

## Wide-range gap switch with digital display for even easier use!

Blockage indicator lamp

Output display 1

Output display 2

Output display color can be selected.

at OFF: Green at ON: Orange<sup>\*2</sup>

or

at OFF: Orange at ON: Green

\*2: Default setting.

Key lock function

PIN number function also built in.

Operation button

Focus on creating a simpler layout which makes operation easier to picture.



Ref. value<sup>\*1</sup>

\*1: The distance from the detection side nozzle to the workpiece is a numerical conversion value, and units do not apply.

Threshold 1

Threshold 2

Pressure display

The threshold display can be switched to the detector side pressure display by pressing the keys.



When IO-Link option is selected, switching to seating ON/OFF display is also possible.

Screen non-display settings selection possible<sup>\*3</sup>

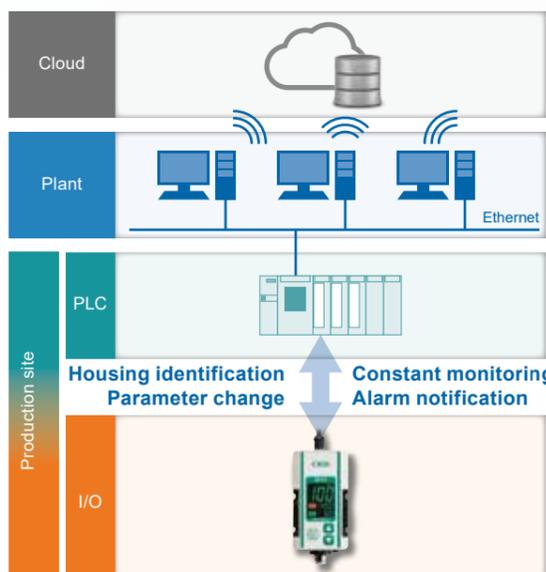
The reference value and threshold can be set to OFF at shipping.

\*3: When screen non-display option is selected.

### IO-Link model available



IO-Link is a digital communication standard for sensors/actuators at factory sites. (IEC 61131-9)  
Unlike analog communication, it enables the transmission of parameters and event data.

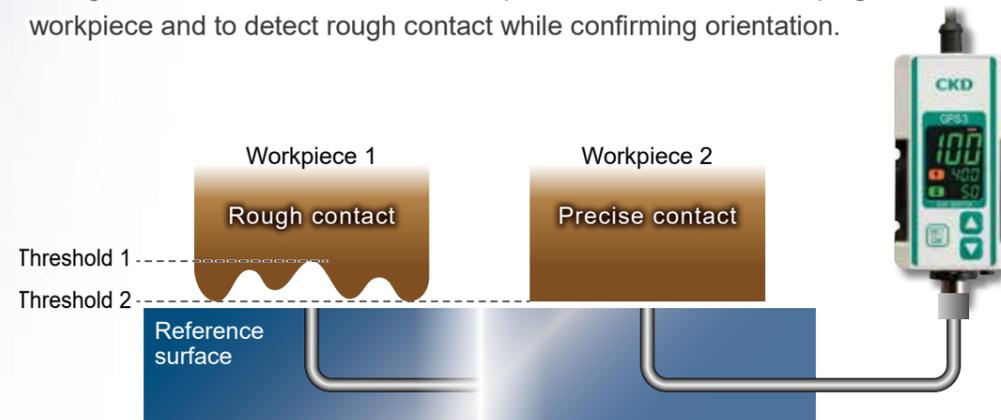


#### Features of IO-Link

- Digital signal**: Constant monitoring via digital data is possible.
- Parameter remote control**: Installation anywhere is possible, as parameters can be configured and changed remotely via the network.
- Housing identification**: Models, serial numbers, etc., can be confirmed on the network.
- Plug & Play**: The settings can be copied from the master, making parameter reconfiguration after maintenance obsolete.
- Error notification**: Device failure and disconnection can be confirmed.
- Connection to fieldbus**: It can also be converted to Ethernet networks and connected, enabling devices to be IoT-ready.

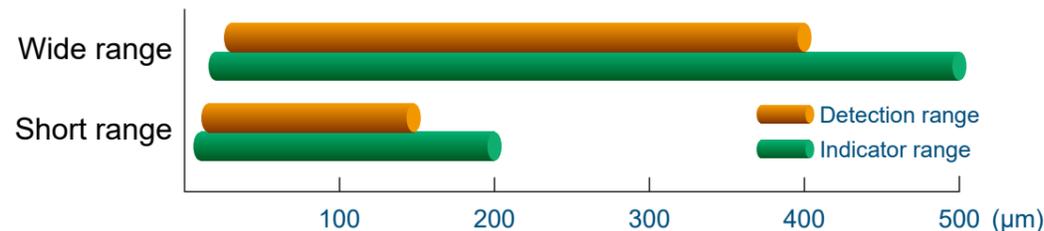
### High precision 2-point output

Threshold can be set to 2 points within the detection distance range. For example, a single device can be used to confirm precise contact after clamping the workpiece and to detect rough contact while confirming orientation.



### Detection over a wide range from raw material surfaces through precision machined surfaces

A single unit with a detection distance range of 0.03 mm to 0.4 mm allows settings for both finished and raw material surface roughness. A new short-range type has also been added to detect shorter distances. (Detection range scale: 0.02 mm to 0.15 mm)



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CKD research



Wide range  
February 2016  
CKD research

### High maintainability (preventative maintenance)

#### [Blockage indicator function]

A lamp blinks/signal outputs a blockage in the detector air flow path<sup>\*4</sup> to informed of this. The blinking period indicates which locations are likely to be blocked, enabling rapid recovery. (Default setting is OFF)



Fast blinking: Internal orifice may be clogged  
Slow blinking<sup>\*5</sup>: Detection nozzle may be clogged

#### [Orifice easy disassembly]

Orifice blockages can be cleaned without having to disassemble the assembled product.



Reset the threshold after disassembly or cleaning.

#### [Direct blow]

Capable of direct blow of max. 0.6 MPa.

\*4: When IO-Link option is selected.

\*5: When the light is blinking without a workpiece present. (Blinking also occurs during regular contact, due to the detection structure)

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

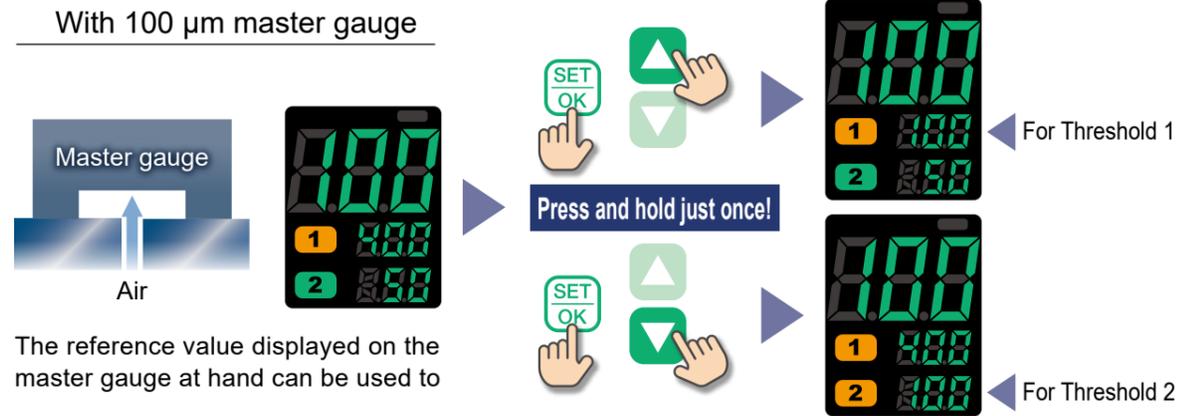
Electronic pressure Switch

Contact Confirm Switch

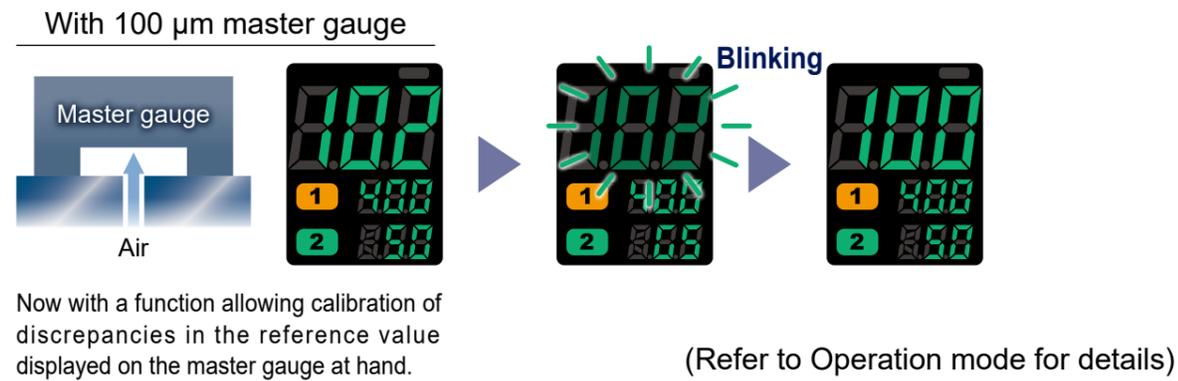
For Coolant Pressure Switch

## Easy operation

The master gauge you have at hand can be used to set the threshold easily.



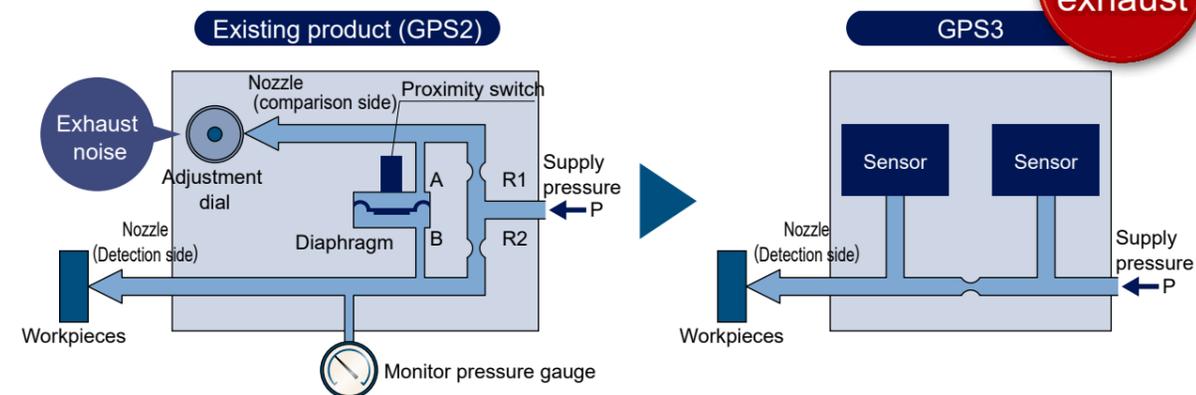
Indicated values can be calibrated (actual measurement calibration function).



## Low noise/energy-saving

Rethinking the detection circuit has eliminated exhaust air on the comparison side. Exhaust noise, previously constant, is no longer a concern. Air consumption when the nozzle is open can also be reduced. Air consumption Less than 9 L/min\*.

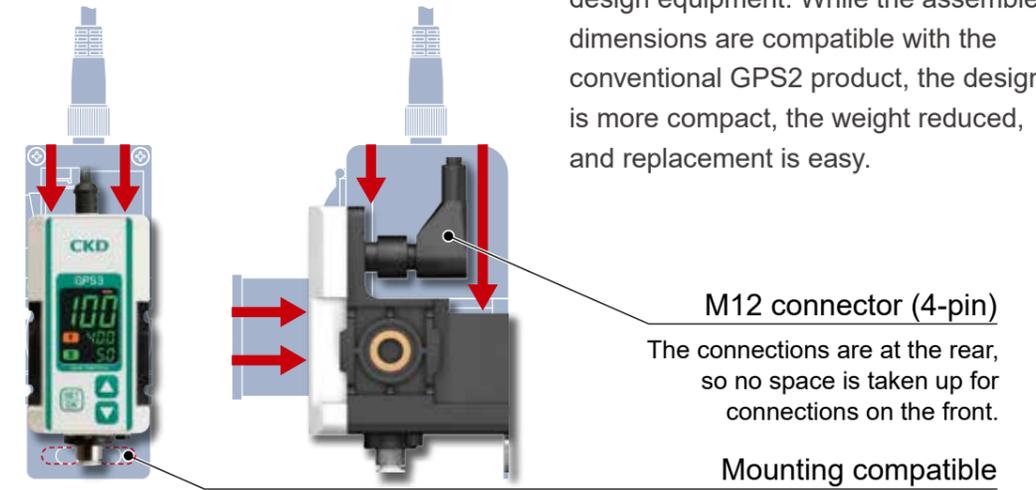
\*: Short range



## Excellent workability

Compact design

The appearance lives up to high-design equipment. While the assembled dimensions are compatible with the conventional GPS2 product, the design is more compact, the weight reduced, and replacement is easy.



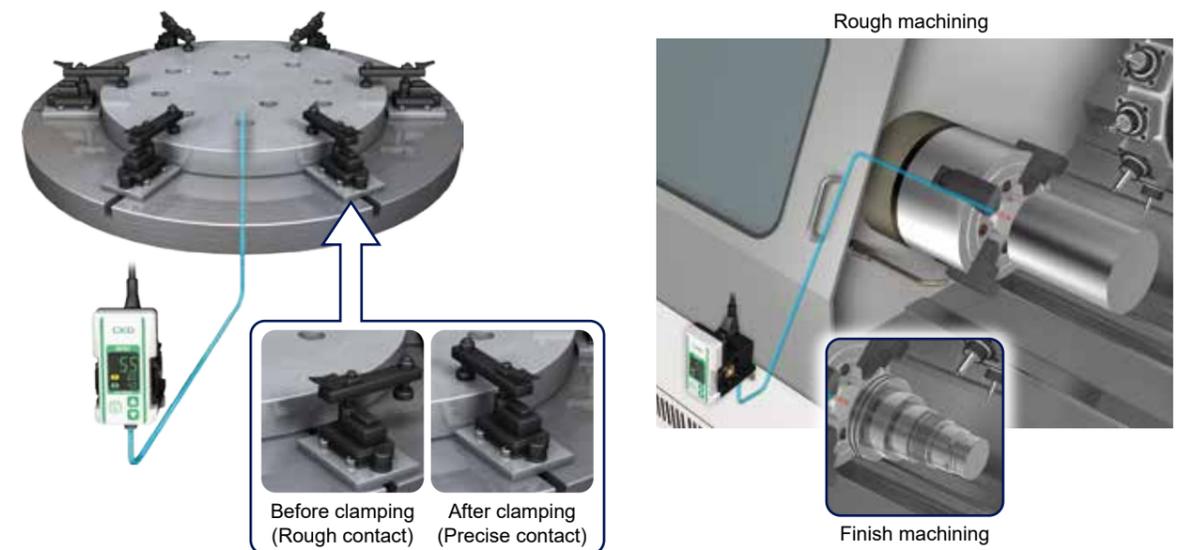
Manifold / Unit supported. Easily expandable.



## Applications

Two-point detection for rough and precise contact.

Two-point detection for rough and finish machining.



\*Can be used with any detection nozzle environment



Contact confirmation switch (digital gap switch) Discrete

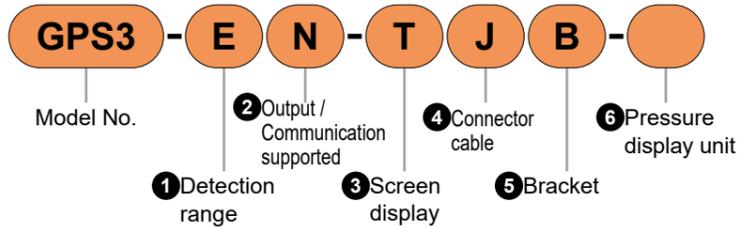
# GPS3 Series

●Port size: Rc1/8



Refer to the CKD website for detailed compatible model Nos.

## Model No. Notation Method



Note: Refer to P. 116 to 117 for discrete model No. of option peripheral devices.

### 1 Detection range

Code	Description
Blank	0.03 to 0.4
E	0.02 to 0.15

### 3 Screen display

Code	Description
Blank	Indicator (default)
T	Non-display (default)

Note: OS mode allows configuration of screen display and non-display settings.

### 5 Bracket

Code	Description
Blank	Without bracket
B	With bracket 

### 2 Output/communication supported

Code	Description
N	NPN open collector (2-point)
P	PNP open collector (2-point)
L	IO-Link communication

### 4 Connector cable

Code	Description
Blank	5 m connector cable attached (one side elbow)
D	5 m connector cable attached (both sides elbows/straight)
J	Without connector cable

### 6 Pressure display unit

Code	Description
Blank	SI units only (domestic model)
KA	With unit switching function (export model)

Note: In compliance with the new Measurement Act, export models (with unit select function "KA") cannot be used in Japan.

## Specifications

Item	Short range GPS3-E	Wide range GPS3
Working fluid	Compressed clean air (after 5 μm filter, lubrication not possible)	
Working pressure kPa	1 to 200	
Proof pressure kPa	600	
Detection range mm	0.02 to 0.15	0.03 to 0.4
Reference value display range	10 to 200 (Unit indicated 1)	20 to 500 (Unit indicated 1)
Repeatability mm	±0.01	±0.01 (detection range min to 0.1)
Hysteresis	Variable (reference value variable from 1 in increments of 1. Default 10)	
Temperature characteristics (standard 25°C)	0.015	0.030 mm or less (detection distance min to 0.3 mm) 0.1 mm or less (detection distance 0.3 to 0.4 mm)
Detection nozzle	Single hole nozzle ø1.5	
Power supply voltage V	24 DC±10% (18 to 30 DC) *1, ripple P-P10% or less (with reverse connection protection)	
Current consumption mA	25 or less (35 or less) *1	
Output/communication supported	2-point output (NPN, PNP open collector) *2	
Output rating	30 VDC, 100 mA or less	
Internal voltage drop V	2 or less (using 100 mA)	
Short-circuit protection circuit *3	Equipped	
Indicator	Reference value, thresholds (2-point), output status indicators (2-point), detection side pressure, blockage indication	
Insulation resistance	No failure after application of 1,000 VAC for 1 minute	
Withstand voltage	10 MΩ and over at 500 VDC megger	
Ambient temperature °C	0 to 50 (no freezing or condensation)	
Degree of Protection	IP 67 or equiv.	
Port size	Supply port: Rc1/8, detection port: push-in fitting ø6	
Wiring *4	M12 connector, 4-pin	
Weight (g)	128 (excluding cable)	
Air consumption L/min	Less than 9	Less than 22

\*1: Values in ( ) are when communication support option L is selected

\*2: For the communication specifications, refer to P. 120.

\*3: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

\*4: M12 connector tightening torque is 0.5 N·m or less.

Pressure switch

Electronic pressure switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure switch

Contact Confirm Switch

For Coolant Pressure Switch

## Dimensions

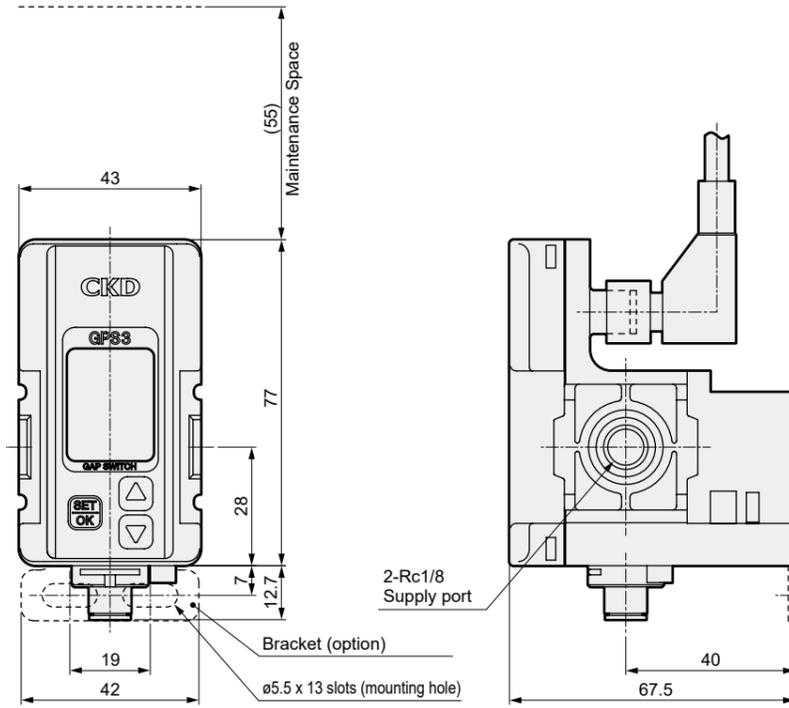
MEMO

Pressure switch

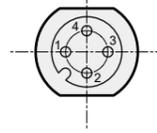
Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

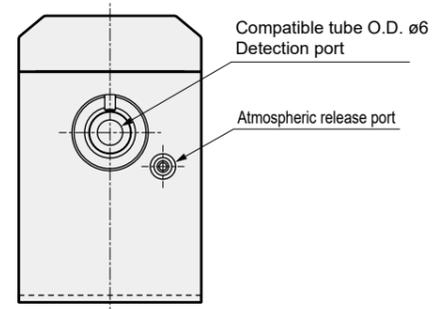


Connector pin array (body side)



Pin No.	Lead wire color	Applications
1	Brown	Power supply +
2	White	Output 2
3	Blue	Power supply -
4	Black	Output 1 (C/Q *1)

\*1: IO-Link communication compatible option



(Atmospheric release port)  
If this port may be blocked by coolant or oil during use, connect a ø(O.D. ø4, I.D. tube 2.5) and install the port so that the tubing end is not blocked.

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch



Gap switch Manifold

# MGPS3 Series

● Station No.: 2 to 6 stations  
Port size: Rc1/8



Refer to the CKD website for detailed compatible model Nos.

## Model No. Notation Method



Note: Refer to P. 116 to 117 for discrete model No. of option peripheral devices.

- 1 Station No.
- 2 Detection range
- 3 Output / Communication supported
- 4 Screen display
- 5 Connector cable
- 6 Bracket
- 7 Pressure display unit

### 1 Station No.

Code	Description
2	2 stations
3	3 stations
4	4 stations
5	5 stations
6	6 stations

### 2 Detection range

Code	Description
Blank	0.03 to 0.4
E	0.02 to 0.15

### 3 Output/communication supported

Code	Description
N	NPN open collector (2-point)
P	PNP open collector (2-point)
L	IO-Link communication

### 4 Screen display

Code	Description
Blank	Indicator (default)
T	Non-display (default)

Note: OS mode allows configuration of screen display and non-display settings.

### 5 Connector cable

Code	Description
Blank	5 m connector cable attached (one side elbow)
D	5 m connector cable attached (both sides elbows/straight)
J	Without connector cable

### 6 Bracket

Code	Description
Blank	Without bracket
B	With bracket

### 7 Pressure display unit

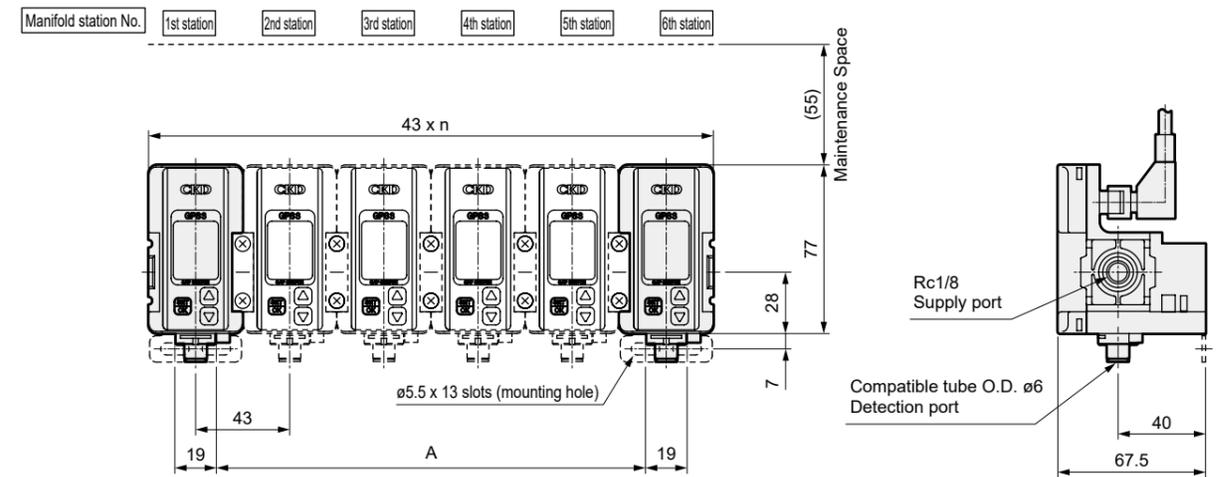
Code	Description
Blank	SI units only (domestic model)
KA	With unit switching function (export model)

Note: In compliance with the new Measurement Act, export models (with unit select function "KA") cannot be used in Japan.

## Specifications

Basic specifications are the same as the Discrete on page 105.

## Dimensions



Dimension A	Station No. n				
	2	3	4	5	6
Dimension A	24	67	110	153	196

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

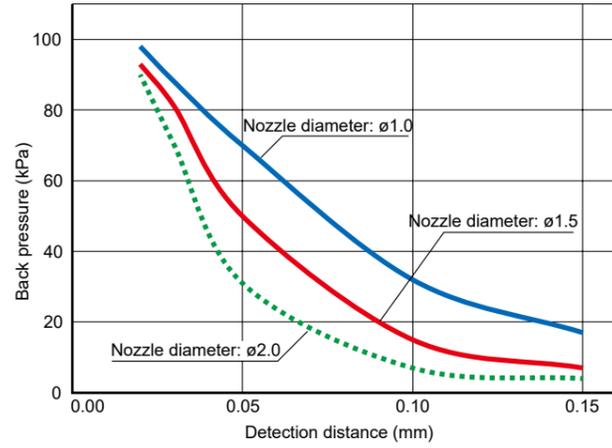
For Coolant Pressure Switch



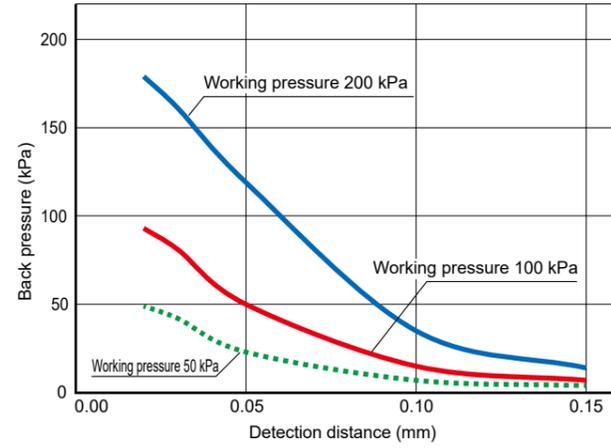
## Characteristics data (short range)

GPS3 single unit data

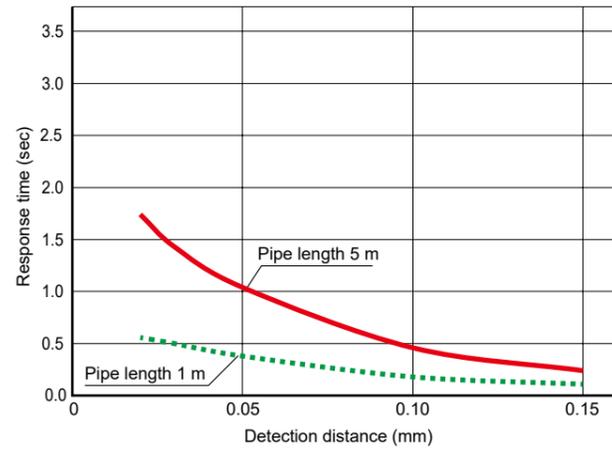
- Back pressure characteristic 1 - Differences in back pressure change due to detection nozzle diameter
  - Model No.: GPS3-E, Bore size:  $\phi 6 \times \phi 4$ , Pipe length: 5 m
  - Supply pressure: 100 kPa



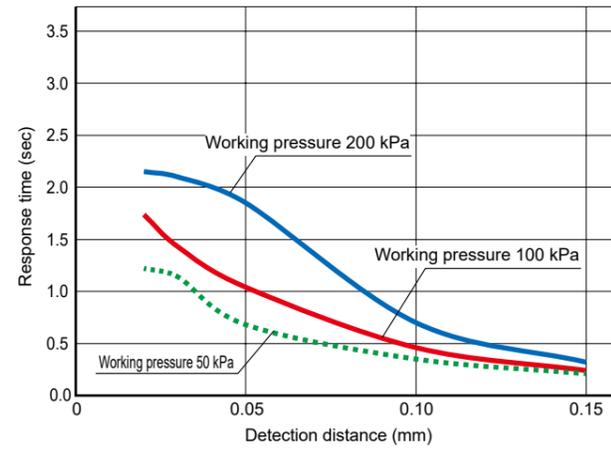
- Back pressure characteristic 2 - Differences in back pressure change due to working pressure
  - Model No.: GPS3-E, Bore size:  $\phi 6 \times \phi 4$ , Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)



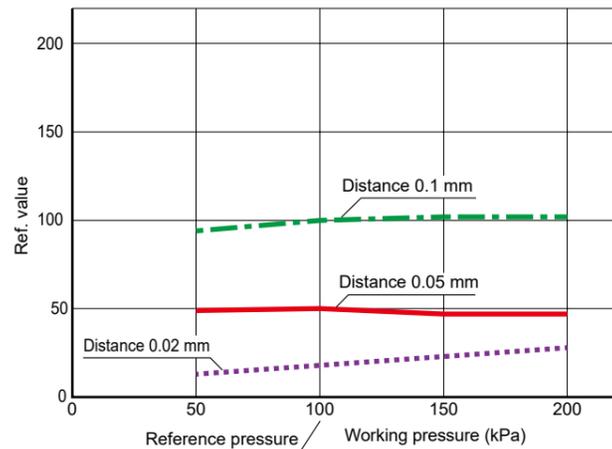
- Effect of pipe length on response time (OFF → ON)
  - Model No.: GPS3-E, Port size:  $\phi 6 \times \phi 4$
  - Supply pressure: 100 kPa • Nozzle diameter:  $\phi 1.5$  (flat end)



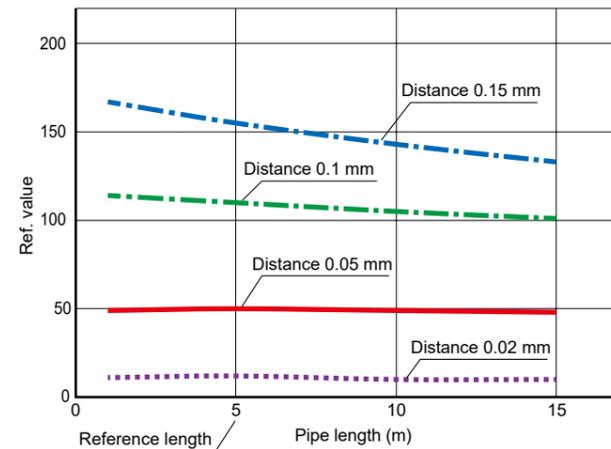
- Effect of working pressure on response time (OFF → ON)
  - Model No.: GPS3-E, Bore size:  $\phi 6 \times \phi 4$ , Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)



- Effect of working pressure change on reference value
  - Model No.: GPS3-E, Bore size:  $\phi 6 \times \phi 4$ , Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)



- Effect of pipe length change on reference value
  - Model No.: GPS3-E, Bore size:  $\phi 6 \times \phi 4$ , Reference pipe length: 5 m
  - Supply pressure: 100 kPa • Nozzle diameter:  $\phi 1.5$  (flat end)

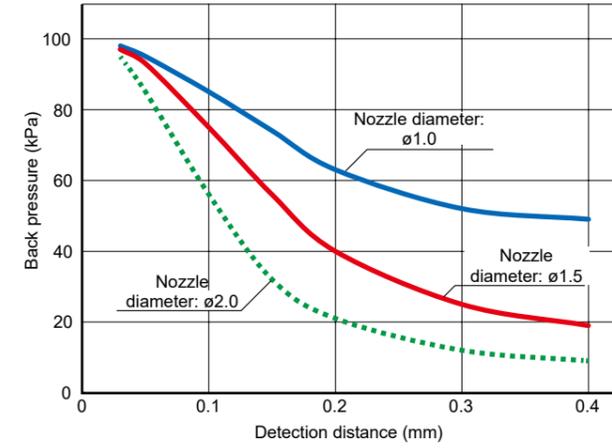


Characteristics data

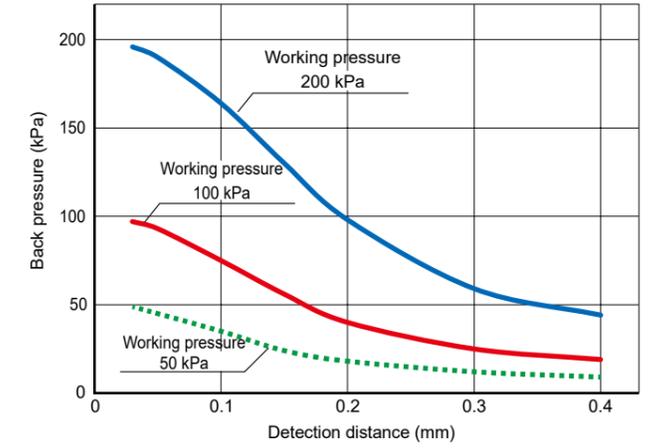
## Characteristics data (wide range)

GPS3 single unit data

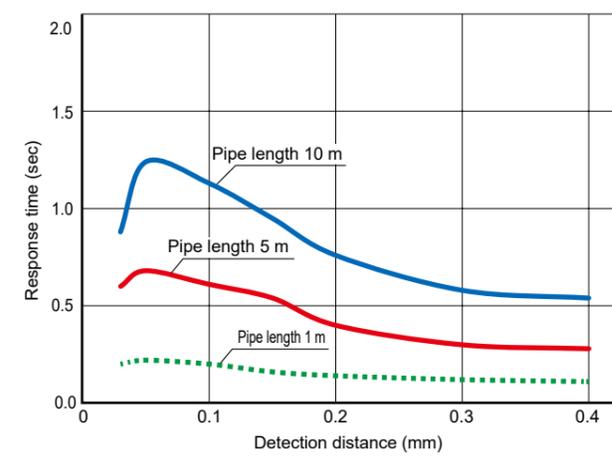
- Back pressure characteristic 1 - Differences in back pressure change due to detection nozzle diameter
  - Model No.: GPS3 / Bore size:  $\phi 6 \times \phi 4$  / Pipe length: 5 m
  - Supply pressure: 100 kPa



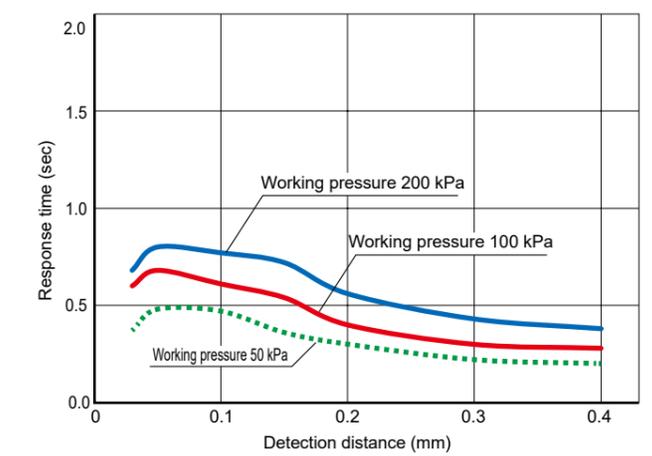
- Back pressure characteristic 2 - Differences in back pressure change due to working pressure
  - Model No.: GPS3 / Bore size:  $\phi 6 \times \phi 4$  / Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)



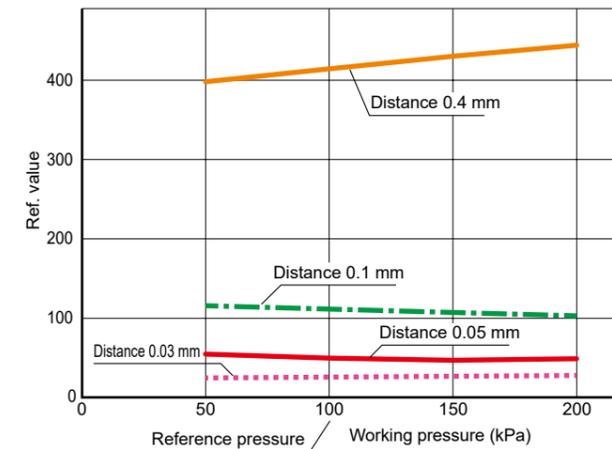
- Effect of pipe length on response time (OFF → ON)
  - Model No.: GPS3 Bore size:  $\phi 6 \times \phi 4$  / Supply pressure: 100 kPa
  - Nozzle diameter:  $\phi 1.5$  (flat tip)
  - (response time is measured at 80% distance of threshold)



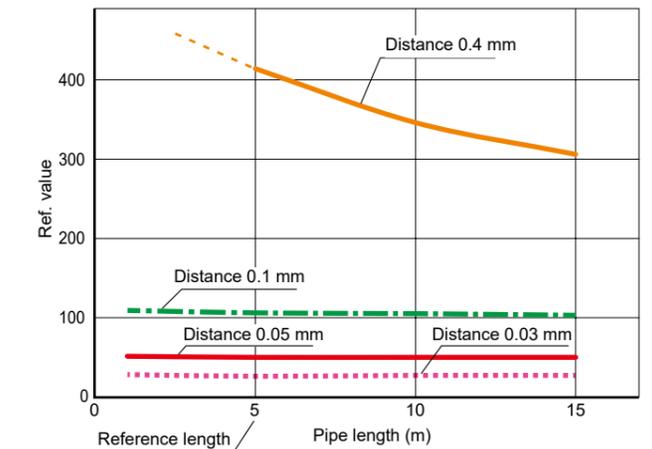
- Effect of working pressure on response time (OFF → ON)
  - Model No.: GPS3 / Bore size:  $\phi 6 \times \phi 4$  / Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)
  - (response time is measured at 80% distance of threshold)



- Effect of working pressure change on reference value
  - Model No.: GPS3 / Bore size:  $\phi 6 \times \phi 4$  / Pipe length: 5 m
  - Nozzle diameter:  $\phi 1.5$  (flat tip)



- Effect of pipe length change on reference value
  - Model No.: GPS3 / Bore size:  $\phi 6 \times \phi 4$  / Reference pipe length: 5 m
  - Supply pressure: 100 kPa • Nozzle diameter:  $\phi 1.5$  (flat end)



Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Ending

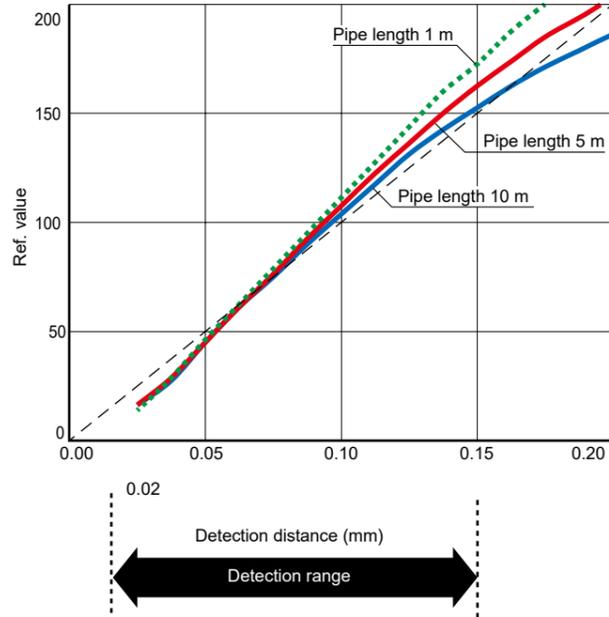
Ending

## Characteristics data

GPS3 single unit data

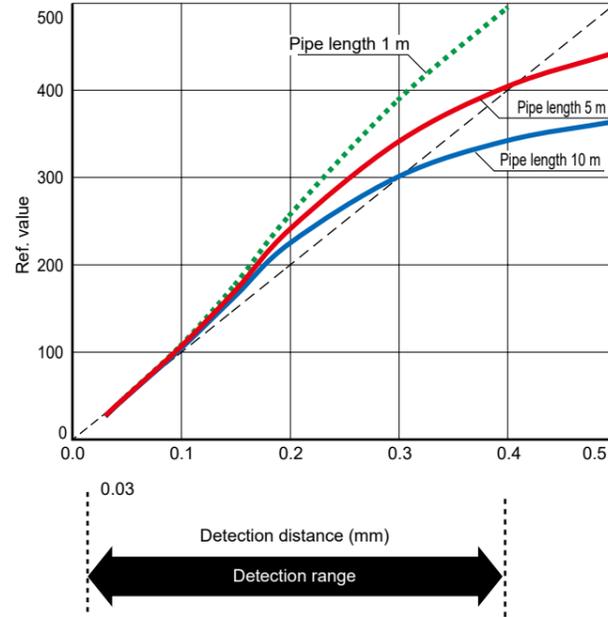
### ● Short range

- Relationship between detection distance and reference value
  - Model No.: GPS3-E / Port size:  $\phi 6 \times \phi 4$
  - Supply pressure: 100 kPa • Nozzle diameter:  $\phi 1.5$  (flat end)



### ● Wide range

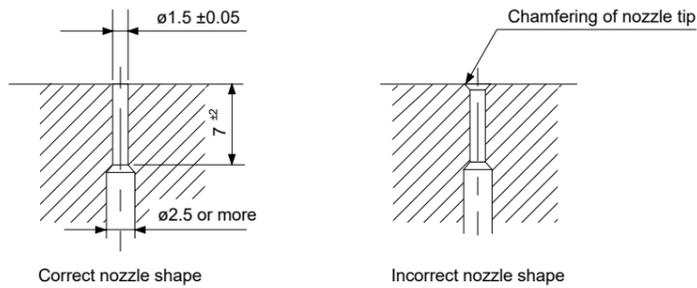
- Relationship between detection distance and reference value
  - Model No.: GPS3 / Port size:  $\phi 6 \times \phi 4$
  - Supply pressure: 100 kPa • Nozzle diameter:  $\phi 1.5$  (flat end)
  - Data from setting at shipment (reference pipe length 5 m).



MEMO

## Design of detection nozzle

### ● Single hole nozzle



Design the detection nozzle with a point size of  $\phi 1.5$  mm and depth of  $7 \pm 2$  mm. The blow-off section of the nozzle cannot be chamfered. If chamfered, the nozzle retracts from the seating surface and the reference value on the display will no longer match the actual dimensions.

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

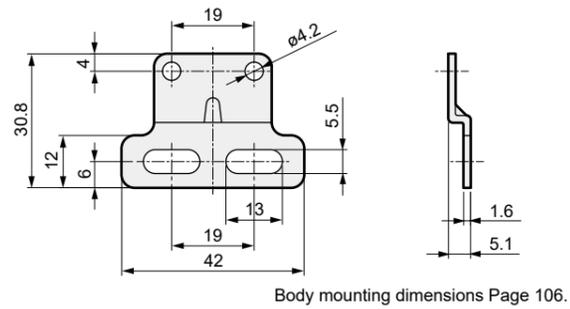
For Coolant Pressure Switch

Options/Model No. Notation Method peripheral components/Dimensions diagram

● Example of bracket model No.

## GPS3-B

Weight: 10 g



Body mounting dimensions Page 106.

● Model No. Notation Method cable with connector

## GPS3-C

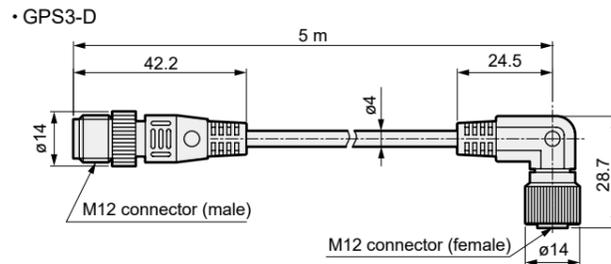
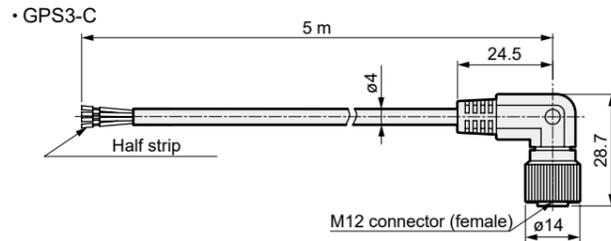
Cable specifications

### 1 Cable specifications

Code	Description
C	Cable with 5 m connector (one side elbow)
D	Cable with 5 m connector (both sides elbows/straight)

Lead wire color	Applications
Brown	Power supply +
White	Output 2
Blue	Power supply -
Black	Output 1

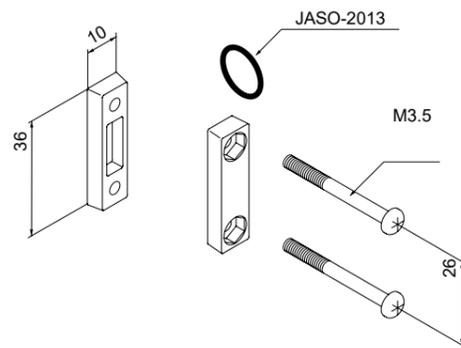
Weight: GPS3-C: 148 g  
GPS3-D: 156 g



● Model No. Notation Method joiner set

## C1000-J100-W

Weight: 11 g



● Gasket

## C1000-GASKET

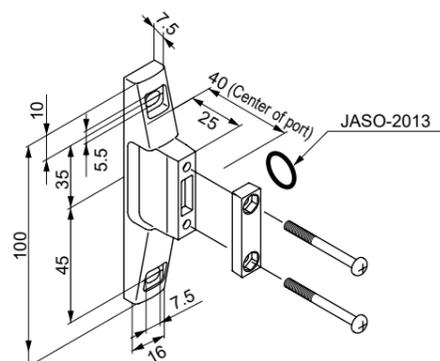
The sales unit is 5 pieces/set.  
Use with a joiner when connecting GPS3 units together.



● Model No. Notation Method T-bracket set

## B110-W

Weight: 24 g



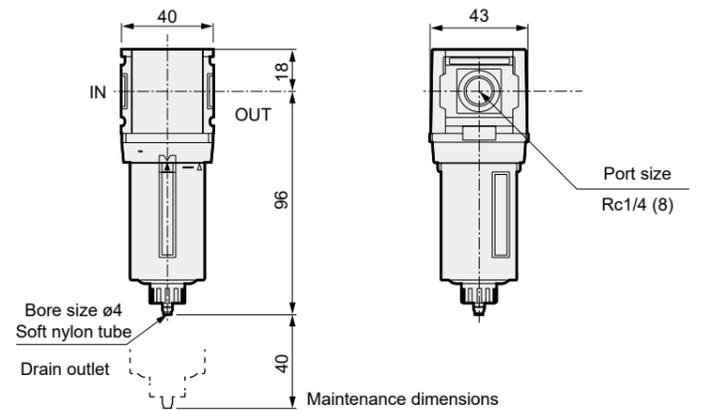
Options/Model No. Notation Method peripheral components/Dimensions diagram

Options/Model No. Notation Method peripheral components/Dimensions diagram

● Model No. Notation Method air filter

## F1000-8-W

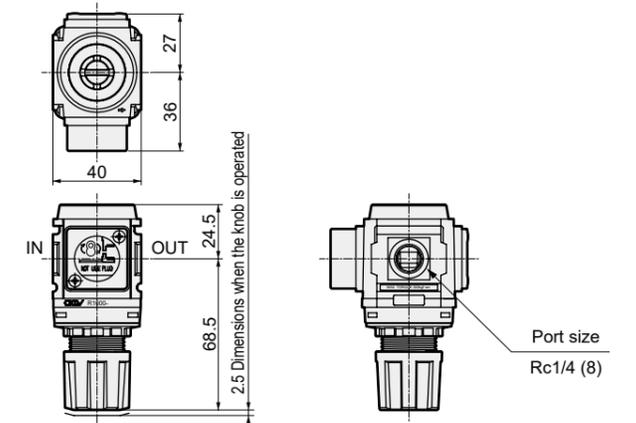
Weight: 87 g



● Model No. Notation Method regulator

## R1000-8-W-LT

Weight: 150 g



● Model No. Notation Method pressure gauge with safety marker

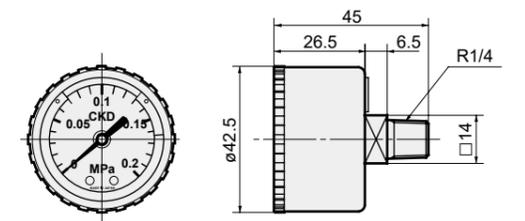
## GPS2-G40D-8-P02-S501

Pressure gauge with safety marker  
1 Pressure display

Port size Rc1/4

Weight: 85 g

Code	Description
P02	0 to 0.2 MPa
P04	0 to 0.4 MPa
P10	0 to 1.0 MPa



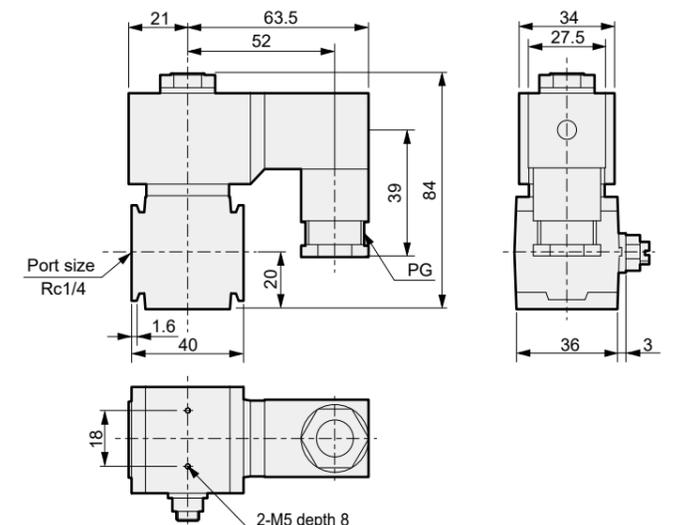
\*1: Safety zone setting range: 0.03 to 0.2 MPa  
\*2: Safety zone setting max. width: 0.09 MPa  
\*3: Gage accuracy: JIS B 7505, Former 3.0 grade  
\*4: Cover material: Transparent nylon

● Model No. Notation Method solenoid valve with needle

## GPS2-AB3X-2H-FL-DC24V

Terminal box:  
DIN terminal  
box with lamp

Weight: 280 g



Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch

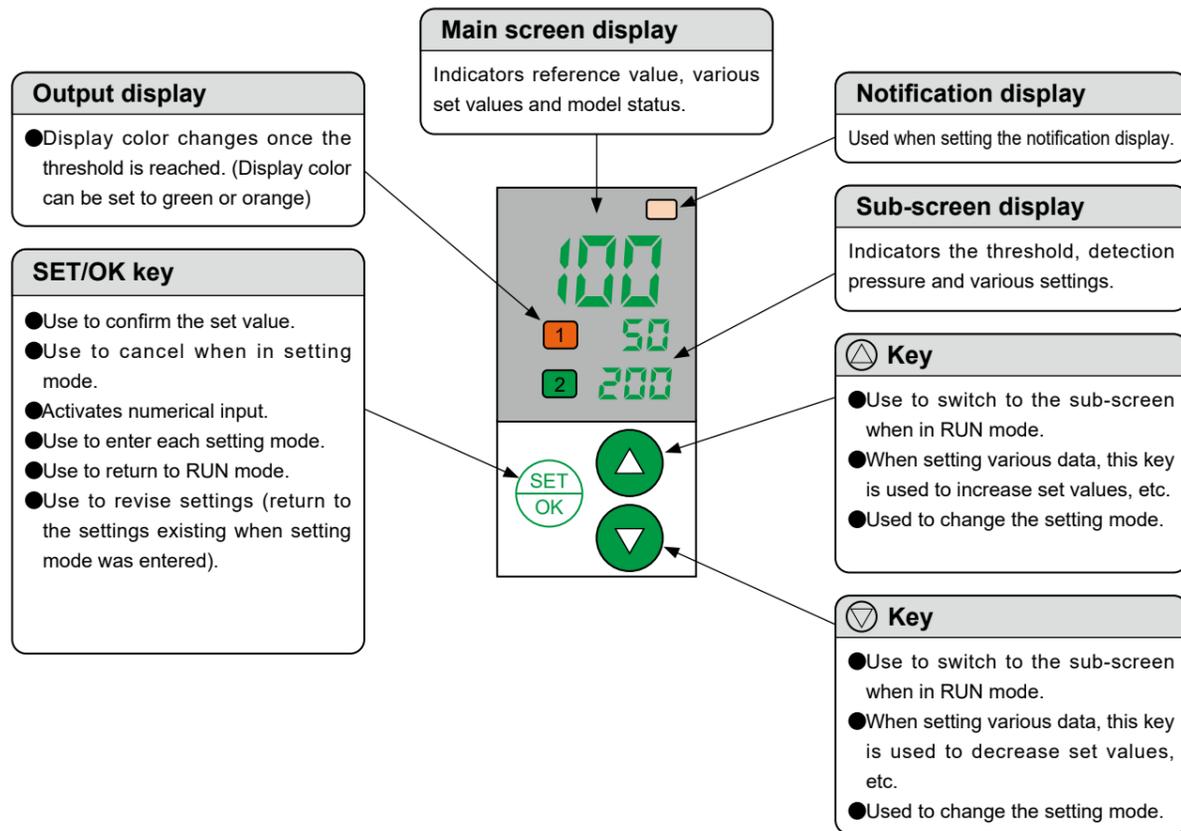
Contact Confirm Switch

For Coolant Pressure Switch

Ending

Ending

Names and functions of display / operation section

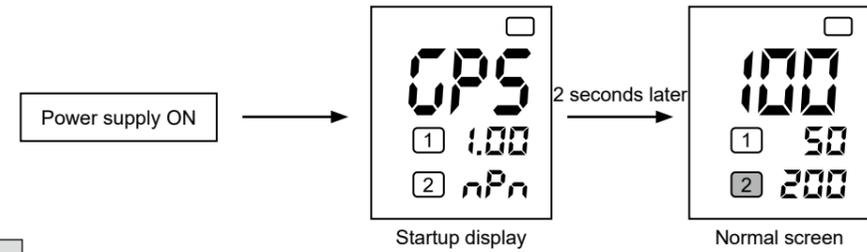


RUN mode (normal operation)

● RUN mode is the regular display and output operation mode which succeeds the startup display when the power is turned on.

Startup display

The following startup display appears when the power is turned on.

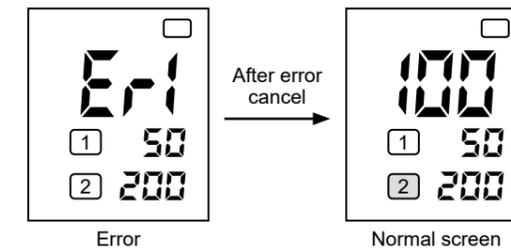


Normal screen

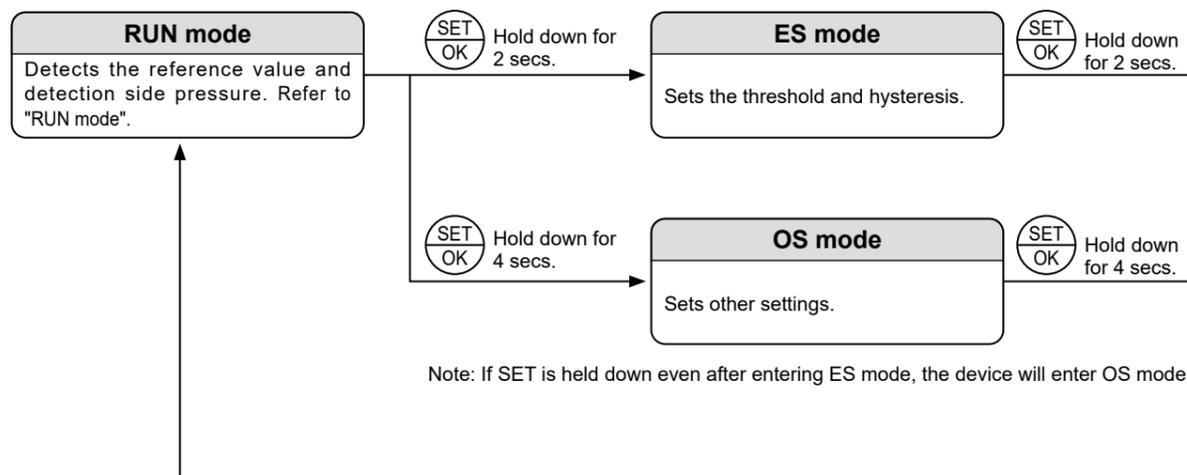
Screen	Indicator		Indicator color
	GPS3-E (short range)	GPS3 (wide range)	
Main screen	1 to 200 FF (beyond display range upper limit) -FF (below display range lower limit)	20 to 500 FF (beyond display range upper limit) -FF (below display range lower limit)	Green display
Sub screen	Threshold (CH1/2): 10 to 200, no display Detection output kPa: 0 to 220 bar: 0 to 2.20 (overseas option only) psi: 0 to 31.9 (export option only) Output display: ON/OFF (IO-Link compatible option only)	Threshold (CH1/2): 20 to 500, no display Detection output kPa: 0 to 220 bar: 0 to 2.20 (overseas option only) psi: 0 to 31.9 (export option only) Output display: ON/OFF (IO-Link compatible option only)	Green display
CH1/2 output display	ON		2-color display (green/orange) Note: Arbitrary setting possible
Notification display	Blinking or OFF Note: Arbitrary setting (default: OFF)		Orange display

Detecting abnormalities

At error detection, the main screen displays an error code indicating the content of the abnormality. (Error code display remains until the error is canceled.)



Setting



Error display	Description	Countermeasures
Er1	Sensor signal error *1 (Damage / Disconnection / Excessive pressure (250 kPa or more) / P2≥P1×1.1)	Indicated when there is a disconnection or the sensor signal exceeds the full scale. Return supply pressure to within the rated pressure range.
Er2	Outside setting range (0-point calibration)	Turn the supply pressure OFF and conduct 0-point calibration at atmospheric pressure.
Er3	Outside setting range (various settings)	Configure within each setting range.
Er4	PIN entry error	Enter the set PIN.
Er7	Temperature sensor error *1	Use within the operating temperature range (0 to 50°C).
Er8	Overcurrent (contact output) *1	Ensure the output current is 100 mA or less.
Er9	Memory error (ROM, RAM, EEPROM)	Contact CKD for details.
-H- (blinking)	Supply pressure is above 220 kPa *1	Lower the supply pressure to within the rated pressure range.
-L- (blinking)	Supply pressure is below 45 kPa *1	Raise the supply pressure to within the rated pressure range.
FF	Above display range upper limit	GPS3-E: over 200, GPS3: over 500 Detect distance within the reference value display range.
-FF	Below display range lower limit	GPS3-E: up to 10, GPS3: up to 20 Detect distance within the reference value display range.

\*1: Output is OFF. Automatic recovery when back within specification range.

Initializing

With the power supply OFF, press SET + △ + ▽ buttons simultaneously and turn the power ON.

\*1: When initializing, make a note in advance of any of the current settings you wish to preserve.

\*2: Display OFF at shipping (option code: T) products will switch to display ON when initialized.

IO-Link Parameter Specifications

●Communication specifications

Item	Details
Communication protocol	IO-Link
Communication protocol version	V1.1
Transmission bit rate	COM2 (38.4 kbps)
Port	Class A
Process data length (input)	4 byte
Process data length (output)	0 byte
Min. cycle time	5 ms
Data storage	1 kbyte
SIO mode support	Yes (PNP only)

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Data name	MSB															LSB
Data range	Ref. value 20 to 500 (for GPS3-L-*) 10 to 200 (for GPS3-EL-*)															
Format	UInteger16															

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				
Data name	Error	WARNING	Alert display output (interior orifice may be clogged)	Alert display output (nozzle may be clogged)	Below display range lower limit	Beyond display range upper limit	Control output CH2	Control output CH1	Detection side pressure value *1											
Data range	True/False								-5 to 250 *2											
Format	Boolean								Integer8											

\*1: "V2.0" is stamped on the upper right side of the product nameplate for products whose detection side pressure value can be confirmed. (As products without the above printing do not use from 0 to 7 bit, the detection side pressure value cannot be checked.)

\*2: Display value on IODD in kPa. Refer to the instruction manual for details about the relation of process data and detection side pressure value.

\*3: IODD files can be downloaded from the CKD website. The IODD file to be applied differs depending on whether \*1 is printed above. Please apply the correct version. IODD file to take advantage of the product's features.

For details on operation and setting method, refer to CKD components product website (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → [Instruction manual](#)



Sensor components (sensor components)

# Safety Precautions

Be sure to read this section before use.

For general pneumatic components precautions, refer to Intro 17 for details.

Product-specific cautions: Digital gap switch GPS3 Series

## Design / Selection

### ⚠ DANGER

- Use with power supply voltage and output in the specified range. Applying a voltage that is outside of the specified range may cause malfunction, damage to the sensor, electrical shock, and/or fire. Do not use any load that exceeds the rated output. Using such a load may result in damage to the output part or fire.

### ⚠ WARNING

- Use the product in the range of conditions specified for the product. Contact CKD when using the product outside specifications or for special applications. Use of the product outside the specifications range may result in insufficient performance, and its safety cannot be guaranteed.

- Confirm before use that the product will withstand the working environment.
  - This product cannot be used in environments where functional obstacles could occur.
  - The main material of this product is resin. Do not use in atmospheres where corrosive gases are generated. Such environments include high temperatures, chemical atmospheres, where chemical liquids, vibration, moisture, water dripping, coolant, or gas is present; where ozone is generated; chemical plants, semiconductor pre-processing, outdoors, etc.
  - Compressed air quality must satisfy JIS1.4.1, "oilless clean dry air."

- This product cannot be used to display the absolute distance from the reference surface to the workpiece. It is a pressure sensor for calculating the detection output and displaying a reference value (dimensionless number). Refer to the characteristics data in the technical data for information about the relationship between reference value and distance.

- Working fluid must be clean air from which solids, water and oil have been sufficiently removed using a dryer, filter and oil mist filter. Never supply lubricated air.

This product has a small orifice, so to prevent the entry of foreign matter, use an air filter for clean air (5 μm or less) with the recommended circuit shown below (Fig. 1).

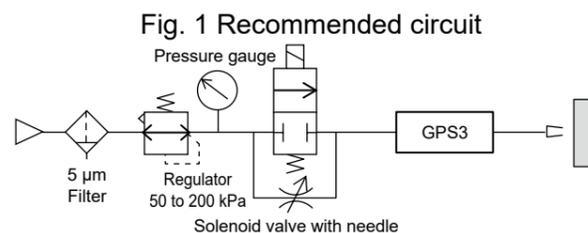
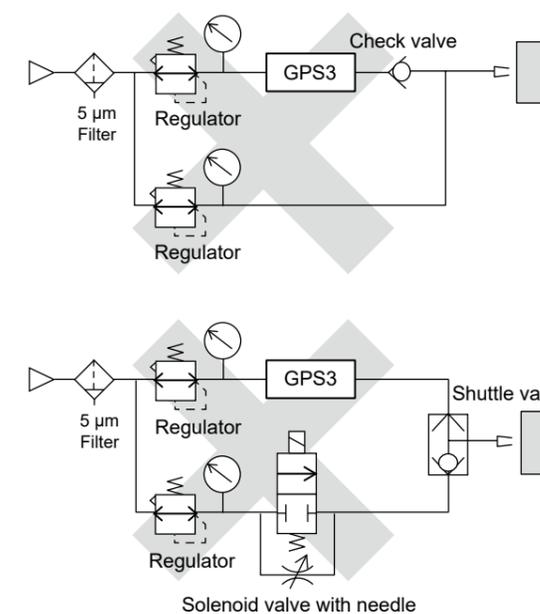


Fig. 1 Recommended circuit

- Do not use the following air circuit when blowing air from the detection nozzle.

- Circuit with check valve  
The check valve acts as exhaust resistance, and limits the adjustable range.
- Circuit with shuttle valve and 2-way valve  
Residual pressure in the OUT side of the 2-way valve prevents a correct detection. Even if a 3-way valve is used, the shuttle valve may vibrate excessively.

Fig. 2



- Check wiring insulation. Check that wires do not come into contact with other circuits, that no ground faults occur, and that the insulator between terminals is not defective. Otherwise, eddy current may flow into the sensor, causing damage.

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Ending

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

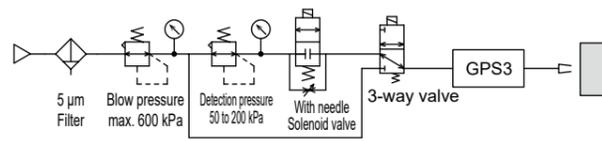
For Coolant Pressure Switch

Ending

**CAUTION**

- The entry of compressor oil and tarry substances may obstruct the flow of air and result in problems. Regularly inspect the compressor and discharge drainage.
- Keep the air flow constant so coolant and oil do not flow back from the detection nozzle, or use a solenoid valve with needle and let in a small amount of air from the bypass as shown in the recommended circuit (Fig. 1).
- Swarf and grinder chips, etc., could clog the nozzle. Switch the supply pressure (max. 600 kPa) when transporting the workpiece during machining processes to prevent the detection nozzle from becoming clogged. (Fig. 3)

Fig. 3 Circuit for detection and air blow



(When using high pressure, GPS3 will display "Er1" or "-H-" and the outputs will turn OFF)

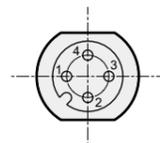
- Select an output format (NPN, PNP) matching the input unit of the programmable controller being used.
- Operation may be disabled if a capacitance load such as an AC/DC buzzer is connected to the load. A protection circuit is provided to prevent damage from incorrect wiring or overcurrent. A relay must be used when connecting a capacitance load.
- Caution
  - Reference for detection side piping (tube) is O.D. ø6, I.D. ø4 and length 5 m. If piping conditions (tube length) differ, use the actual measurement calibration function as needed to bring the reference values closer to the actual values.
  - Contact confirmation detection using this product is effective across a 50 to 200 kPa supply pressure range. Outside the effective range the display will show "Er1", "-H-" or "-L-" and the outputs will turn OFF. In the case of a circuit like Fig. 3, "Er1" is displayed when the detection nozzle blows at high pressure. Furthermore, residual pressure may cause the output to instantaneously turn OFF→ON→OFF when normal supply pressure returns. For this circuit, disable the signal immediately after switching to a blower valve.
  - When using a solenoid valve with needle on the supply side, "-L-" will be displayed when the solenoid is in the OFF state, indicating lower than normal supply pressure. However, a value will be displayed if there is a small amount of air flow through the needle, so the reference value and output should be disabled.

- Observe the following items when installing:
  - Install this product so the detection port faces downward.
  - Install this product at a position higher than the seating surface to prevent coolant from entering.
  - Provide enough space for adjustment, monitoring, and maintenance.
  - Use rust-resistant material such as nylon tubes or stainless steel pipes for piping material.
  - When installing this product on a device, check that no load is applied to the device.
  - When using steel pipes, securely fix the pipe to prevent excessive bending force from being applied to the connection.
  - When welding near this product, cover it to prevent spatter from coming in contact.
  - When housing this product in a box, provide an exhaust port so atmospheric pressure is maintained in the box.

- Observe the following items when wiring:
  - When using a switching regulator for the power supply, ground the F.G. (frame ground).
  - Avoid using in a transient state, continuing 1s after power is turned ON.
  - Take special care to prevent load short-circuits or incorrect wiring. The protective circuit is activated.
  - M12 connector pins are arranged as shown in Fig. 4. Take special care to prevent incorrect wiring.
  - When using a load with a large rush current, such as a motor, the protection circuit will activate. In this case, use a relay.
  - If there is a device (motor, welder) that generates a large surge near this product, insert a surge absorber, such as a varistor, at the source of the surge.
  - If this product's lead wire is wired with the drive cable or power cable, it is affected by surge and noise deteriorating or damaging the sensor element in the switch. Use separate wiring.

- Keep unused wires from coming into contact with other wires.

Fig. 4 Connector pin array (body side)



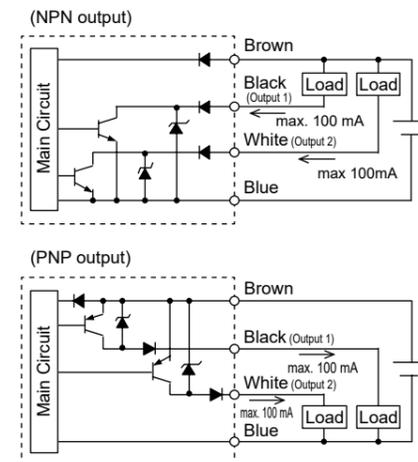
Pin No.	Lead wire color	Applications
1	Brown	Power supply +
2	White	Output 2
3	Blue	Power supply -
4	Black	Output 1 (C/Q *1)

\*1: IO-Link compatible option

- M12 connector is integrated into the GPS3 body. Pulling on the cable is strictly forbidden. Use cable ties to fix the cable in place.
- Do not bind the sensor cable together with AC power wiring.
- The M12 connector pin array is compatible with the GPS2 Series (wiring option C□). (Excluding pin No.2)

NPN output and PNP output contact confirmation switches are available. Wire the switch based on the output as shown in Fig. 5.

Fig. 5 Output circuit



- One detection nozzle can be used for one of these product units.

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (<https://www.ckd.co.jp/kiki/en/>) → "Model No. → Instruction Manual"

Pressure switch

Electronic pressure Switch  
Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch  
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