

SANMOTION

CLOSED LOOP STEPPING SYSTEMS

Model No.PB



SANYO DENKI

Ver.5

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

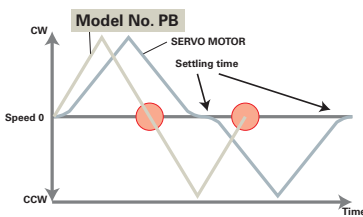
SANMOTION Model No. PB

CLOSED LOOP STEPPING SYSTEMS

MERIT **1** Increased System Speed and Smaller System Size

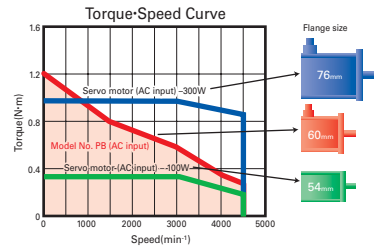
High Speed Positioning

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



Smaller System Size

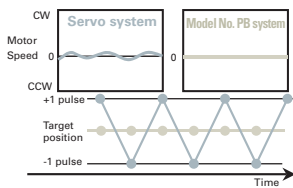
Smaller system size is achievable for low speed applications due to the availability of higher torque performance in the low speed range as compared to conventional servomotors. With the AC power input type, motor torque has been increased by 50% compared with our conventional product.



MERIT **2** Stable Stand-Still

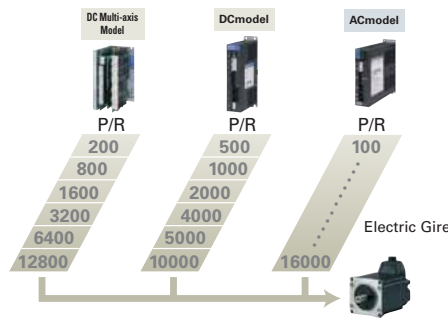
Stable Stand-Still

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

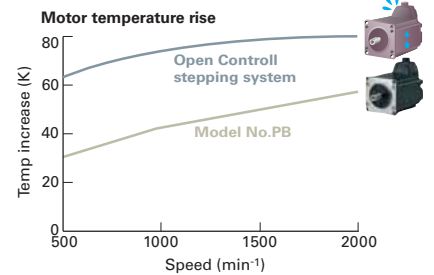
Able to set high resolutions. The AC model comes with electronic gear and enables users to set any resolution, according to the device.



MERIT **3** 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.

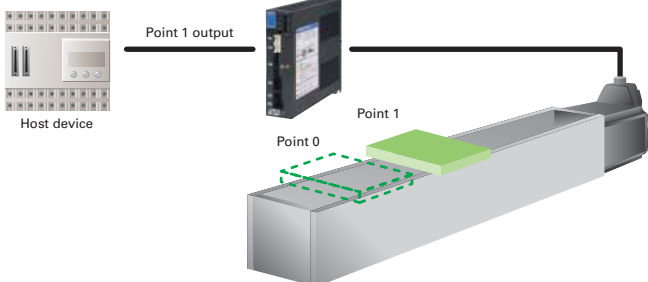


MERIT **4** Simplified Control

General Purpose I/O Input

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

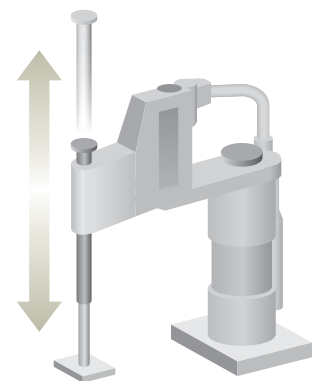
System can be easily controlled by using the general purpose I/O to designate preset point or program numbers. (AC Type R, DC Type M: 128 point DC Type R Multi-axis: 256 point)



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.



AC Power Input

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

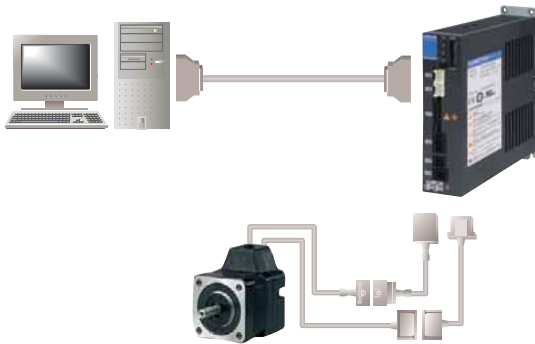
DC Power Input

- 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 + PIO)

MERIT 5 Reduced System Design Cost and Time

Wide Availability of Optional Cables and Connectors

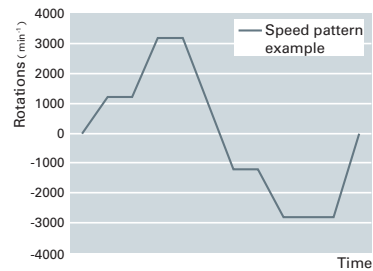
Cables and connectors for controller/amplifier and amplifier/motor connection are available for hassle-free setup.



Built-in Pulse Generation Function

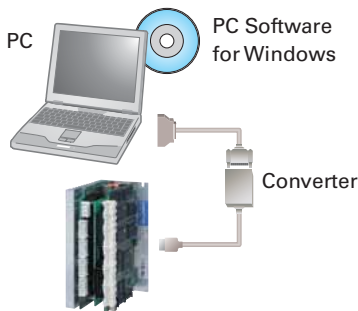
- AC Type R**
- DC Type M**
- DC Type R Multi Axis**

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.

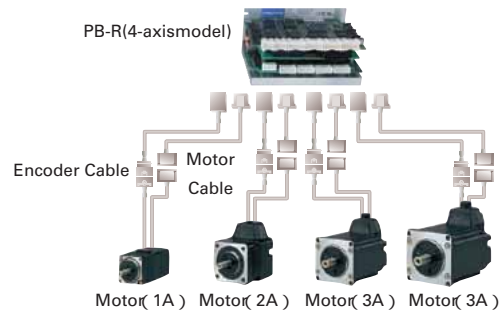


Multi-Axis Type (DC Power Input)

- DC Type R Multi Axis**

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.



MERIT 6 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

General Specifications

Motor Dimensional Drawings

Options

Extensive Closed-Loop Stepping System Lineup

SANMOTION Model No. PB

CLOSED LOOP STEPPING SYSTEMS

How do you want to control the equipment?

The Model No. PB Series offers 3 types of control methods.

Point Command
Control using PLC I/O

Network Control using Serial
Communication(RS-485)

Control using a Pulse
Generator

Power Source

AC Power Source

DC Power Source

Power Source

DC Power
Source

AC Power
Source

AC Power Source

Type R



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.

DC Power Source

Type R Multi-Axis



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.

DC Power Source

Type M



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.

Motion is generated by responding to pulse input commands from a host device.

AC Power Source

Type P



Motion is generated by responding to pulse input commands from a host device.



Standard Model

The standard model includes an amplifier and a motor

Motor Flange Size

AC 42 60 86 ▶ P23

DC 28 42 60 ▶ P25



Low-backlash Gear Model

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

Motor Flange Size

AC 42 60 ▶ P27

DC 42 60 ▶ P31

REDUCTION GEAR RATIO $\frac{1}{3.6}$ $\frac{1}{7.2}$ $\frac{1}{10}$ $\frac{1}{20}$ $\frac{1}{30}$



Spur Gear Model

This model utilizes a spur gear design for gear reduction.

Motor Flange Size

DC 28 ▶ P35

REDUCTION GEAR RATIO $\frac{1}{3.6}$ $\frac{1}{7.2}$ $\frac{1}{10}$ $\frac{1}{20}$ $\frac{1}{30}$ $\frac{1}{50}$



Harmonic Gear Model

The reduction harmonic gear provides high torque and eliminates backlash.

Motor Flange Size

AC 42 60 ▶ P37

DC 28 42 60 ▶ P39

REDUCTION GEAR RATIO $\frac{1}{30}$ $\frac{1}{50}$ $\frac{1}{100}$



Electromagnetic Brake Model

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

Motor Flange Size

AC 42 60 ▶ P41

DC 28 42 60 ▶ P43

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Model Nomenclature

System Model Nomenclature



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+PIO 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

Note 1: No symbol indicates no options.

Note 2: Power (1m) and I/O (1m) cables are included in the set models.

Note 3: PB3A003P201 is the set model amplifier with AC power source input type P.

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+PIO 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



PBM 60 3 F X K 20 - M

- UL · CE
- Specification Identification 20: Standard
- Encoder Type K: 4000P/R with C-phase output
E: 500P/R with C-phase output
A: 200P/R No C-phase output
C: 200P/R with C-phase output } DC (Multi-axis) only
- Options *Contact us for assistance
X: without option
C: 24V DC Break
GA to GL : with Gear
HJ to HM : with Harmonic Gear
- Power Input F: AC Power Source, DC Power Source (Single-axis)
D: DC Power Source (Multi-axis)
- Motor Length
- Motor Flange Size (mm)
- Series Name PBM: Model No.PB Motor

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

Cable Model Nomenclature



PBC 6 P 0010 A

- Specification Identification
- Cable Length (Unit: cm)
- * Connector set model number in case of 0000
- CableType P: Power supply M: Motor E: Encoder
S: I/O C: Communication
- Control Number
- Series Name PBC:PB Cable/Connector Set

Combination Table · Options Table

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		4000×4 Subdivisions=16000P/R	4000×4 Subdivisions=16000P/R	500×4 Subdivisions=2000P/R	200×4 Subdivisions=800P/R
28mm	Standard		/	/	PBM282FXE20	PBM282DXA20
	Spur Gear	1/3.6			PBM282FXE20	PBM282DXA20
		1/7.2			PBM282FGAE20	PBM282DGAA20
		1/10			PBM282FGBE20	PBM282DGBA20
		1/20			PBM282FGEE20	PBM282DGEA20
		1/30			PBM282FGGE20	PBM282DGGA20
		1/50			PBM282FGJE20	PBM282DGJA20
	Harmonic Gear	1/50			PBM282FGLA20	PBM282DGLA20
		1/100			PBM282FHLE20	PBM282DHLE20
	Electromagnetic Brake					
42mm	Standard		PBM423FXXK20		PBM423FXE20	PBM423DXA20
	Low-backlash Gear	1/3.6	PBM423FGAK20		PBM423FGAE20	PBM423DGAA20
		1/7.2	PBM423FGBK20		PBM423FGBE20	PBM423DGBA20
		1/10	PBM423FGEK20		PBM423FGEE20	PBM423DGEA20
		1/20	PBM423FGGK20		PBM423FGGE20	PBM423DGGA20
		1/30	PBM423FGJK20		PBM423FGJE20	PBM423DGJA20
	Harmonic Gear	1/30	PBM423FHJK20		PBM423FHJE20	PBM423DHJA20
		1/50	PBM423FHLE20		PBM423FHLE20	PBM423DHLE20
		1/100	PBM423FHMK20		PBM423FHME20	PBM423DHMA20
	Electromagnetic Brake		PBM423FCK20		PBM423FCE20	PBM423DCA20
60mm	Standard		PBM603FXXK20-M		PBM603FXE20	PBM603DXA20
	Low-backlash Gear	1/3.6	PBM604FXXK20-M		PBM604FXE20	PBM604DXA20
		1/7.2	PBM603FGAK20-M		PBM603FGAE20	PBM603DGAA20
		1/10	PBM603FGBK20-M		PBM603FGBE20	PBM603DGBA20
		1/20	PBM603FGEK20-M		PBM603FGEE20	PBM603DGEA20
		1/30	PBM603FGGK20-M		PBM603FGGE20	PBM603DGGA20
	Harmonic Gear	1/50	PBM603FGJK20-M		PBM603FGJE20	PBM603DGJA20
		1/100	PBM603FHLE20-M		PBM603FHLE20	PBM603DHLE20
	Electromagnetic Brake		PBM603FCK20-M		PBM603FCE20	PBM603DCA20
	86mm	Standard		PBM861FXXK20-M		
		PBM862FXXK20-M				
Options	Power Cable		PBC8P0010A		PBC6P0010A	
	Motor Ext. Cable		PBC7M0030A		PBC6M0030A	PBC4M0030A
	Encoder Ext. Cable		PBC7E0030A		PBC6E0030A	PBC5E0030A PBC5E0030C
	I/O Cable		PBC5S0010A (un shielded) PBC5S0010C (shield)		PBC5S0010A (un shielded) PBC5S0010C (shield)	PBC4S0010A (un shielded)
	Communication Cable <small>Note 1</small>		PBC7C0003A	Not required	PBC6C0003A	PBC4C0003A
	PC I/F Software		SPBALL-01		SPBA1W-01	SPBD2W-01
	USB / RS-485 Converter Unit Regenerative Unit				PBFM-U6	PBFE-01

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

Motor Option Combination Table

Motor No.	Motor Option Combination Table		
	Gear Box	Harmonic Gear	Electromagnetic Brake
PBM282F E20 / PBM282F K20 / PBM282D A20	✓	✓	✓
PBM284F E20 / PBM284F K20 / 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)

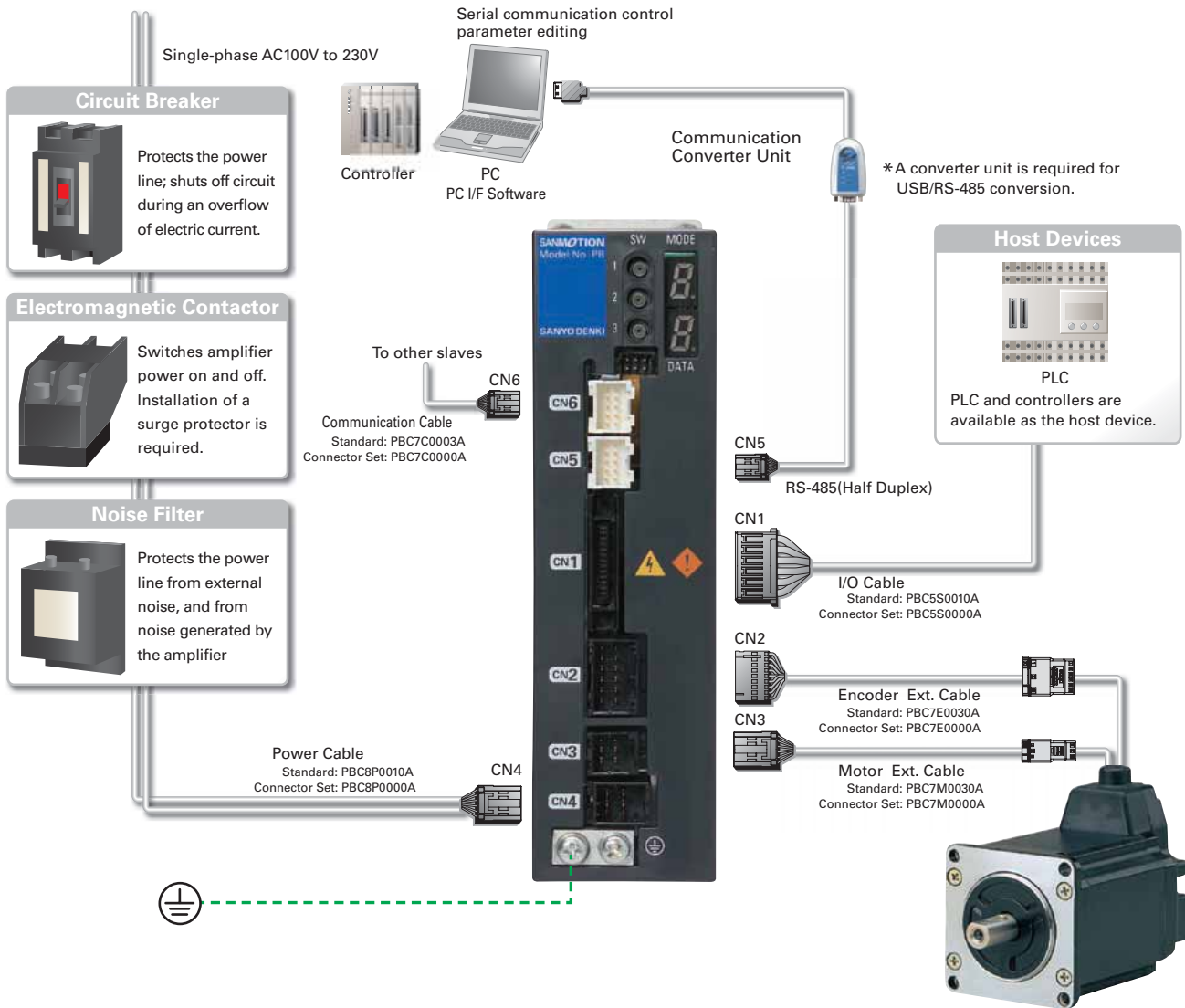
Motor No.	PBM423F, PBM603F, PBM604F, PBM861F, PBM862F		PBM282D, PBM282F, PBM284D, PBM284F, PBM423D, PBM603D, PBM604D	
Insulation class	Class B (130)			
Withstand Voltage	AC1500V 50 / 60Hz 1minute		AC500V 50 / 60Hz 1minute	
Insulation resistance *	DC500V 100M MIN.			
Degrees of protection *	IP40			
Vibration resistance	15 G (Frequency range 10 to 70Hz amplitude 1.52mm 70 to 2000 acceleration 15G)			
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 to + 40 (Harmonic Gear Model 0 to + 40)			
Ambient humidity	20 to 90%RH(No Condensation)			

* 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.

Model No. PB Type R Single-Axis Type

AC Power Input Type

System Configuration

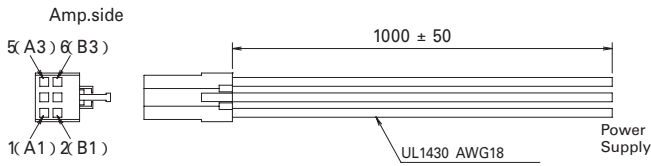


Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
Power Cable	PBC8P0010A (1m)	PBC8P0000A	3 m	-
Motor Ext. Cable	PBC7M0030A (3m)	PBC7M0000A	20 m	Use when an extension of 50cm or more is required.
Encoder Ext. Cable	PBC7E0030A (3m)	PBC7E0000A	20 m	Use when an extension of 50cm or more is required.
I/O Cable (unshielded)	PBC5S0010A (1m)	PBC5S0000A	2 m	Please select depending on the noise environment.
I/O Cable (shielded)	PBC5S0010C (1m)	PBC5S0000A	2 m	Please select depending on the noise environment.
Communication Cable	PBC7C0003A (30cm)	PBC7C0000A	100 m	Use when multiple axes are connected in a daisy-chain configuration for communication.
Communication Converter Unit	PBFM-U6	-	-	USB / RS-485 Half Duplex Converter Unit Converter unit and cable set model
PC I/F Software	SPBALL-01	-	-	Software for operational check and parameter setting

Optional Cable

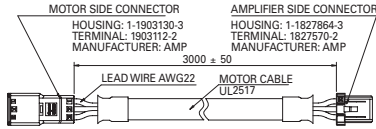
Power Cable



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

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

Motor Ext. Cable

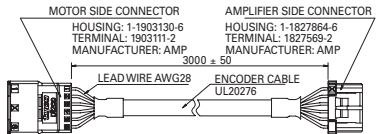


PIN No.	LEAD COLR	Signal Name
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	White	Brake Lead Wire
B3	Black	Brake Lead Wire

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

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

Encoder Ext. Cable

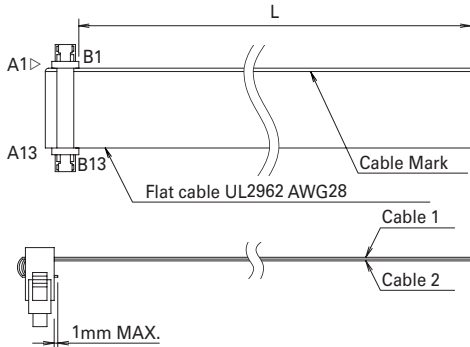


PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	

PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	CHANNEL A
2(B1)	Brown	CHANNEL A
3(A2)	Green	CHANNEL B
4(B2)	Purple	CHANNEL B
5(A3)	White	CHANNEL C
6(B3)	Yellow	CHANNEL 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.	

Manufacturer	Type	Qty.
AMP	Housing : 1-1903130-6	1
	Terminal : 1903111-2	10
	Housing : 1-1827864-6	1
	Terminal : 1827569-2	10

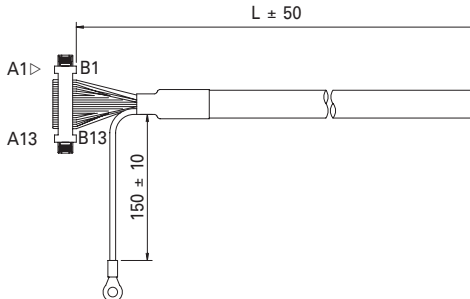
I/O Cable (unshielded)



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

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

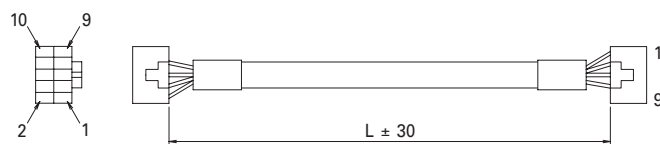
I/O Cable (shielded)



CN1 Pin.No.	Mark Display	Mark	LINE COLR	CN1 Pin.No.	Mark Display	Mark	LINE COLR
A1		Red		B1		Black	Gray
A2		Black	Orange	B2		Red	White
A3		Red		B3		Black	
A4		Black	Gray	B4		Red	Yellow
A5		Red		B5		Black	
A6		Black	White	B6		Red	Pink
A7		Red		B7		Black	
A8		Black	Yellow	B8		Red	Orange
A9		Red		B9		Black	
A10		Black	Pink	B10		Red	Gray
A11		Red		B11		Black	
A12		Black	Orange	B12		Red	White
A13		Red		B13		Black	

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

Communication 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	Purple	6	Vcc
PCA	7	Green	7	PCA
PCB	8	Red	8	PCB
24V	9	Red	9	24V
GND	10		10	GND

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

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Model No. PB Type R Single-Axis Type

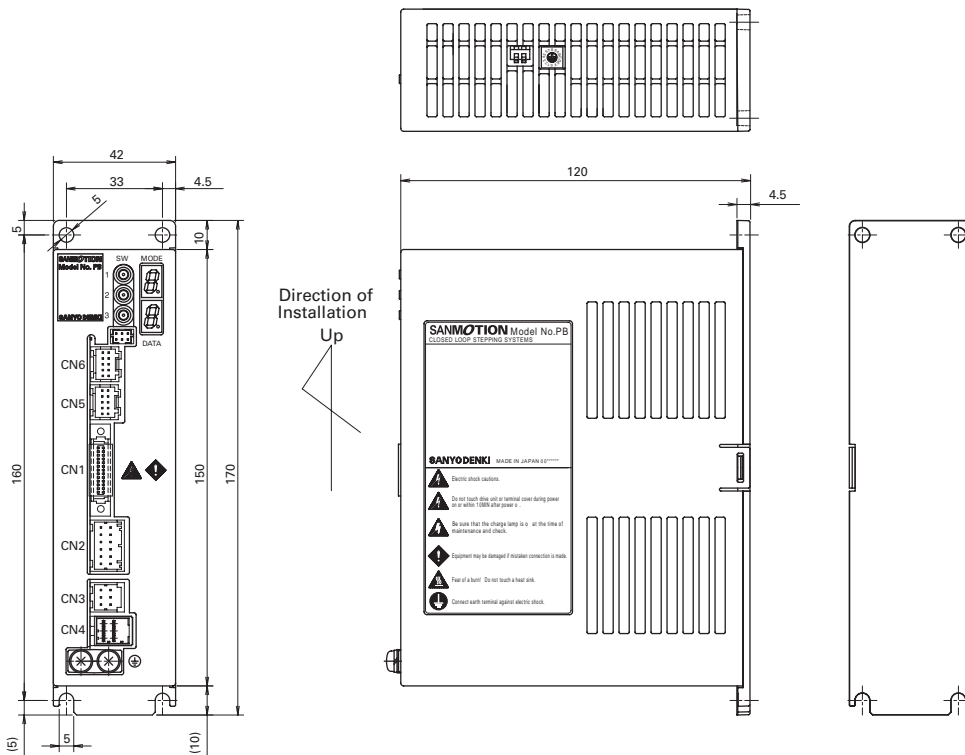
AC Power Input Type

General Specifications

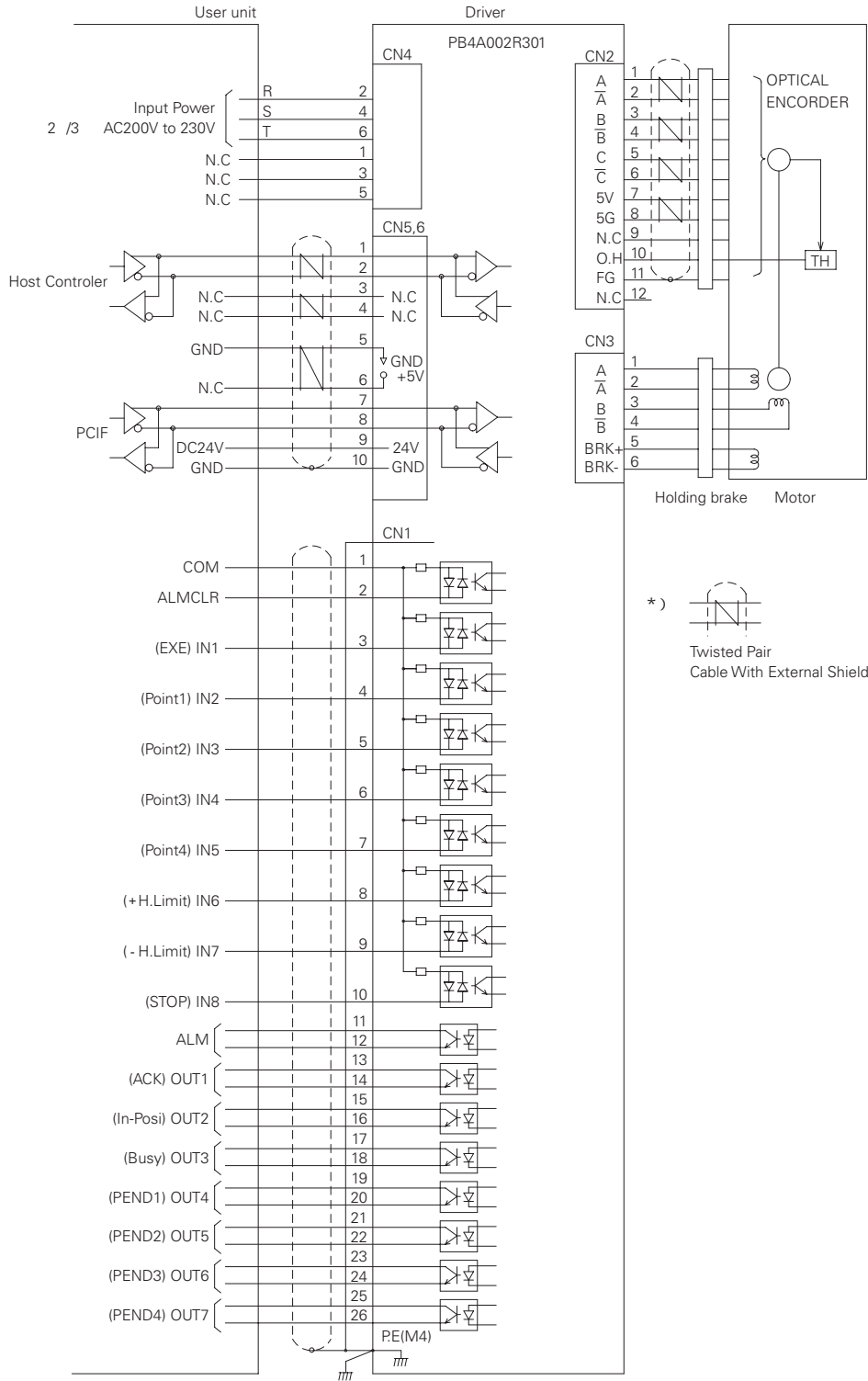
Amplifier Model		PB4A002R300	PB4A002R301
Power Supply		Single phase AC100V to 115V -15% +10% 50 / 60Hz	Single phase / 3-phase AC200V to 230V -15% +10% 50 / 60Hz
Control Mode		PWM Control SIN drive method	
Environment	Ambient temp.	Operating	0 to 55
		Storage	-20 to 65
	Operating/Storage Humidity		Maximum 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
	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 x8(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	ALM General-purpose outputx7(Point No, Ack, Busy, HOME END, Push END, ZONE, Input Monitor)
		Electric	General-purpose output: Open collector, DC30V / 15mA max

Amplifier Dimensional Drawing

(Unit:mm)



External Wiring Diagram



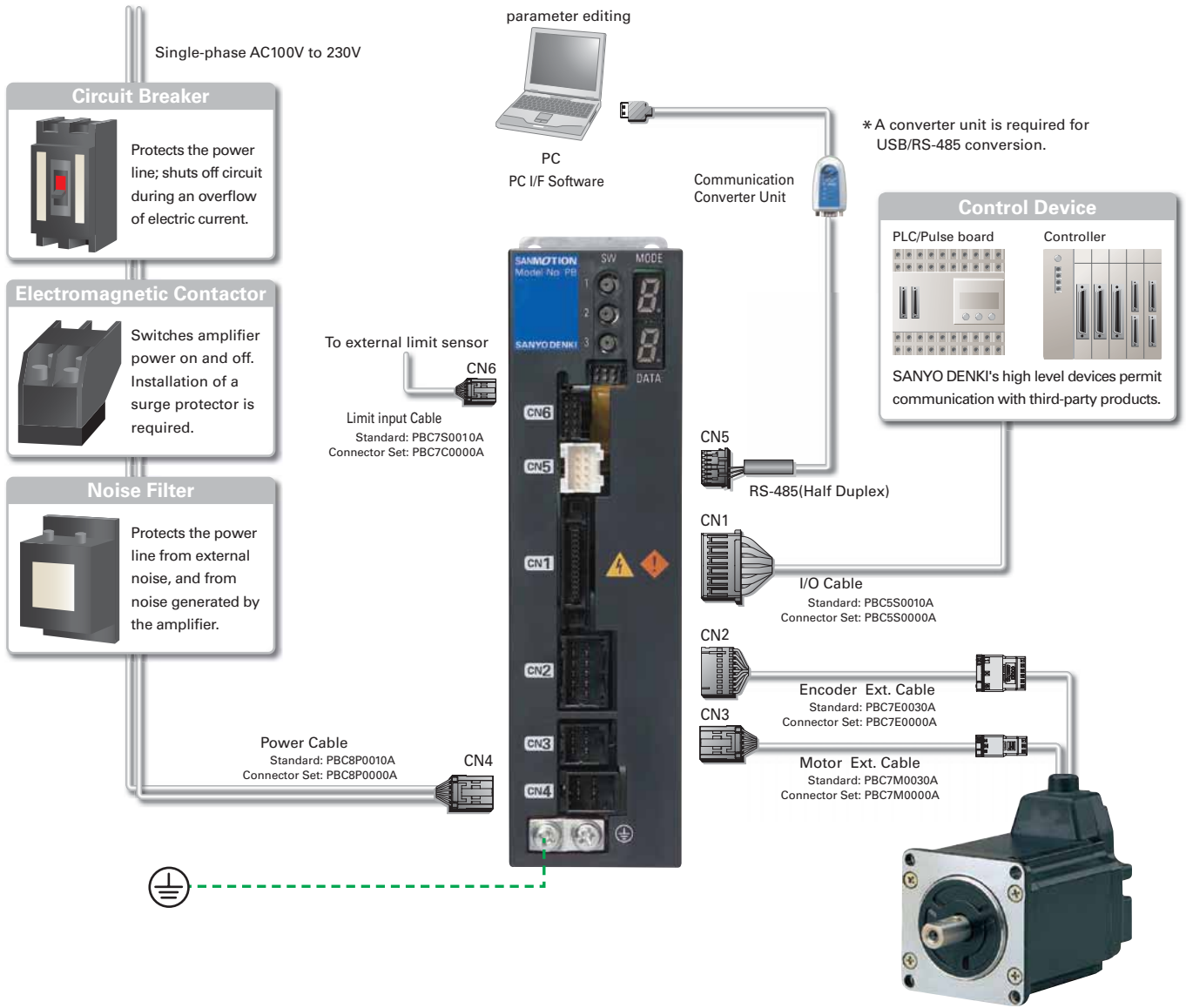
In the case of AC200V input.
The I/O signal name in () shows an initial value.

Features and Functions
Type R
Type P
Type M
Type R Multi-Axis
General Specifications
Motor Dimensional Drawings
Options

Model No. PB Type P

AC Power Input Type

System Configuration

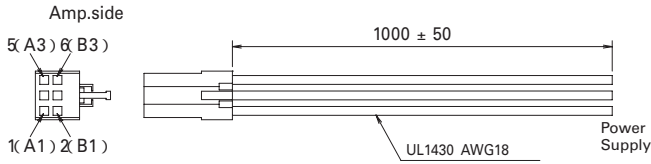


Options

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

Optional Cable

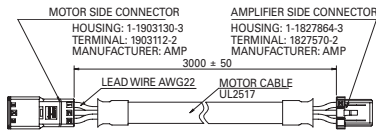
Power Cable



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

Motor Ext. Cable

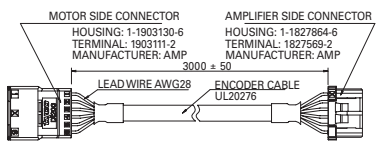


Connector Connection Of Motor Side		
PIN No.	LEAD COLR	Signal Name
A1	Blue	Motor Lead Wire
B1	Orange	Motor Lead Wire
A2	Red	Motor Lead Wire
B2	Yellow	Motor Lead Wire
A3	White	Brake Lead Wire
B3	Black	Brake Lead Wire

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

Encoder Ext. Cable

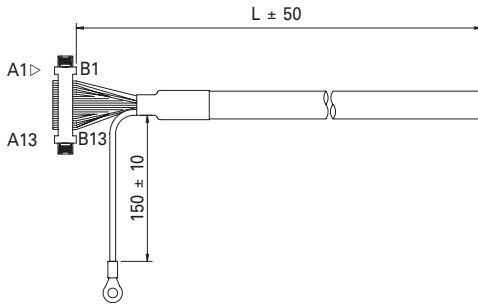


Connector Connection Of Motor Side		
PIN No.	LEAD COLR	Signal Name
A1	Blue	CHANNEL A
B1	Brown	CHANNEL A
A2	Green	CHANNEL B
B2	Purple	CHANNEL B
A3	White	CHANNEL C
B3	Yellow	CHANNEL C
A4	Red	+5V
B4	Black	0V
A5	N.C.	
B5	Orange	OVER HEAT
A6	Black	Shield
B6	N.C.	

Connector Connection Of Amplifier Side		
PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	CHANNEL A
2(B1)	Brown	CHANNEL A
3(A2)	Green	CHANNEL B
4(B2)	Purple	CHANNEL B
5(A3)	White	CHANNEL C
6(B3)	Yellow	CHANNEL 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 : PBC7E0000A		
Manufacturer	Type	Qty.
AMP	Housing : 1-1827864-6	1
	Terminal : 1827569-2	10
	Housing : 1-1903130-6	1
	Terminal : 1903111-2	10

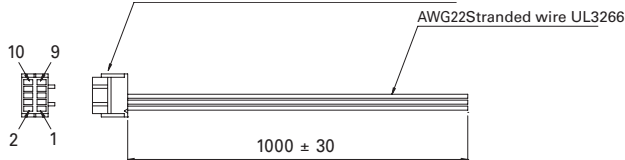
I/O Cable (shielded)



CN1 Wiring			
CN1 Pin.No.	Mark Display	Mark	LINE COLR
A1		Red	Orange
A2		Black	Orange
A3		Red	Gray
A4		Black	Gray
A5		Red	White
A6		Black	White
A7		Red	Yellow
A8		Black	Yellow
A9		Red	Pink
A10		Black	Pink
A11		Red	Orange
A12		Black	Orange
A13		Red	Gray
B1		Black	Gray
B2		Red	Red
B3		Black	White
B4		Red	Yellow
B5		Black	Yellow
B6		Red	Pink
B7		Black	Pink
B8		Red	Orange
B9		Black	Orange
B10		Red	Gray
B11		Black	Gray
B12		Red	White
B13		Black	White

Connector Set : PBC5S0000A		
Manufacturer	Type	Qty.
KEL	Connector : 8822E-026-171D-F	1

Limit Input Cable



Connector Connection	
PIN No.	Signal Name
1	Positive Limit +
2	Positive Limit -
3	Negative Limit +
4	Negative Limit -

Connector Set : PBC7S0000A		
Manufacturer	Type	Qty.
Hirose Electric	Housing : DF11-10DS-2C	1
	Contact : DF11-2428SCA	10

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Model No. PB Type P

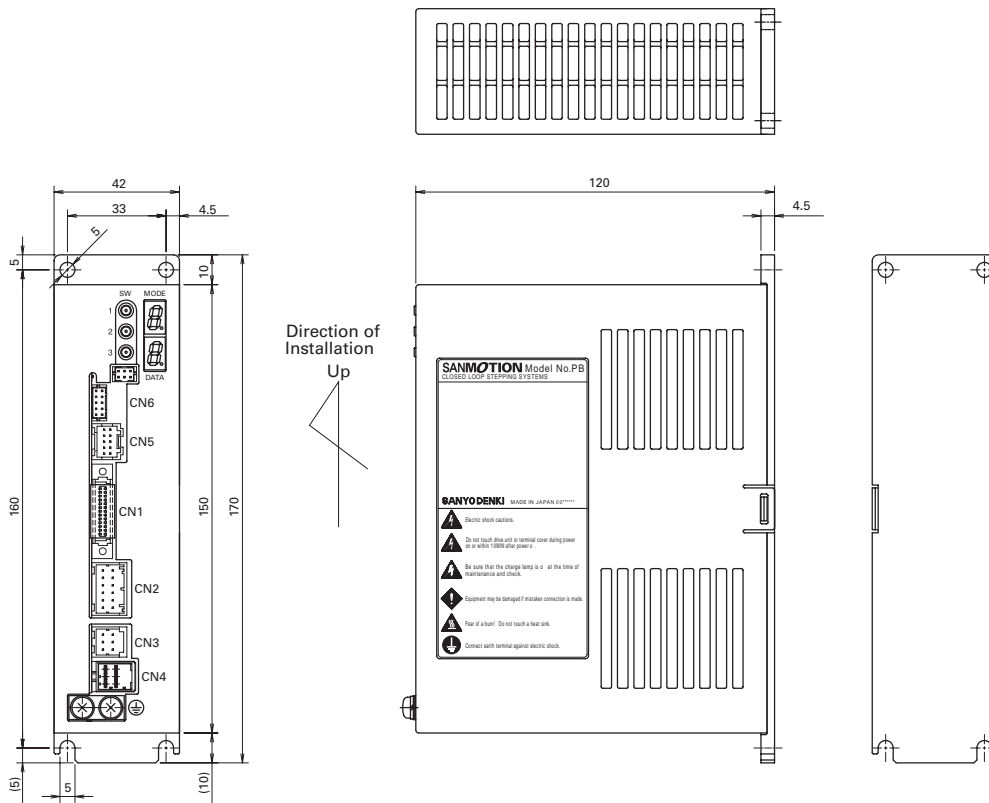
AC Power Input Type

General Specifications

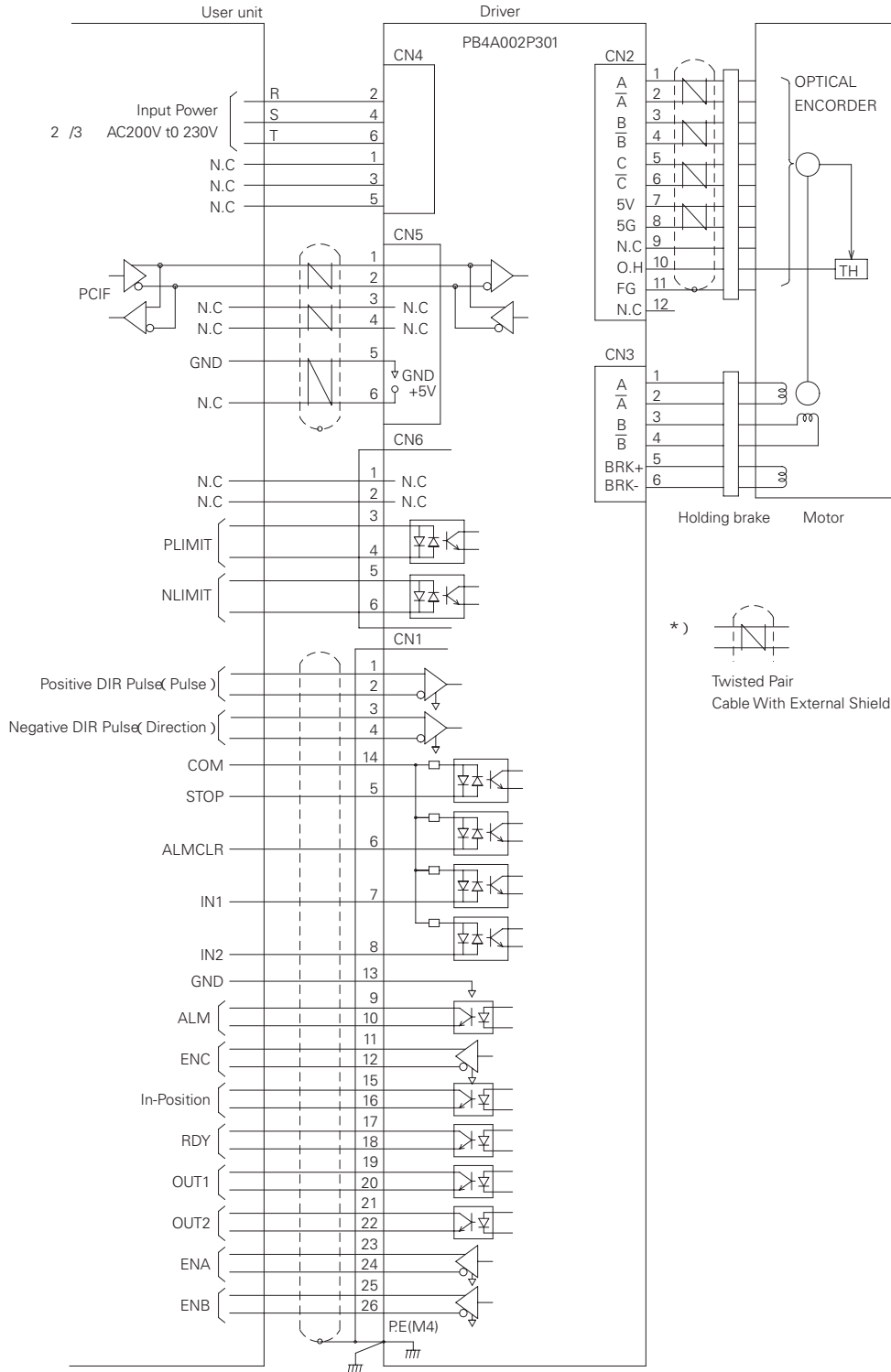
Amplifier Model		PB4A002P300		PB4A002P301	
Power Supply		Single phase AC100V to 115V -15% +10% 50 / 60Hz		Single phase / 3-phase AC200V to 230V -15% +10% 50 / 60Hz	
Control Mode		PWM Control SIN drive method			
Environment	Ambient temp.	Operating	0 to 55		
		Storage	-20 to 65		
	Operating/Storage Humidity		Maximum 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		W42xH150xD120			
Functions	Rotation Speed		0 to 4500min ⁻¹ (86mm: 0 to 4000min ⁻¹)		
	Resolution (P/R)		Electronic gear 100 to 16000		
	Regeneration Process		Internal		
	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 inputx2(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 outputx2(HOME END, Push END, ZONE, Input Monitor)		
		Electric	Encoder Signal Output: Line driver 4000P/R General-purpose output: Open collector DC30V / 15mA max		

Amplifier Dimensional Drawing

(Unit:mm)



External Wiring Diagram



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

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

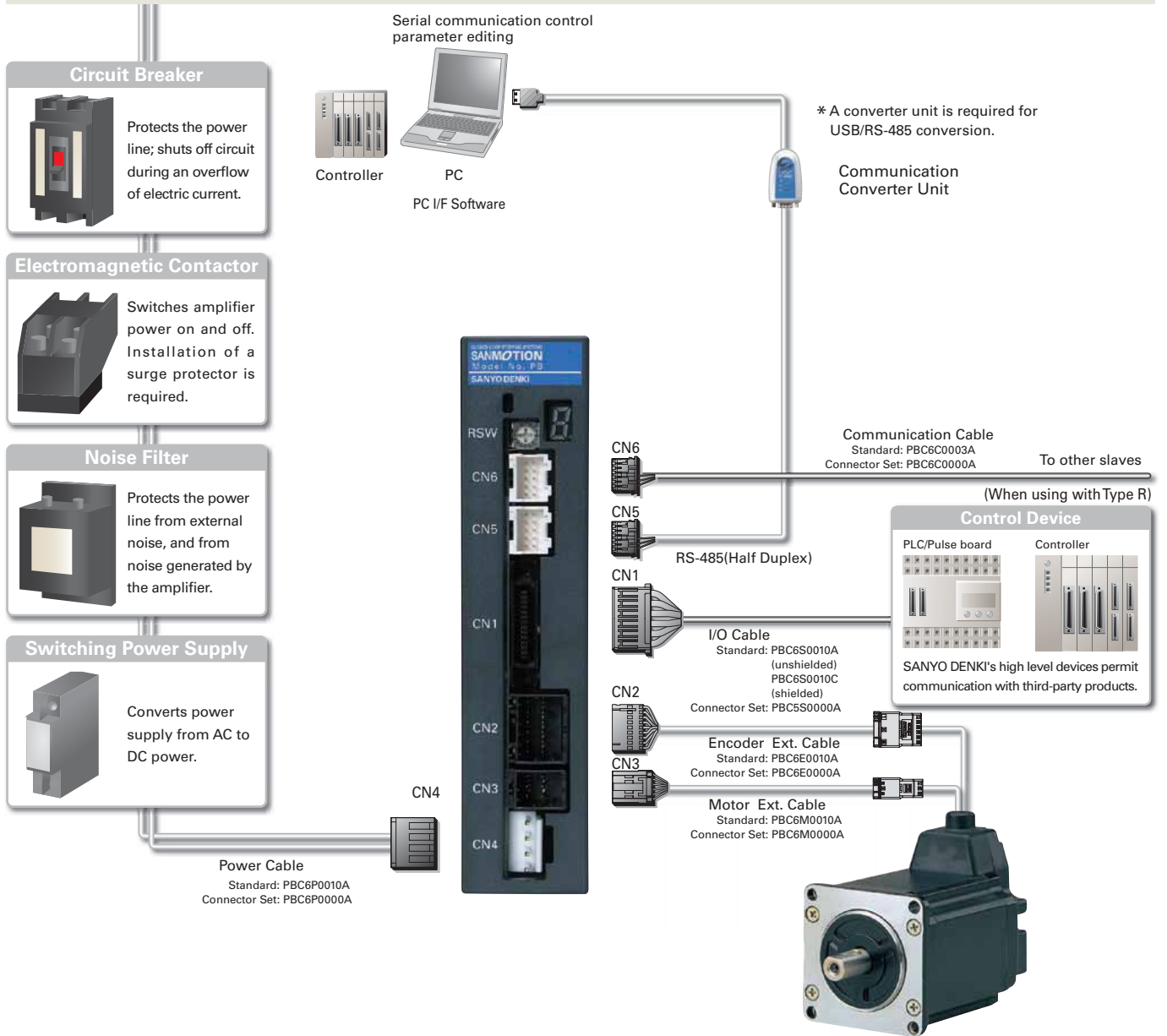
Motor Dimensional Drawings

Options

Model No. PB Type M

DC Power Input Type

System Configuration

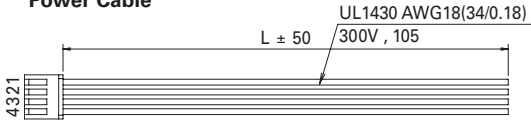


Options

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

Optional Cable

Power Cable



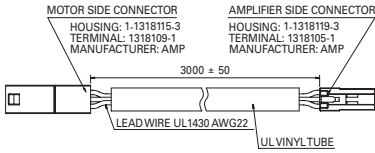
Connector Connection Of Amplifier Side

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

Connector Set : PBC6P0000A

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

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

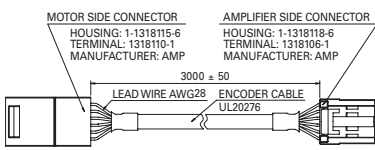
Connector Connection Of Amplifier Side

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

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.	

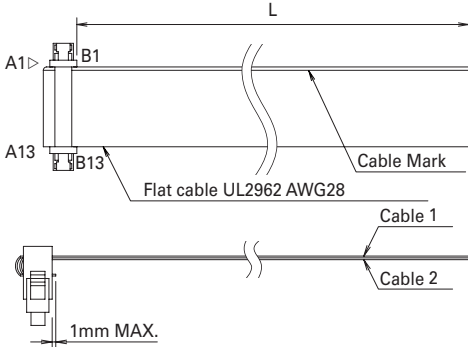
Connector Connection Of Amplifier Side

PIN No.	LEAD COLR	Signal Name
1(A1)	Blue	CHANNEL A
2(B1)	Brown	CHANNEL A
3(A2)	Green	CHANNEL B
4(B2)	Purple	CHANNEL B
5(A3)	White	CHANNEL C
6(B3)	Yellow	CHANNEL 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

I/O Cable (unshielded)



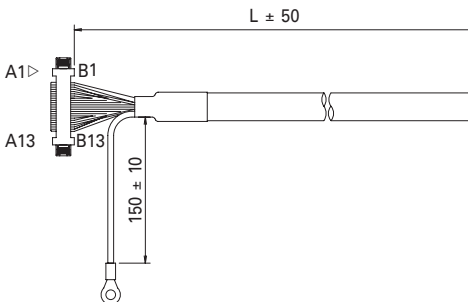
Cable Connection

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	Connector : 8822E-026-171D-F	1

I/O Cable (shielded)



CN Wiring

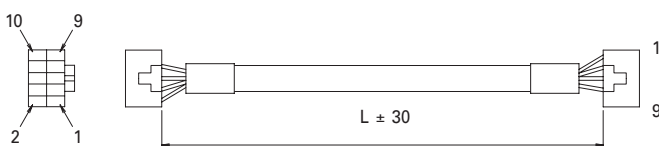
CN1 Pin.No.	Mark Display	Mark	LINE COLR
A1		Red	
A2		Black	Orange
A3		Red	
A4		Black	Gray
A5		Red	
A6		Black	White
A7		Red	
A8		Black	Yellow
A9		Red	
A10		Black	Pink
A11		Red	
A12		Black	Orange
A13		Red	Gray

CN1 Pin.No.	Mark Display	Mark	LINE 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	Connector : 8822E-026-171D-F	1

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	1
	Contact : SPH-002TP0.5L	10

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Model No. PB Type M

DC Power Input Type

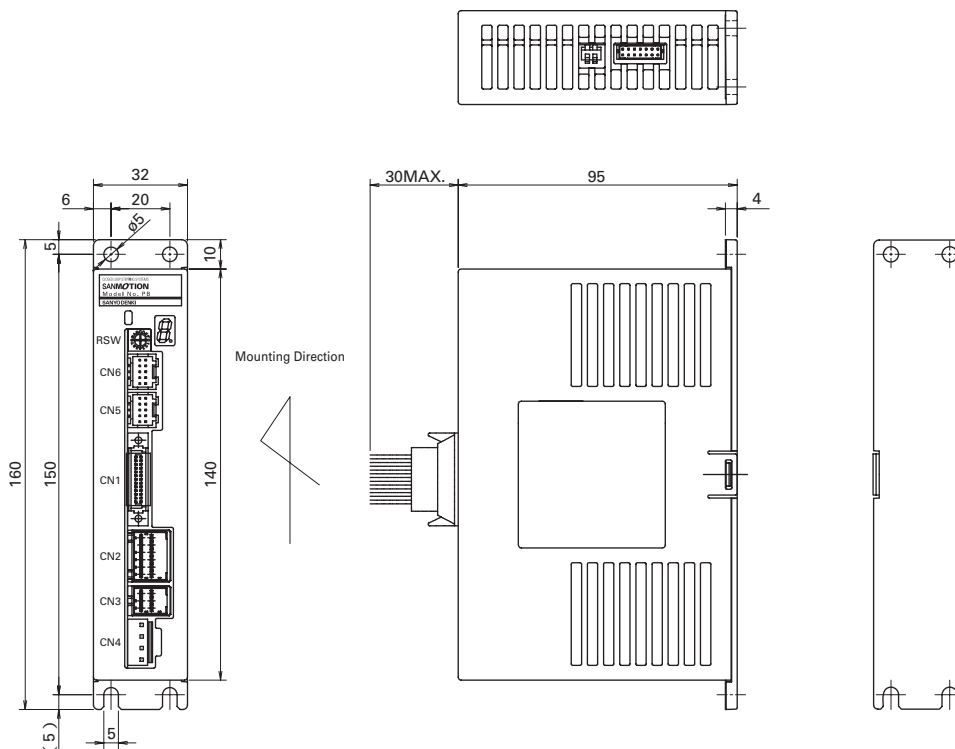
General Specifications

Amplifier Model		PB3D003M200, PB3D003M201		
Interface		Generic Input(SW1=ON)	PulseTrain Input(SW1 = OFF)	
Control Mode		PWM Control SIN drive method		
Power Supply	Single Power	DC24V / 48V ±10%(28mm Motor is only available as 24V.) Note 1		
Environment	Ambient temp.	Operating	0 to 55	
		Storage	-20 to 70	
	Operating/Storage Humidity	Maximum 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: 1PRG×1024Line 32PRG×32Line 128PRG×8Line	Normal Drive, Zero-return	
	Rotary Switch	Node Adress Setting (0 to F)	Normalize velocity loop gain setting	
	DIP-Switches	SW1 : 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	RS-485 Standard Start-Stop Synchronization, Half Duplex		
Trans. Speed		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.

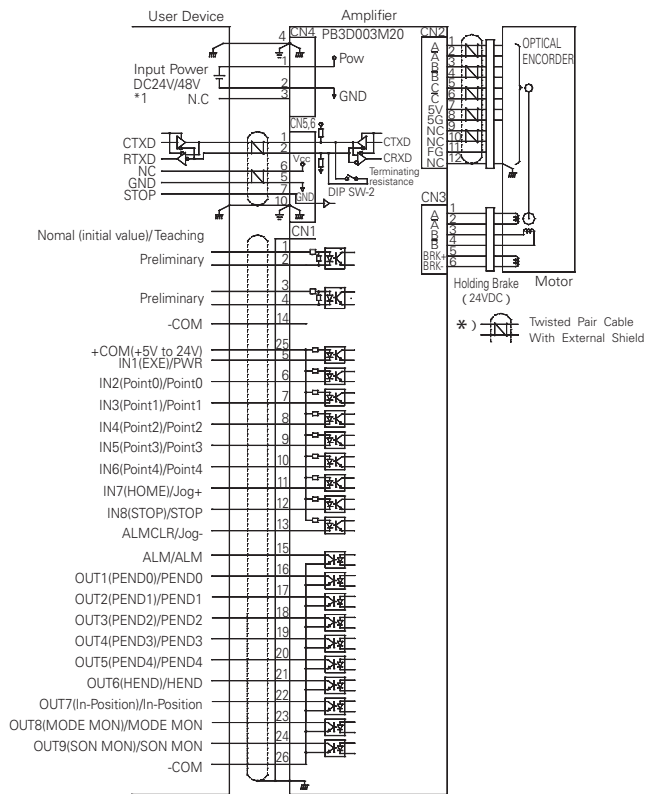
Amplifier Dimensional Drawing

(Unit:mm)

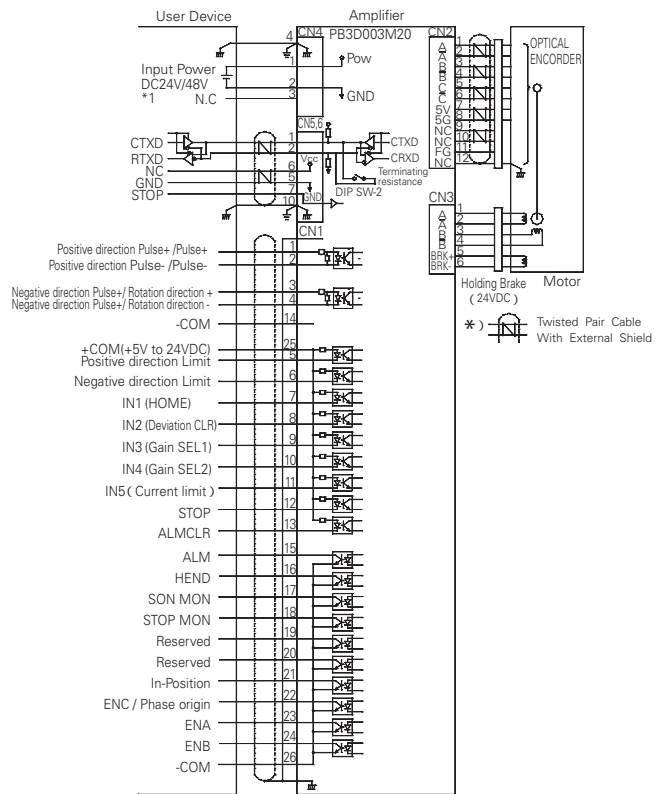


External Wiring Diagram

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 *.

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

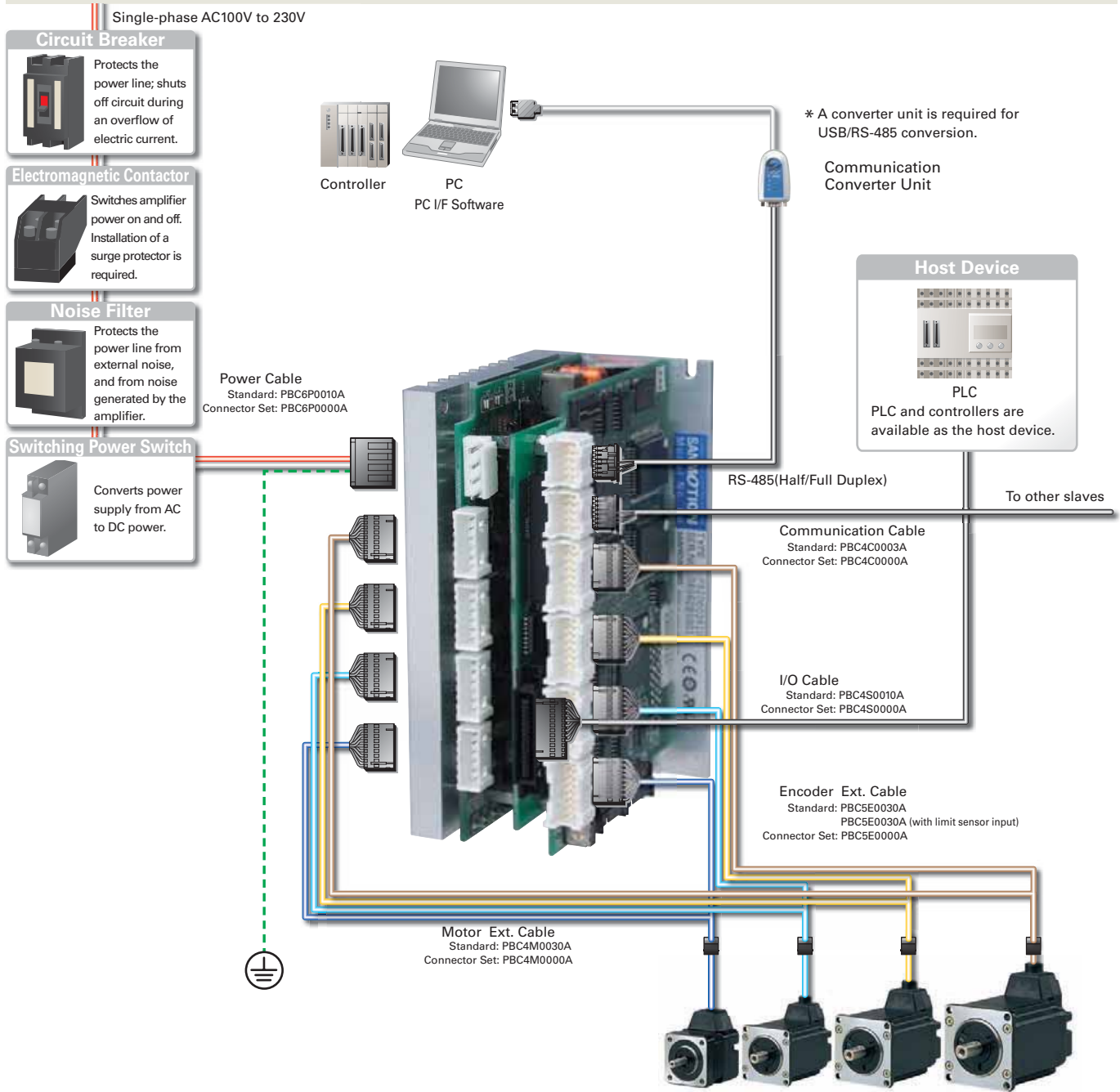
Motor Dimensional Drawings

Options

Model No. PB Type R Multi-Axis Type

DC Power Input Type

System Configuration

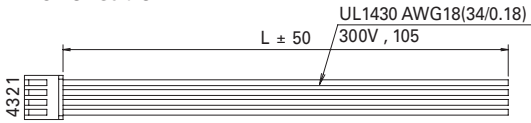


Options

Cable Type	Standard Model Number (Length)	Connector Set Model Number	Maximum Length	Remarks
Power Cable	PBC6P0010A (1m)	PBC6P0000A	2 m	-
Motor Cable	PBC4M0030A (3m)	PBC4M0000A	20 m	An extension cable is required.
Encoder Cable	PBC5E0030A (3m)	PBC5E0000A	20 m	An extension cable is required.
Encoder Cable (with limit sensor input)	PBC5E0030C (3m)	PBC5E0000A	20 m	Please specify when using an external limit sensor.
I/O Cable	PBC4S0010A (1m)	PBC4S0000A	2 m	-
Communication Cable	PBC4C0030A (30cm)	PBC4C0000A	100 m	Use when multiple axes are connected in a daisy-chain configuration for communication.
Communication Converter Unit	PBFM-U6	-	-	USB / RS-485 Half Duplex Converter Unit Converter unit and cable set model
PC I/F Software	SPBD2W-01	-	-	Software for operational check and parameter setting
Regenerative Unit	PBFE-01	-	-	Required if regeneration voltage is more than 40V

Optional Cable

Power Cable



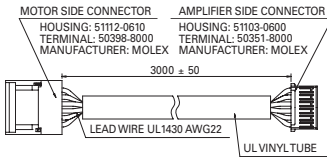
Connector Connection Of Amplifier Side

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

Connector Set : PBC6P0000A

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

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

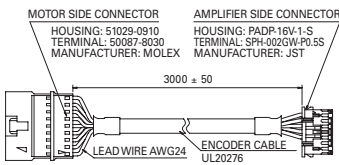
Connector Connection Of Amplifier Side

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

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

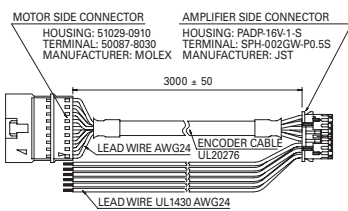
Connector Connection Of Amplifier Side

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
	Housing : PADP-16V-1-S	1
JST	Terminal : SPH-002GW-P0.5S	15

Encoder Cable (with limit sensor input)



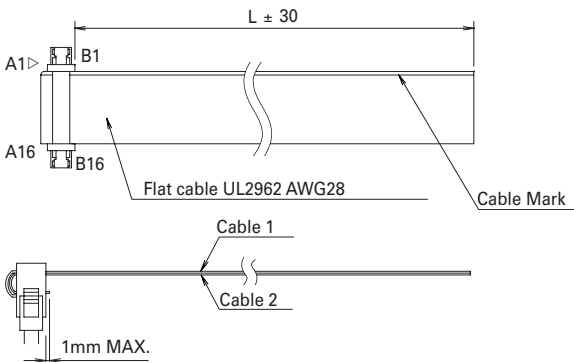
Connector Connection Of Motor Side

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	Blue	SDN
12	Black	GND
13	Yellow	LIMIT
14	Black	GND
15	Red	Vcc
16	Red	Vcc

I/O Cable (unshielded)



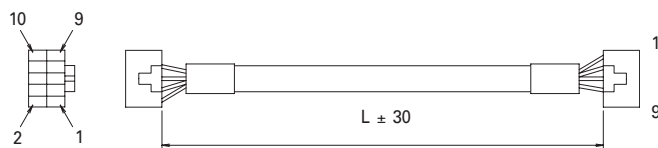
Cable Connection

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	Connector : 8822E-032-171D-F	1

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
STOP(EXZ)	7	Purple	7	STOP(EXZ)
FG	8	Green	8	FG
-	9	Drain	9	-
-	10	-	10	-

Connector Set : PBC4C0000A

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

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Model No. PB Type R Multi-Axis Type

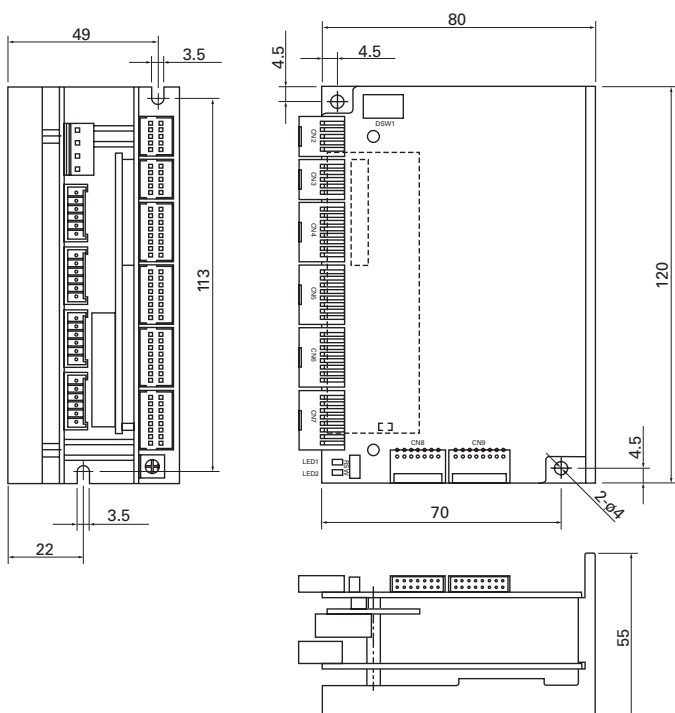
DC Power Input Type

General Specifications

Amplifier Model		PB2D003R1U	
Control Mode		PWM Control Trapezoidal drive method	
Power Supply	Main Power Supply	DC24V/36V±10%	
	Control Power Supply	DC24V±10% (only for part numbers ending with "1" or "3")	
Environment	Ambient temp.	Operating	0 to 55
		Storage	-20 to 70
	Operating/Storage Humidity		Maximum 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 / W120xH55xD80	
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, SDN 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)



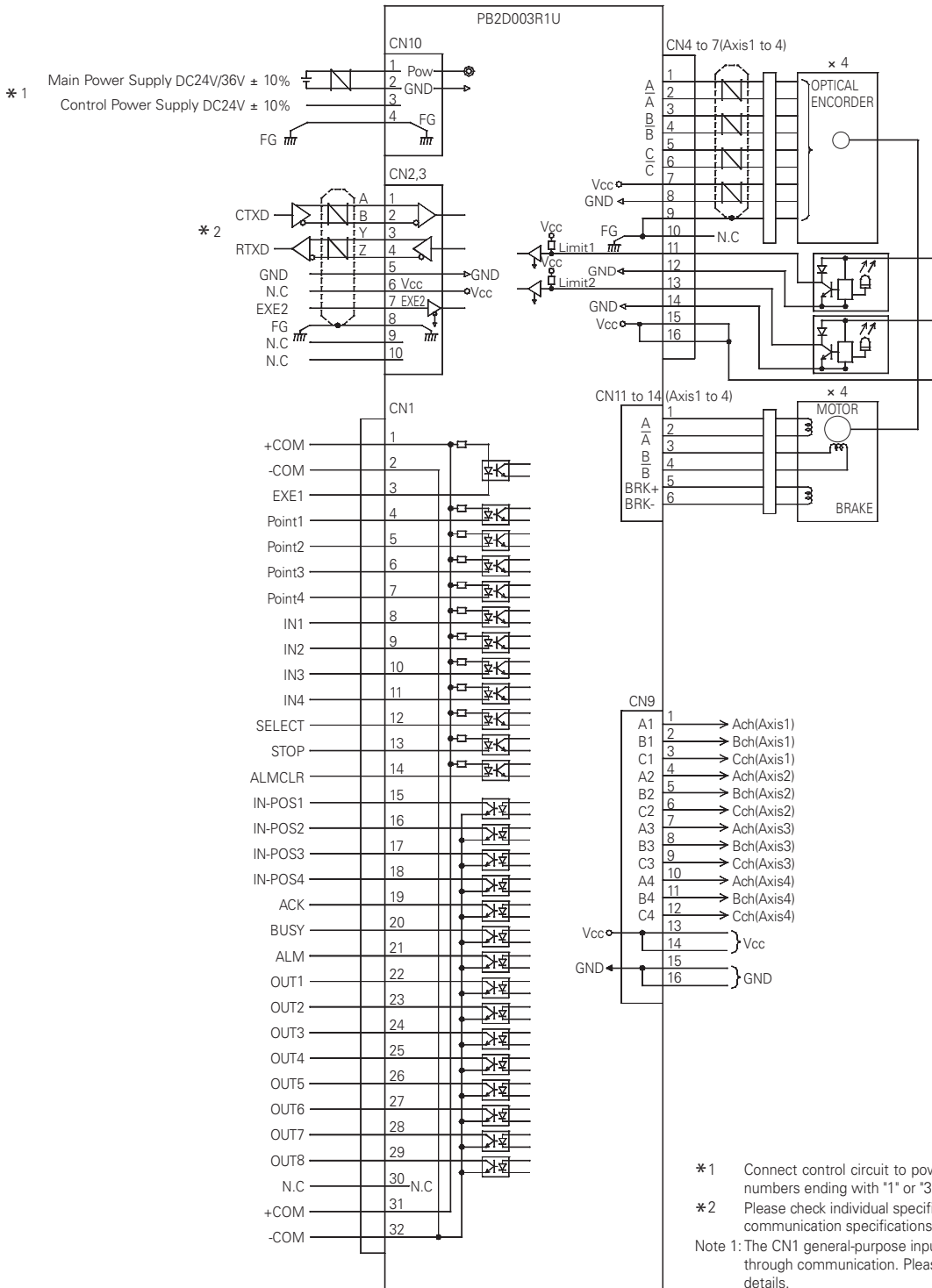
Amplifier Model Number Nomenclature

PB2D003R1U

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

Features and Functions
Type R
Type P
Type M
Type R Multi-Axis
General Specifications
Motor Dimensional Drawings
Options



General Specifications

Standard Model

AC

Motor Flange Size

42

60

86

Size	Motor Flange Size	60mm		
	Motor Length	55.9mm	70.3mm	102.3mm
Motor Model	Unit	PBM423FXK20	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	0.39	1.3	1.9
Rotor Inertia	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.056	0.4	0.84
Allowable Thrust Load	N	9.8	14.7	14.7
Allowable Radial Load ^{Note1}	N	49	167	167
Motor Mass	kg	0.35	0.85	1.42

Motor Characteristics Chart



Torque

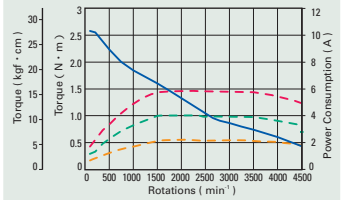
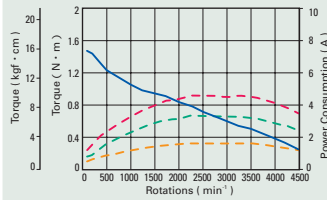
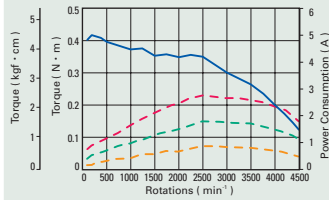
AC100V/200V

Power Consumption

Single-phase AC100V

Single-phase AC200V

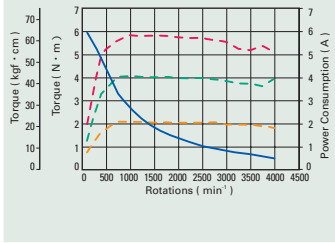
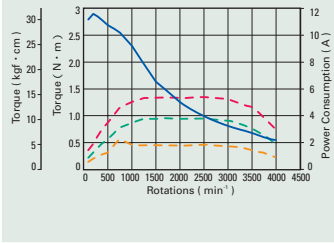
3-phase AC200V



*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.

86mm	
79.5mm	109.1mm
PBM861FXK20-M	PBM862FXK20-M
PBBR861 / PBCR861	PBBR862 / PBCR862
PB4A002R30	
PBBP861 / PBCP861	PBBR862 / PBCR862
PB4A002P30	
3.1	6.1
1.48	3
60	60
200	200
1.9	3.1



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options



General Specifications

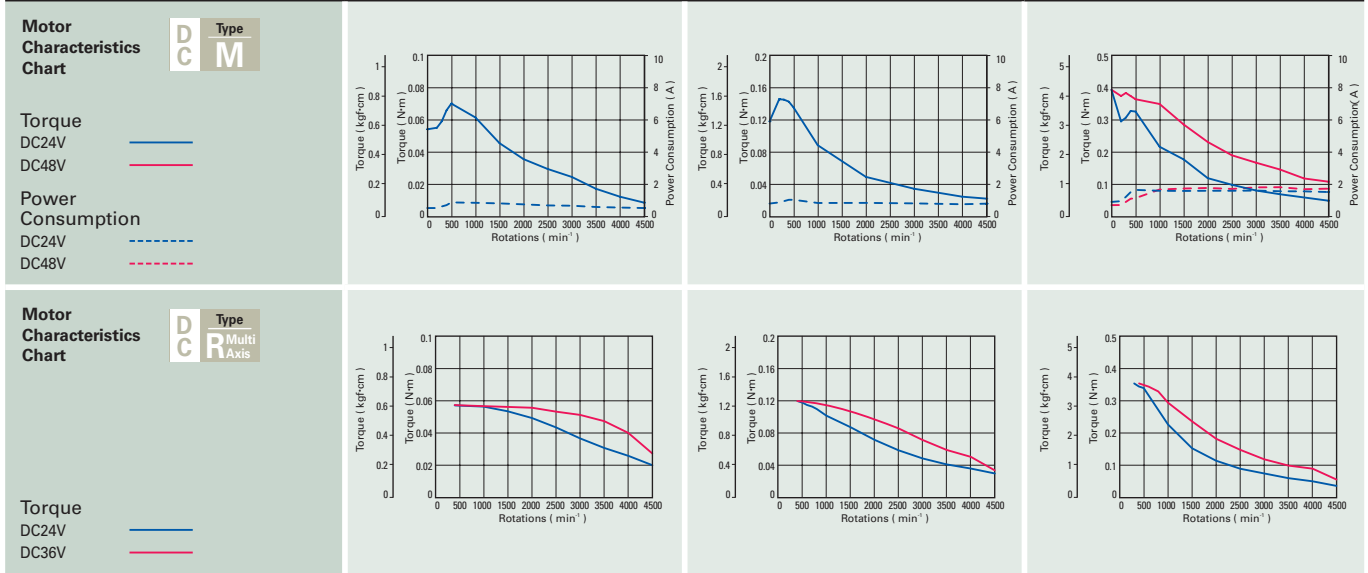
Standard Model

DC

Motor Flange Size

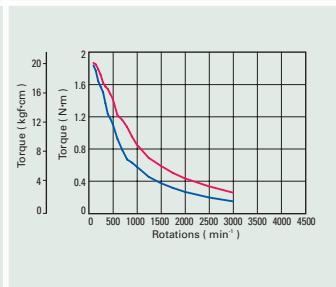
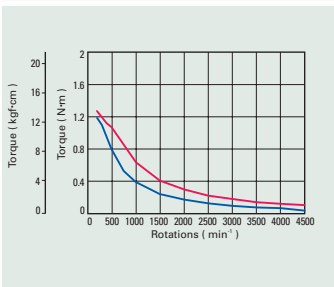
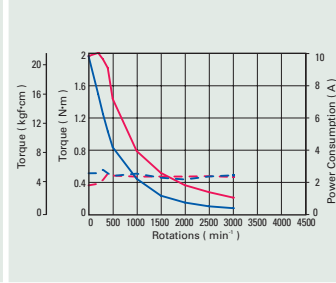
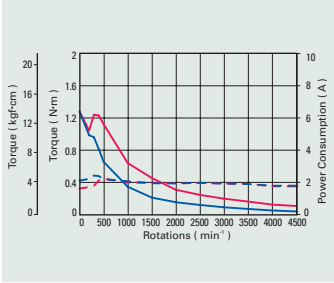
28 | 42 | 60

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	9.8
Allowable Radial Load ^{Note1}	N	33	33	49
Motor Mass	kg	0.16	0.23	0.35



*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	
70.3mm	102.3mm
PBM603FXE20	PBM604FXE20
PBDM603	PBDM604
PB3D003M200	
PBM603DXA20	PBM604DXA20
PB2D003R1U	
1.3	1.9
0.4	0.84
14.7	14.7
167	167
0.85	1.42



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options



General Specifications

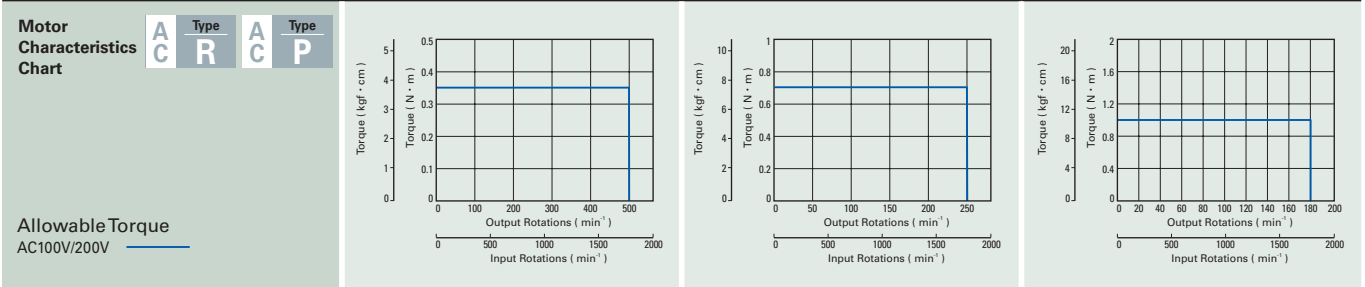
Low-backlash Gear Model

AC

Motor Flange Size

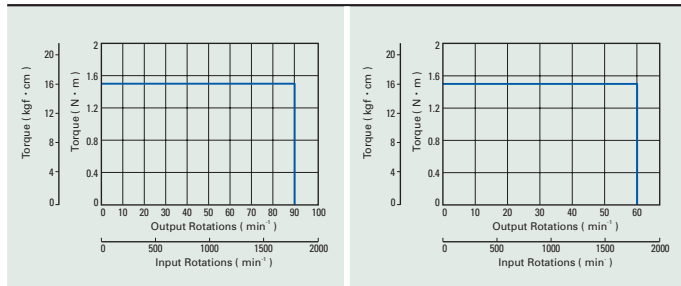
42 60

Size	Motor Flange Size	42mm		
	Motor Length + Gear Length	86.1mm		
Motor Model	Unit	PBM423FGAK20	PBM423FGBK20	PBM423FG EK20
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.		PB4A002R30		
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		



*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	PBM423FGJK20
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	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options



General Specifications

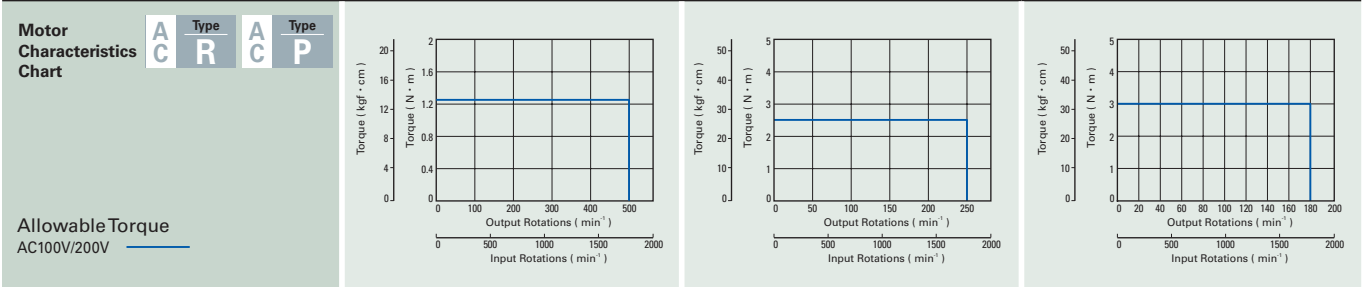
Low-backlash Gear Model

AC

Motor Flange Size

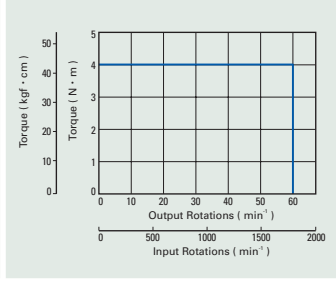
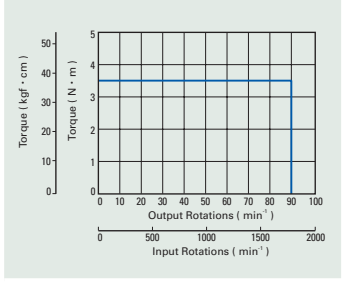
42 60

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	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	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		



*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	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options



General Specifications

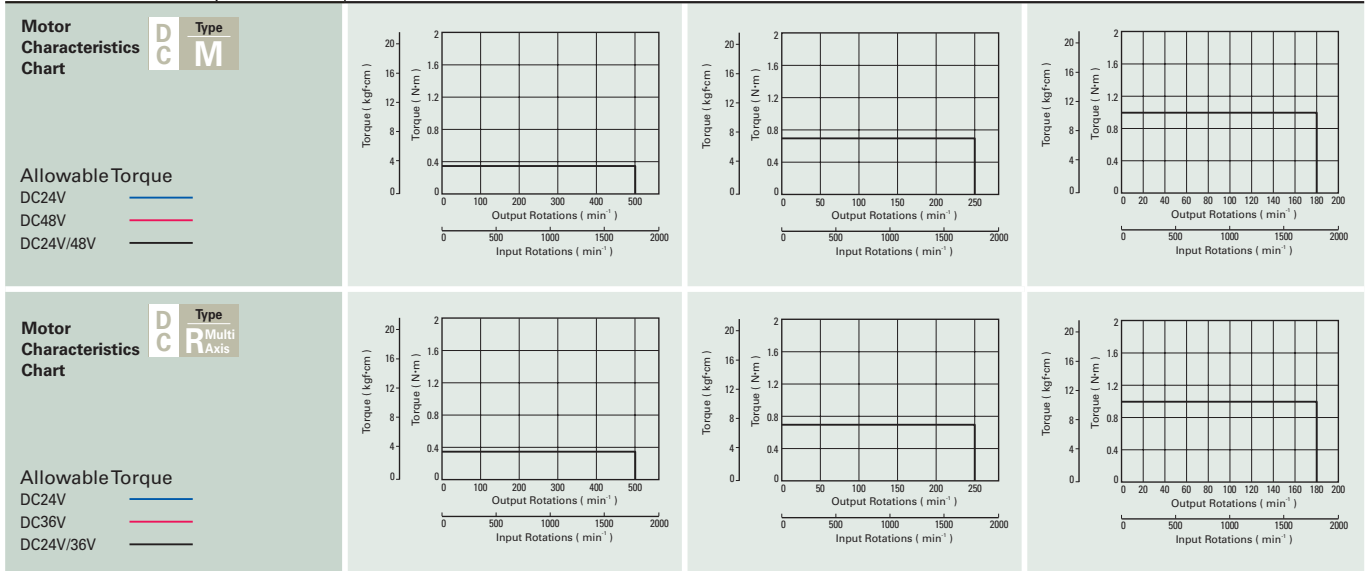
Low-backlash Gear Model

DC

Motor Flange Size

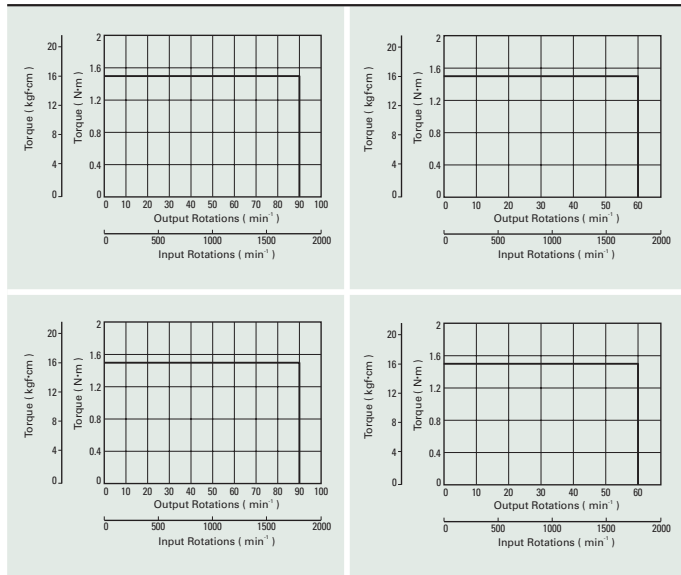
42 60

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		PBM423DGAA20	PBM423DGBA20	PBM423DGEEA20
Related Amplifier 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		



*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	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

General Specifications

Low-backlash Gear Model

DC

Motor Flange Size

42 60



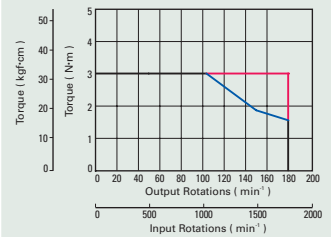
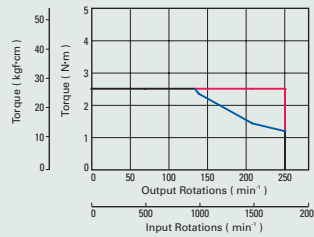
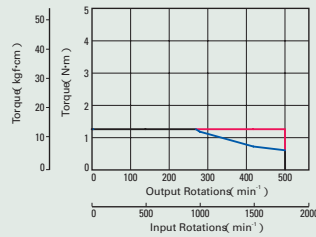
Size	Motor Flange Size	60mm		
	Motor Length + Gear Length	115.8mm		
Motor Model	Unit	PBM603FGAE20	PBM603FGBE20	PBM603FGEE20
Type M Set Model No.		PBDM603-C3.6	PBDM603-C7.2	PBDM603-C10
Related Amplifier Model No.		PB3D003M200		
Motor Model		PBM603DGAA20	PBM603DGBA20	PBM603DGEA20
Related Amplifier Model 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

DC Type M

Allowable Torque

DC24V ————
 DC48V ————
 DC24V/48V ————

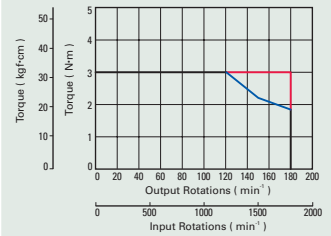
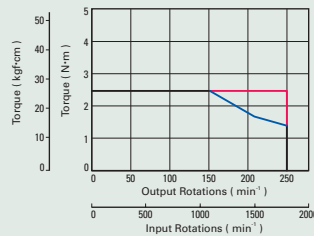
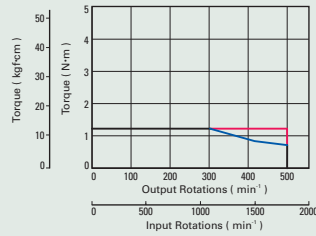


Motor Characteristics Chart

DC Type Multi Axis

Allowable Torque

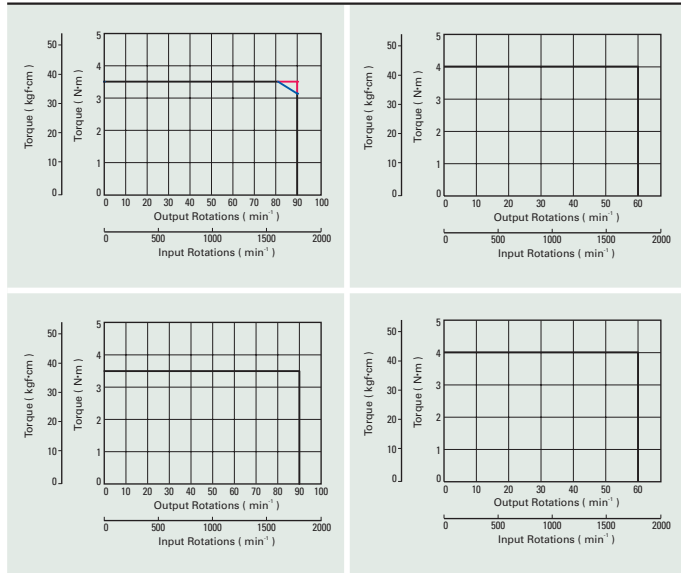
DC24V ————
 DC36V ————
 DC24V/36V ————



*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	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

General Specifications

Spur Gear Model

DC

Motor Flange Size

28



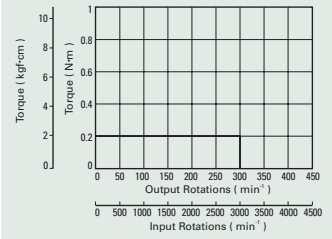
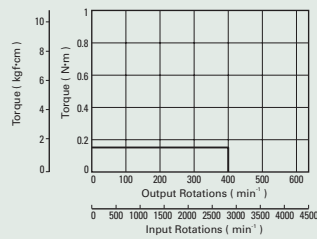
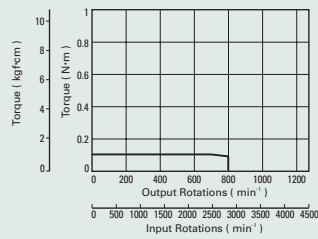
Size	Motor Flange Size	28mm		
	Motor Length + Gear Length	88.5mm		
Motor Model	Unit	PBM282FGAE20	PBM282FGBE20	PBM282FGEE20
Type M Set Model No.		PBDM282-G3.6	PBDM282-G7.2	PBDM282-G10
Related Amplifier Model No.		PB3D003M200		
Motor Model		PBM282DGAA20	PBM282DGBA20	PBM282DGEA20
Type R Multi-axis Model No.		PB2D003R1U		
Allowable 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	2	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

DC Type M

Allowable Torque

DC24V ———
DC48V ———
DC24V/48V ———

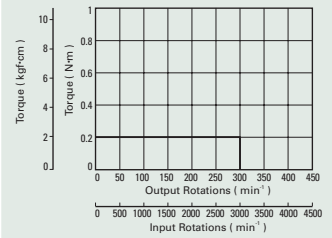
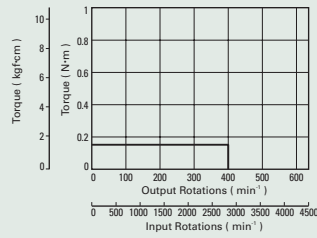
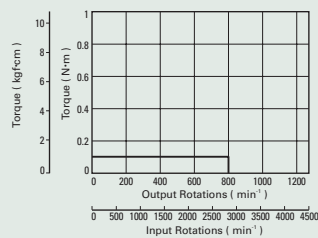


Motor Characteristics Chart

DC Type R Multi Axis

Allowable Torque

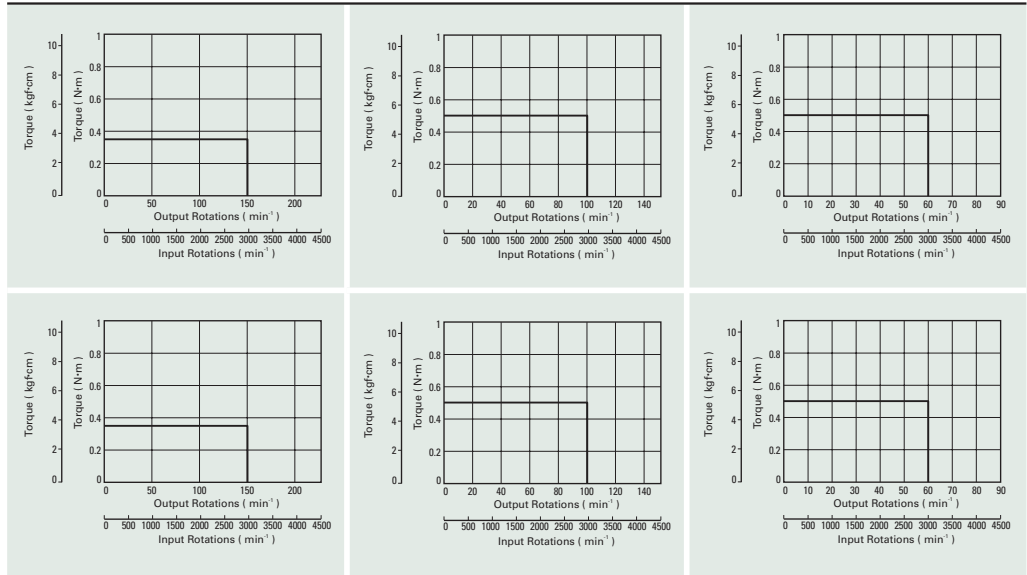
DC24V ———
DC36V ———
DC24V/36V ———



*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	1.5	1.5
150	100	60
Forward		
10		
15		
0.22		



Options
Motor Dimensional Drawings
General Specifications
Type R Multi-Axis
Type M
Type P
Type R
Features and Functions



General Specifications

Harmonic Gear Model

AC

Motor Flange Size

42 60

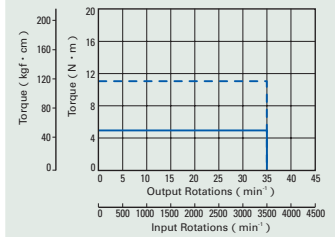
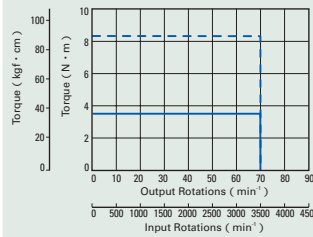
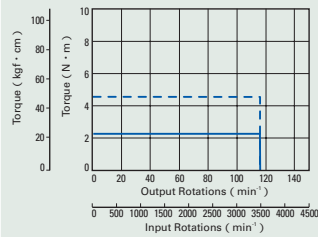
Size	Motor Flange Size	42mm		
	Motor Length + Gear Length			
Motor Model	Unit	PBM423FHJK20	PBM423FHLK20	PBM423FHMK20
Type R Set Model No.		PBBR423-H30 / PBCR423-H30	PBBR423-H50 / PBCR423-H50	PBBR423-H100 / PBCR423-H100
Related Amplifier Model No.		PB4A002R30		
Type P Set Model No.		PBBP423-H30 / PBCP423-H30	PBBP423-H50 / PBCP423-H50	PBBP423-H100 / PBCP423-H100
Related Amplifier Model No.		PB4A002P30		
Allowable 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

AC Type R AC Type P

Allowable Torque
Single-phase AC100V/200

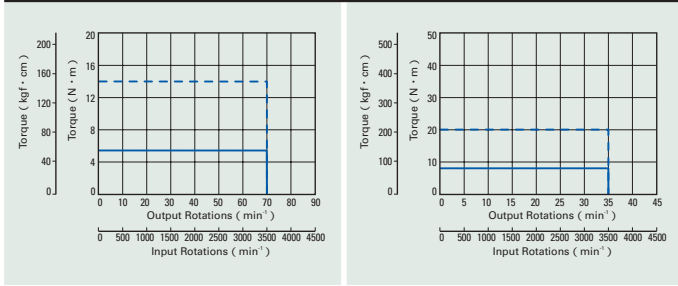
Allow. Instantaneous Torque
Single-phase, 3-phase AC100V/200V



*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

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 (± 0.28N · m)	0.4 to 3 (± 0.4N · m)
70	35
400	
360	
1.45	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

General Specifications

Harmonic Gear Model

DC

Motor Flange Size

28 42 60



Size	Motor Flange Size	28mm		42mm
	Motor Length + Gear Length	97mm		97mm
Motor Model	Unit	PBM282FHLE20	PBM282FHME20	PBM423FHJE20
Type R Set Model No.		PBDM282-H50	PBDM282-H100	PBDM423-H30
Related Amplifier Model No.		PB3D003M200		
Motor Model		PBM282DHLE20	PBM282DHMA20	PBM423DHJA20
Type R Multi-axis Model No.		PB2D003R1U		
Allowable 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 ($\pm 0.06 \text{N} \cdot \text{m}$)		0.4 to 3 ($\pm 0.08 \text{N} \cdot \text{m}$)
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

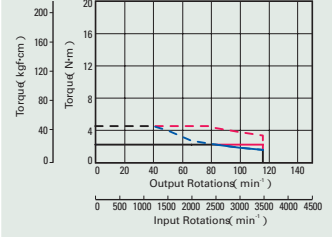
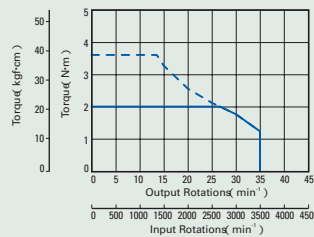
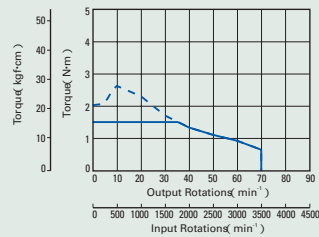
DC Type M

Allowable Torque

DC24V ———
DC48V ———
DC24V/48V ———

Allow. Instantaneous Torque

DC24V - - - - -
DC48V - - - - -
DC24V/48V - - - - -



Motor Characteristics Chart

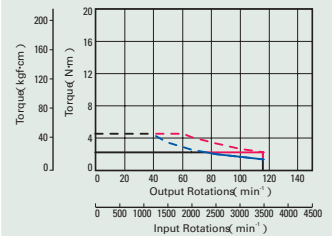
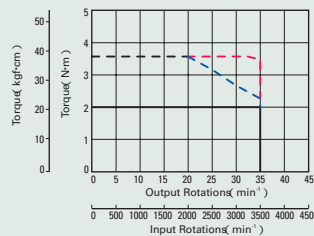
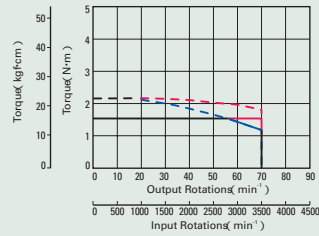
DC Type P Multi Axis

Allowable Torque

DC24V ———
DC36V ———
DC24V+36V ———

Allow. Instantaneous Torque

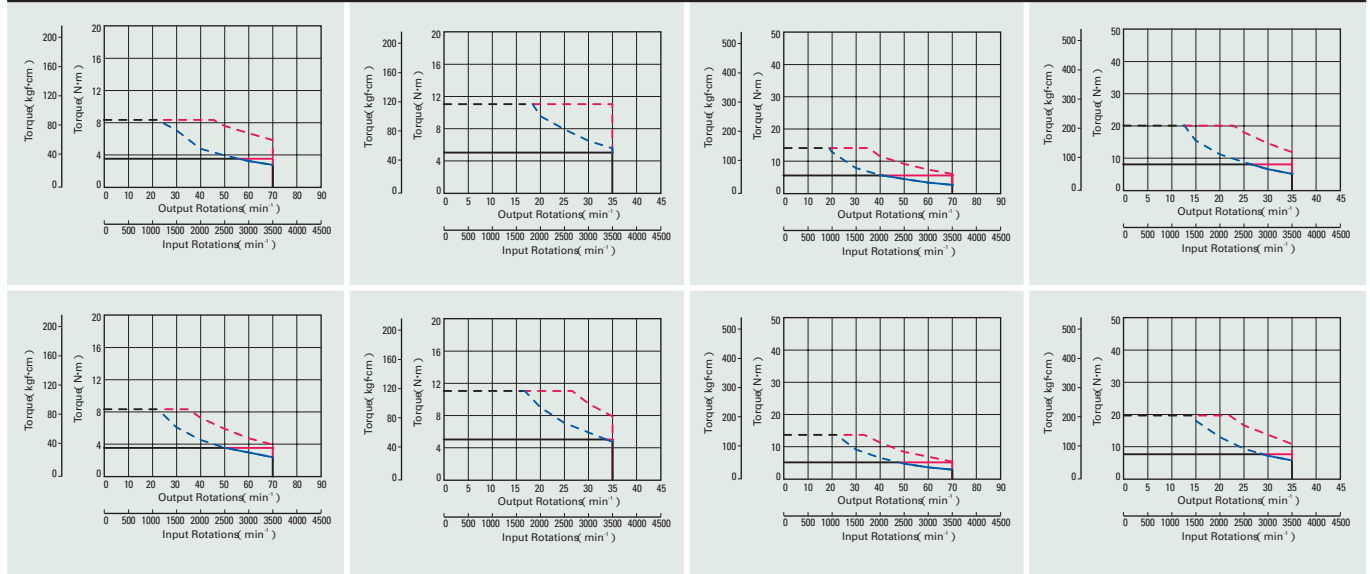
DC24V - - - - -
DC36V - - - - -
DC24V/36V - - - - -



*Maintain motor case temperature at a point below 85 °C. **The gear output shaft rotates in the opposite direction.

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

42mm		60mm	
97mm		137.3mm	
PBM423FHLE20	PBM423FHME20	PBM603FHLK20	PBM603FHMK20
PBDM423-H50	PBDM423-H100	PBDM603-H50	PBDM603-H100
PB3D003M200			
PBM423DHLE20	PBM423DHMA20	PBM603DHLE20	PBM603DHMA20
PB2D003R1U			
3.5	5	5.5	8
8.3	11	14	20
0.068		0.435	
1:50	1:100	1:50	1:100
		0.4 to 3 (± 0.28N · m)	0.4 to 3 (± 0.4N · m)
2.4			
70	35	70	35
1150		400	
209		360	
0.54		1.45	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options



General Specifications

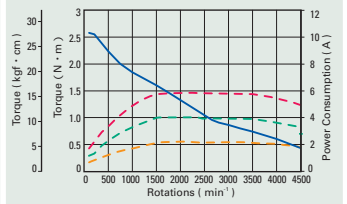
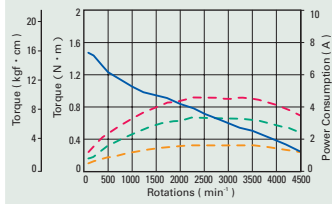
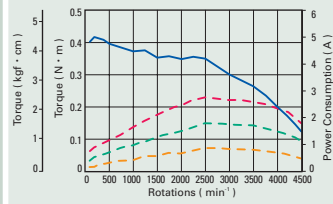
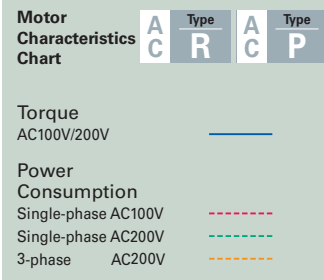
Electromagnetic Brake Model

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		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	$\times 10^{-4} \text{kg} \cdot \text{m}^2$	0.056		0.4	0.84	
Allowable Thrust Load	N	9.8		14.7		
Allowable Radial Load ^{Note1}	N	49		167		
Motor Mass	kg	0.5		1.19	1.76	
Electromagnetic Brake	Operation Method	No excitation actuating type				
	Power Voltage	V				
	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			
	Brake Release Time	ms	30			



*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.

Options								
Motor Dimensional Drawings								
General Specifications								
Type R Multi-Axis								
Type M								
Type P								
Type R								
Features and Functions								



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.		PBM282-B	PBM284-B	PBM423-B
Related Amplifier Model No.		PB3D003M200		
Motor Model		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	DC24V \pm 5%		
	Excitation Current	A	0.15	0.08
	Power Consumption	W	3.6	2
	Friction Torque	N · m	0.049	0.3
	Brake Engage Time	ms	20	
	Brake Release Time	ms	20	30

Motor Characteristics Chart

DC Type M

Torque

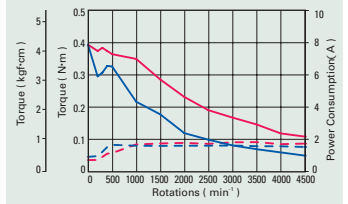
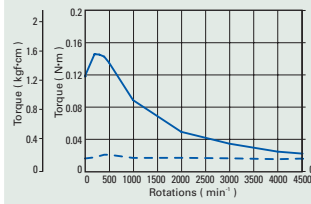
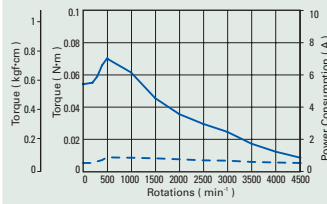
DC24V

DC48V

Power Consumption

DC24V

DC48V



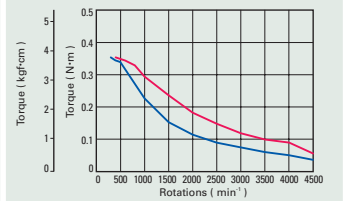
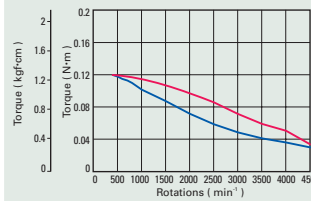
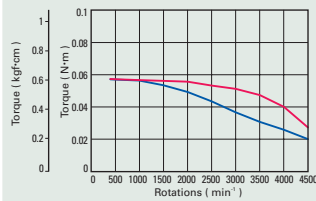
Motor Characteristics Chart

DC Type R Multi Axis

Torque

DC24V

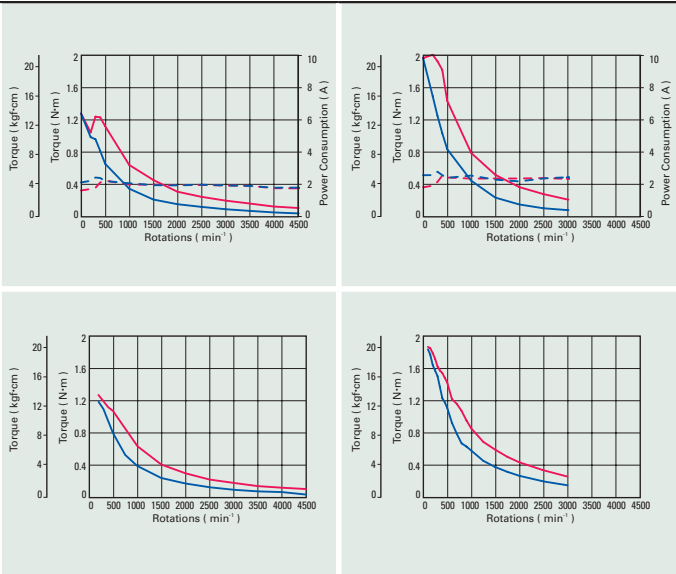
DC36V



*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	



Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Motor Dimensional Drawings

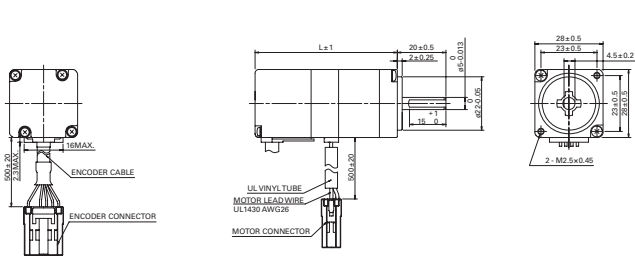
Unit : mm

28mm, 42mm

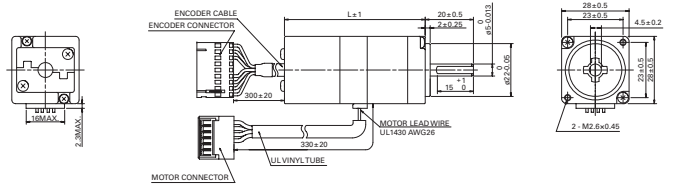
28mm

Standard Model

PBM282FXE20 **DC**
PBM284FXE20 **DC**



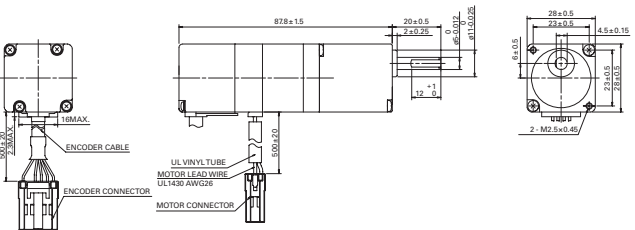
PBM282DXA20 **DC Multi Axis**
PBM284DXA20 **DC Multi Axis**



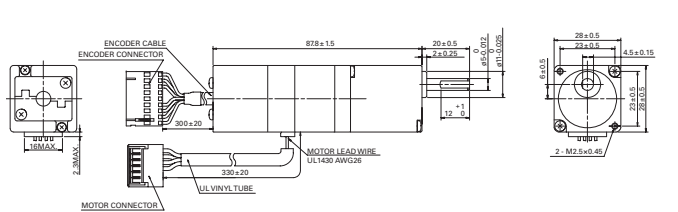
MODEL	L
PBM282	58.5
PBM284	77.8

Spur Gear Model

PBM282FG E20 **DC**

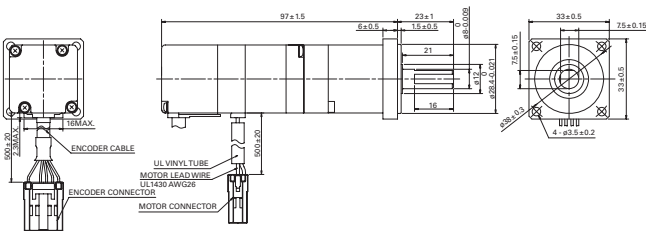


PBM282DG A20 **DC Multi Axis**

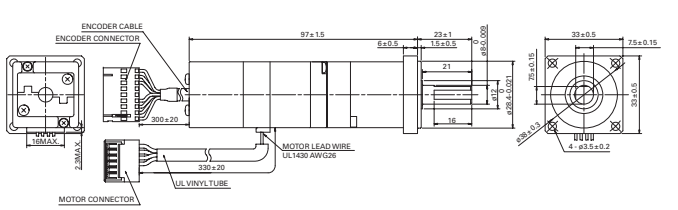


Harmonic Gear Model

PBM282FH E20 **DC**

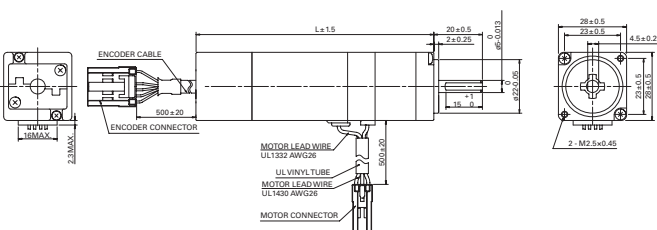


PBM282DH A20 **DC Multi Axis**

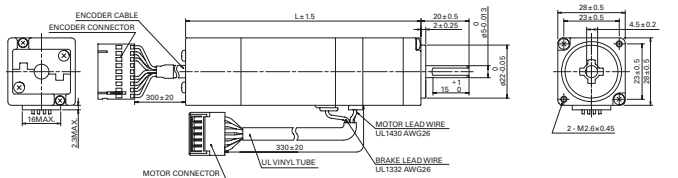


Electromagnetic Brake Model

PBM282FCE20 **DC**
PBM284FCE20 **DC**



PBM282DCA20 **DC Multi Axis**
PBM284DCA20 **DC Multi Axis**

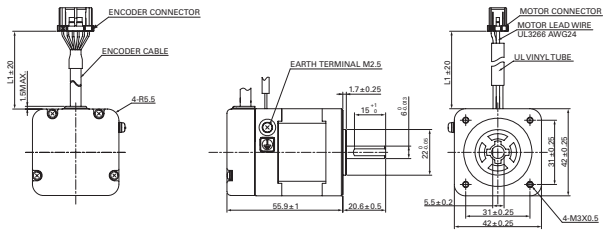


MODEL	L
PBM282	97.8
PBM284	117.1

42mm

Standard Model

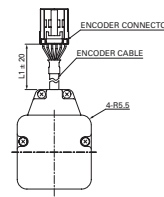
PBM423FXK20 **AC**



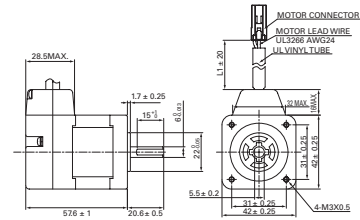
MODEL	L1
PBM423FXK20	500

Standard Model

PBM423FXE20 **DC**



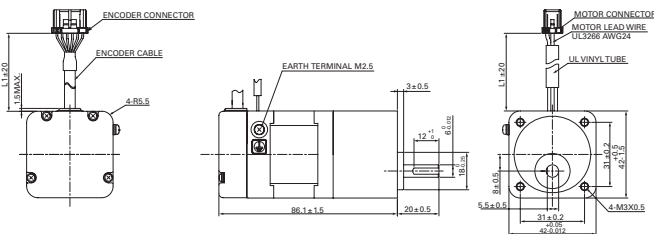
PBM423DXA20 **DC Multi Axis**



MODEL	L1
PBM423FXE20	500
PBM423DXA20	300

Low Backlash Gear Model

PBM423FG K20 **AC**

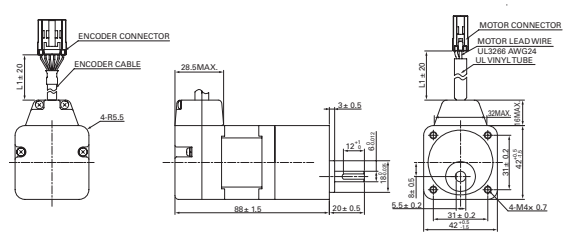


MODEL	L1
PBM423FG K20	500

Low Backlash Gear Model

PBM423FG E20 **DC**

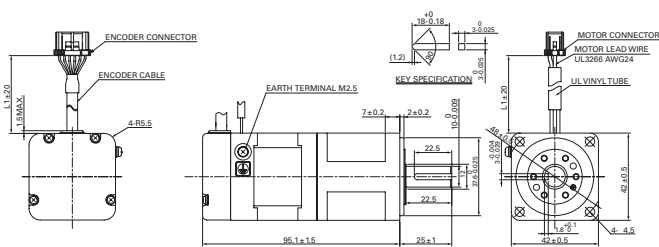
PBM423DG A20 **DC Multi Axis**



MODEL	L1
PBM423FG E20	500
PBM423DG A20	300

Harmonic Gear Model

PBM423FH K20 **AC**

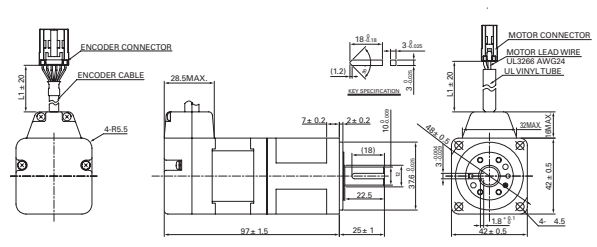


MODEL	L1
PBM423FH K20	500

Harmonic Gear Model

PBM423FH E20 **DC**

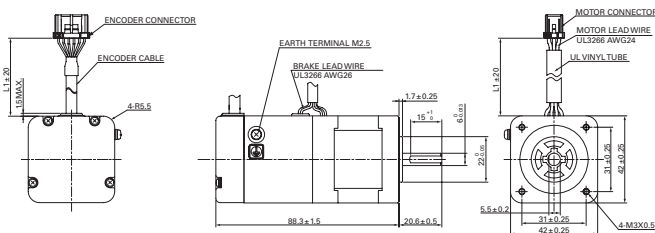
PBM423DH A20 **DC Multi Axis**



MODEL	L1
PBM423FH E20	500
PBM423DH A20	300

Electromagnetic Brake Model

PBM423FCK20 **AC**

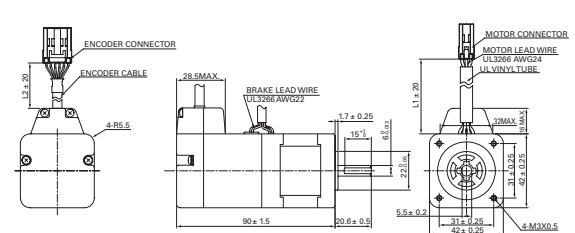


MODEL	L1	L2
PBM423FCK20	515	500

Electromagnetic Brake Model

PBM423FCE20 **DC**

PBM423DCA20 **DC Multi Axis**



MODEL	L1	L2
PBM423FCE20	515	500
PBM423DCA20	315	300

Features and Functions

Type R

Type P

Type M

Type R Multi-Axis

General Specifications

Motor Dimensional Drawings

Options

Motor Dimensional Drawings

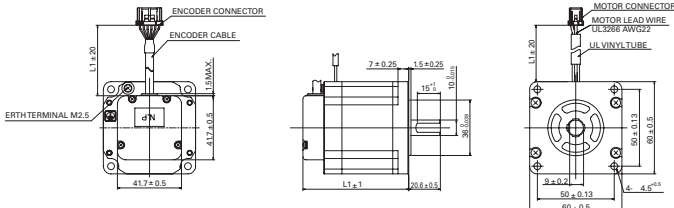
Unit : mm

60mm, 86mm

60mm

Standard Model

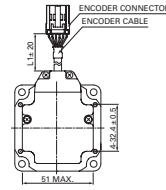
PBM603FXK20-M **AC**
PBM604FXK20-M **AC**



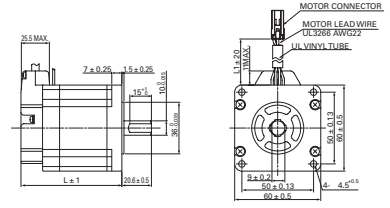
MODEL	L	L1
PBM603FXK20	70.3	500
PBM604FXK20	102.3	500

Standard Model

PBM603FXE20 **DC**
PBM604FXE20 **DC**



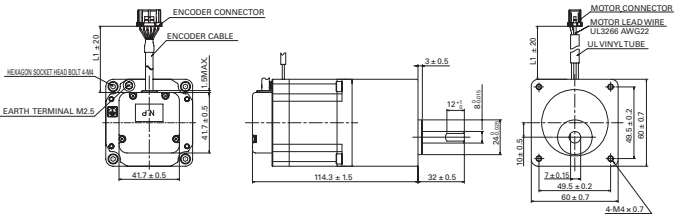
PBM603DXA20 **DC Multi Axis**
PBM604DXA20 **DC Multi Axis**



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

Low Backlash Gear Model

PBM603FG K20-M **AC**

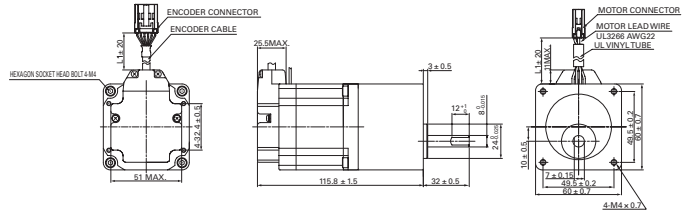


MODEL	L1
PBM603FG K20	500

Low Backlash Gear Model

PBM603FG E20 **DC**

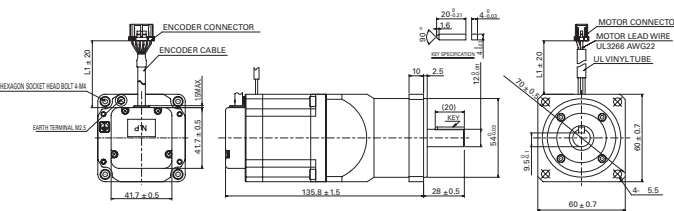
PBM603DG A20 **DC Multi Axis**



MODEL	L1
PBM603FG E20	500
PBM603DG A20	300

Harmonic Gear Model

PBM603FH K20-M **AC**

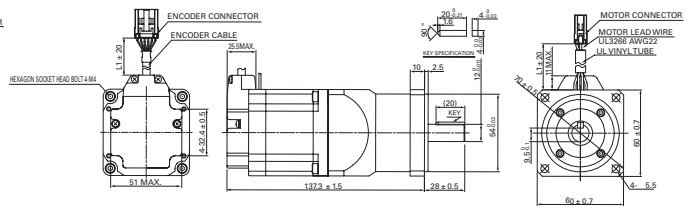


MODEL	L1
PBM603FH K20	500

Harmonic Gear Model

PBM603FH E20 **DC**

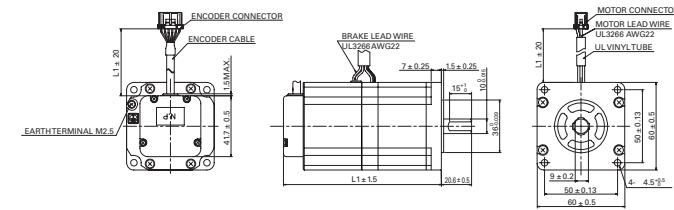
PBM603DH A20 **DC Multi Axis**



MODEL	L1
PBM603FH E20	500
PBM603DH A20	300

Electromagnetic Brake Model

PBM603FCK20-M **AC**
PBM604FCK20-M **AC**

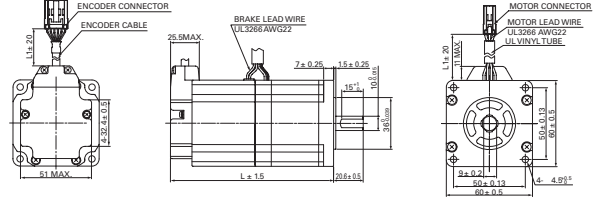


MODEL	L	L1
PBM603FCK20	113.6	500
PBM604FCK20	145.6	500

Electromagnetic Brake Model

PBM603FCE20 **DC**
PBM604FCE20 **DC**

PBM603DCA20 **DC Multi Axis**
PBM604DCA20 **DC Multi Axis**

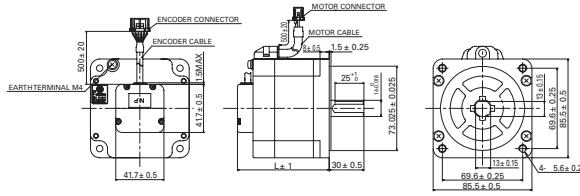


MODEL	L	L1
PBM603FCE20	113.6	500
PBM604FCE20	145.6	500
PBM603DCA20	113.6	300
PBM604DCA20	145.6	300

86mm

Standard Model

PBM861FXK20-M **AC**
 PBM862FXK20-M **AC**



MODEL	L
PBM861FXE20	79.5
PBM862FXE20	109.1

Connector Specification Of Motor Side

AC **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

Features and Functions
Type R
Type P
Type M
Type R Multi-Axis
General Specifications
Motor Dimensional Drawings
Options

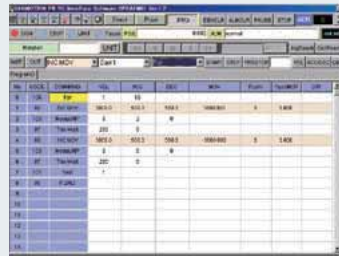
Options

□ PC Interface Description

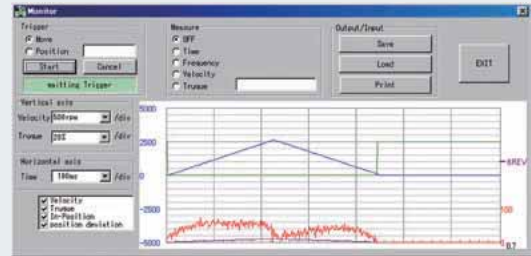
PC Interface Software Display Screens



1:Parameter Input Screen



2:Point/Program Input Screen



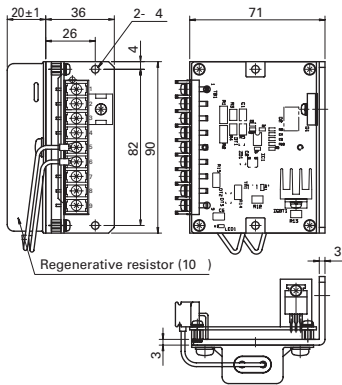
3:Operating Waveform Monitor (*SPBALL-01 and SPBA1W-01 Support)

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 : PBF-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

Inquiry Check Sheet

For more information regarding any products or services described here in, please contact your nearest office listed on the back of this catalog.

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	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Acceleration : __ G·__[m/s²] Feeding SpeedV:__[m/s] Moving DistanceD:__[m] (Stroke)</p> <p>←t1(____)→ ←---t2(____)---→ ←t3(____)→ Time [sec]</p> </div> <div style="width: 35%;"> <p>【 Reference formula 】 【 1G=9.8[m/s²], 1[m/s²] 0.1G 】 【 [m/s²]=V[m/sec]÷t1[sec] 】 【 D[m]=V[m/sec]×(t1+t2)[sec] 】</p> </div> </div>																								
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" style="width: 100%;"> <tr> <td>WΥ(table mass)</td> <td>kg</td> <td>WΛ(work mass)</td> <td>kg</td> <td>WΔ(mass of other drive parts)</td> <td>kg</td> </tr> <tr> <td>WΓ(rack mass)</td> <td>kg</td> <td>WΞ(belt/chain mass)</td> <td>kg</td> <td>WΘ(counterbalance mass)</td> <td>kg</td> </tr> <tr> <td>Fα(external force axial direction)</td> <td>N</td> <td>Fβ(ball-screw preload)</td> <td>N</td> <td>T(roll pushing force)</td> <td>N</td> </tr> <tr> <td>DrΥ(drive-side roll diameter)</td> <td>mm</td> <td>DrΞ(follower-side roll diameter)</td> <td>mm</td> <td></td> <td></td> </tr> </table>	W Υ (table mass)	kg	W Λ (work mass)	kg	W Δ (mass of other drive parts)	kg	W Γ (rack mass)	kg	W Ξ (belt/chain mass)	kg	W Θ (counterbalance mass)	kg	F α (external force axial direction)	N	F β (ball-screw preload)	N	T(roll pushing force)	N	Dr Υ (drive-side roll diameter)	mm	Dr Ξ (follower-side roll diameter)	mm		
		W Υ (table mass)	kg	W Λ (work mass)	kg	W Δ (mass of other drive parts)	kg																			
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(specific gravity of ball-screw/pinion/pulley/table-shaft material)			kg·cm ³																							
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TR(friction torque of motor axis conversion)	N·m	T Δ (imbalance torque of motor axis conversion)	N·m																							
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.)																									

Features and Functions
Type R
Type P
Type M
Type R Multi-Axis
General Specifications
Motor Dimensional Drawings
Options

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.

*For any question or inquiry regarding the above, contact our Sales Department.

<http://www.sanyodenki.com>

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*Remarks : Specifications Are Subject To Change Without Notice.

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