

Series variation

Electronic pressure switch

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/
PTFE FRL
- Outdrs FR
- F.R.L
(Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneur
- AirBoost
- SpdContr
- Silncr
- CheckV/
other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/
ElecPresSw
- ContactSW
- AirSens
- PresSW
Cool
- AirFloSens/
Contr
- WaterRtSens
- TotAirSys
(Total Air)
- TotAirSys
(Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg
etc
- Ending

Model	Type	Pressure range (kPa)								Degree of protection	
		With sensor/amp	No sensor/amp	0 to 980 (1000)	0 to 98 (100)	-100 to 0 (-101.3)	-100 to 980 (1000)	-100 to 300	-100 to 100		-101 to 500
PPX  A digital pressure sensor enabling simultaneous confirmation of the current and set pressure values with dual displays, a 3-color display, setting details copy function, 3 mode settings, etc. This fully loaded digital pressure sensor provides ease-of-use and high functionality not found conventionally.		●	-	-	-	-	● (1000)	-	●	-	IP40
PPD3  Ideal digital indicator pressure switch for pneumatic lines. Thanks to a wide variety of port options, the desired usage is possible for suction confirmation/contact confirmation, etc.		●	-	-	-	-	●	●	●	-	IP65
		-	●								IP65 (IP40 for display section)
PPD3-S  Pressure switch with digital display stainless steel diaphragm is used for sensor section.		●	-	-	-	-	●	●	●	-	IP65
		-	●								IP65 (IP40 for display section)
PPG-C  Basic digital pressure sensor suitable for pneumatic/vacuum pressure. A variety of selectable ports to enable support to be provided globally.		●	-	-	-	●	●	-	●	-	IP65
PPE  Trimmer setting semiconductor pressure switch developed for pneumatic/ vacuum circuits. Usage is flexible due to compact shape and three types of piping connections.		●	-	● (1000)	● (100)	● (-101.3)	-	-	-	-	IP65
PPE- □ A  Semiconductor pressure sensor developed for pneumatic/ vacuum circuits. 1 to 5 V output (analog output) is proportional to applied pressure.		●	-	● (1000)	● (100)	●	-	-	-	-	IP65
PSW  Reliable pressure switch developed for pneumatics/ vacuum circuits. Semiconductor sensor used for high-precision/high-speed response.		●	-	● (1000)	● (100)	●	-	-	-	-	IP40

Electronic pressure switch

Series variation 1

● = Available in lineup
 - = Not available in lineup

*1: Body front operation section only *2: Custom order *3: Select with model No.

	Switch output (number of points) *3			Applicable fluid	Mounting method									Display		Page				
	NPN	PNP	Analog		FR mounting	Panel mount	Others (mount brackets, etc.)	Piping connection						Digital display	Output lamp only					
								Rc1/8	R1/8	Push-in	Plug	M5 female thread	NPT1/8				G1/8			
	● (2)	● (2)	-	Air Non-corrosive gas	● Attached	●	●	-	●	-	-	●	●	●	●	-	1054			
	● (1)	● (1)	● (1)																	
	● (2)	● (2)	-	Air Non-corrosive gas	-	●	●	●	-	●	-	-	-	-	●	-	1080			
	● (1)	● (1)	● (1)																	
	● (2)	● (2)	● (1)																	
	● (2)	● (2)	-	Air/non-corrosive gas (including oil and drain) compressed air	-	●	●	●	-	●	-	-	-	-	●	-	1080			
	● (1)	● (1)	● (1)																	
	● (2)	● (2)	● (1)																	
	● (1)	● (1)	-	Air Non-corrosive gas	-	●	●	●	-	-	-	-	●	●	●	-	1096			
	● (2-wire) (1)	-	-	Air Non-corrosive gas	-	-	-	-	●	●	●	-	-	-	-	●	1104			
	-	-	● (1)	Air Non-corrosive gas	-	-	-	-	●	●	●	-	-	-	-	● (display of energized state only)	1107			
	● (1)	-	● (1)	Air Non-corrosive gas	-	-	●	-	-	-	-	●	-	-	-	●	1110			

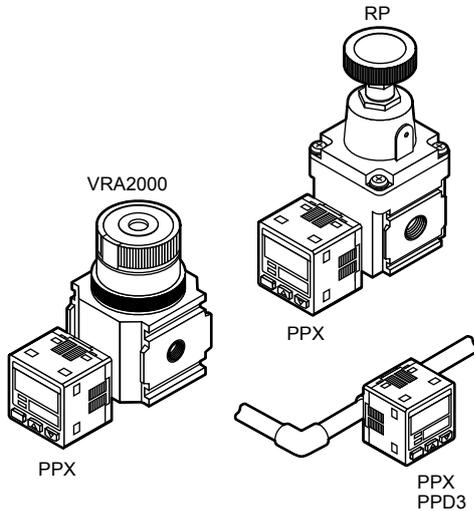
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AirFloSens/ Contr
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TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Electronic pressure switch

Electronic pressure switch Applications of pressure switch

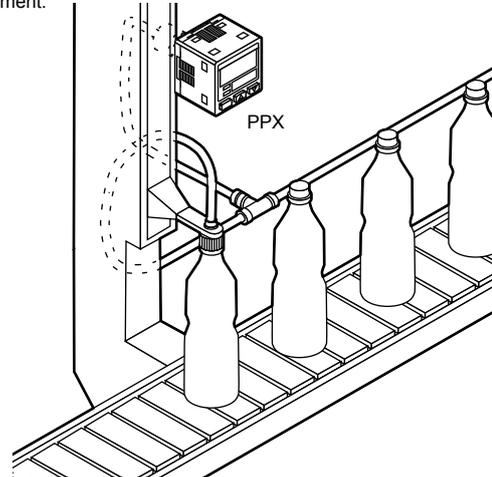
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● Positive pressure/vacuum confirmation and interlock

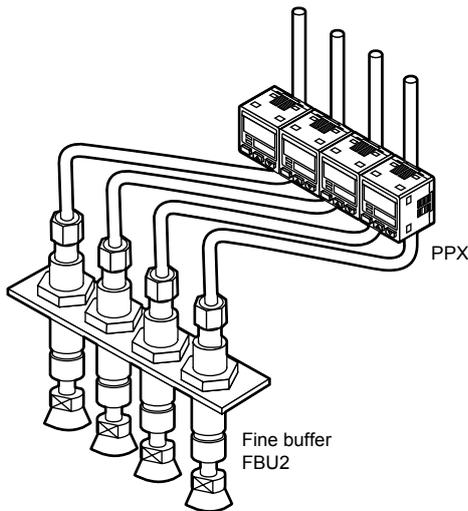


● High-function

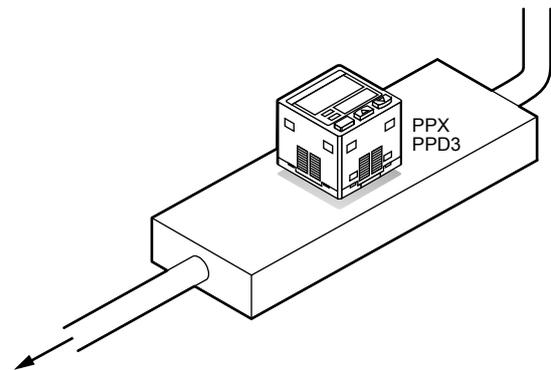
· Settings are made easy with automatic reference and remote zero adjustment.



● Manifold

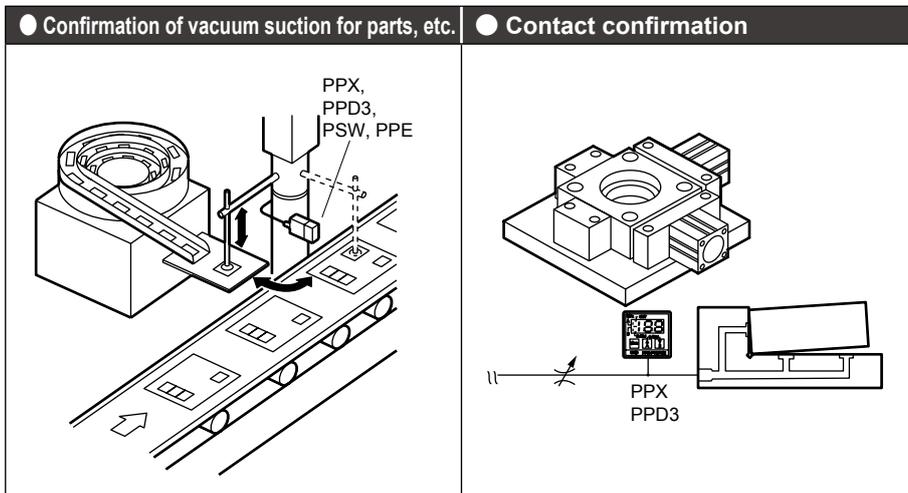
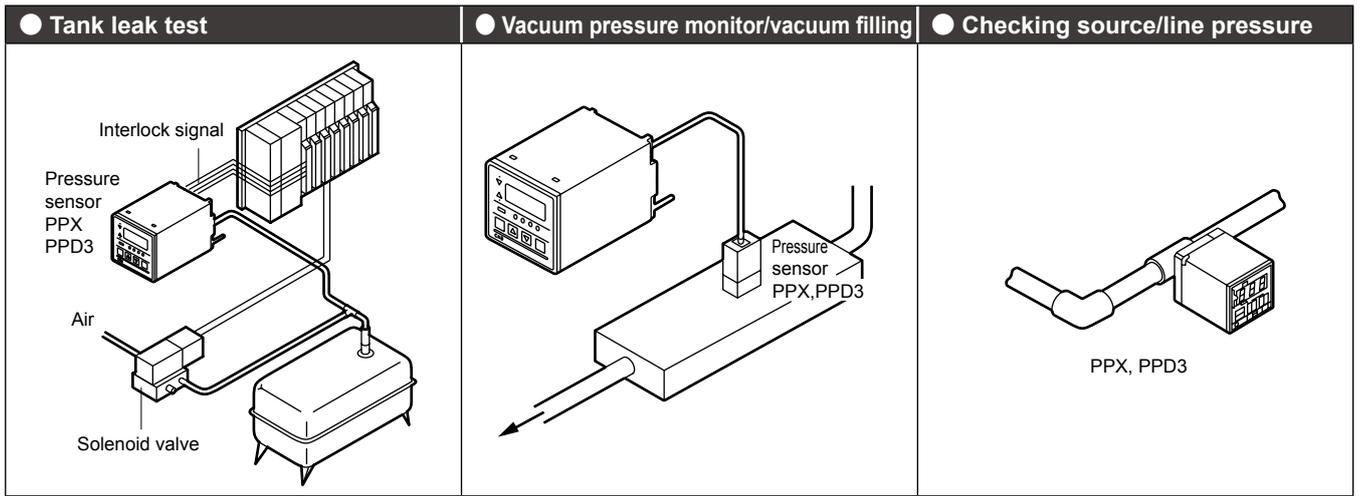


● Attains vacuum and burst pressure with one unit



Electronic pressure switch

Applications



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Operability is improved with 2-screen display!

This product is improved with 3 new functions.

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Increased visibility

The digital display is widened to increase visibility.
The display pressure range and the setting pressure range are expanded.



Analog current output is added to the high-function

High-function replacing comparison output with a selection of analog voltage output, analog current output, or external input. Compatible with multiple applications.

Switches analog current and analog voltage



Selection

Comparison output

Analog voltage output

Low pressure: 1 to 5 V,
High pressure: 0.6 to 5 V

Analog current output

Low pressure: 4 to 20 mA,
High pressure: 2.4 to 20 mA

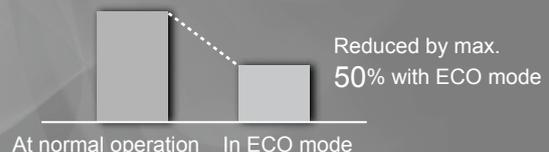
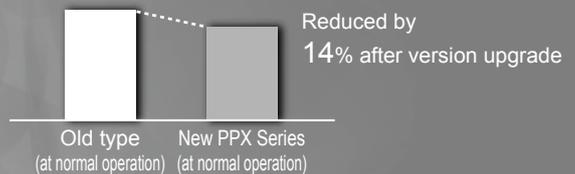
External input

Auto reference/
remote zero adjustment



Power consumption is further reduced

- Reduced 14% compared to conventional products at normal operation
- Reduced 30% to 50% with ECO mode



Digital pressure sensor

PPXseries

CKD

Direct setting with 2-screen display

Comparison output 1 operational indicator lamp

Comparison output 2 operational indicator lamp
(High-function has analog voltage output operational indicator)

Mode switching key

Present value [Main display section]
3-color display (red/green/orange)
Main display section changes between green and red in conjunction with output ON/OFF and shows orange during setting.

Set value [Sub-display section]
Sub-display section can be customized
Arbitrary alphanumeric characters other than setting values can be displayed.

RUN Mode	Operational functions, such as set value adjustment and key locking, are possible.
Menu Setting Mode	Basic settings, such as output mode setting and N.O./N.C. switching, are possible.
PRO Mode	High-function settings, such as copy function and sub-display section change, are possible.

Copy function helpful for reducing work processes and preventing misoperation.



Equipped with 2 independent outputs (standard)

This device is equipped with 2 independent comparison outputs, and a different detection mode can be selected for each output.

3 types of detection modes can be selected

- EASY mode...ON/OFF control of the comparison output
- Hysteresis mode...ON/OFF control of comparison output with hysteresis setting
- Window comparator...ON/OFF control of comparison output within the set pressure range

Strengthened output circuit

- The transistor output circuit is equipped with a reverse connection protection circuit

Even more convenient functions

- Easy-to-read alphanumeric display



- Peak/bottom hold function
The max. and min. values of pressure fluctuation are displayed using 2 screens.
- Response time can be changed in 10 steps (2.5 ms to 5000 ms)
- The setting descriptions can be displayed by code number

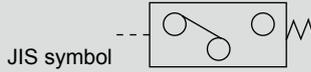


Space saving Contact mounting is possible.

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Ending



Digital pressure sensor PPX Series



Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

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 (≈73 psi, 5 bar)	1.5 MPa (≈220 psi, 15 bar)	500 kPa (≈73 psi, 5 bar)	1.5 MPa (≈220 psi, 15 bar)
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 1/2 oper lamp: Comparison outp ON→lamp)		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 (14°F) to +50°C (122°F), at the time of storage: -10 (14°F) to +60°C (140°F)		
	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 ² (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 (nickeling), switch section: silicone rubber			
Connection	Connector			
Wire length	When the wire is extended, up to 100 m permissible with 0.3 mm ² and over cable (less than 30 m when CE Marking-compliant)			
Unit change function	Only supported for overseas (-KA) (MPa, kPa, kgf/cm ² , 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 ² , bar, psi, mmHg, inchHg			

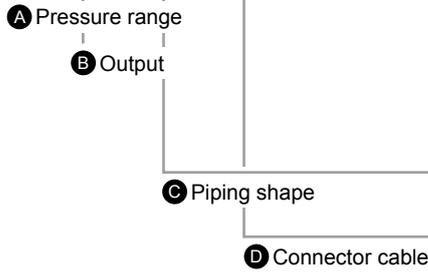
*1: Refer to Table 1 on the next page for export use.

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

How to order

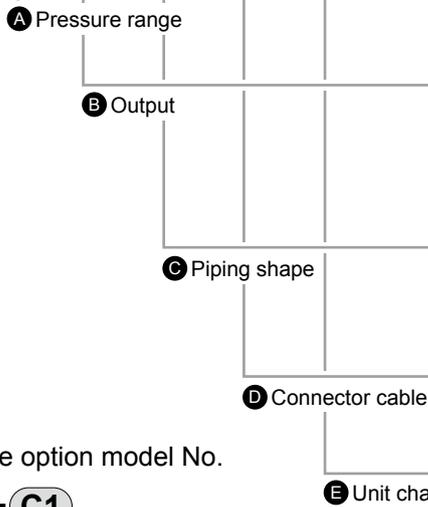
(How to order for domestic market)

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



(How to order for foreign market)

PPX - **R01** - **N** - **6M** - **KA**



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
A Pressure range	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
B Output	
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)
C Piping shape	
6M	R1/8, M5 female thread
D Connector cable	
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
A Pressure range	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
B Output	
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)
C Piping shape	
6M *1	R1/8, M5 female thread
6N	NPT1/8, M5 female thread
6G *2	G1/8, M5 female thread
D Connector cable	
Blank	2 m connector cable attached
J *3	Without connector cable
E Unit change	
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 1122 for the enclosed unit sealant.

[Table 1]

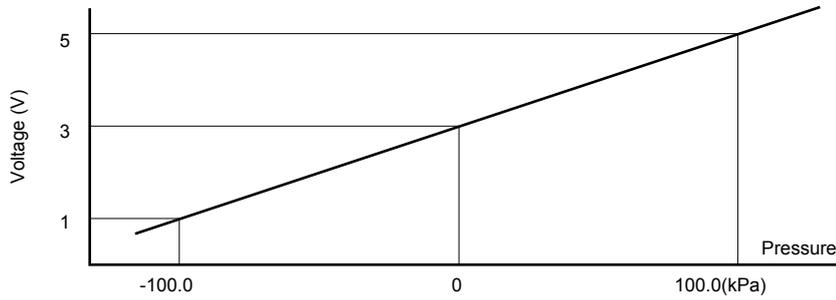
Type	Model No.	Port size	Output	Remarks
Standard	PPX-R01N-6M-(J)-KA	M5 female thread + R (PT) 1/8 male thread	NPN transistor/open collector	For Asia
	PPX-R10N-6M-(J)-KA			
High-function	PPX-R01NH-6M-KA			
	PPX-R10NH-6M-KA			
Standard	PPX-R01P-6G-(J)-KA	M5 female thread + G1/8 male thread	PNP transistor/open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

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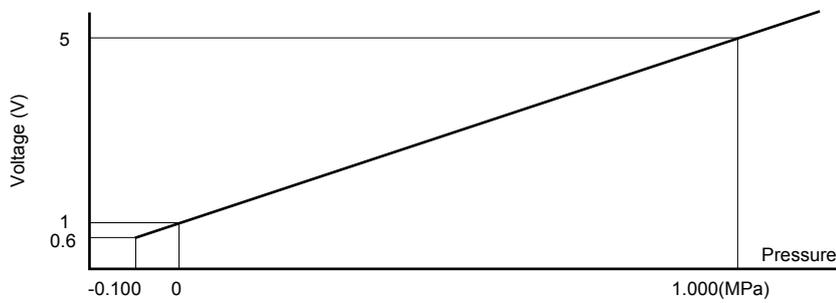
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- TotAirSys
(Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg
etc
- Ending

Analog output voltage - pressure characteristics

● PPX-R01NH
R01PH

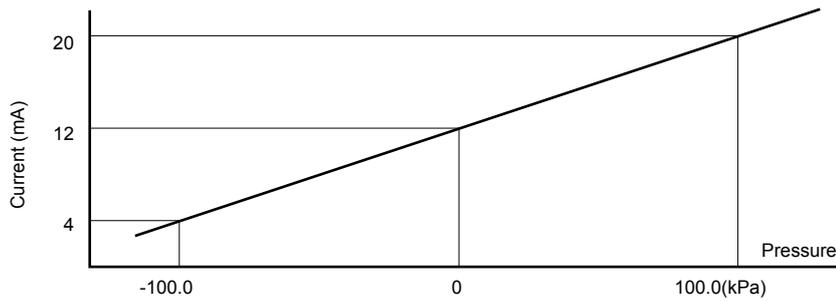


● PPX-R10NH
R10PH

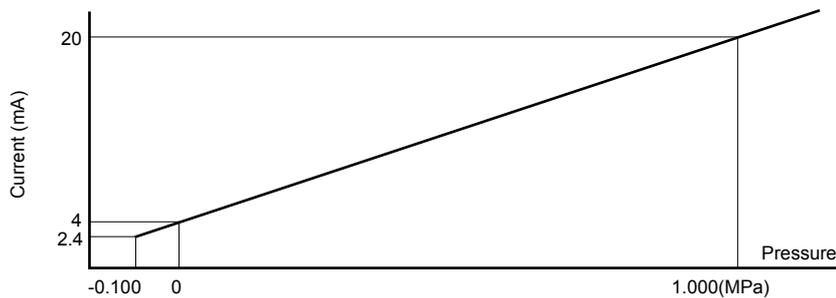


Analog output current - pressure characteristics

● PPX-R01NH
R01PH

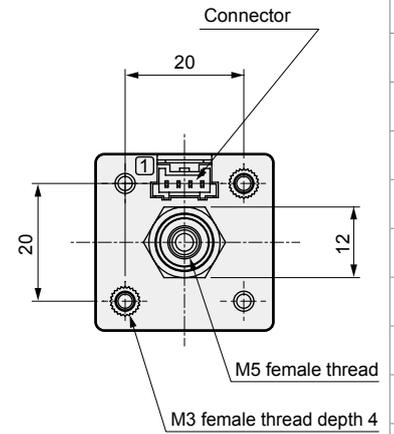
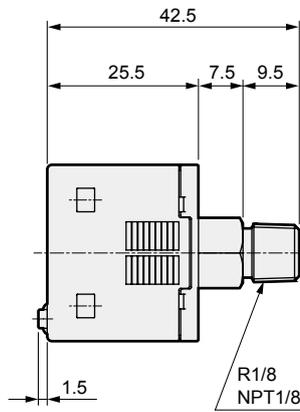
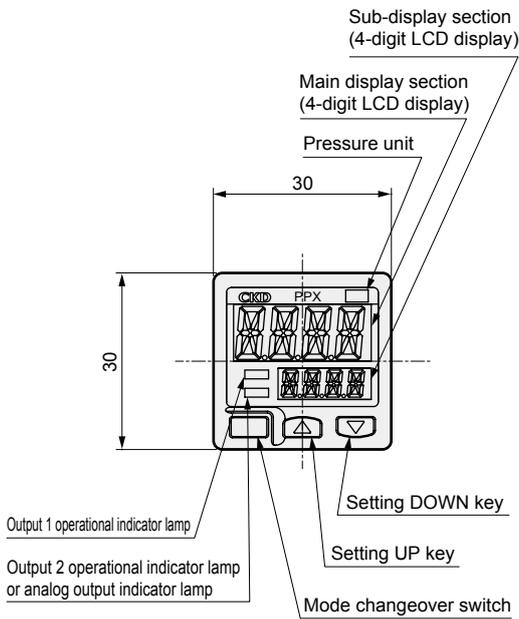


● PPX-R10NH
R10PH

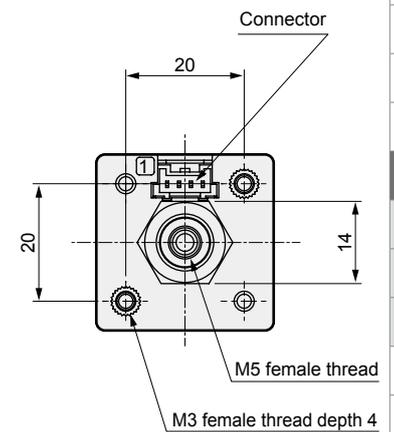
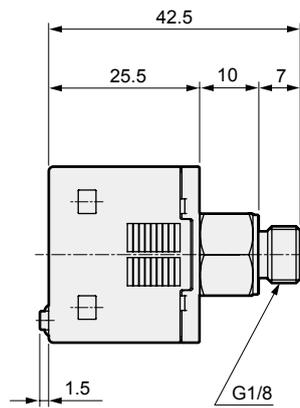
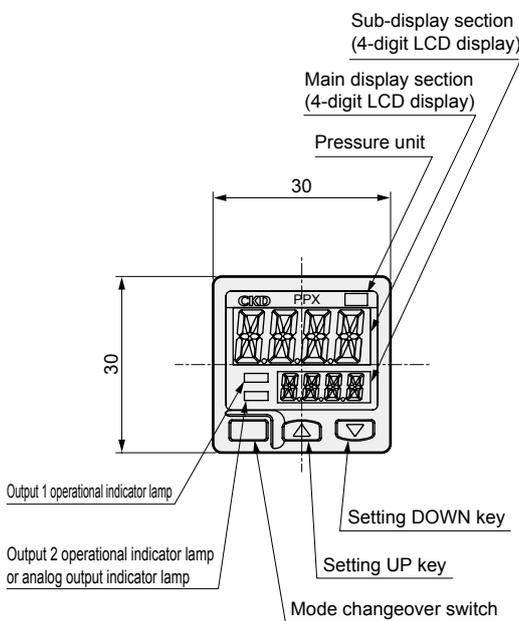


Dimensions

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



● PPX-R □□ -6G (G thread)



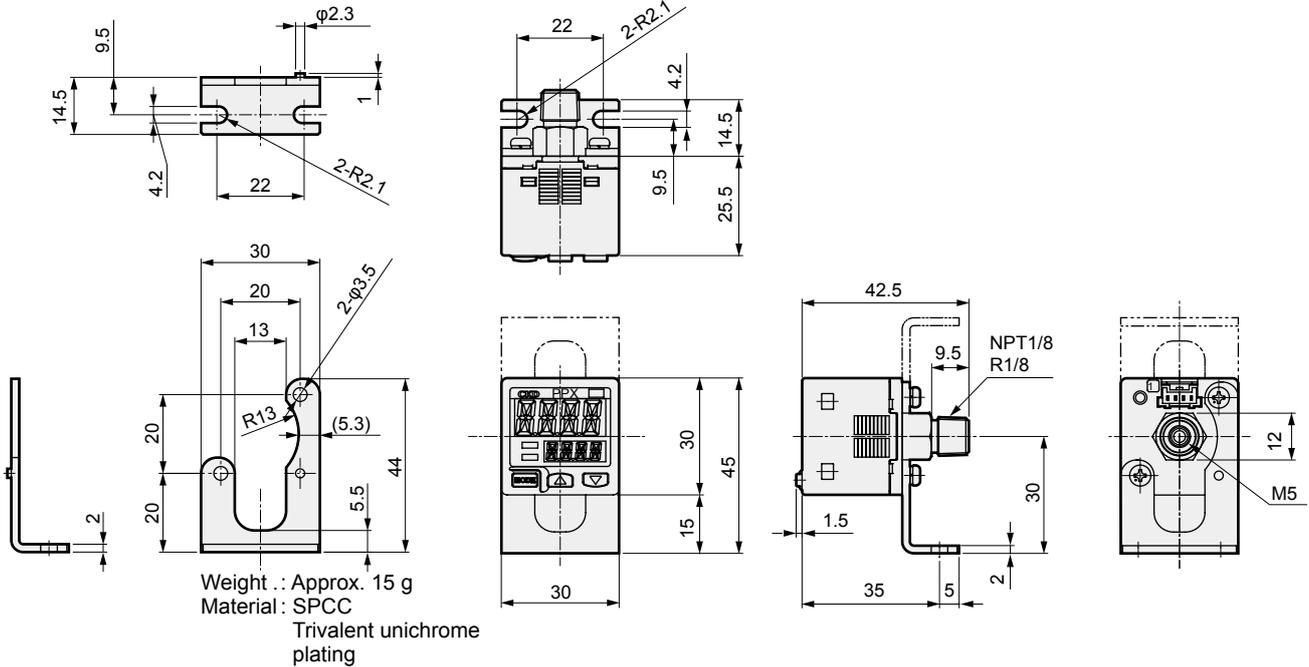
F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRISens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending



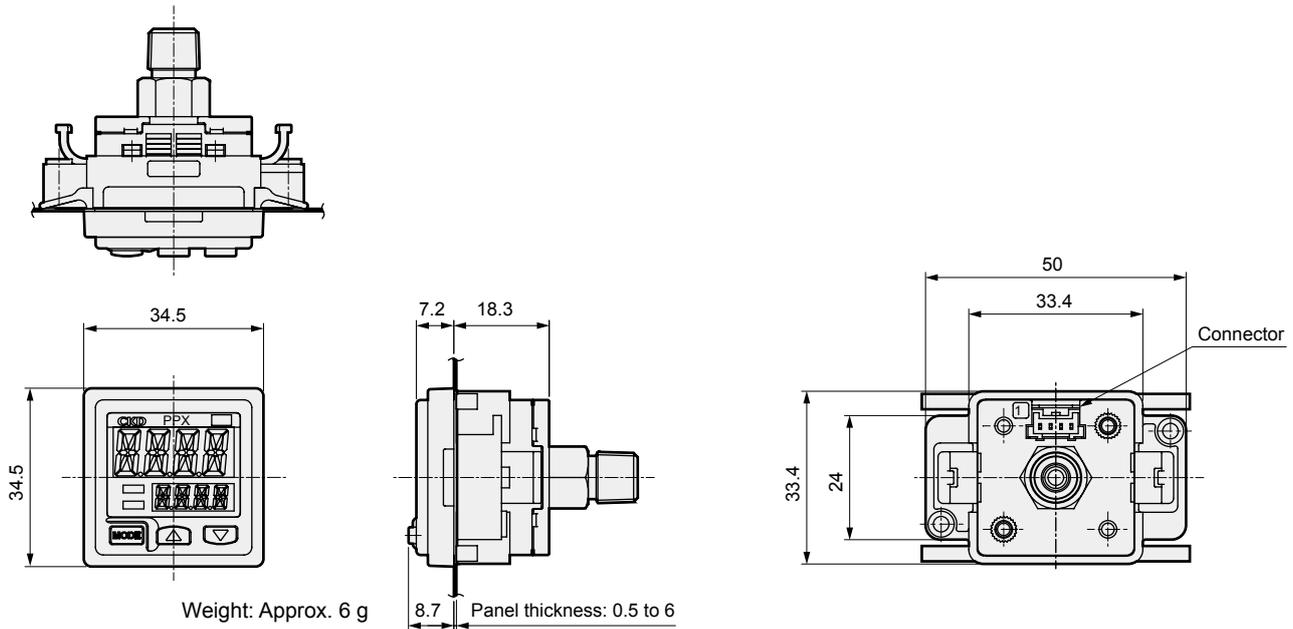
Dimensions with options

● Mounting bracket (PPX-KL)

Installation fig.

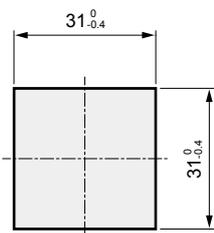


● Panel bracket (PPX-KHS) installation fig.

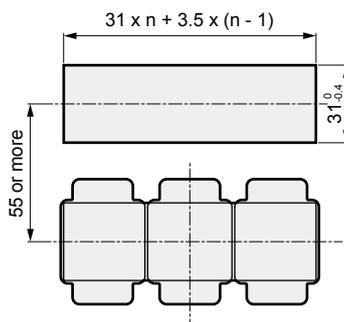


Panel cut dimension

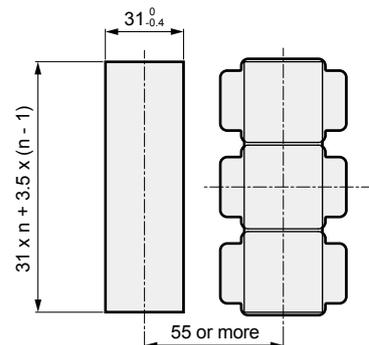
When installing 1 pc.



When installing consecutive n pcs. horizontally



When installing consecutive n pcs. vertically



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

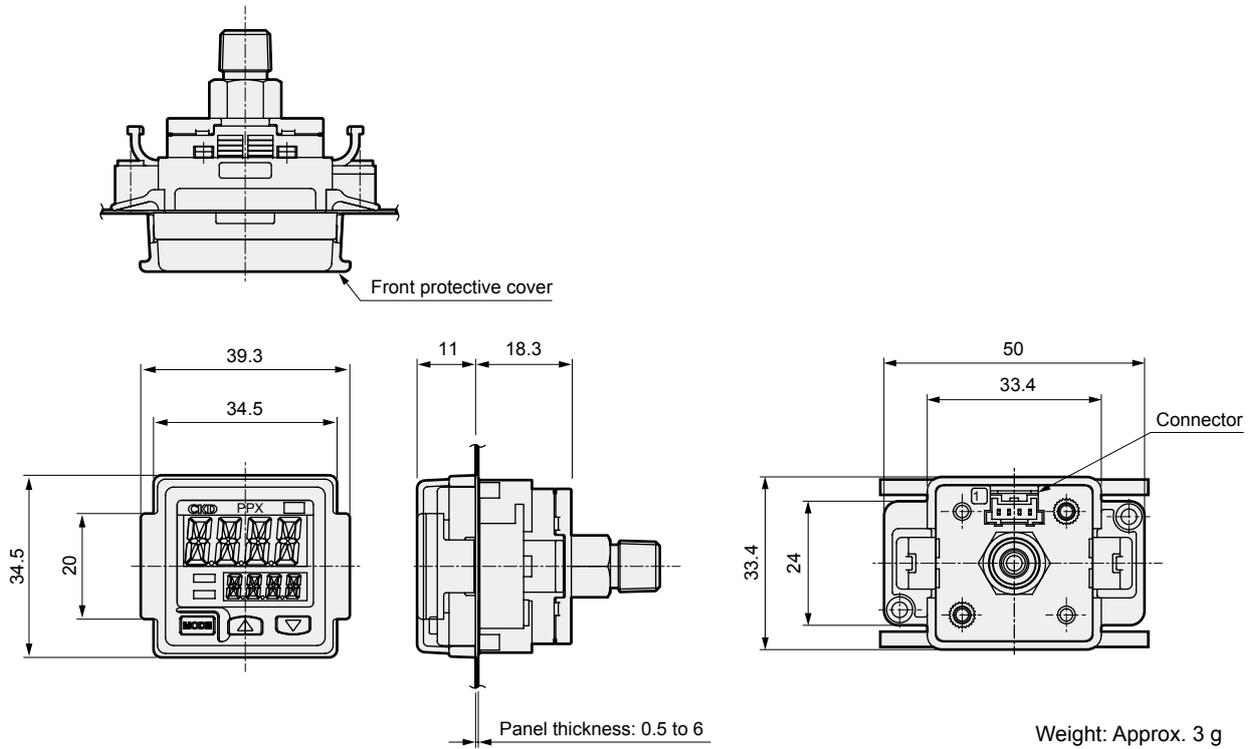
(*1): Panel thickness must be 0.5 to 6 mm.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

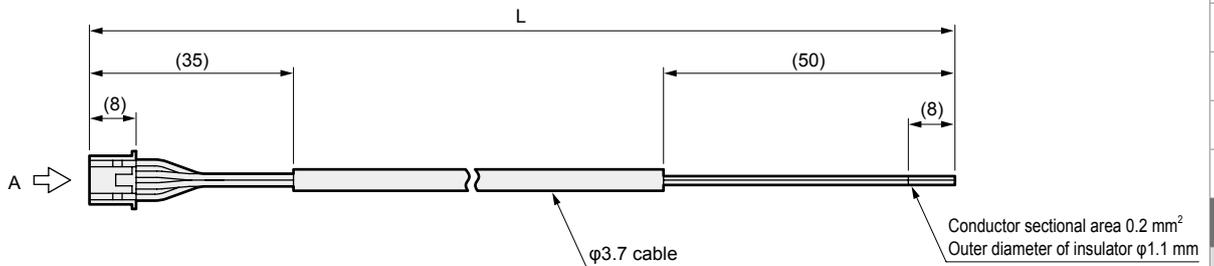
Dimensions with options



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



- Cable with connector (PPX-C□)



(J.S.T.)

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
Terminal name	Insulator color	Terminal No.

Housing PAP-04V-S

Contact (crimping) SPHD-001T-P0.5

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

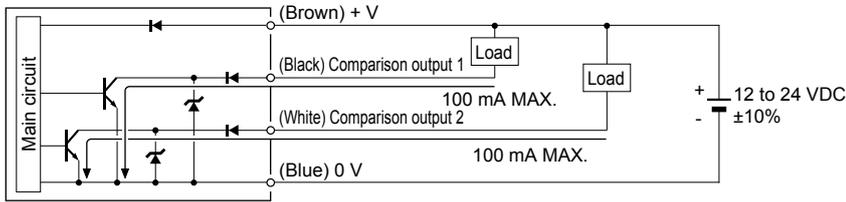
- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/
PTFE FRL
- Outdrs FR
- F.R.L
(Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/
other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/
ElecPresSw
- ContactSW
- AirSens
- PresSW
Cool
- AirFloSens/
Contr
- WaterRISens
- TotAirSys
(Total Air)
- TotAirSys
(Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg
etc
- Ending

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhrR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacFR
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

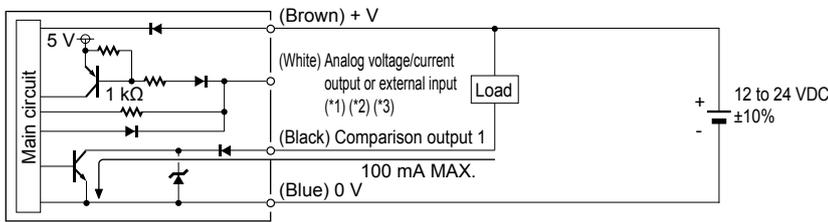
Circuit and connection method

NPN output

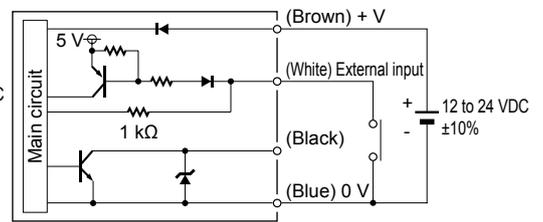
● Standard



● High-function

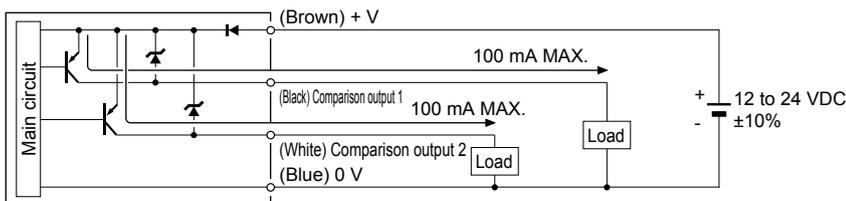


(Example of external input connection)

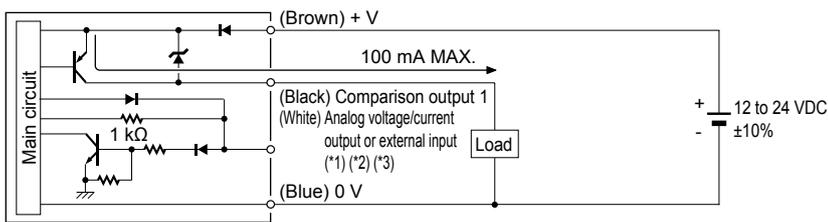


PNP output

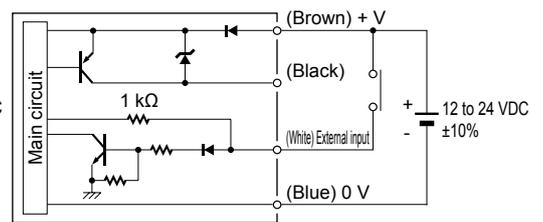
● Standard



● 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.

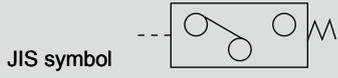
MEMO

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L
 F (Filtr)
 R (Reg)
 L (Lub)
 PresSW
 Shutoff
 SlowStart
 FimResistFR
 Oil-ProhR
 MedPresFR
 No Cu/
 PTFE FRL
 Outdrs FR
 F.R.L
 (Related)
 CompFRL
 LgFRL
 PrecsR
 VacFR
 Clean FR
 ElecPneuR
 AirBoost
 SpdContr
 Silncr
 CheckV/
 other
 Jnt/tube
 AirUnt
 PrecsCompn
 Mech/
 ElecPresSw
 ContactSW
 AirSens
 PresSW
 Cool
 AirFloSens/
 Contr
 WaterRtSens
 TotAirSys
 (Total Air)
 TotAirSys
 (Gamma)
 RefrDry
 DesicDry
 HiPolymDry
 MainFiltr
 Dischrg
 etc
 Ending



Digital pressure sensor oil-prohibited PPX-P12 Series



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

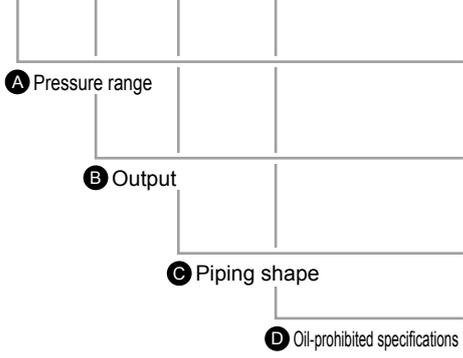
- Ideal for applications susceptible to grease, including liquid crystal, semiconductors, foodstuffs, medical use, and electronic parts.
- Because grease is not used, this type is suitable for pressure detection of paint lines.

Specifications

Specifications are the same as the standard. Refer to page 1056 for details.

How to order

PPX - R01 N - 6M - P12



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

* 2 m connector cable included

Dimensions

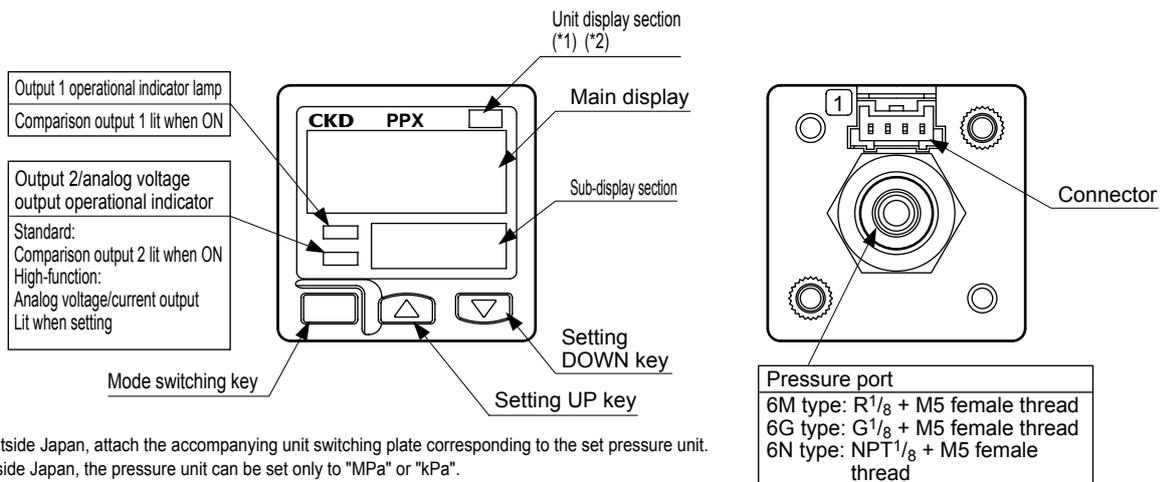
Same as the standard. Refer to page 1059 for details.

MEMO

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Names of display/operation section

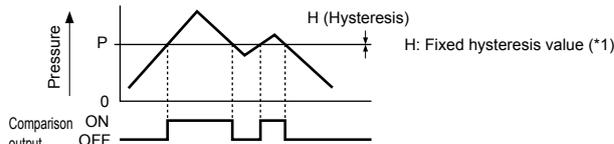


Operation mode and output operation

- The selectable output modes include EASY mode, hysteresis mode, or window comparator mode for comparison output 1 and comparison output 2.
Refer to "Menu setting mode" (page 1068), switch output 1/2 output mode setting, for details.

EASY mode

- This mode is used to turn comparison output ON or OFF.



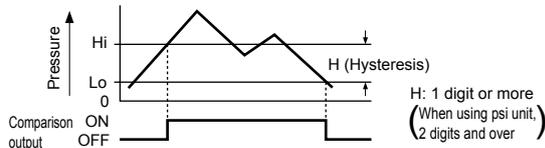
(*1): Hysteresis can be set to eight stages.

Refer to "PRO mode" (page 1070), [Changing fixed hysteresis] for details on setting.

(*2): In case of comparison output 1, "P-1" or, in case of comparison output 2, "P-2" are displayed on the sub-display section.

Hysteresis mode

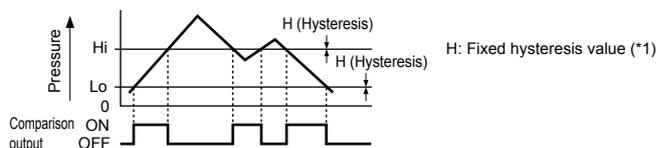
- In this mode, the comparison output hysteresis is randomly set to control the ON and OFF settings.



(*1): In case of comparison output 1, "Hi-1", "Lo-1", or in case of comparison output 2, "Hi-2", "Lo-2" are displayed on the sub-display section.

Window comparator mode

- This mode is used to turn comparison output ON or OFF within the setting range.



(*1): Hysteresis can be set to eight stages.

Refer to "PRO mode" (page 1070), [Changing fixed hysteresis] for details on setting.

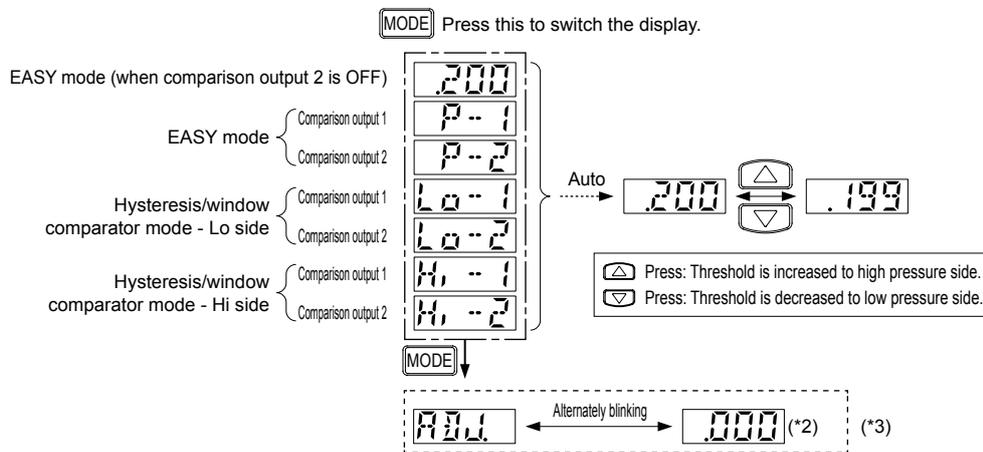
(*2): In case of comparison output 1, "Hi-1", "Lo-1", or in case of comparison output 2, "Hi-2", "Lo-2" are displayed on the sub-display section.

(*3): Set the setting intervals at Lo side and Hi side to the hysteresis fixed value and over.

About RUN Mode

Threshold setting

- Refer to “Menu setting mode”, [Comparison output 1/2 output mode setting], [Analog voltage/current output/external input switching] for setting method of setting conditions.
- Threshold setting is performed on the sub-display section. The main display section is not switched.



- (*1): When pressure exceeding the set pressure range is applied, “UP” (exceeding the upper limit) or “DOWN” (exceeding the lower limit) is displayed by lighting on the sub-display section. In addition, “DOWN” is displayed when the threshold at Hi side falls below the threshold at Lo side at the time of threshold setting of “Hysteresis/window comparator mode”.
- (*2): Auto-reference and remote zero adjusting value are shown. Refer to “Auto reference function” or “Remote zero adjusting function” for details.
- (*3): The area inside the broken line is not displayed unless either “ZERO” or “AREF” is set when switching the external input. Refer to “Menu setting mode”, analog voltage/current output/external input switching, for setting method.

Zero adjustment

- The zero adjustment function forcibly sets the pressure display to “zero” when the pressure port is released to atmospheric pressure.



Key lock function

- The key lock function disables key operations so that conditions set for setting modes cannot be mistakenly changed.

[Setting key lock]



[Releasing key lock]



Peak/bottom hold function

- The peak and bottom hold function is to display the peak and bottom values of varying pressure.
- The peak value is displayed on the main display, and the bottom value is displayed on the sub-display section.
- The value at the high pressure side is the peak value, and the value at the low pressure side is the lowest value.

[Setting peak/bottom hold]



[Releasing peak/bottom hold]



F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/
PTFE FRL
Outdrs FR
F.R.L
(Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PrecsCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

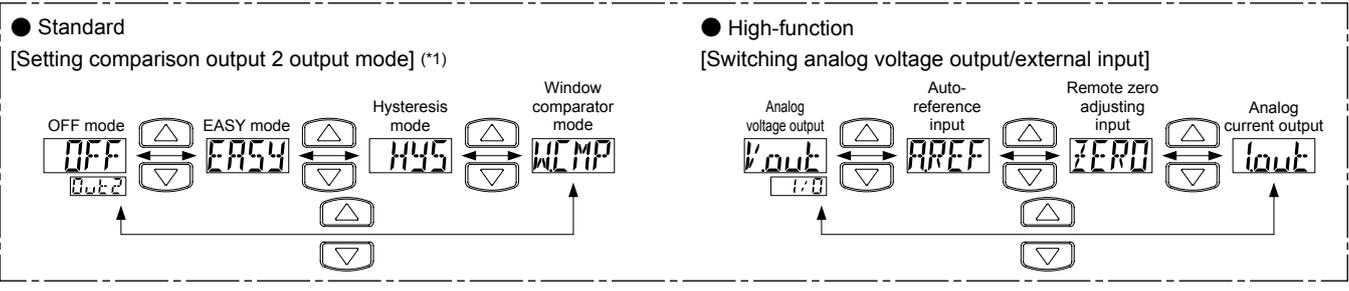
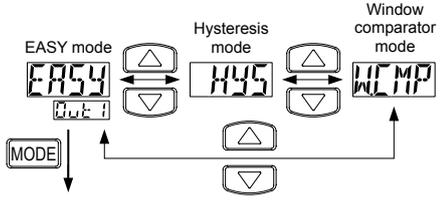
Menu setting mode

● If the mode select key is held down during setting, the RUN mode is initiated. At this time, the changed settings will come into effect.

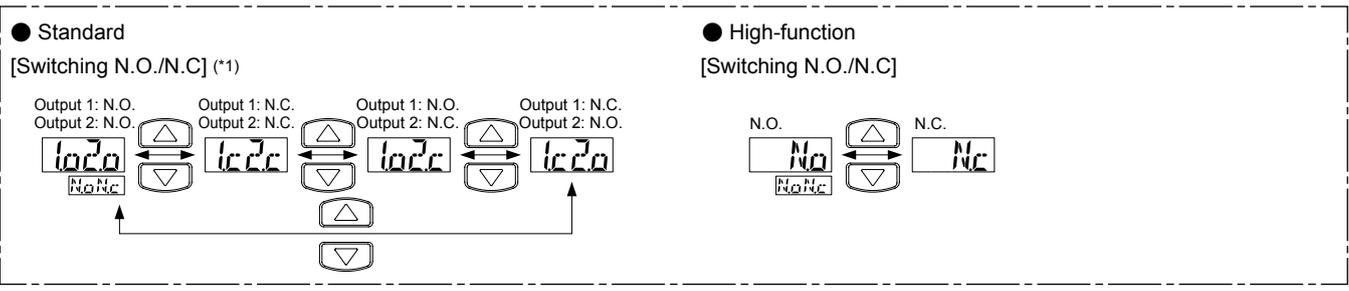
RUN Mode

↓ [MODE] Hold down for 2 seconds

[Setting comparison output 1 output mode]

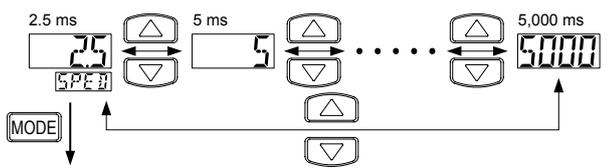


↓ [MODE]

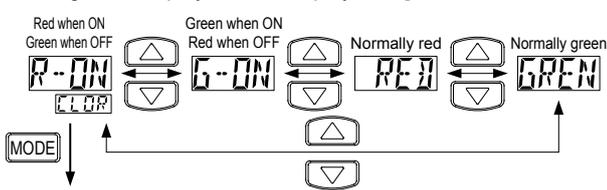


↓ [MODE]

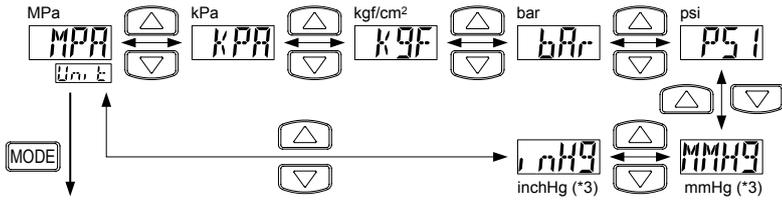
[Setting response time]



[Switching main display section display color]



[Unit switching] (*2)



RUN Mode

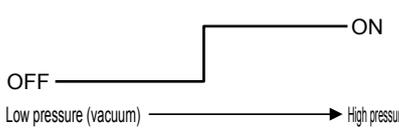
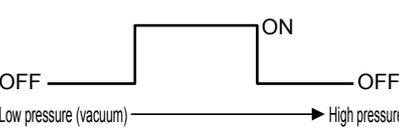
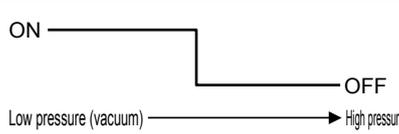
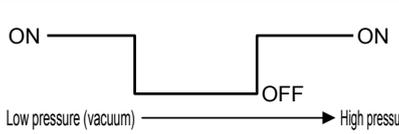
(*1): If the comparison output 2 output mode setting is set to "OFF", the display at NO/NC changeover is the same as for the high-function.

(*2): For inside Japan, the pressure unit can be set only to "MPa" or "kPa". For the low pressure, the setting descriptions of unit switching are not displayed.

(*3): For the high pressure, they are not displayed.

Setting items	Initial state	Content
Setting comparison output 1 output mode		Set comparison output 1 output mode.
Setting comparison output 2 output mode (only standard)		Set comparison output 2 output mode.
Switching analog voltage output/ external input (only high-function)		The item can be selected from analog voltage output, automatic reference input, or remote zero adjustment input.
Switching NO/NC *	Low pressure  High pressure 	Set normally open (NO) or normally closed (NC).
Setting response time		Set the response time. Response time can be selected from 2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, or 5000 ms.
Switching main display section display color		Colors on the main display can be changed.
Unit switching	Low pressure  High pressure 	The pressure unit can be changed.

* NO/NC operation

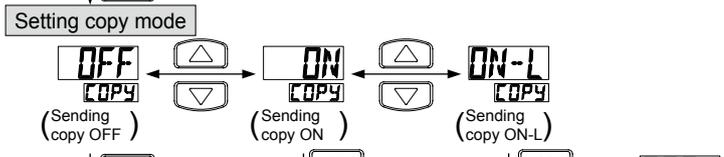
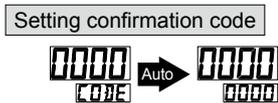
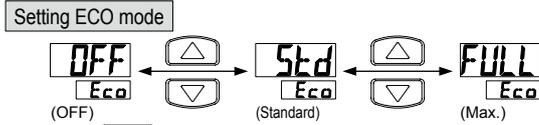
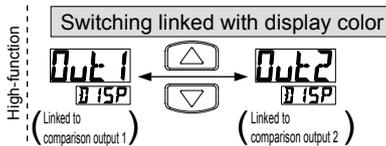
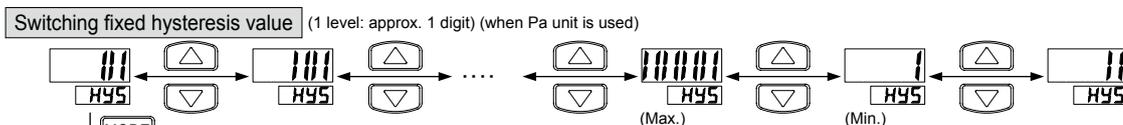
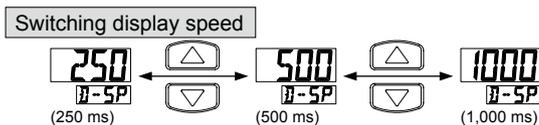
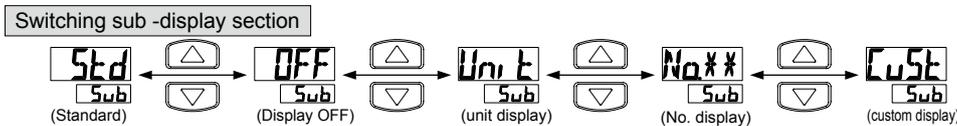
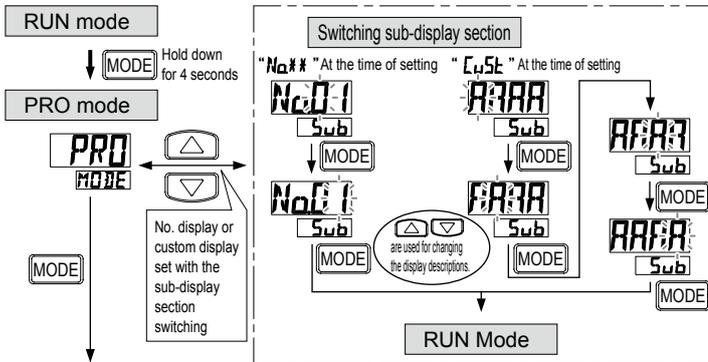
NO	For EASY mode & HYS mode	For WCMP mode
	Switch is turned ON when the pressure reaches or exceeds the set value.	Switch is turned ON when the pressure is within the set value.
		
NC	For EASY mode & HYS mode	For WCMP mode
	Switch is turned ON when the pressure reaches or falls below the set value.	Switch is turned OFF when the pressure is within the set value.
		

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/
PTFE FRL
Outdrs FR
F.R.L
(Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneUR
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PrecsCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

PRO mode

- If the mode select key is held down for four seconds during the RUN mode, the PRO mode is initiated.
- If the mode select key is held down during setting, the RUN mode is initiated. At this time, the changed settings will come into effect.
- The display at the left end shows defaults (factory default).

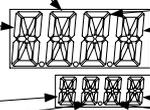


RUN mode

Setting items	Initial state	Content
Switching sub-display section	Std	Set the sub-display section for the RUN mode [0FF]: Nothing is displayed. [0m t]: Displays the current pressure unit. [No**]: Displays a random number. [LuSt]: Displays a random number, alphabetic character (some characters cannot be displayed), and code.
Switching display speed	250	Set the speed of the pressure displayed on the main display.
Switching fixed hysteresis value	01	Set hysteresis for the EASY mode and window comparator mode. (8 stages)
Switching linked with display color (only standard)	00L1	Interlinking the settings made with the main display color switching in the menu setting mode can be done with either comparison output 1 or comparison output 2.
Setting ECO mode	OFF	Power consumption can be reduced. [0FF]: Normal (ECO mode OFF) [Std]: Display is dimmed if no key is pressed for 5 seconds in RUN mode. [Full]: Display is turned OFF if no key is pressed for 5 seconds in RUN mode. The normal display appears temporarily if any key is pressed.
Setting confirmation code	0000	Currently set details can be confirmed. Check codes in the List of Codes.
Setting copy mode	OFF	Details set for the master sensor can be copied to the slave sensor. Refer to "Setting copy function" for details. [0N]: Set details are copied. [0N-L]: Set details are copied and slave side slave sensor keys are locked.
Setting reset	OFF	Settings are returned to defaults. When pressing the mode switching key at the time of "0N", settings are returned to defaults.

Code list

Code	1st digit		2nd digit			3rd digit	4th digit	
			Standard		High-function type		Standard only	
	Compare output 1 mode	Switching NO/NC	Compare output mode	Switching NO/NC	ANLG V output/ ext. input	Threshold display		Main display/ color
0	EASY	NO	OFF	OFF	Analog voltage output	P-1,Lo-1	Red when turned ON	Compare output 1
1		NC	EASY	NO	Auto-reference	Hi-1		Compare output 2
2	Hysteresis	NO	Hysteresis	NC	Remote zero adjustment	P-2,Lo-2	Green when turned ON	Compare output 1
3		NC		NO	Analog current output	Hi-2		Compare output 2
4	Window comparator	NO	Window comparator	NC	-	ADJ.	Normally red	Compare output 1
5		NC		NO	-	-		Compare output 2
6	-	-	-	NC	-	-	Normally green	Compare output 1
7	-	-	-	-	-	-		Compare output 2



Code	5th digit	6th digit	7th digit	8th digit
	Response time	Unit switching	Display speed	Eco mode
0	2.5 ms	MPa	250 ms	OFF
1	5 ms	kPa	500 ms	Std
2	10 ms	kgf/cm ²	1,000 ms	Full
3	25 ms	bar	-	-
4	50 ms	psi	-	-
5	100 ms	mmHg	-	-
6	250 ms	inchHg	-	-
7	500 ms	-	-	-
8	1,000 ms	-	-	-
9	5,000 ms	-	-	-

Limited to export models with unit select functions.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/
PTFE FRL
Outdrs FR
F.R.L
(Related)
CompFRL
LgFRL
PrescR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PresCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

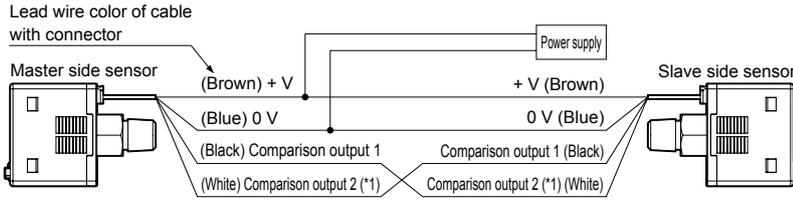
- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

Setting copy function

- This function copies settings from the master sensor to the slave sensor.
- Settings can be copied only between the same models.
Data cannot be copied between different models.
 - The setting copy function can copy settings for one master sensor to one slave sensor.

[Installation procedure]

- (1) Set the master sensor setting copy mode to Copy ON or ON-L, and press the mode select key to prepare for copying.
Refer to [Setting copy mode] in "PRO mode" (page 1070), for details.
- (2) Turn master sensor power OFF.
- (3) Connect the master sensor to the slave sensor as shown below.



*1: Analog voltage output and external input are connected for the high-function.

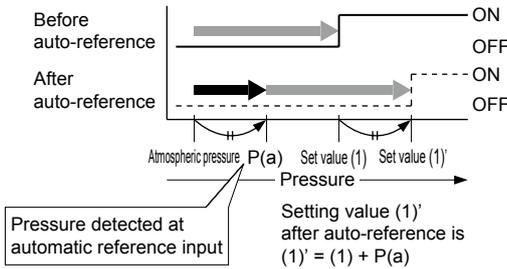
- (4) Turn ON the power for the master sensor and slave sensor simultaneously. (*2) (*3)
 - (5) Setting details are encoded in 16-bit code and displayed in orange on the main sensor display, after which copying begins.
 - (6) The same code as in the procedure (5) is displayed in green on the slave sensor's main display, and "k" is displayed on the sub-display section when copying finishes.
 - (7) Turn master sensor and slave sensor power OFF, and disconnect wires.
* To continue copying settings for a different sensor, repeat steps (3) to (6).
- (*2): Set details may not be copied if sensor power is not turned ON simultaneously.
(*3): Pulse output is output to comparison output 1 when power is turned ON.

[Canceling master sensor setting copy mode]

- (1) Turn the master sensor power ON (with slave sensor wiring disconnected).
- (2) Press the mode select key for 2 seconds.

Automatic reference function (high-function only)

- The automatic reference function compensates for the setting using the pressure detected at automatic reference input as the reference pressure.
- Setting value (1)' is automatically compensated for as "setting value (1) + P (a)" using pressure value P (a) detected during automatic reference input as the reference.



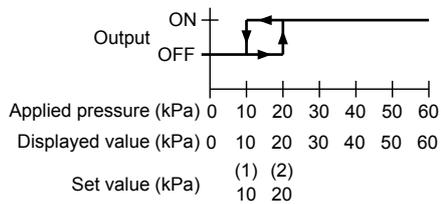
Valid setting range and set pressure range after compensation

- The set pressure range is wider than the rated pressure range to comply with the automatic reference function.

When using automatic reference input, if the compensated setting value exceeds the set pressure, the setting is automatically compensated to within the set pressure range. Check that the set pressure is not exceeded.

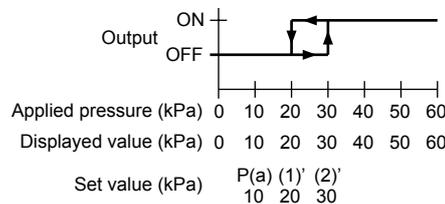
Operation chart

[Normal (NO setting for each comparison output)]



[At auto-reference input
 (NO setting for each comparison output)]

- Detection pressure when auto-reference input: 10 kPa
- Output mode: hysteresis mode



(*1): The setting shifts the same way in EASY and window comparator modes.

- The pressure detected at automatic reference input is set to zero when the setting for the analog voltage output/external input select function is set or power is turned ON again.
- The automatic reference input can be confirmed when the RUN mode threshold is set. Refer to "Threshold setting" in "RUN mode" (page 1067) for details.

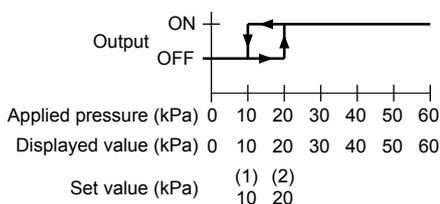
Remote zero adjusting (high-function only)

- The remote zero adjustment function forcibly sets the pressure to zero when the external signal is input.

The setting is not compensated for when remote zero adjustment is input. Check that pressure and setting for the remote zero adjustment function do not exceed the set pressure.

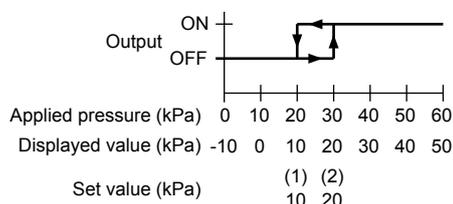
Operation chart

[Normal (NO setting for each comparison output)]



[Pressure for remote zero adjusting input
 (NO setting for each comparison output)]

- Pressure for remote zero adjusting input: 10 kPa
- Output mode: hysteresis mode



(*1): The setting shifts the same way in EASY and window comparator modes.

- The remote zero adjustment function is cleared to zero when the setting for the analog voltage output/external input select function is set or power is turned ON again, and operation returns to normal using atmospheric pressure as a reference. The remote zero adjustment can be confirmed when the RUN mode threshold is set. Refer to "Threshold setting" in "RUN mode" (page 1067) for details.

Error display

Error display	Content	Treatment
E-1	The load was short-circuited and overcurrent flowed.	Turn power OFF and check the load.
E-3	Pressure was applied during zero point adjustment.	Release pressure applied to the pressure port to atmospheric pressure and adjust the zero point again.
E-4	External input is conducted outside the rated pressure range.	Return applied pressure to within the rated pressure.
E-5	Communication error (disconnection, connection fault, etc.)	When using the copy function, check wiring.
E-6	Communication error (different models)	When using the copy function, confirm that the same models are used.
10 10	Applied pressure exceeds the max. display pressure range.	Return applied pressure to within the rated pressure.
10 10	Applied pressure exceeds the min. (reverse pressure) display pressure range.	

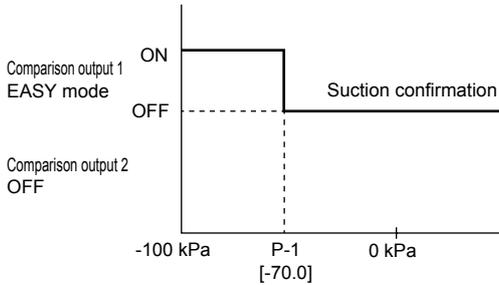
- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

Setting operation example EASY mode

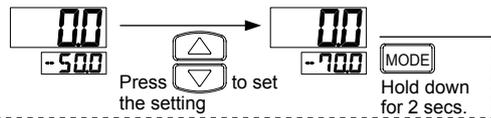
(*1): This is an example of settings from the default when purchased (factory default).
 (*2): If setting conditions are unclear, reset the settings in PRO mode, reset to default mode, then start use.

● Suction confirmation

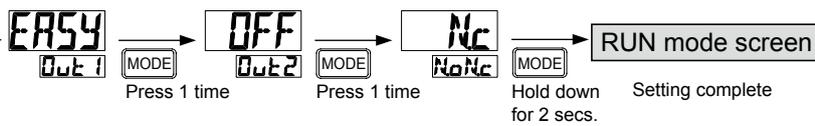
- EASY mode
- R01 (-100.0 to 100.0 kPa)
- Mode when powered ON Start from the (RUN mode).
- In a mode other than RUN mode, hold down the "MODE" key and enter the RUN mode.



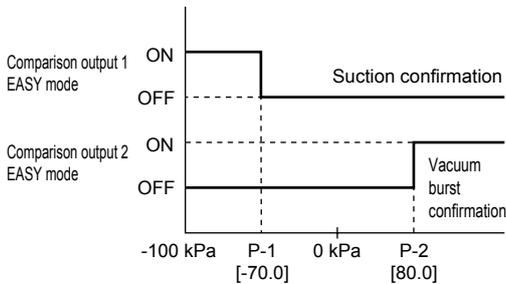
RUN mode screen



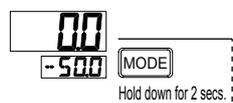
Menu setting mode screen



● Suction confirmation + vacuum burst confirmation



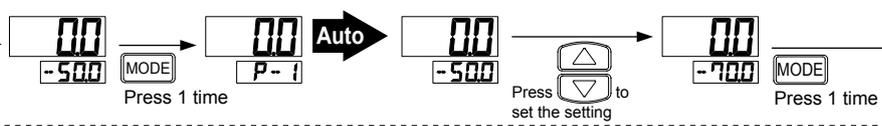
RUN mode screen



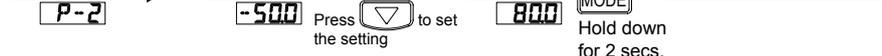
Menu setting mode screen



RUN mode screen



RUN mode screen

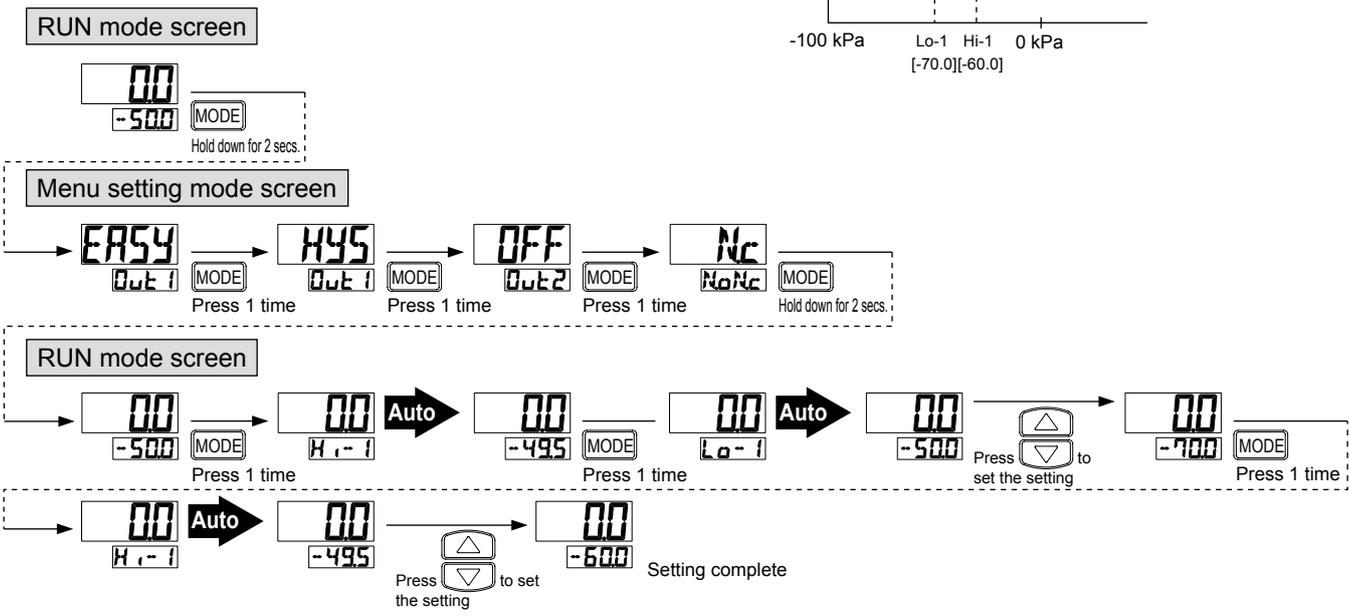
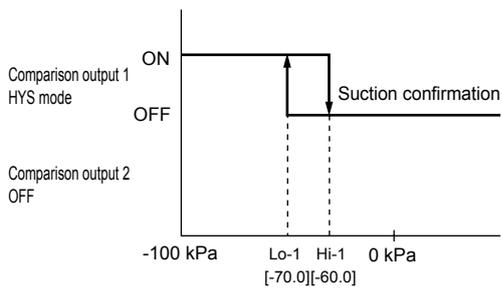


Setting operation example HYS mode (hysteresis mode)

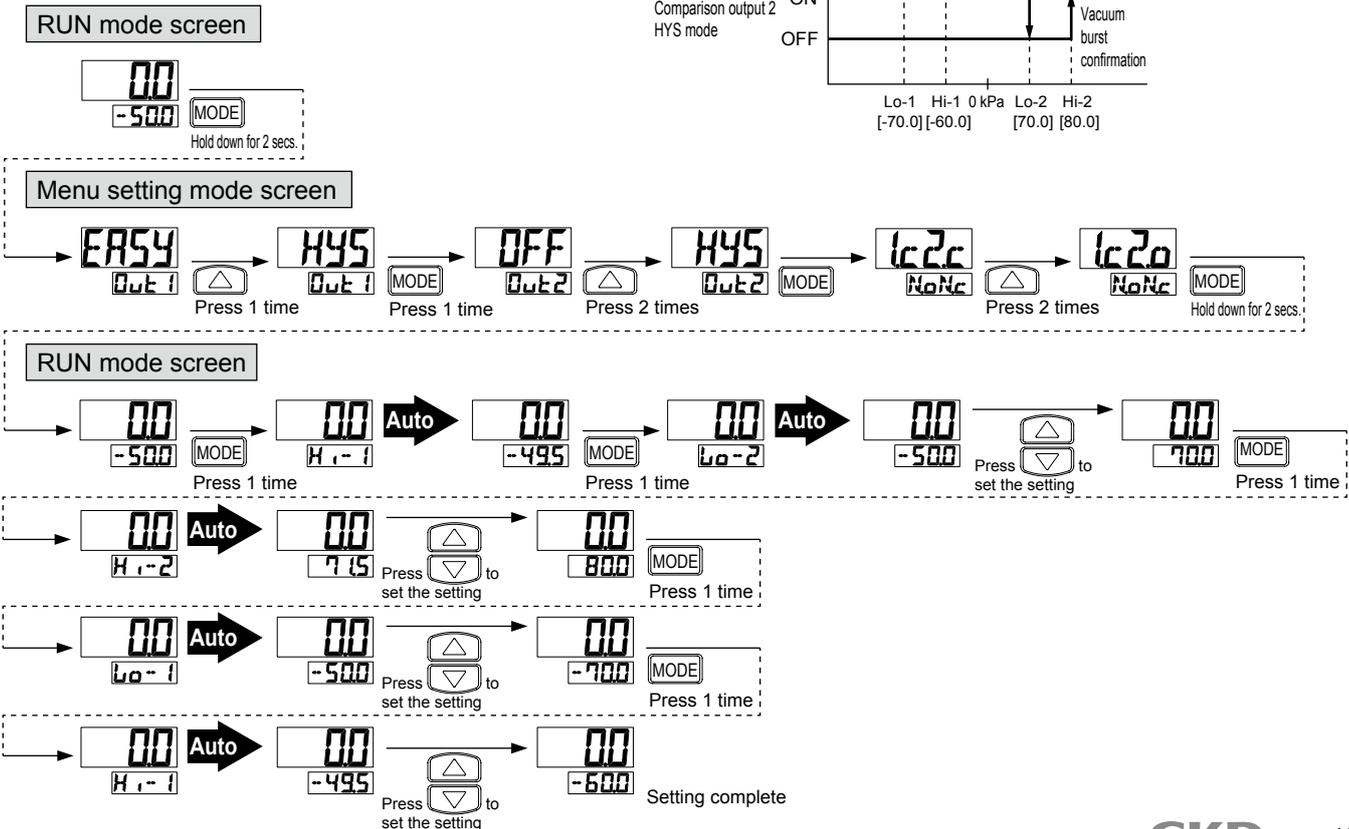
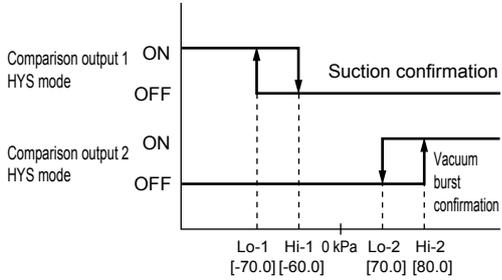
(*1): This is an example of settings from the default when purchased (factory default).
(*2): If setting conditions are unclear, reset the settings in PRO mode, reset to default mode, then start use.

● Suction confirmation

- HYS mode (hysteresis mode)
- R01 (-100.0 to 100.0 kPa)
- Mode when powered ON Start from the (RUN mode).
- In a mode other than RUN mode, hold down the "MODE" key and enter the RUN mode.



● Suction confirmation + vacuum burst confirmation



- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/ PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrescR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/ other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/ Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

Setting operation example WCMP mode (window comparator mode)

(*1): This is an example of settings from the default when purchased (factory default).

(*2): If setting conditions are unclear, reset the settings in PRO mode, reset to default mode, then start use.

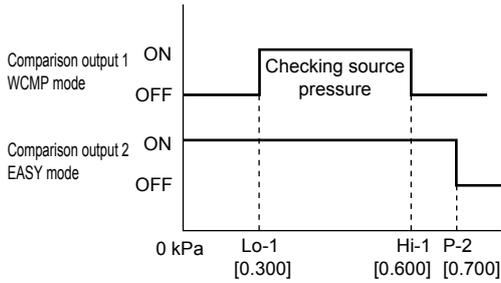
● Checking source pressure

- WCMP mode (window comparator mode)

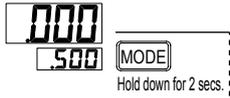
R10 (-0.100 to 1.000 MPa)

· Start from the mode (RUN mode) enabled when power is turned ON.

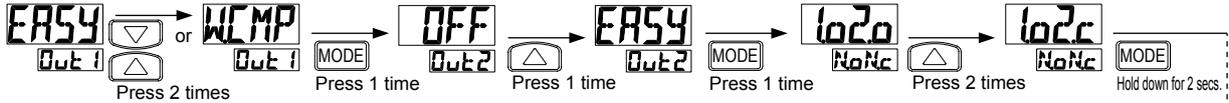
· In a mode other than RUN mode, hold down the "MODE" key and enter the RUN mode.



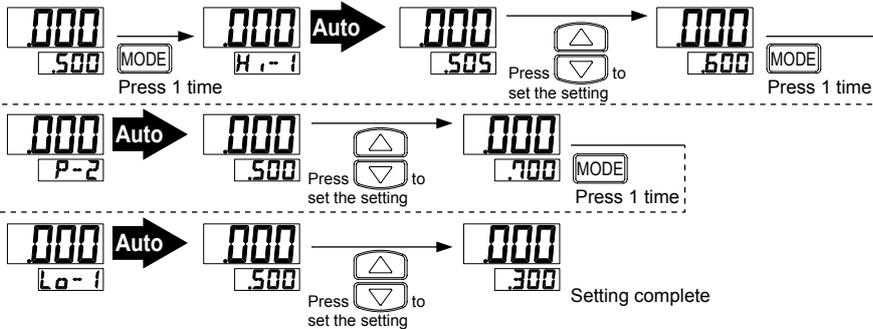
RUN mode screen



Menu setting mode screen



RUN mode screen





Pneumatic components (electronic pressure switch and sensor)

Safety Precautions

Be sure to read this section before use.

Refer to Intro Page 63 for general precautions regarding pneumatic components and refer to “ Safety precautions” for detailed precautions for individual series.

Design/selection

WARNING

- Use this product in accordance with specifications.
 - Use for applications, or at load currents, voltages, temperatures, impacts or sites excluded from the specifications could result in damage or malfunctions.
- Do not use oxygen, corrosive or combustible gases, or toxic fluids with this product.
- Never use this product in an explosive gas atmosphere.
 - The pressure switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.
- Avoid installing this product in a sealed control box or indoors.
 - If the fluid should leak due to any trouble, the pressure in the sealed chamber could change and create a hazardous state. Use this product in the control box having safety device to control internal pressure, or indoors with no pressure differential from the outside.
- Power supply voltage

Do not use this product at levels exceeding the power supply voltage. The product could rupture or burn if voltage exceeding the working range is applied or if an AC power supply (100 VAC) is applied.
- Load short circuit

Do not short-circuit the load. Failure to observe this could result in rupture or burning.
- Incorrect wiring

Avoid incorrect wiring such as mistaken power source polarities, etc. Failure to observe this could result in rupture or burning.

CAUTION

- Applicable fluids

When using applicable fluid other than air, nitrogen gas, etc., oxygen deficiency could be caused. Observe the following instructions.

 - Use in well-ventilated locations.
 - Ventilate the work area when nitrogen gas is being used.
 - Inspect nitrogen gas piping regularly to avoid leaks.
 - Non-corrosive gas means substances such as nitrogen or carbon dioxide contained in air and inert gases such as argon or neon.
 - When using this product for compressed air containing water or oil, use the PPD3-S (stainless steel diaphragm sensor specifications) with increased corrosion resistance.
- If this product is used for vacuum suction confirmation, care must be taken for the following matters.
 - When applying positive pressure for vacuum burst onto the product, check that it does not exceed the specified proof pressure.
- Working environment
 - Avoid using this product where vibration or impact exceeding 100 m/s² could be applied.
 - Check the temperature of fluid being measured and the environmental temperature in piping.
 - When using a type that does not have the corresponding degree of protection, do not use for applications in which water or oil could be applied.

- Determine the setting, taking error caused by accuracy and temperature characteristics into consideration.
- Take care when using this product for an interlock circuit.
 - When using the pressure switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than a pressure switch as a safeguard against failure. Regularly inspect and confirm that the interlock activates correctly.

[Recommended values]

Model	Degree of protection
PPX	IP40
PPE(-A)/PPD3(-S)/PPG-C	IP65

- Response is affected by working pressure and load volume. If reproducibility with stable response time is required, install a regulator in the proceeding stage.
- Take the following countermeasures to prevent malfunction caused by noise.
 - Install a line filter in the AC power supply line.
 - Do not share power with an inverter or components causing motor noise, etc.
 - Use a surge suppressor such as a CR or diode on the inductive load (solenoid valve, relay, etc.) and remove noise from the source.
 - When using a device such as a switching regulator or inverter motor that could generate noise near the sensor, be sure to ground the device frame ground (F.G.) terminal.
 - Separate wiring to the sensors from strong magnetic fields.
 - Connect wiring to sensors with a shield wire.
 - Ground the shield wire on the power supply side.
- When releasing the secondary control pressure, such as air blowing, into the atmosphere, the pressure could fluctuate depending on the piping and flow conditions. Test under actual working conditions, or contact CKD before using this method.
- When selecting dryer, air filter, oil mist filter or regulator, select a device with a flow rate higher than that used by proportional pressure controls.
- Working conditions for CE compliance

The standard for the immunity for industrial environments applied to CE conforming product is EN61000-6-2, but the following requirements must be satisfied in order to conform to this standard. Conditions

 - The assessment of this product is performed by using a cable pairing a power supply line and a signal line, assessing this cable as a signal line.
 - This product is not equipped with surge immunity. Implement surge protection measures on the system side.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-Prohr
MedPresFR
No Cu/
PTFE FRL
Outdrs FR
F.R.L
(Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PresCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

Mounting, installation and adjustment

⚠ WARNING

- Avoid incorrect connection.
 - Incorrect connection could result in fatal damage not only to the product itself but also to peripheral devices.
- DC power not insulated from the AC primary side may damage the product and power, possibly leading to electric shock. Do not use the product in this case.

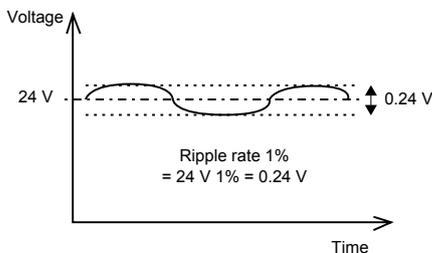
⚠ CAUTION

- Do not use the product where the product is exposed to direct sunlight or may come in contact with water, oil, etc.
- Flush with air the piping connected to sensors before connecting. Prevent pipe from catching tips of sealing tape when piping.
- Correct pressure control is not possible if the exhaust port is plugged. Release this port to the atmosphere.
- Use appropriate torque to tighten the pipes when connecting them.
 - The purpose is to prevent air leakage and damage to bolts.
 - First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.

Port thread	Tightening torque N·m
M3	0.3 to 0.6
M5	1 to 1.5
Rc1/8	3 to 5
Rc1/8 (resin)	1 to 1.5



- Care must be taken to protect the body and lead wire.
 - Do not bump or drop the body, or apply excessive bending or tensile strength to the lead wire. This may lead to disconnection.
 - Connect and wire bending-resistant material, such as robot wire material, for the movable sections.
- Wiring
 - Turn power OFF before wiring this product. Discharge static electricity from personnel and tools before and during work.
 - Use a stabilized noise-free power supply with a ripple voltage of 1% or less.



- Turn the power ON and OFF when voltage rises or falls quickly. If the rated voltage is not reached, the sensor could malfunction. In some cases, the sensor may not recover after the rated voltage is reached. Reset the power in that case. Even if the rated voltage drops temporarily, shut down the power once, then turn ON the power again.
- Install this product and wiring as far away as possible from sources of noise such as power distribution wires. Take separate measures against surge generated from inductive loads that enters the power wire.
- Do not start the control unit, machinery and equipment immediately after wiring. Unpredictable signals could be output due to incorrectly set values. Conduct a power ON test with the control unit, machinery and equipment stopped, and set required switches.
- Stop the machinery and equipment and confirm safety before setting switch outputs.
- Be sure to operate keys with fingertips. If sharp instruments, such as knives or screwdrivers, are allowed to contact the plastic film on the operation section, they may damage the film and compromise its protective functions.
- Piping
 - For the push-in fitting, use the recommended tube, and perform piping work to the push-in fitting assembly after brushing.
 - * Recommended tube: Compatible tube outer diameter 6 mm manufactured by CKD F-1506, U-9506 and others.
 - For the screw-in fitting, wind sealing tape or apply a sealant, and screw in without tightening excessively. Apply a wrench to the metal section when tightening. (Resin section for PPE and PPD3-R □ D-6 only)
 - Wrap sealing tape from threads starting 2 mm inside from the end of piping threads.
 - * If sealing tape protrudes from the pipe threads, it could be cut when screwing the bolts in. This could cause the tape to enter the components, causing failures.



- Set the pipe length to approx. 1 m, and take care not to apply tension or impact to the piping. For longer tubes, due to their own weight and vibration/impact, unexpected tensile strength is generation. In order not to apply weight, fix and relay the tube to the machine device in the middle of the piping.
- Avoid connecting the output for a relay contact, operation switch, or other component output in parallel with the PLC to the product's output, or short-circuit the input terminal of the PLC to which this product is connected with the power supply cable's negative side to test the input device. This product's output circuit could be damaged.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrescR
VacF/R
Clean FR
ElecPneur
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRISens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

- F.R.L
- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- FimResistFR
- Oil-ProhR
- MedPresFR
- No Cu/PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- Silncr
- CheckV/other
- Jnt/tube
- AirUnt
- PresCompn
- Mech/ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

Mounting, installation and adjustment

CAUTION

- Some models have a push-in fitting for the measured pressure port. Check the perpendicularity of the tube side, and check that there are no scratches, indents, or dirt near the end. Air and compressed air are measured. Check that water and dirt do not enter the tube during piping.

Use/maintenance

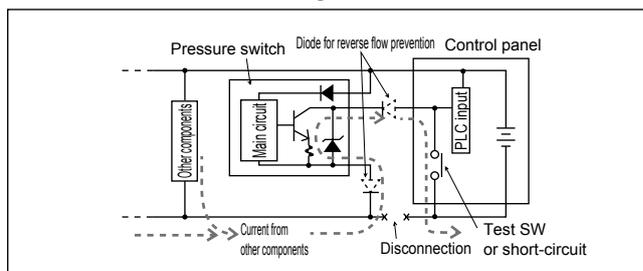
WARNING

- Do not apply overcurrent.
 - If overcurrent flows to the pressure switch due to a load short-circuit, etc., the pressure switch will be damaged with a risk of ignition. Provide an overcurrent protection circuit, such as a fuse, for the output wire and power cable as needed.

CAUTION

- Do not disassemble the product.
 - The product could be damaged or its performance compromised if it is disassembled. CKD does not guarantee performance after disassembly. Remove the entire installation section (pressurized port section) when replacing or moving the product.
- Stop machinery and equipment, then check the safety before operating the product.
- With PPD3, pressure is detected 200 times per second, but this display is updated 4 times a second. and cannot track fast pressure changes. The switch could therefore start operating at a quickly changing pressure even when the display does not indicate the switch setting.
- The case is made of resin. Do not use solvent, alcohol or detergent in cleaning, since the resin could absorb it. There is a risk of affecting the resin. Wipe off dirt with a rag soaked in a diluted neutral detergent solution and wrung out well.

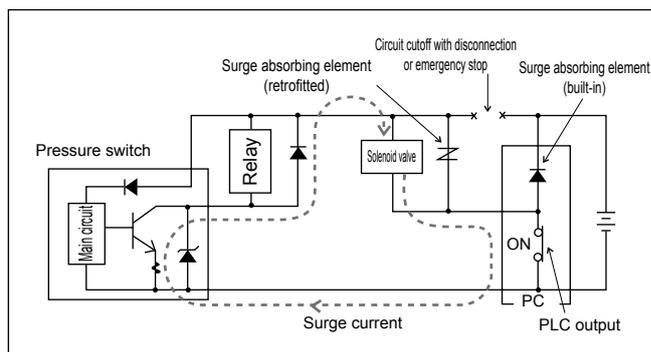
- Pay attention to the reverse current caused by disconnected wires/wiring resistance. When other devices, including pressure switches, are connected to the same power supply as the pressure switch, and the output cable and power cable's minus side are short-circuited or the power supply's minus side is disconnected, check operation of the input device from the control panel as reverse current could flow to the pressure switch's output circuit and cause damage.



Take the following measures to prevent damage caused by reverse current:

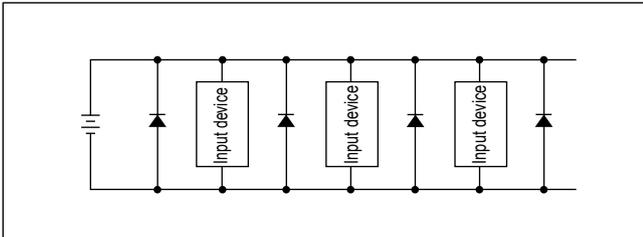
- (1) Avoid centralizing current at the power cable, especially the negative side power cable, and use as thick a cable as possible.
- (2) Limit the number of devices connected to the same power supply as the pressure switch.
- (3) Insert a diode in serial with the pressure switch's output cable to prevent reverse current.
- (4) Insert a diode in serial with the pressure switch's power cable negative side to prevent reverse current.

- Pay attention to surge current flow-round. When pressure switch power is shared with an inductive load that generates surges, such as a solenoid valve or relay, if the circuit is cut off while the inductive load is functioning, surge current could enter the output circuit and cause damage depending on where the surge absorbing element is installed.



Take the measures below to prevent damage from sneak surge current.

- (1) Separate the power supply for the output system comprising the inductive load, such as the solenoid valve and relay, and the input system, such as the pressure switch.
- (2) If a separate power supply cannot be used, directly install a surge absorption element for all inductive loads. Consider that the surge absorption element connected to the PLC, etc., protects only the individual device.
- (3) Connect a surge absorption element to places on the power wiring shown in the figure below, as a measure against disconnections in unspecified areas.



When the devices are connected to a connector, the output circuit could be damaged by the above phenomenon if the connector is disconnected while the power is ON. Turn power OFF before connecting or disconnecting the connector.

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R (Reg)
L (Lub)
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Oil-ProhR
MedPresFR
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Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PrecsCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Product-specific cautions: Digital pressure sensor PPX Series

Design/selection

CAUTION

- Working conditions for CE compliance
 - The PPX Series is a CE-compliant product following EMC Directives. EN61000-6-2; regulation matched to immunity applies to this product. Conditions below are necessary to comply with these standards.
- Conditions
 - The power cable connected to the sensor must be less than 10 m long.

Mounting, installation and adjustment

WARNING

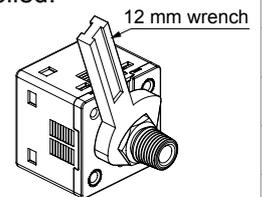
- When using a commercially available switching regulator on the power supply, be sure to ground the power supply frame ground (F.G.) terminal.

CAUTION

- Avoid use in high steam and dirt environments.
- Care must be taken to avoid product contact with organic solvents such as thinner, water, oil and fat.
- Do not put a wire, etc., into the pressure port. The diaphragm may be damaged, resulting in malfunction.
- The expected performance may not be obtained in a strong electromagnetic field.
- Flush with air the piping connected to sensors before connecting. Prevent pipe from catching tips of sealing tape when piping.

Piping

- When connecting a commercially available fitting to the pressure port, attach a 12 mm wrench (14 mm for PPX-6G) to the hexagon section of the pressure port and install with a tightening torque of 9.8 N·m or less. A fitting or the pressure port section could break if too much torque is applied. Use seal tape to connect fittings to prevent air leak.

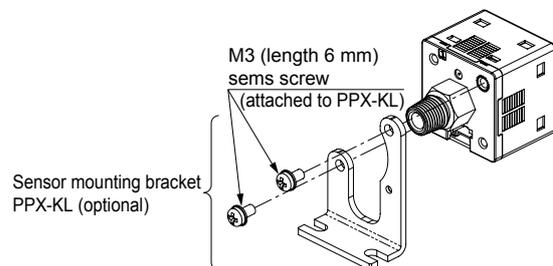


- The piping port has been degreased and washed. Handle carefully when unpacking. (PPX-P12)

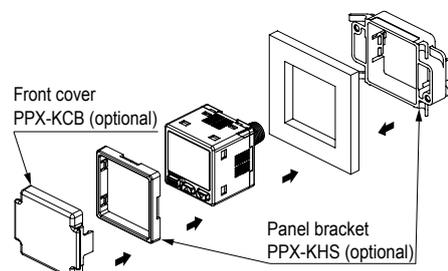
Installation

WARNING

- Sensor mounting bracket PPX-KL is available. If a sensor is installed with a mounting bracket, etc., tightening torque must be 0.5 N·m or less.



- Panel mounting bracket PPX-KHS (optional) and front cover PPX-KCB (optional) are also available.



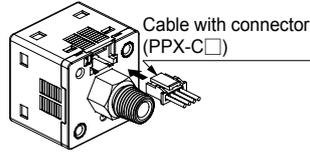
F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FimResistFR
Oil-ProhR
MedPresFR
No Cu/PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrescR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/other
Jnt/tube
AirUnt
PresCompn
Mech/ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Mounting, installation and adjustment

CAUTION

Care must be taken to protect the body and lead wire.

- Check that stress is not directly applied to cable lead outs or connectors.

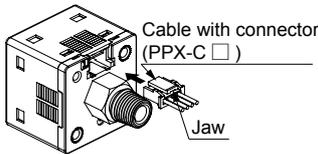


- Do not bump or drop the body, or apply excessive bending or tensile strength to the lead wire. This may lead to disconnection.

- Connect and wire bending-resistant material, such as robot wire material, for the movable sections.

Connector wiring

- Connect by inserting the cable with connector PPX-C □ into the product connection connector as shown at right.

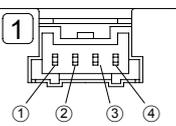


- To remove, press down on the jaws of the cable with a connector and pull out the connector.

[Connector]
Contact: SPHD-001T-P0.5
Housing: PAP-04V-S
(manufactured by J.S.T. Mfg. Co., Ltd.)

- Do not pull on the cable without pressing down on jaws. The cable could break or the connector could be damaged.

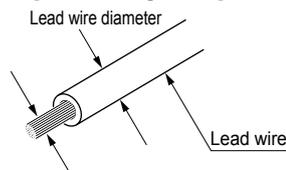
[Connector pin layout drawing]



Connector pin No.	Terminal name
①	+V
②	Comparison output 1
③	Standard: Comparison output 2 High-function: Analog voltage/current output or external input
④	0 V

- When wiring with a connector set (PPX-CN), be sure to use a compatible cable and crimp tool specialized for housing and contacts.

[Conforming cable]

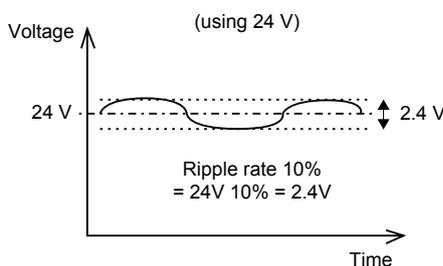


Conductor X-sect area	0.12 to 0.32 mm ² (AWG26 to 22)
Lead wire diameter	φ1.0 to φ1.5 mm
Wire material	Annealed copper twisted wire

Housing	J.S.T. Mfg. Co., Ltd. PAP-04V-S
Contact	J.S.T. Mfg. Co., Ltd. SPHD-001T-P0.5
Recommended crimping tools	J.S.T. Mfg. Co., Ltd. YC-610R (AWG26 to 24) J.S.T. Mfg. Co., Ltd. YC-611R (AWG22)

Wiring

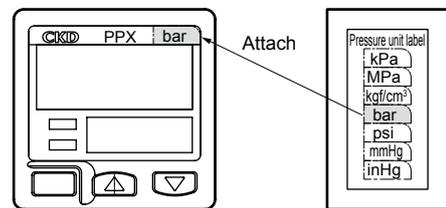
- Turn power OFF before wiring this product. Discharge static electricity from personnel and tools before and during work.
- Use stabilized noise-free power with a ripple voltage of 10% or less for the power supply.



- Turn the power ON and OFF when voltage rises or falls quickly.
If the rated voltage is not reached, the sensor could malfunction. In some cases, the sensor may not recover after the rated voltage is reached.
Reset the power in that case.
Even if the rated voltage drops temporarily, shut down the power once, then turn ON the power again.
- Avoid using in a transient state continuing 0.5 s after power is turned ON.
- Install this product and wiring as far away as possible from sources of noise such as power distribution wires. Take separate measures against surge generated from inductive loads that enters the power wire.
- Do not start the control unit, machinery and equipment immediately after wiring. Unpredictable signals could be output due to incorrectly set values. Conduct a power ON test with the control unit, machinery and equipment stopped, and set required switches.
- Do not turn the power OFF during or immediately after operation setting.
- Cable extension is possible up to a length of 100 m using a cable with 0.3 mm² and over. However, when using this product as a CE conforming product, the power cable connected to this product must be less than 30 m long.

When using the unit change function

- If using export models (for outside Japan), when changing the units other than MPa or kPa, make sure to attach the unit seal enclosed and attached to the product to the unit indication section on the operation section.



[Unit seal label]