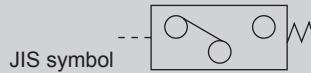




## Digital Pressure Sensor IO-Link

# PPX Series



## Specifications

Descriptions	IO-Link	
	For low pressure PPX-R 01PC	For high pressure PPX-R 10PC
Kind of pressure	Gauge pressure	
Rated pressure	-100.0 to +100.0 kPa	-0.100 to +1.000 MPa
Set pressure	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa
Proof pressure	500 kPa	1.5 MPa
Applicable fluid	Air/Non-corrosive gas	
Power supply voltage	12 to 24 VDC ±10% Ripple P-P 10% or less	
Power consumption	Normal: 720 mW or less (current consumption 30 mA or less at 24 V power supply voltage) ECO mode: 480 mW or less at STD (current consumption 20 mA or less at power supply voltage 24 V), 360 mW or less at FULL (current consumption 15 mA or less at power supply voltage 24 V)	
Communication output (C/Q) *1	IO-Link communication	
	Transmission bit rate	
	Process data	
	Minimum cycle	
Control output (DO)	[PNP output] PNP transistor/open collector · Max. output current: 50 mA · Applied voltage: 30 VDC or less (control output - +V interval) · Residual voltage: 2 V or less (at outflow current 50 mA)	
	Output operation	Select from NO and NC
	Output mode	EASY mode/hysteresis mode/window comparator mode
	Hysteresis	Min. 1 digit (variable)
	Repeatability	±0.1% F.S. (within ±2 digits)
	Response time	2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 5000 ms
	Short-circuit protection	Equipped
Display	4-digit + 4-digit 3-color LCD display (display updating cycle: 250 ms, 500 ms, 1000 ms)	
	Display pressure range	-101.0 to +101.0 kPa
Indicator lamp	Orange LED	
	Output operational indicator lamp 1: Blinks during IO-Link communication, turns ON during control output in non-IO-Link communication (synchronized with output operational indicator lamp 2)	
	Output operational indicator lamp 2: Turns ON when control output is ON	
Environment conditions	Degree of protection	
	Ambient temperature	
	Ambient humidity	
	Withstand voltage	
	Insulation resistance	
	Shock resistance	
Temperature characteristics (+20°C as reference)	Within ±0.5% F.S.	Within ±1% F.S.
Port size *2	M5 female thread + R (PT) 1/8 male thread M5 female thread + G1/8 male thread M5 female thread + NPT1/8 male thread	
Material	Case: PBT (glass fiber included), LCD display part: acrylic resin, pressure port: SUS 303, mounting screw part: copper alloy (nickeling), switch part: silicone rubber	
Connection	PAP-04V-S Connector	
Wire length	When wire is extended, up to total length 20 m permissible with 0.3 mm <sup>2</sup> and over cable (less than 20 m when CE Mark-compliant)	
Unit change function	Only supported for overseas (-KA) (MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg)	
Weight	Body weight: approx. 40 g, weight including package: 130 g	
Accessory	PPX-C2 (2 m cable with connector): 1 pc. Unit seal label (-KA with unit change function): MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg	

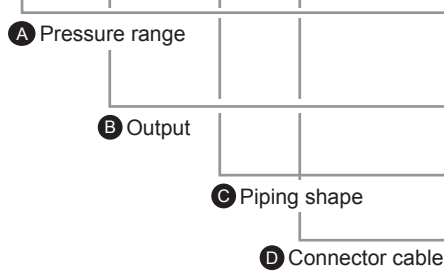
\*1) When used as a standard sensor, communication output (C/Q) will be the same output operation as control output (DO).

\*2) Only "M5 female thread + R (PT) 1/8 male thread" is available for Japan. All types are available for overseas.

## How to order

(How to order for domestic market)

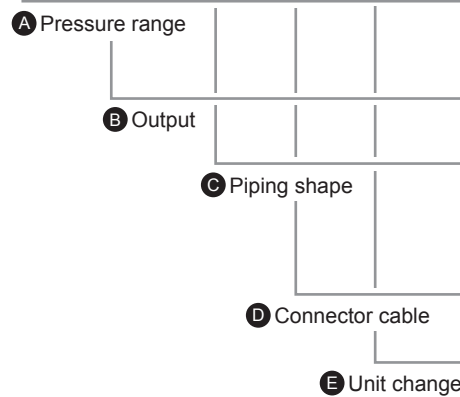
PPX - **R01** **PC** - **6M** - 



Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
PC	PNP output + IO-Link
<b>C Piping shape</b>	
6M	R1/8, M5
<b>D Connector cable</b>	
Blank	2 m connector cable attached *1

(How to order for overseas markets)

PPX - **R01** **PC** - **6M** -  - **KA**



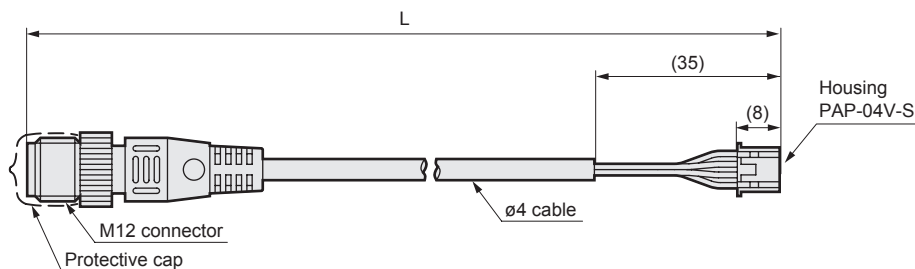
Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
PC	PNP output + IO-Link
<b>C Piping shape</b>	
6M	R1/8, M5
6N	NPT1/8, M5
6G	G1/8, M5
<b>D Connector cable</b>	
Blank	2 m connector cable attached *1
<b>E Unit change</b>	
KA	With unit change function

### ● Discrete option model No.

PPX - **CN1**

Code	Content
CN1	M12 cable with connector 1 m
CN2	M12 cable with connector 2 m
CN3	M12 cable with connector 3 m
KL	Mounting bracket (mounting screw attached)
KHS	Panel bracket
KCB	Front protective cover (when using panel bracket)

\*1: "Blank" 2 m connector is one-sided loose wire. (PPX-C2)  
M12 cable with connector is a separately-sold optional item.



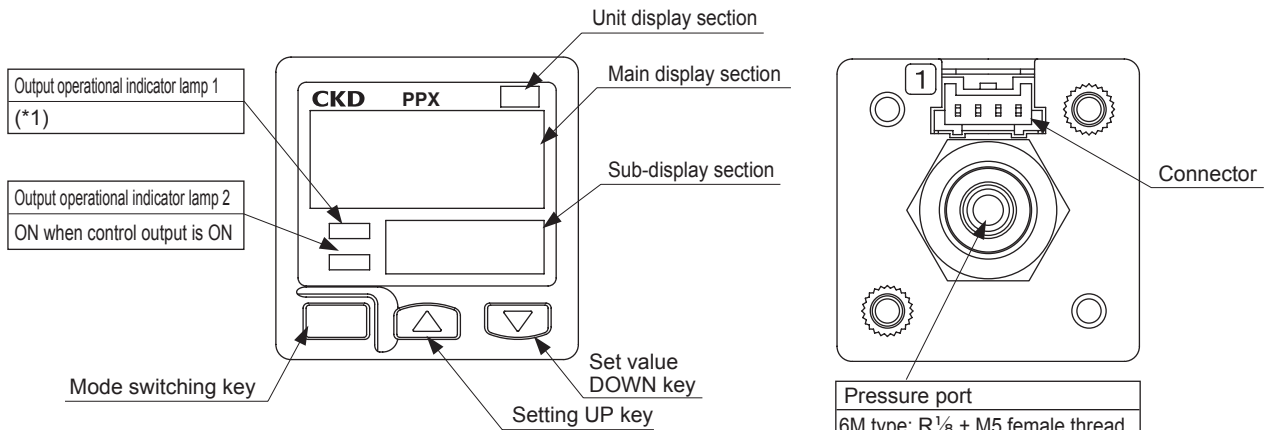
M12 connector pin No.	Lead wire color	Housing terminal No.	Applications
1	Brown	1	+V
2	White	3	DO
3	Blue	4	0 V
4	Black	2	C/Q

Model No.	Cable length	Weight g
PPX-CN1	1 m	Approx. 40
PPX-CN2	2 m	Approx. 70
PPX-CN3	3 m	Approx. 100

## Dimensions

Same as the standard. Refer to page 8 for details.

## Names and functions of display/operation section (IO-Link)



Pressure port  
 6M type: R $\frac{1}{8}$  + M5 female thread  
 6G type: G $\frac{1}{8}$  + M5 female thread  
 6N type: NPT $\frac{1}{8}$  + M5 female thread

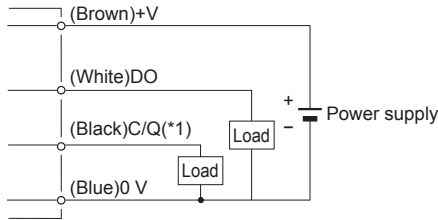
(\*1)

	During non-IO-Link communication	During IO-Link communication
Display lamp operation	ON when control output is ON (*2)	Blinking operation

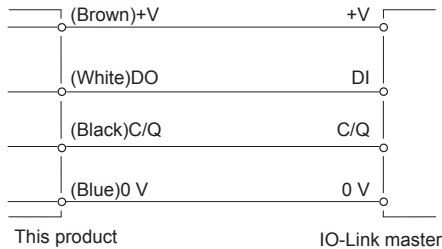
(\*2): Synchronized with operation output display lamp 2

## Connection

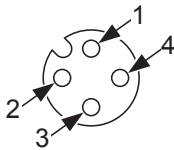
● When used as a standard sensor



● When used connected to IO-Link master



[M12 connector cable terminal array]



Terminal No.	Terminal name
1	+V
2	Control output (DO)
3	0 V
4	IO-Link communication (C/Q) (*1)

(\*1): When used as a standard sensor, IO-Link communication (C/Q) will be the same output operation as control output (DO).

### M12 connector mounting

The connector will detach if the fixing ring loosens, resulting in a communication error from this product. Be sure to confirm before use that the fixing ring is not loose.

### Communication specifications

- Common to all models

Descriptions	Details
Communication protocol	IO-Link
Communication protocol version	V1.1
Transmission bit rate	COM3 (230.4 kbps)
Port	Class A
Process data length (input)	4 bytes
Process data length (output)	0 byte
Minimum cycle time	1 ms
Data storage	15 bytes
SIO mode support	Yes
Vendor ID	855

- Device ID for each model

	Device ID
PPX-R01PC-6M	2179072
PPX-R10PC-6M	2179073
PPX-R01PC-6M-KA	2179074
PPX-R01PC-6N-KA	2179075
PPX-R01PC-6G-KA	2179076
PPX-R10PC-6M-KA	2179077
PPX-R10PC-6N-KA	2179078
PPX-R10PC-6G-KA	2179079

### Process data (PD)

		bit							
		7	6	5	4	3	2	1	0
PD0	Upper bytes of pressure value								
PD1	Lower bytes of pressure value								
PD2		bits				Allocation		Remarks	
7	6	5	4	3	2	1	0	Control output (DO)	0:OFF 1:ON
								Lock	0
								Lock	0
								Lock	0
								Notification information	0: No notification 1: Notification
								Error level	0: Normal 1: Caution 2: Error
PD3	Scale Low pressure sensor : -1 High pressure sensor : -3 (with MPa selected) 0								

### Function list

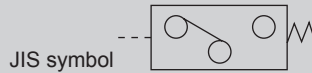
Function	Body side setting	IO-Link communication setting
Control output mode setting	Select from EASY mode/hysteresis mode/window comparator mode	Index61_2
Threshold setting	EASY mode: Threshold setting, Hysteresis mode/window comparator mode: Low side threshold setting	Index60_1
	Hysteresis mode/window comparator mode: Hi side threshold setting	Index60_2
Zero adjustment	Run/Cancel	Index2
Key lock function	Set/Cancel	Index12
Peak/bottom hold function	Setting	Index82_4
Control output operation setting	N.O./N.C.	Index61_1
Setting response time	Select from 10 levels	Index66
Main display section color setting	Select from 4 modes	Index82_1
Pressure unit setting	Select from MPa/kPa/kgf/bar/psi/mmHg/inchHg [List of units that can be set] • For Japan/low pressure: kPa • For Japan/high pressure: MPa, kPa • For overseas/low pressure: kPa, kgf, bar, psi, mmHg, inchHg • For overseas/high pressure: MPa, kPa, kgf, bar, psi	Index83
Sub-display section display setting	Select from 5 modes	Index82_2
	No. display setting	Index84_1
	Custom display setting	Index84_2
Display speed setting	Select from 3 levels	Index82_3
Hysteresis setting	Select from 8 levels	Index61_3
Setting ECO mode	Select from 3 modes	Index80
Setting confirmation code	8-digit display	—
Setting reset	Run	Index2
Remote zero adjustment setting	—	Index2
Zero adjustment notification	—	Index85
Auto-reference setting	—	Index2
Operation time	—	Index163
No. of memory write cycles	—	Index164
Notification flag setting	—	Index168
Notification event code reading	—	Index169

\* The IO-Link setting file (IODD) can be downloaded from the CKD website (<https://www.ckd.co.jp/english/>).



## Digital Pressure Sensor Standard

# PPX Series



## Specifications

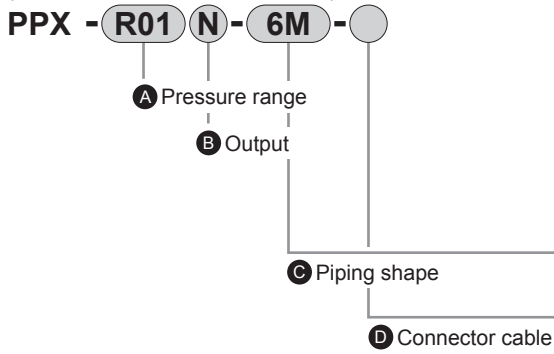
Descriptions	Standard		High-function	
	For low pressure PPX-R01□	For high pressure PPX-R10□	For low pressure PPX-R01□H	For high pressure PPX-R10□H
Kind of pressure	Gauge pressure			
Rated pressure	-100.0 to +100.0 kPa	-0.100 to +1.000 MPa	-100.0 to +100.0 kPa	-0.100 to +1.000 MPa
Set pressure	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa
Proof pressure	500 kPa	1.5 MPa	500 kPa	1.5 MPa
Applicable fluid	Air/non-corrosive gas			
Power supply voltage	12 to 24 VDC ±10% Ripple P-P 10% or less			
Power consumption	Normal: 720 mW or less (current consumption 30 mA or less at 24 V power supply voltage) ECO mode: 480 mW or less at STD (current consumption 20 mA or less at power supply voltage 24 V), 360 mW or less at FULL (current consumption 15 mA or less at power supply voltage 24 V)			
Comparison outputs (comparison output 1, comparison output 2)	[NPN output] NPN transistor/open collector · Max. inrush current: 100 mA · Applied voltage: 30 VDC or less (comparison output - 0 V interval) · Residual voltage: 2 V or less (at inrush current 100 mA)		[PNP output] PNP transistor/open collector · Max. outflow current: 100 mA · Applied voltage: 30 VDC or less (comparison output +V interval) · Residual voltage: 2 V or less (at outflow current 100 mA)	
	Output operation	Select NO/NC with key operation		
Output mode	EASY mode/hysteresis mode/window comparator mode			
Hysteresis	Min. 1 digit (variable)			
Repeatability	±0.1% F.S. (within ±2 digits)	±0.2% F.S. (within ±2 digits)	±0.1% F.S. (within ±2 digits)	±0.2% F.S. (within ±2 digits)
Response time	2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 5000 ms select by key operation			
Short circuit protection	Equipped			
External input (auto reference function / remote zero adjustment function)	_____	_____	[NPN output] ON voltage: 0.4 VDC or less OFF voltage: 5 to 30 VDC or release Input impedance: 10 kΩ Input time: 1 ms and over	[PNP output] ON voltage: 5 V to +VDC OFF voltage: 0.6 VDC or less or release Input impedance: 10 kΩ Input time: 1 ms and over
Analog voltage output	_____	_____	Output voltage: 1 to 5 V Zero point: Within 3V ± 5% F.S. Span: Within 4 V ± 5% F.S. Linearity: Within ±1% F.S. Output impedance: 1 kΩ	Output voltage: 0.6 to 5 V Zero point: Within 1 V ± 5% F.S. Span: Within 4.4 V ± 5% F.S. Linearity: Within ±1% F.S. Output impedance: 1 kΩ
Analog current output	_____	_____	Output current: 4 to 20 mA Zero point: Within 12 mA ± 5% F.S. Span: Within 16 mA ± 5% F.S. Linearity: Within ±1% F.S. Load resistance: 250 Ω (max.)	Output current: 2.4 to 20 mA Zero point: Within 4 mA ± 5% F.S. Span: Within 17.6 mA ± 5% F.S. Linearity: Within ±1% F.S. Load resistance: 250 Ω (max.)
Display	4-digit + 4-digit 3-color LCD display (display updating cycle: 250 ms, 500 ms, 1000 ms select by key operation)			
Display pressure range	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa
Indicator lamp	Orange LED (comparison output 1 operational indicator lamp, comparison output 2 operational indicator lamp: Lit when comparison output is ON)		Orange LED (comparison output 1 oper. lamp: Comparison outp ON-lamp, Anlg V. outp oper lamp: Lit at setup)	
Environment conditions	Degree of protection	IP40(IEC)		
	Ambient temperature	-10 to +50°C, at the time of storage: -10 to +60°C		
	Ambient humidity	35 to 85% RH (no condensation, freezing), store: 35 to 85% RH		
	Withstand voltage	1000 VAC for 1 minute applied to all charged sections/between cases		
	Insulation resistance	50 MΩ and over with 500 VDC megger overall charging section/between cases		
	Vibration resistance	Durability 10 to 500 Hz compound amplitude 3 mm 2 hours each in XYZ directions (when mounted on panel: durability 10 to 150 Hz compound amplitude 0.75 mm 2 hours each in XYZ directions)		
Shock resistance	Durability 100 m/S <sup>2</sup> (approx. 10 G) 3 times each in XYZ directions			
Temp characteristics at +20°C	±0.5% F.S. or less	Within ±1% F.S.	±0.5% F.S. or less	Within ±1% F.S.
Port size	*1 M5 female thread + R (PT) 1/8 male thread			
Material	Case: PBT (glass fiber included), LCD display section: acrylic resin, pressure port: SUS 303, mounting screw section: copper alloy (nickel plating), switch section: silicone rubber			
Connection	PAP-04V-S Connector			
Wire length	When the wire is extended, up to 100 m permissible with 0.3 mm <sup>2</sup> and over cable (less than 30 m when CE Marking-compliant)			
Unit change function	Only supported for overseas (-KA) (MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg)			
Weight	Body weight: approx. 40 g, weight including package: 130 g			
Accessory	*2 PPX-C2 (2 m cable with connector): 1 pc. Unit seal label (KA with unit change): MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg			

\*1: Refer to Table 1 on the next page for export use.

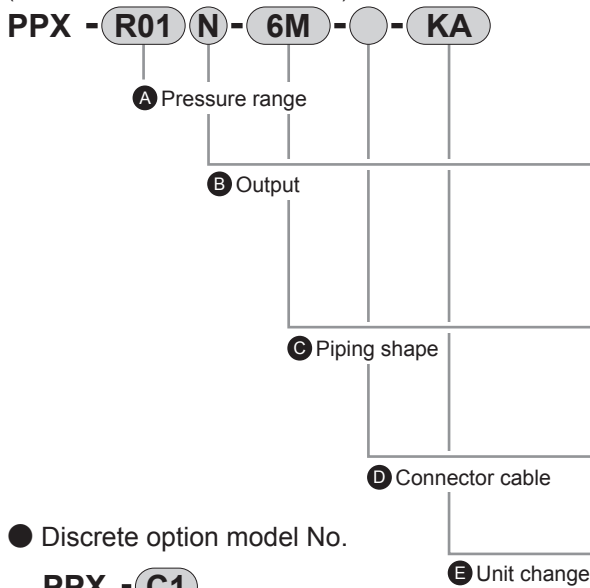
\*2: For (-J), connector cable is not attached.

## How to order

(How to order for domestic market)



(How to order for overseas markets)



● Discrete option model No.

PPX - **C1**

Code	Content
C1	Cable with connector 1 m
C2	Cable with connector 2 m
C3	Cable with connector 3 m
C5	Cable with connector 5 m
CN	Connector set (10 pcs. per set)
KL	Mounting bracket (mounting screw attached)
KHS	Panel bracket
KCB	Front protective cover (when using panel bracket)

Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
N	NPN transistor output 2 point (Standard)
P	PNP transistor output 2 point (Standard)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function)
<b>C Piping shape</b>	
6M	R1/8, M5 female thread
<b>D Connector cable</b>	
Blank	2 m connector cable attached
J *1	Without connector cable

\*1: Selectable only when "N" or "P" is selected for **B** Output.

In compliance with the new Measurement Law, export models with unit select function cannot be used in Japan.

Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
N	NPN transistor output 2 point (Standard)
P	PNP transistor output 2 point (Standard)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function)
<b>C Piping shape</b>	
6M *1	R1/8, M5 female thread
6N	NPT1/8, M5 female thread
6G *2	G1/8, M5 female thread
<b>D Connector cable</b>	
Blank	2 m connector cable attached
J *3	Without connector cable
<b>E Unit change</b>	
KA	With unit change function

\*1: Only "N" or "NH" can be selected for **B** Output.

\*2: Selectable only when "P" or "PH" is selected for **B** Output.

\*3: Selectable only when "N" or "P" is selected for **B** Output.

Destination	Switch output		Unit	Unit change function	With unit seal label *1	Piping port
	NPN	PNP				
Domestic	<input type="radio"/>	<input type="radio"/>	kPa/MPa	-	-	R1/8(M5)
Asia	<input type="radio"/>	-	kPa/MPa	<input type="radio"/>	<input type="radio"/>	R1/8(M5)
Europe	-	<input type="radio"/>	kPa/MPa	<input type="radio"/>	<input type="radio"/>	G1/8(M5)
North America	<input type="radio"/>	<input type="radio"/>	kPa/MPa	<input type="radio"/>	<input type="radio"/>	NPT1/8(M5)

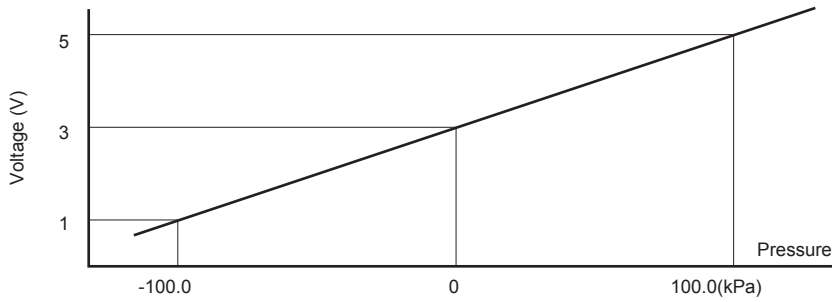
\*1: Refer to page 28 for the enclosed unit sealant.

[Table 1]

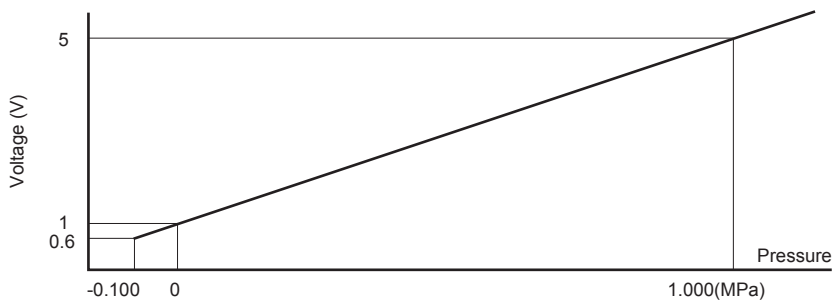
Type	Model No.	Port size	Output	Remarks
Standard	PPX-R01N-6M-(J)-KA	M5 female thread + R (PT) 1/8 male thread	NPN transistor/open collector	For Asia
	PPX-R10N-6M-(J)-KA			
High-function	PPX-R01NH-6M-KA			
	PPX-R10NH-6M-KA			
Standard	PPX-R01P-6G-(J)-KA	M5 female thread + G1/8 male thread	PNP transistor/open collector	For Europe
	PPX-R10P-6G-(J)-KA			
High-function	PPX-R01PH-6G-KA			
	PPX-R10PH-6G-KA			
Standard	PPX-R01N-6N-(J)-KA	M5 female thread + NPT1/8 male thread	NPN transistor/open collector	For North America
	PPX-R01P-6N-(J)-KA		PNP transistor/open collector	
	PPX-R10N-6N-(J)-KA		NPN transistor/open collector	
	PPX-R10P-6N-(J)-KA		PNP transistor/open collector	
High-function	PPX-R01NH-6N-KA		NPN transistor/open collector	
	PPX-R01PH-6N-KA		PNP transistor/open collector	
	PPX-R10NH-6N-KA		NPN transistor/open collector	
	PPX-R10PH-6N-KA		PNP transistor/open collector	

## Analog output voltage - pressure characteristics

● PPX-R01NH  
R01PH

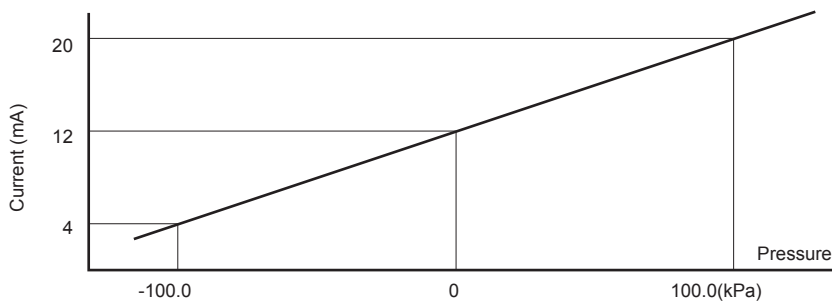


● PPX-R10NH  
R10PH

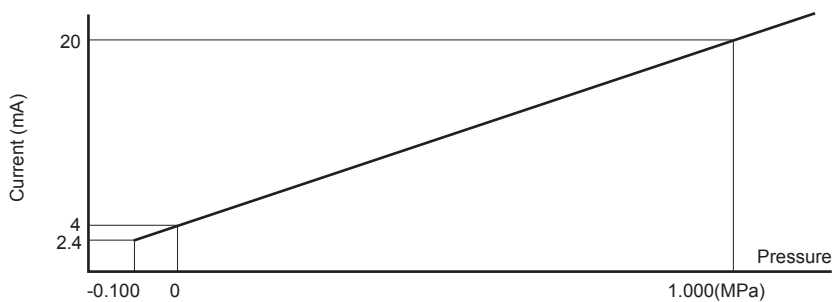


## Analog output current - pressure characteristics

● PPX-R01NH  
R01PH



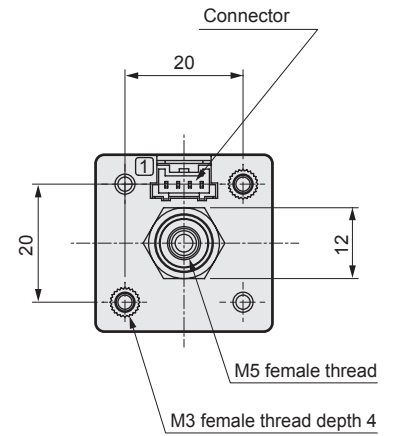
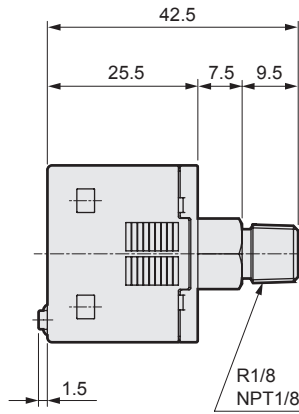
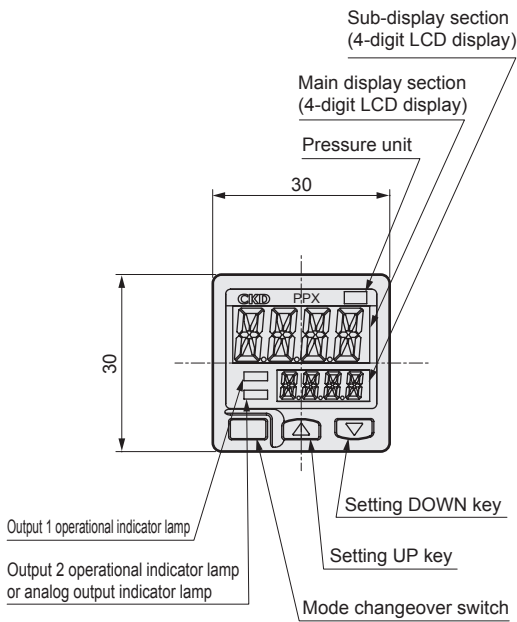
● PPX-R10NH  
R10PH



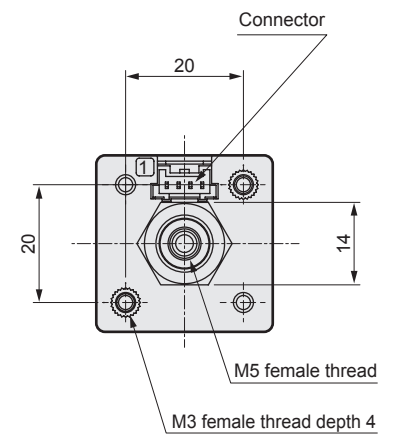
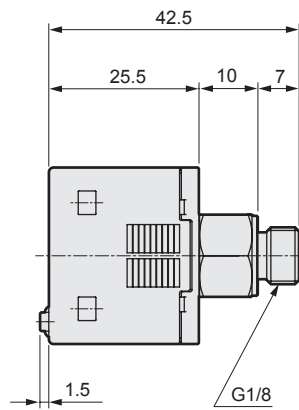
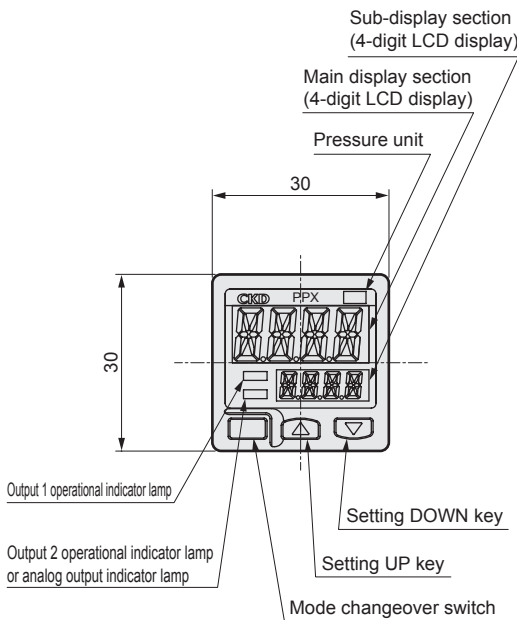
IO-Link  
Standard  
Oil-prohibited  
Operation mode  
Safety precautions  
Related products

Dimensions 

● PPX-R □□ -6M/6N (R thread/NPT thread)



● PPX-R □□ -6G (G thread)



IO-Link

Standard

Oil-prohibited

Operation mode

Safety precautions

Related products

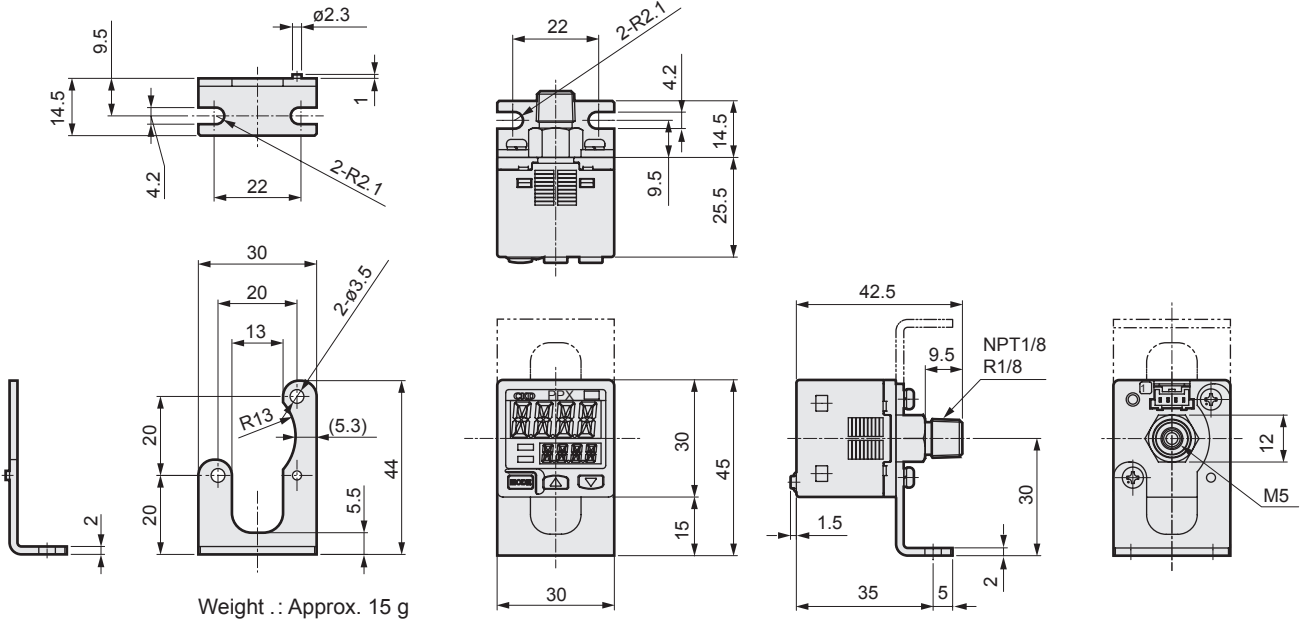


## Dimensions with options

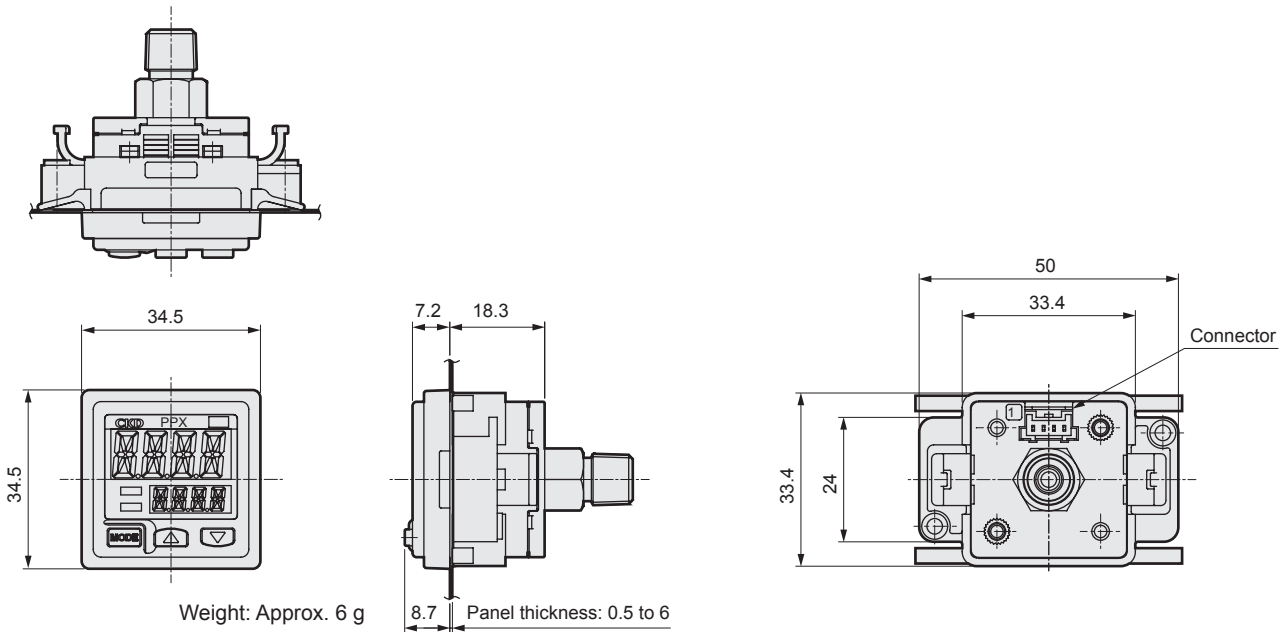


### ● Mounting bracket (PPX-KL)

Installation fig.

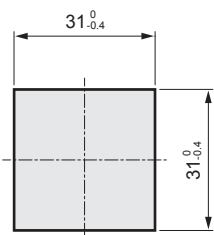


### ● Panel bracket (PPX-KHS) installation fig.

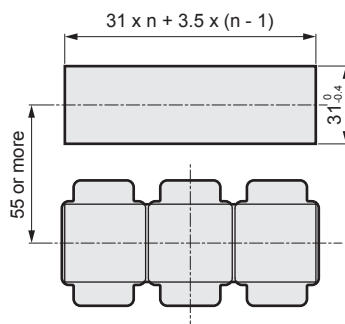


## Panel cut dimension

When installing 1 pc.

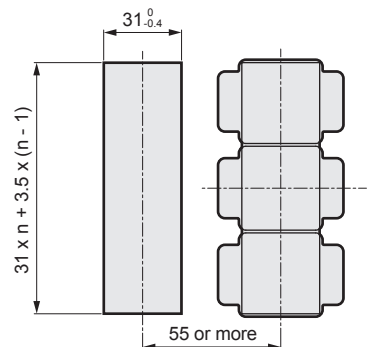


When installing consecutive n pcs. horizontally



(\*1): Panel thickness must be 0.5 to 6 mm.

When installing consecutive n pcs. vertically



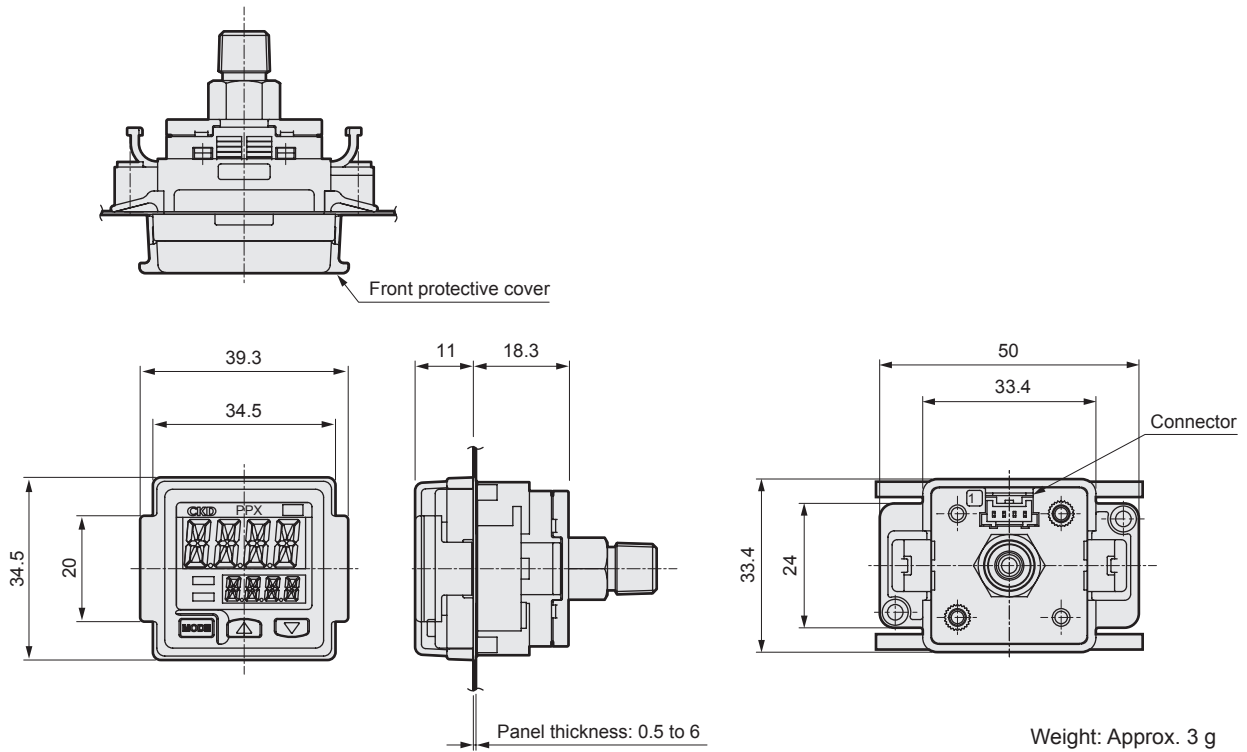
(\*1): Panel thickness must be 0.5 to 6 mm.

IO-Link  
Standard  
Oil-prohibited  
Operation mode  
Safety precautions  
Related products

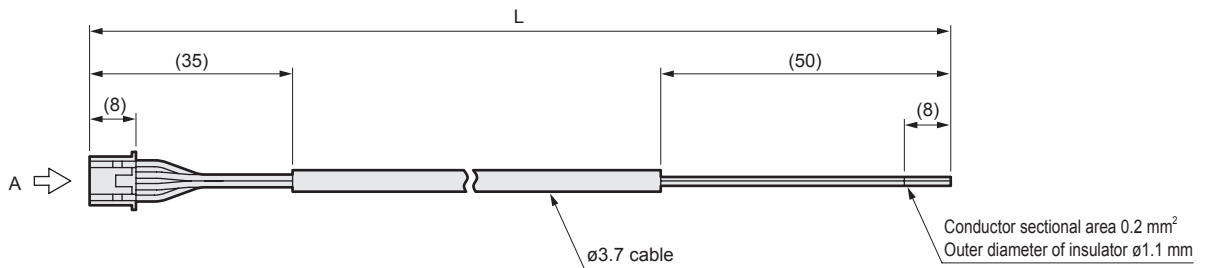
## Dimensions with options



- Front protective cover (PPX-KCB) installation fig.



- Cable with connector (PPX-C□)



(J.S.T.)

Terminal name	Insulator color	Terminal No.
0 V	Blue	④
Standard: Comparison output 2 High-function: Analog voltage output or external input	White	③
Comparison output 1	Black	②
+V	Brown	①

A arrow view

Model No.	Cable length	Weight g
PPX-C1	1 m	Approx. 20 g
PPX-C2	2 m	Approx. 40 g
PPX-C3	3 m	Approx. 60 g
PPX-C5	5 m	Approx. 100 g

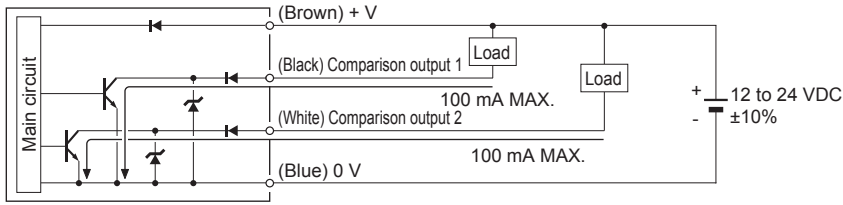
- Connector set (PPX-CN)

- Housing : J.S.T. Mfg. Co., Ltd. PAP-04V-S
- Contact : J.S.T. Mfg. Co., Ltd. SPHD-001T-P0.5

## Circuit and connection method

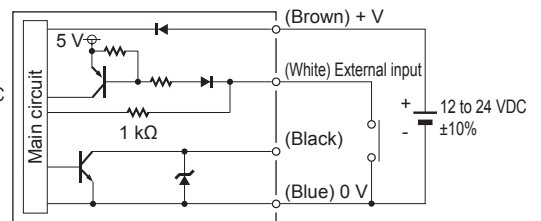
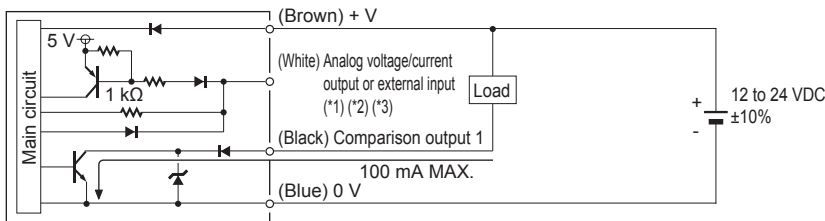
### NPN output

- Standard



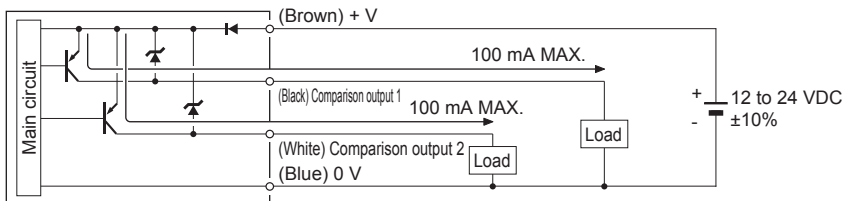
- High-function

(Example of external input connection)



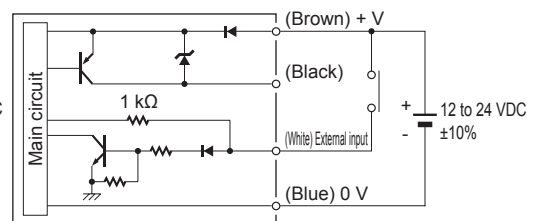
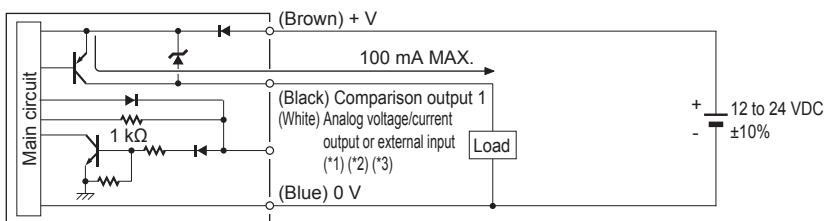
### PNP output

- Standard



- High-function

(Example of external input connection)



\*1: Use 250 Ω (max.) for output load resistance at the time of analog current output.

\*2: Note that the voltage of 5 V and over is generated at the time of analog current output.

\*3: Be careful of input impedance of the connection device when using analog current output.

In addition, note that the voltage is reduced by the resistance of cable at the time of cable extension.



# Digital Pressure Sensor Oil-Prohibited PPX-P12 Series

JIS symbol



## Overview

- Oil-prohibited treatment (degreasing) at gas contact areas (piping ports, etc.)
- Silicone grease-free at gas contact areas (Grease is not used on the gas contact areas)

## Features

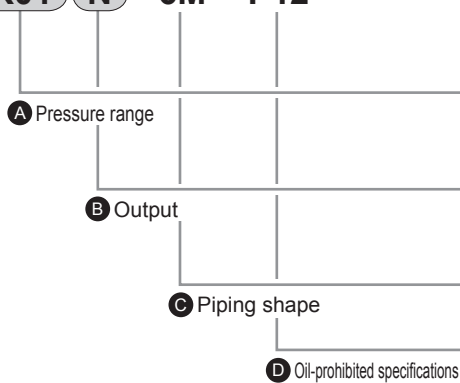
- Ideal for applications susceptible to grease, including liquid crystal, semiconductors, foodstuffs, medical use, and electronic parts.
- Because grease is not used, this type is suitable for pressure detection of paint lines.

## Specifications

Specifications are the same as the standard. Refer to page 5 for details.

How to order

PPX - **R01** **N** - 6M - P12



Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
N	NPN transistor output 2 point
NH	NPN transistor output 1 point + analog voltage output or external input
<b>C Piping shape</b>	
6M	R1/8, M5 female thread
<b>D Oil-prohibited specifications</b>	
P12	Oil free

\* 2 m connector cable included

## Dimensions

Same as the standard. Refer to page 8 for details.

IO-Link

Standard

Oil-prohibited

Operation mode

Safety precautions

Related products