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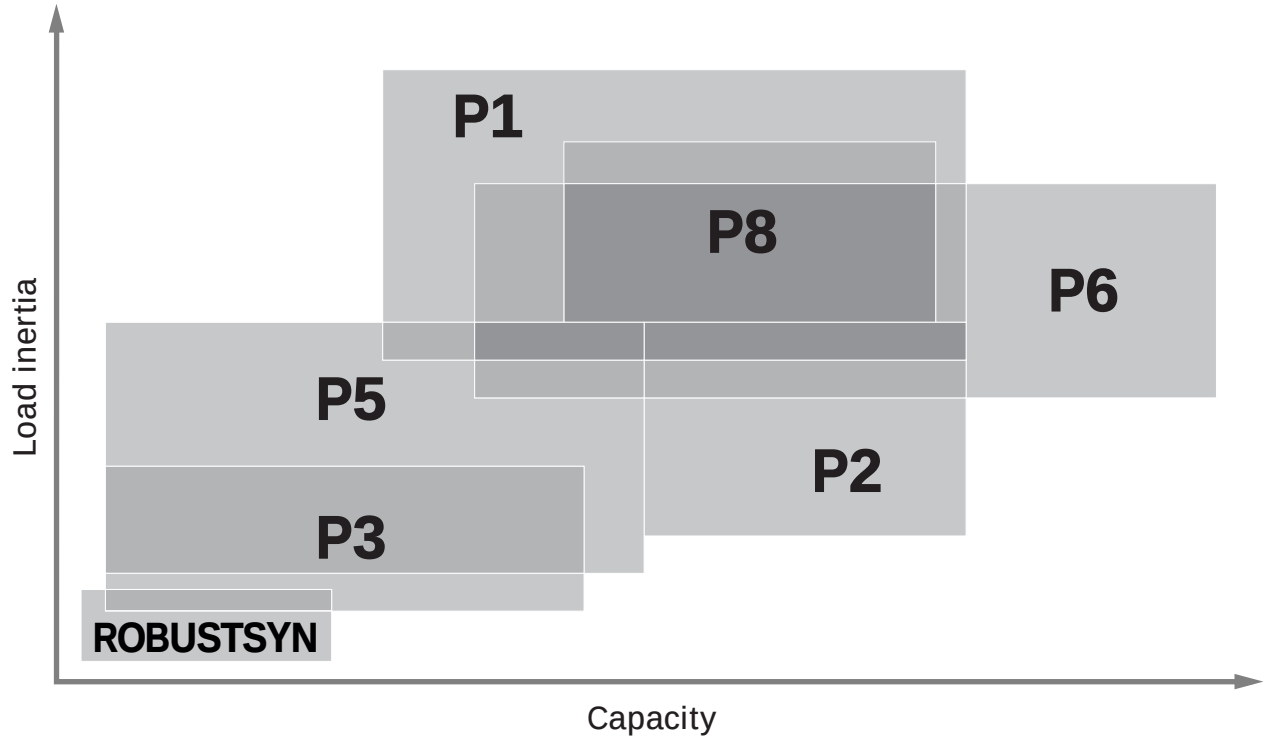
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Index

AC servo systems “ P ” series

Domain diagram

Motors



P1
Motor



Rated rotating speed
2,000min^{-1}

Maximum rotating speed
3,000min^{-1}

Uses
- Machines for precision machining
- Lathes
- Milling machines
- Transfer machines
- General industrial machines

Motor capacity
0.3 to 5.5kW

Applicable amplifier
PZ/PE/C

P2
Motor



Rated rotating speed
3,000min^{-1}

Maximum rotating speed
4,500min^{-1}

Uses
- Machines for superfast response
- Semiconductor-making machines
- Mounters and inserters
- Mounters and inserters printed circuit boards

Motor capacity
1 to 5.0kW

Applicable amplifier
PZ/PE/C

P3
Motor



Rated rotating speed
3,000min^{-1}

Maximum rotating speed
4,500min^{-1}

Uses
- Small simple robots
- Mounters
- Inserters
- Wafer transfer machines
- Semiconductor-making machines

Motor capacity
30 to 750W

Applicable amplifier
PU/PV/PZ/PE/C

P5
Motor



Rated rotating speed
3,000min^{-1}

Maximum rotating speed
4,500min^{-1}

Uses
- Robots
- Winding machines
- General industrial machines

Motor capacity
30 to 1,000W

Applicable amplifier
PU/PV/PZ/PE/C

P6
Motor



Rated rotating speed
2,000min^{-1}

Maximum rotating speed
3,000min^{-1}

Uses
- Robots
- General-purpose machine tools
- General industrial machines
- Transfer machines
- Food processors
- Medical equipment

Motor capacity
0.5 to 30kW

Applicable amplifier
PU/PV/PZ/PE/C

P8
Motor



Rated rotating speed
2,000min^{-1}

Maximum rotating speed
3,000min^{-1}

Uses
- Robots
- General industrial machines
- Take-up machines
- Transfer machines

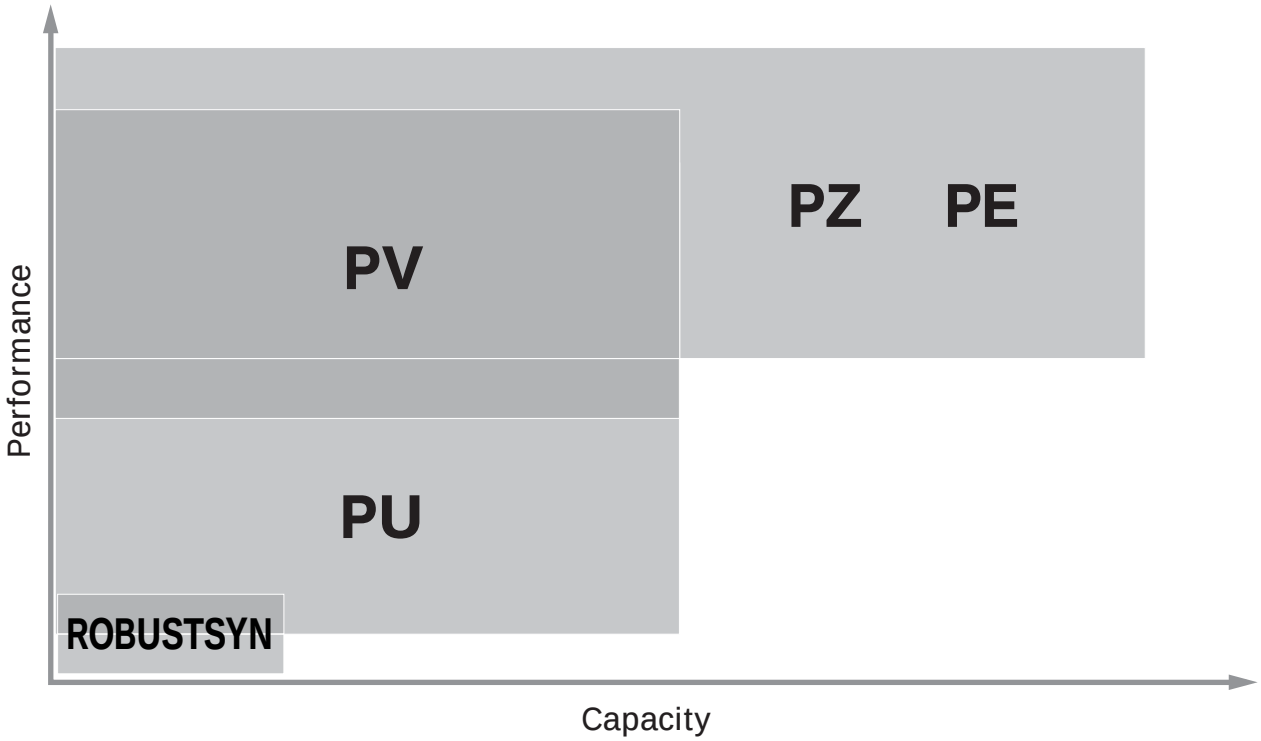
Motor capacity
0.75 to 4.5kW

Applicable amplifier
PZ/PE/C

* For the hollow servomotors “P5”, “P6”, and “P8”, see pages 60 and 61.

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Amplifiers



PU
Amplifier



Amplifier capacity
15A/30A/50A

Uses
- Various robots
- Roll feeders
- Food processors
- General industrial machines

Motor capacity
30 to 1,000W

Applicable motors
P3/P5/P6

PZ
Amplifier



Amplifier capacity
15A/30A/50A/100A
150A/300A/600A

Uses
- Machine tools
- Various robots
- Transfer machines
- Take-up machines
- Printers
- Roll feeders
- Food processors
- General industrial machines

Motor capacity
30W to 30kW

Applicable motors
P1/P2/P3/P5/P6/P8

PE
Amplifier



Amplifier capacity
15A/30A/50A

Uses
- Machine tools
- Various robots
- Transfer machines
- Take-up machines
- Printers
- Roll feeders
- Food processors
- General industrial machines

Motor capacity
30W to 7kW

Applicable motors
P1/P2/P3/P5/P6/P8

PV
Amplifier



Amplifier capacity
15A/30A

Uses
- Machine tools
- Various robots
- Transfer machines
- Take-up machines
- Printers
- Roll feeders
- Food processors
- General industrial machines

Motor capacity
30 to 1,000W

Applicable motors
P3/P5/P6

C-TYPE
Controller-equipped amplifiers



Amplifier capacity
15A/30A/50A
100A/150A

Uses
- Transfer machines
- Index tables
- Various robots
- Food processors
- General industrial machines

Motor capacity
30W to 15kW

Applicable motors
P1/P2/P3/P5/P6/P8

ROBUSTSYN



Rotating speed
4,500min^{-1}

Uses
- Mounters
- Laboratory equipment
- Bonders

Motor capacity
20 to 750W

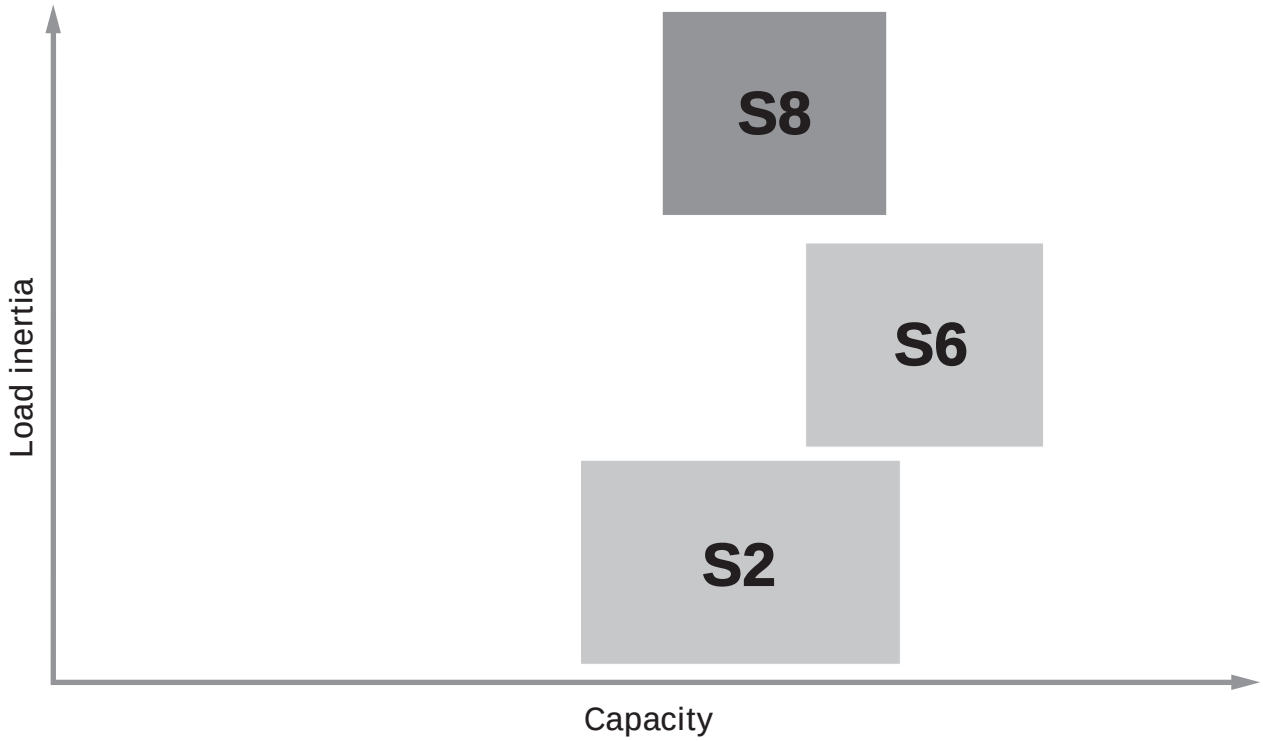
Amplifier Power Input
DC24/38V
AC100/200V

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Index

AC servo systems “ S ” series

Domain diagram



S2
Motor



Rated rotating speed
1,500min^{-1}

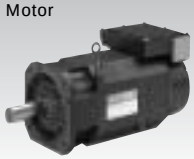
Maximum rotating speed
2,000min^{-1}

Uses
- Press machines
- Paper raisers
- Injection molders
- Transfer machines
- Shearing machines

Motor capacity
5.5 to 30kW

Applicable amplifier
SZ

S6
Motor



Rated rotating speed
1,500min^{-1}

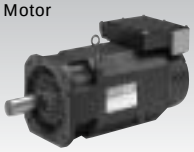
Maximum rotating speed
2,000min^{-1}

Uses
- Tower automatic warehouses
- Tower parking systems
- Transfer machines
- Conveyors
- Pipe benders

Motor capacity
22 to 45kW

Applicable amplifier
SZ

S8
Motor



Rated rotating speed
1,500min^{-1}

Maximum rotating speed
2,000min^{-1}

Uses
- Tower automatic warehouses
- Can-making machines
- Printers

Motor capacity
11 to 30kW

Applicable amplifier
SZ

SZ
Amplifiers



Amplifier capacity
300A/600A
900A

Uses
- Press machines
- Turret machines
- Tower automatic warehouses
- Main spindles of machine tools
- Injection molders

Motor capacity
2.2 to 45kW

Applicable amplifier
S2/S6/S8

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System controllers

Networking controllers and digital controllers

S-MAC

3Types

- Networking NC ...TypeA
- PC based NC ...TypeB
- Motion Cardless NC ...TypeC

PDC-1300



Applicable amplifiers and drivers

- PU
- PZ
- PE
- PV

3 shafts simultaneously
Communications by RS-232C and RS-485
PTP operation
Compatible with G codes

PDC-1600



Applicable amplifiers and drivers

- PU
- PZ
- PE
- PV

6 shafts simultaneously
Communications by RS-232C and RS-485
Bus and PTP operation
Compatible with G codes

DC servo systems

SUPER V



Rated rotating speed
3,000min^{-1}

Maximum rotating speed
5,000min^{-1}

Uses
- Semiconductor-making machines
- Liquid product-making machines
- Sheet metal machines
- Robots
- Ticket vendors

Motor capacity
23 to 500W

Applicable amplifier
DA2

DA2



Amplifier capacity
15A/30A

Uses
- Semiconductor-making machines
- Liquid product-making machines
- Sheet metal machines
- Robots
- Ticket vendors

Motor capacity
23 to 500W

Applicable amplifier
Super V

⚠ Cautions

Failure to observe any of the precautions indicated on the right-hand side may cause a light to medium-degree injury or property damage. It may even lead to a serious disaster. Be sure to observe all of the precautions.

⚠ Cautions

- Do not use any of these products for medical or other equipment that may affect human lives.
- Do not use any of these products for equipment that may have a serious impact on society or the public.
- Do not use any of these products in a vehicle, ship, or other environment exposed to vibration.
- Do not remodel or machine any of these products.
- Before using any of these products, be sure to read its operation manual.

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

●The PDC-1300 and PDC-1600 are strategic commodities as defined in the Foreign Exchange and Foreign Trade Control Law with Concomitant Orders and Ordinances. Exporters of any of these products, therefore, must apply to the Ministry of International Trade and Industry for a permit to export. All other products are non-strategic. Therefore, exporters of these other products do not need a permit to export from the MITI. However, exporters may be asked by the customs officers that the products being exported are non-strategic. Exporters are therefore encouraged to contact us for a document explaining the non-strategic nature of a specific product.

●If any product is incorporated in another product, be sure to follow the strategic or non-strategic requirements of that other product.

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FA total solutions

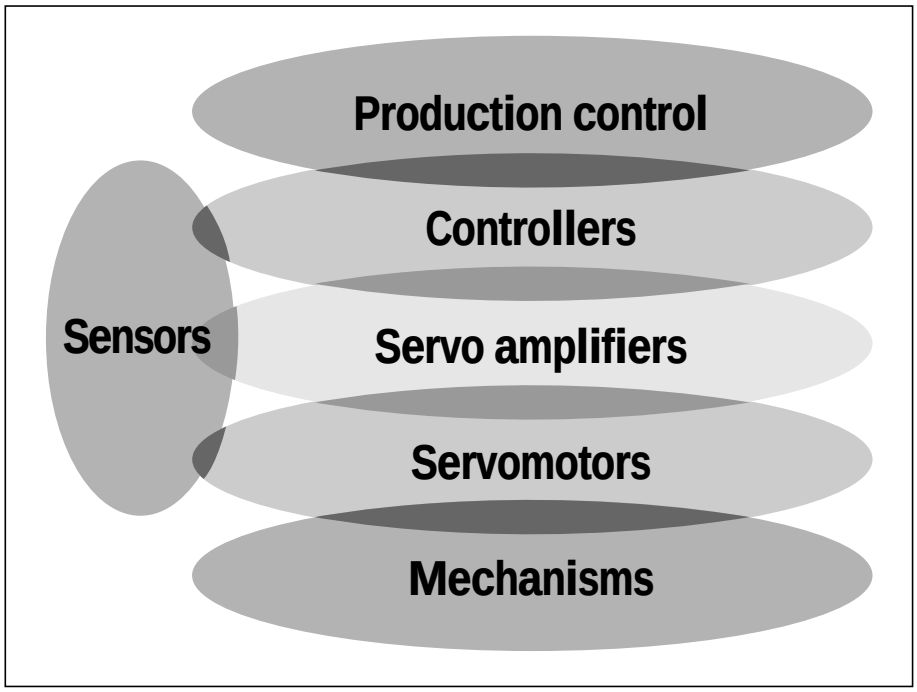
“Technology to protect the earth's environment”
“Technology to protect the health and safety of humans”
“Technology to use new energies and to conserve energy”

Based on these technological principles, we, the members of Sanyo Denki, will aggressively pursue research and development independently of established ideas.
With technologies in sensors, motors, amplifiers, networks, controllers, and other equipment, we will keep making proposals that will bring about true advantages to our customers.



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A diagram of a typical decentralized FA system

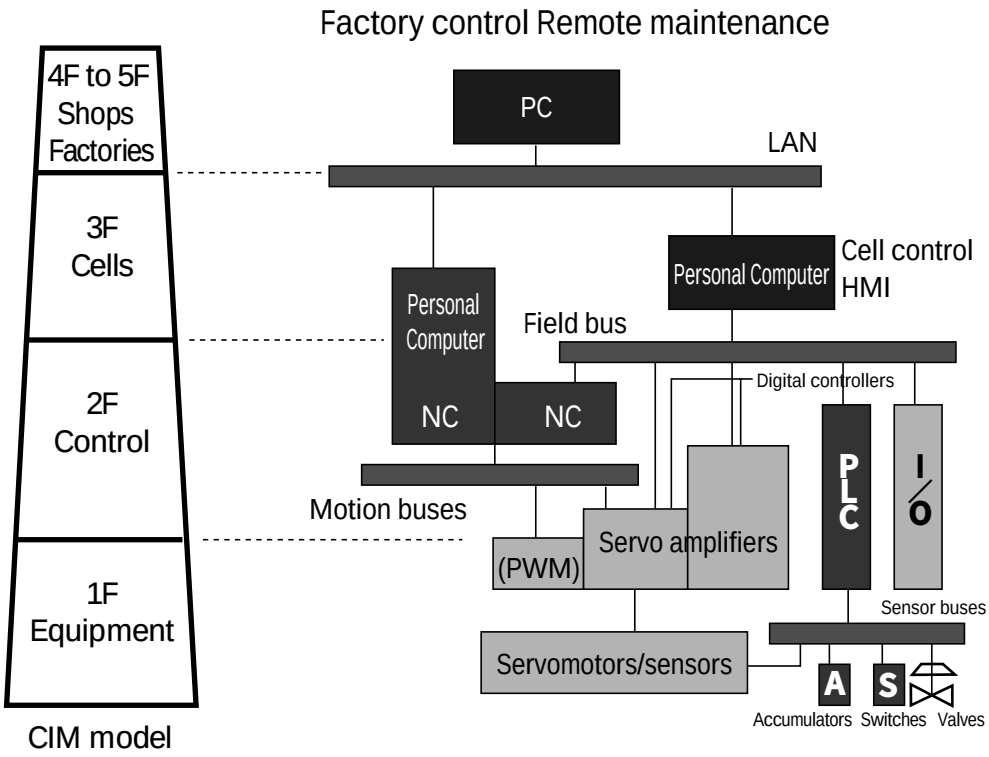


Diagram of a servo system and a field area network (FAN)

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Overview and domain diagram of a typical servo system

Overview

In response to demand for flexible, intelligent products, production systems in various industrial sectors these days are increasingly require smaller, faster, higher-performance, and higher-precision servo systems.

To meet the requirements of these different industrial sectors, Sanyo Denki provides a complete family of servo systems that meet a wide range of applications.

Characteristics

●DC servomotors

DC servomotors incorporate a stator made of a permanent magnet and a rotor made of a coil structure, achieving quick starts and stops and stable, smooth rotation. Our DC servomotors have the following features:
1) small rotor inertia
2) high maximum torque
3) small torque ripples
4) small electrical and mechanical time constants.
In addition to the above, control is relatively easy to build up.
Sanyo Denki's "SUPER V" DC servomotor and "DA2" super-small DC servo amplifier have less brush wear, known to be a major problem with DC motors, and higher reliability.
Uses: press brakes and mat cutters

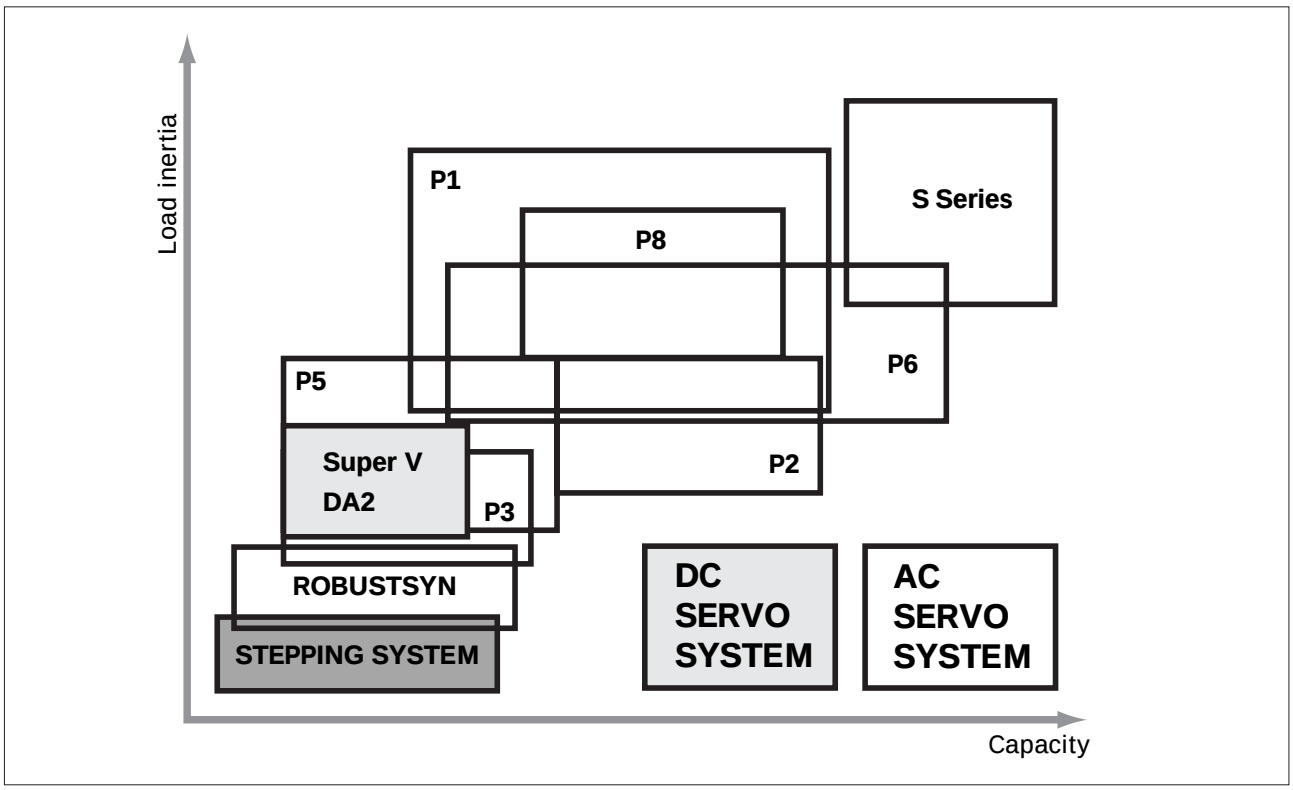
●AC servo amplifiers

In recent years, servo amplifiers have shifted from analog to digital software to increase controllability and maintenance and servicing efficiency, to reduce adjustment time and adjustment variances, to speed up communications, and to bring about other advantages in performance and functions. Attempts to make compact and lightmass servo amplifiers are also under way by using gate arrays and ASICs, compact components, and advanced surface-mount technology.
Families available are “PU” general-purpose compact servo amplifiers, “PZ” and “PV” high-performance and high-functionality servo amplifiers, and “PE” and “PV” servo amplifiers conforming to overseas standards.

●AC servomotors

AC servomotors generally come in two types: synchronous and induction types. Devoid of sliding and contact portions, these motors are maintenance-free and contribute to the buildup of clean environments. Synchronous servos are compact and high in response and precision and consist of a stator made of a coil and a rotor made of a permanent magnet. Rectification is performed electronically, but needs a position sensor.
These servomotors are widely used in robots, machine tools, and semiconductor-making machines, along with various production systems. Sanyo Denki offers a wide variety of products: "P1" through "P8" series.

Induction servos are compact and fast and achieve high torque. The stator incorporates a coil, while the rotor incorporates a secondary coil. A speed sensor is needed for vector control.
Sanyo Denki offers a variety of families designed for particular uses: “S2” through “S8” series.
Uses: Press machines, turret machines, tower automatic warehouses, main spindles of machine tools, injection molders, etc.



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How to read markings

How to read markings

●Safety markings

A safety marking representing a European Union Board of Ministers Directive (EC Directive) (EC).
Only those products conforming to the safety regulations of a specific EU directive can bear this marking and can be sold in the EC territory.
These markings are combined with certification markings affixed by TUV or other private inspection agency.

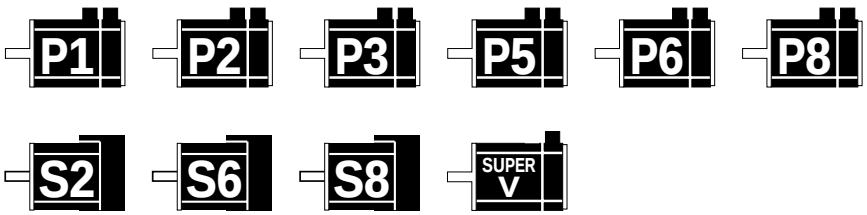
A certification marking representing TÜV Product Service.

●SERCOS

SERCOS stands for SErial Real-time COmmunication System.

This specification is for an interface between an open controller and an intelligent digital drive. SERCOS systems are made noise-resistant by optical fiber cable, and they are designed for serial communications of closed-loop data in a standardized, real-time manner.

●Applicable motor series marking



●Hollow servomotor marking



●IPCODE marking



●Applicable amplifier series marking

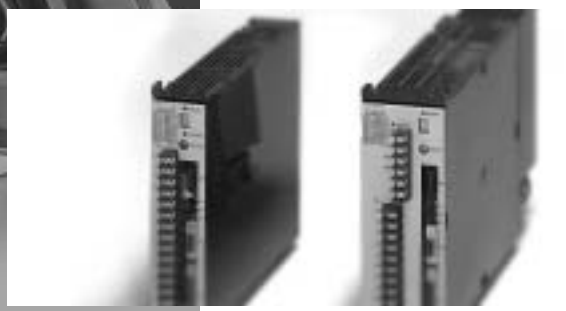


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AC servo sys











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tems

AC servo systems

Selected software of servomotors ····· **p.12**

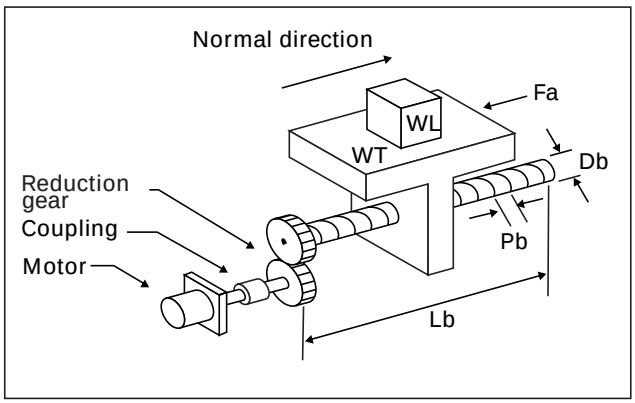
"P" series ····· **p.15**

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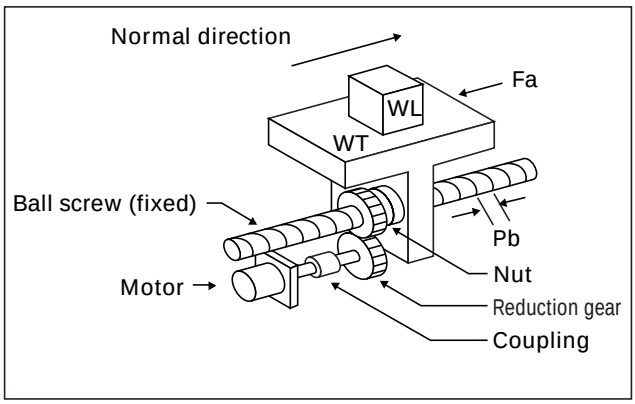
Selected software for servomotors

Selecting a mechanical structure

●Horizontal structure

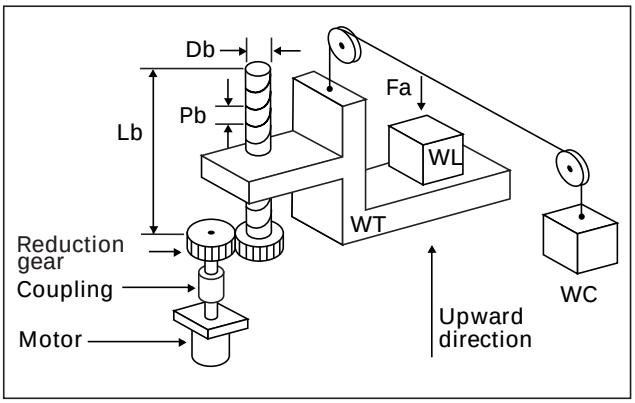


Rotary ball screw and normal screw type

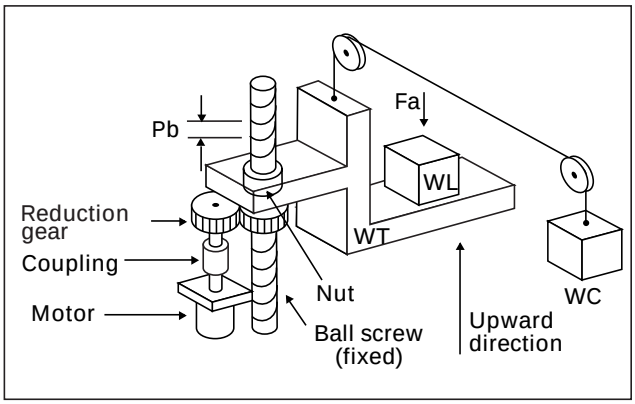


Rotary ball screw and nut type

●Vertical structure

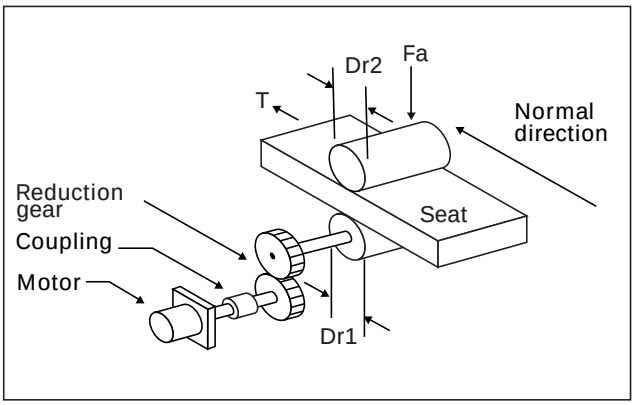


Rotary ball screw and normal screw type

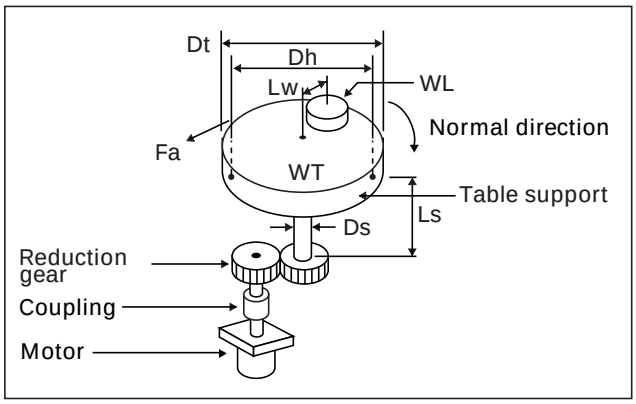


Rotary ball screw and nut type

●Other

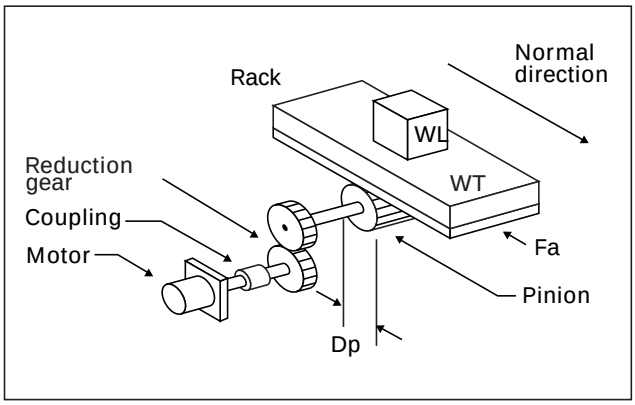


Roll feed

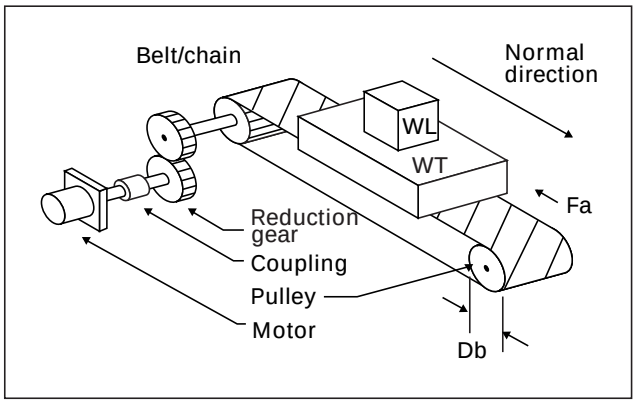


Rotary table

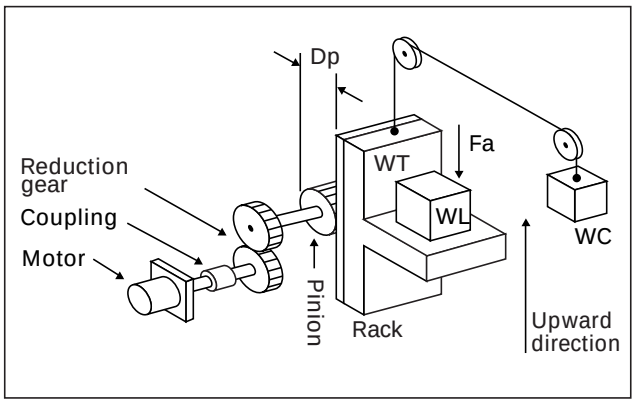
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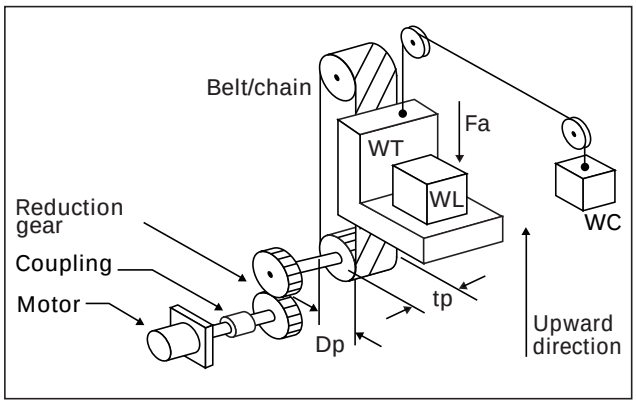
Rack and pinion



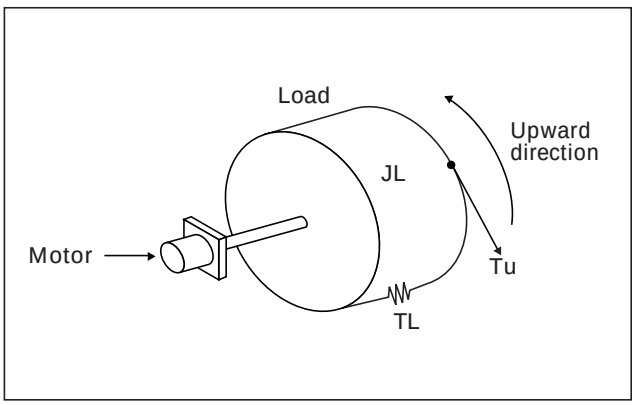
Belt/chain



Rack & pinion



Belt/chain



Irregularly shaped

●For selected software for servomotors, please contact our sales representative.

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P series



Domain diagram ····· p.16

How to read servomotor model numbers ····· p.18

Functions ····· p.22

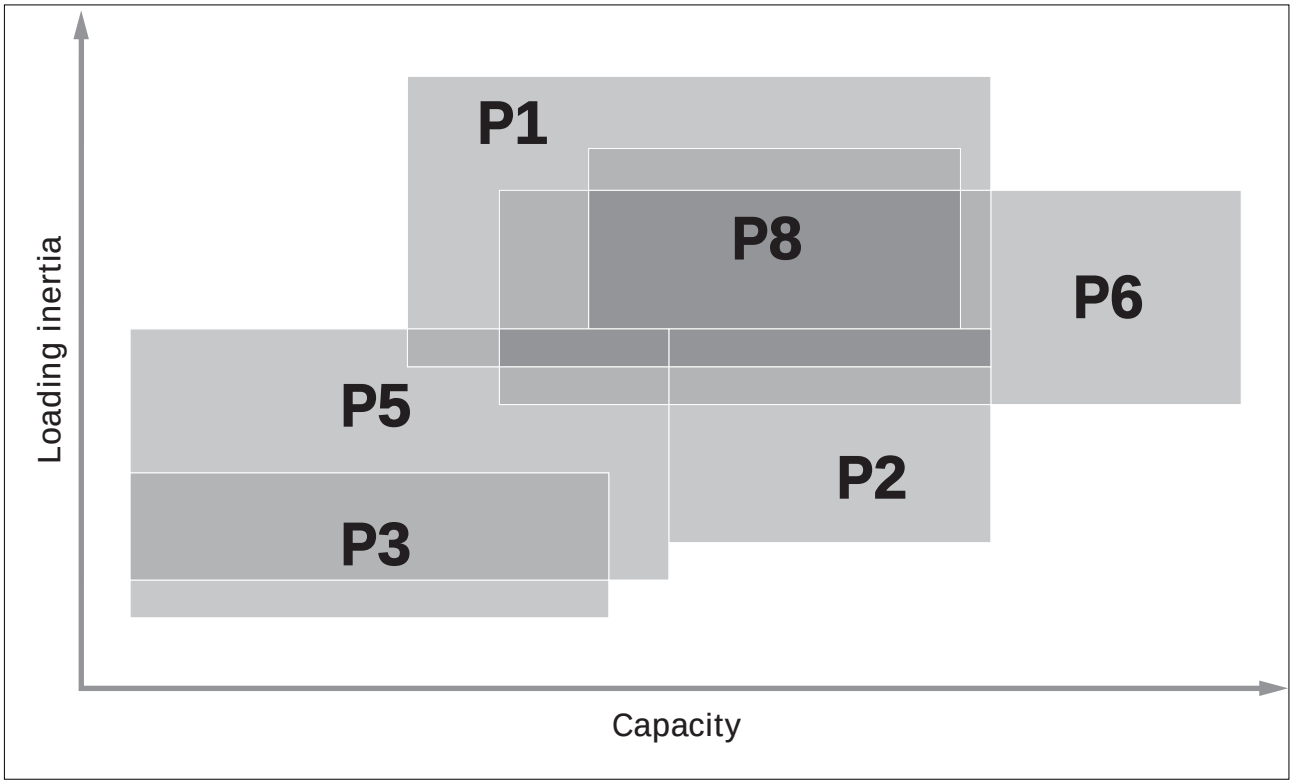
Motors
- P1 ····· p.26
- P2 ····· p.30
- P3 ····· p.34
- P5 ····· p.40
- P6 ····· p.50
- P8 ····· p.56
- Hollow servomotors ····· p.60

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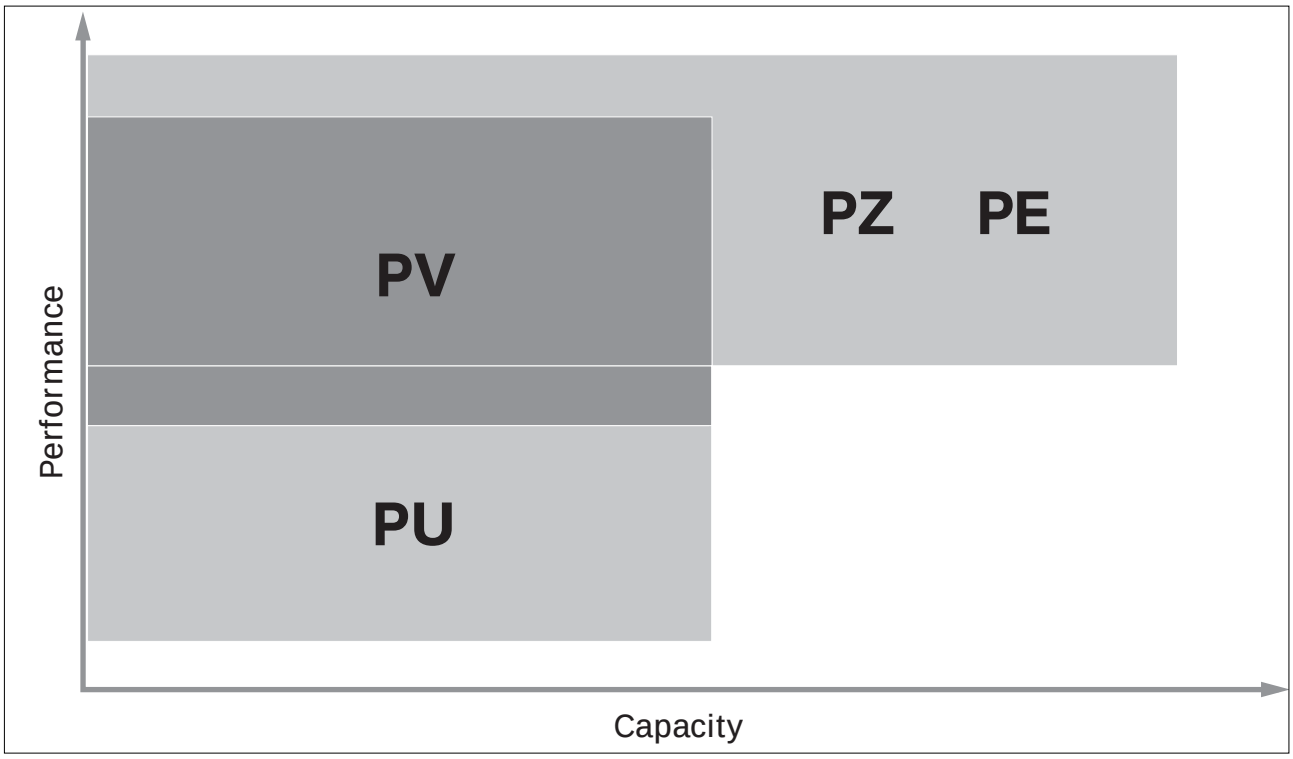
“P” Series

Domain diagram

Motors



Amplifiers

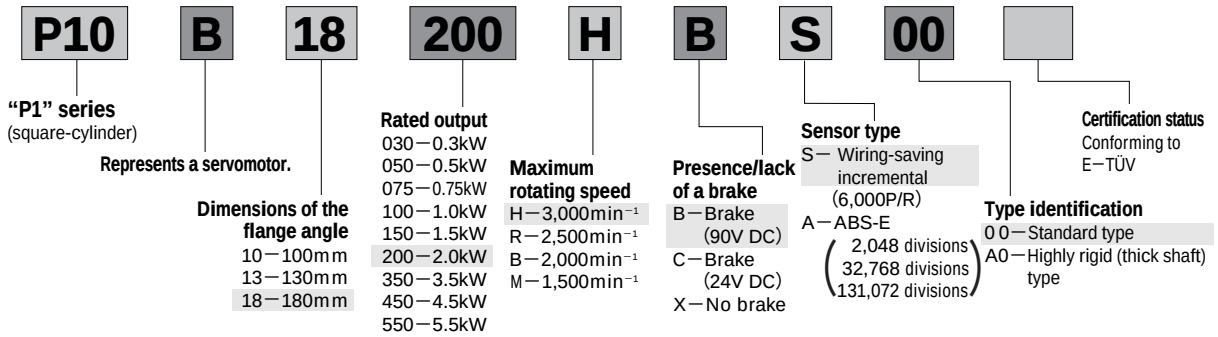


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How to read servomotor model numbers

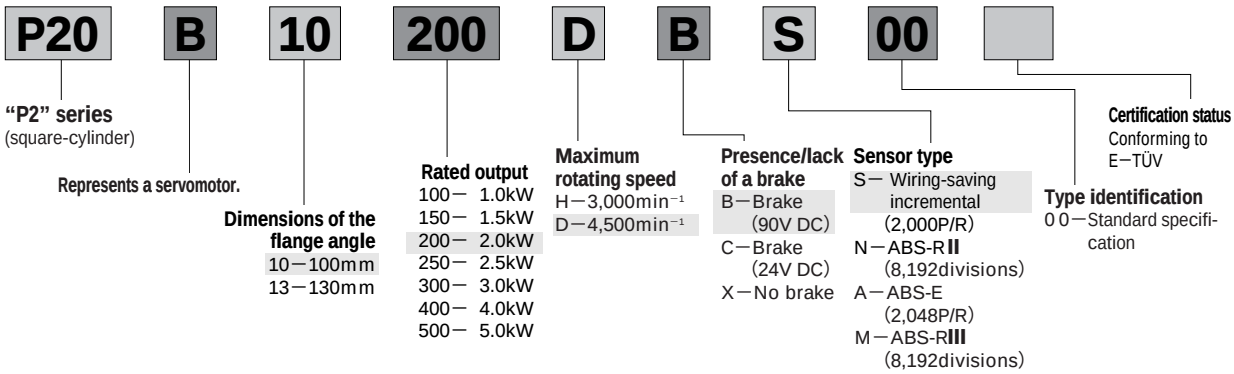
"P1"

Example: If you need a servomotor of the "P1" type (medium-capacity, square-cylinder) having a rated output of 2 kW, a rotational speed of 3,000 min^{-1}, a flange angle 180 × 180 mm, a wiring-saving incremental (6,000P/R), and a 90 VDC brake, use the following model number:



"P2"

Example: If you need a servomotor of the "P2" type (medium-capacity, high-response, square-cylinder) having a rated output of 2 kW, a rotational speed of 4,500 min^{-1}, a flange angle 100 × 100 mm, a wiring-saving incremental (2,000P/R), and a 90 VDC brake, use the following model number:



Outputs and dimensions of motors and amplifiers (The dimensions include those of an incremental encoder but without a brake.)

Dimensions of the flange angle (mm)				100						130						180			
Rated output (kW)		0.3	0.75	1.0	1.5	2.0	2.5	0.5	1.0	1.5	3.0	4.0	5.0	2.0	3.5	4.5	5.5
"P1"	Overall length (mm)	182	272					176	221	272				230	280	350	501
	Installed dimensions ϕ(mm)	115	115					145	145	145				200	200	200	200
	Shaft diameter ϕ(mm)	16	16					19	19	22				35	35	35	42
"P2"	Overall length (mm)			147	172	197	222				194	228	267				
	Installed dimensions ϕ(mm)			115	115	115	115				145	145	145				
	Shaft diameter ϕ(mm)			22	22	22	22				28	28	28				
"PZ"	Amplifier capacity (A) / Maximum rotating speed symbol D			50	50	100	100				100	150	150				
	H	15	30	30	50	50	100	30	50	50	100	100	150	100	150		
	R															150	
	B							30	30	50				50	100	100	
	M																150

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"P" Series

How to read servomotor model numbers

"P3"

Example: If you need a servomotor of the "P3" type (super-small, square-cylinder) having a rated output of 400W, a rotating speed of 4,500min^{-1}, a motor 60 × 60mm, an absolute sensor (ABS-R Ⅱ), and a 90 VDC brake, use the following model number:

P30 B 06 040 D B N 00 □ ■

- **P30** — **"P3" series** (square-cylinder)
- **B** — Represents a servomotor.
- **06** — **Dimensions of the flange angle**: 04—40; 06—60; 08—80
- **040** — **Rated output**: 003— 30W; 005— 50W; 010—100W; 020—200W; 040—400W; 075—750W
- **D** — **Maximum rotating speed**: D—4,500min^{-1} (200V AC); H—3,000min^{-1} (200V AC); P—4,500min^{-1} (100V AC)
- **B** — **Presence/lack of a brake**: B—Brake (90V DC); C—Brake (24V DC); X—No brake
- **N** — **Sensor type**: S— Wiring-saving incremental (2,000 P/R); N—ABS-R Ⅱ (8,192 divisions); M—ABS-R Ⅲ (8,192 divisions)
- **00** — **Type identification**: 00—Standard type (w/o oil seal, w/o connector); 01—w/ oil seal, w/o connector; 50—w/o oil seal, w/ connector; 51—w/ oil seal, w/ connector
- □ — **Certification status**: Conforming to E—TÜV
- ■ — **Gear type identification**

Identification	Gear type	Gear ratio
A	A type Planetary gear	1/3
B		1/5
C		1/9
D		1/15
E		1/25
J	B type Spur gear	1/5
K		1/10
L		1/15
S	C type Backlash-less planetary gear	1/5
T		1/11
U		1/21
V		1/33

"P5"

Example: If you need a servomotor of the "P5" type (compact, square-cylinder) having a rated output of 750W, a rotating speed of 4,500min^{-1}, a motor 86 × 86mm, an absolute sensor (ABS-R Ⅱ), and a 90 VDC brake, use the following model number:

P50 B 08 075 D B N 00 □ ■

- **P50** — **"P5" series** (square-cylinder)
- **B** — Represents a servomotor.
- **08** — **Dimensions of the flange angle**: 03—35; 04—42; 05—54; 07—76; 08—86
- **075** — **Rated output**: 003— 30W; 005— 50W; 006— 60W; 010—100W; 020—200W; 030—300W; 040—400W; 050—500W; 075—750W; 100—1,000W
- **D** — **Maximum rotating speed**: D—4,500min^{-1}; H—3,000min^{-1}
- **B** — **Presence/lack of a brake**: B—Brake (90V DC); C—Brake (24V DC); X—No brake
- **N** — **Sensor type**: S— Wiring-saving incremental (2,000 P/R); N—ABS-R Ⅱ (8,192 divisions); A—ABS-E※ (2,048 divisions); M—ABS-R Ⅲ (8,192 divisions)
- **00** — **Type identification**: 00—Standard type
- □ — **Certification status**: Conforming to E—TÜV
- ■ — **Gear type identification**

* A flange angle 35 × 35mm is unavailable.
The flange angles 42 × 42mm and 54 × 54mm are J.

Outputs and dimensions of motors and amplifiers (The dimensions include those of an incremental encoder but without a brake.)

Dimensions of the flange angle (mm)		35		40			42	54		54	60		76		76	80	86		86
Rated output (kW)		30	30	50	100	60	100	50	100	200	200	400	200	300	400	750	500	750	1000
"P3"	Overall length (mm)		64	70	88						95.5	123.5				140			
	Installed dimensions ϕ(mm)		30	30	30						50	50				70			
	Shaft diameter ϕ(mm)		6	8	8						14	14				16			
"P5"	Overall length (mm)	67.5				82	95	76	86	105			97	103	113		126	149	172
	Installed dimensions ϕ(mm)	30				34	34	50	50	50			70	70	70		80	80	80
	Shaft diameter ϕ(mm)	5				7	7	8	8	11			14	14	14		16	16	1
"PU"	Amplifier capacity (A)	15	15	15	15	15	15	15	15	15	15	30	15		30	30	30	50	50
"PZ"	Amplifier capacity (A)	15	15	15	15	15	15	15	15	15	15	30	15		30	30	30	50	50
"PV"	Amplifier capacity (A)	15	15	15	15	15	15	15	15	15	15	30	15		30				

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"P6"

Example: If you need a servomotor of the "P6" type (medium-capacity, square-cylinder, super-small) having a rated output of 2kW, a rotating speed of 3,000min^{-1}, a flange angle 180 × 180mm, a wiring-saving incremental (2,000P/R), and a 90 VDC brake, use the following model number:

P60 B 18 200 H B S 00 ☐

- **P60** — **"P6" series** (square-cylinder)
- **B** — Represents a servomotor.
- **18** — **Dimensions of the flange angle**: 13—130mm; 15—150mm; 18—180mm; 22—220mm; 28—275mm
- **200** — **Rated output**: 050—0.5kW; 100—1.0kW; 150—1.5kW; 200—2.0kW; 300—3.0kW; 350—3.5kW; 450—4.5kW; 550—5.5kW; 700—7.0kW; 750—7.5kW; 11k— 11kW; 15k— 15kW; 20k— 20kW; 25k— 25kW; 30k— 30kW
- **H** — **Maximum rotating speed**: H—3,000min^{-1}; R—2,500min^{-1}; B—2,000min^{-1}; M—1,500min^{-1}; S—1,000min^{-1}
- **B** — **Presence/lack of a brake**: B—Brake (90V DC); C—Brake (24V DC); X—No brake
- **S** — **Sensor type**: S— Wiring-saving incremental (2,000 P/R); N—ABS-R Ⅱ (8,192 divisions); A—ABS-E (2,048 divisions); M—ABS-R Ⅲ (8,192 divisions)
- **00** — **Type identification**: 00—Standard type
- ☐ — **Certification status**: Conforming to E—TÜV

"P8"

Example: If you need a servomotor of the "P8" type (medium-capacity, super-flat) having a rated output of 3.5kW, a rotating speed of 3,000min^{-1}, a flange 220 × 220mm, an absolute unit (ABS-R Ⅱ, with 8,192 divisions), and a 90 VDC brake, use the following model number:

P80 B 22 350 H B N 00 ☐

- **P80** — **"P8" series** (flat)
- **B** — Represents a servomotor.
- **22** — **Dimensions of the flange angle**: 15—150mm; 18—180mm; 22—220mm
- **350** — **Rated output**: 075—0.75kW; 120— 1.2kW; 250— 2.5kW; 350— 3.5kW; 450— 4.5kW
- **H** — **Maximum rotating speed**: H—3,000min^{-1}; R—2,500min^{-1}
- **B** — **Presence/lack of a brake**: B—Brake (90V DC); C—Brake (24V DC); X—No brake
- **N** — **Sensor type**: S— Wiring-saving incremental (2,000 P/R); N—ABS-R Ⅱ (8,192 divisions); A—ABS-E (2,048 divisions); M—ABS-R Ⅲ (8,192 divisions)
- **00** — **Type identification**: 00—Standard type
- ☐ — **Certification status**: Conforming to E—TÜV

Outputs and dimensions of motors and amplifiers (The dimensions include those of an incremental encoder but without a brake.)

Dimensions of the flange angle (mm)		130						150		180						220													275				
Rated output (kW)		0.5	1.0	1.5	2.0			0.75	3.0	1.2	2.0	3.5	4.5	5.5	7.5	2.5	3.5	4.5	5.5	7.0	11	15	20	20	25	30						
"P6"	Overall length (mm)	113	133	152	171			182		144	169	192	267	332					209	285	362	405	490	429	454	479						
	Installed dimensions ϕ(mm)	145	145	145	145			165		200	200	200	200	200					235	235	235	235	235	300	300	300						
	Shaft diameter ϕ(mm)	22	22	22	28			28		35	35	35	42	42					55	55	55	55	55	55	55	55						
"P8"	Overall length (mm)							116		119						122	136	151														
	Installed dimensions ϕ(mm)							165		200						235	235	235														
	Shaft diameter ϕ(mm)							22		28						35	35	35														
"PU"	Amplifier capacity (A)		50	50																												
"PZ"	Amplifier capacity (A)	30	50	50	100			30	150	50	100	150	150	150	300	100	150	150	150	150	300	300	600	600	600	600						
"PE"	Amplifier capacity (A)	30	50	50	100			30	150	50	100	150	150	150		100	150	150	150	150												

*** For the 20kW, 25kW, and 30kW models, contact our sales representative.**

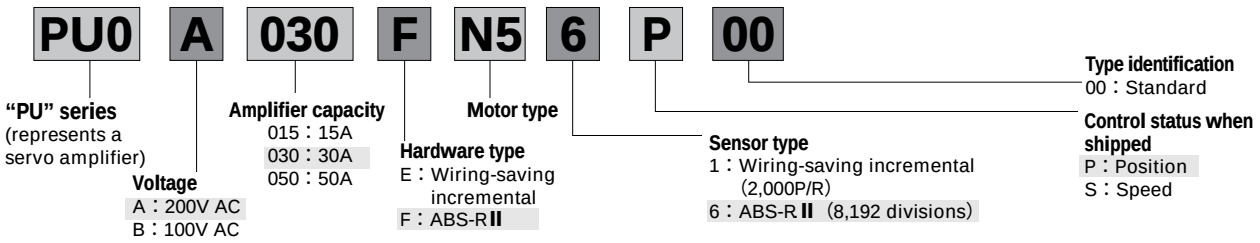
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How to read servo amplifier model numbers

How to read servomotor model numbers

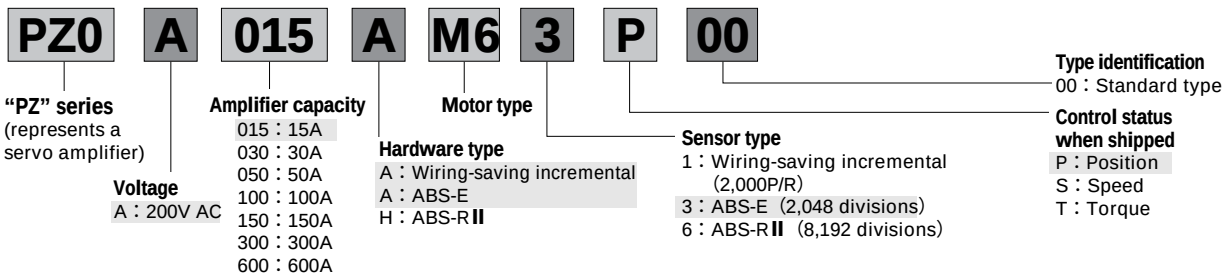
"PU" servo amplifiers

Example: If you need a servo amplifier of the "PU" type (super-small amplifier) having a "P3" motor, an output of 400W, a position control mechanism, a 200 VAC input, and an absolute sensor (ABS-RII), use the following model number:



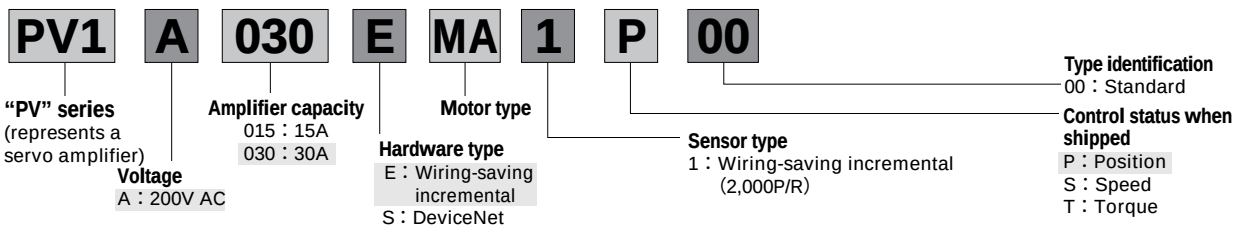
"PZ" servo amplifiers

Example: If you need a servo amplifier of the "PZ" type (small amplifier) having a "P5" motor, an output of 200W, dimensions 54 × 54mm, a position control mechanism, a 200 VAC input, and an absolute sensor (ABS-E), use the following model number:



"PV" servo amplifiers

Example: If you need a servo amplifier of the "PV" type (super-small amplifier) having a "P5" motor, an output of 400W, a position control mechanism, a 200 VAC input, and a wiring-saving incremental, use the following model number:



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“PE” servo amplifiers

Example: If you need a servo amplifier of the “PE” type (small amplifier) having a “P5” motor, an output of 200W, dimensions 54 × 54mm, a position control mechanism, a 200 VAC input, and an absolute sensor (ABS-E), use the following model number:

PE2 **A** **015** **A** **M6** **3** **P** **00**

- **“PE” series** (represents a servo amplifier)
- **Voltage**
  - A：200V AC
- **Amplifier capacity**
  - 015：15A
  - 030：30A
  - 050：50A
  - 100：100A
  - 150：150A
- **Hardware type**
  - A：Wiring-saving incremental
  - A：ABS-E
  - H：ABS-RII
- **Motor type**
- **Sensor type**
  - 1：Wiring-saving incremental (2,000P/R)
  - 3：ABS-E (2,048 divisions)
  - 6：ABS-RII (8,192 divisions)
- **Control status when shipped**
  - P：Position
  - S：Speed
  - T：Torque
- **Type identification**
  - 00：Standard

Motor types

●200 VAC family

11：P10B10030H	1A：P10B13050B	21：P20B10100D	2A：P20B10200H	N1：P30B04003D
12：P10B10075H	1B：P10B13100B	22：P20B10150D	2B：P20B10250H	N2：P30B04005D
13：P10B13050H	1C：P10B13150B	23：P20B10200D	2C：P20B13300H	N3：P30B04010D
14：P10B13100H	1D：P10B18200B	24：P20B10250D	2D：P20B13400H	N4：P30B06020D
15：P10B13150H	1E：P10B18350B	25：P20B13300D	2E：P20B13500H	N5：P30B06040D
16：P10B18200H	1F：P10B18450B	26：P20B13400D		N6：P30B08075D
17：P10B18350H		27：P20B13500D		
18：P10B18450R		28：P20B10100H		
19：P10B18550M		29：P20B10150H		

M1：P50B03003D	MA：P50B07040D	PA：P60B13050H		
M2：P50B04006D	MC：P50B08050D	P1：P60B13100H	PR：P60B18550R	R2：P80B15075H
M3：P50B04010D	MF：P50B08075H	P2：P60B13150H	PW：P60B18750R	R3：P80B18120H
M4：P50B05005D	MG：P50B08100H	P3：P60B13200H	PG：P60B2211KB	R4：P80B22250H
M5：P50B05010D	MB：P50B08040D	P4：P60B15300H	PX：P60B2215KB	R5：P80B22350H
M6：P50B05020D	MD：P50B08075D	P5：P60B18200H	T4：P60B2220KB	R6：P80B22450R
M8：P50B07020D	ME：P50B08100D	P6：P60B18350H	T5：P60B2820KM	
M9：P50B07030D		P7：P60B18450R	T6：P60B2825KM	
		P8：P60B22550M	T7：P60B2830KM	
		P9：P60B22700S		

●100 VAC family

MH：P50B03003P	NA：P30B04003P
MJ：P50B04006P	NB：P30B04005P
MK：P50B04010P	NC：P30B04010P
ML：P50B05005P	ND：P30B06020P
MM：P50B05010P	
MN：P50B05020P	
MR：P50B07020P	

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AC servo systems “P” series

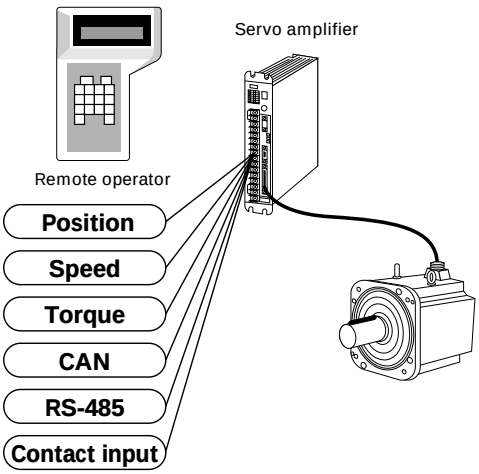
Functions

List of functions of “P” series servo amplifiers

Function	Position control	Speed control	Torque control	Position, speed, and torque One pack	Serial communications (CAN,RS-485)
“PU” amplifiers	○	○			
“PZ” amplifiers	○	○	○	○	
“PE” amplifiers	○	○	○	○	
“PV” amplifiers	○	○	○	○	○

Selection of various controls and various styles of communications

●These flexible servos allow users to select various styles of control, including position control, speed control, torque control, and serial communications (CAN RS-485).



Built-in regenerative processing function PZ PE CⅡZ

●These servos incorporate a regenerative processing circuit and a regenerative resistor.

●Allowable effective power of a regenerative resistor contained in “PU” amplifiers

Amplifier capacity	15A	30A
Resistance (Ω)	100	100
Allowable effective value (W)	5	7

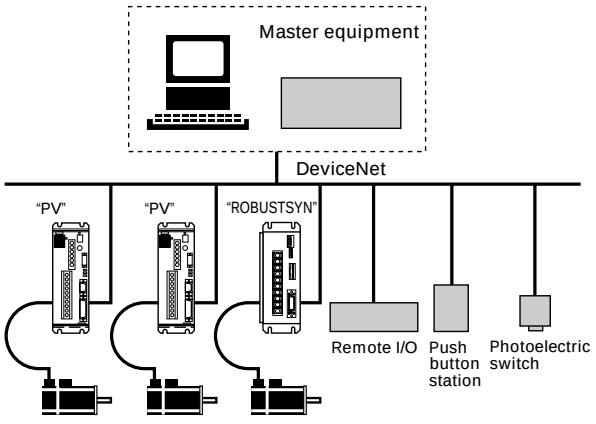
● Allowable effective power of a regenerative resistor contained in “PZ”, “PE”, and “PV” amplifiers

Amplifier capacity	15A	30A	50A	100A	150A
Resistance (Ω)	100	50*	20	10	6.7
Allowable effective value (W)	5	5	30	60	90

Note: 100 Ω only for “PV”.
* For 300A and above, use an external regenerative resistor.

Compatible with open networks PV

●These servos incorporate an interface for CAN (patents applied for) DeviceNet.



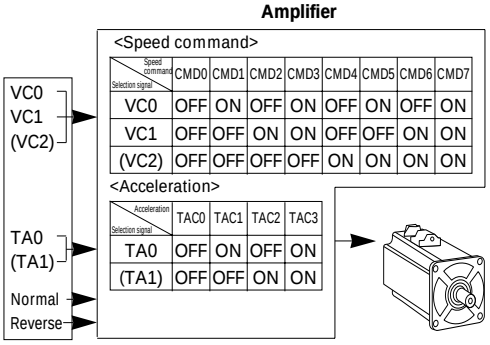
A system incorporating a DeviceNet-compatible “PV”

Contact input (speed selection type) ※Optional PV

●Four speeds preset inside can be selected according to the external contact.

Speed selection type
Turning on normal or reverse rotation turns on the unit at an acceleration detected with TA0 (TA1) up to a speed selected with VC0 and VC1 (VC2).
Turning it off turns the unit off at a selected acceleration.

Amplifier



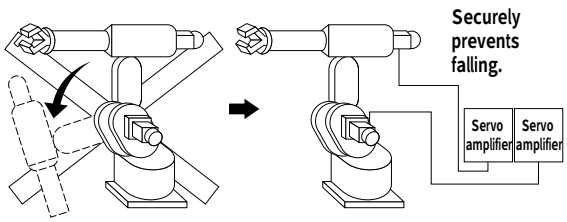
Note: The speed selection signal (VC2) and acceleration selection signal (TA1) are optional. They can be selected on the remote operator.

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Contact input	Regenerative processing	Built-in dynamic brake	Brake timing output	Vibration control	Power supply separation of control and main circuit
	○			○	○
	○	○	○	○	○
	○	○	○	○	○
○ (Optional)	○	○		○	○

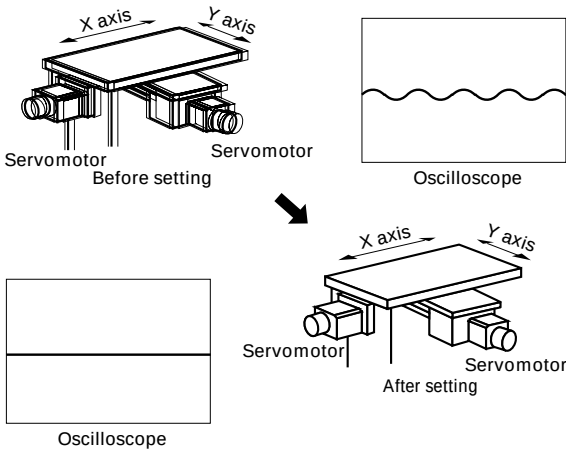
Timing output for the operation of the holding brake PZ PE C□Z

●Timing signals for operating the holding brake are output by the amplifier. Operating the holding brake according to these signals prevents the gravity shaft from falling by its own mass in an event such as an emergency stop.



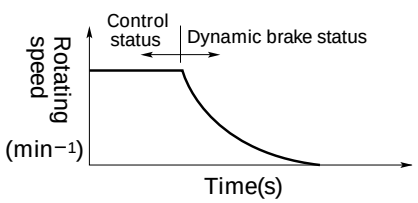
Vibration control PU PZ PE PV C□Z

●This unit incorporates a programmable filter. Adjusting the filter controls the vibration level of the machine on the load side and achieves smooth, silent operation.



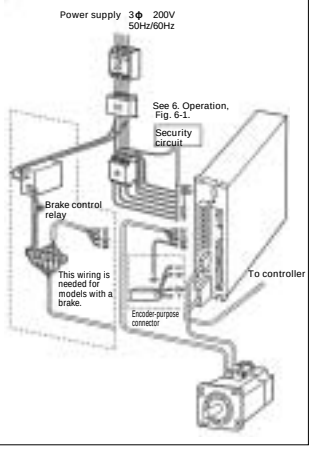
Built-in dynamic brake PZ PE PV C□Z

●These amplifiers incorporate a dynamic brake circuit. It is activated in the event of a blackout or a shutdown of the main circuit power supply. It is activated when an alarm occurs, regardless of the status of the main circuit power supply. “PU” amplifiers provide an external dynamic brake. Contact our sales representative when you need one.



Separation of control power supply from main circuit power supply PU PZ PE PV C□Z

●The control power supply is separated from the main circuit power supply. In the case of an alarm or emergency stop, only the main circuit power supply can be shut down for safety. The control power supply can be separated and held to maintain the transmission status of alarms, thus facilitating analysis and maintenance.



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AC servo systems “P” series

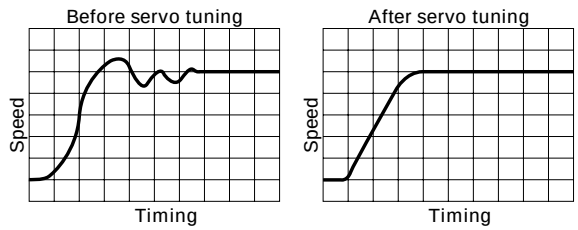
Functions

List of functions of "P" series servo amplifiers

Function	Supporting function for servo tuning	Electronics gear	Pulse resolution switchover	Alarm tracing	Normal/reverse switchover
“PU” Amplifier	○	○	○	○	○
“PZ” Amplifier	○	○	○	○	○
“PE” Amplifier	○	○	○	○	○
“PV” Amplifier	○	○	○	○	○

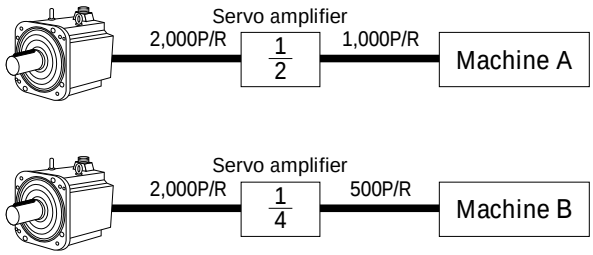
Supporting function for servo tuning PU PZ PE PV C□Z

●This function automatically estimates load inertia levels, allows users to set appropriate parameters, and facilitates adjustment in test runs.



Pulse resolution switchover PU PZ PE PV

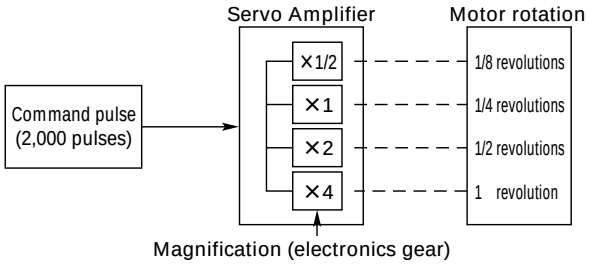
●Changing the parameters with the remote operator divides encoder signal pulses in a desired manner.



Note : Effective only in the case of a wiring-saving incremental encoder and an absolute encoder (ABS-E).

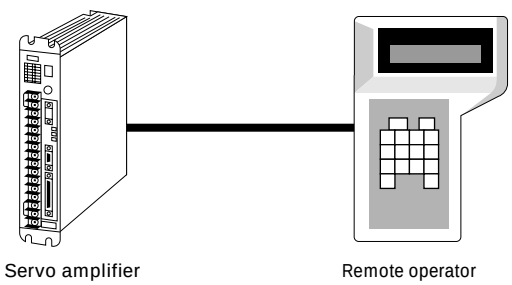
Electronics gear PU PZ PE PV C□Z

●These servos incorporate an electronics gear that sets the amount of movement per pulse of position command to a desired value. The amount of movement can be changed without changing the mechanical gear.



Alarm tracing PU PZ PE PV C□Z

●These servos store the history of the last seven alarms. They can be monitored on the remote operator to help in troubleshooting.



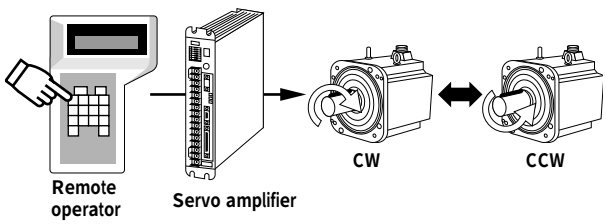
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Overtravel stop	Built-in circuit for preventing rush currents in main circuit	Incremental encoder	ABS-R II	ABS-R III	ABS-E
	○	○	○		
○	○	○	○	○	○
○	○	○	○	○	○
○	○	○			

Normal/reverse switchover

PU PZ PE PV C□Z

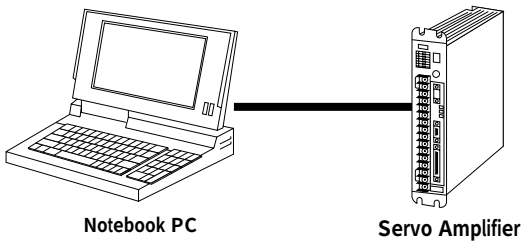
●Parameter values can be changed to switch over normal and reverse commands. This obviates the need for command polarity and wire replacement, thus facilitating operation.



PC interface

PZ PE PV C□Z

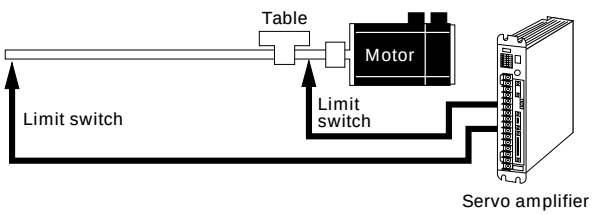
●This interface allows users to edit and set servo parameters, display various monitor panels, and indicate other operation statuses on the remote operator. In addition, users can store data onto floppy disks and perform other operations on a PC.



Overtravel stop

PZ PE PV C□Z

●Overtravel signals can be entered with the limit switch to stop the motor instantaneously. This protects machines from damage due to runaway or other operation exceeding their operational limits.



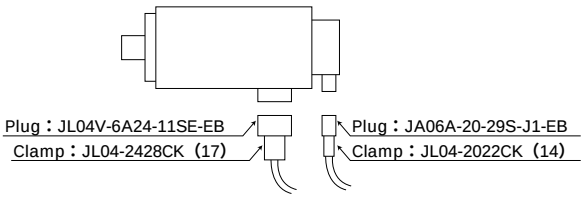
IP CODE

●The protective model of a motor itself satisfies the IEC standards. For use in an environment constantly exposed to liquid, contact Sanyo Denki.

	P1	P2	P3	P5	P6	P8
Protective model	IP67		IP40	P50B03、04:IP40 P50B05、07、08:IP55	IP67	

The cannon connector types “P1”, “P2”, “P6”, and “P8” can be adapted to by using a waterproof connector or conduit for the destination cannon connector.

For “P6” and “P8”



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P1
Servomotors



■Capacity
0.3 to 5.5kW(9 types)

■Features
High rigidity and performance

●High in rigidity and performance, these motors run smoothly even at super-low speeds. They are best suited for precision positioning and feeding.

■Uses
Machines for precision machining
Lathes
Milling machines
Transfer machines
Machines for industrial industries

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection system	Fully closed, self-cooling
Presence/lack of seal	Yes
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V10
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet
Installation method	Flange type

■Standard specifications

Motor model (wiring-saving INC, w/o brake);< > dimensions of flange angle				P10B10030HXS	P10B10075HXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《100》	《100》
Rated output	★	P_R	kW	0.3	0.75
Rated rotating speed	★	N_R	min^{-1}	2,000	
Maximum rotating speed	★	Nmax	min^{-1}	3,000	
Rated torque	★	T_R	N・m	1.5	3.5
Continuous stall torque	★	T_S	N・m	1.5	3.9
Instantaneous maximum stall torque	★	T_P	N・m	4.4	10.8
Rated armature current	★	I_R	Arms	2.7	5.1
Continuous stall armature current	★	I_S	Arms	2.5	5.2
Instantaneous maximum stall armature current	★	I_P	Arms	7.9	15.5
Torque constant	☆	K_T	N・m/Arms	0.67	0.81
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	23.4	28.5
Phase armature resistance	☆	$R\phi$	Ω	3.63	1.05
Rated power rate	★	Q_R	kW/S	5.5	9.1
Electric time constant	☆	te	ms	1.9	3.0
Mechanical time constant (w/o sensor)	☆	tm	ms	9.6	6.5
Rotor inertia (INC)		J_M	$kg\cdot m^2$ $(GD^2/4)$	3.98×10^{-4}	14.08×10^{-4}
Rotor inertia (ABS-E)		J_M	$kg\cdot m^2$ $(GD^2/4)$	4.0×10^{-4}	14.1×10^{-4}
Detector wiring-saving INC			P/R	6,000	
Detector ABS-E			Division	32,768	
Mass including wiring-saving INC		W_E	kg	5.1	9.9
Brake holding torque		T_B	N・m	3.9	
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.23 (0.76)	
Brake inertia		J_B	$kg\cdot m^2$ $(GD^2/4)$	0.34×10^{-4}	
Brake mass		W	kg	0.8	
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A015	PZ0A030
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	1.0	1.9
Amplifier mass	kg	2.2	

Motor model (wiring-saving INC, w/o brake);< > dimensions of flange angle				P10B13050BXS	P10B13100BXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《130》	《130》
Rated output	★	P_R	kW	0.5	1.0
Rated rotating speed	★	N_R	min^{-1}	2,000	
Maximum rotating speed	★	Nmax	min^{-1}	2,000	
Rated torque	★	T_R	N・m	2.4	4.7
Continuous stall torque	★	T_S	N・m	2.9	5.9
Instantaneous maximum stall torque	★	T_P	N・m	8.8	15.2
Rated armature current	★	I_R	Arms	2.9	4.8
Continuous stall armature current	★	I_S	Arms	3.4	5.2
Instantaneous maximum stall armature current	★	I_P	Arms	11.0	14.6
Torque constant	☆	K_T	N・m/Arms	0.98	1.27
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	34.3	44.6
Phase armature resistance	☆	$R\phi$	Ω	2.43	1.32
Rated power rate	★	Q_R	kW/S	4.7	9.0
Electric time constant	☆	te	ms	3.2	4.5
Mechanical time constant (w/o sensor)	☆	tm	ms	9.0	5.9
Rotor inertia (INC)		J_M	$kg\cdot m^2$ $(GD^2/4)$	12.08×10^{-4}	25.08×10^{-4}
Rotor inertia (ABS-E)		J_M	$kg\cdot m^2$ $(GD^2/4)$	12.1×10^{-4}	25.1×10^{-4}
Detector wiring-saving INC			P/R	6,000	
Detector ABS-E			Division	32,768	
Mass including wiring-saving INC		W_E	kg	7.6	11.7
Brake holding torque		T_B	N・m	8.8	
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.25 (0.86)	
Brake inertia		J_B	$kg\cdot m^2$ $(GD^2/4)$	0.5×10^{-4}	
Brake mass		W	kg	1.5	
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A030	
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	1.3	2.5
Amplifier weight	kg	2.2	

Note 1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

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	P10B13050HXS 《130》	P10B13100HXS 《130》	P10B13150HXS 《130》	P10B18200HXS 《180》	P10B18350HXS 《180》	P10B18450RXS 《180》	Symbol
	0.5	1.0	1.5	2.0	3.5	4.5	P_R
	2,000						N_R
	3,000					2,500	Nmax
	2.4	4.7	7.4	9.3	16.7	21.6	T_R
	2.9	5.9	8.8	11.8	21.6	32.4	T_S
	8.8	15.2	18.6	29.4	55.9	78.5	T_P
	4.0	8.3	11.2	16.9	23.3	26.0	I_R
	4.6	9.0	12.0	19.7	29.5	34.0	I_S
	15.1	25.0	26.5	48.3	74.2	83.0	I_P
	0.72	0.75	0.83	0.74	0.92	1.16	K_T
	25.1	25.8	28.9	25.9	32.2	40.2	$K_E\phi$
	1.31	0.44	0.32	0.16	0.096	0.080	$R\phi$
	4.7	9.0	15	12	19	23	Q_R
	3.2	4.5	5.3	7.5	8.8	11	te
	9.0	5.9	4.9	6.3	4.9	3.7	tm
	12.08×10^{-4}	25.08×10^{-4}	35.08×10^{-4}	73.08×10^{-4}	144.08×10^{-4}	206.08×10^{-4}	J_M
	12.1×10^{-4}	25.1×10^{-4}	35.1×10^{-4}	73.1×10^{-4}	144.1×10^{-4}	206.1×10^{-4}	J_M
	6,000						
	32,768						
	7.6	11.7	16.1	23.1	32.6	44.7	W_E
	8.8			32.4			T_B
	90 (24)						V_B
	0.25 (0.86)			0.37 (1.4)			I_B
	0.5×10^{-4}			3.4×10^{-4}			J_B
	1.5			5.0			W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)						

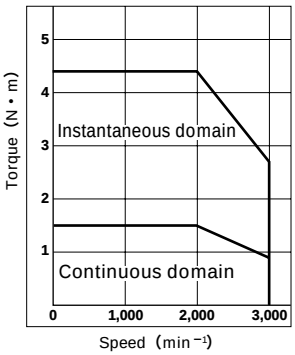
	PZ0A030	PZ0A050		PZ0A100	PZ0A150		
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase						
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)						
	1.3	3.5	3	4	5.8	7.5	
	2.2	4.4		6.0	8.5		

	P10B13150BXS 《130》	P10B18200BXS 《180》	P10B18350BXS 《180》	P10B18450BXS 《180》	P10B18550MXS 《180》	Symbol
	1.5	2.0	3.5	4.5	5.5	P_R
	2,000			1,500		N_R
	2,000				1,500	Nmax
	7.4	9.3	16.7	21.6	35.3	T_R
	8.8	11.8	21.6	32.4	46.1	T_S
	19.6	29.4	45.6	69.6	118	T_P
	6.9	9.5	17.5	18.4	24.4	I_R
	7.9	11.1	22.1	23.2	30.2	I_S
	17.9	26.5	45.5	52.7	79.0	I_P
	1.34	1.32	1.23	1.62	1.81	K_T
	47.0	46.0	42.9	56.3	63.3	$K_E\phi$
	0.84	0.50	0.17	0.157	0.113	$R\phi$
	15.0	12.0	19.0	23.0	38	Q_R
	5.3	7.5	8.8	11	12	te
	4.9	6.3	4.9	3.7	3.4	tm
	35.08×10^{-4}	73.08×10^{-4}	144.08×10^{-4}	206.08×10^{-4}	330.08×10^{-4}	J_M
	35.1×10^{-4}	73.1×10^{-4}	144.1×10^{-4}	206.1×10^{-4}	330.1×10^{-4}	J_M
	6,000					
	32,768					
	16.1	23.1	32.6	44.7	66.1	W_E
	8.8	32.4			49.0	T_B
	90 (24)					V_B
	0.25 (0.86)	0.37 (1.4)			0.28 (1.1)	I_B
	0.5×10^{-4}	3.4×10^{-4}			7.8×10^{-4}	J_B
	1.5	5.0			7.0	W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)					

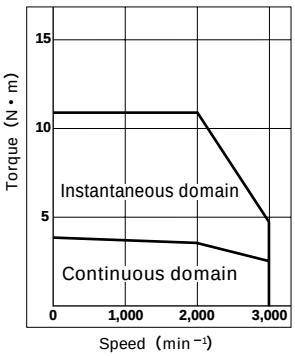
	PZ0A050		PZ0A0100		PZ0A150	
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase					
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)					
	3	4	5.8	7.5	9.2	
	4.4		6.0		8.5	

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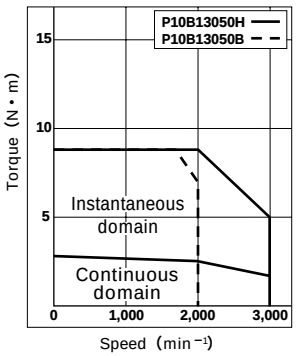
■"P1" + "PZ" system: characteristics of torque versus rotating speed



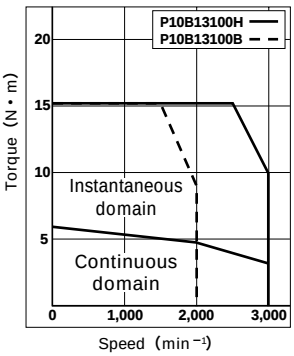
P10B10030H (0.3kW)



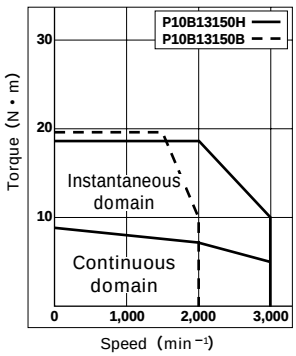
P10B10075H (0.75kW)



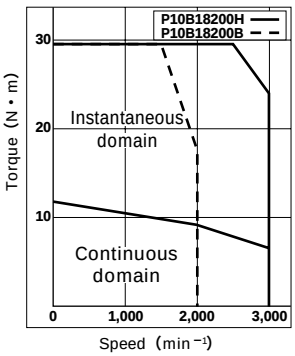
P10B13050H (0.5kW)
P10B13050B (0.5kW)



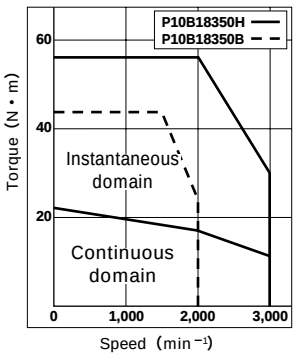
P10B13100H (1.0kW)
P10B13100B (1.0kW)



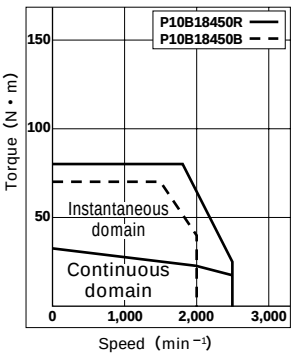
P10B13150H (1.5kW)
P10B13150B (1.5kW)



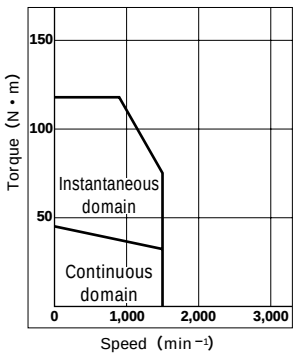
P10B18200H (2.0kW)
P10B18200B (2.0kW)



P10B18350H (3.5kW)
P10B18350B (3.5kW)



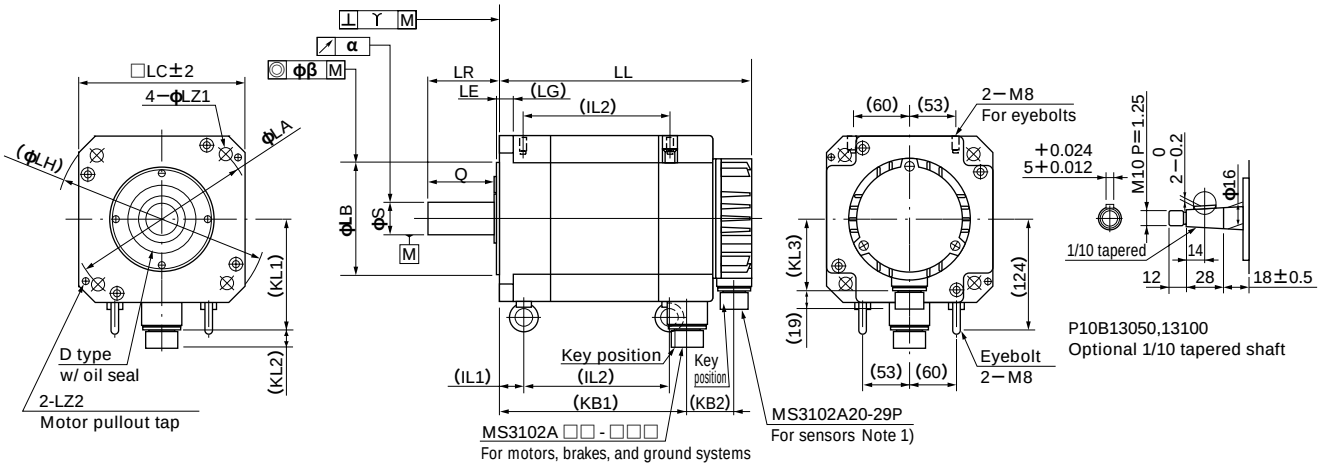
P10B18450R (4.5kW)
P10B18450B (4.5kW)



P10B18550M (5.5kW)

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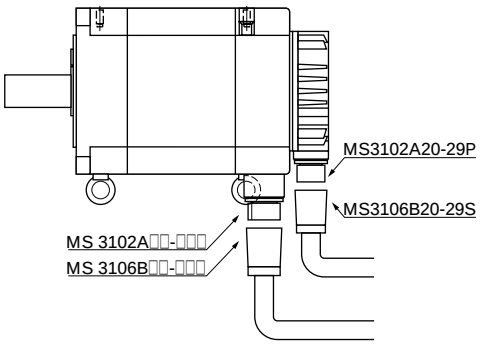
■Dimensions [unit:mm]



MODEL	Incremental w/o brake LL	Incremental w/o brake KB2	Incremental w/ brake LL	Incremental w/ brake KB2	ABS−E w/o brake LL	ABS−E w/o brake KB2	ABS−E w/ brake LL	ABS−E w/ brake KB2	Connector (motor), Note 1) w/o brake	KL1	KL2	w/ brake	KL1	KL2	LG	LA	LB	LE	LH	LC	LZ1	LZ2	Shaft Standard LR	Standard S	Standard Q	Highly rigid LR	Highly rigid S	Highly rigid Q	KB1	KL3 Incremental	KL3 ABS−E	α	β	γ	IL1	IL2
P10B10030△□◇	182	53	225	96	234	73	277	116	18−10P	76	19	20−15P	76	19	10	115	0 95−0.035	3	130	100	9	—	35	0 16−0.011	30	45	0 22−0.013	40	108	64	96	0.02	0.04	0.04	–	–
P10B10075△□◇	272		315		324		367																				0 25−0.013		198							
P10B13050△□◇	176	56	216	97	214	61	253	100	18−10P	91	19	20−15P	91	19	12	145	0 110−0.035	6	165	130	9	M6	58	0 19−0.013	52	58	0 25−0.013	40	100	80	96	0.02	0.04	0.04	–	–
P10B13100△□◇	221		261		259		298																						145							
P10B13150△□◇	272		312		310		349																0 22−0.013	40		0 35 0.016		196							
P10B18200△□◇	230	52	278	100	269	58	317	106	22−22P	118	19	24−11P	118	21	16	200	0 114.3−0.035	3	230	180	13.5	M8	79	35 +0.01 0.	76	79	0 48−0.016	76	158	80	96	0.02	0.04	0.04	27	113
P10B18350△□◇	280		328		319		367																						208							163
P10B18450△□◇	350		398		389		437		24−10P		21																		278							233
P10B18550△□◇	501		565	116	544		604	122							19							110	0 42−0.016	110	110	0 63−0.019	110	429			0.04	0.04	0.04	30	381

Note 1): Connectors are waterproof when engaged. To meet the needs of IP76, therefore, use waterproof connectors for receiving plugs.
* For the dimensions of the high-resolution ABS-E (131,072 divisions), consult us.

■External connection diagram for “P1”



MODEL	Brake	Plug and clamp	Terminal number U	V	W	E	Brake
P10B10030 ~ P10B13150	Yes	MS3106B20-15S,MS3057-12A	A	B	C	D	E,F
	No	MS3106B18-10S,MS3057-10A	A	B	C	D	–
P10B18200	Yes	MS3106B24-11S,MS3057-16A	D	E	F	G,H	A,B
P10B18350	No	MS3106B22-22S,MS3057-12A	A	B	C	D	–
P10B18450	Yes	MS3106B24-11S,MS3057-16A	D	E	F	G,H	A,B
P10B18550	No	MS3106B24-10S,MS3057-16A	A,B	C,D	E,F	G	–

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P2
Servomotors



■Capacity
1 to 5.0kW(7 types)

■Features
Low inertia

High response

Faster servos

●Maximum rotating speed of 4,500min^{-1} for quicker positioning.

■Uses
Super-fast response machines

Semiconductor-making machines

Mounters and inserters

PCB drilling units

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection system	Fully closed, self-cooling
Presence/lack of seal	Yes
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V10
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet
Installation method	Flange type

■Standard specifications

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P20B10100DXS	P20B10150DXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《100》	《100》
Rated output	★	P_R	kW	1.0	1.5
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	4,500	
Rated torque	★	T_R	N・m	3.19	4.79
Continuous stall torque	★	T_S	N・m	3.92	4.90
Instantaneous maximum stall torque	★	T_P	N・m	10.3	14.7
Rated armature current	★	I_R	Arms	6.9	8.4
Continuous stall armature current	★	I_S	Arms	8.0	8.1
Instantaneous maximum stall armature current	★	I_P	Arms	23.2	26.5
Torque constant	☆	K_T	N・m/Arms	0.53	0.65
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	18.6	22.6
Phase armature resistance	☆	$R\phi$	Ω	0.51	0.42
Rated power rate	★	Q_R	kW/S	69	117
Electric time constant	☆	te	ms	11	13
Mechanical time constant (w/o sensor)	☆	tm	ms	0.80	0.59
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	1.55×10^{-4}	2.04×10^{-4}
Rotor inertia (ABS-E)		J_M	kg・m^2 (GD^2/4)	1.54×10^{-4}	2.03×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-E			Division	8,192	
Mass including wiring-saving INC		W_E	kg	5.4	6.5
Brake holding torque		T_B	N・m	3.92	7.84
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.20 (0.75)	
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.15×10^{-4}	0.40×10^{-4}
Brake mass		W	kg	1.3	1.5
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A050
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)
Power capacity (at rating)	kVA	2.5 / 3
Amplifier mass	kg	4.4

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P20B10100HXS	P20B10150HXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《100》	《100》
Rated output	★	P_R	kW	1.0	1.5
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	3,000	
Rated torque	★	T_R	N・m	3.19	4.79
Continuous stall torque	★	T_S	N・m	3.92	4.90
Instantaneous maximum stall torque	★	T_P	N・m	10.3	17.7
Rated armature current	★	I_R	Arms	4.1	6.5
Continuous stall armature current	★	I_S	Arms	4.7	6.3
Instantaneous maximum stall armature current	★	I_P	Arms	14	26.5
Torque constant	☆	K_T	N・m/Arms	0.89	0.83
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	31.2	29.0
Phase armature resistance	☆	$R\phi$	Ω	1.6	0.67
Rated power rate	★	Q_R	kW/S	69	117
Electric time constant	☆	te	ms	10	13
Mechanical time constant (w/o sensor)	☆	tm	ms	0.89	0.57
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	1.55×10^{-4}	2.04×10^{-4}
Rotor inertia (ABS-E)		J_M	kg・m^2 (GD^2/4)	1.54×10^{-4}	2.03×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-E			Division	8,192	
Mass including wiring-saving INC		W_E	kg	5.4	6.5
Brake holding torque		T_B	N・m	3.92	7.84
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.20 (0.75)	
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.15×10^{-4}	0.40×10^{-4}
Brake mass		W	kg	1.3	1.5
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A030	PZ0A050
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	2.5	3
Amplifier mass	kg	2.2	4.4

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

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	P20B10200DXS 《100》	P20B10250DXS 《100》	P20B13300DXS 《130》	P20B13400DXS 《130》	P20B13500DXS 《130》	Symbol
	2.0	2.5	3.0	4.0	5.0	P_R
			3,000			N_R
			4,500			Nmax
	6.37	7.97	9.51	12.7	15.7	T_R
	7.36	8.82	10.8	14.7	18.1	T_S
	19.6	23.8	28.4	39.2	47.6	T_P
	16.5	16.5	16.4	23.4	24.5	I_R
	17.9	17.6	18.2	25.6	26.9	I_S
	53.0	52.0	55.0	76.0	77.0	I_P
	0.44	0.54	0.64	0.62	0.73	K_T
	15.5	18.8	22.3	21.6	25.3	$K_E\phi$
	0.14	0.15	0.13	0.076	0.071	$R\phi$
	148	175	128	167	198	Q_R
	13	14	18	20		te
	0.59	0.56	0.68	0.58	0.50	tm
	2.83×10^{-4}	3.71×10^{-4}	7.14×10^{-4}	9.79×10^{-4}	12.58×10^{-4}	J_M
	2.82×10^{-4}	3.43×10^{-4}	7.13×10^{-4}	9.78×10^{-4}	12.57×10^{-4}	J_M
			2,000			
			8,192			
	8.7	9.4	11.4	14.4	18.1	W_E
	7.84	9.8	11.8	19.6		T_B
			90 (24)			V_B
	0.20 (0.75)			0.25 (0.95)		I_B
	0.40×10⁻⁴		0.5×10⁻⁴	0.58×10⁻⁴		J_B
	1.5		1.7	2.2		W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)					

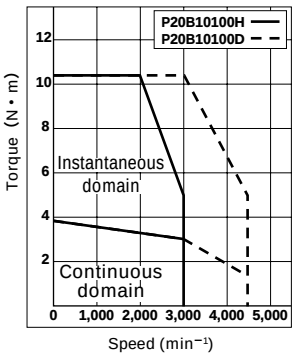
	PZ0A100			PZ0A150		
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase					
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)					
	4	4.2	5	6.7	8.3	
	6.0			8.5		

	P20B10200HXS 《100》	P20B10250HXS 《100》	P20B13300HXS 《130》	P20B13400HXS 《130》	P20B13500HXS 《130》	Symbol
	2.0	2.5	3.0	4.0	5.0	P_R
			3,000			N_R
			3,000			Nmax
	6.37	7.97	9.51	12.7	15.7	T_R
	7.36	8.82	10.8	14.7	18.1	T_S
	19.6		34.3	39.2	53.9	T_P
	8.5	11.0	14.7	17.0	22.3	I_R
	9.3	11.9	14.4	18.1	22.9	I_S
	26.5	55	52	54	76	I_P
	0.85	0.79	0.80	0.87	0.85	K_T
	30.0	27.6	28.0	30.4	29.7	$K_E\phi$
	0.50	0.31	0.19	0.16	0.11	$R\phi$
	148	175	128	167	198	Q_R
	13	14		19		te
	0.56	0.54	0.62	0.61	0.57	tm
	2.83×10^{-4}	3.71×10^{-4}	7.14×10^{-4}	9.79×10^{-4}	12.58×10^{-4}	J_M
	2.82×10^{-4}	3.43×10^{-4}	7.13×10^{-4}	9.78×10^{-4}	12.57×10^{-4}	J_M
			2,000			
			8,192			
	8.7	9.4	11.4	14.4	18.1	W_E
	7.84	9.8	11.8	19.6		T_B
			90 (24)			V_B
	0.20 (0.75)			0.25 (0.95)		I_B
	0.40×10⁻⁴		0.50×10⁻⁴	0.58×10⁻⁴		J_B
	1.5		1.7	2.2		W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)					

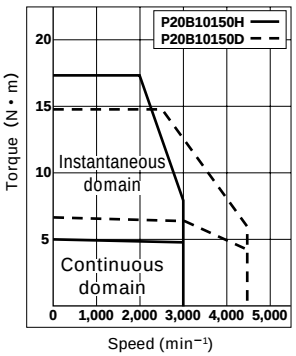
	PZ0A050	PZ0A0100			PZ0A150	
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase					
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)					
	4	4.2	5	6.7	8.3	
	4.4	6.0			8.5	

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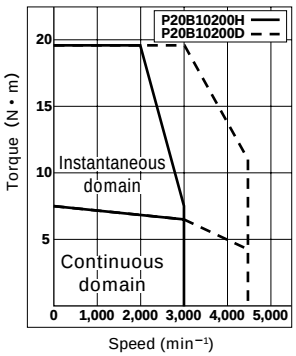
■"P2" + "PZ" system: characteristics of torque versus rotating speed



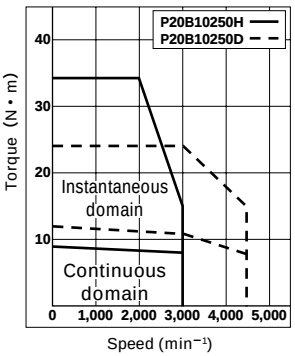
P20B10100H (1.0kW)
P20B10100D (1.0kW)



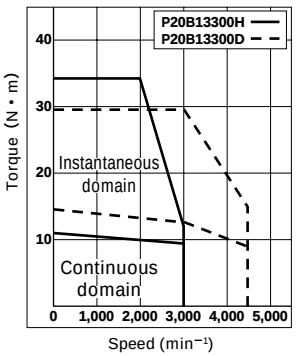
P20B10150H (1.5kW)
P20B10150D (1.5kW)



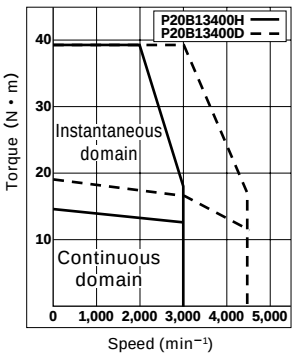
P20B10200H (2.0kW)
P20B10200D (2.0kW)



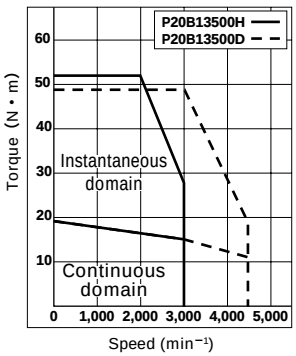
P20B10250H (2.5kW)
P20B10250D (2.5kW)



P20B13300H (3.0kW)
P20B13300D (3.0kW)



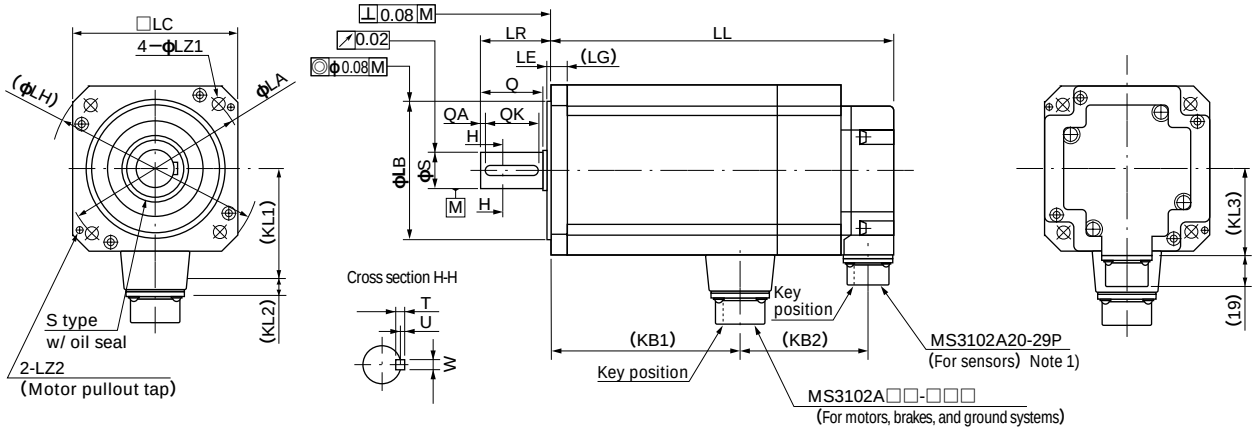
P20B13400H (4.0kW)
P20B13400D (4.0kW)



P20B13500H (5.0kW)
P20B13500D (5.0kW)

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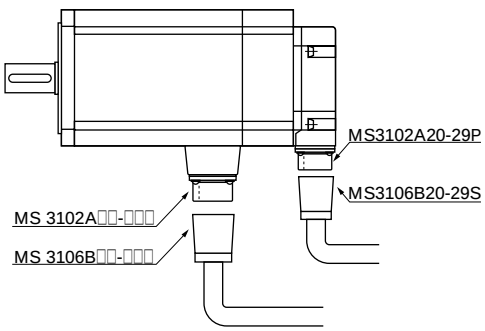
■Dimensions [unit:mm]



	Incremental				ABS−RⅡ				ABS−E				Note 1) Connector																				
	w/o brake		w/ brake		w/o brake		w/ brake		w/o brake		w/ brake																				Incremental	ABS−RⅡ	ABS−E
MODEL	LL	KB2	LL	KB2	LL	KB2	LL	KB2	LL	KB2	LL	KB2	MS3102A	KL1	KL2	LG	LA	LB	LE	LH	LC	LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	KL3	KL3	KL3
P20B10100△□◇	147		191		177		221		187		231																				80			
P20B10150△□◇	172	48	216	92	202	78	246	122	212	88	256	132	20−15P	76	19	10	115	$^{0}_{95-0.035}$	3	130	100	9	—	45	$^{0}_{22-0.013}$	40	3	32	$^{0}_{6-0.030}$	6	2.5	105			
P20B10200△□◇	197		241		227		271		237		281																				130			
P20B10250△□◇	222		266		252		296		262		306																				155	70	80	80
P20B13300△□◇	194		236		224		266		234		276																				117			
P20B13400△□◇	228	58	270	100	258	88	300	130	268	98	310	140	24−11P	98	21	12	145	$^{0}_{110-0.035}$	4	165	130	9	M6	55	$^{0}_{28-0.013}$	50	3	42	$^{0}_{8-0.036}$	7	3	151			
P20B13500△□◇	267		309		297		339		307		349																				190			

Note 1): Connectors are waterproof when engaged. To meet the needs of IP76, therefore, use waterproof connectors for receiving plugs.

■External connection diagram for “P2”



MODEL	Brake	Plug and clamp	Terminal number				
			U	V	W	E	Brake
P20B10100 ~ P20B10250	Yes	MS3106B20-15S,MS3057-12A	A	B	C	D	E,F
	No		A	B	C	D	–
P20B13300 P20B13400	Yes	MS3106B24-11S,MS3057-16A	D	E	F	G,H	A,B
P20B13500	No		D	E	F	G,H	–

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P3
Servomotors



■Capacity
30 to 750W(6 types)

■Features
Low inertia /high power rate
●Best suited for high-response applications with light-load low machine inertia levels

Faster servos
●Maximum rotating speed of 4,500min^{-1} for quick

■Uses
Small simple robots
Semiconductor-making machines
Mounters and inserters
Wafer transfer

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection system	Fully closed, self-cooling IP40
Presence/lack of seal	No
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V15
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet type
Installation method	Flange type

■Standard specifications
200 VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle Sq. flange size in 《 》	Condition	Symbol	Unit	P30B04003DXS 《40》	P30B04005DXS 《40》
Rated output	★	P_R	W	30	50
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	4,500	
Rated torque	★	T_R	N・m	0.098	0.157
Continuous stall torque	★	T_S	N・m	0.108	0.167
Instantaneous maximum stall torque	★	T_P	N・m	0.322	0.49
Rated armature current	★	I_R	Arms	0.54	0.74
Continuous stall armature current	★	I_S	Arms	0.56	0.75
Instantaneous maximum stall armature current	★	I_P	Arms	1.79	2.4
Torque constant	☆	K_T	N・m/Arms	0.20	0.235
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	7.1±10%	8.2±10%
Phase armature resistance	☆	$R\phi$	Ω	12.5	9.1
Rated power rate	★	Q_R	kW/S	4.9	9.3
Electric time constant	☆	te	ms	1.2	1.2
Mechanical time constant (w/o sensor)	☆	tm	ms	1.8	1.3
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	0.024×10^{-4}	0.031×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	0.021×10^{-4}	0.028×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	0.3	0.35
Brake holding torque		T_B	N・m	0.098	0.157
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.07 (0.26)	
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.0078×10^{-4}	
Brake mass		W	kg	0.24	
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0A015-／PZ0A015-
Amplifier power supply		200 to 230V AC +10%−15% 50/60Hz 1φ
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)
Power capacity (at rating)	kVA	0.2
Amplifier mass	kg	0.85

100VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle Sq. flange size in 《 》	Condition	Symbol	Unit	P30B04003PXS 《40》	P30B04005PXS 《40》
Rated output	★	P_R	W	30	50
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	4,500	
Rated torque	★	T_R	N・m	0.098	0.157
Continuous stall torque	★	T_P	N・m	0.322	0.49
Instantaneous maximum stall torque	★	I_R	Arms	1.0	1.5
Rated armature current	★	I_P	Arms	3.6	5.1
Continuous stall armature current	☆	K_T	N・m/Arms	0.1	0.113
Instantaneous maximum stall armature current	☆	$K_E\phi$	mV/min^{-1}	3.65±10%	3.93±10%
Torque constant	☆	$R\phi$	Ω	3.04	2.25
Induced voltage constant	★	Q_R	kW/S	4.9	9.3
Phase armature resistance	☆	te	ms	1.2	1.3
Rated power rate	☆	tm	ms	1.6	1.4
Electric time constant		J_L	kg・m^2 (GD^2/4)	0.24×10^{-4}	0.31×10^{-4}
Mechanical time constant (w/o sensor)			P/R	2,000	
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	0.024×10^{-4}	0.031×10^{-4}
Rotor inertia (ABS-RII / RIII)		W_E	kg	0.3	0.35
Detector wiring-saving INC			P/R	8,192	
Detector ABS-RII / RIII		J_M	kg・m^2 (GD^2/4)	0.021×10^{-4}	0.028×10^{-4}
Mass including wiring-saving INC		W_E	kg	0.39	0.44
Brake holding torque		T_B	N・m	0.098	0.157
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.07 (0.26)	
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.0078×10^{-4}	
Brake mass		W	kg	0.24	
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0B015-
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz single-phase
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)
Power capacity (at rating)	kVA	0.2
Amplifier mass	kg	0.85

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

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	P30B04010DXS 《40》	P30B06020DXS 《60》	P30B06040DXS 《60》	P30B08075DXS 《80》	Symbol
	100	200	400	750	PR
	3,000				NR
	4,500				Nmax
	0.32	0.637	1.274	2.38	TR
	0.353	0.686	1.372	2.55	TS
	0.98	1.96	3.82	7.15	TP
	1.1	2.2	2.7	4.6	IR
	1.3	2.3	2.8	4.8	IS
	4.1	7.5	8.6	15.0	IP
	0.292	0.316	0.533	0.565	KT
	10.2±10%	11.0±10%	18.6±10%	19.74±10%	KEϕ
	4.3	1.5	1.4	0.52	Rϕ
	22.0	29.0	64.0	92.0	QR
	1.4	3.8	4.6	8.3	te
	0.7	0.63	0.38	0.3	tm
	0.051×10^{-4}	0.144×10^{-4}	0.255×10^{-4}	0.635×10^{-4}	JM
	0.048×10^{-4}	0.141×10^{-4}	0.252×10^{-4}	0.647×10^{-4}	JM
	2,000				
	8,192				
	0.5	1.15	1.7	3.3	WE
	0.32	0.637	1.274	2.38	TB
	90 (24)				VB
	0.07 (0.26)	0.07 (0.31)		0.08 (0.37)	IB
	0.0078×10^{-4}	0.06×10^{-4}		0.343×10^{-4}	JB
	0.24	0.44		0.8	W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)				

	PU0A015-／PZ0A015-		PU0A030-／PZ0A030-		
	200 to 230V AC +10%−15% 50/60Hz 1ϕ				
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)				
	0.3	0.5	1.0	1.7	
	0.85		1.1		

	P30B04010PXS 《40》	P30B06020PXS 《60》	Symbol
	100	200	PR
	3,000		NR
	4,500		Nmax
	0.32	0.637	TR
	0.98	1.96	TP
	2.2	4.6	IR
	7.4	15.8	IP
	0.162	0.151	KT
	5.63±10%	5.28±10%	KEϕ
	1.58	0.39	Rϕ
	22.0	29.0	QR
	1.3	3.6	te
	0.8	0.71	tm
	0.51×10^{-4}	1.44×10^{-4}	JL
	2,000		
	0.051×10^{-4}	0.144×10^{-4}	JM
	0.5	1.15	WE
	8,192		
	0.048×10^{-4}	0.141×10^{-4}	JM
	0.59	1.35	WE
	0.32	0.637	TB
	90 (24)		VB
	0.07 (0.26)	0.07 (0.31)	IB
	0.0078×10^{-4}	0.06×10^{-4}	JB
	0.24	0.44	W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)		

	PU0B015-	PU0B030-	
	200 to 230V AC +10% −15% 50/60Hz ±3Hz single-phase		
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)		
	0.3	0.5	
	0.85	1.1	

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■Planetary gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min^{-1}	mm
P30B04010DXS□□∗A	100	1/3	30	75	0.7	2.2	1,000	54 × 54mm
P30B04010DXS□□∗B		1/5		80	1.3	3.9	600	
P30B04010DXS□□∗C		1/9	42		2.3	7.1	333	
P30B04010DXS□□∗D		1/15			3.8	11.8	200	
P30B04005DXS□□∗E	50	1/25		70	2.9	8.9	120	
P30B06040DXS□□∗A	400	1/3	24	75	2.9	8.6	1,000	78 × 78mm
P30B06040DXS□□∗B		1/5			4.8	14.3	600	
P30B06040DXS□□∗C		1/9	30		8.5	25.8	333	
P30B06040DXS□□∗D		1/15			14.3	43.0	200	
P30B06020DXS□□∗E	200	1/25			11.9	36.8	120	
P30B08075DXS□□∗A	750	1/3	24		5.4	16.1	1,000	
P30B08075DXS□□∗B		1/5			8.9	26.8	600	
P30B08075DXS□□∗C		1/9	30	70	15.0	45.0	333	96 × 96mm
P30B08075DXS□□∗D		1/15			25.0	75.1	200	

■Flat gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min^{-1}	mm
P30B04005DXS□□∗J	50	1/5	60	95	0.75	1.8	600	60 × 60mm
P30B04005DXS□□∗K		1/10		90	1.4	3.4	300	
P30B04005DXS□□∗L		1/15			2.1	5.2	200	
P30B06020DXS□□∗J	200	1/5		95	3.0	6.0	600	82 × 82mm
P30B06020DXS□□∗K		1/10		90	5.7	11.4	300	
P30B04010DXS□□∗L	100	1/15			4.3	8.6	200	
P30B04010DXS□□∗J	400	1/5		95	6.0	12.0	600	102 × 102mm
P30B04010DXS□□∗K		1/10		90	11.5	23.0	300	
P30B06020DXS□□∗L	200	1/15			8.6	25.2	200	
P30B08075DXS□□∗J	750	1/5		80	9.5	19.0	600	120 × 120mm
P30B08075DXS□□∗K		1/10			19.0	38.0	300	

Note: To protect the gears, limit the torques to double their ratings.
Amplifiers can be delivered with different internal settings if you specify them when placing an order.

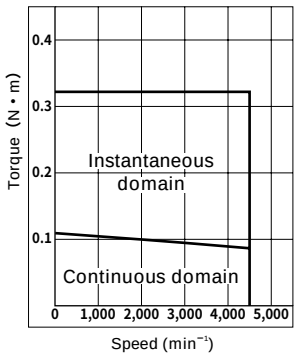
■Backlash-less planetary gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min^{-1}	mm
P30B04010DXS□□∗S	100	1/5	2	75	1.2	3.7	600	70 × 70mm
P30B04010DXS□□∗T		1/11	3	80	2.8	8.6	273	
P30B04005DXS□□∗U	50	1/21			2.7	8.2	143	
P30B04005DXS□□∗V		1/33			4.2	12.9	91	
P30B06040DXS□□∗S	400	1/5	2	75	4.8	14.3	600	90 × 90mm
P30B06040DXS□□∗T		1/11	3		10.5	31.5	273	105× 105mm
P30B06020DXS□□∗U	200	1/21			10.0	30.9	143	
P30B06020DXS□□∗V		1/33			15.8	48.5	91	
P30B08075DXS□□∗S	750	1/5	2	70	8.3	25.0	600	
P30B08075DXS□□∗T		1/11	3		18.3	55.1	273	120 × 120mm

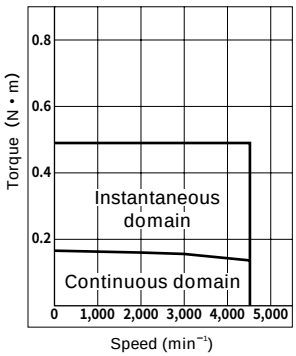
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■"P3" + "PZ" system: characteristics of torque versus rotating speed

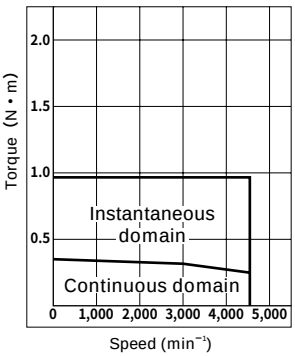
200 VAC type



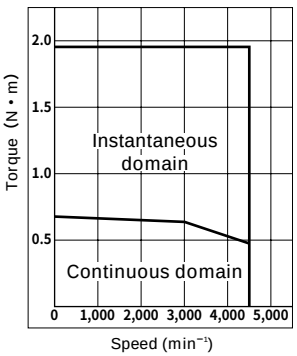
P30B04003D (30W)



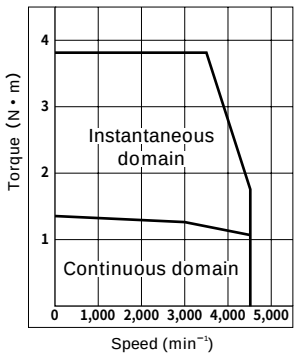
P30B04005D (50W)



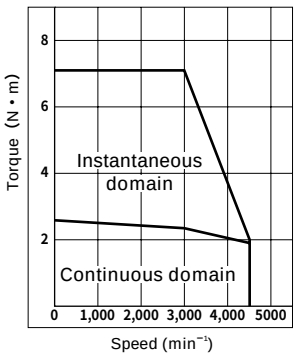
P30B04010D (100W)



P30B06020D (200W)



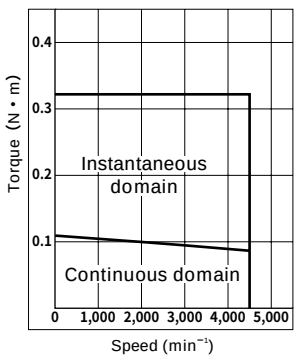
P30B06040D (400W)



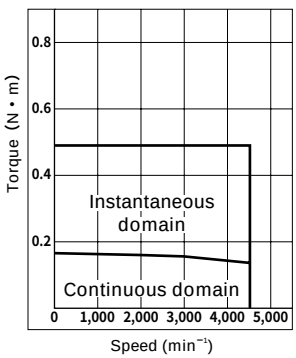
P30B08075D (750W)

■"P3" + "PU" system: characteristics of torque versus rotating speed

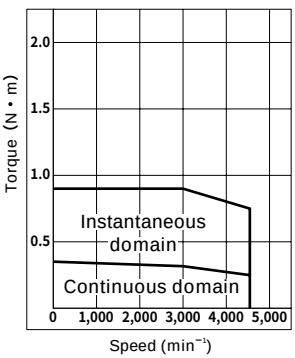
100 VAC type



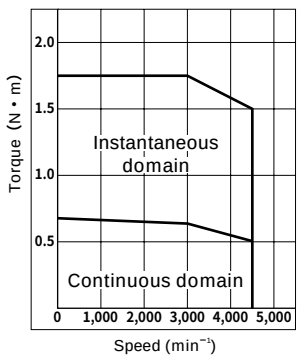
P30B04003P (30W)



P30B04005P (50W)



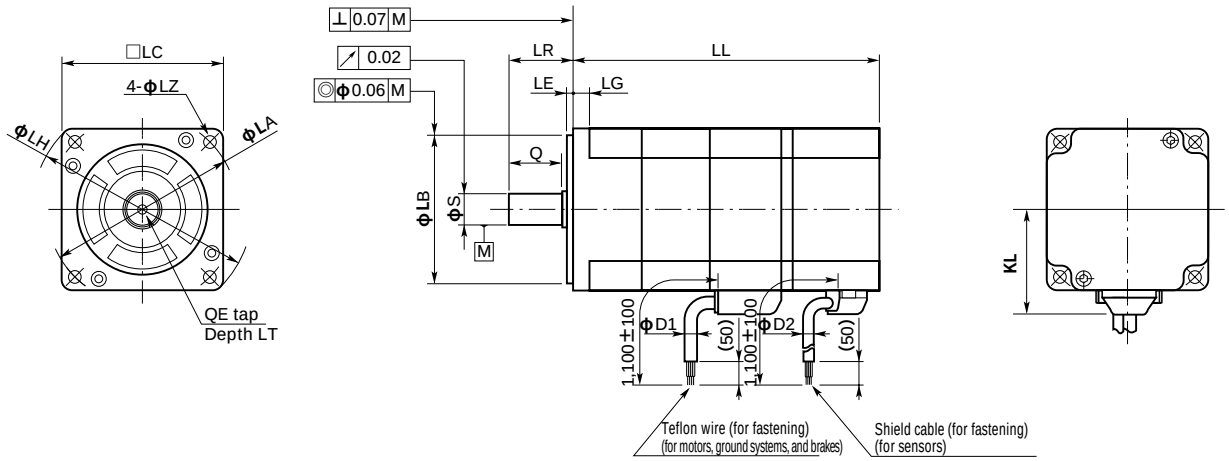
P30B04010P (100W)



P30B06020P (200W)

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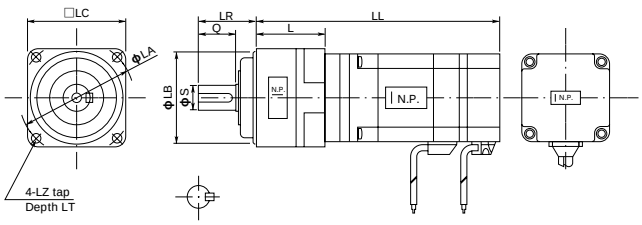
■Dimensions [unit:mm]



MODEL	Incremental w/o brake LL	Incremental w/ brake LL	ABS-RII w/o brake LL	ABS-RII w/ brake LL	LG	KL	LA	LB	LE	LH	LC	LZ	LR	S	Q	QE	LT	D1	Incremental D2	ABS-RII D2
P30B04003△□◇	64	102.5	70	108.5	5	30	46	0 30−0.021	2.5	54	40	4.5	25	0 6−0.008	—	—	—	6	4.7	5.1
P30B04005△□◇	70	108.5	76	114.5																
P30B04010△□◇	88	126.5	94	132.5										0 8−0.009						
P30B06020△□◇	95.5	133.5	101	139	6	41	70	0 50−0.025	3	81	60	5.5	30	0 14−0.011		M5	12	6.7		
P30B06040△□◇	123.5	161.5	129	167																
P30B08075△□◇	140	180.5	145	185.5	8	52	90	0 70−0.030	3	107	80	6.6	40	0 16-0.011	35					7.9

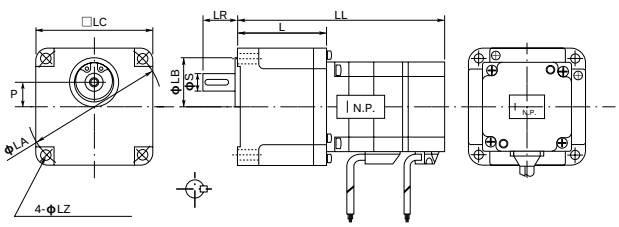
Note: ABS-E and ABS-RIII come with sensors having different dimensions.

■Planetary gears



Planetary gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	Q mm	LZ mm	LT mm	Mass kg
P30B04010DXS□□∗A	138	50	60	50	54	12	32	20	M5	10	0.5
P30B04010DXS□□∗B											
P30B04010DXS□□∗C	153	65									0.65
P30B04010DXS□□∗D											
P30B04005DXS□□∗E	135										
P30B06040DXS□□∗A	191	67	90	70	78	19	50	30	M6	12	1.85
P30B06040DXS□□∗B											
P30B06040DXS□□∗C	211	87									2.3
P30B06040DXS□□∗D											
P30B06020DXS□□∗E	183										
P30B08075DXS□□∗A	208	68									1.85
P30B08075DXS□□∗B											
P30B08075DXS□□∗C	242	102	115	90	96	24	61	40	M8	16	3.5
P30B08075DXS□□∗D											

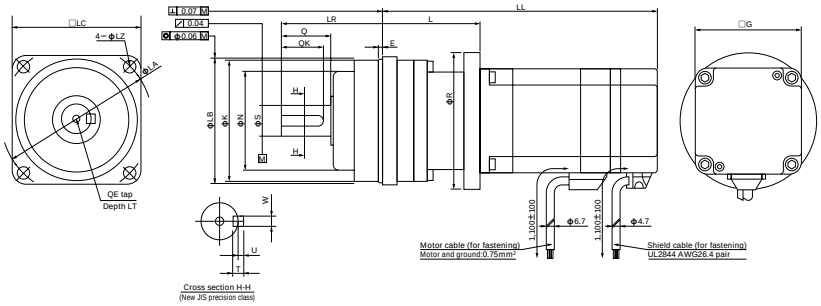
■Flat gears



Flat gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	Q mm	LZ mm	LT mm	Mass kg
P30B04005DXS□□∗J	117	47	70	18	60	8	32	5	10	4.5	0.4
P30B04005DXS□□∗K											
P30B04005DXS□□∗L											
P30B06020DXS□□∗J	147	51	94	44	82	12	26.5	5	15	6.5	0.7
P30B06020DXS□□∗K											
P30B04010DXS□□∗L	139										
P30B06040DXS□□∗J	202	78	120	40	102	15	32	3	20	6.5	1.3
P30B06040DXS□□∗K											
P30B06020DXS□□∗L	174										
P30B08075DXS□□∗J	220	80	146	50	120	19	35	5	25	9	1.5
P30B08075DXS□□∗K											

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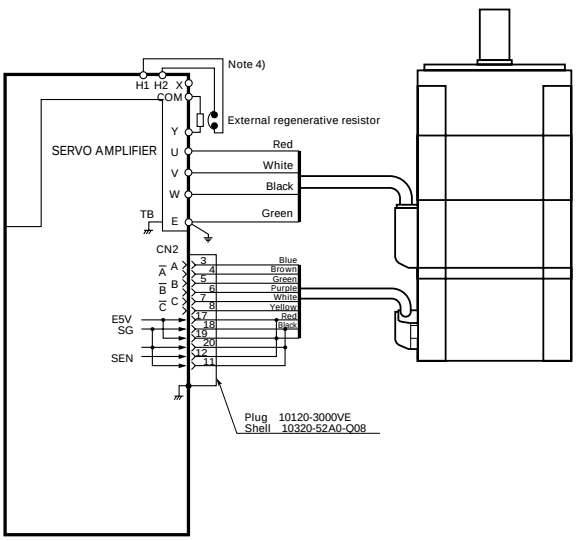
■Backlash-less planetary gears



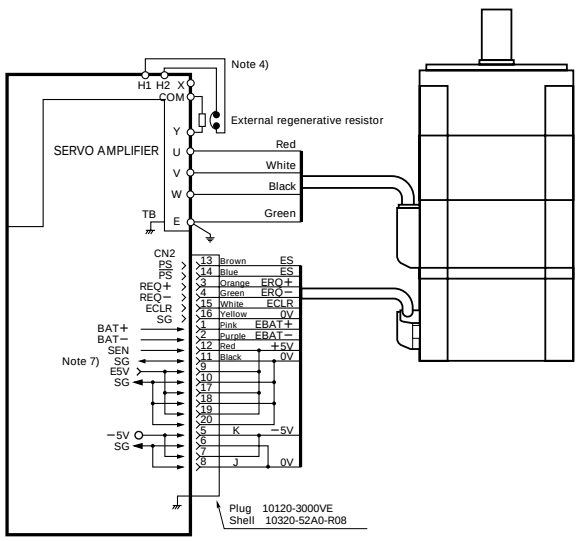
Backlash-less planetary gear	LL	L	LA	LB	E	LC	LR	G	S	QK	Q	K	N	R	LZ	QE	LT	KL	W	T	U	Mass
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg
P30B04010DXS□□∗S	127	57	80	65	8	70	60	40	16	25	28	64.5	50	72	6.6	M4	8	38	5	5	2	0.8
P30B04010DXS□□∗T	154	66																				
P30B04005DXS□□∗U	136																					
P30B04005DXS□□∗V																						
P30B06040DXS□□∗S	192	68	105	85	10	90	74	60	20	32	36	83	60	104	9	M5	10	50	6	6	2.5	1.6
P30B06040DXS□□∗T	211	87	120	100	12	105	84		25	36	42	96	70			M6	12		8	7	3	2.4
P30B06020DXS□□∗U	183																					
P30B06020DXS□□∗V																						
P30B08075DXS□□∗S	216	76	120	100	12	105	84	80	25	36	42	96	70	116	9	M6	12	55	8	7	3	2.4
P30B08075DXS□□∗T	236	96	135	115	14	120	105		32	50	58	112	90	120	11	M8	16		10	8		3.9

■External connection diagram for “P3”

Incremental encoder



Absolute sensor (ABS-RⅡ)



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P5
Servomotors



■Capacity
30 to 1,000W(13 types)

■Features
High rigidity

Faster servos

●Maximum rotating speed of 4,500min^{-1} for quicker positioning.

■Uses
Robots

Machines with windings

Machines for industrial industries

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection system	Fully closed, self-cooling
	P50B03,04 : IP40 P50B05,07,08 : IP55
Presence/lack of seal	P50B03,04 : No P50B05,07,08 : Yes
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V15
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet
Installation method	Flange type

■Standard specifications
200 VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P50B03003DXS	P50B04006DXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《35》	《42》
Rated output	★	P_R	W	30	60
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	4,500	
Rated torque	★	T_R	N・m	0.098	0.191
Continuous stall torque	★	T_S	N・m	0.108	0.216
Instantaneous maximum stall torque	★	T_P	N・m	0.323	0.647
Rated armature current	★	I_R	Arms	0.5	0.7
Continuous stall armature current	★	I_S	Arms	0.53	0.76
Instantaneous maximum stall armature current	★	I_P	Arms	1.8	2.7
Torque constant	☆	K_T	N・m/Arms	0.206	0.304
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	7.2±10%	10.6±10%
Phase armature resistance	☆	$R\phi$	Ω	20.5	10.4
Rated power rate	★	Q_R	kW/S	6.5	7.5
Electric time constant	☆	te	ms	0.7	1.4
Mechanical time constant (w/o sensor)	☆	tm	ms	2.1	1.6
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	0.0197×10^{-4}	0.054×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	0.0167×10^{-4}	0.051×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	0.24	0.46
Brake holding torque		T_B	N・m	0.098	0.191
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.07 (0.25)	0.07 (0.26)
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.0021×10^{-4}	0.0078×10^{-4}
Brake mass		W	kg	0.15	0.24
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0A015-／PZ0A015-	
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	0.2	0.3
Amplifier mass	kg	2.2	

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P50B07040DXS	P50B08050DXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《76》	《86》
Rated output	★	P_R	W	400	500
Rated rotating speed	★	N_R	min^{-1}	3,000	
Maximum rotating speed	★	Nmax	min^{-1}	4,500	
Rated torque	★	T_R	N・m	1.274	1.589
Continuous stall torque	★	T_S	N・m	1.372	1.96
Instantaneous maximum stall torque	★	T_P	N・m	3.92	5.88
Rated armature current	★	I_R	Arms	3.0	3.9
Continuous stall armature current	★	I_S	Arms	3.1	4.5
Instantaneous maximum stall armature current	★	I_P	Arms	10.0	15.0
Torque constant	☆	K_T	N・m/Arms	0.481	0.473
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	16.8±10%	16.5±10%
Phase armature resistance	☆	$R\phi$	Ω	1.65	0.94
Rated power rate	★	Q_R	kW/S	22.1	21.8
Electric time constant	☆	te	ms	4.0	5.2
Mechanical time constant (w/o sensor)	☆	tm	ms	1.6	1.5
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	0.74×10^{-4}	1.161×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	0.752×10^{-4}	1.173×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	2.1	3.0
Brake holding torque		T_B	N・m	0.98	1.96
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.08 (0.3)	0.08 (0.33)
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.245×10^{-4}	0.343×10^{-4}
Brake mass		W	kg	0.57	0.8
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PU0A030-／PZ0A030-	
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	1.3	1.5
Amplifier mass	kg	2.2	

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

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	P50B04010DXS 《42》	P50B05005DXS 《54》	P50B05010DXS 《54》	P50B05020DXS 《54》	P50B07020DXS 《76》	P50B07030DXS 《76》	Symbol
	100	50	100	200	200	300	P_R
	3,000						N_R
	4,500						Nmax
	0.319	0.159	0.319	0.637	0.637	0.931	T_R
	0.353	0.167	0.353	0.686	0.686	0.98	T_S
	0.98	0.49	0.98	1.96	1.96	2.94	T_P
	1.0	0.85	1.1	1.6	2.2		I_R
	1.2	0.85	1.2	1.7	2.3	2.2	I_S
	3.6	2.9	3.7	5.5	7.4	7.5	I_P
	0.333	0.249	0.319	0.436	0.348	0.483	K_T
	11.6±10%	8.7±10%	11.1±10%	15.2±10%	12.15±10%	16.86±10%	$K_E\phi$
	7.0	9.2	4.9	3.4	2.5	2.9	$R\phi$
	13.8	4.4	10.6	24.2	10.6	17.7	Q_R
	1.5	2.1	2.5	2.9	3.6	3.8	te
	1.4	2.6	1.4	0.9	2.4	1.8	tm
	0.079×10^{-4}	0.063×10^{-4}	0.101×10^{-4}	0.173×10^{-4}	0.386×10^{-4}	0.495×10^{-4}	J_M
	0.076×10^{-4}	0.06×10^{-4}	0.098×10^{-4}	0.17×10^{-4}	0.398×10^{-4}	0.507×10^{-4}	J_M
	2,000						
	8,192						
	0.59	0.53	0.74	1.07	1.57	1.71	W_E
	0.319	0.167	0.353	0.353	0.69	0.98	T_B
	90 (24)						V_B
	0.07 (0.26)	0.11 (0.4)			0.08 (0.3)		I_B
	0.0078×10^{-4}	0.029×10^{-4}			0.245×10^{-4}		J_B
	0.24	0.3			0.57		W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)						

	PU0A015-／PZ0A015-					
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase					
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)					
	0.4	0.3	0.4	0.8	1.0	
	2.2					

	P50B08075DXS 《86》	P50B08100DXS 《86》	Symbol
	750	1,000	P_R
	3,000		N_R
	4,500		Nmax
	2.381	3.185	T_R
	2.94	3.92	T_S
	8.82	11.76	T_P
	6.0	6.7	I_R
	7.1	7.5	I_S
	23.7	25.7	I_P
	0.447	0.553	K_T
	15.6±10%	19.3±10%	$K_E\phi$
	0.43	0.41	$R\phi$
	29.5	38.3	Q_R
	5.8	5.9	te
	1.2	1.1	tm
	1.926×10^{-4}	2.651×10^{-4}	J_M
	1.938×10^{-4}	2.663×10^{-4}	J_M
	2,000		
	8,192		
	3.9	5.05	W_E
	2.94		T_B
	90 (24)		V_B
	0.08 (0.33)		I_B
	0.343×10^{-4}		J_B
	0.8		W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)		

	PZ0A050-	
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
	2.0	2.5
	5.2	

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■Standard specifications

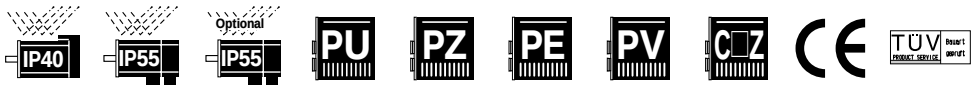
200 VAC type

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P50B03003PXS	P50B04006PXS	P50B04010PXS	P50B05005PXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《35》	《42》	《42》	《54》
Rated output	★	P_R	W	30	60	100	50
Rated rotating speed	★	N_R	min^{-1}	3,000			
Maximum rotating speed	★	Nmax	min^{-1}	4,500			
Rated torque	★	T_R	N・m	0.098	0.191	0.319	0.159
Instantaneous maximum stall torque	★	T_P	N・m	0.322	0.647	0.98	0.49
Rated armature current	★	I_R	Arms	1.0	1.3	1.8	1.6
Instantaneous maximum stall armature current	★	I_P	Arms	3.6	5.0	6.0	5.0
Torque constant	☆	K_T	N・m/Arms	0.108	0.164	0.195	0.136
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	3.79±10%	5.74±10%	6.8±10%	4.76±10%
Phase armature resistance	☆	$R\phi$	Ω	5.4	2.95	2.35	2.6
Rated power rate	★	Q_R	kW/S	6.5	7.5	13.8	4.4
Electric time constant	☆	te	ms	0.7	1.5	1.6	2.2
Mechanical time constant (w/o sensor)	☆	tm	ms	2.0	1.5	1.3	2.4
Applicable load inertia		J_L	$kg \cdot m^2$ ($GD^2/4$)	0.197×10^{-4}	0.54×10^{-4}	0.79×10^{-4}	0.63×10^{-4}
Detector wiring-saving INC			P/R	2,000			
Inertia (including wiring-saving INC)		J_M	$kg \cdot m^2$ ($GD^2/4$)	0.02×10^{-4}	0.054×10^{-4}	0.079×10^{-4}	0.063×10^{-4}
Mass including wiring-saving INC		W_E	kg	0.24	0.46	0.59	0.53
Detector ABS-RII			P/R	8,192			
Inertia (including ABS-RII)		J_M	$kg \cdot m^2$ ($GD^2/4$)	0.167×10^{-4}	0.051×10^{-4}	0.076×10^{-4}	0.06×10^{-4}
Mass including ABS-RII		W_E	kg	0.31	0.52	0.65	0.61
Brake holding torque		T_B	N・m	0.098	0.191	0.319	0.167
Brake excitation voltage		V_B	V	90/24			
Brake excitation current		I_B	A	0.07/0.25	0.07/0.26		0.11/0.4
Brake inertia		J_B	$kg \cdot m^2$ ($GD^2/4$)	0.0021×10^{-4}	0.0078×10^{-4}		0.029×10^{-4}
Brake mass		W	kg	0.15	0.24		0.3
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)			

Applicable amplifier model		PU0B015-				
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase				
Amplifier operating temperature and humidity		Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)				
Power capacity (at rating)	kVA	0.2	0.3	0.2	0.2	
Amplifier mass	kg	0.85				

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.
3. The constants are those measured when the motor is mounted on an aluminum plate 305 x 305 x 12mm thick.

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	P50B05010PXS 《54》	P50B05020PXS 《54》	P50B07020PXS 《76》	Symbol
	100	200		P_R
	3,000			N_R
	4,500			Nmax
	0.319	0.637		T_R
	0.98	1.96	1.96	T_S
	2.1	3.4	4.3	I_R
	6.7	11	14.4	I_P
	0.176	0.218	0.18	K_T
	6.25±10%	7.6±10%	6.3±10%	$K_E\phi$
	1.5	0.85	0.66	$R\phi$
	10.6	24.2	10.6	Q_R
	2.6	2.8	3.6	te
	1.4	0.9	2.3	tm
	1.01×10^{-4}	1.73×10^{-4}	3.86×10^{-4}	J_L
	2,000			
	0.101×10^{-4}	0.173×10^{-4}	0.386×10^{-4}	J_M
	0.74	1.07	1.57	W_E
	8,192			
	0.098×10^{-4}	0.17×10^{-4}	0.398×10^{-4}	J_M
	0.82	1.15	1.61	W_E
	0.353		0.69	T_B
	90/24			V_B
	0.11/0.4		0.08/0.3	I_B
	0.029×10^{-4}		0.245×10^{-4}	J_B
	0.3		0.57	W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)			

	PU0B015-	PU0B030-		
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase			
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)			
	0.3	0.5	0.6	
	0.85	1.1		

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■Planetary gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rated rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min-1	mm
P50B05010DXS□□∗A	100	1/3	30	75	0.72	2.2	1,000	54 × 54mm
P50B05010DXS□□∗B		1/5		80	1.3	3.9	600	
P50B05010DXS□□∗C		1/9	42		2.3	7.1	333	
P50B05010DXS□□∗D		1/15			3.8	11.8	200	
P50B05005DXS□□∗E	50	1/25		70	2.9	8.9	120	
P50B07040DXS□□∗A	400	1/3	24	75	2.9	8.9	1,000	78 × 78mm
P50B07040DXS□□∗B		1/5			4.8	14.8	600	
P50B07040DXS□□∗C		1/9	30		8.5	26.3	333	
P50B07040DXS□□∗D		1/15			14.3	44.1	200	
P50B07030DXS□□∗E	300	1/25			17.4	55.1	120	
P50B08075DXS□□∗A	750	1/3	24		5.4	19.8	1,000	
P50B08075DXS□□∗B		1/5			8.9	33.1	600	
P50B08075DXS□□∗C		1/9	30	70	15.0	55.5	333	98 × 98mm
P50B08075DXS□□∗D		1/15			25.0	92.2	200	

■Flat gears

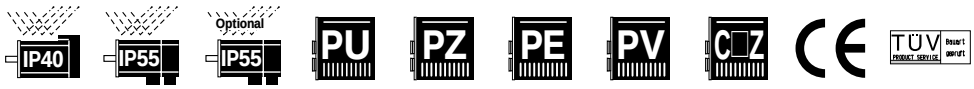
Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rated rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min-1	mm
P50B04006DXS□□∗J	60	1/5	60	95	0.9	1.8	600	60 × 60mm
P50B04006DXS□□∗K		1/10		90	1.7	3.4	300	
P50B04006DXS□□∗L		1/15			2.6	5.2	200	
P50B05020DXS□□∗J	200	1/5		95	3.0	6.0	600	82 × 82mm
P50B05020DXS□□∗K		1/10		90	5.7	11.4	300	
P50B05010DXS□□∗L	100	1/15			4.3	8.6	200	
P50B07040DXS□□∗J	400	1/5		95	6.0	12.0	600	102 × 102mm
P50B07040DXS□□∗K		1/10		90	11.5	23.0	300	
P50B07030DXS□□∗L	300	1/15			12.6	25.2	200	
P50B08075DXS□□∗J	750	1/5		80	9.5	19.0	600	120 × 120mm
P50B08075DXS□□∗K		1/10			19.0	38.0	300	
P50B08050DXS□□∗L	500	1/15		90	21.5	43.0	200	

Note: To protect the gears, limit the torques to double their ratings.
Amplifiers can be delivered with different internal settings if you specify them when placing an order.

■Backlash-less planetary gears

Model	Motor output	Reduction ratio	Backlash	Efficiency	Rated torque	Instantaneous maximum torque	Rated rotating speed	Dimensions
	W		Minute	%	N • m	N • m	min-1	mm
P50B05010DXS□□∗S	100	1/5	2	75	1.2	3.7	600	70× 70mm
P50B05010DXS□□∗T		1/11	3	80	2.8	8.6	273	
P50B05005DXS□□∗U	50	1/21			2.7	8.2	143	
P50B05005DXS□□∗V		1/33			4.2	12.9	91	
P50B07040DXS□□∗S	400	1/5	2	75	4.8	14.7	600	90 × 90mm
P50B07040DXS□□∗T		1/11	3		10.5	32.3	273	105× 105mm
P50B07030DXS□□∗U	300	1/21			14.7	46.3	143	
P50B07020DXS□□∗V	200	1/33			15.8	48.5	91	
P50B08075DXS□□∗S	750	1/5	2	70	8.3	30.9	600	
P50B08075DXS□□∗T		1/11	3		18.3	72.8	273	120 × 120mm
P50B08050DXS□□∗U	500	1/21			25.0	92.6	143	

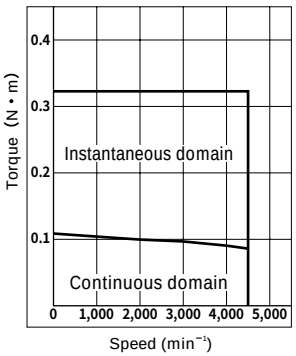
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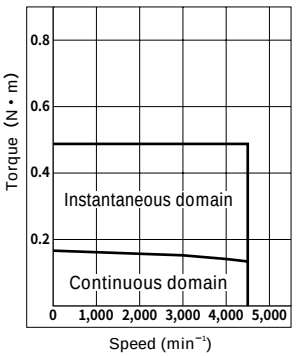
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■ "P5" + "PZ" system: characteristics of torque versus rotating speed

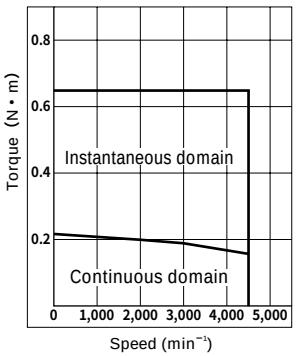
200 VAC type



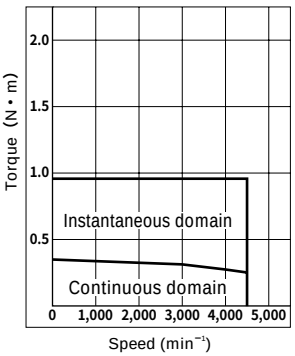
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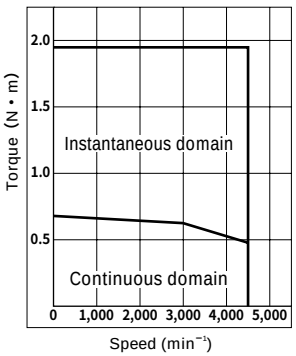
P50B05005D (50W)



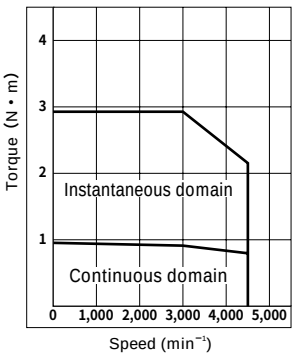
P50B04006D (60W)



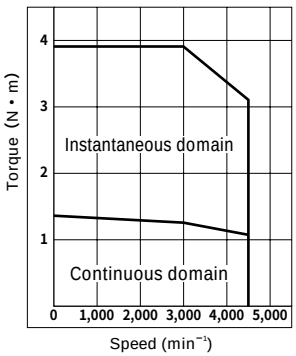
P50B04010D (100W)
P50B05010D (100W)



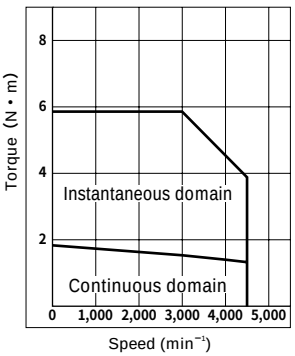
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P50B07020D (200W)



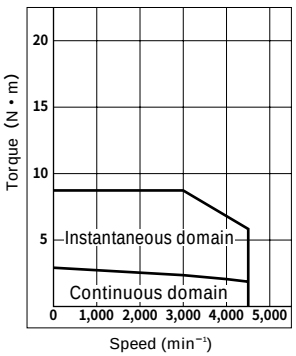
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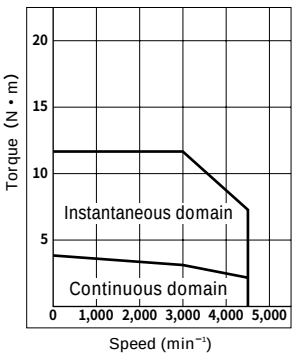
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P50B08050D (500W)



P50B08075D (750W)

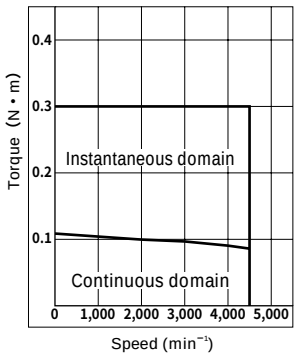


P50B08100D (1000W)

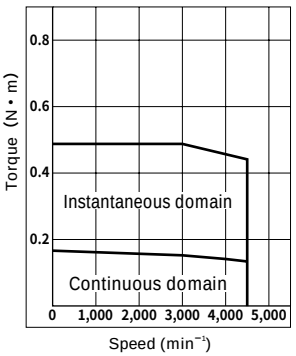
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■ “P5” + “PU” system: characteristics of torque versus rotating speed

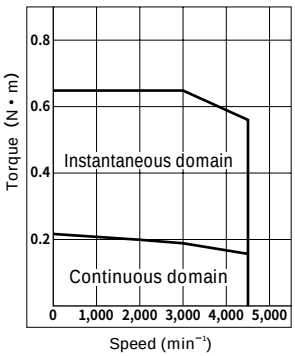
100 VAC type



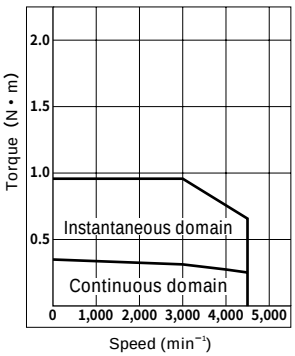
P50B03003P（30W）



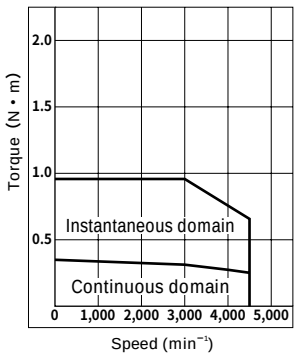
P50B05005P（50W）



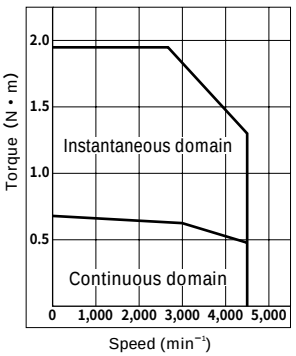
P50B04006P（60W）



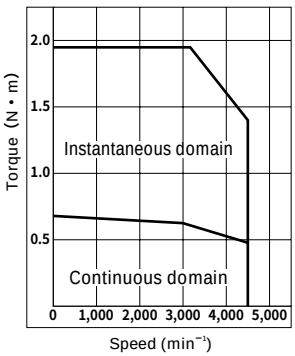
P50B04010P（100W）



P50B05010P（100W）



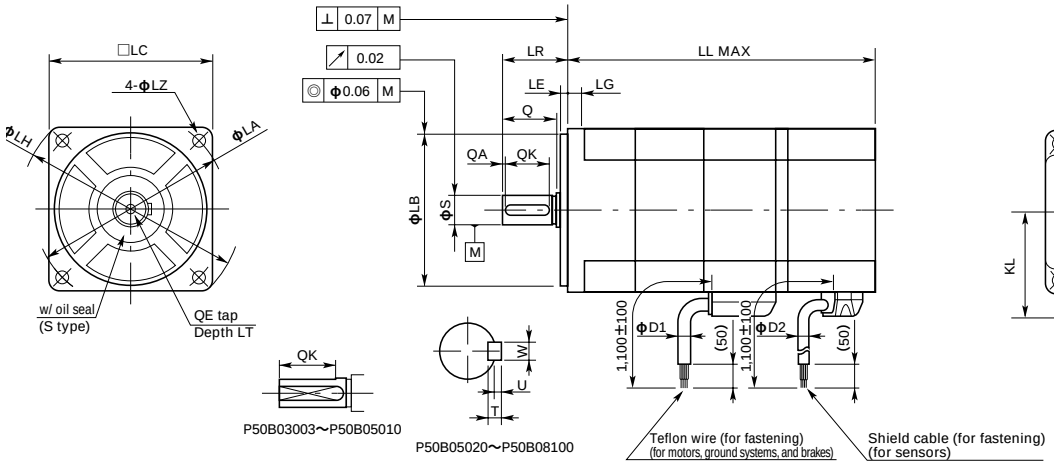
P50B05020P（200W）



P50B07020P（200W）

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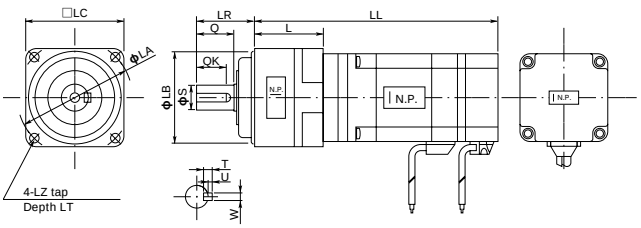
■Dimensions [unit:mm]



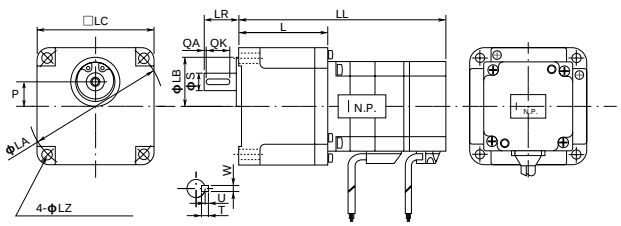
MODEL	Incremental w/o brake LL	Incremental w/ brake LL	ABS-RII w/o brake LL	ABS-RII w/ brake LL	LG	KL	LA	LB	LE	LH	LC	LZ	LR	S	Q	QA	QK	W	T	U	QE	LT	D1	Incremental D2	ABS-RII D2	Oil seal
P50B03003△□◇	67.5	98	87	117	4.5	27.5	40	$30^{0}_{-0.021}$	2	47	35	3.5	15	$5^{0}_{-0.008}$	—	—	11	With 2 slots 4.5±0.2			—	—	6			
P50B04006△□◇	82	114	100	132	5	31	48	$34^{0}_{-0.025}$	2	57	42	3.5	24	$7^{0}_{-0.009}$	20	—	15	With 2 slots 6.5±0.2			—	—			5.1	No
P50B04010△□◇	95	127	113	145																						
P50B05005△□◇	76	105	95.5	124.5	5	38	60	$50^{0}_{-0.025}$	2.5	71.5	54	4.5	24	$8^{0}_{-0.009}$	20	—	15	With 2 slots 7.5±0.2			M3	8				
P50B05010△□◇	86	115	105.5	134.5																						
P50B05020△□◇	105	134	124.5	153.5									30	$11^{0}_{-0.011}$	25	2	20	4	4	1.5	M4	10		4.7		
P50B07020△□◇	97	124	102	129	8	50	90	$70^{0}_{-0.030}$	3	102.5	76	5.5	30	$14^{0}_{-0.011}$	25	2	20	5	5	2	M5	12	6.7			
P50B07030△□◇	103	130	108	135																						Yes
P50B07040△□◇	113	140	118	145																					7.9	
P50B08050△□◇	126	166	131	171	8	55	100	$80^{0}_{-0.030}$	3	115	86	6.6	35	$16^{0}_{-0.011}$	30	2	25	5	5	2	M5	12				
P50B08075△□◇	149	189	154	194																						
P50B08100△□◇	172	212	177	217																						

Note: ABS-E and ABS-RIII come with sensors having different dimensions.

■Planetary gears



■Flat gears

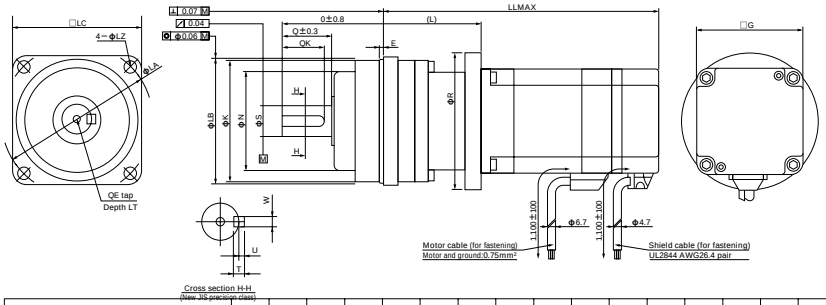


Flat gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	Q mm	LZ mm	LT mm	QK mm	W mm	T mm	U mm	Mass of gear only Kg
P50B05010DXS□□∗A	129	43	60	50	54	12	32	20	M5	10	16	4	4	1.5	0.5
P50B05010DXS□□∗B															
P50B05010DXS□□∗C	144	58													0.65
P50B05010DXS□□∗D															
P50B05005DXS□□∗E	134														
P50B07040DXS□□∗A	173	60	90	70	78	19	50	30	M6	12	22	6	6	2.5	1.85
P50B07040DXS□□∗B															
P50B07040DXS□□∗C	193	80													2.3
P50B07040DXS□□∗D															
P50B07030DXS□□∗E	183														
P50B08075DXS□□∗A	209	60													1.85
P50B08075DXS□□∗B															
P50B08075DXS□□∗C	243	94	115	90	96	24	61	40	M8	16	30	8	7	3	3.5
P50B08075DXS□□∗D															

Flat gears	LL mm	L mm	LA mm	LB mm	LC mm	S mm	LR mm	LZ mm	LT mm	QK mm	QA mm	W mm	T mm	U mm	Mass of gear only Kg
P50B04006DXS□□∗J	129	47	70	18	60	8	32	4.5	6	12	2	3	3	1.5	0.4
P50B04006DXS□□∗K															
P50B04006DXS□□∗L															
P50B05020DXS□□∗J	156	51	94	44	82	12	26.5	6.6	8	16	2	4	4		0.7
P50B05020DXS□□∗K															
P50B05010DXS□□∗L	137														
P50B07040DXS□□∗J	191	78	120	40	102	15	32	6.5	10	20	2	5	5	2	1.3
P50B07040DXS□□∗K															
P50B07030DXS□□∗L	181														
P50B08075DXS□□∗J	229	80	146	50	120	19	35	9	12	25	2	6	6	2.5	1.5
P50B08075DXS□□∗K															
P50B08050DXS□□∗L	206														

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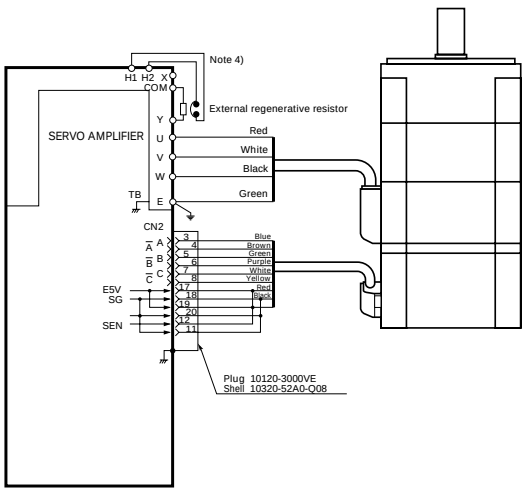
■Backlash-less planetary gears



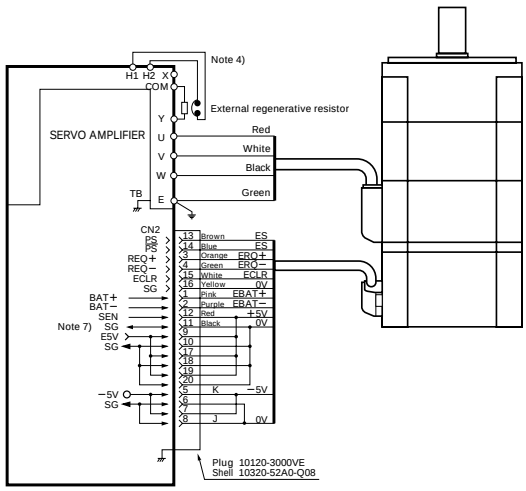
Backlash-less planetary gear	LL	L	LA	LB	E	LC	LR	G	S	QK	Q	K	N	R	LZ	QE	LT	KL	W	T	U	Mass
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg
P50B05010DXS□□∗S	136	50	80	65	8	70	60	54	16	25	28	64.5	50	72	6.6	M4	8	38	5	5	2	0.8
P50B05010DXS□□∗T	145	59																				
P50B05005DXS□□∗U	135																					
P50B05005DXS□□∗V																						
P50B07040DXS□□∗S	174	61	105	85	10	90	74	76	20	32	36	83	60	104	9	M5	10	50	6	6	2.5	1.6
P50B07040DXS□□∗T	193	80	120	100	12	105	84		25	36	42	96	70			M6	12		8	7	3	2.4
P50B07030DXS□□∗U	183																					
P50B07020DXS□□∗V	177																					
P50B08075DXS□□∗S	217	68	120	100	12	105	84	86	25	36	42	96	70	116	9	M6	12	55	8	7	3	2.4
P50B08075DXS□□∗T	237	88	135	115	14	120	105		32	50	58	112	90	120	11	M8	16		10	8		3.9
P50B08050DXS□□∗U	214																					

■External connection diagram for “P5”

Incremental encoder



Absolute sensor (ABS-R**II**)



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P6
Servomotors



■Capacity
0.5 to 30kW(18 types)

■Features
Small and highly rigid

Faster servos

●Maximum rotating speed of 4,500min^{-1} for quicker positioning.

■Uses
Robots

General-purpose machine tools

Transfer machines

Food processors

Medical equipment

Machines for industrial industries

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection method	Fully closed, self-cooled, IP67 Models with 20kW through 30kW fans are forcefully cooled, IP45.
Presence/lack of seal	Yes
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V15
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet
Installation method	Flange type

■Standard specifications

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle Sq. flange size in 《 》	Condition	Symbol	Unit	P60B13050HXS 《130》	P60B13100HXS 《130》
Rated output	★	P_R	kW	0.5	1.0
Rated rotating speed	★	N_R	min^{-1}	2,000	
Maximum rotating speed	★	Nmax	min^{-1}	3,000	
Rated torque	★	T_R	N・m	2.5	5.0
Continuous stall torque	★	T_S	N・m	3.0	6.0
Instantaneous maximum stall torque	★	T_P	N・m	7.0	15.0
Rated armature current	★	I_R	Arms	4.5	7.8
Continuous stall armature current	★	I_S	Arms	5.2	8.7
Instantaneous maximum stall armature current	★	I_P	Arms	15.0	23.7
Torque constant	☆	K_T	N・m/Arms	0.65	0.76
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	22.5	26.2
Phase armature resistance	☆	$R\phi$	Ω	0.64	0.31
Rated power rate	★	Q_R	kW/S	22	46
Electric time constant	☆	te	ms	9.1	10
Mechanical time constant (w/o sensor)	☆	tm	ms	1.3	0.90
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	2.8×10^{-4}	5.6×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	2.8×10^{-4}	5.6×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	4.7	6.6
Brake holding torque		T_B	N・m	3.5	9.0
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.25 (0.91)	0.25 (0.86)
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.5×10^{-4}	
Brake mass		W	kg	1.3	1.5
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A030	PZ0A050
Amplifier power supply	---	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	1.4	2.5
Amplifier mass	kg	2.2	4.4

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle Sq. flange size in 《 》	Condition	Symbol	Unit	P60B18750RXS 《180》	P60B22550MXS 《220》
Rated output	★	P_R	kW	7.5	5.5
Rated rotating speed	★	N_R	min^{-1}	1,500	
Maximum rotating speed	★	Nmax	min^{-1}	2500	1500
Rated torque	★	T_R	N・m	48.0	35.0
Continuous stall torque	★	T_S	N・m	54.9	42.0
Instantaneous maximum stall torque	★	T_P	N・m	118	90.0
Rated armature current	★	I_R	Arms	58	28.8
Continuous stall armature current	★	I_S	Arms	65	33.4
Instantaneous maximum stall armature current	★	I_P	Arms	155	79.5
Torque constant	☆	K_T	N・m/Arms	0.90	1.35
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	31.6	47.3
Phase armature resistance	☆	$R\phi$	Ω	0.014	0.051
Rated power rate	★	Q_R	kW/S	243	136
Electric time constant	☆	te	ms	26	31
Mechanical time constant (w/o sensor)	☆	tm	ms	0.49	0.75
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	95.1×10^{-4}	90.1×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	95.1×10^{-4}	90.1×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	44.7	34.8
Brake holding torque		T_B	N・m	54.9	90.0
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.37 (1.4)	0.44 (1.7)
Brake inertia		J_B	kg・m^2 (GD^2/4)	4.5×10^{-4}	24×10^{-4}
Brake mass		W	kg	6.0	10.4
Cooling fan		P_F	W		
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A300	PZ0A150
Amplifier power supply	---	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	12.6	10.1
Amplifier mass	kg	22	8.5

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

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	P60B13150HXS 《130》	P60B13200HXS 《130》	P60B15300HXS 《150》	P60B18200HXS 《180》	P60B18350HXS 《180》	P60B18450RXS 《180》	P60B18550RXS 《180》	Symbol
	1.5	2.0	3.0	2.0	3.5	4.5	5.5	P_R
	2,000						1,500	N_R
	3,000					2,500		Nmax
	7.5	9.5	14.5	9.5	17.0	21.5	35.0	T_R
	9.0	12.0	18.0	12.0	22.0	32.0	37.3	T_S
	20.0	30.0	44.0	30.0	50.0	70.0	88.3	T_P
	9.4	15.5	25.0	14.6	26.4	24.9	32	I_R
	10.7	18.3	28.1	17.0	32.3	34.0	33	I_S
	26.5	52.4	77.7	48.7	80.2	81.2	83	I_P
	0.90	0.69	0.68	0.74	0.75	1.03	1.18	K_T
	31.4	24.1	23.5	25.7	26.0	36.0	41.2	$K_E\phi$
	0.27	0.10	0.048	0.079	0.048	0.052	0.040	$R\phi$
	67	77	102	42	83	98	198	Q_R
	10	12	17	20	19	23	23	te
	0.82	0.75	0.65	0.94	0.89	0.69	0.52	tm
	8.3×10^{-4}	12.1×10^{-4}	20.1×10^{-4}	22.1×10^{-4}	34.1×10^{-4}	47.1×10^{-4}	61.9×10^{-4}	J_M
	8.3×10^{-4}	12.1×10^{-4}	20.1×10^{-4}	22.1×10^{-4}	34.1×10^{-4}	47.1×10^{-4}	61.9×10^{-4}	J_M
	2,000							
	8,192							
	7.8	9.8	13.4	13.6	17.7	21.7	31.7	W_E
	9.0	12.0	20.0	12.0	32.0		54.9	T_B
	90 (24)							V_B
	0.25 (0.86)	0.28 (1.0)	0.27 (1.0)	0.28 (1.0)	0.37 (1.4)			I_B
	0.5×10^{-4}		0.68×10^{-4}	0.5×10^{-4}	3.4×10^{-4}		4.5×10^{-4}	J_B
	1.5	1.7	2.6	1.9	5.0		6.0	W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)							

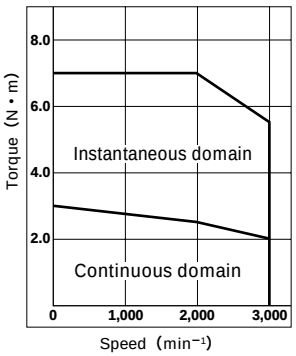
	PZ0A050	PZ0A100	PZ0A150	PZ0A100	PZ0A150			
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase							
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)							
	3.9	5.0	6.9	5.0	7.4	8.4	10.1	
	4.4	6.0	8.5	6.0	8.5			

	P60B22700SXS 《220》	P60B2211KBXS 《220》	P60B2215KBXS 《220》	P60B2220KBXS 《220》	P60B2820KMXS 《275》	P60B2825KMXS 《275》	P60B2830KMXS 《275》	Symbol
	7.0	11	15	20		25	30	P_R
	1,000	1,500						N_R
	1,000	2,000			1,500			Nmax
	67.0	70.0	95.5	127.4		156.8	191.1	T_R
	70.0	88.3	95.5	127.4		156.8	191.1	T_S
	150.0	181	240	280.3	313.6	362.6	411.6	T_P
	31.3	51	58	104.7	97.5	108.2	117.7	I_R
	32.4	64	58	98.3	87.1	94.7	109.5	I_S
	77.1	142	155	180.6	179	177.3	185.3	I_P
	2.32	1.48	1.78	1.38	1.49	1.74	1.88	K_T
	80.9	51.5	62.3	48.1	52.1	60.7	65.7	$K_E\phi$
	0.063	0.0155	0.020	0.012	0.014	0.015	0.014	$R\phi$
	254	217	367	655	428	581	821	Q_R
	32	39	37	33	34	36	38	te
	0.62	0.53	0.47	0.47	0.71	0.63	0.53	tm
	177×10^{-4}	225×10^{-4}	248×10^{-4}		380×10^{-4}	424×10^{-4}	445×10^{-4}	J_M
	177×10^{-4}	225×10^{-4}	248×10^{-4}		380×10^{-4}	424×10^{-4}	445×10^{-4}	J_M
	2,000							
	8,192							
	52.8	67.5	77.5	83	95	100	109	W_E
	90.0			191.1				T_B
	90 (24)							V_B
	0.44 (1.7)			0.75 (2.46)				I_B
	24×10^{-4}			11.8×10^{-4}				J_B
	10.4			19.1				W
				65				P_F
				200 to 230V AC +10%～−15% 3-phase 50/60Hz				
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)							

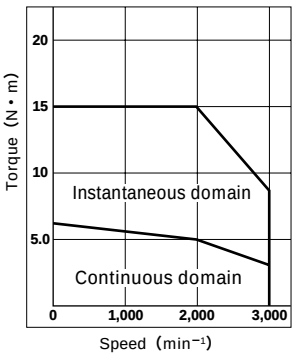
	PZ0A150	PZ0A300		PZ0A600			
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase						
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)						
	12.2	15.7	21.4				
	8.5	22					

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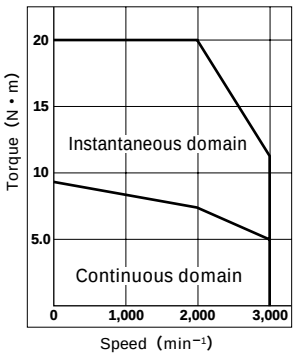
■"P6" + "PZ" system: characteristics of torque versus rotating speed



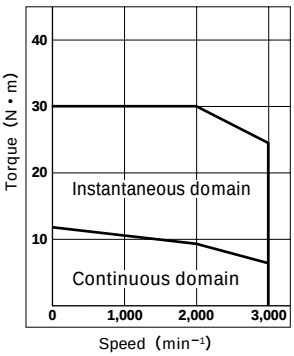
P60B13050H (0.5kW)



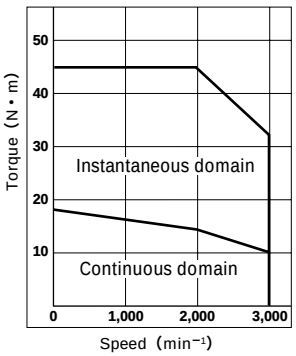
P60B13100H (1.0kW)



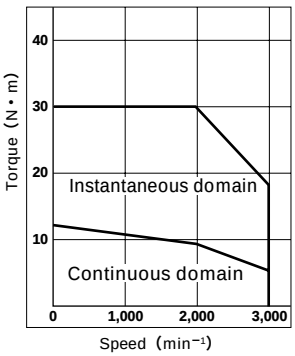
P60B13150H (1.5kW)



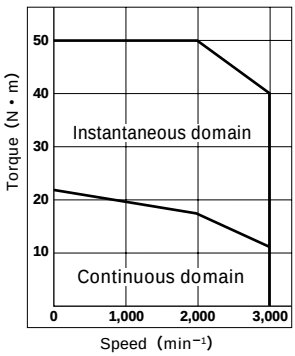
P60B13200H (2.0kW)



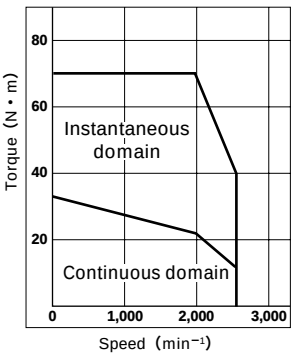
P60B15300H (3.0kW)



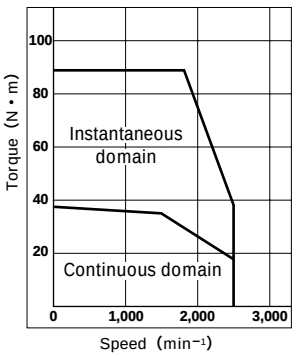
P60B18200H (2.0kW)



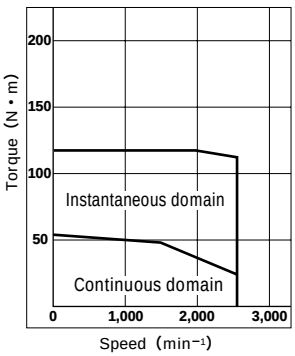
P60B18350H (3.5kW)



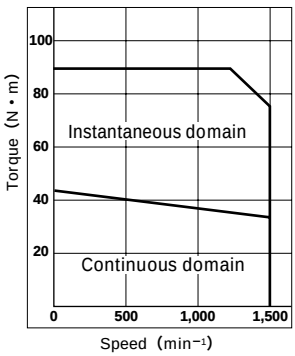
P60B18450R (4.5kW)



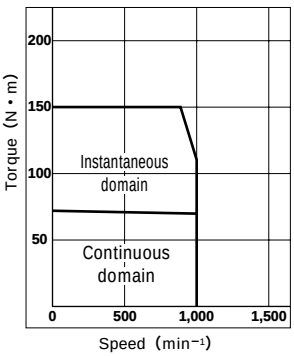
P60B18550R (5.5kW)



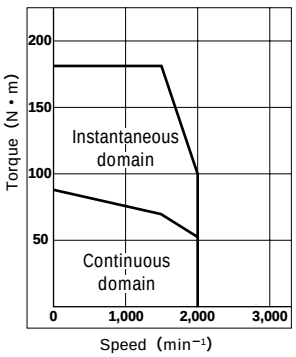
P60B18750R (7.5kW)



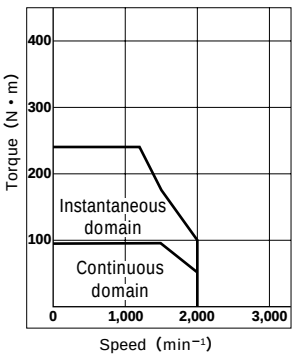
P60B22550M (5.5kW)



P60B22700S (7.0kW)

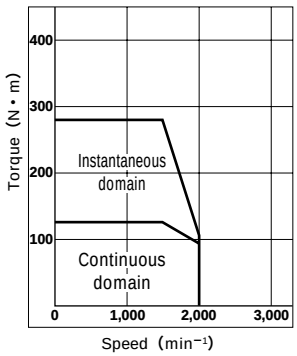


P60B2211KB (11kW)

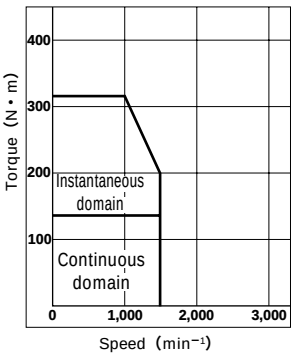


P60B2215KB (15kW)

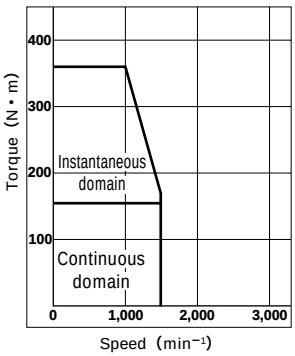
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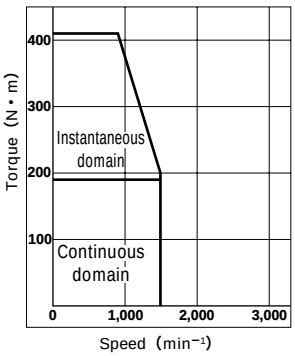
P60B2220KB（20kW）



P60B2820KM（20kW）



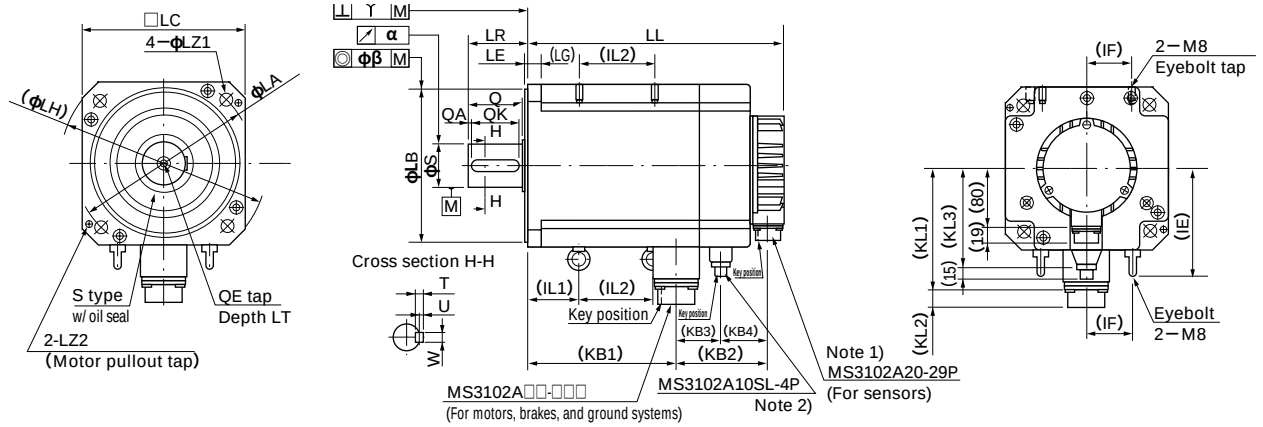
P60B2825KM（25kW）



P60B2830KM（30kW）

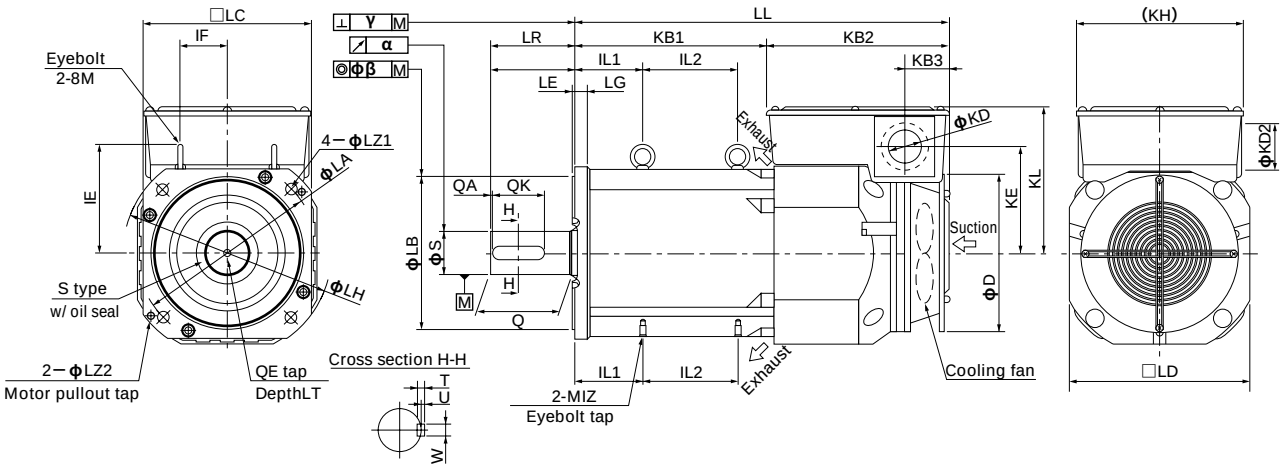
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■Dimensions [unit:mm]



MODEL	Incremental,ABS−RⅡ w/o brake LL	KB2	w/ brake LL	KB2	KB3	KB4	ABS−E w/o brake LL	KB2	w/ brake LL	KB2	KB3	KB4	Connector, note 1) Motor and ground system	Brake (if any)	KL1	KL2	KL3	LG	LA	LB	LE	LH	LC	LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	α	β	γ	QE	LT	IE	IF	IL1	IL2
P60B13050△□◇	113	56	143	86	—	—	123	66	153	96	—	—	24−11P		98	21	—	12	145	$110^{0}_{-0.035}$	4	165	130	9	M6	55	$22^{0}_{-0.013}$	50	3	42	$6^{0}_{-0.030}$	6	2.5	37	0.02	0.08	0.08	M6	20	—	—	—	—
P60B13100△□◇	133		166	90	—	—	143		176	100	—	—																					56									
P60B13150△□◇	152	57	185				162	67	195																								75									
P60B13200△□◇	171		208	94	—	—	181		218	104	—	—														$28^{0}_{-0.013}$				$8^{0}_{-0.036}$	7	3	94				M8	25				
P60B15300△□◇	182	56	225	99	—	—	192	66	235	109	—	—	24−11P		106	21	—	12	165	$130^{0}_{-0.040}$	4	190	150	11	M6	50	$28^{0}_{-0.013}$	50	3	42	$8^{0}_{-0.036}$	7	3	106	0.02	0.08	0.08	M8	25	—	—	—	—
P60B18200△□◇	144		179				154		189																								68						—	—	—	—
P60B18350△□◇	169	56	204	91	—	—	179	66	214	101	—	—	24−11P		123	21	—	16	200	$114.3^{0}_{-0.035}$	3	230	180	13.5	M8	65	$35^{0}_{-0.016}$	60	3	50	$10^{0}_{-0.036}$	8	3	93	0.02	0.08	0.08	M8	25	124	50	64	20
P60B18450△□◇	192		227				202		237																								116								62	45
P60B18550△□◇	267	72	314	119	59	60	277	102	324	129	59	70	32−17P	10SL−4P	144	22	115	19	200	$114.3^{0}_{-0.035}$	3	230	180	13.5	M8	79	$42^{0}_{-0.016}$	75	3	67	$12^{0}_{-0.043}$	8	3	175	0.02	0.08	0.08	M10	25	124	50	60	70
P60B18750△□◇	332		379				342		389																								240								60	135
P60B22550M□◇	209	60	256	107	—	—	219	70	266	117	—	—	24−11P		141	21	—	19	235	$200^{0}_{-0.046}$	4	270	220	13.5	M10	79	$55^{0}_{-0.019}$	75	3	67	$16^{0}_{-0.043}$	10	4	129	0.03	0.08	0.10	M10	25	142	60	53	40
Note 3) P60B22700S□◇	285		332				295		342																								205								69	100
P60B2211K△□◇	362	87	409	134	59	75	382	107	429	154	59	95	32−17P	10SL−4P	162	22	132	19	235	$200^{0}_{-0.046}$	4	270	220	13.5	M10	79	$55^{0}_{-0.019}$	75	3	67	$16^{0}_{-0.043}$	10	4	256	0.03	0.08	0.10	M10	25	142	60	69	130
P60B2215K△□◇	405		452				425		472																								299								69	170

Note 1): Connectors are waterproof when engaged. To meet the needs of IP76, therefore, use waterproof connectors for receiving plugs.
Note 2): Available only in P60B18550, 18750, 2211K, and 2215K equipped with a brake.
Note 3): Some models of P60B22700 have different dimensions when the maximum rotating speed changes. Contact our sales representative.

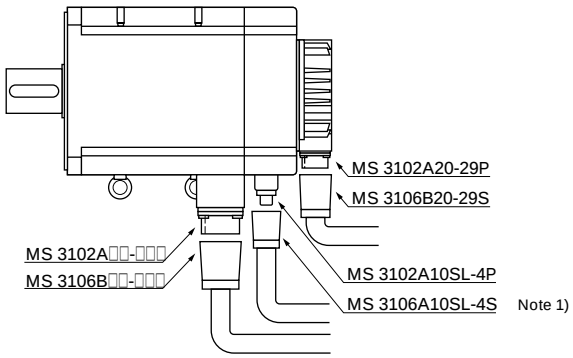


MODEL	Incremental,ABS−RⅡ w/o brake LL	KB2	w/ brake LL	KB2	KL	KH	LG	LA	LB	LE	LH	LC	LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	KB3	KD1	KD2	KE	α	β	γ	QE	LT	IE	IF	IL1	IL2	IZ	LD	D
P60B2220K△□◇	490		605		191		19	235	$200^{0}_{-0.046}$	4	270	220	13.5	M10			106						251				139	0.03	0.08					142	60	89	124	8	235	
P60B2820K△□◇	429	238	529	238		218																	190												70				
P60B2825K△□◇	454		554		215		20	300	$250^{0}_{-0.052}$	5	345	275	18.5	M12	110	$55^{0}_{-0.019}$	105	3	67	$16^{0}_{-0.043}$	10	4	215	58	42.5	61	163	0.04	0.1	0.1	M10	25	117	124	95	50	10	280	205
P60B2830K△□◇	479		579																				240												120				

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■External connection diagram for “P6”

1.P60B13050 to 2215K (models with a cannon plug)

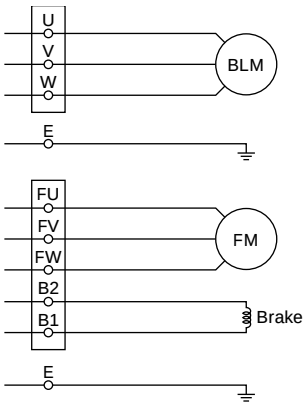


Note 1) Available in P60B18550, 18750, 2211K, and 2215K with a brake.

MODEL	Brake	Plug and clamp	Terminal number				
			U	V	W	E	Brake
Other than those below	Yes	MS3106B24-11S,MS3057-16A	D	E	F	G,H	A,B
	No	(non-waterproof)	D	E	F	G,H	–
P60B18550 **P60B18750** **P60B2211K**	Yes	MS3106B32-17S,MS3057-40A MS3106B10SL-4S,MS3057-4A	A	B	C	D	A,B
P60B2215K	No	MS3106032-17S,MS3057-40A	A	B	C	D	–

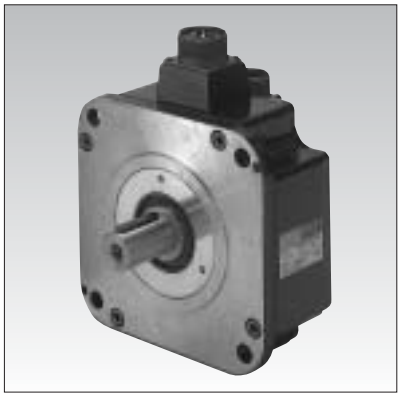
2.P60B2220K to 2830K(Terminal block type)

MODEL	Brake	Terminal block	
		Motor	Fan motor and brake
P60B2220K **P60B2820K**	Yes	UF1005-150A-3P (M8、hexagon bolt)	F1005-20S-5P (M4、round head sems screw)
P60B2825K **P60B2830K**	No		



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P8
Servomotors



■Capacity
0.75 to 4.5kW (5 types)

■Features
Flat

Faster servos

●Maximum rotating speed of 4,500min^{-1} for quicker positioning.

■Uses
Robots

General-purpose machine tools

Transfer machines

Machines for industrial industries

■Common specifications

Time rating	Continuous
Insulation grade	F type
Dielectric strength	1,500 VAC, 1 minute
Insulation grade	500 VDC, 10 MΩ or more
Protection system	Fully closed, self-cooling, IP67
Presence/lack of seal	Yes
Ambient temperature	0 to +40℃
Storage temperature	−20 to 65℃
Ambient humidity	20 to 90% (non-condensing)
Vibration grade	V15
Paint color	Munsell N1.5 or equivalent (circumference)
Excitation system	Permanent magnet
Installation method	Flange type

■Standard specifications

Motor model (wiring-saving INC, w/o brake); < > dimensions of flange angle				P80B15075HXS	P80B18120HXS
Sq. flange size in 《 》	Condition	Symbol	Unit	《150》	《180》
Rated output	★	P_R	W	0.75	1.2
Rated rotating speed	★	N_R	min^{-1}	2,000	
Maximum rotating speed	★	Nmax	min^{-1}	3,000	
Rated torque	★	T_R	N・m	3.6	5.6
Continuous stall torque	★	T_S	N・m	3.7	6.5
Instantaneous maximum stall torque	★	T_P	N・m	9.0	14.0
Rated armature current	★	I_R	Arms	5.2	10.4
Continuous stall armature current	★	I_S	Arms	5.2	10.8
Instantaneous maximum stall armature current	★	I_P	Arms	13.9	26.5
Torque constant	☆	K_T	N・m/Arms	0.78	0.73
Induced voltage constant	☆	$K_E\phi$	mV/min^{-1}	27.0	25.3
Phase armature resistance	☆	$R\phi$	Ω	0.44	0.22
Rated power rate	★	Q_R	kW/S	25	27
Electric time constant	☆	te	ms	13	18
Mechanical time constant (w/o sensor)	☆	tm	ms	1.1	1.5
Rotor inertia (INC)		J_M	kg・m^2 (GD^2/4)	5.3×10^{-4}	12.1×10^{-4}
Rotor inertia (ABS-RII / RIII)		J_M	kg・m^2 (GD^2/4)	5.3×10^{-4}	12.1×10^{-4}
Detector wiring-saving INC			P/R	2,000	
Detector ABS-RII / RIII			P/R	8,192	
Mass including wiring-saving INC		W_E	kg	6.2	10.0
Brake holding torque		T_B	N・m	9.0	
Brake excitation voltage		V_B	V	90 (24)	
Brake excitation current		I_B	A	0.25 (0.86)	
Brake inertia		J_B	kg・m^2 (GD^2/4)	0.5×10^{-4}	
Brake mass		W	kg	1.5	
Motor operating temperature and humidity				Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)	

Applicable amplifier model		PZ0A030	PZ0A050
Amplifier power supply		200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase	
Amplifier operating temperature and humidity		Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)	
Power capacity (at rating)	kVA	1.8	3.1
Amplifier mass	kg	2.2	4.4

Notes:1. ★ means a combination with a standard amplifier after the temperature rises and gets saturated. The values are typical.
2. ☆ means values when the windings are at 20℃. The values are typical.

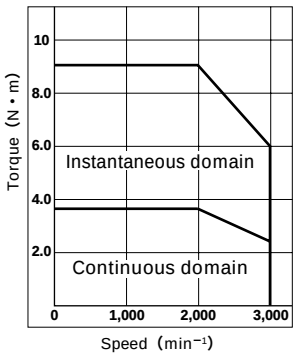
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	P80B22250HXS 《220》	P80B22350HXS 《220》	P80B22450RXS 《220》	Symbol
	2.5	3.5	4.5	P_R
	2,000			N_R
	3,000		2,500	Nmax
	12.0	17.0	21.5	T_R
	13.5	22.0	32.0	T_S
	30.0	50.0	70.0	T_P
	21.4	24.3	24.1	I_R
	22.4	29.3	31.6	I_S
	55.0	76.1	79.7	I_P
	0.66	0.78	1.05	K_T
	23.0	27.4	36.7	$K_E\phi$
	0.056	0.036	0.043	$R\phi$
	52	67	80	Q_R
	27	31	33	te
	1.1	0.76	0.68	tm
	27.1×10^{-4}	43.1×10^{-4}	58.1×10^{-4}	J_M
	27.1×10^{-4}	43.1×10^{-4}	58.1×10^{-4}	J_M
	2,000			
	8,192			
	15.5	18.5	22.0	W_E
	32.0			T_B
	90 (24)			V_B
	0.42 (1.6)			I_B
	9.9×10^{-4}			J_B
	5.9			W
	Temperature: 0 to 40℃, humidity: 90% or less (non-condensing)			

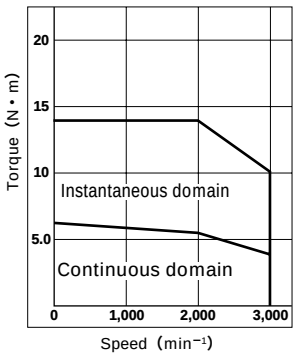
	PZ0A100	PZ0A150		
	200 to 230V AC +10% −15% 50/60Hz ±3Hz 3-phase			
	Temperature: 0 to 55℃, humidity: 90% or less (non-condensing)			
	5.9	7.4	8.4	
	6.0	8.5		

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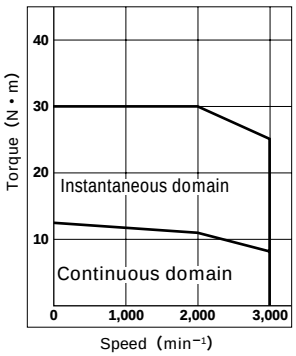
■"P8" + "PZ" system: characteristics of torque versus rotating speed



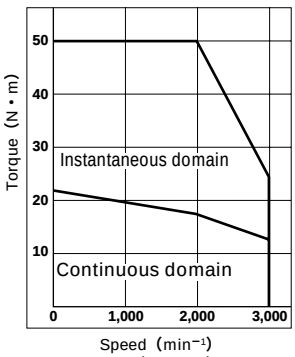
P80B15075H (0.75kW)



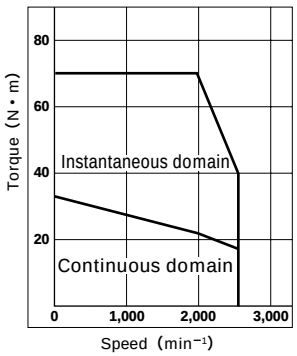
P80B18120H (1.2kW)



P80B22250H (2.5kW)



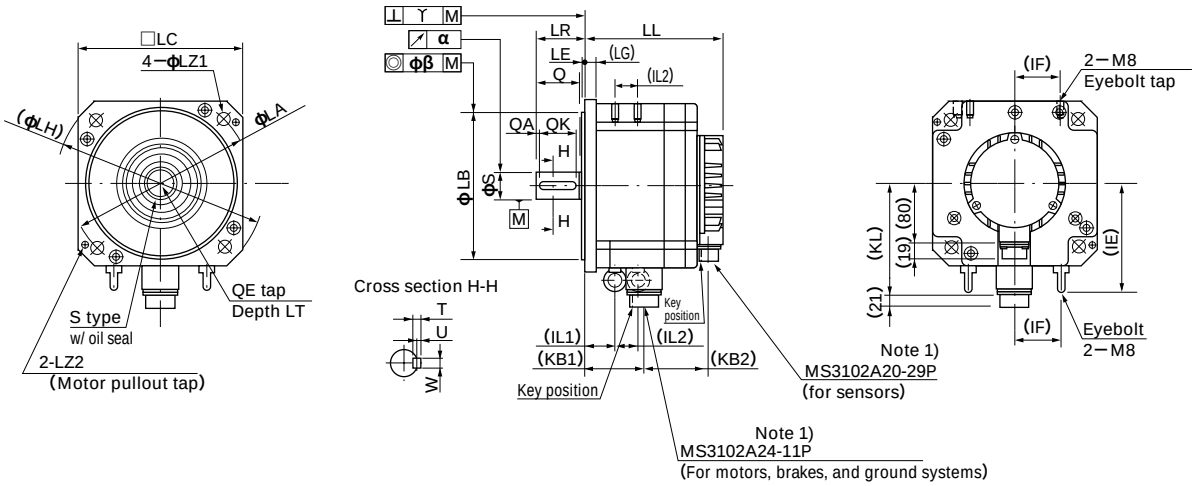
P80B22350H (3.5kW)



P80B22450R (4.5kW)

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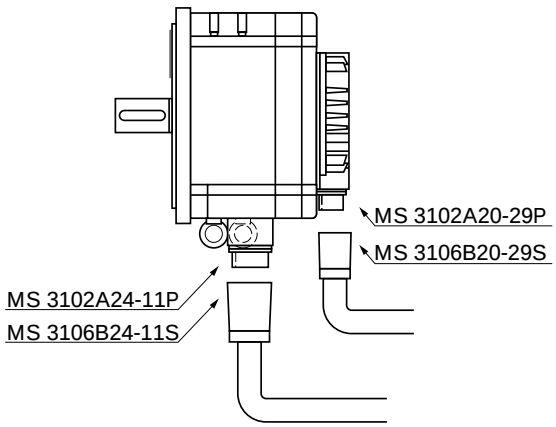
■Dimensions [unit:mm]



	Incremental,ABS−RⅡ				ABS−E																								
	w/o brake		w/ brake		w/o brake		w/ brake																						
MODEL	LL	KB2	LL	KB2	LL	KB2	LL	KB2	KL	LG	LA	LB	LE	LH	LC	LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	QE	LT	IE	IF	IL1	IL2
P80B15075△□◇	116	56	150	90	126	66	160	100	106	12	165	0 −0.040 130	4	190	150	11	M6	55	0 −0.013 22	50	3	42	0 −0.030 6	6	2.5	40	M6	20	—	—	—	—
P80B18120△□◇	119	55	152	88	129	65	162	98	123	12	200	0 −0.035 114.3	3	230	180	13.5	M8	55	0 −0.013 28	50	3	42	0 −0.036 8	7	3	44	M8	25	—	—	—	—
P80B22250△□◇	122		154		132		164																			50					41	—
P80B22350△□◇	136	52	168	84	146	62	178	94	141	16	235	0 −0.046 200	4	270	220	13.5	M10	65	0 −0.016 35	60	3	50	0 −0.036 10	8	3	64	M8	25	142	60	40	15
P80B22450△□◇	151		183		161		193																			79					40	30

Note 1): Connectors are waterproof when engaged. To meet the needs of IP67, therefore, use waterproof connectors for receiving plugs.

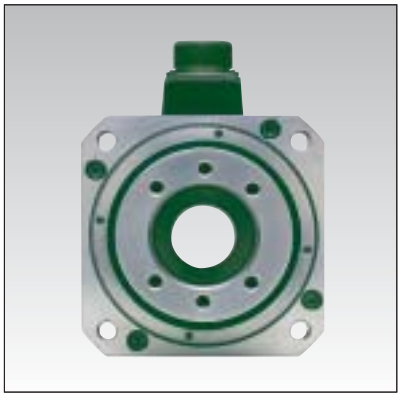
■External connection diagram for “P8”



MODEL	Brake	Plug and clamp	Terminal number				
			U	V	W	E	Brake
P80B15075 P80B18120	Yes	MS3106B24-11S,MS3057-16A	D	E	F	G,H	A,B
P80B22250 P80B22350 P80B22450	No	MS3106B24-11S,MS3057-16A	D	E	F	G,H	–

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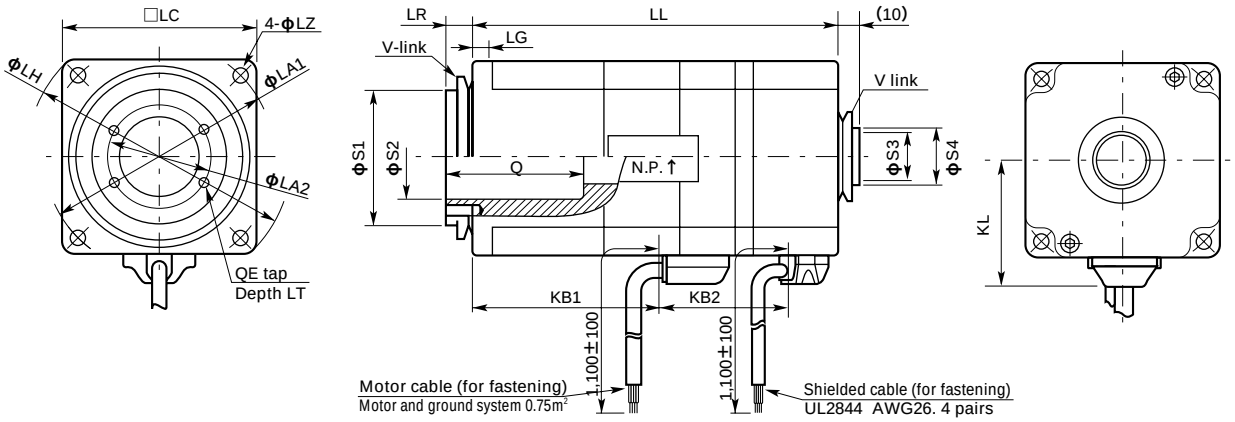
Hollow shaft
Servomotors



■Uses

Robots
Machines with windings
Machines for industrial industries
General-purpose machine tools
Transfer machines
Food processors
Medical equipment

■Dimensions [unit:mm]



MODEL	Motor characteristics					Outside dimensions (note 1) (Unit: mm)																			
	Output W	Rated torque N•m	Instantaneous maximum torque N•m	Rated rotating speed min⁻¹	Maximum rotating speed min⁻¹	Applicable ball screw dia	LC	LH	LL	LA1	LZ1	LG	KB1	KB2	KL	LA2	Q	QE	LT	LR	S1	S2	S3	S4
P50C07020DXS□□	200	0.637	1.96	3,000	4,500	ϕ20mm dia or smaller	76	102.5	124	90	5.5	8	62	47	50	(Note 2)							ϕ22±0.2 (Ball screw, 20mm dia or smaller)	ϕ25
P50C07030DXS□□	300	0.931	2.94						140				68											
P50C07040DXS□□	400	1.276	3.92						150				78											
P50C08050DXS□□	500	1.589	5.88				86	115	165	100	6.6		83	57	55									
P50C08075DXS□□	750	2.381	8.82						188				106											
P50C08100DXS□□	1,000	3.185	11.76						211				129											

How to read model numbers

Example: **P50C07020DXS□□**

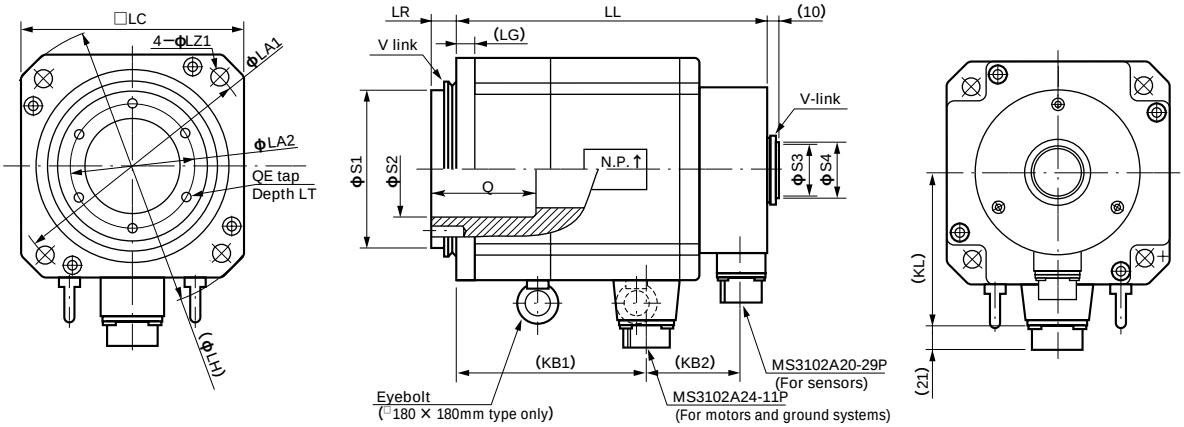
Models equipped with a hollow shaft are marked C here. For other symbols, see the Standard Catalog for the "P5" series.

Sensor: Incremental encoder (wiring-saving); number of basic divisions, 2,000P/R

Waterproof: IP55 (except for the shaft end)

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■Dimensions [unit:mm]



MODEL	Motor characteristics					Outside dimensions (note 1) (Unit: mm)																		
	Output kW	Rated torque N•m	Instantaneous maximum torque N•m	Rated rotating speed min-1	Maximum rotating speed min-1	Applicable ball screw dia	LC	LH	LL	LA1	LZ1	KB1	KB2	KL	LG	LA2	Q	QE	LT	LR	S1	S2	S3	S4
P60C13050HXS□□	0.5	2.5	7.0	2,000	3,000	ϕ45mm dia or smaller	130	165	182	145	9	89	72	98	12	(Note 2)							ϕ40±0.3 (Ball screw, 36mm dia or smaller)	ϕ50
P60C13100HXS□□	1.0	5.0	15.0						202			109												
P60C13150HXS□□	1.5	7.5	20.0						221			128												
P60C13200HXS□□	2.0	9.5	30.0						240			147												
P60C18200HXS□□	2.0	9.5	30.0			ϕ45mm dia or smaller	180	230	225	200	13.5	128	76	123	16								ϕ50±0.3 (Ball screw, 45mm dia or smaller)	ϕ55
P60C18350HXS□□	3.5	17.0	50.0						250			153												
P60C18450RXS□□	4.5	21.5	70.0		2,500				273			176												

How to read model numbers

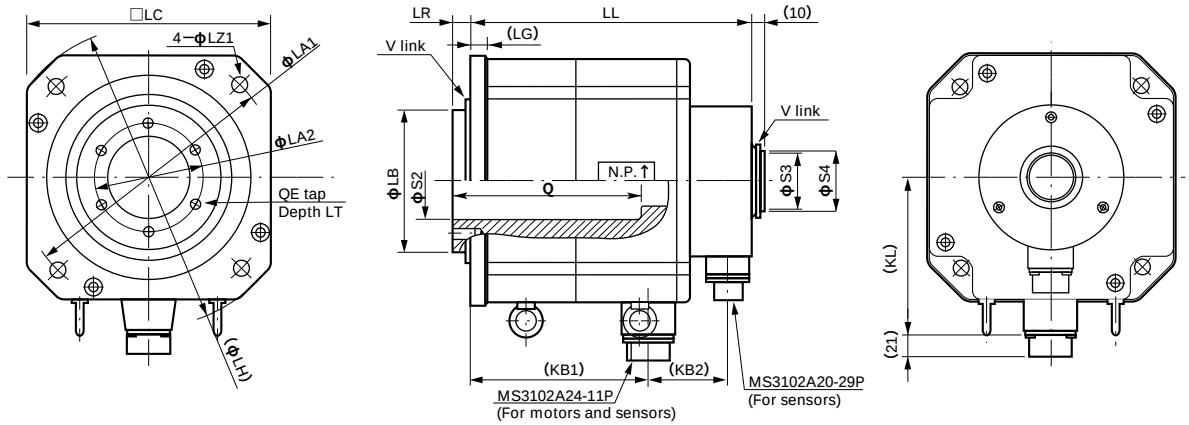
Example: **P60C13050DXS□□**

Models equipped with a hollow shaft are marked C here. For other symbols, see the Standard Catalog for the “P6” and “P8” Series.

Sensor: Incremental encoder (wiring-saving); number of basic divisions, 2,000P/R

Waterproof: IP55 (except for the shaft end)

■Dimensions [unit:mm]



MODEL	Motor characteristics					Outside dimensions (note 1) (Unit: mm)																		
	Output kW	Rated torque N•m	Instantaneous maximum torque N•m	Rated rotating speed min-1	Maximum rotating speed min-1	Applicable ball screw dia	LC	LH	LL	LA1	LZ1	KB1	KB2	KL	LG	LA2	Q	QE	LT	LR	S1	S2	S3	S4
P80C22250HXS□□	2.5	12	30	2,000	3,000	ϕ45mm dia or smaller	220	270	223	235	13.5	129	72.5	141	16	(Note 2)							ϕ50±0.3 (Ball screw, 45mm dia or smaller)	ϕ55
P80C22350HXS□□	3.5	17	50						237			143												
P80C22450RXS□□	4.5	21.5	70		2,500				252			158												

How to read model numbers

Example: **P80C22250DXS□□**

Models equipped with a hollow shaft are marked C here. For other symbols, see the Standard Catalog for the "P6" and "P8" Series.

Sensor: Incremental encoder (wiring-saving); number of basic divisions, 2,000P/R

Waterproof: IP55 (except for the shaft end)

Note 1: The outside dimensions are subject to change. When you consider purchasing any of these models, check their latest specifications with us.
Note 2: The dimensions of the nut bases for ball screws vary with ball screw types. For detailed dimensions, contact us.

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Sales network

■ Network

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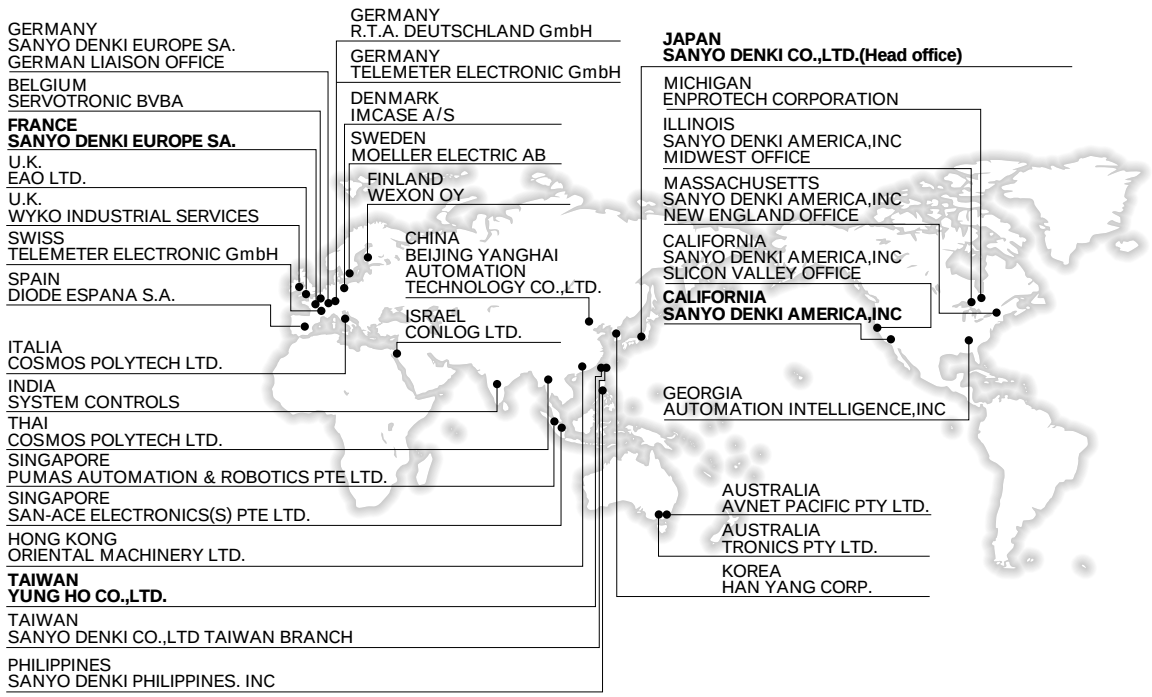
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Specification List of System Configuration

When making an inquiry or placing an order, please fill out the following list.
If you have any question or desire, write them on a separate sheet.

Company name

Section　　Person in charge　　Date.　.　.　.

Phone No

Fax No

Phone No. +81-3-3917-5151 (Main)
FAX No. +81-3-3917-0643

1. Application :

2. Machine name :　　**3. Quantity:**

4. Enter your desired model to the following item:

- AC Servo System ①P1 Series ②P2 Series ③P3 Series ④P5 Series ⑤P6 Series ⑥P8 Series ⑦Robustsyn ⑧S2+SZ Series ⑨S6+SZ Series ⑩S8+SZ Series
- DC Servo System ⑪Super V ⑫DA2
- Stepping Motor ⑬Two-phase Series ⑭Five-phase Series

5.Enter the control method to the following item: ①Speed control ②Position control ③Torque control

6. Enter your desired sensor to the following item:

①Incremental encoder ②ABS-RⅡ ③ABS-E ④Tacho-generator
⑤Incremental encoder + Tacho-generator (DC servo only for ④ and ⑤.)

7. Enter the drive direction to the following item: ①Horizontal ②Vertical ③Aslant

8.Fill out the following list referring to the driving method

	Symbol	Unit	1st axis	2nd axis	3rd axis	4th axis	5th axis
(4) Desired Model No.							
(5) Control Method No.							
(6) Desired Sensor No.							
(7) Drive Direction No.							
(8) Driving Method No.							
Desired revolving speed		min^{-1}					
Mover mass	W	kg					
Driver specific gravity	ρ	kg/m^3					
Load inertia	GD^2	$kg \cdot m^2$					
Loading torque	T_L	N·m					
Tension	F	N					
Pressing force	W	N					
Roll diameter	D	cm					
Friction factor	μ						
Transmission efficiency	η						
Gear reduction ratio	1/G						
Ball screw pitch	P	cm					
Ball screw diameter	D	cm					
Ball screw length	L	cm					
Pulley diameter (Motor side)	D_1	cm					
Pulley length (Motor side)	t_1	cm					
Pulley diameter (Load side)	D_2	cm					
Pulley length (Load side)	t_2	cm					
Pinion pitch	P	cm					
Pinion diameter	D	cm					
Pinion thickness	t	cm					

9. Duty Cycle

	Symbol	Unit	1st axis	2nd axis	3rd axis	4th axis	5th axis
Positioning distance	Lp	mm					
Moving part speed	Vp	m/min					
Positioning time	tr	s					
Accelerating/Decelerating time	ta,tb	s					

10. Working Environment ・Operating temperature ＿＿＿＿＿＿ ～ ＿＿＿＿＿＿
・Others ＿＿＿＿＿＿

※ Contact our sales personnel for Servomotor selecting software.

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"PU" series

PU
Servo amplifiers

P3 P5 P6



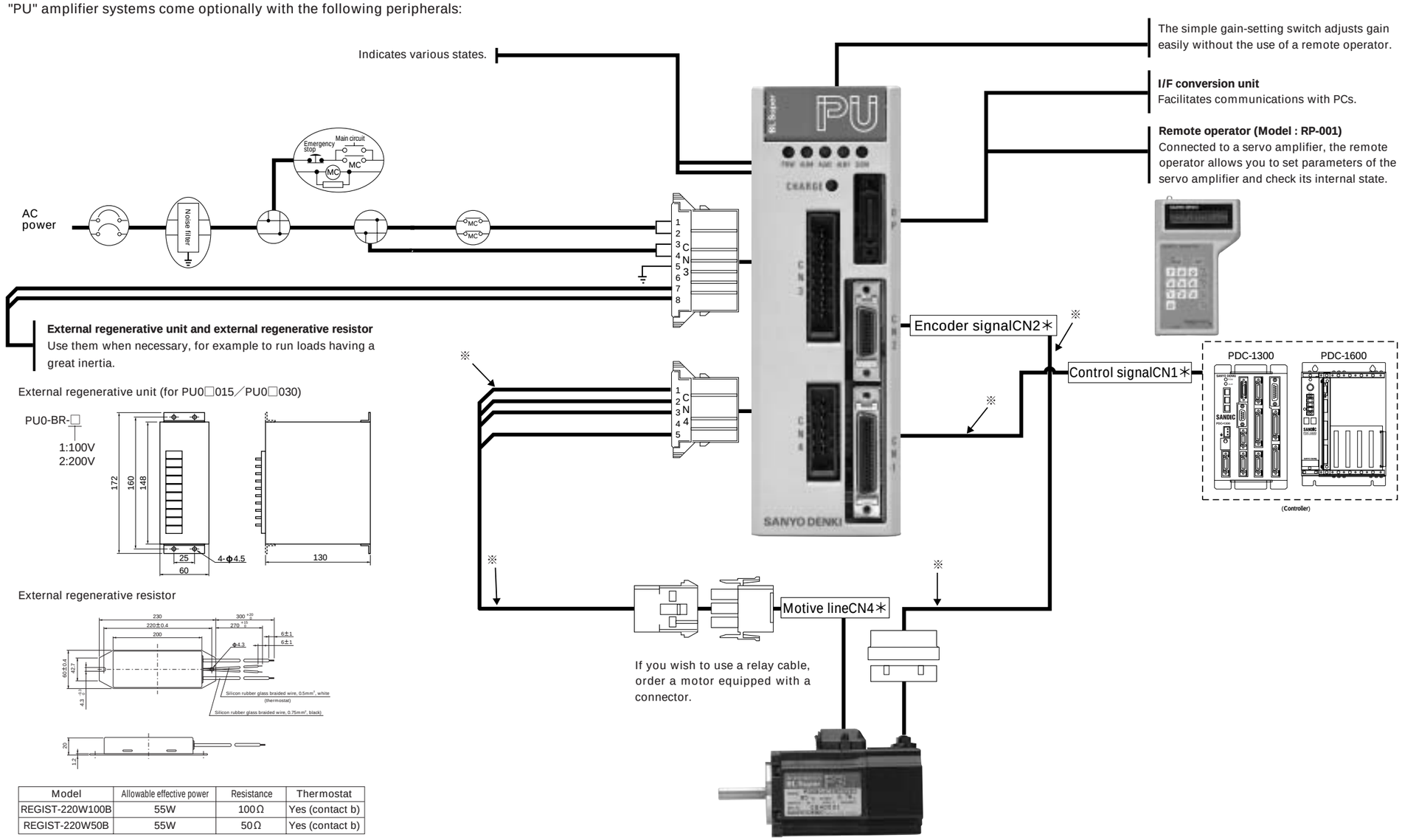
■Capacity
15A to 50A (3 types)

■Features
High rigidity

■Uses
Machines for precision machining
Lathes
Milling machines
Transfer machines
Machines for industrial industries

■Configuration diagram of a typical amplifier system

"PU" amplifier systems come optionally with the following peripherals:



External regenerative unit and external regenerative resistor
Use them when necessary, for example to run loads having a great inertia.

External regenerative unit (for PU0□015／PU0□030)

External regenerative resistor

Model	Allowable effective power	Resistance	Thermostat
REGIST-220W100B	55W	100Ω	Yes (contact b)
REGIST-220W50B	55W	50Ω	Yes (contact b)

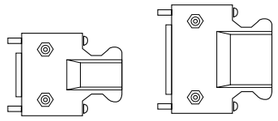
The simple gain-setting switch adjusts gain easily without the use of a remote operator.

I/F conversion unit
Facilitates communications with PCs.

Remote operator (Model : RP-001)
Connected to a servo amplifier, the remote operator allows you to set parameters of the servo amplifier and check its internal state.

If you wish to use a relay cable, order a motor equipped with a connector.

* Connectors for CN1, CN2, CN3, and CN4 are furnished with the servo amplifier.

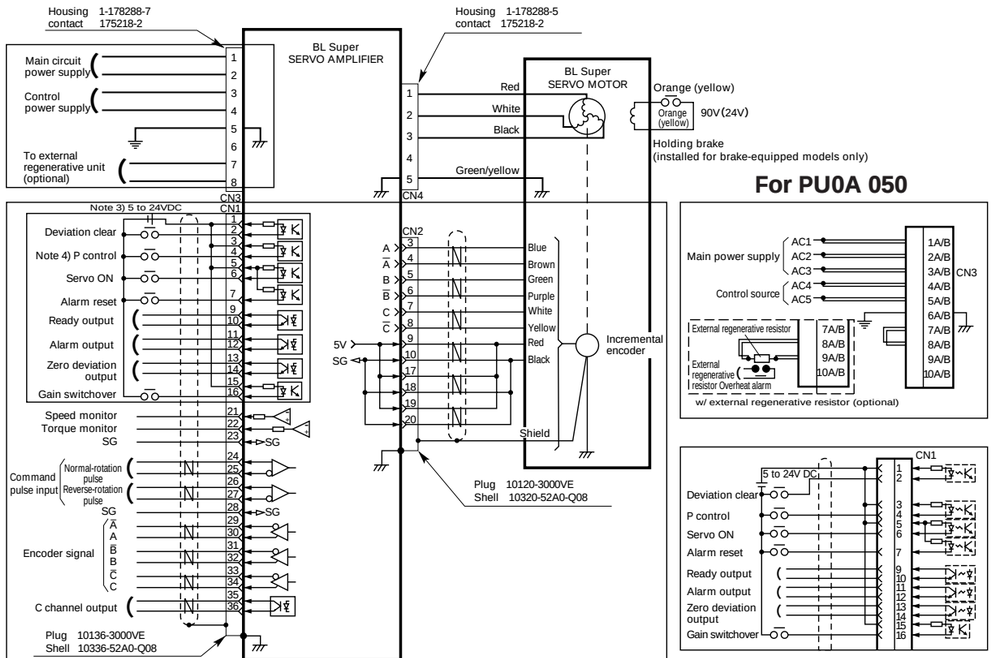


For the relay cable and extension cable, see page 67.

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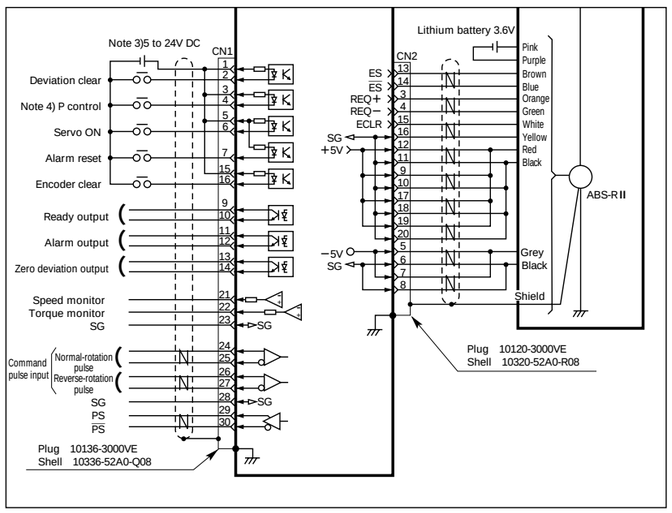
External connection diagram (position control type)

■Incremental encoder



For PU0A 050

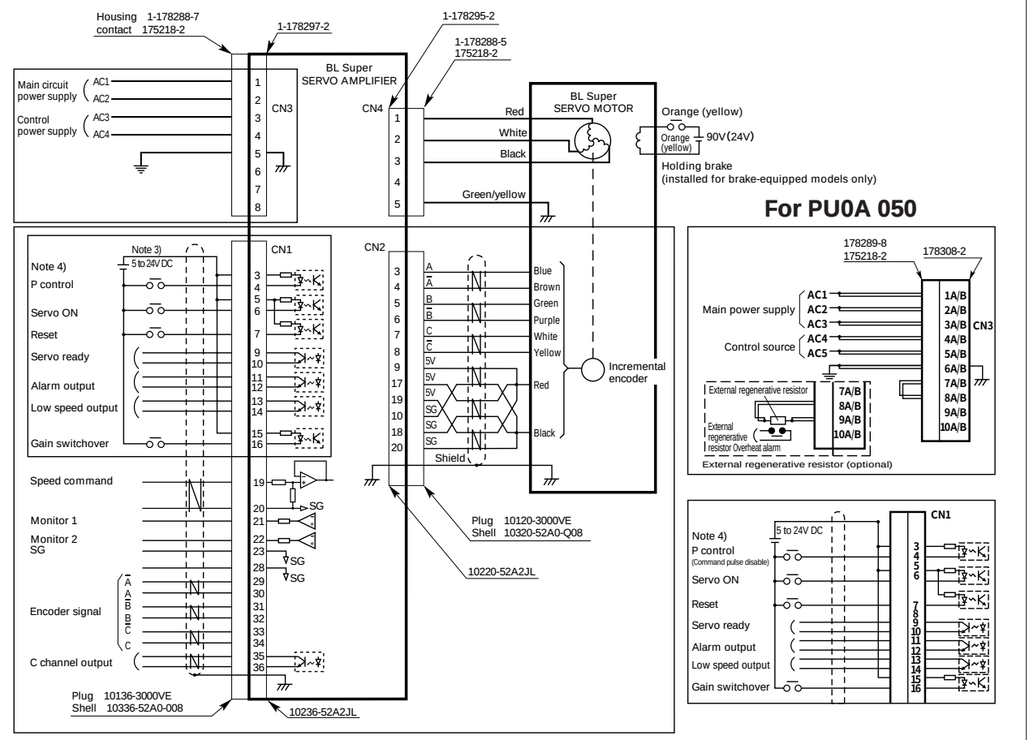
■Absolute sensor（ABS-RⅡ）



Note 1) For ⏦, use a covered shielded cable of the twisted pair type.
Note 2) For ——(thick-lined), use a cable AWG#16 and having a finish outside diameter of 2.8mm or smaller.
Note 3) The power supply must be provided by the customer.
Note 4) For the #4 pin of CN1, P control and command pulse disable can be selected on the remote operator.
* For ABS-RⅢ, see ABS-RⅡ.

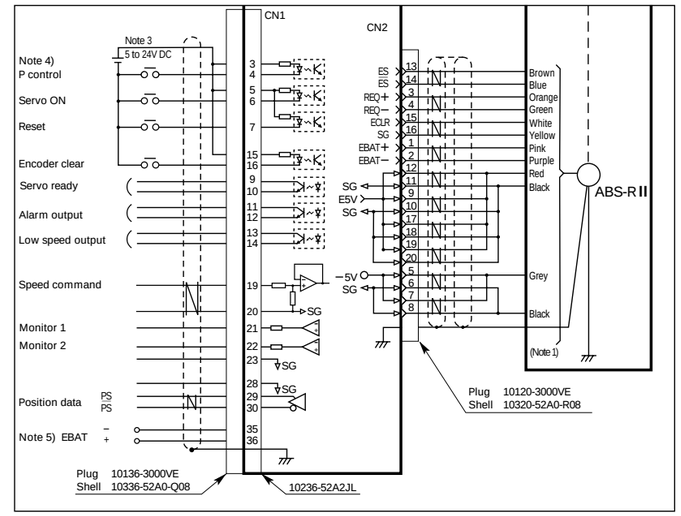
External connection diagram (speed control type)

■Incremental encoder



For PU0A 050

■Absolute sensor（ABS-RⅡ）



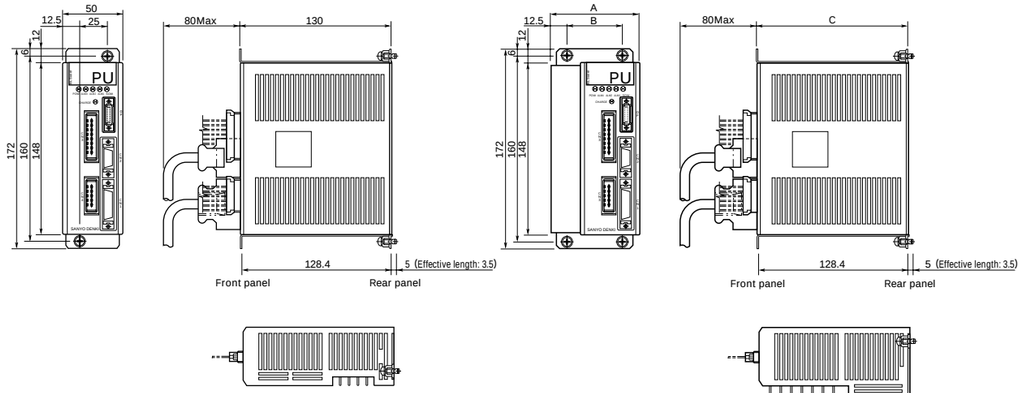
Note 1) For ⏦, use a covered shielded cable of the twisted pair type.
Note 2) For ——(thick-lined), use a cable AWG#16 and having a finish outside diameter of 2.8mm or smaller.
Note 3) The power supply must be provided by the customer.
Note 4) For the #4 pin of CN1, P control and command pulse disable can be selected on the remote operator.
Note 5) Make sure that you connect the encoder batteries (EBAT) with the correct polarity.
* For ABS-RⅢ, see ABS-RⅡ.

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Dimensions

PU0□015

PU0□030
PU0A050



Model	A	B	C
PU0□030	75	50	130
PU0A050	120.5	70	163.8

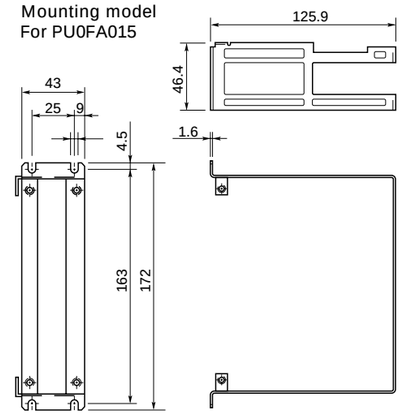
[unit:mm]

Options

Metal fittings for the "PU" series

"PU" amplifiers are equipped with a standard rear panel. Equipped with metal fittings, you can install the amplifier on the front panel or otherwise, in a variety of manners.

Mounting model
For PU0FA015

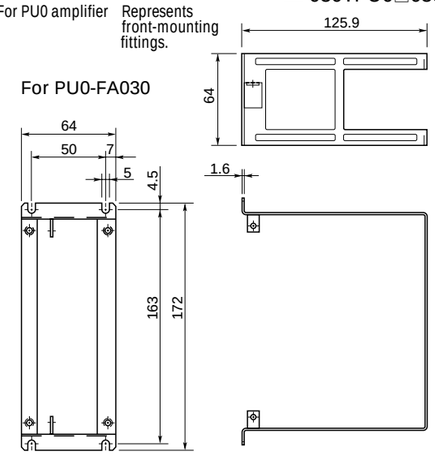


Front mounting model

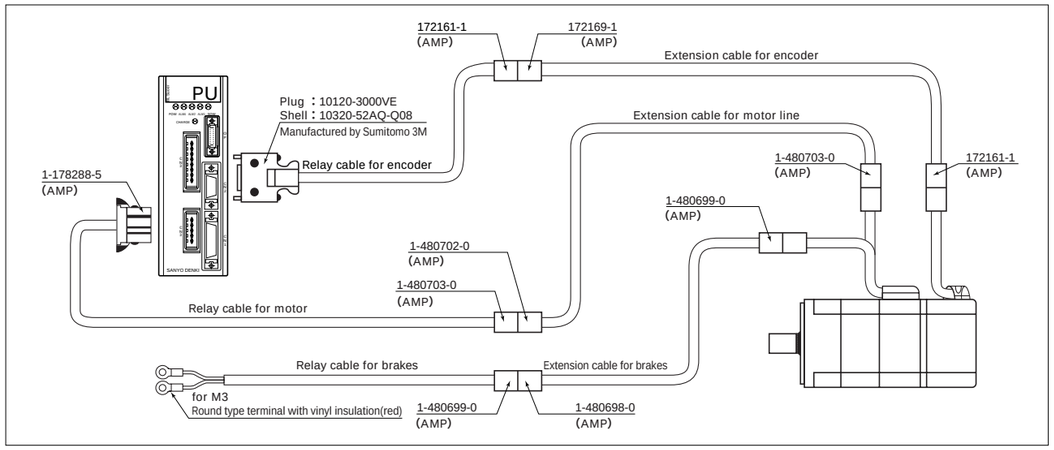
P U 0 — F A □ □ □

- For PU0 amplifier
- Represents front-mounting fittings.
- 015 : PU0□015E
- 030 : PU0□030E

For PU0-FA030



[unit:mm]



Remote operator

Connected to a servo amplifier, the remote operator allows you to set servo parameters and check its internal state.

Model RP-001

Common to "PU", "PZ", "PE", and "PV" amplifiers



Optional cable for PU0□015 and 030:
Wiring-saving incremental relay cable (between CN2 and sensor)

Model		L (m)
Connector to connector	Connector to lead	
PU0-CIS1R5	PU0-CI1R5	1.5
PU0-CIS03	PU0-CI03	3
PU0-CIS05	PU0-CI05	5

* The standard motor models are with a lead.

Extension cables

Model	L (m)
PU0-CIS05L	5
PU0-CIS10L	10
PU0-CIS15L	15

Relay cable (between CN4 and the motive line of the motor)

Model		L (m)
Connector to connector	Connector to lead	
PU0-CM1R5	PU0-C1R5	1.5
PU0-CM03	PU0-C03	3
PU0-CM05	PU0-C05	5

* The standard motor models are with a lead.

Extension cables

Model	L (m)
PU0-CM05L	5
PU0-CM10L	10
PU0-CM15L	15

* A standard cable can be combined with any of these extension cables to achieve a wiring length of up to 20m.

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"PZ" series

PZ
Servo amplifiers

P1 P2 P3 P5 P6 P8 SERCOS interface



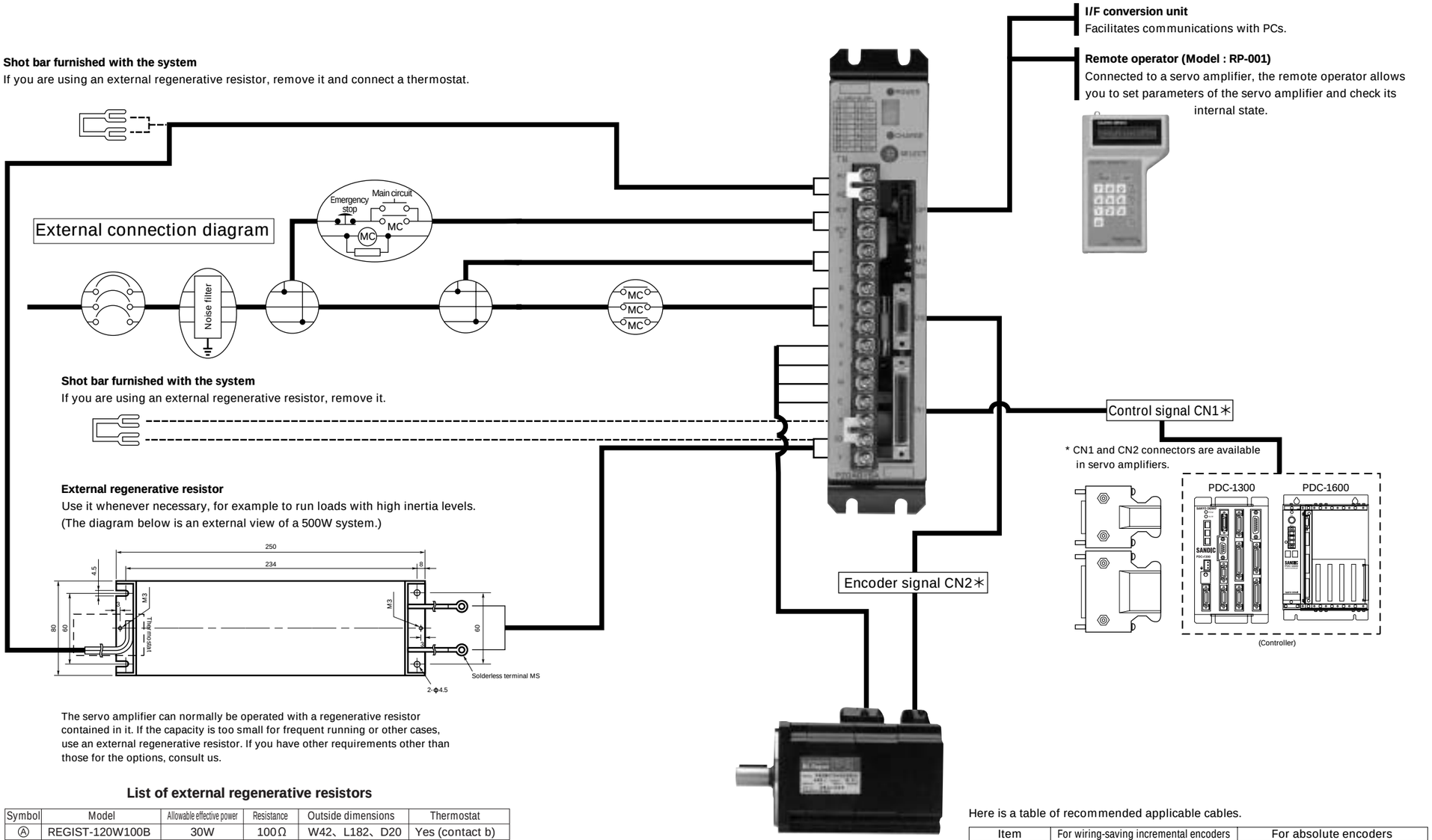
■Capacity
15A to 600A (8 types)

■Features
High rigidity

■Uses
Machines for precision machining
Lathes
Milling machines
Transfer machines
Machines for industrial industries

■Configuration diagram of a typical amplifier system

"PZ" amplifier systems come optionally with the following peripherals:



List of external regenerative resistors

Symbol	Model	Allowable effective power	Resistance	Outside dimensions	Thermostat
Ⓐ	REGIST-120W100B	30W	100Ω	W42、L182、D20	Yes (contact b)
Ⓑ	REGIST-120W50B	30W	50Ω	W42、L182、D20	Yes (contact b)
Ⓒ	REGIST-220W100B	55W	100Ω	W60、L230、D20	Yes (contact b)
Ⓓ	REGIST-220W50B	55W	50Ω	W60、L230、D20	Yes (contact b)
Ⓔ	REGIST-220W20B	55W	20Ω	W60、L230、D20	Yes (contact b)
Ⓕ	REGIST-500W20B	125W	20Ω	W80、L250、D40	Yes (contact b)
Ⓖ	REGIST-500W10B	125W	10Ω	W80、L250、D40	Yes (contact b)
Ⓗ	REGIST-500W7B	125W	7Ω	W80、L250、D40	Yes (contact b)
Ⓘ	REGIST-500W14B	125W	14Ω	W80、L250、D40	Yes (contact b)
Ⓙ	REGIST-1000W6R7B	250W	6.7Ω	W140、L340、D57	Yes (contact b)

Here is a table of recommended applicable cables.

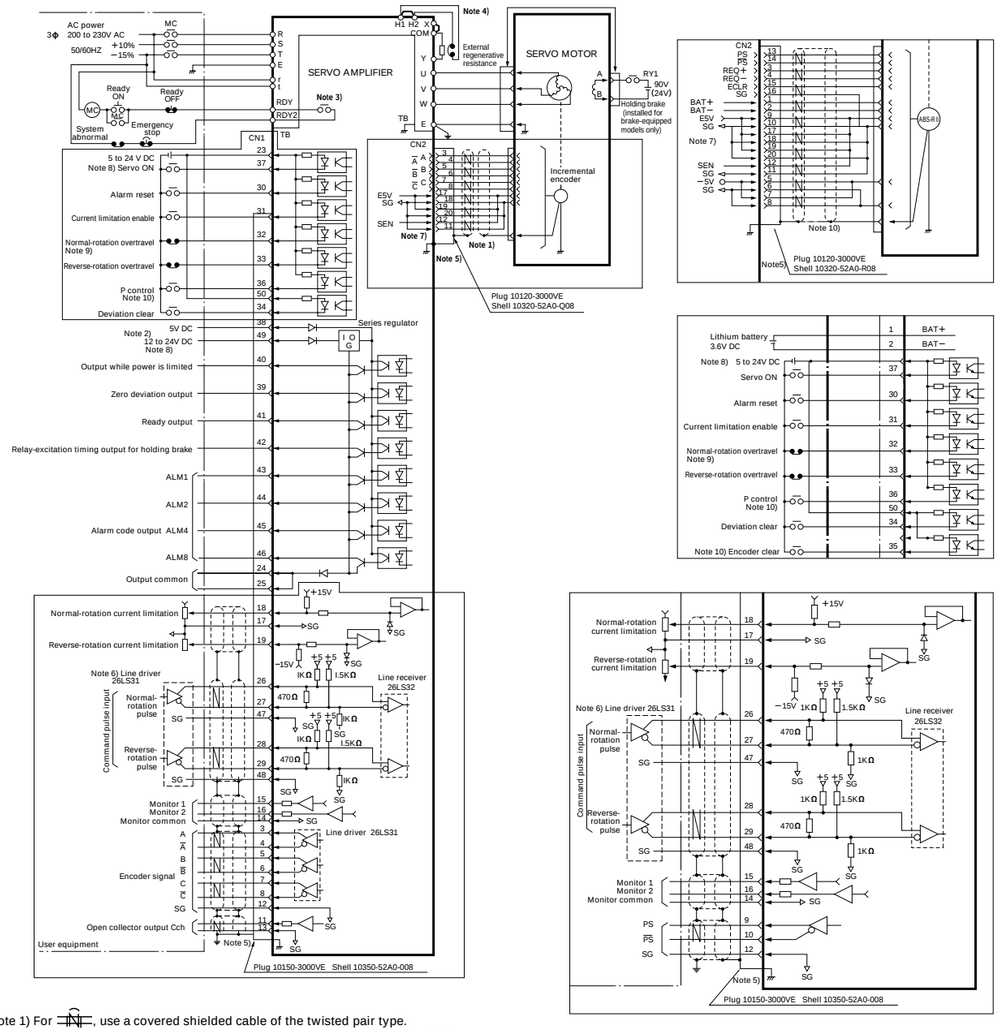
Item	For wiring-saving incremental encoders	For absolute encoders
Model	6879019-1	6870010-1
Connection system	Soldering	Soldering
Manufacturer	Tonichi Cable	Tatsuta Electric Wire & Cable
Outlined specification	6 pairs × 0.2mm² (tin-plated mild copper wire)	10 pairs × 0.2mm² (stranded wire of high-strength copper alloy)
Finish outside dia	8.0mm MAX	10.0mm MAX
Conductor resistance	91Ω/km MAX	123Ω/km MAX

Note 1 : The allowable wiring distance between servo amplifier and motor (PG) is 50m maximum when an applicable cable is used.
Note 2 : For use in a moving part, consult us.

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External connection diagram (position control type)

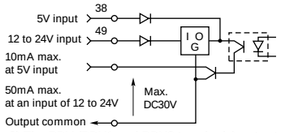
■Incremental encoder



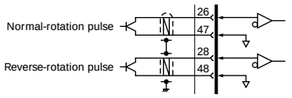
■Absolute Sensor (ABS-RⅡ)

Note 1) For ⊣N⊢, use a covered shielded cable of the twisted pair type.
Note 2) For the power supply, select from among the two types: 5V or 12 to 24V.

	CN1-38 pins	CN1-49 pins
Equipped with 5V power supply	Connection	Open
Equipped with 12 to 24V power supply	Open	Connection



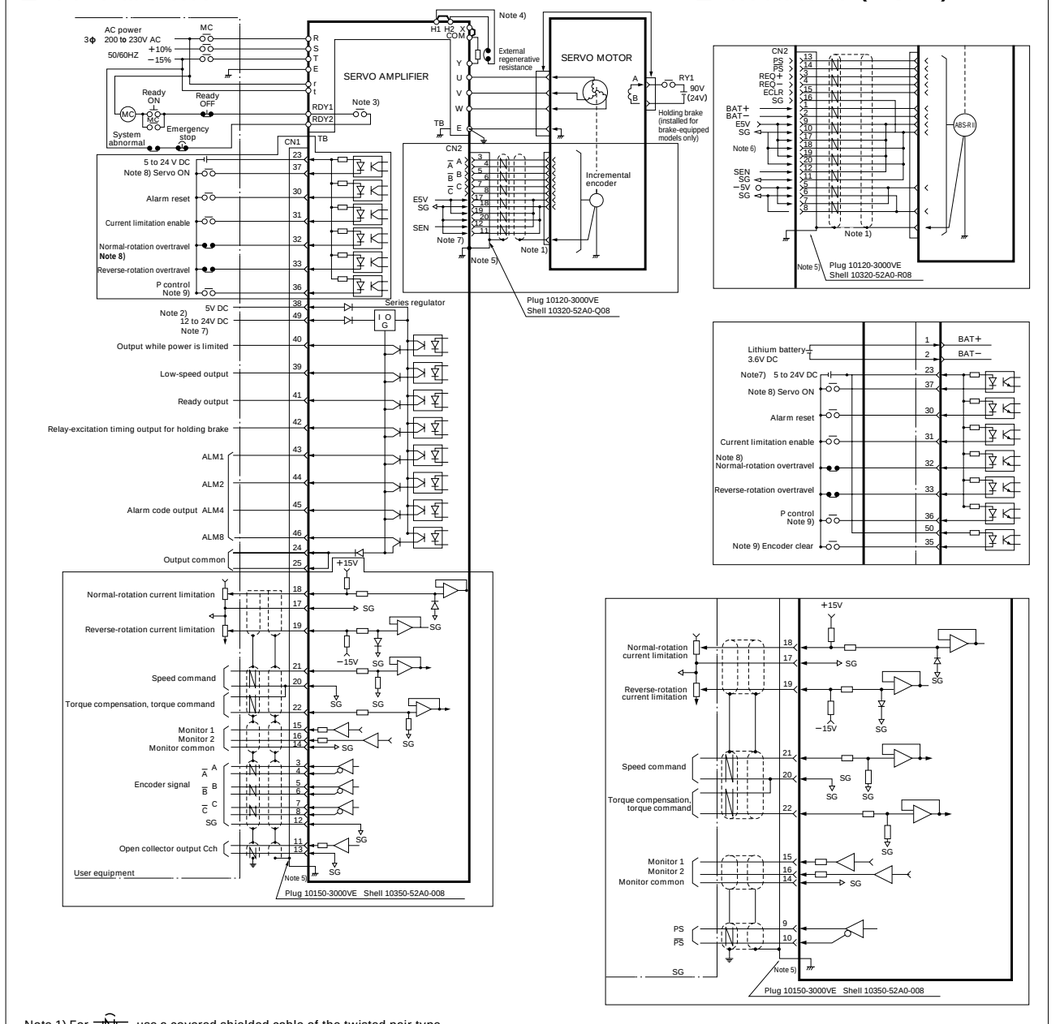
Note 3) The RDY (RDY1 and RDY2 terminals) outputs are contact outputs.
Contact ratings 250V AC 2A, 30V DC 2A Induced load (COSφ=0.4 L/R=7ms)
Note 4) If you wish to use an external regenerative resistor, remove the short bar between the X terminal and COM terminal and that between the H1 terminal and H2 terminal.
Note 5) Connect the shielded wire to the cable clamp of the connector.
Note 6) For connecting it to the open collector output:



Note 7) If you wish to use a sensor cable length of no more than 5m, you do not have to connect the pins 11, 12, 17, or 18 of the CN2.
Note 8) The power supply must be provided by the customer.
Note 9) You can delete this function or activate the contact-a input on the remote operator.
Note 10) For the pins 35 and 36 of the CN1, you can select on the remote operator from among the P control, command multiplication, command pulse disable input, and encoder clear (absolute sensor only).
* For the detailed external connections of ABS-E, PZA300, and other parts, see the operation manual.

External connection diagram (speed/torque control type)

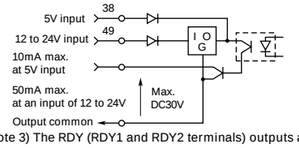
■Incremental encoder



■Absolute sensor (ABS-RⅡ)

Note 1) For ⊣N⊢, use a covered shielded cable of the twisted pair type.
Note 2) For the power supply, select from among the two types: 5V or 12 to 24V.

	CN1-38 pins	CN1-49 pins
Equipped with 5V power supply	Connection	Open
Equipped with 12 to 24V power supply	Open	Connection



Note 3) The RDY (RDY1 and RDY2 terminals) outputs are contact outputs.
Contact ratings 250V AC 2A, 30V DC 2A Induced load (COSφ=0.4 L/R=7ms)
Note 4) If you wish to use an external regenerative resistor, remove the short bar between the X terminal and COM terminal and that between the H1 terminal and H2 terminal.
Note 5) Connect the shielded wire to the cable clamp of the connector.
Note 6) If you wish to use a sensor cable length of no more than 5m, you do not have to connect the pins 11, 12, 17, or 18 of the CN2.
Note 7) The power supply must be provided by the customer.
Note 8) You can delete this function or activate the contact-a input on the remote operator.
Note 9) For the pins 35 and 36 of the CN1, you can select on the remote operator from among the P control, encoder clear (absolute sensor only), and zero clamp enable input.
* For the detailed external connections of ABS-E, PZA300, and other parts, see the operation manual.

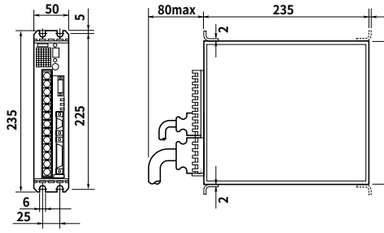
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PZ
Servo amplifiers

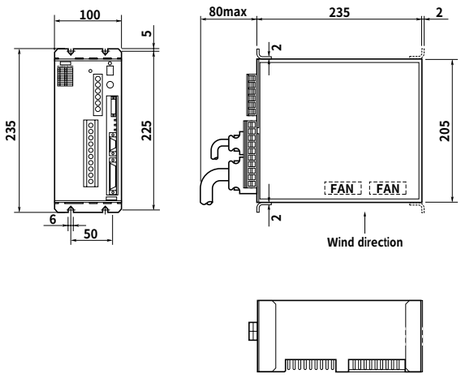
P1 P2 P3 P5 P6 P8 SERCOS interface

Dimensions

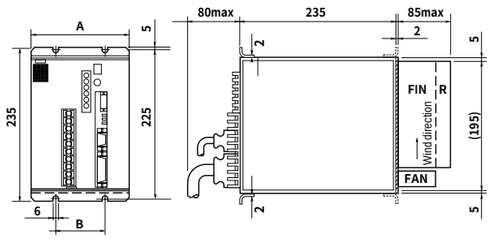
PZ0A015
PZ0A030

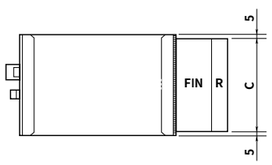


PZ0A050



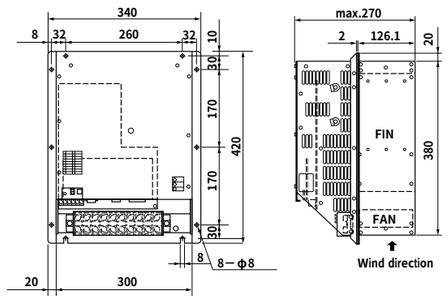
PZ1A050
PZ0A100
PZ0A150



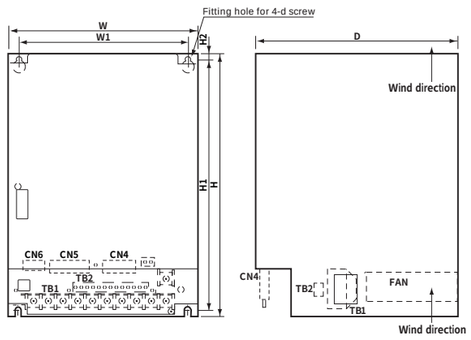


Model	A	B	C
PZ1A050	75	50	65
PZ0A100	100	50	90
PZ0A150	150	75	140

PZ0A300



PZ0A600



Model	Outside dimensions			Installed dimensions			
PZ0A-	W	H	D	W1	H1	H2	d
600	365	430	320	330	411	10	M8

Unit: mm

Options

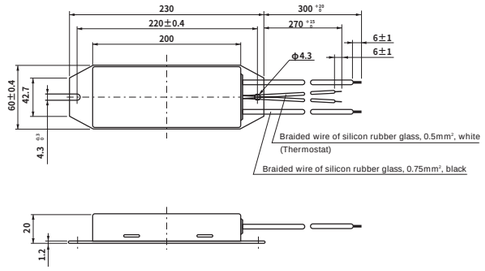
Remote operator

Connected to a servo amplifier, the remote operator allows you to set servo parameters and check its internal state.

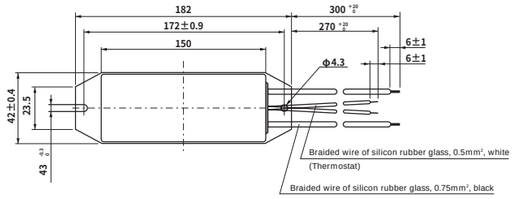
Model RP-001

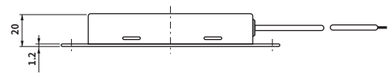
Common to "PU", "PZ", "PE", and "PV" amplifiers



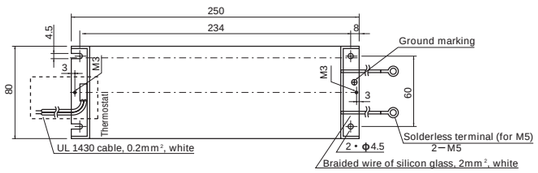


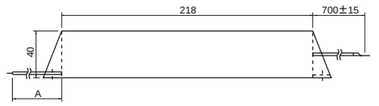
Dimensions of an external regenerative resistor [unit:mm]



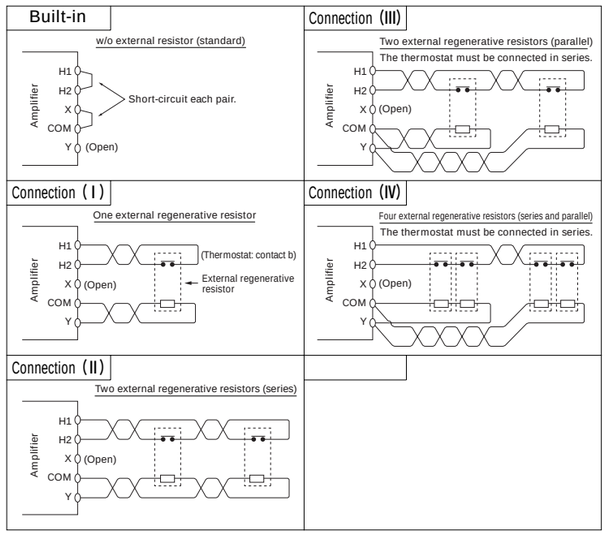


	Model	Remark
1	REGIST-120W100B	Thermostat, contact b
2	REGIST-120W50B	Thermostat, contact b





How to connect an external regenerative resistor



	Model	A	Remark
1	REGIST-500W20B	350±15	Thermostat, contact b
2	REGIST-500W20	——	Without thermostat
3	REGIST-500W10B	350±15	Thermostat, contact b
4	REGIST-500W10	——	Without thermostat
5	REGIST-500W7B	350±15	Thermostat, contact b
6	REGIST-500W7	——	Without thermostat
7	REGIST-500W14B	350±15	Thermostat, contact b
8	REGIST-500W14	——	Without thermostat

Unit : mm

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"PE" Series

PE
Servo amplifiers

P1 P2 P3 P5 P6 P8 TÜV CE



■Capacity
15A to 150A (4 types)

■Features
High rigidity

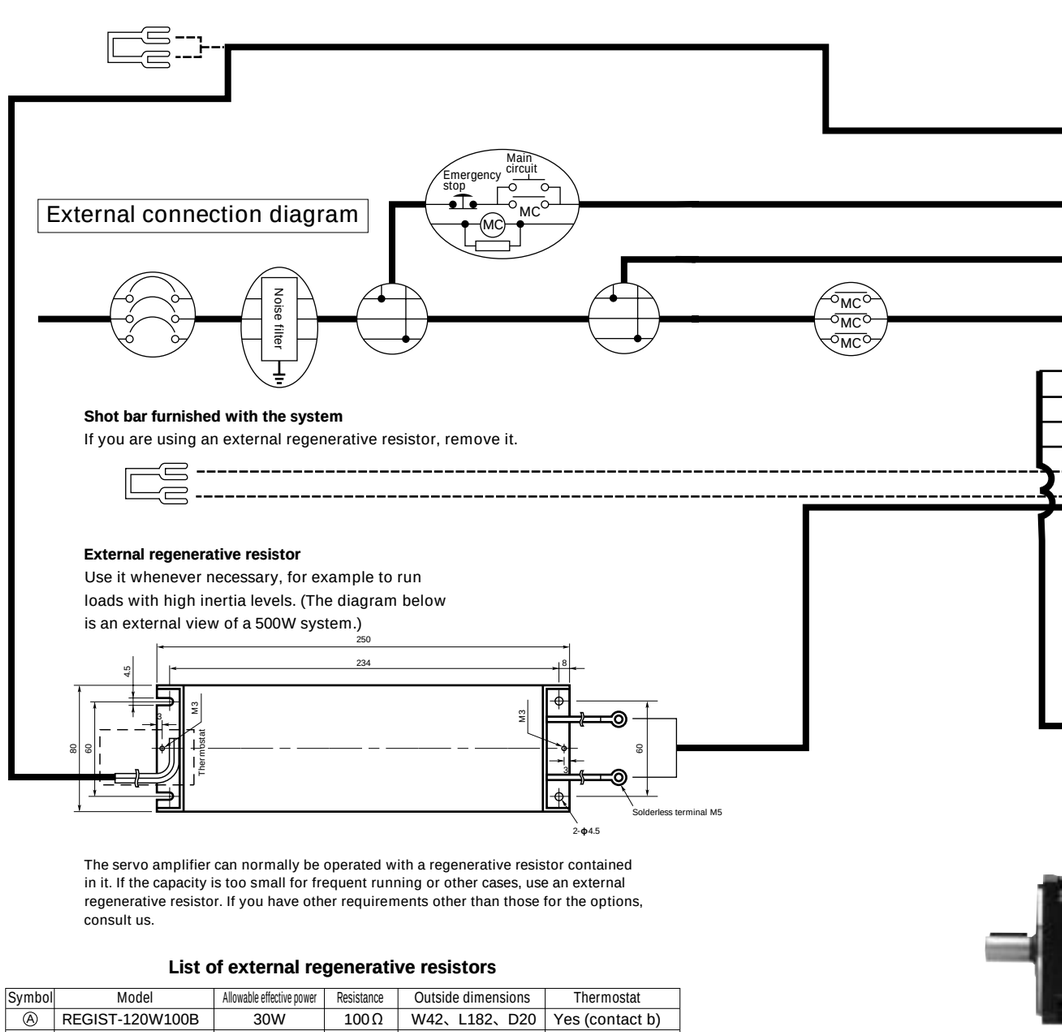
■Uses
Machines for precision machining
Lathes
Milling machines
Transfer machines
Machines for industrial industries

■Configuration diagram of a typical amplifier system

"PE" amplifier systems come optionally with the following peripherals:

Shot bar furnished with the system
If you are using an external regenerative resistor, remove it and connect a thermostat.

External connection diagram



Shot bar furnished with the system
If you are using an external regenerative resistor, remove it.

External regenerative resistor
Use it whenever necessary, for example to run loads with high inertia levels. (The diagram below is an external view of a 500W system.)

The servo amplifier can normally be operated with a regenerative resistor contained in it. If the capacity is too small for frequent running or other cases, use an external regenerative resistor. If you have other requirements other than those for the options, consult us.

I/F conversion unit
Facilitates communications with PCs.

Remote operato (Model : RP-001)
Connected to a servo amplifier, the remote operator allows you to set parameters of the servo amplifier and check its internal state.



List of external regenerative resistors

Symbol	Model	Allowable effective power	Resistance	Outside dimensions	Thermostat
Ⓐ	REGIST-120W100B	30W	100Ω	W42、L182、D20	Yes (contact b)
Ⓑ	REGIST-120W50B	30W	50Ω	W42、L182、D20	Yes (contact b)
Ⓒ	REGIST-220W100B	55W	100Ω	W60、L230、D20	Yes (contact b)
Ⓓ	REGIST-220W50B	55W	50Ω	W60、L230、D20	Yes (contact b)
Ⓔ	REGIST-220W20B	55W	20Ω	W60、L230、D20	Yes (contact b)
Ⓕ	REGIST-500W20B	125W	20Ω	W80、L250、D40	Yes (contact b)
Ⓖ	REGIST-500W10B	125W	10Ω	W80、L250、D40	Yes (contact b)
Ⓗ	REGIST-500W7B	125W	7Ω	W80、L250、D40	Yes (contact b)
Ⓘ	REGIST-500W14B	125W	14Ω	W80、L250、D40	Yes (contact b)
Ⓙ	REGIST-1000W6R7B	250W	6.7Ω	W140、L340、D57	Yes (contact b)

Here is a table of recommended applicable cables.

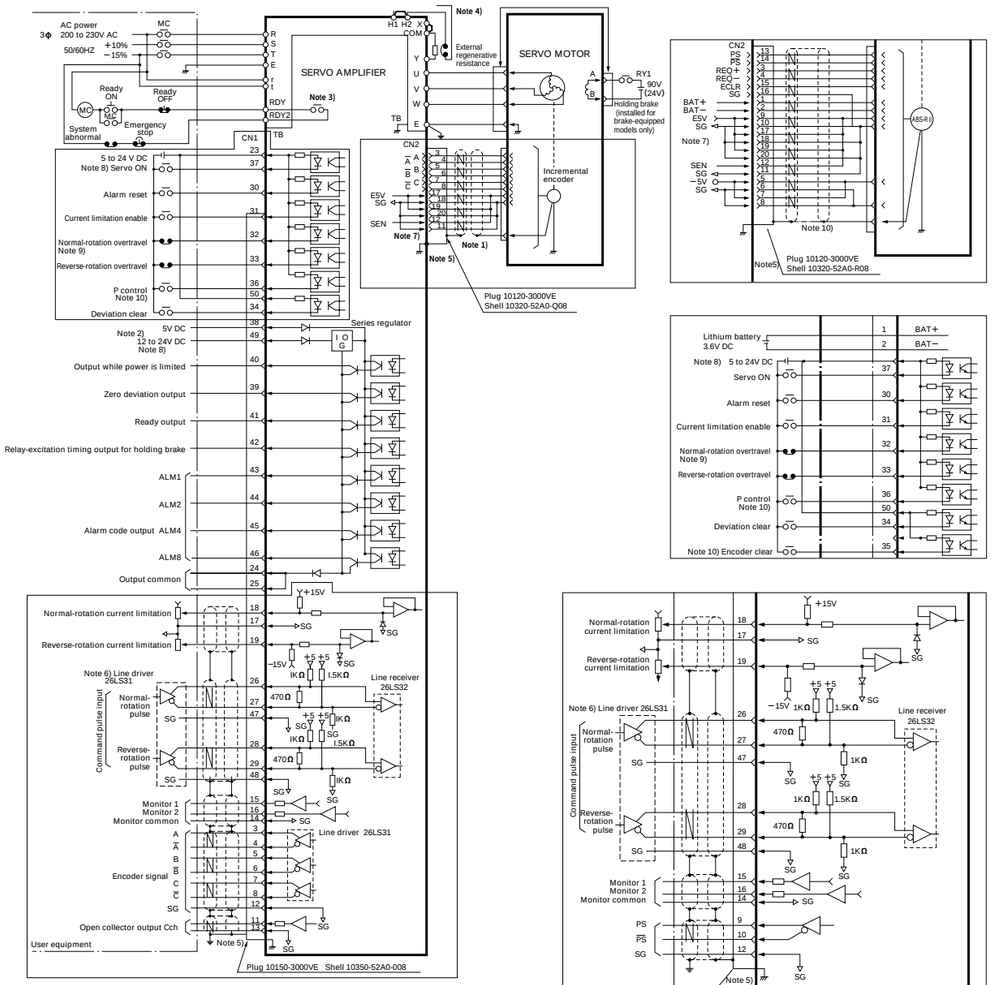
Item	For wiring-saving incremental encoders	For absolute encoders
Model	6879019-1	6870010-1
Connection system	Soldering	Soldering
Manufacturer	Tonichi Cable	Tatsuta Electric Wire & Cable
Outlined specification	6 pairs × 0.2mm² (tin-plated mild copper wire)	10 pairs × 0.2mm² (stranded wire of high-strength copper alloy)
Finish outside dia	8.0mm MAX	10.0mm MAX
Conductor resistance	91Ω/km MAX	123Ω/km MAX

Note 1: The allowable wiring distance between servo amplifier and motor (PG) is 50m maximum when an applicable cable is used.
Note 2: For use in a moving part, consult us.

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External connection diagram (position control type)

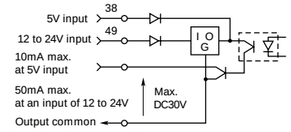
■Incremental encoder



■Absolute sensor (ABS-R Ⅱ)

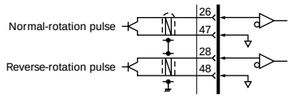
Note 1) For ⊣N⊢, use a covered shielded cable of the twisted pair type.
Note 2) For the power supply, select from among the two types: 5V or 12 to 24V.

	CN1-38 pins	CN1-49 pins
Equipped with 5V power supply	Connection	Open
Equipped with 12 to 24V power supply	Open	Connection



Note 3) The RDY (RDY1 and RDY2 terminals) outputs are contact outputs.
Contact ratings 250V AC 2A, 30V DC 2A — Induced load (COSφ=0.4 L/R=7ms)
Note 4) If you wish to use an external regenerative resistor, remove the short bar between the X terminal and COM terminal and that between the H1 terminal and H2 terminal.

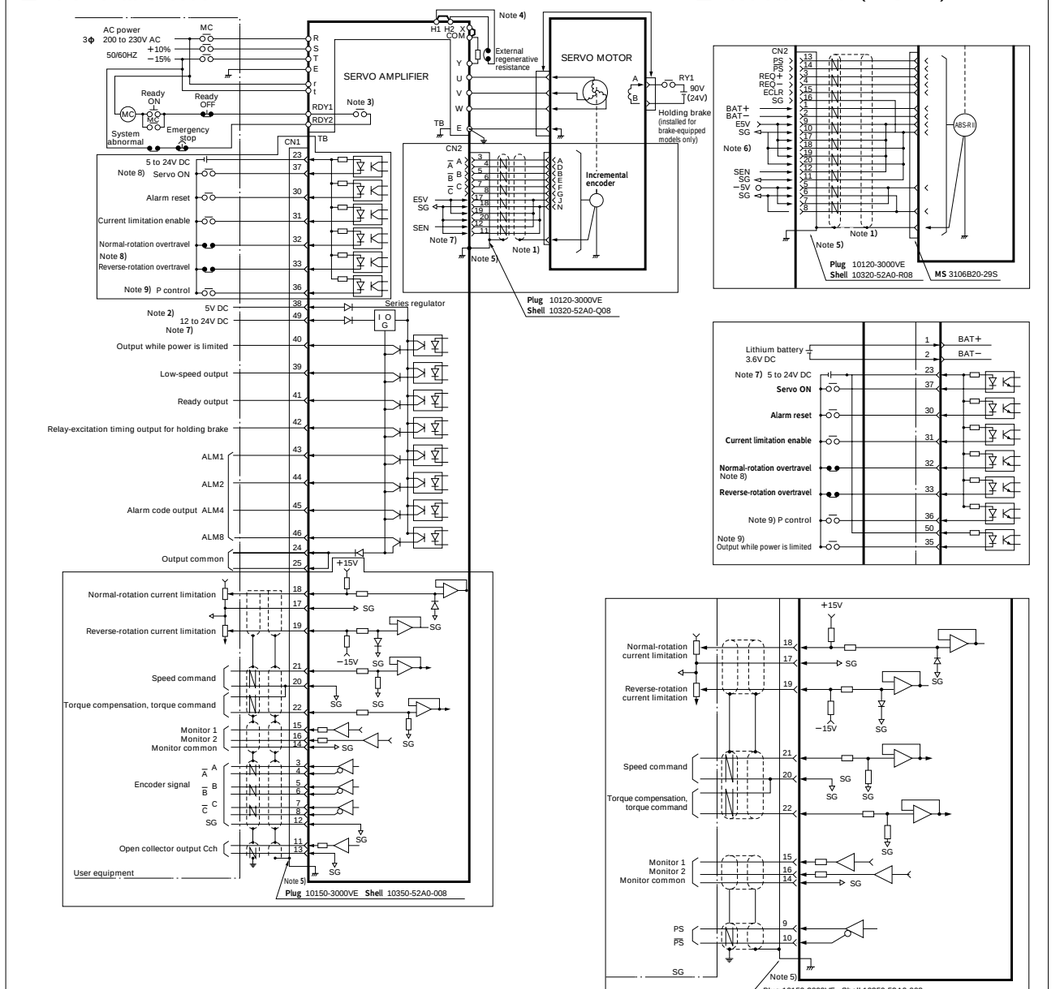
Note 5) Connect the shielded wire to the cable clamp of the connector.
Note 6) For connecting it to the open collector output:



Note 7) If you wish to use a sensor cable length of no more than 5m, you do not have to connect the pins 11, 12, 17, or 18 of the CN2.
Note 8) The power supply must be provided by the customer.
Note 9) You can delete this function or activate the contact-a input on the remote operator.
Note 10) For the pins 35 and 36 of the CN1, you can select on the remote operator from among the P control, command multiplication, command pulse disable input, and encoder clear (absolute sensor only).
* For the detailed external connections of ABS-E, PZ0A300, and other parts, see the operation manual.

External connection diagram (speed/torque control type)

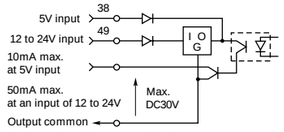
■Incremental encoder



■Absolute sensor (ABS-R Ⅱ)

Note 1) For ⊣N⊢, use a covered shielded cable of the twisted pair type.
Note 2) For the power supply, select from among the two types: 5V or 12 to 24V.

	CN1-38 pins	CN1-49 pins
Equipped with 5V power supply	Connection	Open
Equipped with 12 to 24V power supply	Open	Connection



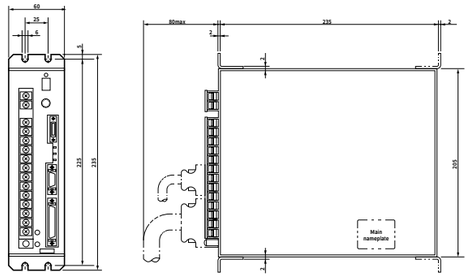
Note 3) The RDY (RDY1 and RDY2 terminals) outputs are contact outputs.
Contact ratings 250V AC 2A, 30V DC 2A — Induced load (COSφ=0.4 L/R=7ms)
Note 4) If you wish to use an external regenerative resistor, remove the short bar between the X terminal and COM terminal and that between the H1 terminal and H2 terminal.

Note 5) Connect the shielded wire to the cable clamp of the connector.
Note 6) If you wish to use a sensor cable length of no more than 5m, you do not have to connect the pins 11, 12, 17, or 18 of the CN2.
Note 7) The power supply must be provided by the customer.
Note 8) You can delete this function or activate the contact-a input on the remote operator.
Note 9) For the pins 35 and 36 of the CN1, you can select on the remote operator from among the P control, encoder clear (absolute sensor only), and zero clamp enable input.
* For the detailed external connections of ABS-E, PZ0A300, and other parts, see the operation manual.

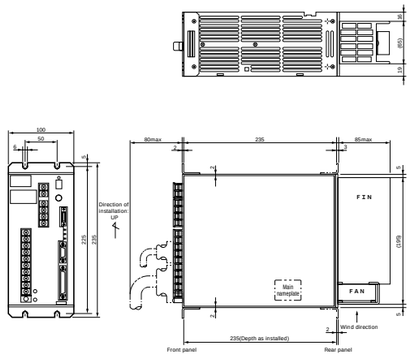
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Dimensions

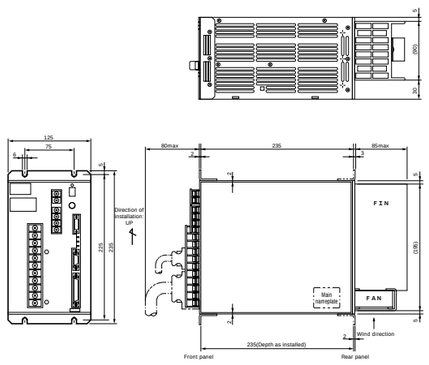
PE2A15A
PE2A30A



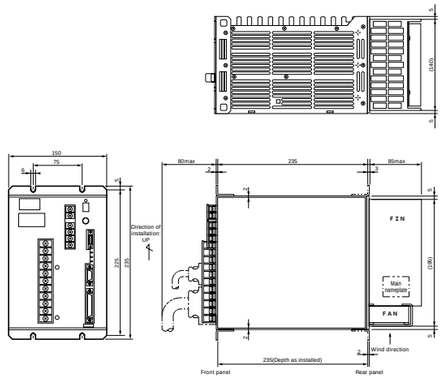
PE2A50A



PE2A100A



PE2A150A



[unit:mm]

Options

Remote operator

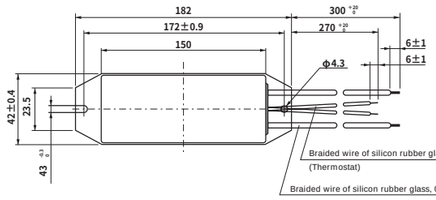
Connected to a servo amplifier, the remote operator allows you to set servo parameters and check its internal state.

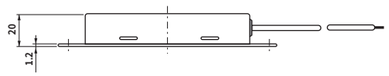
Model No. RP-001 :

Common to "PU", "PZ", "PE", and "PV" amplifiers

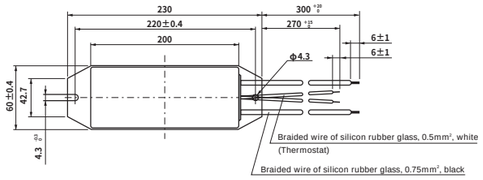


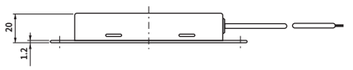
Dimensions [unit:mm]



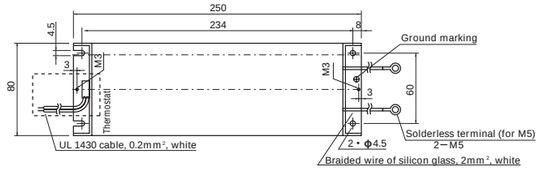


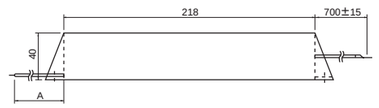
	Model	Remark
1	REGIST-120W100B	Thermostat, contact b
2	REGIST-120W50B	Thermostat, contact b



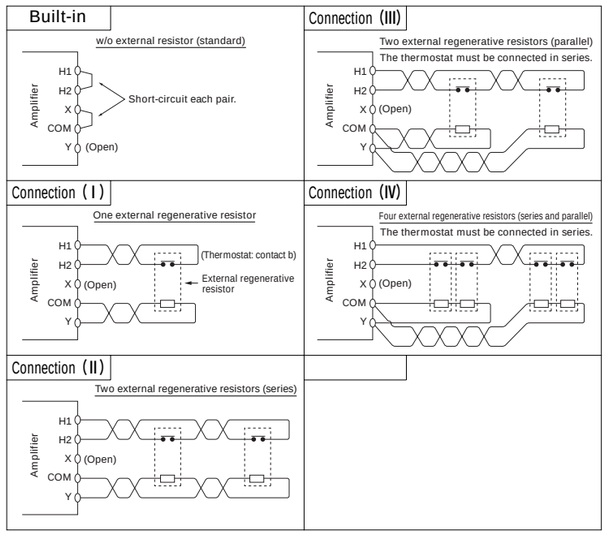


	Model	Remark
1	REGIST-220W50B	Thermostat, contact b
2	REGIST-220W20B	Thermostat, contact b
3	REGIST-220W100B	Thermostat, contact b





How to connect an external regenerative resistor



	Model	A	Remark
1	REGIST-500W20B	350±15	Thermostat, contact b
2	REGIST-500W20	——	Without thermostat
3	REGIST-500W10B	350±15	Thermostat, contact b
4	REGIST-500W10	——	Without thermostat
5	REGIST-500W7B	350±15	Thermostat, contact b
6	REGIST-500W7	——	Without thermostat
7	REGIST-500W14B	350±15	Thermostat, contact b
8	REGIST-500W14	——	Without thermostat

Unit: mm

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"PV" Series

PV
Servo amplifiers

P3 P5 P6 TÜV CE



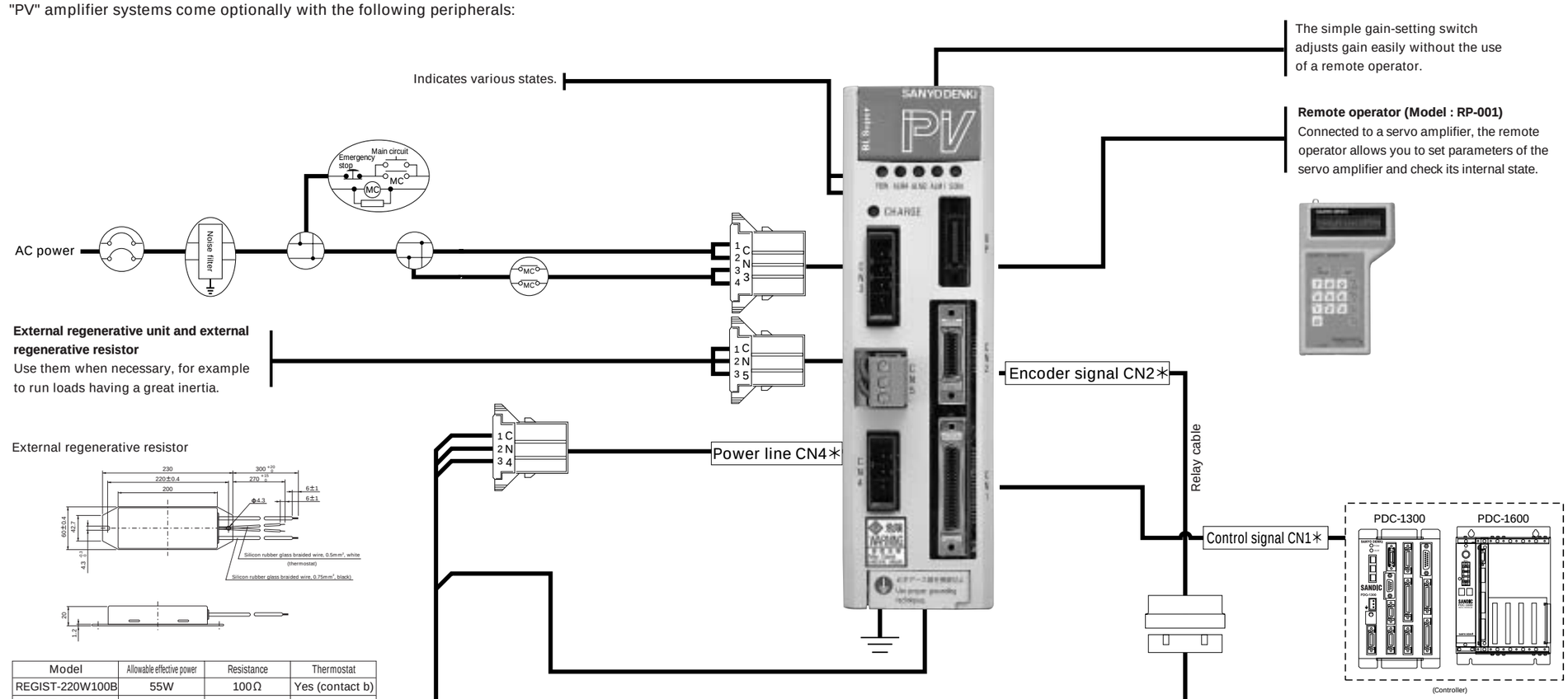
■Capacity
15A to 30A (2 types)

■Features
High rigidity

■Uses
Machines for precision machining
Lathes
Milling machines
Transfer machines
Machines for industrial industries

■Configuration diagram of a typical amplifier system

"PV" amplifier systems come optionally with the following peripherals:



Model	Allowable effective power	Resistance	Thermostat
REGIST-220W100B	55W	100Ω	Yes (contact b)
REGIST-220W50B	55W	50Ω	Yes (contact b)

Relay cable for encoder (common with PU0)

Model		L (m)
Connector to connector	Connector to lead	
PU0-CIS1R5	PU0-CI1R5	1.5
PU0-CIS03	PU0-CI03	3
PU0-CIS05	PU0-CI05	5

* The standard motor models have a lead.

Extension cable for encoder (common with PU0)

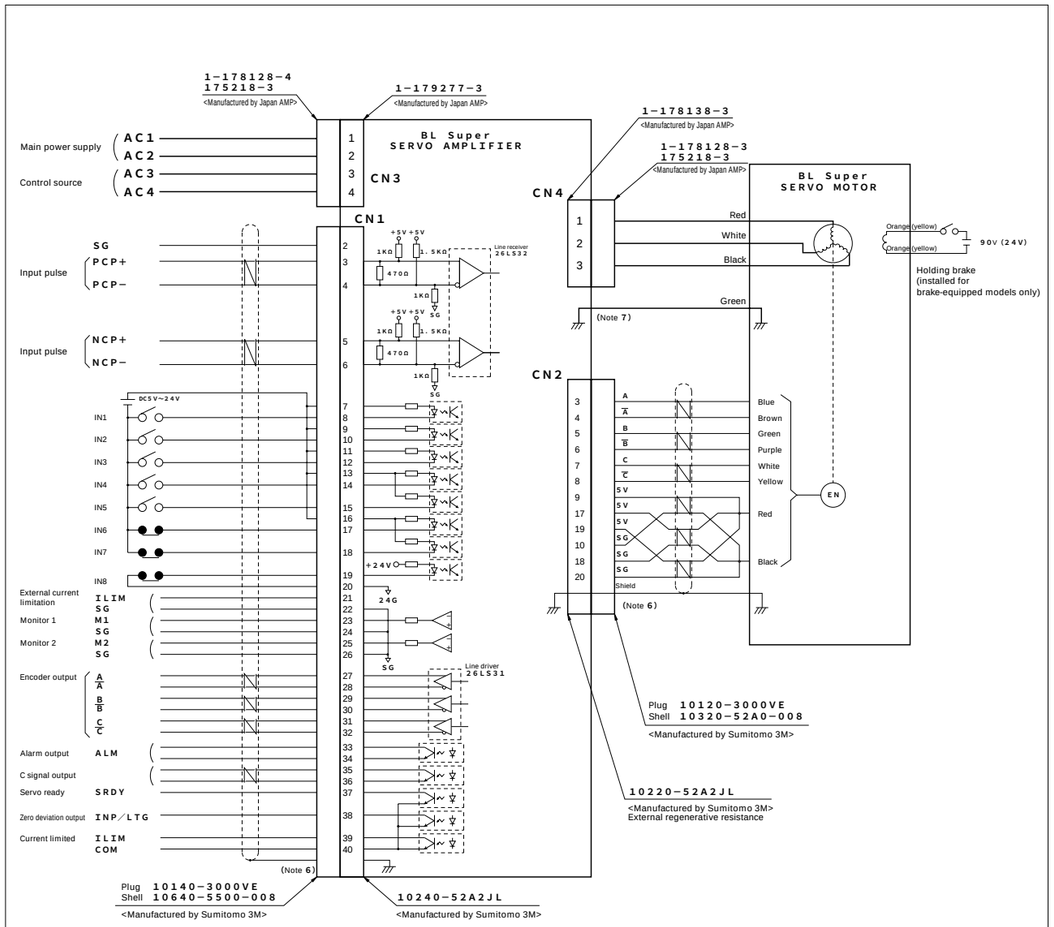
Model	L (m)
PU0-CIS05L	5
PU0-CIS10L	10
PU0-CIS15L	15

* For the relay cable and extension cable, see page 67.

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External connection diagram (position/torque control type)



Note 1) For ⊣⊢, use a covered shielded cable of the twisted pair type.

Note 2) <Applicable cable> AWG#16 wire

Note 3) The power supply for IN1 through IN7 must be provided by the customer.

Note 4) ( ) represents a case with a 24V holding brake.

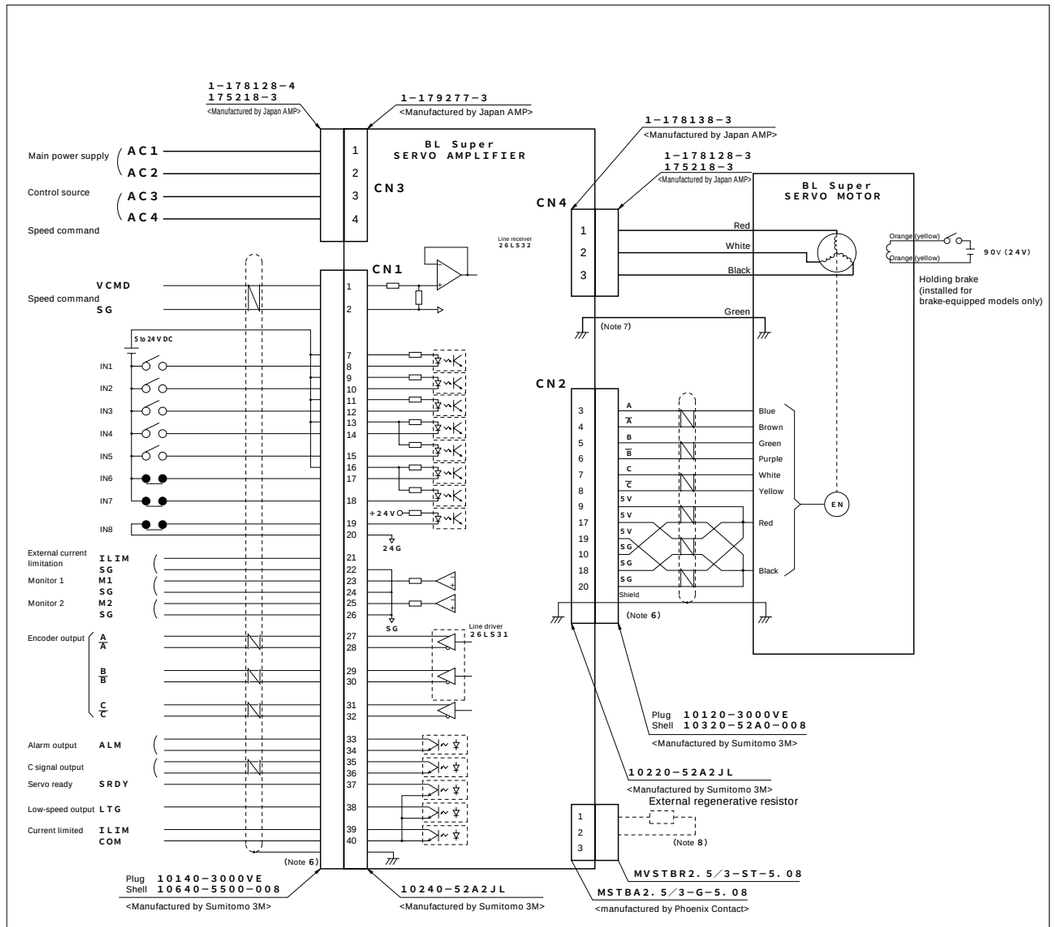
Note 5) Main power supply and control power supply

	Main power supply	Main power supply
	AC1 to AC2	AC3 to AC4
PV1	AC200	AC200

Note 6) Connect the shielded wire to the cable clamp of the connector.

Note 7) The ground conductor of the motor must be connected to the ground tap of the servo amplifier.

External connection diagram (speed/torque control type)



Note 1) For ⊣⊢, use a covered shielded cable of the twisted pair type.

Note 2) <Applicable cable>AWG#16 wire

Note 3) The power supply for IN1 through IN7 must be provided by the customer.

Note 4) ( ) represents a case with a 24V holding brake.

Note 5) Main power supply and control power supply

	Main power supply	Main power supply
	AC1 to AC2	AC3 to AC4
PV1	AC200	AC200

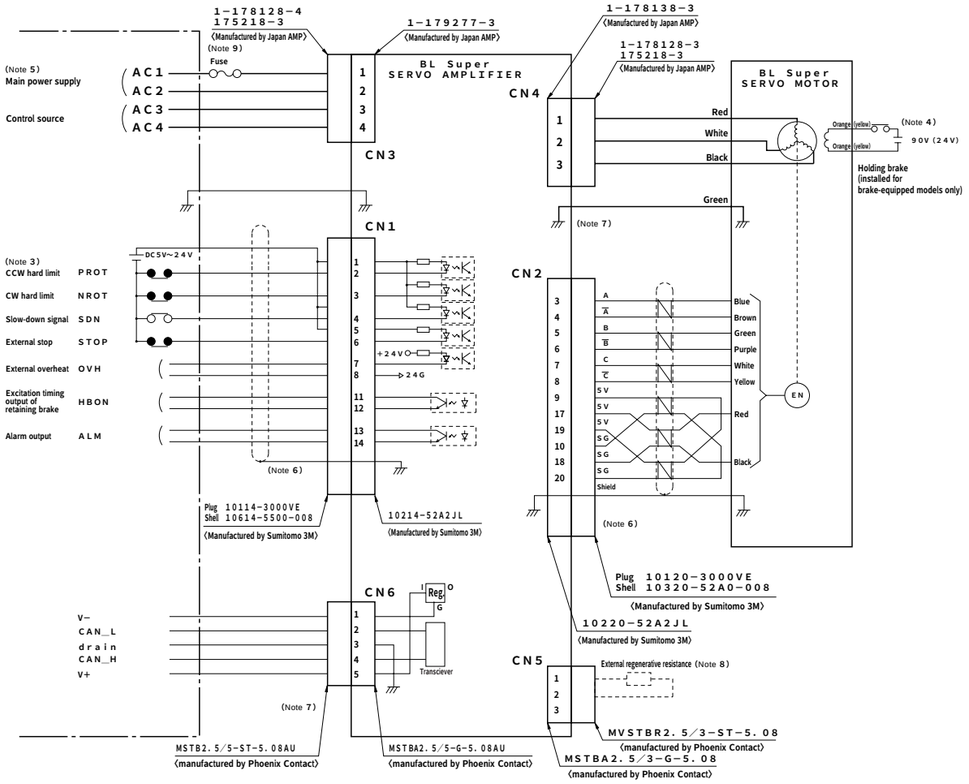
Note 6) Connect the shielded wire to the cable clamp of the connector.

Note 7) The ground conductor of the motor must be connected to the ground tap of the servo amplifier.

Note 8) Regenerative resistor
The standard type regenerative resistor is connected with t he internal regenerative resistor through CN5. When using the external regenerative resistor, remove CN5 and newly insert the external regenerative resistor into CN5.

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External connection diagram (of the CAN and DeviceNet types)



Note 1) For , uuse a covered shielded cable of the twisted pair type.

Note 2) <Applicable cable> AWG#16 wire

Note 3) The power supply for IN1, IN2, IN3, IN4, IN5, IN6, IN7 must be provided by the customer.

Note 4) ( ) represents a case with a 24V holding brake.

Note 5) Main power supply and control power supply

	Main power supply	Main power supply
	AC1 to AC2	AC3 to AC4
PV1	AC200	AC200

Note 6) Connect the shielded wire to the cable clamp of the connector.

Note 7) The ground conductor of the motor must be connected to the ground tap of the servo amplifier.

Note 8) Regenerative resistor
A standard regenerative resistor is connected to the internal regenerative resistor via CN5. If you wish to use an external regenerative resistor, remove the CN5 and insert another external regenerative resistor into CN5.

Note 9) Fuse capacity

Model	Fuse
PV1A015	15A
PV1A030	20A

Functions of input signals (For details, see the manual.)

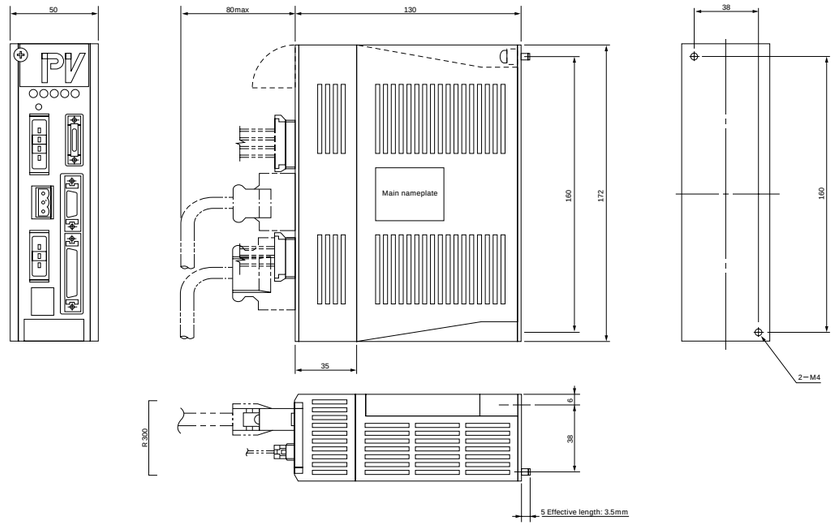
Input signal	Speed control, position control, and torque control types		Speed selection type	
	Standard function (abbreviation)	Function selection (abbreviation)	Function selection (abbreviation)	
IN1	Servo ON (SON)	————————	Servo ON (SON)	Speed selection 2 (VC2) Acceleration/deceleration selection (TA1)
IN2	Alarm reset (ARST)	————————	Alarm reset (ARST)	————————
IN3	Deviation clear (HCLR)	Current limitation enable (ILM) Command disable (INH/ZCMD) Command multiplication enable (PMUL)	Acceleration selection Q (TAQ)	Current limitation enable (ILM)
IN4	Proportional control of speed line (PCON)	————————	Normal-rotation command (CCW)	Reverse-rotation command (CW)
IN5	Current limitation enable (ILM)	————————	Reverse-rotation command (CW)	Normal-rotation command (CCW)
IN6	————————	Normal-rotation overtravel (PROT)	Speed selection Q (VCQ)	Normal-rotation overtravel (PROT)
IN7	————————	Reverse-rotation overtravel (NROT)	Speed selection I (VCI)	Reverse-rotation overtravel (NROT)
IN8	————————	External heatup (EXOH)	————————	External heatup (EXOH)

- IN6 through 8 need no connection if you decide not to select functions.
- IN8 is an input for connecting the thermal output of the external regenerative resistor. (If you wish to use one, select functions on the operator.)
- For the external current limitation input, select functions on the operator. It will not become effective unless you enter an ILM.
- The speed selective type is optional. The standard type is not applicable.

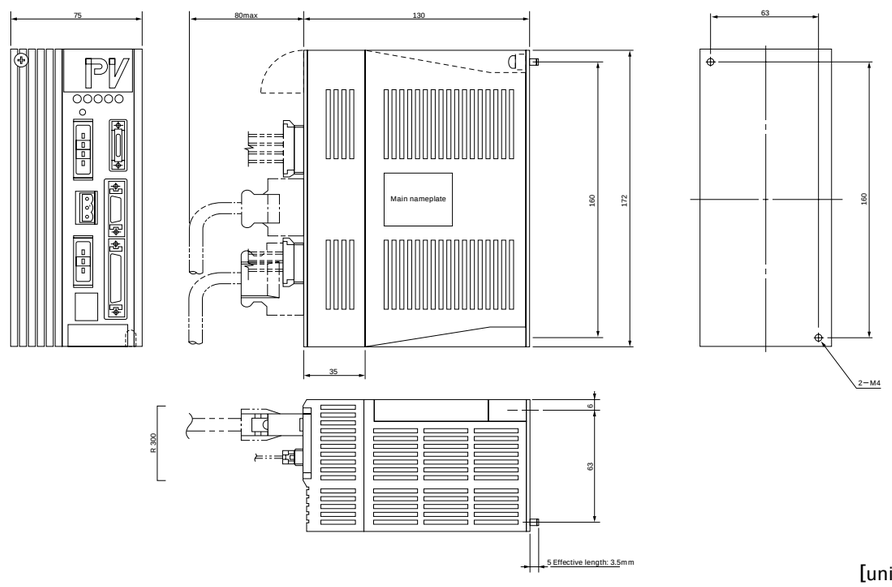
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Dimensions

PV1A015



PV1A030



[unit:mm]

Options

Remote operator

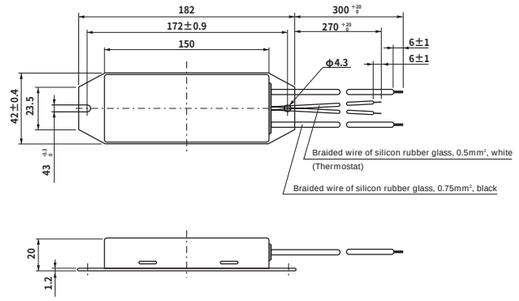
Connected to a servo amplifier, the remote operator allows you to set servo parameters and check its internal state.

Model RP-001 :

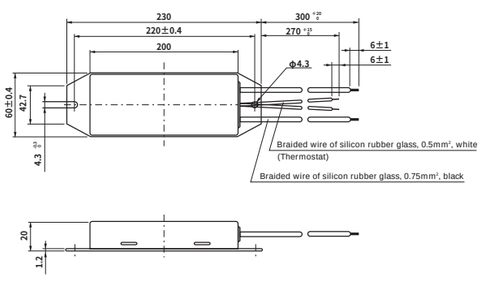
Common to "PU", "PZ", "PE", and "PV" amplifiers



Dimensions of an external regenerative resistor [unit:mm]



Model	Remark
REGIST-120W100B	Thermostat, contact b



Model	Remark
REGIST-220W100B	Thermostat, contact b

Relay cables

If you wish to use a relay cable, order an appropriate model according to the information given below.
All cables can be common with PU0.

Relay cables for encoders
(connector to connector)

Model	L (m)
PU0-CIS1R5	1.5
PU0-CIS03	3
PU0-CIS05	5

Relay cables for brakes

Model	L (m)
PU0-CBM1R5	1.5
PU0-CBM03	3
PU0-CBM05	5

Extension cables for encoders

Model	L (m)
PU0-CIS05L	5
PU0-CIS10L	10
PU0-CIS15L	15

Extension cables for brakes

Model	L (m)
PU0-CBM05L	5
PU0-CBM10L	10
PU0-CBM15L	15

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