Digital Pressure Sensor For Gas
DP-0 SERIES

FIBER SENSORS
LASER SENSORS
PHOTOELECTRIC SENSORS
MICRO PHOTOELECTRIC SENSORS
AREA SENSORS
SAFETY LIGHT CURTAINS / SAFETY COMPONENTS
PRESSURE / FLOW SENSORS
INDUCTIVE PROXIMITY SENSORS
PARTICULAR USE SENSORS
SENSOR OPTIONS
SIMPLE WIRE-SAVING UNITS
WIRE-SAVING SYSTEMS
MEASUREMENT SENSORS
STATIC CONTROL DEVICES
LASER MARKERS
PLC
HUMAN MACHINE INTERFACES
ENERGY MANAGEMENT SOLUTIONS
FA COMPONENTS
MACHINE VISION SYSTEMS
UV CURING SYSTEMS

Selection Guide
Pressure/ Digital Display
Pressure/ Head-separated
Flow

DP-0
DP-100
DP-M

Related Information
■ General terms and conditions..... F-3
■ Glossary of terms..... P.1563~
■ Selection guide ..... P.699~
■ General precautions P.1566

panasonic.net/id/pidsx/global

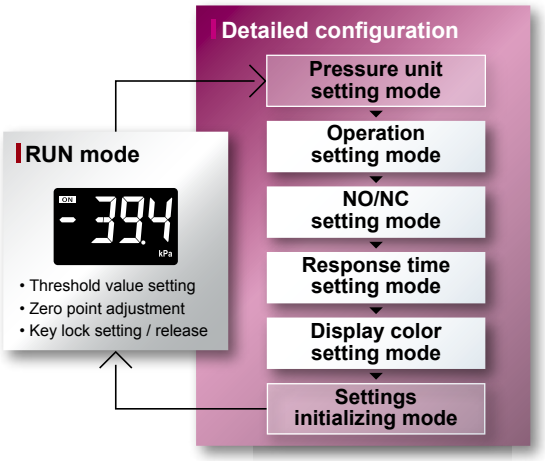
LCD Digital

Simple and easy operation
Redesigned for improvement of pressure sensor usability from ground up

Simple & easy operation

Two levels of configuration for easy operation of essential functions

The “RUN mode” is for setting the threshold value, the zero point adjustment and key lock/release setting, and the “detailed configuration” allows the basic settings of sensor operation. The two-level configuration enables an easy and immediate use of the product.



Main menu for detailed configuration

Operation setting mode*

Select from EASY mode, hysteresis mode or window comparator mode.

NO/NC setting mode

Set the comparative output operation to NO or NC.

Response time setting mode

Select the response time from 2.5 ms, 25 ms or 250 ms.

Display color setting mode

Select the comparative output ON/ OFF display color and the normal display color from red or white.

* Refer to p.705 for details of operation setting mode.

Functional design

Black body for enhanced visibility of LCD display

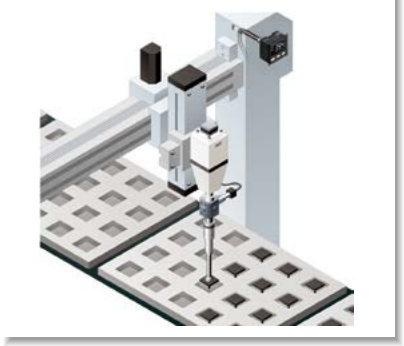
The unit body is completely black to make the LCD display easier to see.

Firm and crisp clicking feel

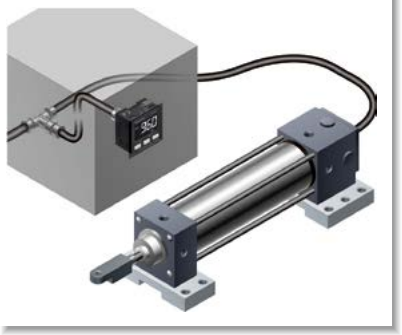
The buttons offer firm and crisp clicking feel for smooth and reliable setting operations.

APPLICATIONS

Suction confirmation for electronic parts



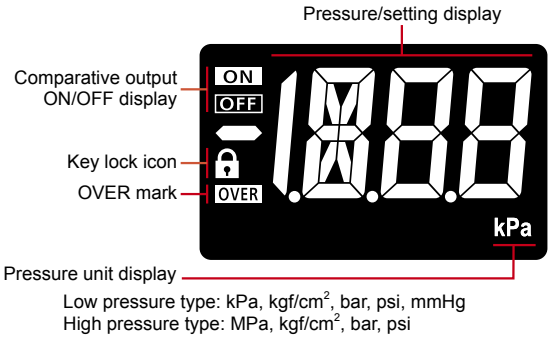
Reference pressure check



High-quality LCD display

Simple and highly visible display

The LCD offers a wide viewing angle so the display is easy to see even from an oblique angle. The alphanumeric display (12-segment display), the key lock mark and the OVER mark are also clear and easy to see.



Low pressure type: kPa, kgf/cm^2, bar, psi, mmHg
High pressure type: MPa, kgf/cm^2, bar, psi

Selection of display color from red or white

The display color can be selected from red or white in accordance with the output operation. Since the detailed setting mode display is pink (unchangeable), the pressure sensor status can be easily recognized by color.

Mode / Display color setting	RUN mode: Comparative output ON	RUN mode: Comparative output OFF	Detailed mode
Red for ON, white for OFF	Red	White	Pink
White for ON, red for OFF	White	Red	
Red in normal status	Red		
White in normal status	White		

RUN mode

Detailed setting mode

Compact & light weight design

Extra-short depth and light weight

The unit body measures only 24.9 mm 0.980 in in depth to allow installation in a shallow space. The main unit weighs only about 25 g. The lightweight unit means minimal load when mounted on a moving part such as a robot arm.

Comparison with conventional model (**DP-100** series standard pressure port type)		
	Depth dimension	: Approx. **41**% shorter!
	Main unit weight	: Approx. **38**% lighter!

DP-0 series

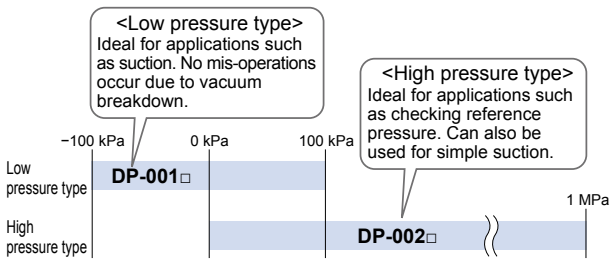
< Actual size >

Conventional model
(**DP-100** series standard pressure port type)

Low pressure type and high pressure type available

Two types to choose from depending on your application

The low pressure type can be used with positive or negative pressure, while the high pressure type is suitable for positive pressure of up to 1 MPa.

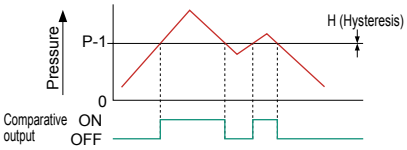


Three output modes

Equipped with three output modes for use in a wide range of applications

(1) EASY mode

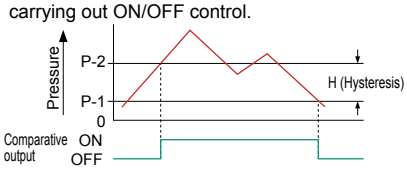
This mode is used for comparative output ON/ OFF control.



*H: 4 digits (fixed) (10 digits or more when using psi unit)

(2) Hysteresis mode

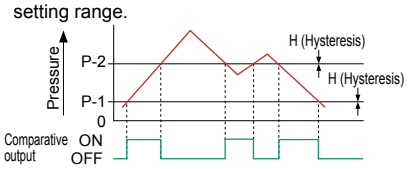
This mode is used for setting comparative output hysteresis to the desired level and for carrying out ON/OFF control.



*H: 2 digits or more (5 digits or more when using psi unit)

(3) Window comparator mode

This mode is used for setting comparative output ON and OFF at pressures within the setting range.



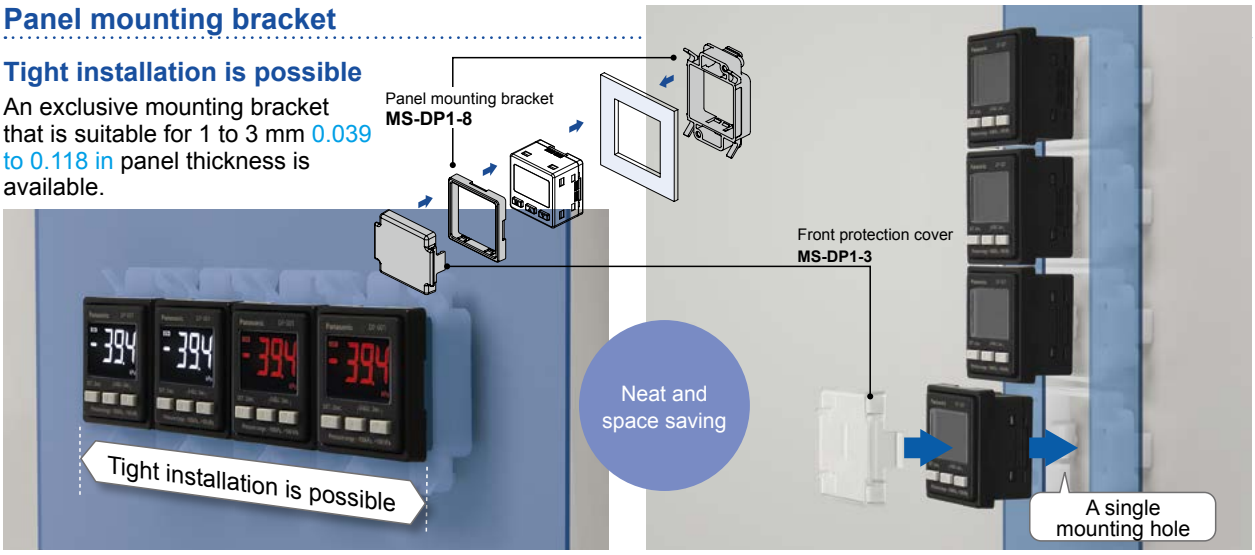
*H: 4 digits or more (10 digits or more when using psi unit)

Designed for easy installation

Panel mounting bracket

Tight installation is possible

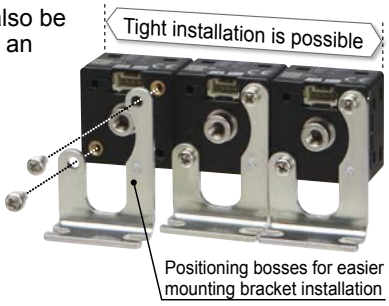
An exclusive mounting bracket that is suitable for 1 to 3 mm 0.039 to 0.118 in panel thickness is available.



Exclusive mounting bracket

Supports tight installation

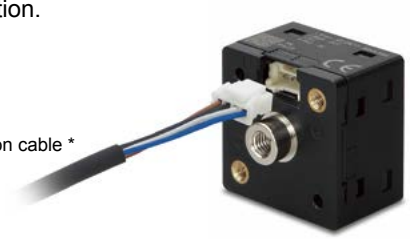
Space savings can also be achieved even when an L-shaped mounting bracket is used.



Connection cable

Cable can be connected with one-touch

Connector attached cable (2 m 6.562 ft), as an accessory, can be connected easily with one-touch connection.



* Options: 1 m 3.281 ft / 3 m 9.843 ft / 5 m 16.404 ft types are also available.

Types without connector attached cable are also available

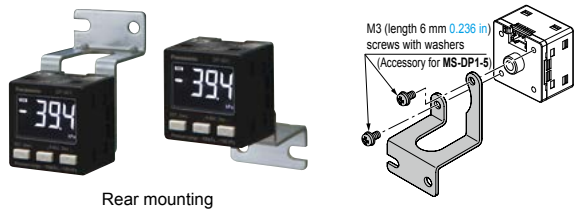
DP-00□-J

Commercially-available connectors can be used for cable connections. Cables in required length can be used, so this contributes to reduction in waste of unwanted cables.

* Refer to p.706 for recommended commercially-available connectors.

MS-DP1-1

MS-DP1-5



ORDER GUIDE

Model No.

DP-00 [1] - [P] - [J]

Rated pressure range
- **1** : −100.0 to +100.0 kPa (Low pressure type)
- **2** : 0.000 to +1.000 MPa (High pressure type)

Comparative output
- None : NPN output type
- **P** : PNP output type

Cable
- None : Connector attached cable 2 m 6.562 ft
- **J** : Type without connector attached cable

Type	Appearance	Rated pressure range	Model No.	Pressure port	Comparative output
Low pressure type	*CN-14A-C2 (Connector attached cable 2 m 6.562 ft) is attached.	−100.0 to +100.0 kPa	**DP-001**	M5 female thread	NPN open-collector transistor
			DP-001-P		PNP open-collector transistor
High pressure type		0.000 to +1.000 MPa	**DP-002**		NPN open-collector transistor
			DP-002-P		PNP open-collector transistor

Type without connector attached cable

Type without connector attached cable **CN-14A-C2** is available. When ordering this type, suffix "**-J**" to the Model No.
(e.g.) Type without connector attached cable of **DP-001-P** is "**DP-001-P-J**"

Accessory

- **CN-14A-C2** (Connector attached cable 2 m 6.562 ft)

OPTIONS

Designation	Model No.	Description	
Connector attached cable	**CN-14A-C1**	Length: 1 m 3.281 ft	0.2 mm² 4-core cabtyre cable with connector on one end Cable outer diameter: ø3.7 mm ø0.146 in
	CN-14A-C2 (Note)	Length: 2 m 6.562 ft	
	CN-14A-C3	Length: 3 m 9.843 ft	
	CN-14A-C5	Length: 5 m 16.404 ft	
Connector attached cable (Bending-resistant cable)	**CN-14A-R-C1**	Length: 1 m 3.281 ft	0.2 mm² 4-core bending-resistant cabtyre cable with connector on one end Cable outer diameter: ø3.7 mm ø0.146 in
	CN-14A-R-C2	Length: 2 m 6.562 ft	
	CN-14A-R-C3	Length: 3 m 9.843 ft	
	CN-14A-R-C5	Length: 5 m 16.404 ft	
Connector	**CN-14A**	Set of 10 housings and 40 contacts	
Sensor mounting bracket	**MS-DP1-1**	Allows sensors to be installed on the flooring or ceiling. Multiple sensors can also be mounted closely.	
	MS-DP1-5	Allows sensors to be installed on the wall. Multiple sensors can also be mounted closely.	
Panel mounting bracket	**MS-DP1-8**	Allows installation to panels with thickness of 1 to 3 mm 0.039 to 0.118 in. Multiple sensors can also be mounted closely.	
Front protection cover	**MS-DP1-3**	Protects the adjustment surfaces of sensors. (Can be attached when using the panel mounting bracket)	
Conversion bushing	**MS-DP1-7**	Pressure port can be converted to Rc⅛ female thread.	

Note: The connector attached cable **CN-14A-C2** is supplied with the **DP-0** series.

Recommended connector

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

Recommended crimping tool

Model No.: YC-610R
(Manufactured by J.S.T. Mfg. Co., Ltd.)

Recommended connector (e-CON)

Applicable connector: 37104-3122-000 FL
(Manufactured by 3M Japan Limited)

Note: Contact the manufacturer for details of the recommended products.

SPECIFICATIONS

Item		Type	Low pressure	High pressure
	Model No.	NPN output	**DP-001**	**DP-002**
		PNP output	**DP-001-P**	**DP-002-P**
CE marking directive compliance			EMC Directive, RoHS Directive	
Type of pressure			Gauge pressure	
Rated pressure range			−100.0 to +100.0 kPa	0.000 to +1.000 MPa
Set pressure range			−101.0 to +101.0 kPa −1.030 to +1.030 kgf/cm² −1.010 to + 1.010 bar −14.65 to +14.65 psi −756 to +756 mmHg	−0.010 to +1.010 MPa −0.1 to +10.30 kgf/cm² −0.1 to + 10.10 bar −0.1 to +146.5 psi
Pressure withstandability			500 kPa	1.5 MPa
Applicable fluid			Air, non-corrosive gas	
Selectable unit			Low pressure type: kPa, kgf/cm², bar, psi, mmHg High pressure type: MPa, kgf/cm², bar, psi	
Supply voltage			12 to 24 V DC ±10 % Ripple P-P 10 % or less	
Power consumption			30 mA or less	
Comparative output			<NPN output type> NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between comparative output and 0 V) • Residual voltage: 2 V or less (at 50 mA sink current)	<PNP output type> PNP open-collector transistor • Maximum source current: 50 mA • Applied voltage: 30 V DC or less (between comparative output and +V) • Residual voltage: 2 V or less (at 50 mA source current)
		Output operation	Selectable either NO or NC by key operation	
		Hysteresis	Minimum 2 digits (variable)	
		Repeatability	±0.2 % F.S. (within ±4 digits)	±0.4 % F.S. (within ±4 digits)
		Response time	2.5 ms, 25 ms, 250 ms, selectable by key operation	
		Short-circuit protection	Incorporated	
Display			3 + 1/2 digits, 3-color (white / red / pink) LCD display (Display update period: 250 ms)	
		Displayable pressure range	−101.0 to +101.0 kPa −1.030 to +1.030 kgf/cm² −1.010 to + 1.010 bar −14.65 to +14.65 psi −756 to +756 mmHg	−0.010 to +1.010 MPa −0.1 to +10.30 kgf/cm² −0.1 to + 10.10 bar −0.1 to +146.5 psi
Environmental resistance		Protection	IP40 (IEC)	
		Ambient temperature	0 to +50 °C +32 to +122 °F (No dew condensation allowed), Storage: -10 to +60 °C +14 to +140 °F	
		Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH	
		Voltage withstandability	500 V AC for one min. between all supply terminals connected together and enclosure	
		Insulation resistance	50 MΩ or more with 500 V DC megger between all supply terminals connected together and enclosure	
		Vibration resistance	10 to 150 Hz frequency, double amplitude 0.75 mm 0.030 in or maximum acceleration 49 m/s², in X, Y and Z directions for two hours each	
		Shock resistance	100 m/s² acceleration (10 G approx.) in X, Y and Z directions three times each	
Pollution degree			2	
Overvoltage category			I	
Usable altitude			2,000 m 6,562 ft or less	
Temperature characteristics (+20 °C +68 °F standard)			+10 to +40 °C +50 to +104 °F: Within ±1 % F.S. 0 to +50 °C +32 to +122 °F: Within ±2.5 % F.S.	+10 to +40 °C +50 to +104 °F: Within ±2 % F.S. 0 to +50 °C +32 to +122 °F: Within ±5 % F.S.
Grounding method			Floating	
Pressure port			M5 female thread	
Material			Enclosure: PBT (glass fiber reinforced), LCD display: Acrylic, Pressure port: Brass (nickel plated) Mounting threaded part: Brass, O-ring: Nitrile rubber (NBR), Key section: Polycarbonate	
Weight			25 g approx.	
Accessory			**CN-14A-C2** (Connector attached cable 2 m 6.562 ft): 1 pc.	

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

Selection Guide
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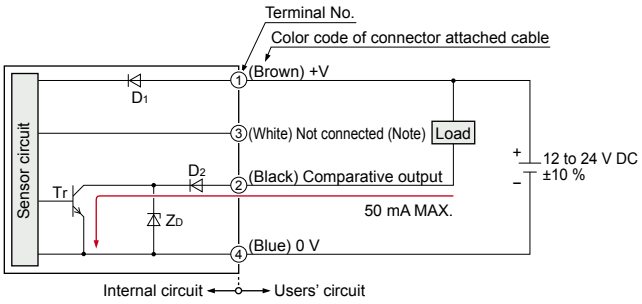
I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

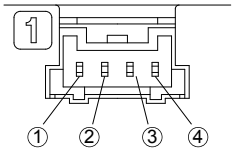
I/O circuit diagram



Note: Open or, connect to 0 V.

Symbols…D1, D2: Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr: NPN output transistor

Terminal arrangement diagram

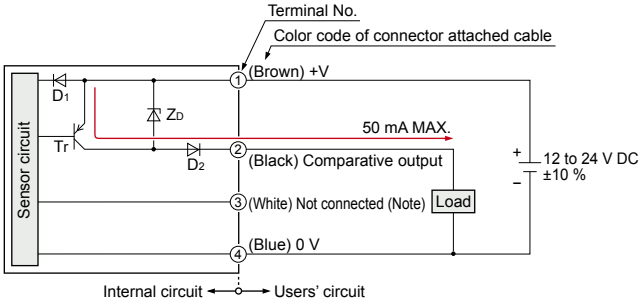


Terminal No.	Designation
①	+V
②	Comparative output
③	Not connected (Note)
④	0V

Note: Open or, connect to 0 V.

PNP output type

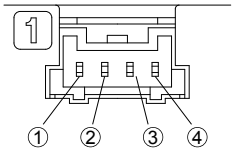
I/O circuit diagram



Note: Open or, connect to 0 V.

Symbols…D1, D2: Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr: PNP output transistor

Terminal arrangement diagram



Terminal No.	Designation
①	+V
②	Comparative output
③	Not connected (Note)
④	0V

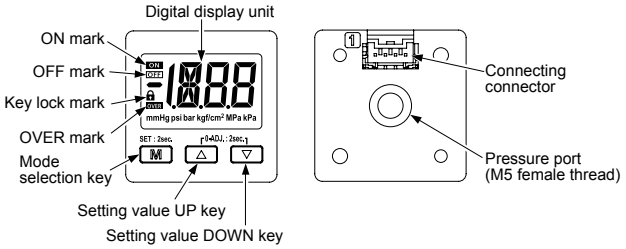
Note: Open or, connect to 0 V.

PRECAUTIONS FOR PROPER USE

Refer to p.1566 for general precautions.

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- This product is used for non-corrosive gas. The product shall not be used for liquid or corrosive gas. Never use fluids having inflammability, toxicity, etc., that affect the human body, either.

Part description

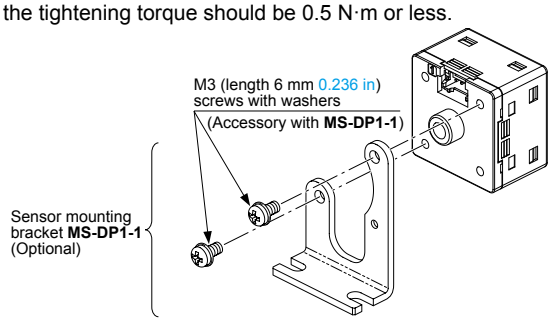


Piping

- When using this product, connect a joint available in the market to the pressure port. At the time, the tightening torque should be 1.0 N·m or less.

Mounting

- Use sensor mounting bracket **MS-DP1-1** prepared independently.
  When mounting this product with sensor mounting bracket, etc., the tightening torque should be 0.5 N·m or less.



- Panel mounting bracket **MS-DP1-8** (optional) and front protection cover **MS-DP1-3** (optional) are available.
- For the method for mounting panel mounting bracket, refer to the instruction manual that came with the **MS-DP1-8**.

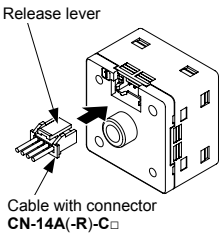
Wiring

- Make sure that the power supply is OFF while performing the wiring operation.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- When extending the cable, use a cable whose conductor cross-section area is 0.3 mm^2 or more. The cable can be extended to up to 10 m 32.808 ft in total length.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Do not apply stress directly to the connection cable leader or to the connector.

Connection

How to connect

- Insert the cable with connector **CN-14A(-R)-C□** into this product's connection connector section as shown in the right figure.



How to disconnect

- Pressing the release lever of the cable with connector, pull out the connector.

Note: Do not pull by holding the cable without pressing the release lever, as this can cause cable break or connector break.

Factory setting

Type	Low pressure type	High pressure type
Operation setting	EASY mode	
NO/NC setting	NC	NO
Threshold value	−50.0	0.500
Pressure unit	kPa	MPa
Display color	Red when ON, White when OFF	
Response speed	2.5 ms	

Error indication

Error indication	Description	Remedy
E-1	The load is short-circuited causing an overcurrent to flow.	Turn OFF the power and check the load.
E-3	Pressure is applied during zero point adjustment.	Applied pressure at the pressure port should be brought to atmospheric pressure and zero-point adjustment should be done again.
10.0	The applied pressure exceeds the upper limit of the displayed pressure range.	Applied pressure range should be brought within the rated pressure range.
-10.0	The applied pressure exceeds the lower limit (back pressure) of the displayed pressure range.	

When other error massage is displayed, contact us.

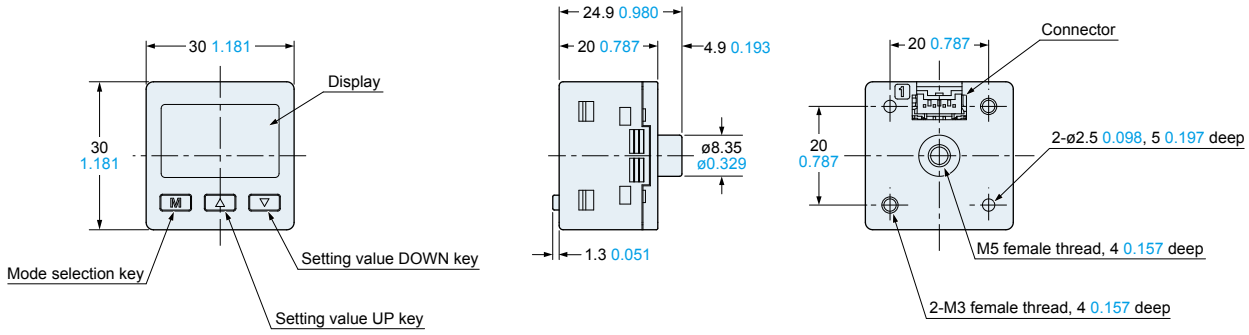
Others

- This product has been developed / produced for industrial use only.
- The product shall be used only within the rated pressure range.
- Do not apply pressure exceeding the pressure resistance. Otherwise, destruction of diaphragm occurs, preventing the product to perform normal operation.
- Do not use during the initial transient time (0.5 sec.) after the power supply is switched ON.
- The specification may not be satisfied in a strong magnetic field.
- This product is suitable for indoor use only.
- Take care that strong impact such as fall is not given to this product. Otherwise, it may be destroyed.
- Avoid dust, dirt, and steam.
- Take care that the product does not come into contact with organic solvents such as thinner.
- Take care that the product does not come into contact with oil or grease.
- Take care that the product does not come into contact with strong acid or alkaline.
- Do not insert wire into the pressure port. Otherwise, destruction of diaphragm occurs, preventing the product to perform normal operation.

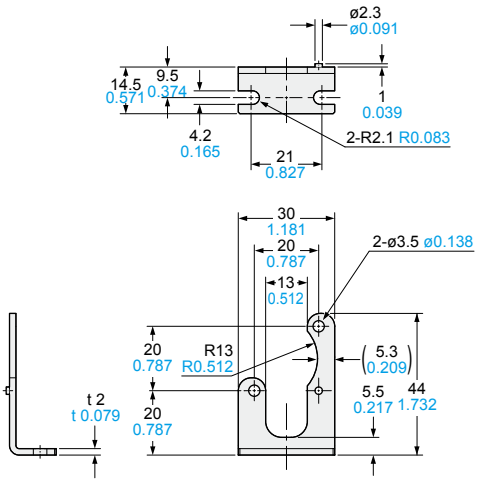
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from the website.

DP-00□ — Sensor

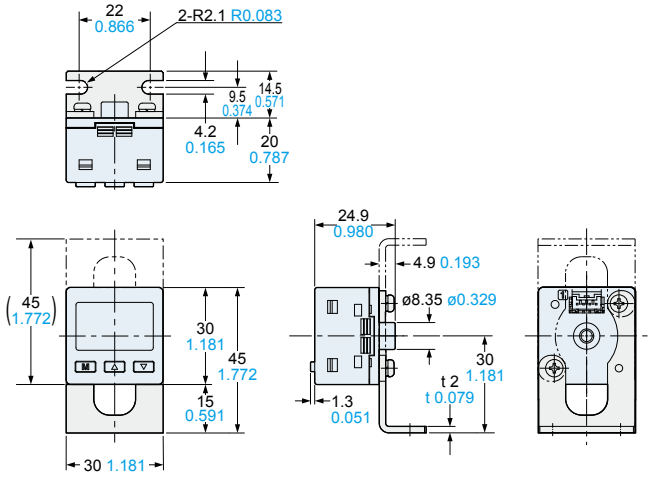


MS-DP1-1 — Sensor mounting bracket (Optional)

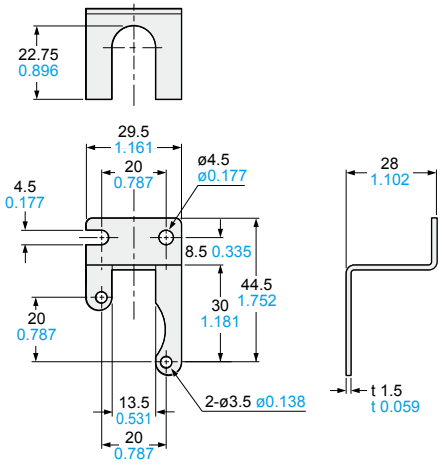


Material: Cold rolled carbon steel (SPCC)
(Trivalent uni-chrome plated)
Two M3 (length 6 mm 0.236 in) screws with washers are attached.

Assembly dimensions

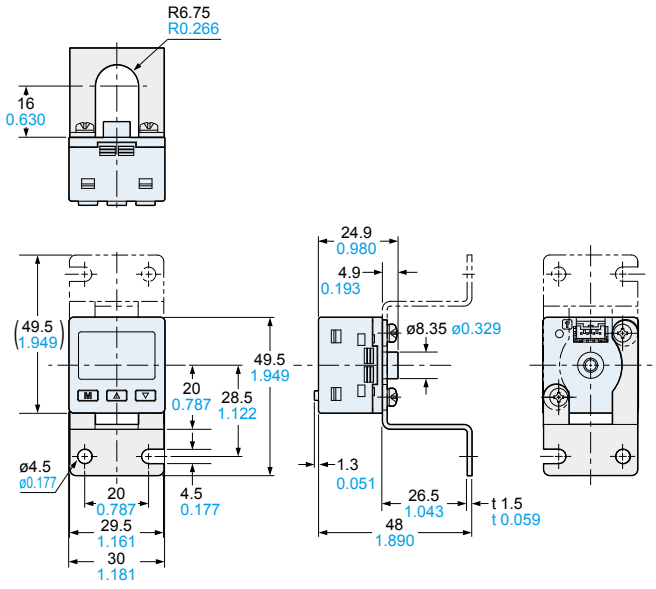


MS-DP1-5 — Sensor mounting bracket (Optional)



Material: Stainless steel (SUS304)
Two M3 (length 6 mm 0.236 in) screws with washers are attached.

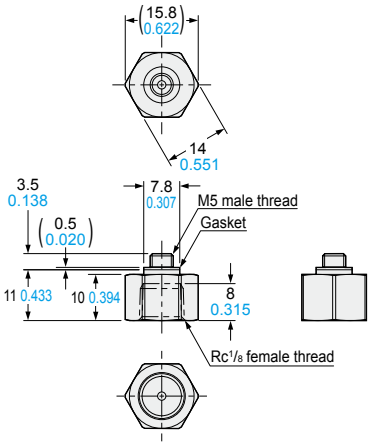
Assembly dimensions



DIMENSIONS (Unit: mm in)

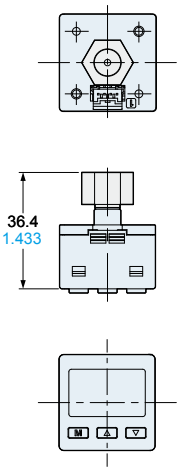
The CAD data can be downloaded from the website.

MS-DP1-7 — Conversion bushing (Optional)



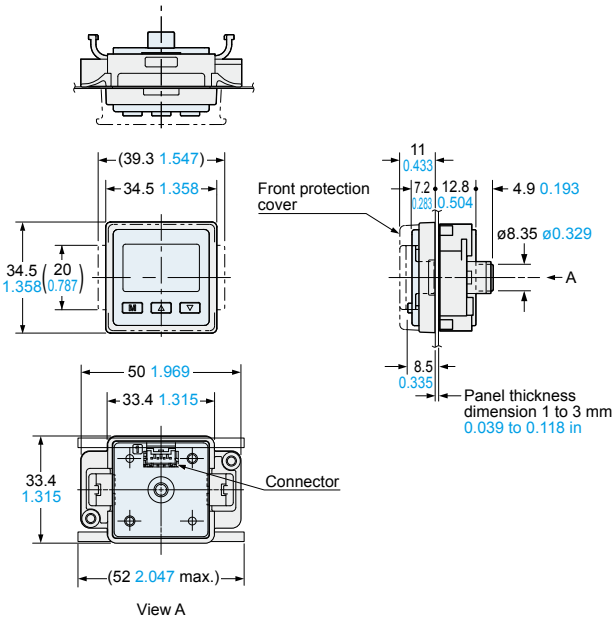
Material: Brass (Nickel plated)
Weight: 10 g approx.

Assembly dimensions



MS-DP1-8 MS-DP1-3 — Panel mounting bracket (Optional), Front protection cover (Optional)

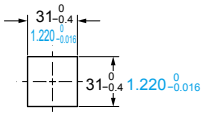
Mounting drawing with DP-00□



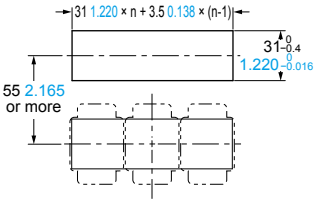
Material: Polyacetal (Panel mounting bracket)
Polycarbonate (Front protection cover)

Panel cut-out dimensions

When 1 unit is installed

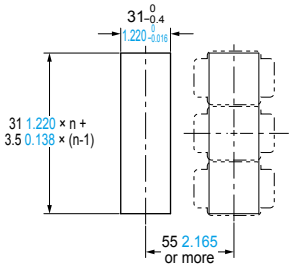


When “n” units are installed horizontally in series



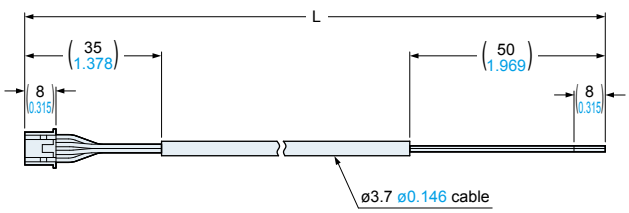
Note: The panel thickness should be 1 to 3 mm 0.039 to 0.118 in.

When “n” units are installed vertically in series



Note: The panel thickness should be 1 to 3 mm 0.039 to 0.118 in.

CN-14A(-R)-C□ — Connector attached cable (Optional, **CN-14A-C2** is attached to the sensor)



Model No.	Cable length L (mm in)
CN-14A(-R)-C1	1,000 39.370
CN-14A(-R)-C2	2,000 78.740
CN-14A(-R)-C3	3,000 118.110
CN-14A(-R)-C5	5,000 196.850

MEMO