Position sensing cylinders using absolute type

- The position sensor applying a magneto-striction phenomenon enables high-accuracy absolute position detection.
- No sensor is needed for original position setting, and position correction is not required.
- Space-saving design and easy to install.
- Since cushions can be provided as standard, they can be used for general switching valves without any problem.
- They are applicable to wide variations of highly appreciated 70/140H-8 Series.

Standard Specifications

Type	General purpose type	
Nominal pressure	7 MPa	14 MPa
Maximum allowable pressure	9 MPa	18 MPa
Proof test pressure	21 MPa	
Minimum operating pressure	Cap side: 0.3 MPa or less Rod side: 0.45 MPa or less	
Working speed range	ϕ50·63 : 8 to 400mm/s ϕ80 to 125 : 8 to 300mm/s ϕ140 to 250: 8 to 200mm/s	
Working temperature range (ambient temperature)	Standard type: −10 to +80℃ Switch Set (AX/AZ type): −10 to +70℃ Switch Set (WR/WS type): −10 to +60℃ (No freezing)	
Structure of cushioning	Metal fitting system	
Adaptable fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)	
Tolerance for thread	JIS 6g/6H	
Tolerance of strokes	0 to 100 mm $^{+0.8}_{0}$ 101 to 250mm $^{+1.0}_{0}$ 251 to 630mm $^{+1.25}_{0}$ 631 to 1000mm $^{+1.4}_{0}$ 1001 to 1600mm $^{+1.6}_{0}$ 1601 to 2000mm $^{+1.8}_{0}$	
Mounting style	SD·FA·FY·LA·LB·TA·TC	SD·FY·LA·TA·TC
Rod series	Rod B	
Accessories	Rod eye (T-end), rod clevis (Y-end) with pin, floating joint (F-end) (for 7 MPa), lock nut Boots : Nylon tarpaulin : Chloroprene : Conex	

Terminologies

Nominal pressure

Pressure given to a cylinder for convenience of naming.
It is not always the same as the working pressure (rated pressure) that guarantees performance under the specified conditions.

Maximum allowable pressure

Maximum allowable pressure generated in a cylinder (surge pressure, etc.).

Proof test pressure

Test pressure against which a cylinder can withstand without unreliable performance at the return to nominal pressure.

Minimum operating pressure

Minimum pressure at which cylinder installed horizontally operates under no load.

Notes)
- The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
- The piston rod has a 13- to 16-mm dia. through hole. If the wall thickness is reduced or the wall is broken when a hex. screw is fitted, oil leakage can occur. Fit the screw carefully.
- Do not loosen the plug at the rod end. Doing so may cause spout of oil.
- The working temperature range depends on the seal material. For details, refer to the selection materials at the beginning of this catalog.
- In the case that the lock nut is attached to the piston rod end thread part, increase the thread length (dimension A).
- Conex, material of the boots, is the registered trademark of Teijin Limited.

Product Lineup

Unit: mm

Series Variation	Type	ϕ50	ϕ63	ϕ80	ϕ100	ϕ125	ϕ140	ϕ150	ϕ160	ϕ180	ϕ200	ϕ224	ϕ250
General purpose type	Double acting single rod	Standard type PTN-1B PTH-1B	●	●	●	●	●	●	●	●	●	●	●	●
		Switch Set PTN-1BR PTH-1BR	▲	▲	▲	▲	▲	▲						

Note) ●-marked cylinders are the standard cylinders, and ▲-marked ones can be manufactured by design.

Detector Specifications

Power supply		24 V DC±2V 0.05A
Accuracy	Linearity	±0.025%FS or ±75 μmTYP
	Resolution	±0.01%FS or ±30 μm or less
	Repeatability	±0.01%FS or ±30 μm or less
	Temperature characteristics	40 ppmFS/ or 12 μm/ or less
Output		Current output: 4 to 20 mA Load resistance: 500 Ω or less For the voltage output (0 to 10 V, etc.), contact us.
Response speed		Scanning frequency 1 kHz
Working temperature range		−20 to +80℃ (No freezing)
Impact resistance		50G 2m/s
Vibration resistance		6 G or 40 Hz2mmPP
Protective structure		IP67 (10 kPa, 30min)
Connection		Pin No. — Signal 1 — 24 V DC 2 — 0V 3 — Output 4 — COM Shield to be connected to 0 V by user 0 V and COM are connected internally.
Supplied connector		OMRON XS2C-D4S1
Applicable cable (not supplied)		Outer diameter: ϕ5 to ϕ6 mm Wire size: 0.18 to 0.75 mm²

- Above shown are the specifications for the sensor only.
- A larger value of two values of each accuracy item is applicable.
- In the mounted state on the cylinder, the above accuracy cannot be assured due to deformation of cylinder elements caused by pressure and load.
  For the repeatability under the same conditions, a value close to the above accuracy can be obtained because the deformation of cylinder elements is similar.
- The output is 4.0 to 4.5 mA at the cylinder retracting end and 12 to 20 mA at the cylinder advancing end. (In some cases, part of the effective length of the sensor is not used depending on the cylinder stroke.)
  Set the controller parameters based on the actual output at the cylinder advancing and retracting ends.
- For sensors with adjustable output at the advancing and retracting ends, contact us.

Stroke Range

Unit: mm

Bore	Standard	Semi-standard
ϕ50	50 to 500	501 to 1200
ϕ63·ϕ80	50 to 500	501 to 1600
ϕ100	50 to 500	501 to 2000
ϕ125 to ϕ160	—	50 to 2000
ϕ180 to ϕ250	—	50 to 2000

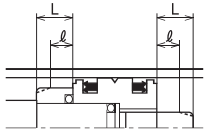
- The above strokes indicate the maximum available strokes for the standard type. Contact us for other strokes.
- For the rod buckling, check with the buckling chart in the selection materials.

Cushion Stroke Length

Unit: mm

Bore \ Type	Cushion ring length L	Cushion ring parallel part length ℓ
ϕ50·ϕ63	25	7
ϕ80 to ϕ125	25	8
ϕ100 to ϕ160	30	12
ϕ180 to ϕ224	40	20
ϕ250	45	25

- The cushion stroke lengths in case of cylinders used up to the stroke end.
- In the case that a cylinder is not used up to the stroke end, and it is stopped 5 mm or more before the stroke end, the cushioning effect will be weakened.
  In such a case, consult us.

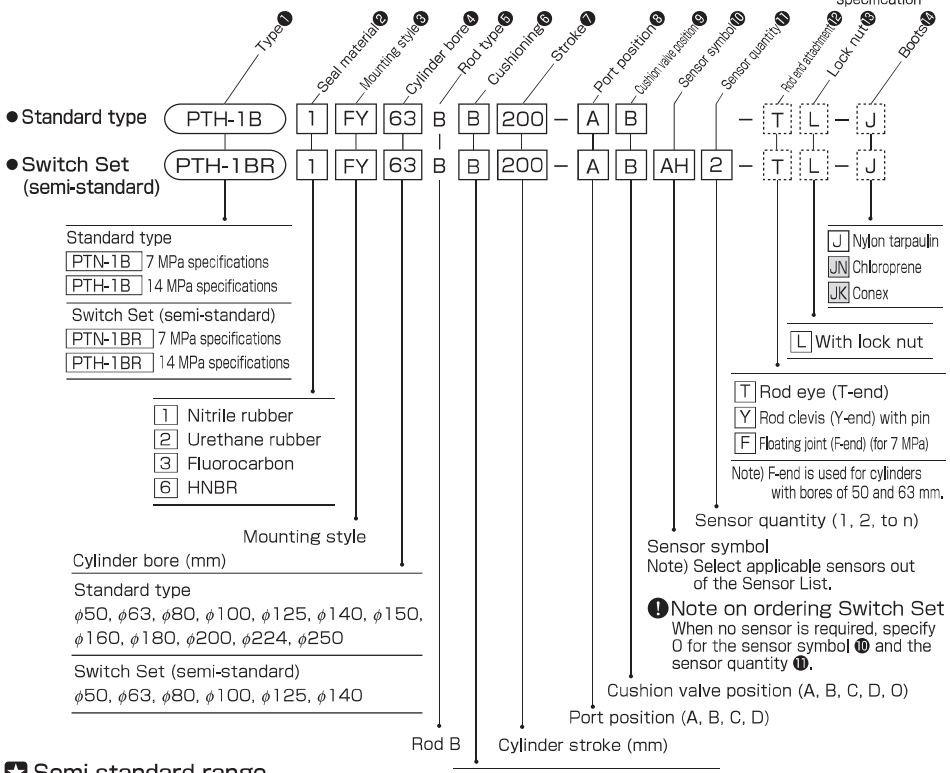


● How to order

General Purpose Type

The item enclosed by broken line needs not to be entered, if unnecessary.

Semi-standard specification



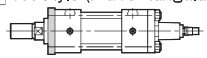
✪ Semi-standard range

- With boots
- With sensor
- Changes to detector specifications
  Inverted output (20 to 4 mA), voltage output (0 to 10 V), digital output, etc.
- Change of piston rod end (dimensional symbol: W, A, KK)
- Other material
- Change of TC accessory position (dimensional symbol: PH)
- Plated cylinder tube (hard chrome plating thickness: 0.02 mm)

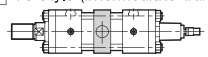
Mounting Style

SD SD style (basic style)

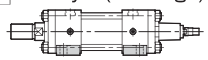
FA FA style (rod rectangular flange)



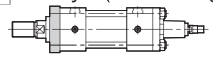
TC TC style (intermediate trunnion)



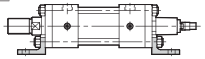
LA LA style (side lugs)



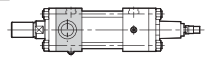
FY FY style (rod rectangular flange)



LB LB style (end angles)



TA TA style (rod trunnion)



Sensor List

Semi-standard

Type	Sensor symbol	Load voltage range	Load current range	Max. switching capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load
Reed sensor	AF AX101CE	DC: 5 to 30V AC: 5 to 120V	DC: 5 to 40mA AC: 5 to 20mA	DC: 1.5W AC: 2VA	None	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	1.5m	Small relay, programmable controller
	AG AX105CE							5m	
	AH AX111CE				Provided			1.5m	
	AJ AX115CE							5m	
	AE AX125CE	DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AD: 20 mA or less		None	None		5m	
	AK AX11ACE	AC: 5 to 120V	5 to 20mA	2VA	Provided	LED (Lights in red when sensing)	4-pin connector type, rear wiring	0.5m	
	AL AX11BCE	DC: 5 to 30V	5 to 40mA	1.5W				0.5m	
	AM AX135CE	AC/DC: 90 to 240V	5 to 300mA	B contact output	Provided	LED (Lights in red when not sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	5m	
	AY AZ135CE						0.3 mm², 2-core, outer dia. ϕ4 mm, upper wiring	5m	
	S SR405	AC: 80 to 220V	2 to 300mA	30VA	Provided	Neon lamp (Lights when not sensing)	0.5 mm², 2-core, outer dia. ϕ6 mm, rear wiring	5m	
	5 WR505	DC: 5 to 50V AC: 5 to 120V	DC: 3 to 40mA AC: 3 to 20mA	DC: 1.5W AC: 2VA	None	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	5m	
	7 WR505F							5m	
	6 WR515							5m	
Solid state sensor	BE AX201CE-1	DC: 5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	1.5m	Small relay, programmable controller
	BF AX205CE-1							5m	
	CE AX211CE-1					LED (2-LED type in red/green)		1.5m	
	CF AX215CE-1							5m	
Cutting oil proof type	RA AX205WCE	DC: 5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	5m	
	RB AZ205WCE						0.3 mm², 2-core, outer dia. ϕ4 mm, upper wiring	5m	
	RE AX215WCE		5 to 20mA			LED (2-LED type in red/green)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	5m	
	RF AZ215WCE						0.3 mm², 2-core, outer dia. ϕ4 mm, upper wiring	5m	
Solid state sensor	2 WS215-1	DC: 10 to 30V	5 to 20mA	—	Provided	LED (2-LED type in red/green)	0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	5m	
	4 WS215-1F							5m	
	3 WS225-1							5m	
	CT AX211CE-1	DC: 5 to 30V	5 to 40mA				0.3 mm², 2-core, outer dia. ϕ4 mm, rear wiring	1.5m	
	CU AX215CE-1							5m	
	CV AX21BCE-1						4-pin connector type, rear wiring	0.5m	
	CW AZ211CE-1						0.3 mm², 2-core, outer dia. ϕ4 mm, upper wiring	1.5m	
	CX AZ215CE-1							5m	
	CY AZ21BCE-1						4-pin connector type, upper wiring	0.5m	

Notes)
- For the sensors without a protective circuit, be sure to provide a protective circuit (SK-100) with the load when using any induction load (relay, etc.).
- The output logic of AX and AZ135CE is B contact. When the piston is detected, the sensor contact turns off (the lamp turns on).
- For the details of sensors, be sure to read the sensor specifications at the end of this catalog.
- All AX type sensors can be mounted. For types other than the above, refer to the sensor specifications at the end of this catalog.
- WR/WS, AX∗W and AZ∗W type sensors are cutting oil proof.
- Sensor SR405 can be mounted only to cylinders with bores from 32 to 125 mm.

● General purpose type
AX type sensor

Cord type

Connector type

● Cutting oil proof type
WR/WS type sensors

- When ordering the cutting oil proof type sensors, WR and WS types, please be careful about the following points.

5 WR505 2 WS215-1	The sensor and straight box connector (F-SB) are combined (the flexible tube (F-0.5: 4,8 m) is required).
7 WR505F 4 WS215-1F	The flexible tube (F-0.5: 4,8 m) is attached to the sensor and straight box connector (F-SB).

Position Sensing Cylinders PTN-1B/PTH-1B

Discontinued

PQCPA Series dedicated to analog/pulse output position sensing cylinders

- Environmentally-friendly lead-free indicator.
- Analog input and pulse input types are available.
- Provided with multi-point output function (5 points) as a standard function to enable to individually set the upper and lower limits.Note 1)
- A 16-bit AD converter is provided to realize high resolution. (Analog input type)
- Provided with a counter with a response frequency of 200 kHz (Pulse input type)
- Provided with a pulse position correcting function.Note 2)

Note 1) Setting the bank switching enables to use the multi-output function of up to 15 points.
Note 2) Position correction can be made by mounting a cylinder sensor. Positional error caused by slippage of the encoder is eliminated.

Standard Specifications

Type	Analog	Pulse
Model number	PQCPA-CU-A	PQCPA-CU-P
Applicable input signals	Analog voltage/analog current	Phase AB
Display range	±999999	
Resolution	Stroke×1/10000	—
Response frequency	1 kHz	200 kHz
Linearity	±0.02%FS	—
Signals	Voltage input 0 to 10 V Voltage input 1 to 5 V Current input 4 to 20 mA	Open collector input Differential input (line driver input) 12 V voltage input 24 V voltage input
Monitor output	Voltage output Note)	Line driver output
Sampling speed	1000 times/sec	
Display speed	10 times/sec	
Display method	Display by fluorescent display tube	
Control input	No-voltage input (reed sensor/solid state sensor)	
Control output	Open collector Max. rating: 50 V DC, 50 mA (Provided with multi-point output function (5 points) to enable to individually set the upper and lower limits and pulse position correcting function)	
Power supply voltage	24 V DC ±10%	
Ambient temperature	0 to 50℃ (No freezing)	
Ambient humidity	35 to 85%RH (No condensing)	

Note) The monitor output at current input (4 to 20 mA) is voltage output of 1 to 5 V.

Function Table

Type	Analog input	Pulse input
Model number	PQCPA-CU-A-A	PQCPA-CU-P-12
	PQCPA-CU-A-V	PQCPA-CU-P-24
	—	PQCPA-CU-P-00
Functions	Display of position	Display of position
	Bank switching	Bank switching
	Multi-point output	Multi-point output
	Positional data hold	Positional data hold
	—	0 setting signal
	—	Correcting function

List of Applicable Actuators

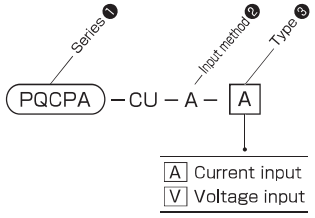
Series	Detection method	Signal type
PTN-1B	Absolute type	Analog type (4 to 20 mA, 0 to 10 V)
PTH-1B		
PTT-1B		
PSR-1A		Analog type (1 to 5 V)
35P-3	Linear pulse encoder	Encoder type
70P-8		
140P-8		

Note) For the details of each cylinder, refer to the section of each series.

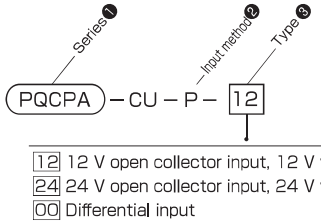
How to order Discontinued

Position Indicator

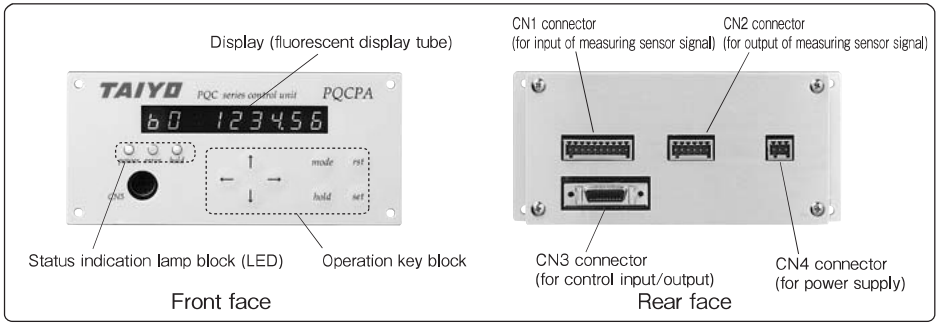
●Analog input



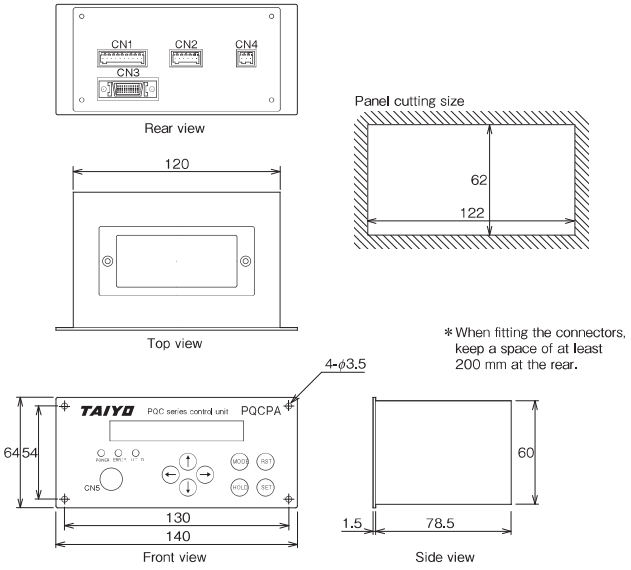
●Pulse input



Note) Cylinders do not come with indicators of differential input type 00.
(Specification to use the indicator in stand-alone state)



Dimensional Drawings

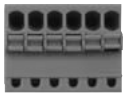


＊When fitting the connectors, keep a space of at least 200 mm at the rear.

Supplied Connector

● CN1 connector
(for input of measuring sensor signal)

● CN2 connector
(for output of measuring sensor signal)

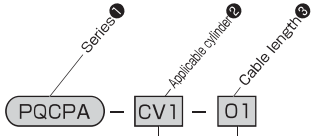


● CN3 connector
(for control input/output)

● CN4 connector
(for power supply)

Discontinued

How to order cable between sensor and indicator

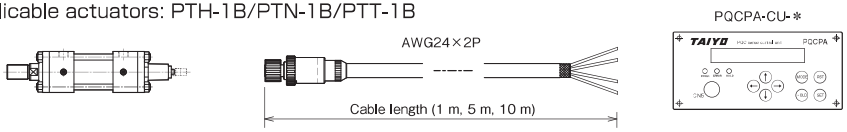


CV1	PTH-1・PTN-1B・PTT-1B	01	1m
CV2	35P-3・70P-8・140P-8	05	5m
CV3	PSR-1A	10	10m

＊When ordering a cable, confirm the series name of the actuator on the sensor side. Some models cannot be connected.
＊After wiring, connect the indicator side connector to the CN1 connector on the indicator.

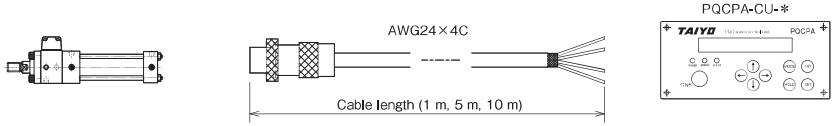
PQCPA-CV1-Cable length

Applicable actuators: PTH-1B/PTN-1B/PTT-1B



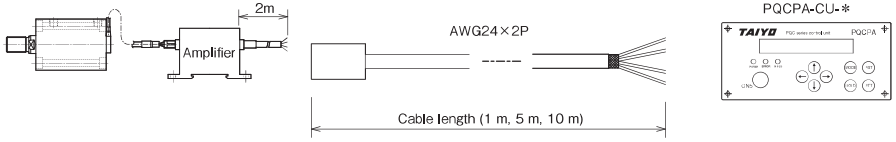
PQCPA-CV2-Cable length

Applicable actuators: 35P-3/70P-8/140P-8



PQCPA-CV3-Cable length

Applicable actuators: PSR-1A

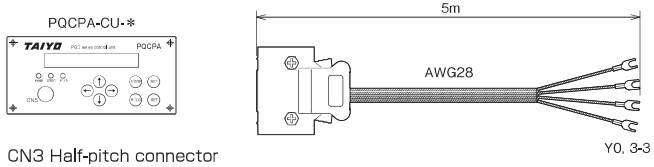


Note) PSR-1A comes with a 2m cable as a standard accessory. If another cable is required, select this cable. (In this case, disconnect the standard cable (2 m) of PSR-1A, and connect the selected cable directly to the amplifier.)

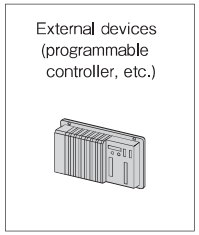
How to order I/O cable

PQCPA – IO

＊The I/O cable is 5 m long.



CN3 Half-pitch connector
Note) Only the CN3 half-pitch connector is supplied as a standard accessory. If you need the connector with a cable, place an order for the connector.



Discontinued

External input/output

CN1

Pin No.	Description	Signals
1	Voltage/current input	Analog input
2	NC	–
3	Voltage/current GND	Analog input
4	Phase A	Pulse input
5	Phase −A	Pulse input
6	Phase B	Pulse input
7	Phase −B	Pulse input
8	+24V	Power supply output
9	+12V	Power supply output
10	GND	Power supply output/Phase AB GND

CN2

Pin No.	Description	Signals
1	Pout	Analog output
2	Vss	Analog output
3	A pulse	Pulse output
4	A pulse GND	Pulse output
5	B pulse	Pulse output
6	B pulse GND	Pulse output

CN4

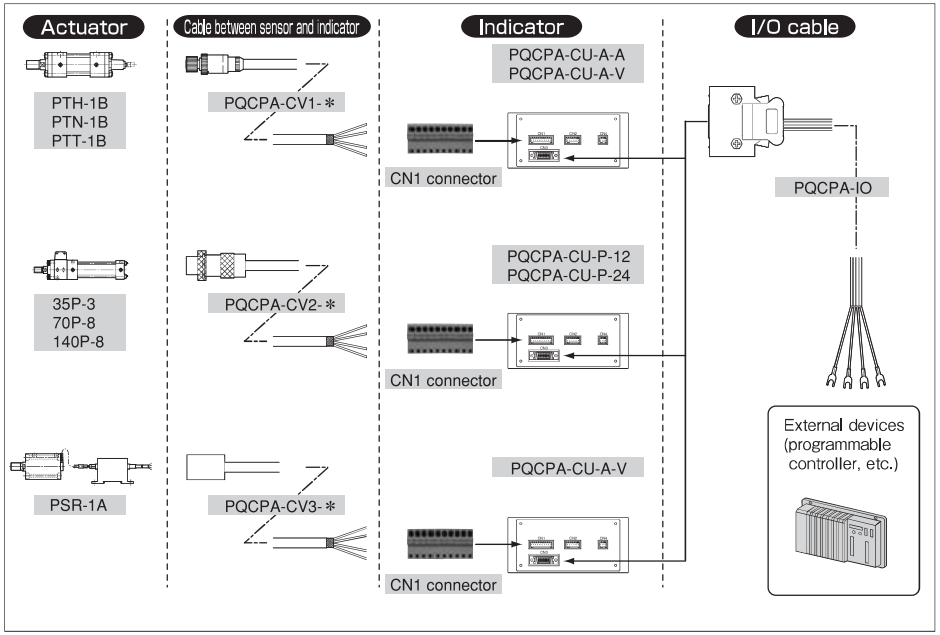
Pin No.	Description	Signals
1	P24	Power supply
2	N24	Power supply
3	PE	Power supply

CN3

Pin No.	Description	Signals
1	0 setting signal	Input
2	Positional data hold	Input
3	Correcting function	Input
4	Bank switching 0	Input
5	Bank switching 1	Input
6	Bank switching 2	Input
7	Reserved input	Input
8	Reserved input	Input
9	Input common	Input
10	Input common	Input
11	Multi-point output signal 0	Output
12	Multi-point output signal 1	Output
13	Multi-point output signal 2	Output
14	Multi-point output signal 3	Output
15	Multi-point output signal 4	Output
16	Reserved output	Output
17	Reserved output	Output
18	Reserved output	Output
19	Output common	Output
20	Output common	Output

＊For details, see the instruction manual.

Example of product configuration



Weight table

Unit: kg

Bore mm	Basic weight (SD style)	Additional weight per mm of stroke	Mounting accessory weight						Rod end attachment weight			
			LA	LB	FA	FY	TA	TC	Rod eye (T-end)	Rod clevis (Y-end) with pin	Floating joint (F-end)	Lock nut
ϕ50	5.9	0.014	0.9	—	0.7	1.1	0.4	1.0	1.0	1.2	1.4	0.1
ϕ63	9.4	0.017	1.0	1.2	1.0	1.6	0.6	1.2	2.7	3.9	2.7	0.1
ϕ80	18.9	0.032	1.8	2.0	1.1	2.1	0.6	2.1	2.2	3.7	—	0.2
ϕ100	30.5	0.048	2.1	2.9	1.8	3.9	1.0	3.8	4.2	7.7	—	0.5
ϕ125	43.5	0.077	3.2	5.5	2.9	6.2	2.1	6.2	8.0	14.6	—	1.1
ϕ140	60.2	0.100	3.8	7.7	3.2	8.2	4.1	11.1	19.0	28.8	—	1.4
ϕ150	69.6	0.118	4.8	9.6	4.9	10.7	4.6	10.9	18.9	28.3	—	1.7
ϕ160	84.3	0.121	5.4	10.0	5.3	11.3	5.2	14.8	22.7	34.2	—	1.9
ϕ180	115.1	0.179	7.9	13.8	7.7	17.5	—	19.4	37.6	53.7	—	2.9
ϕ200	155.2	0.220	11.4	21.0	10.6	22.6	—	27.2	53.9	87.4	—	3.2
ϕ224	203.8	0.268	12.7	32.0	11.6	30.6	—	36.5	77.2	128.3	—	6.0
ϕ250	283.7	0.333	18.3	46.7	17.5	42.5	—	43.3	74.4	123.9	—	7.8

Sensor Additional Weight

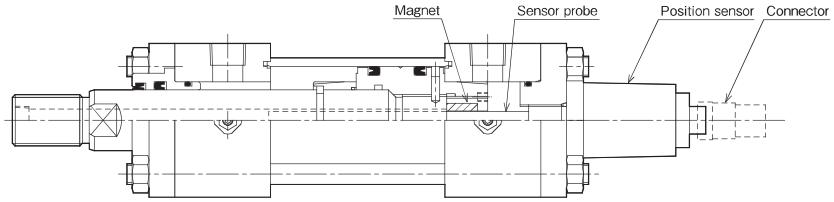
Unit: kg

Symbol / Bore (mm)	AX type			SR type	WR/WS type
	Cord length 1.5 m	Cord length 5 m	Connector type	Cord length 5 m	
ϕ50	0.05	0.13	0.04	0.22	0.5
ϕ63	0.07	0.14	0.06	0.22	
ϕ80・ϕ100	0.07	0.15	0.06	0.22	
ϕ125	0.09	0.16	0.07	0.22	
ϕ140	0.09	0.16	0.08	—	—

Calculation formula: Cylinder weight (kg)=basic weight+(cylinder stroke (mm)×additional weight per mm of stroke)+(sensor additional weight×sensor quantity)+mounting accessory weight+rod end attachment weight

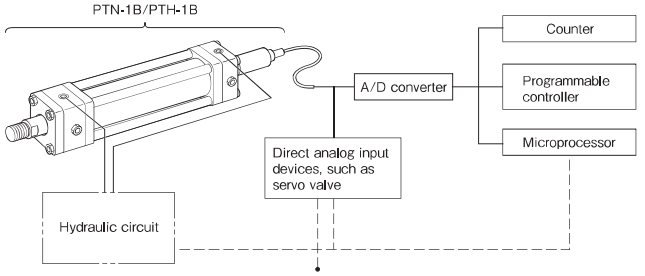
Calculation example: PTH-1BR, bore ϕ80, cylinder stroke 200 mm, 2 pcs of AX101 (cord length 1.5 m), LA style
18.9+(0.032×200)+(0.05×2)+1.8=27.2kg

Sectional Drawing



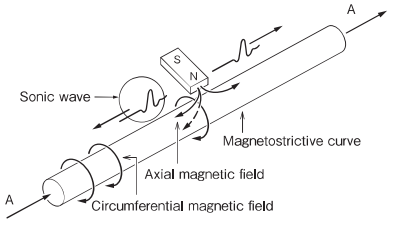
Note) The structure differs slightly depending on the cylinder bore and the position sensor type.

Application Example



◎The cylinder position and operation can be checked on the counter, and position adjustment and inching can be easily performed by manual operation.
◎When combined with a personal computer or a microprocessor, the cylinder can be decelerated and stopped at any position.

Principle of Operation of Position Sensor



The figure shows the basic principle.
When a current pulse shown by arrow A is given to the magnetostrictive curve, a circumferential magnetic field is generated on the magnetostrictive curve.
When a magnet is positioned as shown in the figure, an axial magnetic field is given only to the position, and a diagonal magnetic field as shown by the dotted line is generated, thereby causing torsion in this part of the magnetostrictive curve. Since this torsion is a kind of vibration, it propagates at the sonic speed on the magnetostrictive curve which is a metallic tube.
PTN-1B and PTH-1B Series use absolute type position sensors which measure the propagation time at the supersonic speed to find the magnet position.

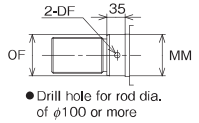
PTN_PTH-1B/THPT1B Bore B CAD/DATA is available.

SD

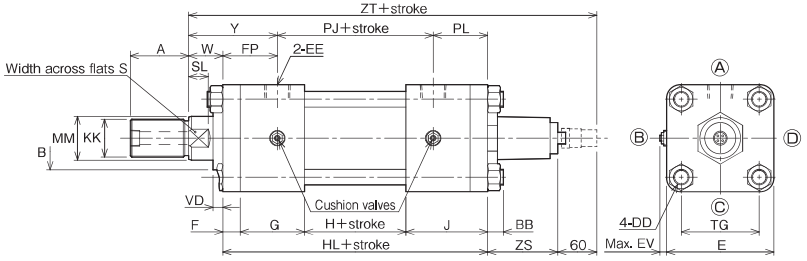
PTN-1B | 1 | SD | Bore | B | B | Stroke | – | A | B

PTH-1B | 1 | SD | Bore | B | B | Stroke | – | A | B

● Bore ϕ50 to ϕ250



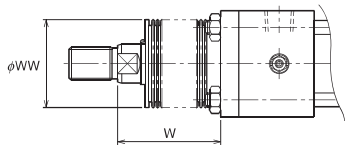
Rod dia.	OF	DF
ϕ100	ϕ99.5	ϕ12
ϕ112	ϕ111.5	ϕ15
ϕ125	ϕ124.5	ϕ15
ϕ140	ϕ139.5	ϕ15



● The above figure shows a cylinder with bores from 63 to 100 mm. The shape of the sensor area differs depending on the bore.

- When using the SD style, refer to the "Precautions for Use" at the beginning of this catalog.
- For the thread length (dimension A) in case of using the lock nut, refer to "Accessories".
- Some piston rods have a through hole for fitting a sensor (ϕ13 to ϕ16). If a hole is made, the thickness may be excessively reduced. It is recommended to use a lock nut to lock the rod end attachment. When drilling is performed to use a hex. screw, the drilling depth must be 2 mm or less. Do not use a spring pin.
- Switch Set Cylinders (ϕ50 to ϕ140) are manufactured as semi-standard models. For the mounting of sensors, refer to the dimensional drawings of "Switch Set".
- The shape of the sensor fitting area differs depending on the cylinder bore.

With Boots



Dimension W

Nylon tarpaulin Chloroprene	ϕ50	1/3.5	stroke+X
	ϕ63 to ϕ100	1/4	stroke+X
	ϕ125 to ϕ200	1/5	stroke+X
	ϕ224 to ϕ250	1/6	stroke+X
Conex	ϕ50	1/2.5	stroke+X
	ϕ63 to ϕ100	1/3	stroke+X
	ϕ125·ϕ140	1/3.5	stroke+X
	ϕ150 to ϕ200	1/4	stroke+X
	ϕ224·ϕ250	1/4.5	stroke+X

● If the calculated value has a fractional part, round it up.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80℃	130℃	200℃

Notes)
- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

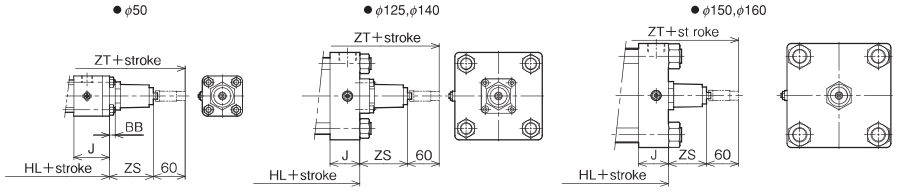
Dimensional Table

Bore \ Symbol	Rod B						
	A	B	KK	MM	S	SL	VD
ϕ50	35	ϕ46	M24×1.5	ϕ28	24	14	10
ϕ63	45	ϕ55	M30×1.5	ϕ35.5	30	16	10
ϕ80	60	ϕ65	M39×1.5	ϕ45	41	20	10
ϕ100	75	ϕ80	M48×1.5	ϕ56	50	23	10
ϕ125	95	ϕ95	M64×2	ϕ71	65	27	10
ϕ140	110	ϕ105	M72×2	ϕ80	75	31	10
ϕ150	115	ϕ110	M76×2	ϕ85	80	33	10
ϕ160	120	ϕ115	M80×2	ϕ90	85	33	10
ϕ180	140	ϕ125	M95×2	ϕ100	—	—	10
ϕ200	150	ϕ140	M100×2	ϕ112	—	—	10
ϕ224	180	ϕ150	M120×2	ϕ125	—	—	10
ϕ250	195	ϕ170	M130×2	ϕ140	—	—	10

Bore \ Symbol	BB	DD	E	EE	EV	F	FP	G	H	HL	J	PJ	PL	TG	W	Y	ZS	ZT
ϕ50	11	M10×1.25	□76	Rc1/2	7	13	42	54	48	182	67	98	42	□52	30	72	83	355
ϕ63	13	M12×1.5	□90	Rc1/2	7	15	46	56	52	194	71	102	46	□63	35	81	72	361
ϕ80	16	M16×1.5	□110	Rc3/4	7	18	56	66	54	222	84	110	56	□80	35	91	72	389
ϕ100	18	M18×1.5	□135	Rc3/4	7	20	58	66	60	232	86	116	58	□102	40	98	72	404
ϕ125	21	M22×1.5	□165	Rc1	11	24	67	76	64	220	56	130	23	□122	45	112	90	415
ϕ140	22	M24×1.5	□185	Rc1	11	26	69	76	72	230	56	138	23	□138	50	119	90	430
ϕ150	25	M27×1.5	□196	Rc1	11	28	71	76	80	240	56	146	23	□148	50	121	72	422
ϕ160	25	M27×1.5	□210	Rc1	13	31	74	81	80	253	61	156	23	□160	55	129	72	440
ϕ180	27	M30×1.5	□235	Rc1¼	13	33	75	85	86	275	71	172	28	□182	55	130	72	462
ϕ200	29	M33×1.5	□262	Rc1½	13	37	85	95	90	301	79	184	32	□200	55	140	72	488
ϕ224	34	M39×1.5	□292	Rc1½	13	41	89	95	90	305	79	184	32	□225	60	149	72	497
ϕ250	37	M42×1.5	□325	Rc2	13	46	106	115	90	346	95	200	40	□250	65	171	72	543

● The tolerance of B is h8, and that of MM is f8.

Outline Drawings of Sensor Area



With Boots

Bore \ Symbol	ϕ50	ϕ63	ϕ80	ϕ100	ϕ125	ϕ140	ϕ150	ϕ160	ϕ180	ϕ200	ϕ224	ϕ250
WW	63	71	80	100	125	125	140	140	160	180	180	200
X	45	55	55	55	65	65	65	65	65	65	80	80

Position Sensing Cylinders PTN-1B/PTH-1B