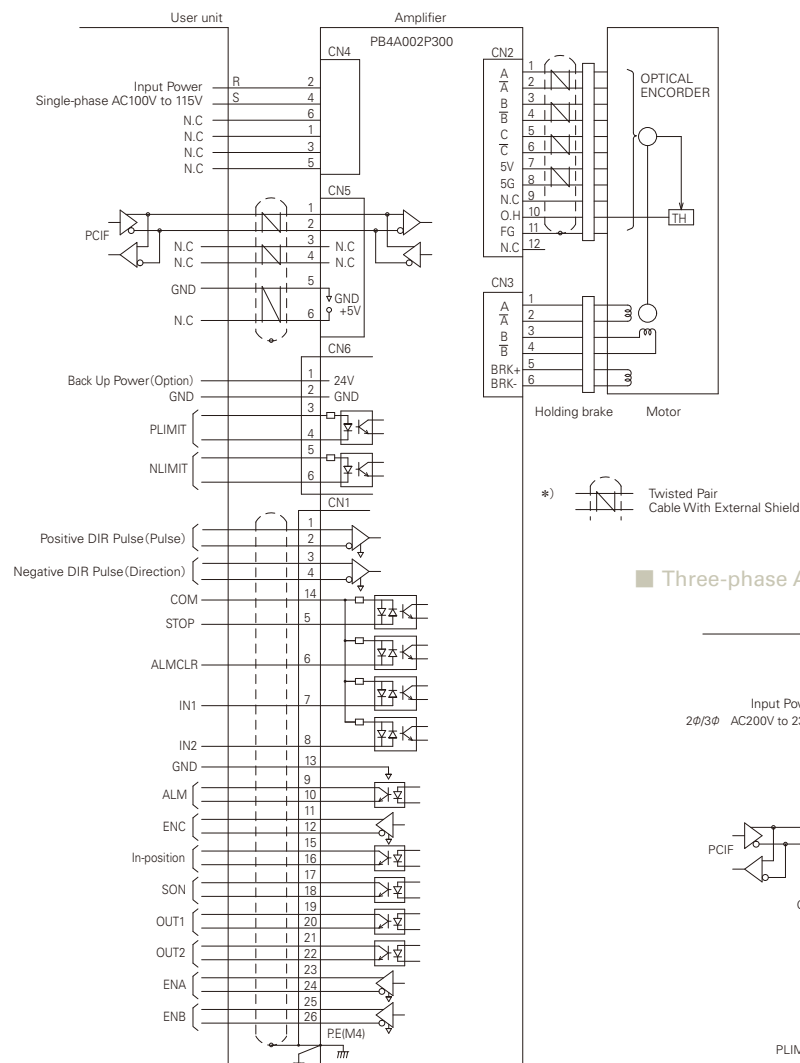
Amplifier Dimensional Drawing

(Unit:mm)

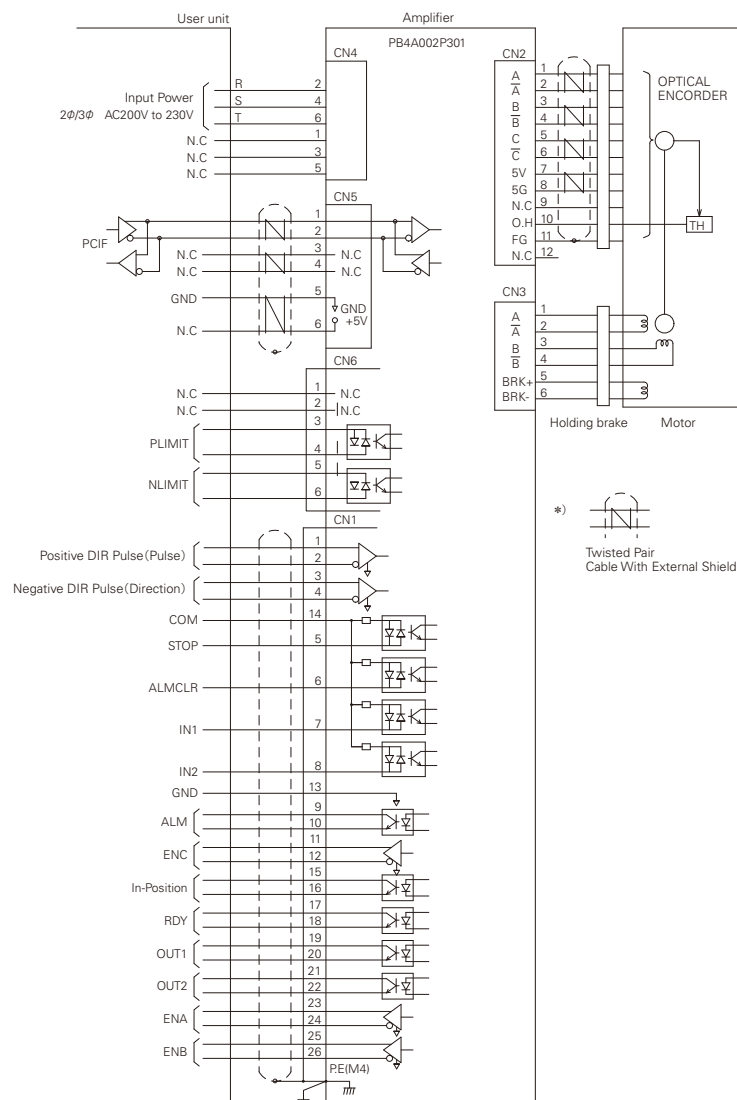


External Wiring Diagram

Single-phase AC100V to 115V Amplifier Model No.: PB4A002P300



Three-phase AC 200 to 230V Amplifier Model No.: PB4A002P301

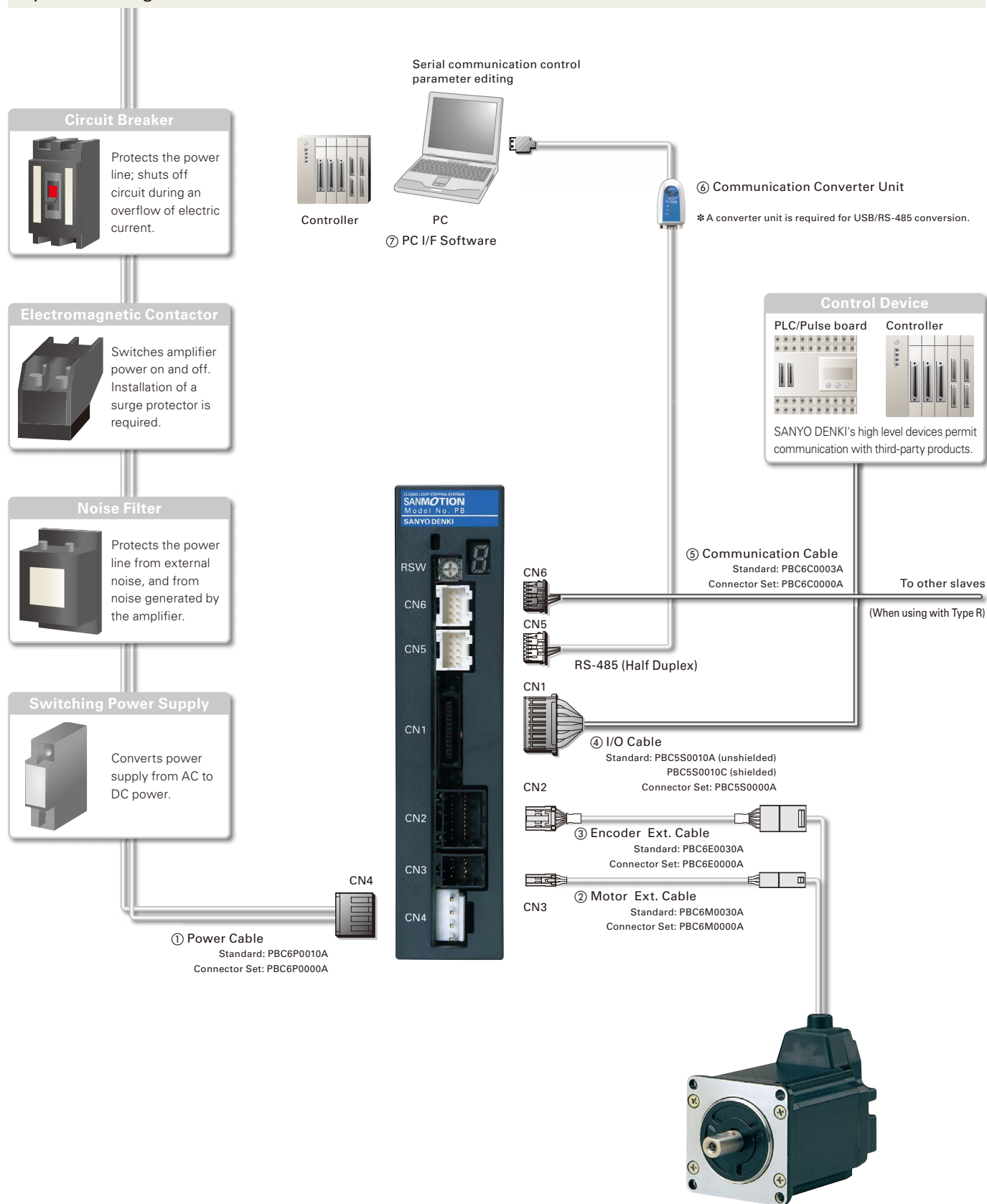


* IN1, IN2, OUT1, and OUT2 functions are selected by PC I/F software.

Model No. PB Type M

DC Power Input Type

System Configuration



Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
① Power Cable	PBC6P0010A (1m)	PBC6P0000A	3m	—
② Motor Ext. Cable	PBC6M0030A (3m)	PBC6M0000A	20m	Use when an extension of 50cm or more is required.
③ Encoder Ext. Cable	PBC6E0030A (3m)	PBC6E0000A	20m	Use when an extension of 50cm or more is required.
④ I/O Cable (unshielded)	PBC5S0010A (1m)	PBC5S0000A	2m	Please select depending on the noise environment.
④ I/O Cable (shielded)	PBC5S0010C (1m)	PBC5S0000A	2m	Use for pulse input
⑤ Communication Cable (to Amp.)	PBC6C0003A (30cm)	PBC6C0000A	100m	Use when multiple axes are connected in a daisy-chain configuration for communication. Not required when using pulse stream input.
⑥ Communication Converter Unit	PBFM-U6	—		USB/RS-485 Converter Unit Converter unit and cable set model
⑦ PC I/F Software	SPBA1W-01	—	—	Software for operational check and parameter setting

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

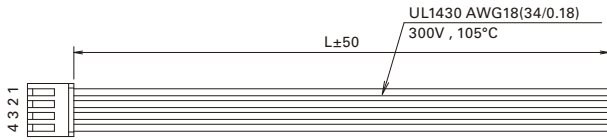
Options

Model No. PB Type M

DC Power Input Type

Optional Cable

① Power Cable



Connector Connection Of Amplifier Side

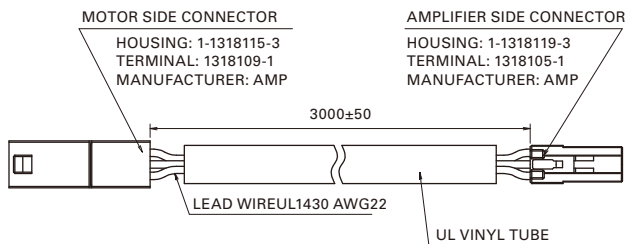
PIN No.	LEAD COLR	Signal Name
1	Red	DC+24/48V
2	Blue	GND
3	Yellow	(DC24V) ^{*1}
4	Green	FG

^{*1} Connect control circuit to power source only for models with part numbers ending with " 1".

Connector Set:PBC6P0000A

Manufacturer	Type	Qty.
JST	Housing: VHR-4N	1
	Contact: SVH-41T-P1.1	4

② Motor Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	White	Brake Lead Wire
B3	Black	Brake Lead Wire

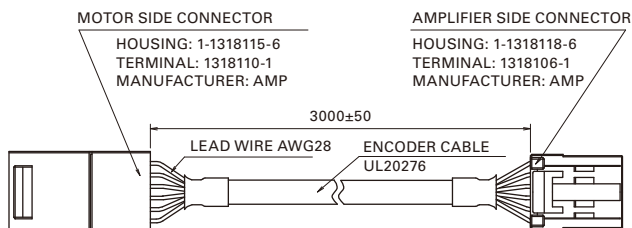
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	Motor Lead Wire
2(B1)	Orange	Motor Lead Wire
3(A2)	Red	Motor Lead Wire
4(B2)	Yellow	Motor Lead Wire
5(A3)	White	Brake Lead Wire
6(B3)	Black	Brake Lead Wire

Connector Set:PBC6M0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1318115-3	1
	Terminal: 1318109-1	6
	Housing: 1-1318119-3	1
	Terminal: 1318105-1	6

③ Encoder Ext. Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL $\bar{A}$
A2	Green	CHANNEL B
B2	Purple	CHANNEL $\bar{B}$
A3	White	CHANNEL C
B3	Yellow	CHANNEL $\bar{C}$
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Connector Connection Of Amplifier Side

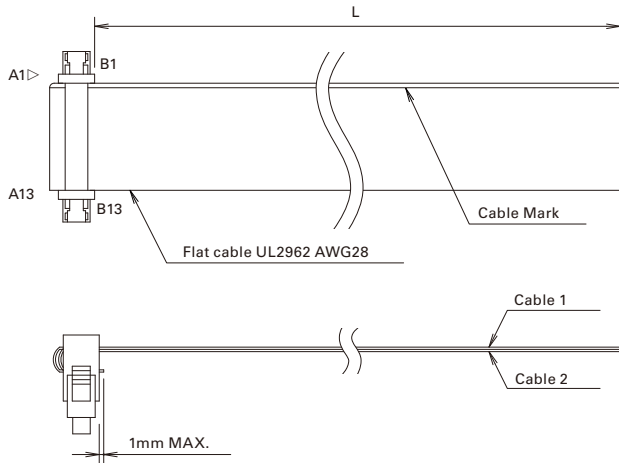
PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	CHANNEL A
2(B1)	Brown	CHANNEL $\bar{A}$
3(A2)	Green	CHANNEL B
4(B2)	Purple	CHANNEL $\bar{B}$
5(A3)	White	CHANNEL C
6(B3)	Yellow	CHANNEL $\bar{C}$
7(A4)	Red	+5V
8(B4)	Black	0V
9(A5)	N.C.	—
10(B5)	Orange	OVER HEAT
11(A6)	Black	Shield
12(B6)	N.C.	—

Connector Set:PBC6E0000A

Manufacturer	Type	Qty.
AMP	Housing: 1-1318115-6	1
	Terminal: 1318110-1	10
	Housing: 1-1318118-6	1
	Terminal: 1318106-1	10

Optional Cable

④ I/O Cable (unshielded)



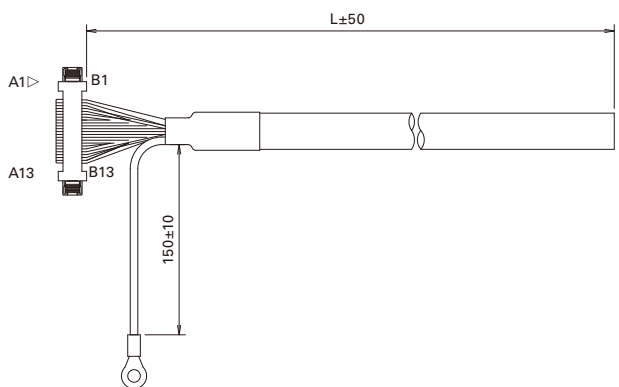
Cable Connection

Cable 1	Cable 2
A1-No.1	B1-No.14
A2-No.2	B2-No.15
A3-No.3	B3-No.16
A4-No.4	B4-No.17
A5-No.5	B5-No.18
A6-No.6	B6-No.19
A7-No.7	B7-No.20
A8-No.8	B8-No.21
A9-No.9	B9-No.22
A10-No.10	B10-No.23
A11-No.11	B11-No.24
A12-No.12	B12-No.25
A13-No.13	B13-No.26

Connector Set: PBC5S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-026-171D-F	1

④ I/O Cable (shielded)



CN Wiring

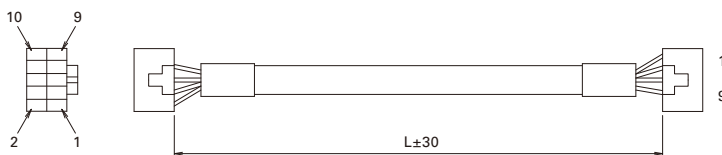
CN1 Pin.No.	Mark Display	Mark	LINE COLR
A1		Red	Orange
A2		Black	
A3		Red	Gray
A4		Black	
A5		Red	White
A6		Black	
A7		Red	Yellow
A8		Black	
A9		Red	Pink
A10		Black	
A11		Red	Orange
A12		Black	
A13		Red	Gray

CN1 Pin.No.	Mark Display	Mark	LINE COLR
B1		Black	Gray
B2		Red	
B3		Black	White
B4		Red	
B5		Black	Yellow
B6		Red	
B7		Black	Pink
B8		Red	
B9		Black	Orange
B10		Red	
B11		Black	Gray
B12		Red	
B13		Black	White

Connector Set: PBC5S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-026-171D-F	1

⑤ Communication Cable



Connector relay cable

Signal Name	CNA Pin.No.	Color	CNB Pin.No.	Signal Name
A	1	Yellow	1	A
B	2	White	2	B
(Y)	3	Brown	3	(Y)
(Z)	4	Blue	4	(Z)
GND	5	Black	5	GND
Vcc	6	Red	6	Vcc
—	7	Purple	7	—
—	8	Green	8	—
—	9	Drain	9	—
FG	10	Drain	10	FG

Connector Set: PBC6C0000A

Manufacturer	Type	Qty.
JST	Housing: PADP-10V-1-S Contact: SPH-002T-P0.5L	1 10

Model No. PB Type M

DC Power Input Type

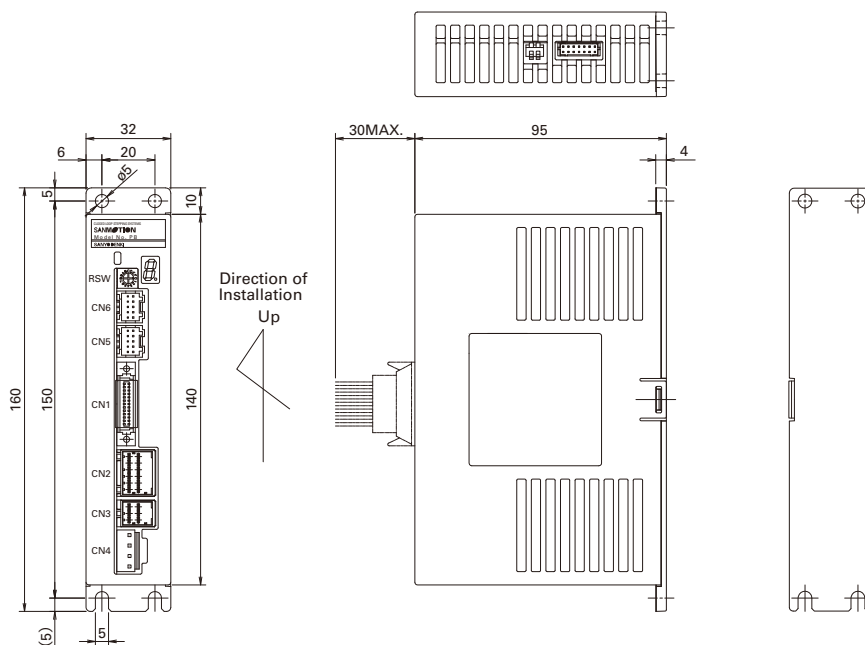
General Specifications

Amplifier Model		PB3D003M200, PB3D003M201	
Interface		Generic Input (SW1=ON)	Pulse Train Input (SW1 = OFF)
Control Mode		PWM Control SIN drive method	
Power Supply	Single Power	DC24V/48V $\pm 10\%$ ($\square 28\text{mm}$ Motor is only available as 24V.) ^{Note 1}	
Environment	Ambient temp.	Operating	0 to 55°C
		Storage	-20 to 70°C
	Operating/Storage Humidity		90% RH (non-condensing)
	Vibration Resistance		0.5G (tested with frequency range 10 to 55 Hz, X, Y, Z each direction 2H)
Mass/Dimensions		Approx. 0.36Kg/W32xH160xD95	
Functions	Rotation Speed	0 to 4500min ⁻¹	
	Resolution (P/R)	500, 1000, 2000, 4000, 5000, 10000	
	Regeneration Process	Internal	
	Protective Functions	Power Voltage Error, Regeneration Voltage Error, Over-speed, Encoder Disconnection, CPU Error, Overload Stop, Excessive Position Deviation, Zero-return Error, Nonvolatile Memory Error, Initialization Error (Power Line Disconnection)	
	Display	7SEG LED Display	
	Functions	Normal Drive (incremental move, absolute move), Zero-return, Module Operation, Push Operation, Teaching Functions Point Functions: 128Point Program Functions: 1PRGx1024Line 32PRGx32Line 128PRGx8Line	Normal Drive, Zero-return
	Rotary Switch	Node Address Setting (0 to F)	Normalize velocity loop gain setting
	DIP-Switches	SSW1: Interface Selection (On: RS-485, OFF: Pulse) SW2: Terminating Resistor Setting (On: with terminating resistance)	
Input/ Output Signals	Input Signals	(Normal Mode) STOP, EXE, POINT, HOME, JOG, SELECT, Pause, Interlock, Generic Input, MODE SELECT, Hard Limit, ALM CLR (Teaching Mode) STOP, JOG, Point, PWR Pulse input: Photo coupler: DC3V to 5V (Input resistance=270Ω) Input signal: DC5V to 24V	Pulse, STOP, ALMCLR, Gain Setting, Deviation Clear, HOME
	Output Signals	(Normal Mode) Ack, PEND, END, Busy, Zone, Mode MON, STOP MON, In-Position, Homing complete, Generic Output, Encoder Output, SON MON, ALM, HEND, Input Monitor (Teaching Mode) PEND, HEND, In-Position, Mode MON, SON MON Output signal: Open collector DC30V / 30mA max *Encoder C-phase signal outputs within 200 min ⁻¹	ALM, STOP MON, In-Position, Homing complete, Encoder Output, SON MON, STOP MON
	Communication Specifications Trans. Speed	RS-485 Standard Start-Stop Synchronization, Half Duplex 9600, 38400, 115200, 128000bps	9600bps

Note 1 : Operation of the holding brake is not available when the single input voltage amplifier is used at 48V input voltage. If operation of the holding brake is required at 48V input voltage, please use amplifier model PB3D003M201 (separate voltage type) with control voltage (CN4-3pin/common GND with main circuit) set at 24V.

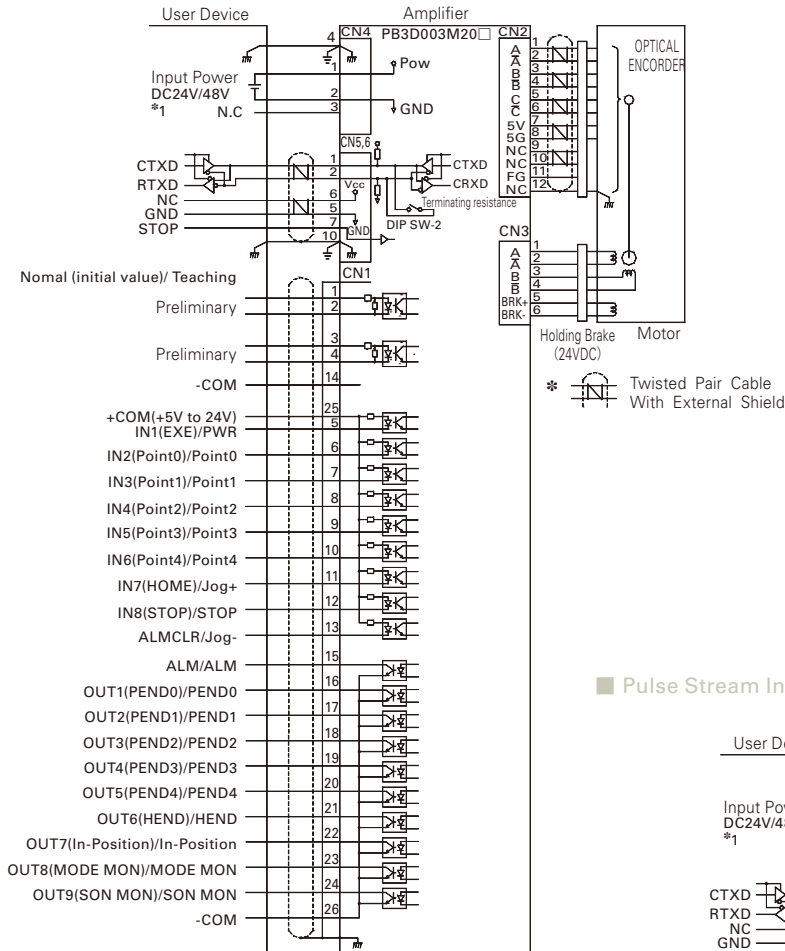
Amplifier Dimensional Drawing

(Unit:mm)

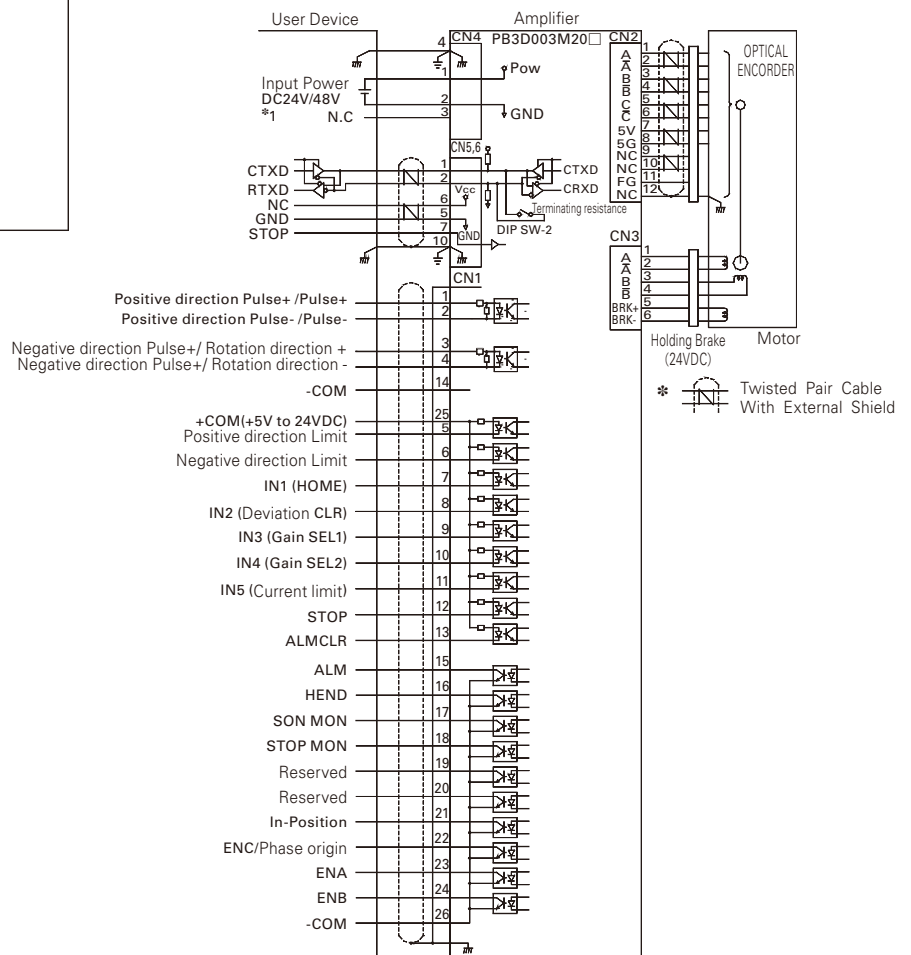


External Wiring Diagram

Generic Input DIP Switch SW1:ON



Pulse Stream Input DIP Switch SW1:OFF



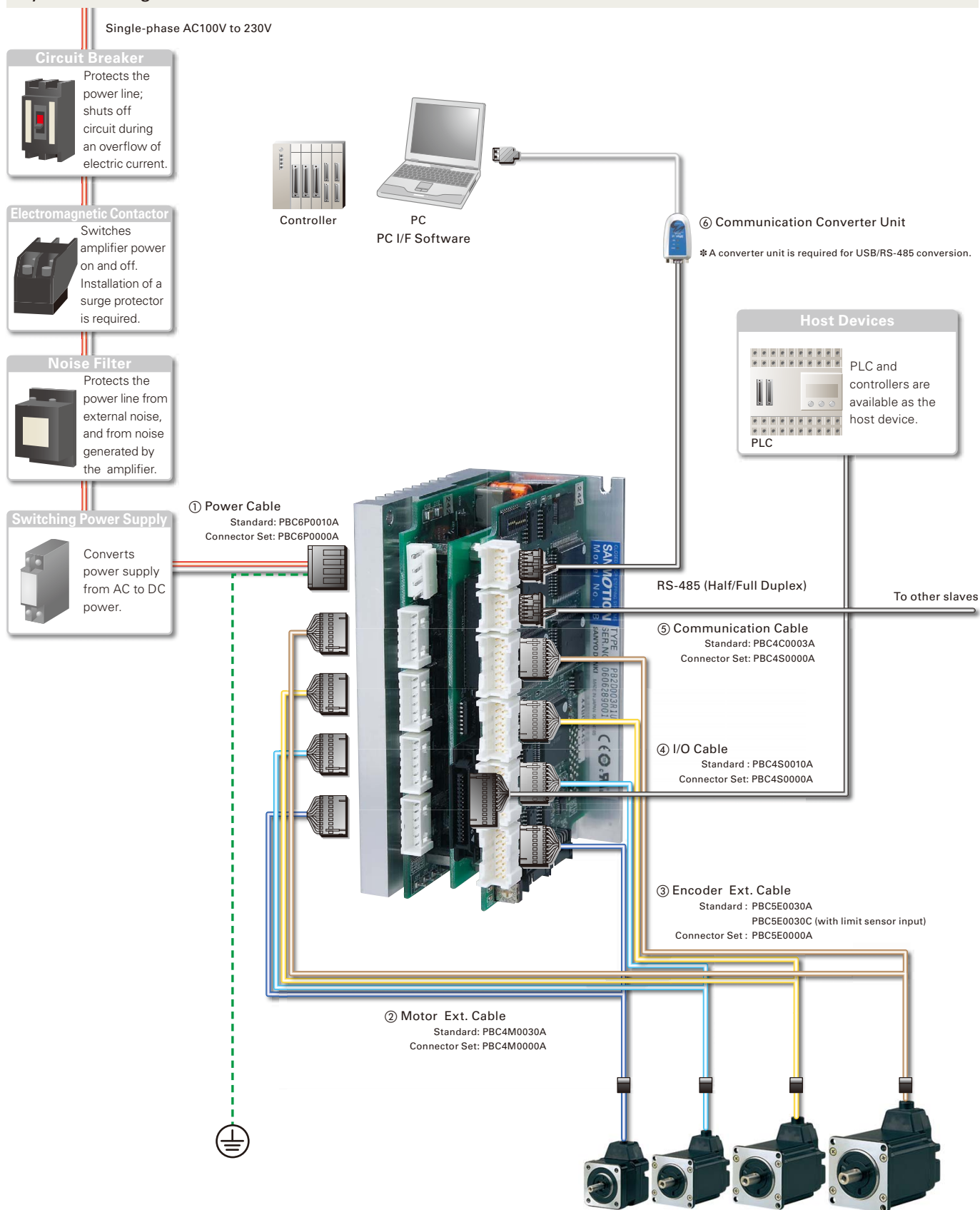
Note : The CN1 general-purpose input / output signal function is selected through communication. Please see the basic specifications for details.

*1 Connect control circuit to power source only for models with part numbers ending with " 1".

Model No. PB Type R Multi-Axis Type

DC Power Input Type

System Configuration



Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
① Power Cable	PBC6P0010A (1m)	PBC6P0000A	2m	—
② Motor Cable	PBC4M0030A (3m)	PBC4M0000A	20m	An extension cable is required.
③ Encoder Cable	PBC5E0030A (3m)	PBC5E0000A	20m	An extension cable is required.
③ Encoder Cable (with limit sensor input)	PBC5E0030C (3m)	PBC5E0000A	20m	Please specify when using an external limit sensor.
④ I/O Cable	PBC4S0010A (1m)	PBC4S0000A	2m	—
⑤ Communication Cable	PBC4C0003A (30cm)	PBC4C0000A	100m	Use when multiple axes are connected in a daisy-chain configuration for communication.
⑥ Communication Converter Unit	PBFM-U6	—		USB/RS-485 Half Duplex Converter Unit Converter unit and cable set model
⑦ PC I/F Software	SPBD2W-01	—	—	Software for operational check and parameter setting
⑧ Regenerative Unit	PBFE-01	—	—	Required if regeneration voltage is more than 40V

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

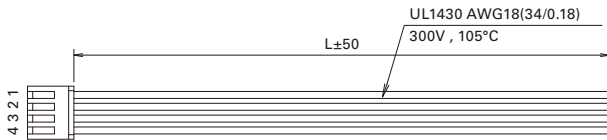
Options

Model No. PB Type R Multi-Axis Type

DC Power Input Type

Optional Cable

① Power Cable



Connector Connection Of Amplifier Side

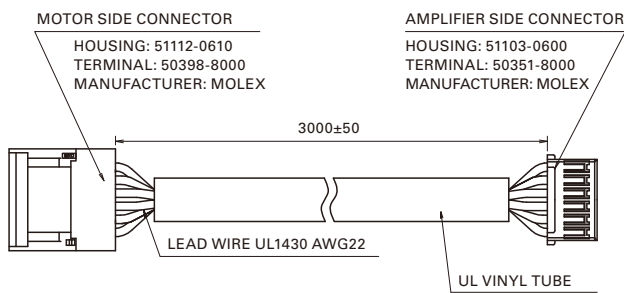
PIN No.	LEAD COLR	Signal Name
1	Red	DC+24/48V
2	Blue	GND
3	Yellow	DC+24V*1
4	Green	FG

*1 Connect only for amplifiers with part numbers ending with '1' or '2'

Connector Set:PBC6P0000A

Manufacturer	Type	Qty.
JST	Housing: VHR-4N	1
	Contact: SVH-41T-P1.1	4

② Motor Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
1	Blue	Motor Lead Wire
2	Orange	Motor Lead Wire
3	Red	Motor Lead Wire
4	Yellow	Motor Lead Wire
5	White	Brake Lead Wire
6	Black	Brake Lead Wire

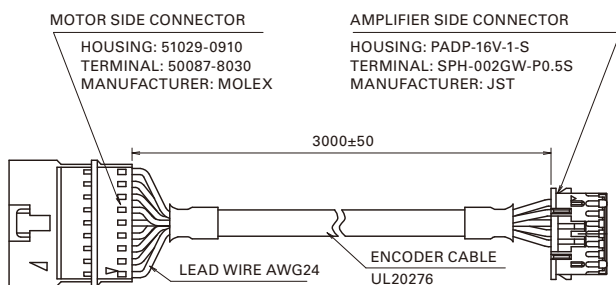
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1	Blue	Motor Lead Wire
2	Orange	Motor Lead Wire
3	Red	Motor Lead Wire
4	Yellow	Motor Lead Wire
5	White	Brake Lead Wire
6	Black	Brake Lead Wire

Connector Set:PBC4M0000A

Manufacturer	Type	Qty.
MOLEX	Housing: 51112-0610	1
	Terminal: 50398-8000	6
	Housing: 51103-0600	1
	Terminal: 50351-8000	6

③ Encoder Cable



Connector Connection Of Motor Side

PIN No.	LEAD COLR	Signal Name
1	Blue	CHANNEL A
2	Brown	CHANNEL A
3	Green	CHANNEL B
4	Purple	CHANNEL B
5	White	CHANNEL C
6	Yellow	CHANNEL C
7	Red	+5V
8	Black	0V
9	Black	Shield

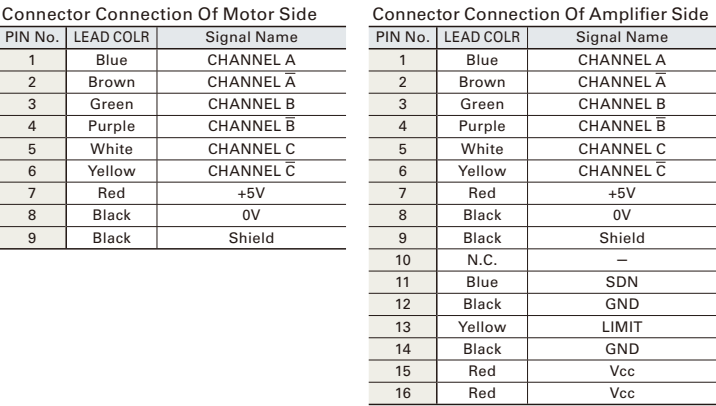
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1	Blue	CHANNEL A
2	Brown	CHANNEL A
3	Green	CHANNEL B
4	Purple	CHANNEL B
5	White	CHANNEL C
6	Yellow	CHANNEL C
7	Red	+5V
8	Black	0V
9	Black	Shield
10	N.C.	—
11	N.C.	—
12	N.C.	—
13	N.C.	—
14	N.C.	—
15	N.C.	—
16	N.C.	—

Connector Set:PBC5E0000A

Manufacturer	Type	Qty.
MOLEX	Housing: 51029-0910	1
	Terminal: 50087-8030	9
JST	Housing: PADP-16V-1-S	1
	Terminal: SPH-002GW-P0.5S	15

③ Encoder Cable (with limit sensor input)



The technical drawing consists of two views of the cable assembly:

- Top View (Side View):** Shows the cable assembly with a total length dimension of $L \pm 30$. The left end features a connector with pins labeled A1 and A16, and mounting points labeled B1 and B16. The cable is identified as "Flat cable UL2962 AWG28". A break symbol (two wavy lines) indicates the cable continues. A label "Cable Mark" with an arrow points to the cable body.
- Bottom View (Cross-sectional View):** Shows the cable assembly with a maximum thickness dimension of "1mm MAX.". It identifies "Cable 1" and "Cable 2" with arrows. A break symbol is also present.

Cable Connection	
Cable 1	Cable 2
A1-No.1	B1-No.17
A2-No.2	B2-No.18
A3-No.3	B3-No.19
A4-No.4	B4-No.20
A5-No.5	B5-No.21
•	•
•	•
•	•
•	•
A13-No.13	B13-No.29
A14-No.14	B14-No.30
A15-No.15	B15-No.31
A16-No.16	B16-No.32

Connector Set:PBC4S0000A

Manufacturer	Type	Qty.
KEL	Housing: 8822E-032-171D-F	1

Technical drawing of a cable assembly. The left part shows a cross-section of a 9-core cable with dimensions: 0 (outer diameter), 9 (core diameter), 2 (core spacing), and 1 (core thickness). The right part shows a side view of the cable assembly with a length dimension $L \pm 30$.

Connector relay cable

Signal Name	CNA Pin No.			CNB Pin No.	Signal Name
A	1	Yellow	Yellow	1	A
B	2	White	White	2	B
(Y)	3	Brown	Brown	3	(Y)
(Z)	4	Blue	Blue	4	(Z)
GND	5	Black	Black	5	GND
Vcc	6	Red	Red	6	Vcc
($\overline{STP}/EX2$)	7	Purple	Purple	7	($\overline{STP}/EX2$)
FG	8	Green	Green	8	FG
—	9	Drain	Drain	9	—
—	10			10	—

Connector Set:PBC4C0000A

Manufacturer	Type	Qty.
JST	Housing: PADP-10V-1-S	1
	Contact: SPH-002T-P0.5L	10

Model No. PB Type R Multi-Axis Type

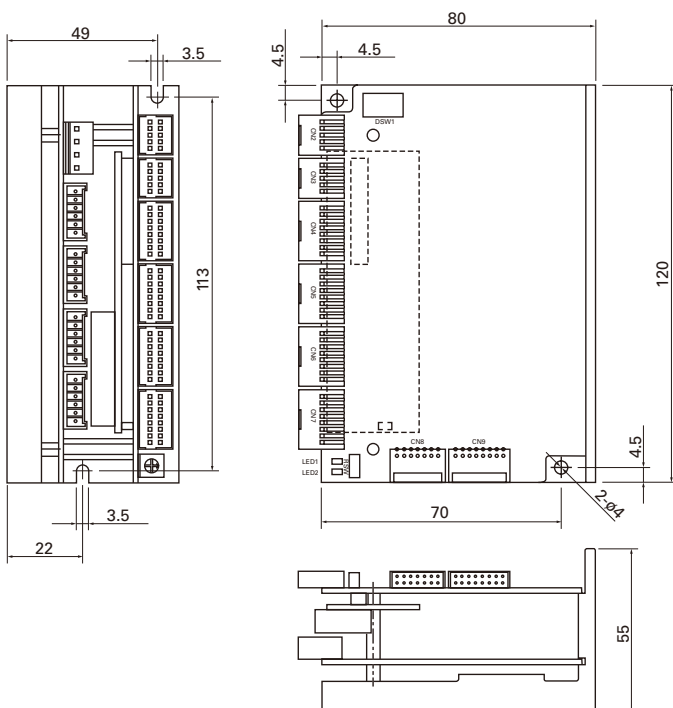
DC Power Input Type

General Specifications

Amplifier Model			PB2D003R1U△
Control Mode			PWM Control Trapezoidal drive method
Power Supply	Main Power Supply Control Power Supply		DC24V/36V±10% DC24V±10% (only for part numbers ending with "1" or "3")
Environment	Ambient temp.	Operating	0 to 55°C
		Storage	−20 to 70°C
	Operating/ Storage Humidity		90% RH (non-condensing)
	Vibration Resistance		0.5G (tested with frequency range 10 to 55 Hz, X, Y, Z each direction 2H)
Structure			Open Frame
Mass/Dimensions			Approx. 0.8kg W120×H55×D80
Functions	Rotation Speed		0 to 4500min ⁻¹
	Resolution (P/R)		200, 800, 1600, 3200, 6400, 12800
	Regeneration Process		Not available (External regenerative unit is optional)
	Protective Functions		Over-voltage, Regenerated voltage overload, Over-speed, Encoder disconnection, Reset error, CPU error, Overload stop, Soft Servo Error, Amplifier Overheat
	Display		Power status, Alarm (flashing indicator)
	Functions		Operation Functions: Normal Drive (incremental move , absolute move) , Zero-return, push operation Point Function: 256Point Program Function: 256PRG×16Line 8PRG×512LINE
	Switch		DIP SW1,2: Transmission Speed Setting DIP SW3 to 6: Axis valid / invalid (On: Activate) DIP SW7 to 10: Terminating Resistor Setting (On: with terminating resistance) Rotary SW: Node Address Setting (0 to E)
Input/ Output Signals	Input Signals		CN1 Fixed function : EXE, Point (4), SELECT, STOP, ALMCLR CN1 Selectable (4): Generic Input, Point, Pause, Interlock CN4 to CN7 Allocation Function (2 x 4-axis) Hard.Limit (SDN) Signal Input signal: DC5V to 24V Limit sensor (CN4 to 7 Pin.No.11,13): Inside 5V Pull Up
	Output Signals		CN1 Fixed function In-Position, Ack, Busy, ALM CN1Selectable (8) Generic Output, Motor Stop, H.Limit Monitor, ZONE, Zero-return completion, END, STOP Monitor Output signal: Open collector DC30V / 30mA max
	Communication Specifications		RS-485 Standard Start-Stop Synchronization, Half Duplex (Part numbers ending with "0" or "1") RS-485 Standard Start-Stop Synchronization, Full Duplex (Part numbers ending with "2" or "3")

Amplifier Dimensional Drawing

(Unit:mm)



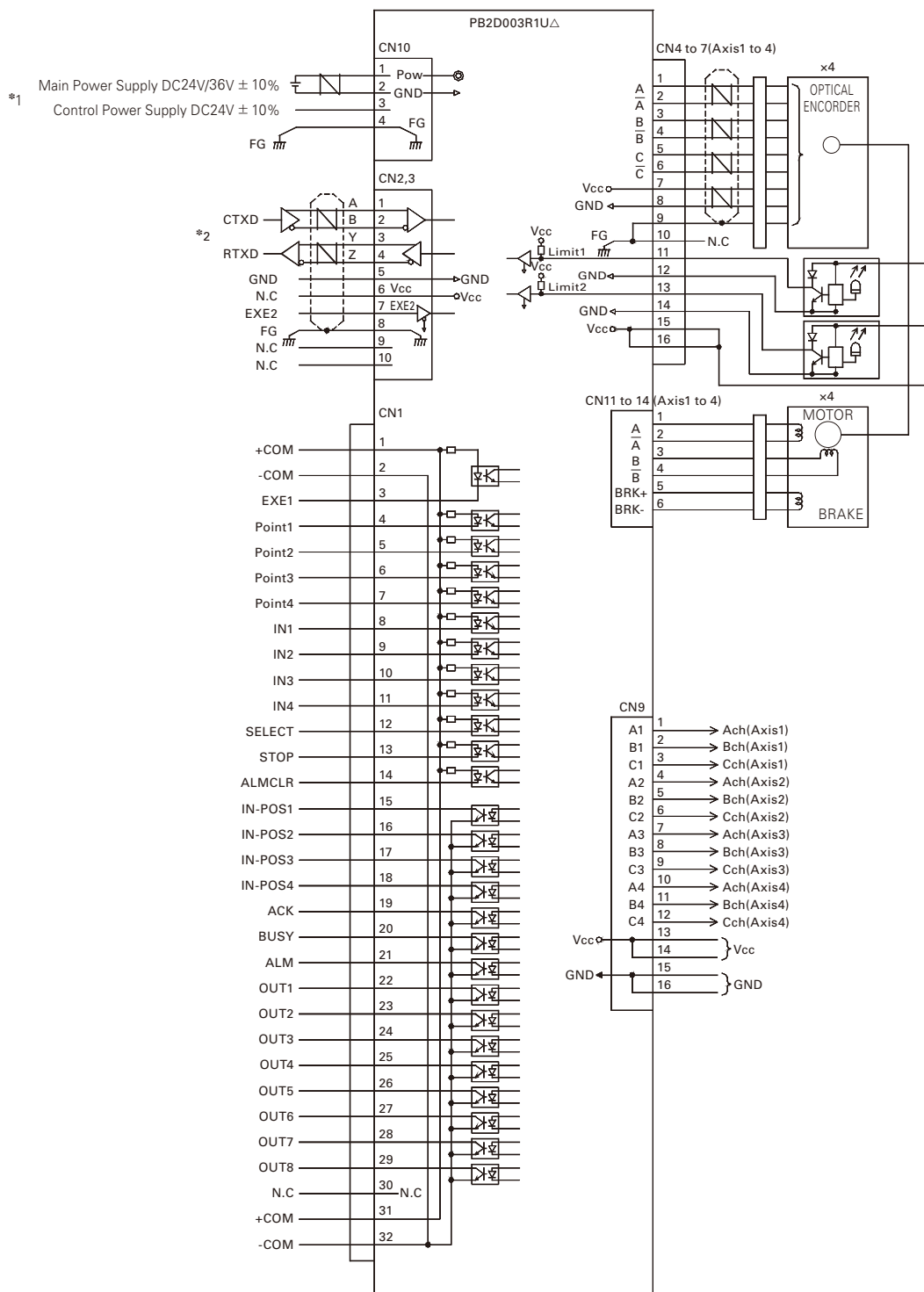
Amplifier Model Number Nomenclature

PB2D003R1U△

△	Communication Specifications	Power Input
0	Start-Stop Synchronization, Half Duplex	Single Power
1		Separate
2	Start-Stop Synchronization, Full Duplex	Single Power
3		Separate

Note : Operation of the holding brake is not available when the single input voltage amplifier is used at 36V input voltage. If operation of the holding brake is required at 36V input voltage, please use the separate power type amplifier, and set control voltage at 24V.

External Wiring Diagram



*1 Connect control circuit to power source only for models with part numbers ending with "1" or "3".

*2 Please check individual specifications for each part number, as communication specifications differ according to amplifier model.

Note 1: The CN1 general-purpose input/output signal function is selected through communication. Please see the basic specifications for details.



General Specifications

Standard Model **AC**

Motor Flange Size



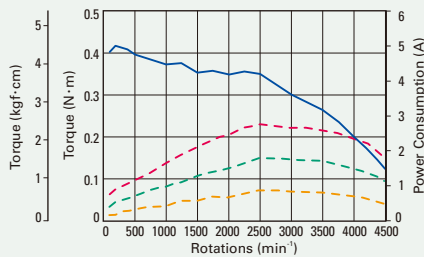
Size	Motor Flange Size	□42mm		□60mm			
	Motor Length	55.9mm		70.3mm		102.3mm	
Motor Model	Unit	PBM423FXK20-M		PBM603FXK20-M		PBM604FXK20-M	
Type R Set Model No.		PBBR423	PBCR423	PBBR603	PBCR603	PBBR604	PBCR604
Related Amplifier Model No.		PB4A002R30□					
Type P Set Model No.		PBBP423	PBCP423	PBBP603	PBCP603	PBBP604	PBCP604
Related Amplifier Model No.		PB4A002P30□					
MAX. Stall Torque	N・m	0.35		1.3		1.9	
Rotor Inertia	×10 ⁻⁴ kg・m ²	0.056		0.4		0.84	
Allowable Thrust Load	N	9.8		14.7			
Allowable Radial Load Note1	N	47		190			
Motor Mass	kg	0.35		0.85		1.42	
Motor Characteristics Chart	Type R	①		②		③	
	Type P						

Motor Characteristics Chart

Torque AC100V/200V — Power Consumption Single-phase AC100V - - - Single-phase AC200V - - - 3-phase AC200V - - -

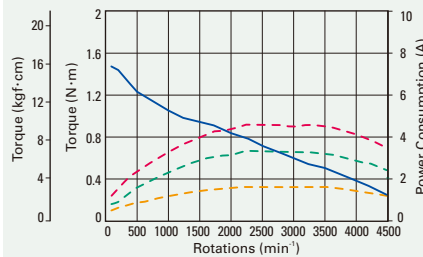
① Motor Model PBM423FXK20-M

Type R Type P



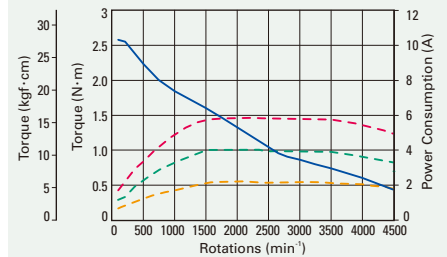
② Motor Model PBM603FXK20-M

Type R Type P



③ Motor Model PBM604FXK20-M

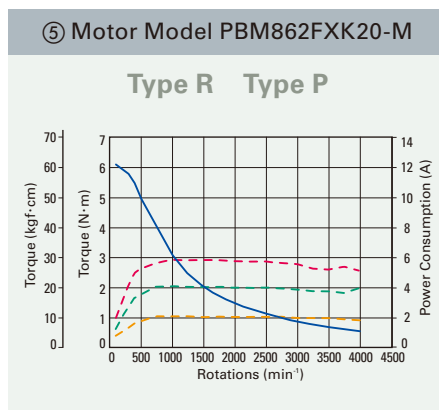
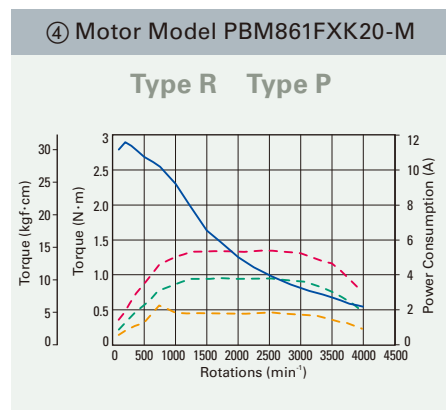
Type R Type P



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is the output shaft end edge.

□86mm			
79.5mm		109.1mm	
PBM861FXK20-M		PBM862FXK20-M	
PBBR861	PBCR861	PBBR862	PBCR862
PB4A002R30□			
PBBP861	PBCP861	PBBP862	PBCP862
PB4A002P30□			
3.1		6.1	
1.48		3	
60			
200			
1.9		3.1	
④		⑤	





General Specifications

Standard Model **DC**

Motor Flange Size

□28 □42 □60

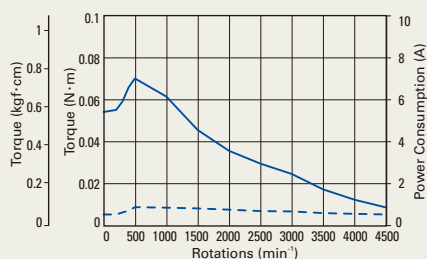
Size	Motor Flange Size	□28mm		□42mm
	Motor Length	58.5mm	77.8mm	57.6mm
Motor Model	Unit	PBM282FXE20	PBM284FXE20	PBM423FXE20
Type M Set Model No.		PBDM282	PBDM284	PBDM423
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM282DXA20	PBM284DXA20	PBM423DXA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	0.05	0.155	0.39
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.008	0.016	0.056
Allowable Thrust Load	N	9.8		9.8
Allowable Radial Load Note1	N	33		49
Motor Mass	kg	0.16	0.23	0.35
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

Motor Characteristics Chart

Type M Torque DC24V — DC48V — Power Consumption DC24V - - - - - DC48V - - - - -
Type R Multi-Axis Torque DC24V — DC36V —

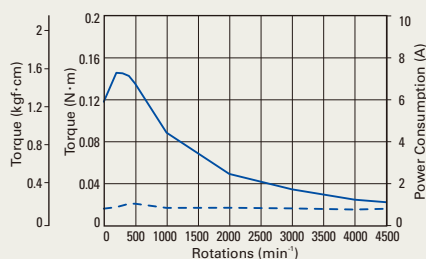
① Motor Model PBM282FXE20

Type M



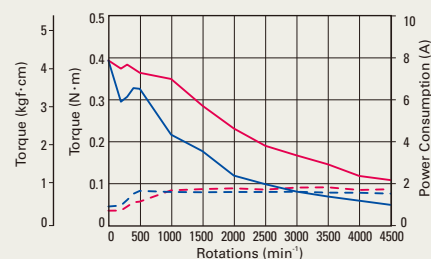
③ Motor Model PBM284FXE20

Type M



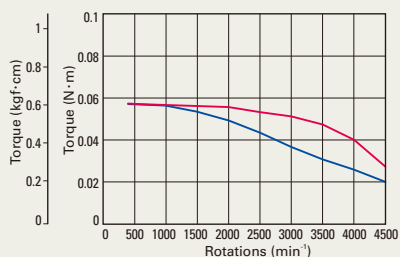
⑤ Motor Model PBM423FXE20

Type M



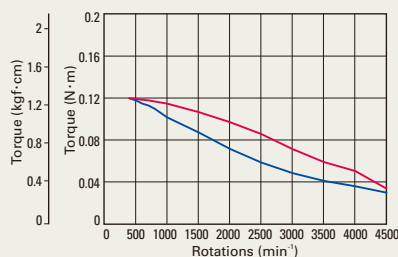
② Motor Model PBM282DXA20

Type R Multi-Axis



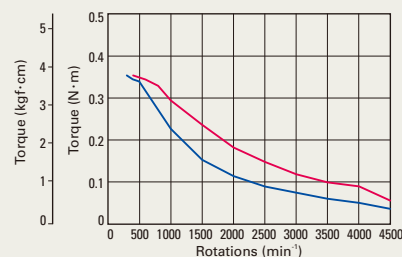
④ Motor Model PBM284DXA20

Type R Multi-Axis



⑥ Motor Model PBM423DXA20

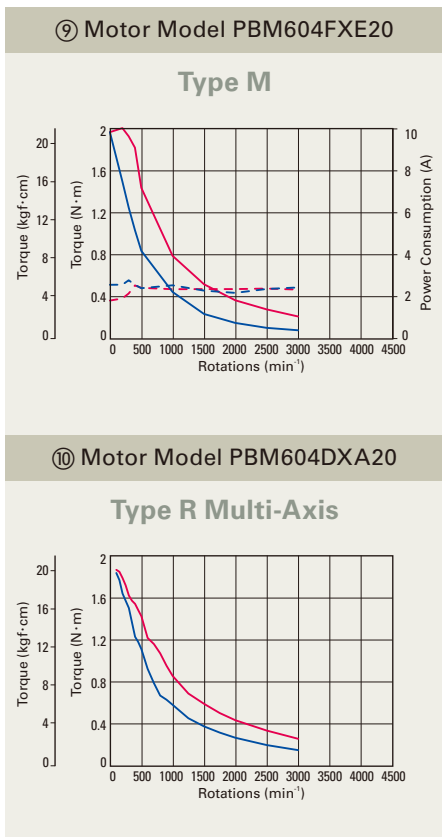
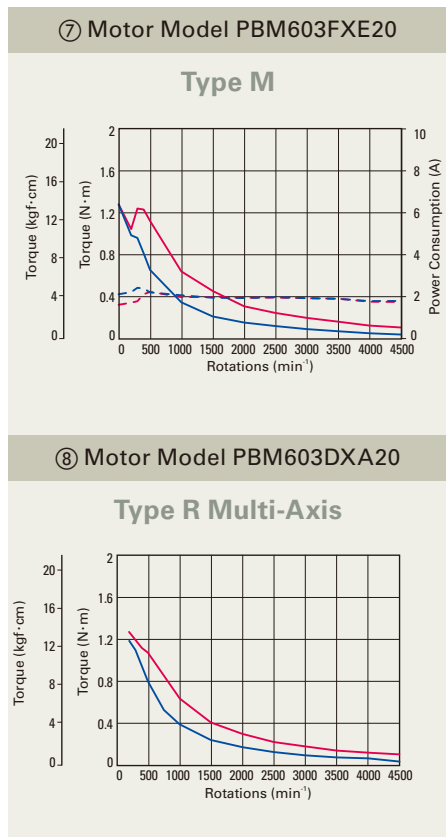
Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 14mm from the mounting surface.

□60mm	
70.3mm	102.3mm
PBM603FXE20	PBM604FXE20
PBDM603	PBDM604
PB3D003M200	
PBM603DXA20	PBM604DXA20
PB2D003R1U△	
1.3	1.9
0.4	0.84
14.7	
167	
0.85	1.42
⑦	⑨
⑧	⑩





General Specifications

Low-backlash Gear Model

AC

Motor Flange Size

42 60

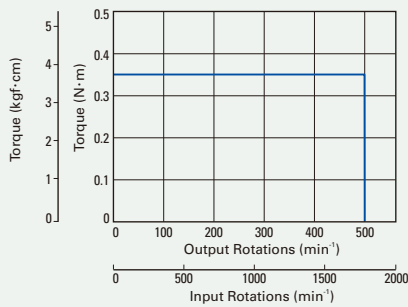
Size	Motor Flange Size	□42mm					
	Motor Length + Gear Length	86.1mm					
Motor Model	Unit	PBM423FGAK20-M		PBM423FGBK20-M		PBM423FGEK20-M	
Type R Set Model No.		PBBR423-C3.6	PBCR423-C3.6	PBBR423-C7.2	PBCR423-C7.2	PBBR423-C10	PBCR423-C10
Related Amplifier Model No.		PB4A002R30□					
Type P Set Model No.		PBBP423-C3.6	PBCP423-C3.6	PBBP423-C7.2	PBCP423-C7.2	PBBP423-C10	PBCP423-C10
Related Amplifier Model No.		PB4A002P30□					
MAX. Stall Torque	N・m	0.343		0.686		0.98	
Rotor Inertia	×10 ⁻⁴ kg・m ²			0.056			
Reduction Gear Ratio		1:3.6		1:7.2		1:10	
Backlash	DEG	0.6		0.4		0.35	
Allowable Rotations	min ⁻¹	500		250		180	
Rotation Direction	Rel. to command dir.	Forward					
Allowable Thrust Load	N	15					
Allowable Radial Load Note1	N	20					
Motor Mass	kg	0.48					
Motor Characteristics Chart	Type R	①		②		③	
	Type P						

Motor Characteristics Chart

Allowable Torque AC100V/200V

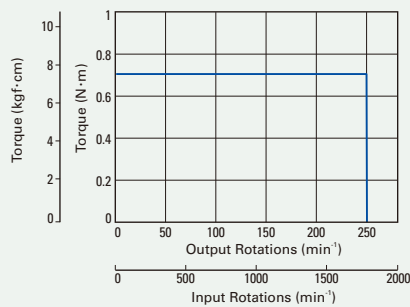
① Motor Model PBM423FGAK20-M

Type R Type P



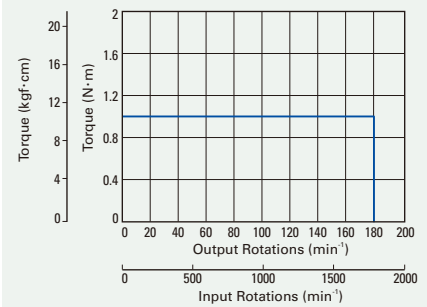
② Motor Model PBM423FGBK20-M

Type R Type P



③ Motor Model PBM423FGEK20-M

Type R Type P



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□42mm			
86.1mm			
PBM423FGGK20-M		PBM423FGJK20-M	
PBBR423-C20	PBCR423-C20	PBBR423-C30	PBCR423-C30
PB4A002R30□			
PBBP423-C20	PBCP423-C20	PBBP423-C30	PBCP423-C30
PB4A002P30□			
1.47			
0.056			
1:20		1:30	
0.25			
90		60	
Forward			
15			
20			
0.48			
④		⑤	

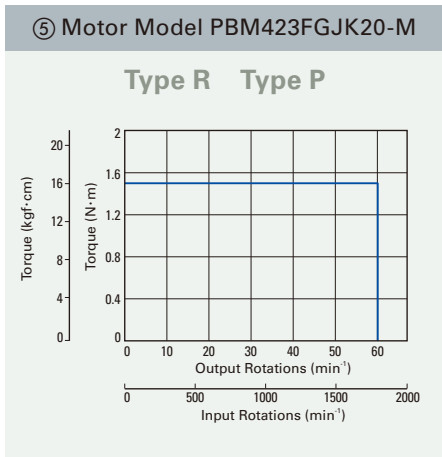
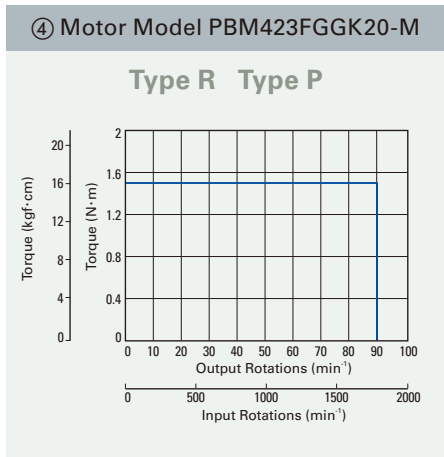
Features and Functions

Type R

Type P

Type M

Type R Multi-Axis



Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

Spur Gear Model

Motor Dimensional Drawings

Options



General Specifications

Low-backlash Gear Model

AC

Motor Flange Size

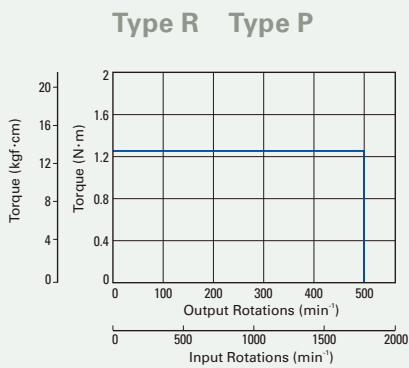
42 60

Size	Motor Flange Size	□60mm					
	Motor Length + Gear Length	114.3mm					
Motor Model	Unit	PBM603FGAK20-M		PBM603FGBK20-M		PBM603FGEK20-M	
Type R Set Model No.		PBBR603-C3.6	PBCR603-C3.6	PBBR603-C7.2	PBCR603-C7.2	PBBR603-C10	PBCR603-C10
Related Amplifier Model No.		PB4A002R30□					
Type P Set Model No.		PBBP603-C3.6	PBCP603-C3.6	PBBP603-C7.2	PBCP603-C7.2	PBBP603-C10	PBCP603-C10
Related Amplifier Model No.		PB4A002P30□					
MAX. Stall Torque	N・m	1.25		2.5		3	
Rotor Inertia	×10 ⁻⁴ kg・m ²			0.4			
Reduction Gear Ratio		1:3.6		1:7.2		1:10	
Backlash	DEG	0.55		0.25			
Allowable Rotations	min ⁻¹	500		250		180	
Rotation Direction	Rel. to command dir.	Forward				Reverse	
Allowable Thrust Load	N	30					
Allowable Radial Load Note1	N	100					
Motor Mass	kg	1.22					
Motor Characteristics Chart	Type R	①		②		③	
	Type P						

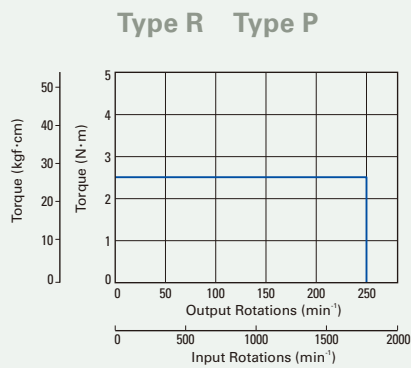
Motor Characteristics Chart

Allowable Torque AC100V/200V

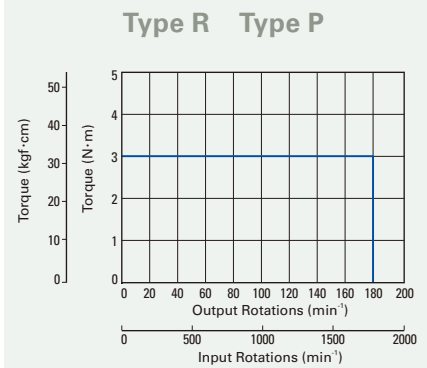
① Motor Model PBM603FGAK20-M



② Motor Model PBM603FGBK20-M



③ Motor Model PBM603FGEK20-M

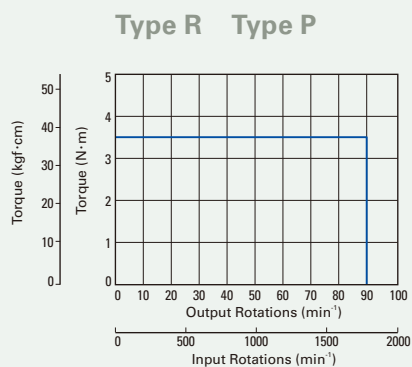


*Maintain motor case temperature at a point below 85°C.

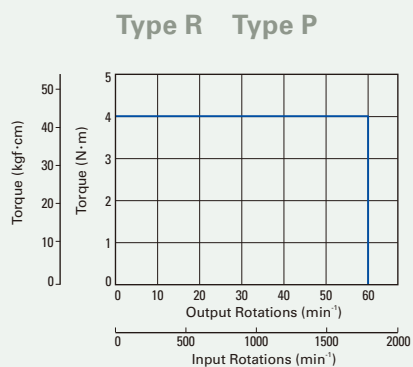
Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□60mm			
114.3mm			
PBM603FGGK20-M		PBM603FGJK20-M	
PBBR603-C20	PBCR603-C20	PBBR603-C30	PBCR603-C30
PB4A002R30□			
PBBP603-C20	PBCP603-C20	PBBP603-C30	PBCP603-C30
PB4A002P30□			
3.5		4	
0.4			
1:20		1:30	
0.17			
90		60	
Reverse			
30			
100			
1.22			
④		⑤	

④ Motor Model PBM603FGGK20-M



⑤ Motor Model PBM603FGJK20-M





General Specifications

Low-backlash Gear Model

DC

Motor Flange Size



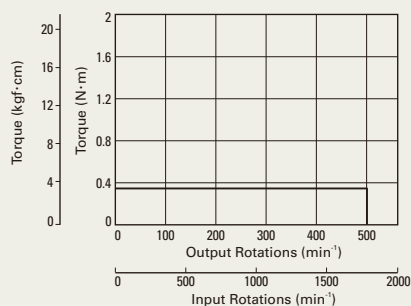
Size	Motor Flange Size	□42mm		
	Motor Length + Gear Length	87.9mm		
Motor Model	Unit	PBM423FGAE20	PBM423FGBE20	PBM423FGEE20
Type M Set Model No.		PBDM423-C3.6	PBDM423-C7.2	PBDM423-C10
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM423DGAA20	PBM423DGBA20	PBM423DGEA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	0.343	0.686	0.98
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.056		
Reduction Gear Ratio		1:3.6	1:7.2	1:10
Backlash	DEG	0.6	0.4	0.35
Allowable Rotations	min^{-1}	500	250	180
Rotation Direction	Rel. to command dir.	Forward		
Allowable Thrust Load	N	15		
Allowable Radial Load Note1	N	20		
Motor Mass	kg	0.48		
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

Motor Characteristics Chart

Type M Allowable Torque DC24V — DC48V — DC24V/48V —
 Type R Multi-Axis Allowable Torque DC24V — DC36V — DC24V/36V —

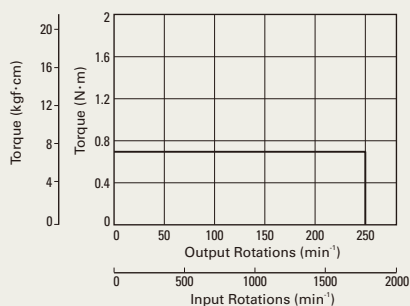
① Motor Model PBM423FGAE20

Type M



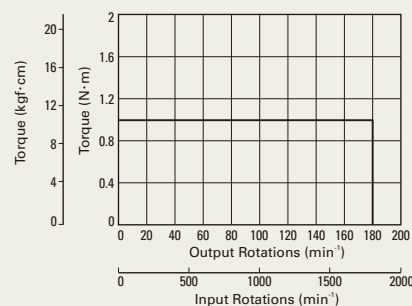
③ Motor Model PBM423FGBE20

Type M



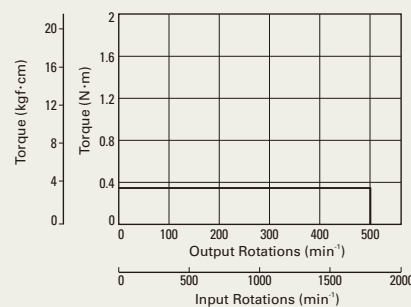
⑤ Motor Model PBM423FGEE20

Type M



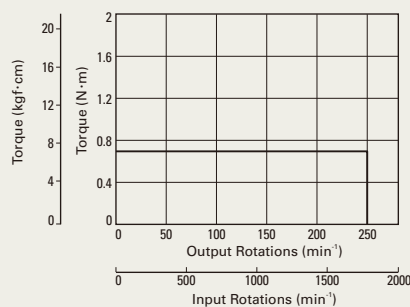
② Motor Model PBM423DGAA20

Type R Multi-Axis



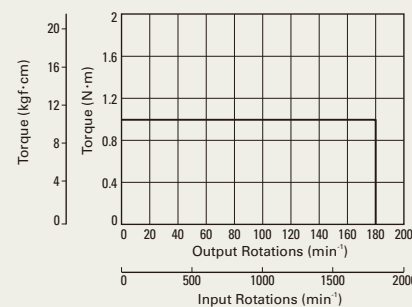
④ Motor Model PBM423DGBA20

Type R Multi-Axis



⑥ Motor Model PBM423DGEA20

Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□42mm	
87.9mm	
PBM423FGGE20	PBM423FGJE20
PBDM423-C20	PBDM423-C30
PB3D003M200	
PBM423DGGA20	PBM423DGJA20
PB2D003R1U△	
1.47	
0.056	
1:20	1:30
0.25	0.25
90	60
Reverse	
15	
20	
0.48	
⑦	⑨
⑧	⑩

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

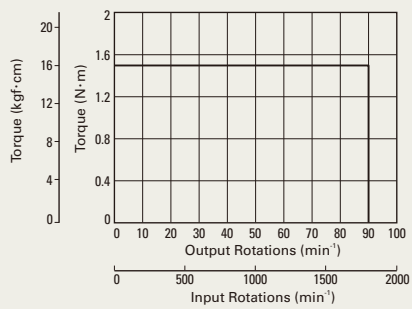
Spur Gear Model

Motor Dimensional Drawings

Options

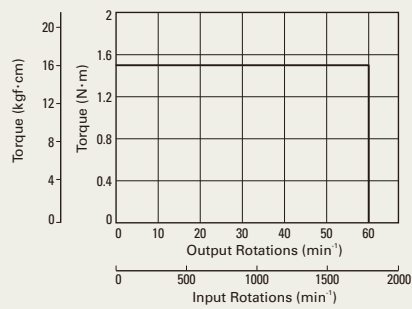
⑦ Motor Model PBM423FGGE20

Type M



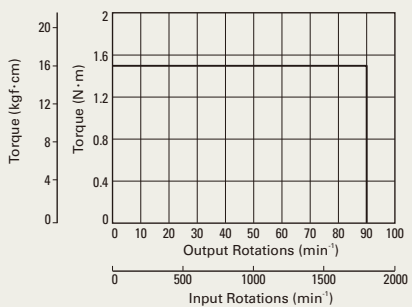
⑨ Motor Model PBM423FGJE20

Type M



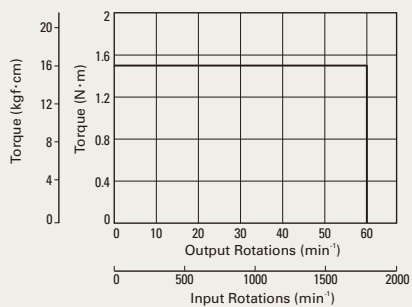
⑧ Motor Model PBM423DGGA20

Type R Multi-Axis



⑩ Motor Model PBM423DGJA20

Type R Multi-Axis





General Specifications

Low-backlash Gear Model

DC

Motor Flange Size



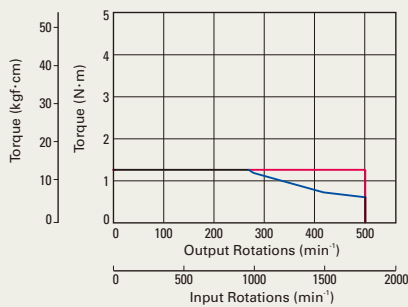
Size	Motor Flange Size	□60mm		
	Motor Length + Gear Length	115.8mm		
Motor Model	Unit	PBM603FGAE20	PBM603FGBE20	PBM603FGEE20
Type M Set Model No.		PBDM603-C3.6	PBDM603-C7.2	PBDM603-C10
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM603DGAA20	PBM603DGBA20	PBM603DGEA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	1.25	2.5	3
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.4		
Reduction Gear Ratio		1:3.6	1:7.2	1:10
Backlash	DEG	0.55	0.25	
Allowable Rotations	min^{-1}	500	250	180
Rotation Direction	Rel. to command dir.	Forward		Reverse
Allowable Thrust Load	N	30		
Allowable Radial Load Note1	N	100		
Motor Mass	kg	1.22		
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

Motor Characteristics Chart

Type M Allowable Torque DC24V — DC48V — DC24V/48V —
Type R Multi-Axis Allowable Torque DC24V — DC36V — DC24V/36V —

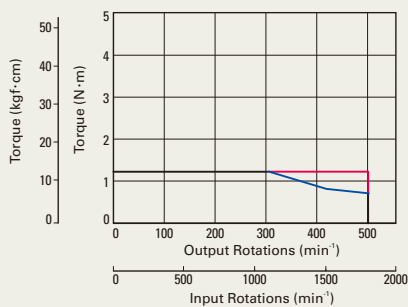
① Motor Model PBM603FGAE20

Type M



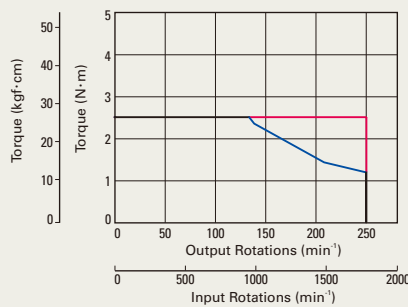
② Motor Model PBM603DGAA20

Type R Multi-Axis



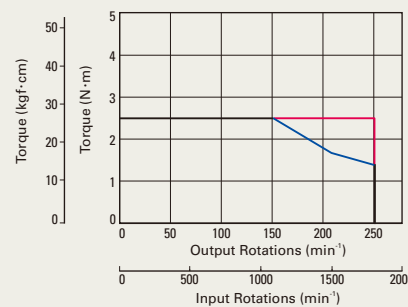
③ Motor Model PBM603FGBE20

Type M



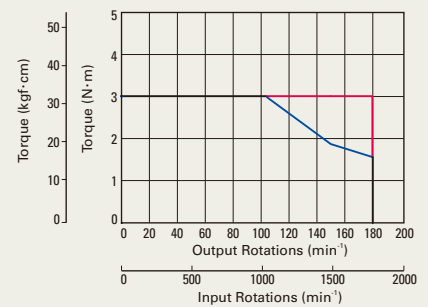
④ Motor Model PBM603DGBA20

Type R Multi-Axis



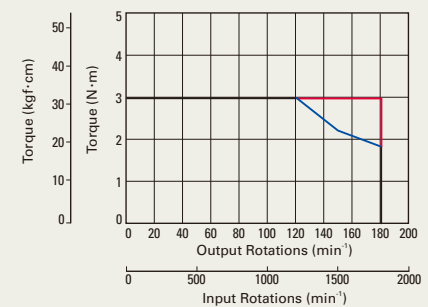
⑤ Motor Model PBM603FGEE20

Type M



⑥ Motor Model PBM603DGEA20

Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□60mm	
115.8mm	
PBM603FGGE20	PBM603FGJE20
PBDM603-C20	PBDM603-C30
PB3D003M200	
PBM603DGGA20	PBM603DGJA20
PB2D003R1U△	
3.5	4
0.4	
1:20	1:30
0.17	
90	60
Reverse	
30	
100	
1.22	
⑦	⑨
⑧	⑩

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

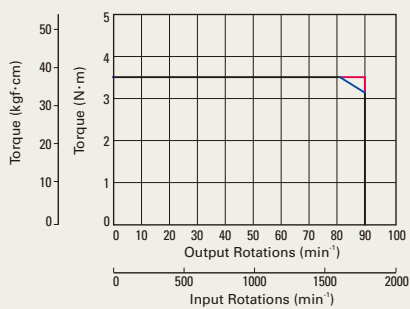
Spur Gear Model

Motor Dimensional Drawings

Options

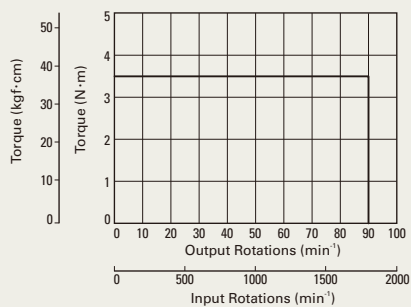
⑦ Motor Model PBM603FGGE20

Type M



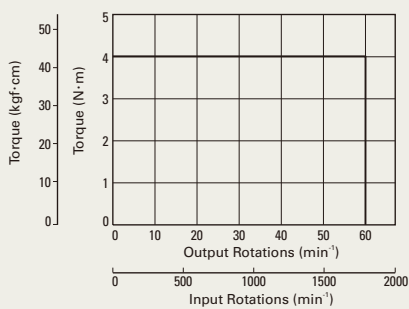
⑧ Motor Model PBM603DGGA20

Type R Multi-Axis



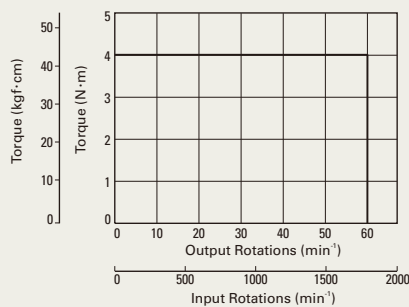
⑨ Motor Model PBM603FGJE20

Type M



⑩ Motor Model PBM603DGJA20

Type R Multi-Axis





General Specifications

Harmonic Gear Model

AC

Motor Flange Size

42 60

Size	Motor Flange Size	42mm		
	Motor Length + Gear Length	95.1mm		
Motor Model	Unit	PBM423FHJK20-M	PBM423FHLK20-M	PBM423FHMK20-M
Type R Set Model No.		PBBR423-H30 / PBCR423-H30	PBBR423-H50 / PBCR423-H50	PBBR423-H100 / PBCR423-H100
Related Amplifier Model No.		PB4A002R30□		
Type P Set Model No.		PBBP423-H30 / PBCP423-H30	PBBP423-H50 / PBCP423-H50	PBBP423-H100 / PBCP423-H100
Related Amplifier Model No.		PB4A002P30□		
MAX. Stall Torque	N·m	2.2	3.5	5
Allow. Instantaneous Torque	N·m	4.5	8.3	11
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.068		
Reduction Gear Ratio		1:30	1:50	1:100
Lost Motion	min	—		
Hysteresis Loss	min	3.6	2.4	
Allowable Rotations	min^{-1}	116	70	35
Allowable Thrust Load	N	1150		
Allowable Radial Load Note1	N	209		
Motor Mass	kg	0.54		
Motor Characteristics Chart	Type R	①	②	③
	Type P			

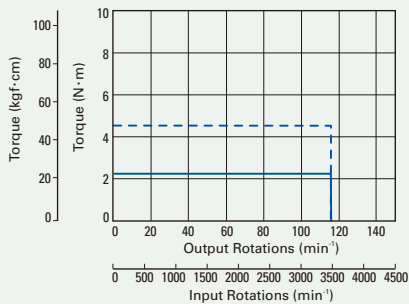
Motor Characteristics Chart

Allowable Torque Single-phase AC100V/200V ———

Allow. Instantaneous Torque Single-phase, 3-phase AC100V/200V - - - - -

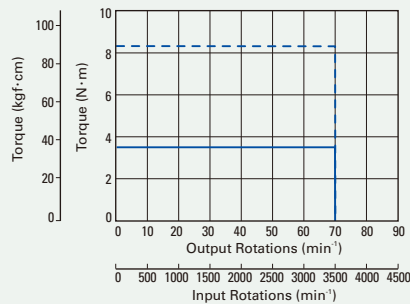
① Motor Model PBM423FHJK20-M

Type R Type P



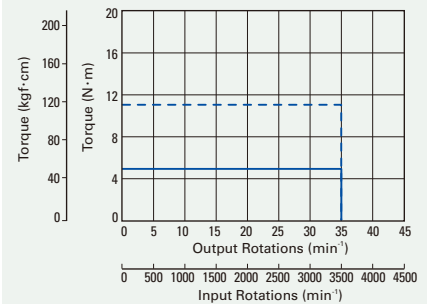
② Motor Model PBM423FHLK20-M

Type R Type P



③ Motor Model PBM423FHMK20-M

Type R Type P



*Maintain motor case temperature at a point below 85°C.

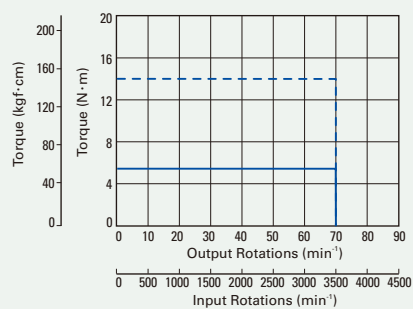
*The gear output shaft rotates in the opposite direction.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□60mm	
135.8mm	
PBM603FHLK20-M	PBM603FHMK20-M
PBBR603-H50 / PBCR603-H50	PBBR603-H100 / PBCR603-H100
PB4A002R30□	
PBBP603-H50 / PBCP603-H50	PBBP603-H100 / PBCP603-H100
PB4A002P30□	
5.5	8
14	20
0.435	
1:50	1:100
0.4 to 3 [$\pm 0.28\text{N}\cdot\text{m}$]	0.4 to 3 [$\pm 0.4\text{N}\cdot\text{m}$]
—	
70	35
400	
360	
1.45	
④	⑤

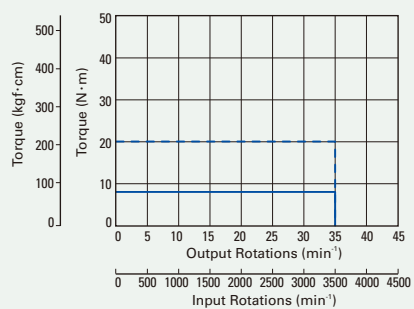
④ Motor Model PBM603FHLK20-M

Type R Type P



⑤ Motor Model PBM603FHMK20-M

Type R Type P





General Specifications

Harmonic Gear Model

DC

Motor Flange Size

28 42

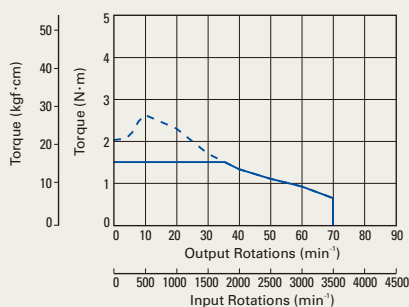
Size	Motor Flange Size	□28mm		□42mm
	Motor Length + Gear Length	97mm		97mm
Motor Model	Unit	PBM282FHLE20	PBM282FHME20	PBM423FHJE20
Type M Set Model No.		PBDM282-H50	PBDM282-H100	PBDM423-H30
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM282DHLE20	PBM282DHMA20	PBM423DHJA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	1.5	2	2.2
Allow. Instantaneous Torque	N·m	2.7	3.6	4.5
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.012		0.068
Reduction Gear Ratio		1:50	1:100	1:30
Lost Motion	min	0.4 to 3 [$\pm 0.06 \text{N} \cdot \text{m}$]		—
Hysteresis Loss	min	—		3.6
Allowable Rotations	min^{-1}	70	35	116
Allowable Thrust Load	N	100		1150
Allowable Radial Load Note1	N	160		209
Motor Mass	kg	0.27		0.54
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

Motor Characteristics Chart

Type M Allowable Torque DC24V — DC48V — DC24V/48V — Allow. Instantaneous Torque DC24V - - - - DC48V - - - - DC24V/48V - - - -
 Type R Multi-Axis Allowable Torque DC24V — DC36V — DC24V+36V — Allow. Instantaneous Torque DC24V - - - - DC36V - - - - DC24V/36V - - - -

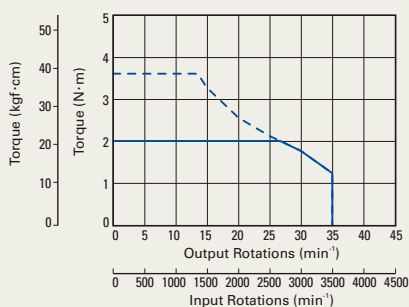
① Motor Model PBM282FHLE20

Type M



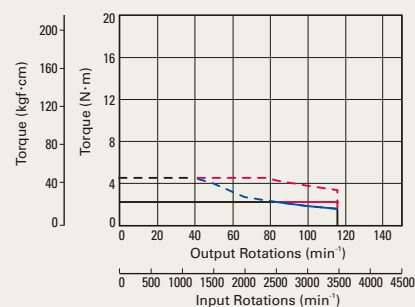
③ Motor Model PBM282FHME20

Type M



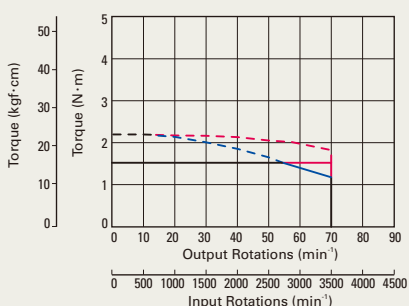
⑤ Motor Model PBM423FHJE20

Type M



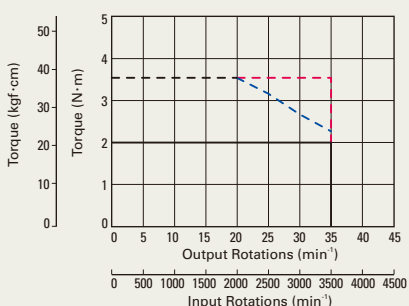
② Motor Model PBM282DHLE20

Type R Multi-Axis



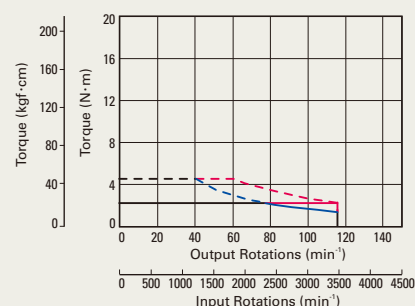
④ Motor Model PBM282DHMA20

Type R Multi-Axis



⑥ Motor Model PBM423DHJA20

Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

*The gear output shaft rotates in the opposite direction.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□42mm	
97mm	
PBM423FHLE20	PBM423FHME20
PBDM423-H50	PBDM423-H100
PB3D003M200	
PBM423DHLA20	PBM423DHMA20
PB2D003R1U△	
3.5	5
8.3	11
0.068	
1:50	1:100
—	
2.4	
70	35
1150	
209	
0.54	
⑦	⑨
⑧	⑩

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

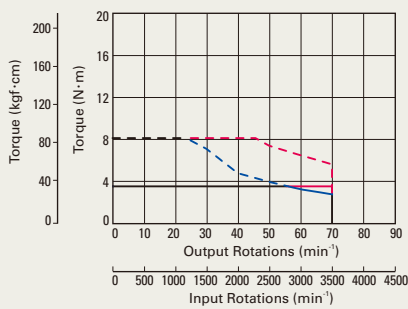
Spur Gear Model

Motor Dimensional Drawings

Options

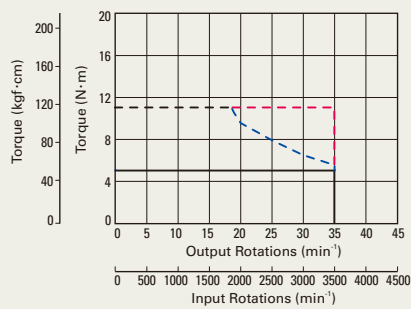
⑦ Motor Model PBM423FHLE20

Type M



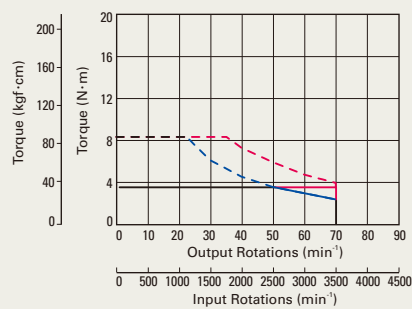
⑨ Motor Model PBM423FHME20

Type M



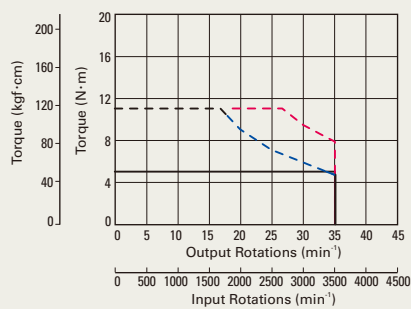
⑧ Motor Model PBM423DHLA20

Type R Multi-Axis



⑩ Motor Model PBM423DHMA20

Type R Multi-Axis





General Specifications

Harmonic Gear Model

DC

Motor Flange Size

60

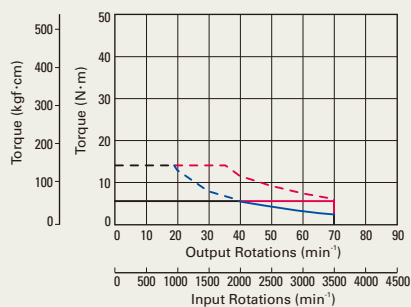
Size	Motor Flange Size	□60mm	
	Motor Length + Gear Length	137.3mm	
Motor Model	Unit	PBM603FHLE20	PBM603FHME20
Type M Set Model No.		PBDM603-H50	PBDM603-H100
Related Amplifier Model No.		PB3D003M200	
Motor Model	Unit	PBM603DHLE20	PBM603DHMA20
Type R Multi-axis Model No.		PB2D003R1U△	
MAX. Stall Torque	N·m	5.5	8
Allow. Instantaneous Torque	N·m	14	20
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.435	
Reduction Gear Ratio		1:50	1:100
Lost Motion	min	0.4 to 3 [$\pm 0.28 \text{N} \cdot \text{m}$]	
Hysteresis Loss	min	—	
Allowable Rotations	min^{-1}	70	35
Allowable Thrust Load	N	400	
Allowable Radial Load ^{Note1}	N	360	
Motor Mass	kg	1.45	
Motor Characteristics Chart	Type M	①	③
	Type R Multi-Axis	②	④

Motor Characteristics Chart

Type M Allowable Torque DC24V — DC48V — DC24V/48V — Allow. Instantaneous Torque DC24V - - - - DC48V - - - - DC24V/48V - - - -
Type R Multi-Axis Allowable Torque DC24V — DC36V — DC24V+36V — Allow. Instantaneous Torque DC24V - - - - DC36V - - - - DC24V/36V - - - -

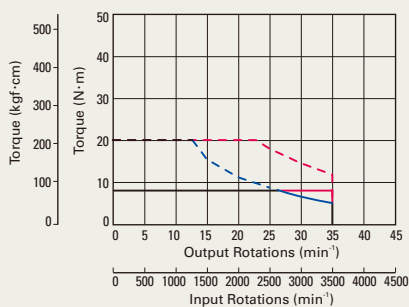
① Motor Model PBM603FHLE20

Type M



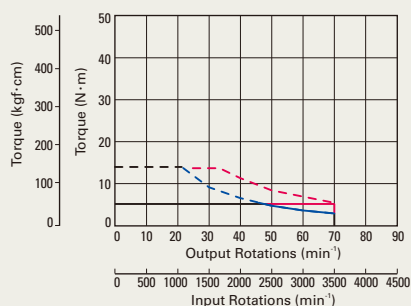
③ Motor Model PBM603FHME20

Type M



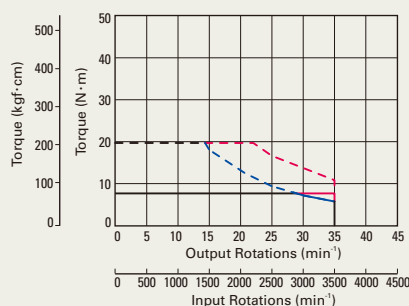
② Motor Model PBM603DHLE20

Type R Multi-Axis



④ Motor Model PBM603DHMA20

Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

*The gear output shaft rotates in the opposite direction.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.



General Specifications

Electromagnetic Brake Model AC

Motor Flange Size

42 60

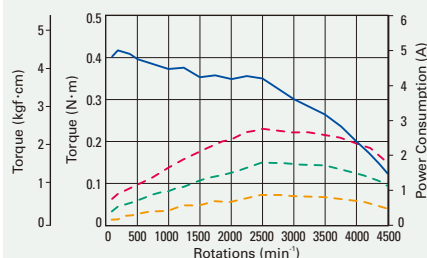
Size		Motor Flange Size	□42mm		□60mm			
		Motor Length + Brake Length	88.3mm		113.6mm		145.6mm	
Motor Model		Unit	PBM423FCK20-M		PBM603FCK20-M		PBM604FCK20-M	
Type R Set Model No.			PBBR423-B	PBCR423-B	PBBR603-B	PBCR603-B	PBBR604-B	PBCR604-B
Related Amplifier Model No.			PB4A002R30□					
Type P Set Model No.			PBBP423-B	PBCP423-B	PBBP603-B	PBCP603-B	PBBP604-B	PBCP604-B
Related Amplifier Model No.			PB4A002P30□					
MAX. Stall Torque		N・m	0.39		1.3		1.9	
Rotor Inertia		×10 ⁻⁴ kg・m ²	0.056		0.4		0.84	
Allowable Thrust Load		N	9.8		14.7			
Allowable Radial Load Note1		N	47		190			
Motor Mass		kg	0.5		1.19		1.76	
Electromagnetic Brake	Operation Method		No excitation actuating type					
	Power Voltage	V	DC24V±5%					
	Excitation Current	A	0.08		0.25			
	Power Consumption	W	2		6			
	Friction Torque	N・m	0.3		0.78			
	Brake Engage Time	ms	20		20			
	Brake Release Time	ms	30		30			
Motor Characteristics Chart		Type R	①		②		③	
		Type P						

Motor Characteristics Chart

Torque AC100V/200V — Power Consumption Single-phase AC100V - - - Single-phase AC200V - - - 3-phase AC200V - - -

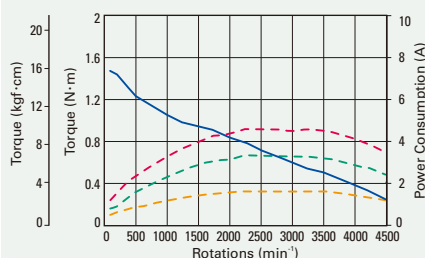
① Motor Model PBM423FCK20-M

Type R Type P



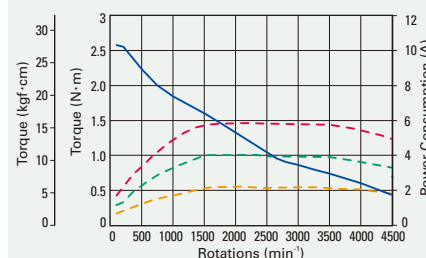
② Motor Model PBM603FCK20-M

Type R Type P



③ Motor Model PBM604FCK20-M

Type R Type P



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is the output shaft end edge.



General Specifications

Electromagnetic Brake Model DC

Motor Flange Size

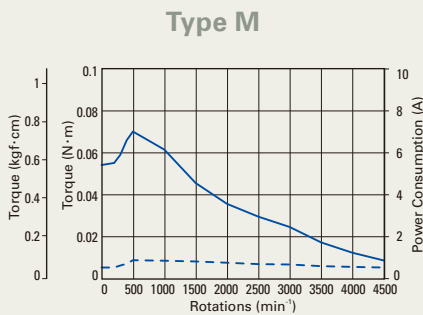
28 42 60

Size	Motor Flange Size	28mm		42mm
	Motor Length + Brake Length	97.8mm	117.1mm	90mm
Motor Model	Unit	PBM282FCE20	PBM284FCE20	PBM423FCE20
Type M Set Model No.		PBDM282-B	PBDM284-B	PBDM423-B
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM282DCA20	PBM284DCA20	PBM423DCA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	0.055	0.155	0.39
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.0091	0.0171	0.056
Allowable Thrust Load	N	9.8		
Allowable Radial Load ^{Note1}	N	33		49
Motor Mass	kg	0.28	0.35	0.5
Electromagnetic Brake	Operation Method	No excitation actuating type		
	Power Voltage	V		
	Excitation Current	A		
	Power Consumption	W		
	Friction Torque	N·m		
	Brake Engage Time	ms		
	Brake Release Time	ms		
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

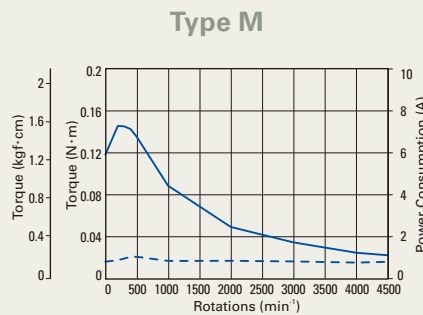
Motor Characteristics Chart

Type M Torque DC24V — DC48V — Power Consumption DC24V - - - DC48V - - -
 Type R Multi-Axis Torque DC24V — DC36V —

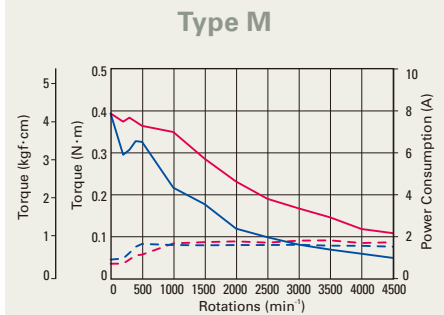
① Motor Model PBM282FCE20



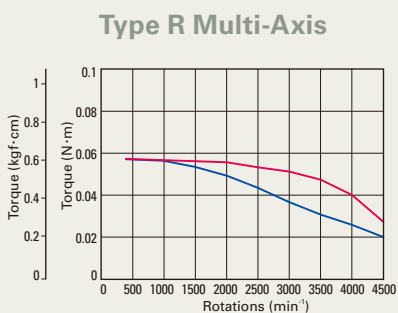
③ Motor Model PBM284FCE20



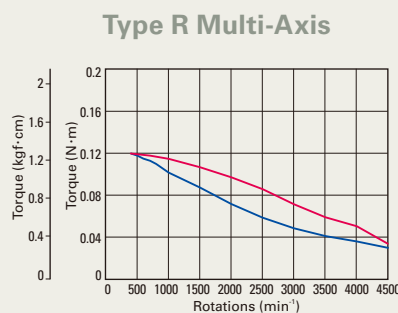
⑤ Motor Model PBM423FCE20



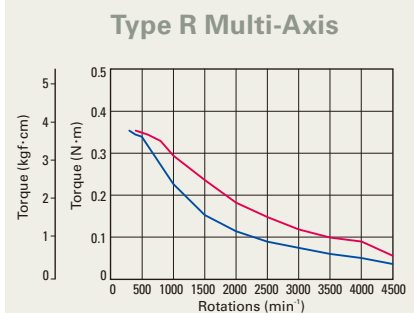
② Motor Model PBM282DCA20



④ Motor Model PBM284DCA20



⑥ Motor Model PBM423DCA20



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□60mm	
113.6mm	145.6mm
PBM603FCE20	PBM604FCE20
PBDM603-B	PBDM604-B
PB3D003M200	
PBM603DCA20	PBM604DCA20
PB2D003R1U△	
1.3	1.9
0.4	0.84
14.7	
167	
1.19	1.76
No excitation actuating type	
DC24V±5%	
0.25	
6	
0.78	
20	
30	
⑦	⑨
⑧	⑩

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

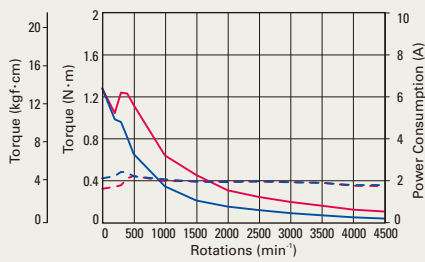
Spur Gear Model

Motor Dimensional Drawings

Options

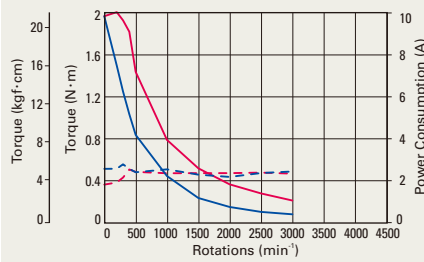
⑦ Motor Model PBM603FCE20

Type M



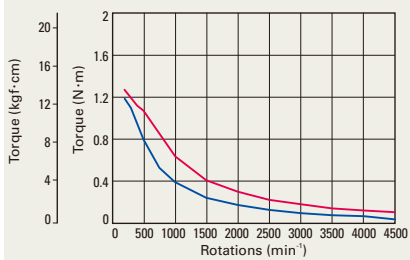
⑨ Motor Model PBM604FCE20

Type M



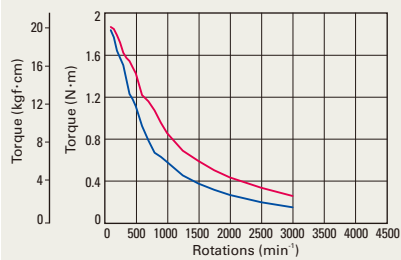
⑧ Motor Model PBM603DCA20

Type R Multi-Axis



⑩ Motor Model PBM604DCA20

Type R Multi-Axis





General Specifications

Spur Gear Model DC

Motor Flange Size



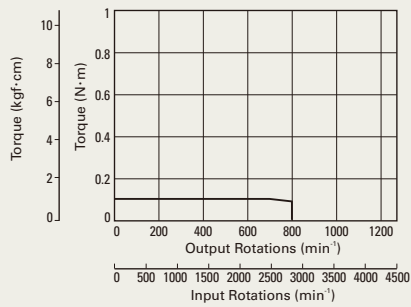
Size	Motor Flange Size	□28mm		
	Motor Length + Gear Length	88.5mm		
Motor Model	Unit	PBM282FGAE20	PBM282FGBE20	PBM282FGEE20
Type M Set Model No.		PBDM282-G3.6	PBDM282-G7.2	PBDM282-G10
Related Amplifier Model No.		PB3D003M200		
Motor Model	Unit	PBM282DGAA20	PBM282DGBA20	PBM282DGEA20
Type R Multi-axis Model No.		PB2D003R1U△		
MAX. Stall Torque	N·m	0.1	0.15	0.2
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.017		
Reduction Gear Ratio		1:3.6	1:7.2	1:10
Backlash	DEG	2		
Allowable Rotations	min^{-1}	800	400	300
Rotation Direction	Rel. to command dir.	Forward		Reverse
Allowable Thrust Load	N	10		
Allowable Radial Load Note1	N	15		
Motor Mass	kg	0.22		
Motor Characteristics Chart	Type M	①	③	⑤
	Type R Multi-Axis	②	④	⑥

Motor Characteristics Chart

Type M Allowable Torque DC24V — DC48V — DC24V/48V —
Type R Multi-Axis Allowable Torque DC24V — DC36V — DC24V/36V —

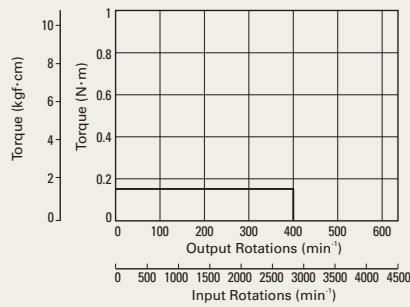
① Motor Model PBM282FGAE20

Type M



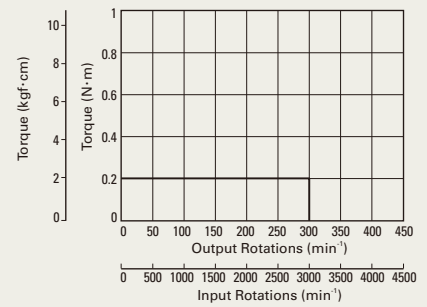
③ Motor Model PBM282FGBE20

Type M



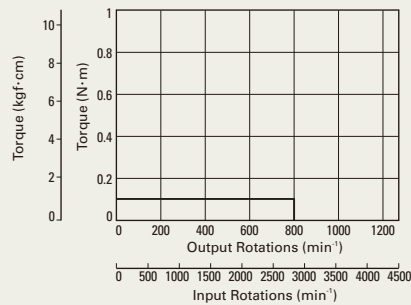
⑤ Motor Model PBM282FGEE20

Type M



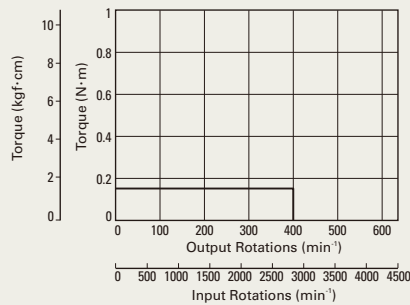
② Motor Model PBM282DGAA20

Type R Multi-Axis



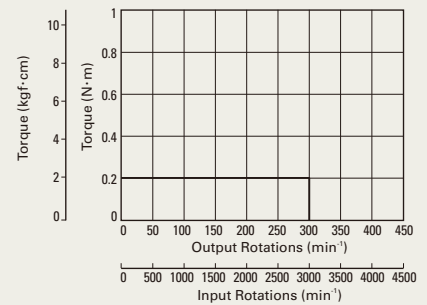
④ Motor Model PBM282DGBA20

Type R Multi-Axis



⑥ Motor Model PBM282DGEA20

Type R Multi-Axis



*Maintain motor case temperature at a point below 85°C.

Note1: The load point is determined at a position 1/3 of the length from the output shaft.

□28mm		
88.5mm		
PBM282FGGE20	PBM282FGJE20	PBM282FGLE20
PBDM282-G20	PBDM282-G30	PBDM282-G50
PB3D003M200		
PBM282DGGA20	PBM282DGJA20	PBM282DGLA20
PB2D003R1U△		
0.35	0.5	
0.017		
1:20	1:30	1:50
1.5		
150	100	60
Forward		
10		
15		
0.22		
⑦	⑨	⑪
⑧	⑩	⑫

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

Standard Model

Low-backlash Gear Model

Harmonic Gear Model

Electromagnetic Brake Model

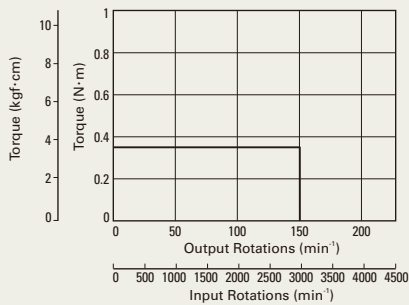
Spur Gear Model

Motor Dimensional Drawings

Options

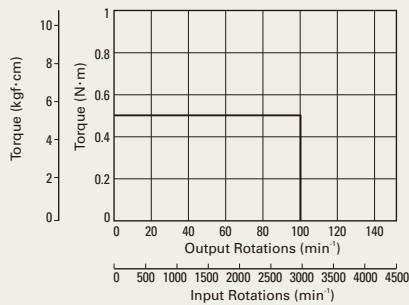
⑦ Motor Model PBM282FGGE20

Type M



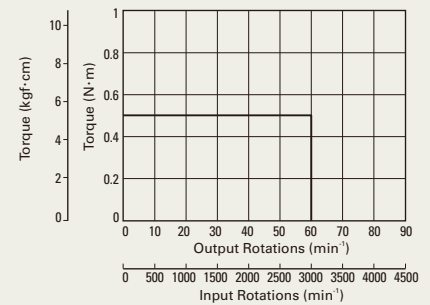
⑨ Motor Model PBM282FGJE20

Type M



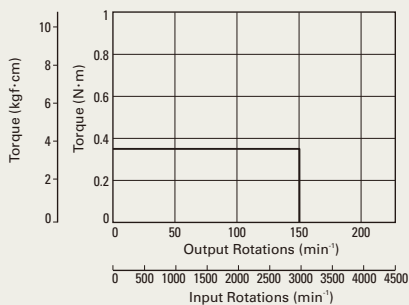
⑪ Motor Model PBM282FGLE20

Type M



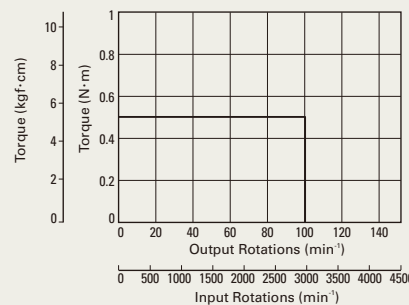
⑧ Motor Model PBM282DGGA20

Type R Multi-Axis



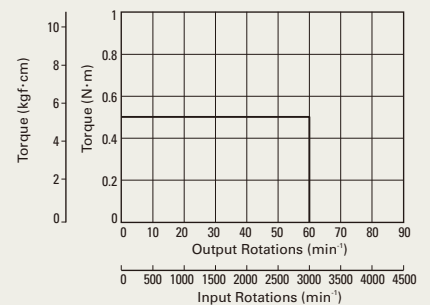
⑩ Motor Model PBM282DGJA20

Type R Multi-Axis



⑫ Motor Model PBM282DGLA20

Type R Multi-Axis



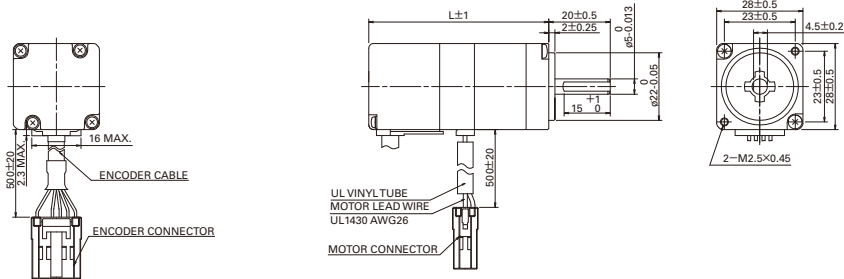
Motor Dimensional Drawings (Unit : mm)

□ 28mm

● Standard Model

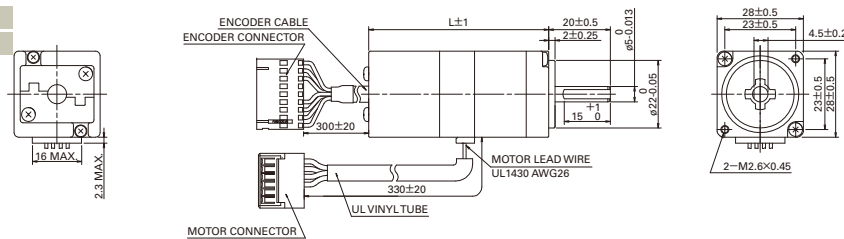
PBM282FXE20 DC

PBM284FXE20 DC



PBM282DXA20 DC Multi Axis

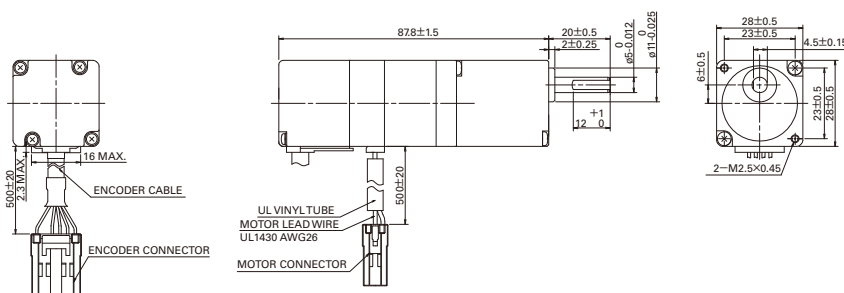
PBM284DXA20 DC Multi Axis



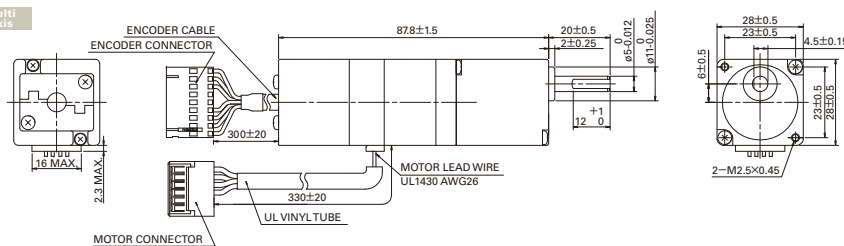
MODEL	L
PBM282	58.5
PBM284	77.8

● Spur Gear Model

PBM282FG E20 DC

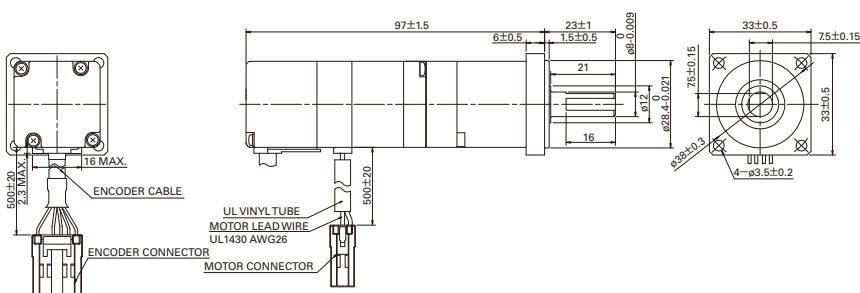


PBM282DG A20 DC Multi Axis

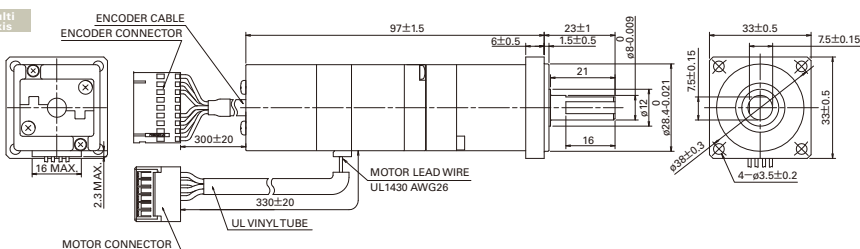


● Harmonic Gear Model

PBM282FH E20 DC



PBM282DH A20 DC Multi Axis

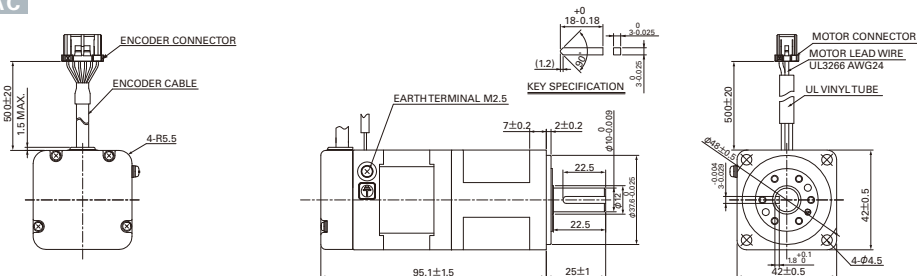


Motor Dimensional Drawings (Unit : mm)

□ 42mm

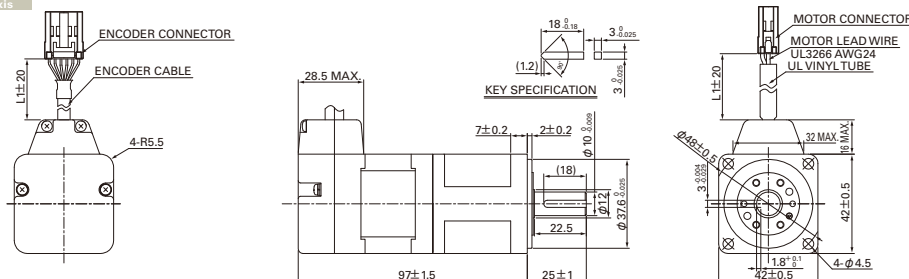
● Harmonic Gear Model

PBM423FH□K20-M AC



PBM423FH□E20 DC

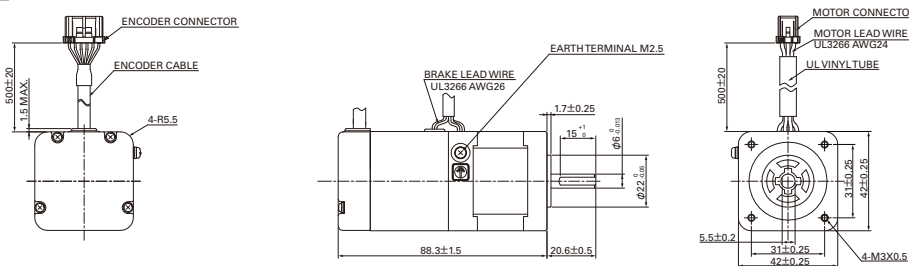
PBM423DH□A20 DC Multi Axis



MODEL	L1
PBM423FH□E20	500
PBM423DH□A20	300

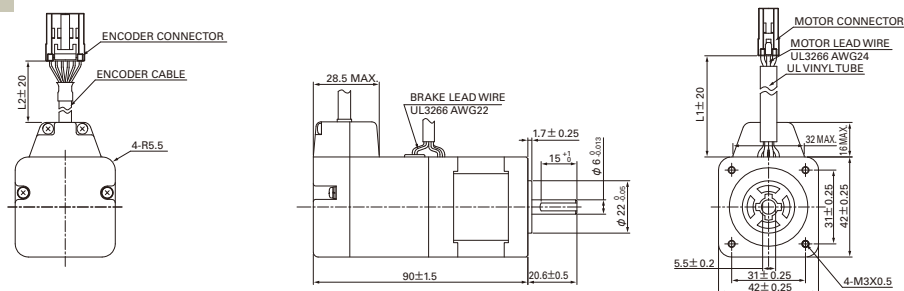
● Electromagnetic Brake Model

PBM423FCK20-M AC



PBM423FCE20 DC

PBM423DCA20 DC Multi Axis

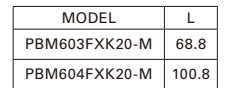


MODEL	L1	L2
PBM423FCE20	515	500
PBM423DCA20	315	300

☐ 60mm

● **Standard Model**

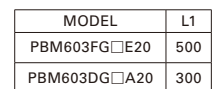
PBM604FXK20-M AC



MODEL	L	L1
PBM603FXE20	70.3	500
PBM604FXE20	102.3	500
PBM603DXA20	70.3	300
PBM604DXA20	102.3	300

Low-backlash Gear Model

1000



Connector Specification Of Motor Side

AC

Encoder Connector

Housing: 1827864-6
Terminal: 1827569-2
Manufacturer: AMP

Motor Connector

Housing: 1827864-3
Terminal: 1827570-2
Manufacturer: AMP

DC

Encoder Connector

Housing: 1-1318118-6
Terminal: 1318106-1
Manufacturer: AMP

Motor Connector

Housing: 1-1318119-3
Terminal: 1318105-1
Manufacturer: AMP

Connector Connection Of Encoder Side

PIN No.	LEAD COLR	
A1	Blue	CHANNEL A
B1	Brown	CHANNEL $\bar{A}$
A2	Green	CHANNEL B
B2	Purple	CHANNEL $\bar{B}$
A3	White	CHANNEL C
B3	Yellow	CHANNEL $\bar{C}$
A4	Red	+5V
B4	Black	0V
A5	N.C.	—
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	—

Encoder Cable: UL20276

Connector Connection Of Motor Side

Standard Model, Low Backlash Gear Model, Harmonic Gear Model

PIN No.	LEAD COLR	
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	N.C.	—
B3	N.C.	—

Electromagnetic Brake Model

PIN No.	LEAD COLR	
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	Brake +	Brake Lead Wire
B3	Brake —	Brake Lead Wire

DC Multi-axis

Encoder Connector

Housing: 51030-0930
Terminal: 50083-8070
Manufacturer: MOLEX

Motor Connector

Housing: 5111-0610
Terminal: 50397-8000
Manufacturer: MOLEX

Connector Connection Of Encoder Side

2 Channel

PIN No.	LEAD COLR	
1	Blue	CHANNEL A
2	Brown	CHANNEL $\bar{A}$
3	Green	CHANNEL B
4	Purple	CHANNEL $\bar{B}$
5	N.C.	—
6	N.C.	—
7	Red	+5V
8	Black	0V
9	Black	FG (Shield)

Encoder Cable: UL20121

(3 Channel)

PIN No.	LEAD COLR	
1	Blue	CHANNEL A
2	Brown	CHANNEL $\bar{A}$
3	Green	CHANNEL B
4	Purple	CHANNEL $\bar{B}$
5	White	CHANNEL C
6	Yellow	CHANNEL $\bar{C}$
7	Red	+5V
8	Black	0V
9	Black	FG (Shield)

Encoder Cable: UL20276

Connector Connection Of Motor Side

Standard Model, Low Backlash Gear Model, Harmonic Gear Model

PIN No.	LEAD COLR	
1	Blue	Motor Lead Wire
2	Orange	Motor Lead Wire
3	Red	Motor Lead Wire
4	Yellow	Motor Lead Wire
5	N.C.	—
6	N.C.	—

Electromagnetic Brake Model

PIN No.	LEAD COLR	
1	Blue	Motor Lead Wire
2	Orange	Motor Lead Wire
3	Red	Motor Lead Wire
4	Yellow	Motor Lead Wire
5	Brake +	Brake Lead Wire
6	Brake —	Brake Lead Wire

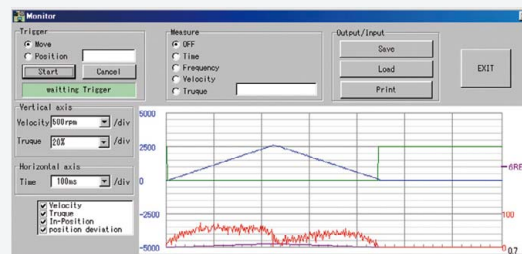
Options

PC Interface Description

PC Interface Description

Axis	Command	VEL	ACC	DEC	MOV	Pos	Param	Unit
14	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
15	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
16	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
17	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
18	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
19	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
20	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
21	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
22	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
23	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
24	MOVE	0.0	0.0	0.0	0.000	0	0.000	m

Axis	Command	VEL	ACC	DEC	MOV	Pos	Param	Unit
14	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
15	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
16	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
17	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
18	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
19	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
20	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
21	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
22	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
23	MOVE	0.0	0.0	0.0	0.000	0	0.000	m
24	MOVE	0.0	0.0	0.0	0.000	0	0.000	m



1: Parameter Input Screen

2: Point/Program Input Screen

3: Operating Waveform Monitor (*SPBALL-01 and SPBA1W-01 Support)

PB-R PC Interface Software Functions

Functions

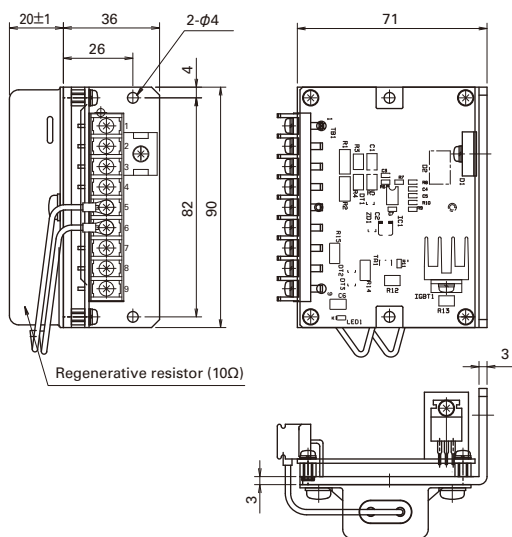
- Direct command capability
- Point data editing/execution
- Program data editing/execution
- Current position/Alarm/Amplifier status monitoring
- Operating waveform monitor
- Off-line Editing
- Teaching Function, etc

Program Functions

- Various branching conditions (Position, Input Port, ZONE, Direct, Motor Stop)
- Timer Wait
- Subroutine Structure
- Loop Counter, etc.

Regenerative Unit (For Type R Multi-axis) Unit: mm

Model: PBFE-01



Note 1 : TB1-Connector block wiring screw M3
Tightening torque 0.6 N·m

Note 2 : The external regenerative resistor is mounted on the rear surface

To SANYO DENKI Co.,LTD.

Date :

Company:

Department:

Name:

Tel:

FAX:

E-mail:

Item	Contents																																																																																																
① Name of target equipment	Equipment name, category (transport, processing, test, other)																																																																																																
② Name of servo axis	Axis name, axial mechanism (horizontal/vertical), brake mechanism (yes/no)																																																																																																
③ Current condition of above axis	Manufacturer Name () Series Name () Motor Capacity () Hydraulic, Mechanical, or New System ()																																																																																																
④ Positioning accuracy	± mm ± μm																																																																																																
⑤ Operation pattern	Acceleration α: ____ G ____ [m/s²] Feeding Speed V: ____ [m/s] Moving Distance D: ____ [m] (Stroke) Time [sec] ← t1 (____) → ← t2 (____) → ← t3 (____) → [Reference formula] 1G=9.8[m/s²], 1[m/s²]=0.1G α[m/s²]=V[m/sec]÷t1[sec] D[m]=V[m/sec]×(t1+t2)[sec]																																																																																																
⑥ Mechanism	Ball-screw/screw-rotation type (horizontal), ball-screw/nut-rotation type (horizontal), rack and pinion (horizontal), belt/chain (horizontal), rotary table, roll feed, instability																																																																																																
⑦ Mechanical structure	<table border="0"> <tr> <td>WT(table mass)</td><td>kg</td> <td>WL(work mass)</td><td>kg</td> <td>WA(mass of other drive parts)</td><td>kg</td> </tr> <tr> <td>WR(rack mass)</td><td>kg</td> <td>WB(belt/chain mass)</td><td>kg</td> <td>WC(counterbalance mass)</td><td>kg</td> </tr> <tr> <td>Fa(external force axial direction)</td><td>N</td> <td>Fb(ball-screw preload)</td><td>N</td> <td>T(roll pushing force)</td><td>N</td> </tr> <tr> <td>Dr1(drive-side roll diameter)</td><td>mm</td> <td>Dr2(follower-side roll diameter)</td><td>mm</td> <td></td><td></td> </tr> <tr> <td>Lr1(drive-side roll length)</td><td>mm</td> <td>Lr2(follower-side roll length)</td><td>mm</td> <td>G(reduction ratio)</td><td></td> </tr> <tr> <td>JG(speed-reducer inertia)</td><td>kg·m²</td> <td>JC(coupling inertia)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>JN(nut inertia)</td><td>kg·m²</td> <td>JO(other motor-axis conversion inertia)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>Db(ball-screw diameter)</td><td>mm</td> <td>Lb(ball-screw axial length)</td><td>mm</td> <td>Pb(ball-screw lead)</td><td>mm</td> </tr> <tr> <td>Dp(pinion/pulley diameter)</td><td>mm</td> <td>Lp(pinion axial length)</td><td>mm</td> <td>tp(pully thickness)</td><td>mm</td> </tr> <tr> <td>Dt(table diameter)</td><td>mm</td> <td>Dh(table-support dianeter)</td><td>mm</td> <td>LW(load shift from axis)</td><td>mm</td> </tr> <tr> <td>Ds(table shaft diameter)</td><td>mm</td> <td>Ls(table shaft length)</td><td>mm</td> <td></td><td></td> </tr> <tr> <td>ρ(specific gravity of ball-screw/pinion/pulley/table-shaft material)</td><td>kg·cm³</td> <td></td><td></td> <td></td><td></td> </tr> <tr> <td>μ(friction coefficient between sheet and shilding-surface/support-section/roll)</td><td></td> <td>ρ1(specific gravity of roll-1 material)</td><td>kg/cm³</td> <td></td><td></td> </tr> <tr> <td>ρ2(specific gravity of roll-2 material)</td><td>kg/cm³</td> <td>κ(internal friction coefficient of preload nut)</td><td></td> <td></td><td></td> </tr> <tr> <td>η(mechanical efficiency)</td><td></td> <td>JL(load inertia of motor-axis conversion)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>TF(friction torque of motor axis conversion)</td><td>N·m</td> <td>Tu(imbalance torque of motor axis conversion)</td><td>N·m</td> <td></td><td></td> </tr> </table>	WT(table mass)	kg	WL(work mass)	kg	WA(mass of other drive parts)	kg	WR(rack mass)	kg	WB(belt/chain mass)	kg	WC(counterbalance mass)	kg	Fa(external force axial direction)	N	Fb(ball-screw preload)	N	T(roll pushing force)	N	Dr1(drive-side roll diameter)	mm	Dr2(follower-side roll diameter)	mm			Lr1(drive-side roll length)	mm	Lr2(follower-side roll length)	mm	G(reduction ratio)		JG(speed-reducer inertia)	kg·m ²	JC(coupling inertia)	kg·m ²			JN(nut inertia)	kg·m ²	JO(other motor-axis conversion inertia)	kg·m ²			Db(ball-screw diameter)	mm	Lb(ball-screw axial length)	mm	Pb(ball-screw lead)	mm	Dp(pinion/pulley diameter)	mm	Lp(pinion axial length)	mm	tp(pully thickness)	mm	Dt(table diameter)	mm	Dh(table-support dianeter)	mm	LW(load shift from axis)	mm	Ds(table shaft diameter)	mm	Ls(table shaft length)	mm			ρ(specific gravity of ball-screw/pinion/pulley/table-shaft material)	kg·cm ³					μ(friction coefficient between sheet and shilding-surface/support-section/roll)		ρ1(specific gravity of roll-1 material)	kg/cm ³			ρ2(specific gravity of roll-2 material)	kg/cm ³	κ(internal friction coefficient of preload nut)				η(mechanical efficiency)		JL(load inertia of motor-axis conversion)	kg·m ²			TF(friction torque of motor axis conversion)	N·m	Tu(imbalance torque of motor axis conversion)	N·m		
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⑧ Speed reducer	Customer-provided (/) Sanyo denki standard(planet/spur/no-backlash-planet /) other(/)																																																																																																
⑨ Encoder type	Encoder type specified (yes / no) Yes:(incremental , optical absolute , optical absolute with incremental function, resolver absolute) Resolution()																																																																																																
⑩ Input format	Position , velocity , torque , other ()																																																																																																
⑪ Host equipment (controller)	Sequencer , laptop , customer-developed product , Sanyo dennki-provided , other ()																																																																																																
⑫ Usage environment and other requirements	Cutting , clean-room use , anti-dust measures , other ()																																																																																																
⑬ Estimated production	Single product: () units/month () units/year																																																																																																
⑭ Development schedule	Prototype period: () Year () Month Production period: () Year () Month																																																																																																
⑮ Various measures	Related documentation (already submitted; send later by mail) Visit/PR desired (yes / no) Meeting desired (yes / no)																																																																																																
⑯ Miscellaneous (questions, pending problems, unresolved issues, etc.)																																																																																																	

■ Precautions For Adoption

Cautions

Failure to follow the precautions on the right may cause moderate injury and property damage, or in some circumstances, could lead to a serious accident. Always follow all listed precautions.

Cautions

- Read the accompanying Instruction Manual carefully prior to using the product.
- If applying to medical devices and other equipment affecting people's lives, please contact us beforehand and take appropriate safety measures.
- If applying to equipment that can have significant effects on society and the general public, please contact us beforehand.
- Do not use this product in an environment where vibration is present, such as in a moving vehicle or shipping vessel.
- Do not perform any retrofitting, re-engineering, or modification to this equipment.
- The amplifiers presented in this catalog are meant to be used for general industrial applications. If using for special applications related to aviation and space, nuclear power, electric power, submarine repeaters, etc., please contact us beforehand.

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