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With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

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Compact Size Digital Pressure Sensor For Gas

DP4 SERIES

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STATIC CONTROL DEVICES

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ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide Pressure/ Digital Display Pressure/ Head-separated

DP4

Related Information

■ Glossary of terms......P.1373~







* Passed the UL 991 Environment Test

* UL 61010C-1 compatible, Passed the UL 991 Environment Test based on SEMI S2-0200. [Category applicable for semiconductor manufacturing: TWW2, Process Equipment] [Applicable standards: UL 61010C-1] [Additional test / evaluation standards as per intended use: UL 991, SEMI S2-0200]





New shape makes it most suitable for panel mounting

Can be mounted on a DIN rail

The sensor can be mounted even on a 35 mm 1.378 in width DIN rail by using the optional DIN rail mounting bracket (MS-DP-2). It can be mounted in a narrow space inside of your device.

Mountable from four different directions



Light-weight, compact design

A compact form specifically designed for mounting on an equipment panel. It only uses half the space of our conventional product and provides the light weight of just 30 g (cables excluded).



Can be mounted closely

Even when you use more than one sensor at the same time, you can mount them close together in one hole to save both space and man-hours.



Supplied with a simple-to-mount panel mounting bracket

A panel mounting bracket **MS-DP-1** is enclosed to enable simple mounting of the sensor onto the panel surface, thus contributing to the total cost reduction.



The bracket is suitable for a panel with a thickness of 1 to 6 mm 0.035 to 0.236 in.

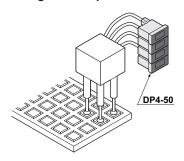
* The panel mounting bracket MS-DP-5 (optional) enabling the sensors to be attached to each other laterally is available.

Incorporated with the memory bank function

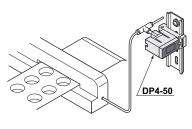
You can store two patterns of set values. Hence, the setup can be changed by a single touch.

APPLICATIONS

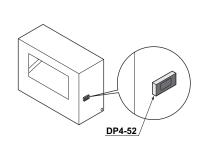
Checking IC absorption



Checking degree of vacuum for vacuum molding



Checking reference pressure of device



ORDER GUIDE

Туре		Appearance	Rated pressure range (Note)	Model No.	Pressure port	Output
Vacuum pressure	–101 kPa type		0 to -101.3 kPa	DP4-50	M5 female thread	NPN open-collector transistor
Vac	-101 type		0 to -101.3 KFa	DP4-50P		PNP open-collector transistor
Positive pressure	a type	-101-3kg down	0 to 1.000 MPa	DP4-52		NPN open-collector transistor
Pos	1 MPa			DP4-52P		PNP open-collector transistor
Compound	±100 kPa type		–100.0 to 100.0 kPa	DP4-57		NPN open-collector transistor
Compour	±10(type	5		DP4-57P		PNP open-collector transistor

Note: The rated pressure range indicates the range for full product performance.

Accessory

• MS-DP-1 (Panel mounting bracket)



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LASER

PHOTO-ELECTRIC SENSORS

AREA SENSORS

....

LIGHT CURTAINS PRESSURE /

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

.....

WIRE-SAVING UNITS WIRE-SAVING

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS

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Products

DP4

Horizontal multiple panel mounting bracket

* The above illustration shows two units connected in

Panel fixing screw

(Accessory)

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LASER SENSORS PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

PARTICULAR USE SENSORS

SENSOR OPTIONS SIMPLE WIRE-SAVING UNITS

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• MS-DP-5

sequence.

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LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS

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MACHINE VISION SYSTEMS

CURING SYSTEMS

Flow

OPTIONS

Designation	Model No.	Description			
Connector	CN-63	Set of 10 housings and 30 connector pins			
Connector	CN-63-C2	Length: 2 m 6.562 ft	0.2 mm ² 3-core cabtyre cable with connector		
attached cable	CN-63-C5	Length: 5 m 16.404 ft	Cable outer diameter: ø3.8 mm ø0.150 in		
DIN rail mounting bracket	MS-DP-2	For installation to 35 mm 1.378 in width DIN rail			
Sensor mounting	MS-DP-3	Vertical mounting bracket			
bracket	MS-DP-4	Horizontal mounting bracket			
Horizontal multiple panel mounting bracket	MS-DP-5	Enables the sensors to be attached to each other laterally and mounted on the panel.			

Sensor mounting bracket

• MS-DP-3

• MS-DP-4





Designed with a 9 mm 0.354 in label space to enable the labeling of the sensors with a label printer (9 mm 0.354 in width) for sensor number and application data.

Connector

• CN-63

Connector pin



Connector attached cable

• CN-63-C2



DIN rail mounting bracket

• MS-DP-2



SPECIFICATIONS

		Vacuum pressure		Positive pressure		Compound pressure		
//	Туре	-101 kPa type		1 MP	1 MPa type		±100 kPa type	
	, ,	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	
Item	n Model No.	DP4-50	DP4-50P	DP4-52	DP4-52P	DP4-57	DP4-57P	
Турє	e of pressure			Gauge	pressure			
Rate	ed pressure range	0 to -101.3	3 kPa	0 to 1.0	000 MPa	-100.0 to	100.0 kPa	
Set pressure range		5.1 to -101. { 0.052 to -1.033 kgf/cm², 0 0.74 to -14.70 psi, 38 to -1.5 to -29.9 inHg	0.051 to –1.013 bar	-0.050 to 1.050 MPa -0.51 to 10.71 kgf/cm² -0.50 to 10.50 bar -7.2 to 152.2 psi		-101.3 to 105.0 kPa -1.033 to 1.071 kgf/cm² -1.013 to 1.050 bar -14.68 to 15.22 psi		
Pres	sure withstandability	490 kPa 1.470 MPa 490 kPa			kPa			
Appl	icable fluid			Non-corr	osive gas			
Hyst	eresis	1 digit (however, variable in hysteresis mode)						
Rep	eatability	Within ±0.2 % F.S. ± 2 digits (within ±6 digits)						
Sup	ply voltage	12 to 24 V DC ⁺¹⁰ ₋₁₅ % Ripple P-P 10 % or less						
Curr	ent consumption				or less			
Output		<npn output="" type=""> NPN open-collector transistor Maximum sink current: 100 mA Applied voltage: 30 V DC or less (between output and 0 V) Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current) <pnp output="" type=""> Maximum source current: 100 mA Applied voltage: Same as supply voltage (between output and +V) Residual voltage: 2 V or less (at 100 mA source current) </pnp></npn>						
	Utilization category	DC-12 or DC-13						
	Output operation	NO / NC (selectable by key operation)						
Output modes		Equipped with 4 types of modes: Hysteresis mode, window comparator mode, automatic sensitivity setting mode, forced output mode (selectable by key operation)						
	Short-circuit protection	Incorporated						
Resp	ponse time	2 ms, 16 ms, 128 ms, 512 ms or less (selectable by key operation)						
Display		3 1/2 digit LCD display (with red and green backlight) (Sampling rate: 256 ms, 512 ms, 1,024 ms selectable by key operation)						
	Displayable pressure range	$\begin{array}{c} 5.1 \text{ to } -101.\\ \left\{ \begin{array}{l} 0.052 \text{ to } -1.033 \text{ kgf/cm}^2\text{, 0}\\ 0.74 \text{ to } -14.70 \text{ psi, 38 to } -1.5 \text{ to } -29.9 \text{ inHg} \end{array} \right. \end{array}$	0.051 to -1.013 bar)					
Anal	og bar display	Bar display in steps of 14 % F.S. approx.						
Operation display		LCD segment is red when the output is ON, and green when the output is OFF						
	Pollution degree	3 (Industrial environment)						
ce	Protection	IP40 (IEC)						
stan	Ambient temperature	0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -10 to +60 °C +14 to +140 °F						
resi	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH						
ntal	EMC	EN 61000-6-2, EN 61000-6-4						
Environmental resistance	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure						
viro	Insulation resistance	$50~\text{M}\Omega$, or more, with $500~\text{V}$ DC megger between all supply terminals connected together and enclosure						
ш	Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude, 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 for three times each						
Temperature characteristics		Over ambient temperature range +10 to +40 °C +50 to +104 °F: within ±2 % F.S. of detected pressure at +25 °C +77 °F Over ambient temperature range 0 to +50 °C +32 to +122 °F: within ±5 % F.S. of detected pressure at +25 °C +77 °F						
Pressure port		M5 female thread						
Material		Front case: ABS, LCD display: PET, Rear case: PBT [M5 threaded part: Brass (nickel plated)]						
Mate		Connector						
	necting method		0.16 to 0.32 mm² (AWG#25 to #22) (Note 2)					
Coni	Conductor cross-section area		(0.16 to 0.32 mm ² (AVI	/G#25 to #22) (Note 2	-)		
Coni			(7G#25 to #22) (Note 2 0.047 to 0.071 in	-)		
	Conductor cross-section area		(ø1.2 to ø1.8 mm ø		-)		
Suitable cable	Conductor cross-section area Lead wire diameter	Total length up to 100 m		ø1.2 to ø1.8 mm ø Tin plated, soft, to n 10 m 32.808 ft when	ø0.047 to ø0.071 in wisted copper wire conforming to CE mark		mm², or more, cable.	
Suitable cable	Conductor cross-section area Lead wire diameter Wire material le length	Total length up to 100 m	328.084 ft (less than	ø1.2 to ø1.8 mm ø Tin plated, soft, to n 10 m 32.808 ft when Net weight:	Ø0.047 to Ø0.071 in wisted copper wire	king) is possible with 0.3	mm², or more, cable.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

2) If the wiring is longer than 5 m 16.404 ft, use a cable with a diameter of 0.3 mm² or more.

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LASER SENSORS

PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

Selection Guide Pressure/ Digital Display

FIBER SENSORS

LASER SENSORS PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT

INDUCTIVE PROXIMITY SENSORS

PARTICULAR SENSORS SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

MEASURE-MENT SENSORS STATIC CONTROL

ENDOSCOPE LASER MARKERS

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ENERGY VISUALIZATION COMPONENTS

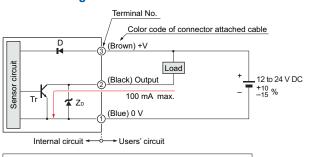
COMPONENTS MACHINE

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Pressure Digital Display Flow

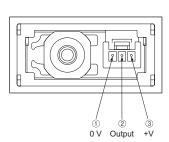
I/O CIRCUIT AND WIRING DIAGRAMS

DP4-5□ I/O circuit diagram



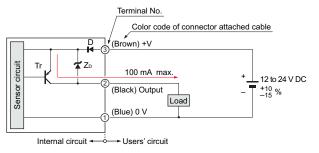
D: Reverse supply polarity protection diode Symbols ... ZD: Surge absorption zener diode Tr : NPN output transistor

Terminal arrangement diagram



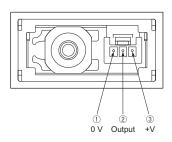
DP4-5□P PNP output type

I/O circuit diagram



Symbols ... D : Reverse supply polarity protection diode ZD: Surge absorption zener diode Tr : PNP output transistor

Terminal arrangement diagram



PRECAUTIONS FOR PROPER USE

Refer to General precautions.

NPN output type

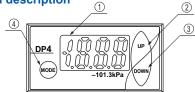


- · Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- The DP4 series is designed for use with noncorrosive gas. It cannot be used with liquid or corrosive gas.

Operation

- If setting is impossible even with pressing the MODE key, verify whether the key-protect function is enabled. Please note that pressing down on the MODE key for an extended moment will enable the key-protect function as soon as the key is released.
- If using the window comparator mode, set the pressure value so that there is a difference of 3 digits, or more, between Set Value 1 (P-1) and Set Value 2 (P-2). No output will be possible with a 0 to 2 digit difference.

Functional description



		Relei to General	precautions.	
	Description	Function -		
1	3 1/2 digit LCD display (with red and green backlight	Displays measured pressure, settings, error messages and key-protect status. Red display when output is ON. Green display when output is OFF.		
2	Increment key (UP)	In the initial setting mode and supplementary setting mode, pressing the key changes the setting item. In the pressure value setting mode, pressing the key changes the set value. In the sensing mode, pressing the key continuously for 4 sec., or more, displays the peak hold value.	the key pressed for 4 et Value 4 (P-4) nge to either setting mode. continuously for y-protect. rement key and anges the mode by and Mode	
3	Decrement key (DOWN)	In the initial setting mode and supplementary setting mode, pressing the key changes the set conditions. In the pressure value setting mode, pressing the key changes the set value. In the sensing mode, pressing the key continuously for 4 sec., or more, displays the bottom hold value.		
4	Mode selection key (MODE)	In the pressure setting mode, pressing the changes the setting item. In addition, if presec., or more, in Set Value 1 (P-1) or Set setting mode, the setting mode will change Set Value 4 (P-4) or Set Value 1 (P-1) set In the sensing mode, pressing the key condessed., or more, can set / cancel the key-Fellow in the sensing mode, pressing both Incremed Mode selection key simultaneously change to the initial setting mode. Whereas, pressing both Decrement key a selection key simultaneously changes the supplementary setting mode.		

PRECAUTIONS FOR PROPER USE

Refer to General precautions

Conditions in use for CE conformity

• The **DP4** series is a CE conformity product complying with EMC Directive. The harmonized standard with regard to immunity that applies to this product is EN 61000-6-2 and the following condition must be met to conform to that standard.

Conditions

- The sensor should be connected less than 10 m 32.808 ft from the power supply.
- The signal line to connect with this sensor should be less than 30 m 98.425 ft.

Setting

 The conditions which are set are stored in an EEPROM. Kindly note that the EEPROM has a life span and its guaranteed life is 100,000 write operation cycles.

Forced output mode

• In the initial setting mode, if the output mode is set to the forced output mode (#), the output is forcibly maintained at OFF level in the sensing mode, irrespective of Set Value 1 to 3 (P-1 to P-3).

Further, if the keys are operated as per the procedure given below, the output can be forcibly switched either ON or OFF without applying pressure at the pressure port. This is convenient for an operation check of the comparative output or for an inspection before commencing work.

The diagram below appears when the **DP4-50(P)** has been used to set the display to "Digital display" ()



- · In the sensing mode, press MODE key to change to the forced output mode.
- · Whenever UP key is pressed, the output state switches to either ON and OFF alternately.
- · Press MODE key to return to the sensing mode.
- Output is kept off at the point where the mode is changed from another output mode to forced output control mode (!).
- · Even if output has been set to stay on during forced output control mode, it will be forcibly changed to off at the point where the mode changes back to sensing mode.

Memory bank function

• The memory bank function is a function which allows two types of output to be stored: Set Values 1 to 3 (P-1 to P-3) and Set Values 4 to 6 (P-4 to P-6).

This make it possible to change set values quickly.



- If the MODE key is pressed in a sensing mode other than forced output mode, the mode will change to pressure value setting mode.
- After releasing the MODE key, press the MODE key again continuously until P . 4 is displayed (4 sec. or more).
- Make the setting for Set Values 4 to 6 (P-4 to P-6). Set Values 4 to 6 (P-4 to P-6) correspond to Set Values 1 to 3 (P-1 to P-3) respectively.

Peak hold & bottom hold functions

- Peak hold and bottom hold functions enable the display of the peak value (maximum pressure value) and the bottom value (minimum pressure value) of the varying measured pressure. These functions are convenient for finding the pressure variation range or for determining the reference for pressure settings.
 - Please note that the peak value and the bottom value data is erased when it is no longer displayed.

Key-protect function

- Key-protect is a function which prevents any unintentional change in the conditions which have been entered in each setting mode by making the sensor not to respond to the key operations.
- · Since the key-protect information is stored in an EEPROM, it is not erased even if the power supply is
- Please take care to remember if the key-protect function has been set.
- · When the keys are to be operated, make sure that keyprotect is released.

Piping

• When connecting a commercial M5 coupling to the pressure port, hold the flat sides of the pressure port with a 13 mm 0.512 in spanner and make sure that the tightening torque is 1 N·m or less.

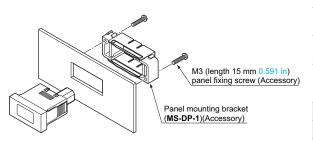
If excessive tightening torque is applied, the commercial fitting may break.



Mounting

• Install the enclosed panel mounting bracket (MS-DP-1) as shown in the figure below.

The tightening torque should be 0.15 N·m or less. Further. tighten both the right and the left screw gradually and equally, so that the panel mounting bracket does not tilt.



Others

- · Use within the rated pressure range.
- · Do not apply pressure exceeding the pressure withstandability value. The diaphragm will get damaged and correct operation shall not be maintained.
- Do not use during the initial transient time (3 sec. approx.) after the power supply is switched on.
- · Avoid dust, dirt, and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- · Do not insert wires, etc., into the pressure port. The diaphragm will get damaged and correct operation shall not be maintained.
- Do not operate the keys with pointed or sharp objects.

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LASER SENSORS

PHOTO-ELECTRIC SENSORS MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

MEASURE

MENT SENSORS

CONTROL ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES ENERGY CONSUMPTION

VISUALIZATION COMPONENTS FA COMPONENTS

MACHINE SYSTEMS

Pressure/ Digital Displa

FIBER SENSORS

LASER SENSORS PHOTO-ELECTRIC SENSORS

DP4-5□(**P**)

AREA SENSORS

LIGHT

PARTICULAR SENSORS SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

MEASURE-MENT SENSORS STATIC CONTROL DEVICES

ENDOSCOPE LASER MARKERS

HUMAN MACHINE INTERFACES ENERGY COMPONENTS

MACHINE VISION SYSTEMS

Flow

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from our website.

DIN rail mounting bracket (Optional)

7 0.276 3 1/2 digit LCD display 29 (5) (0.19) (Green and red) Increment key M5 female thread Connector Mode selection key Decrement key

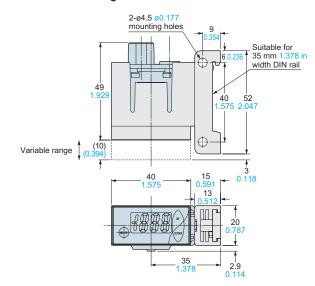
MS-DP-2 **Assembly dimensions**

<Horizontal mounting>

<Vertical mounting>

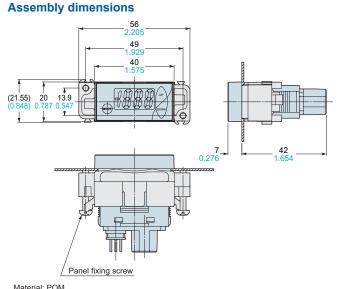
Panel cut-out dimensions

Variable range 42 .65 2 0.079 20 mounting holes _6 [†] 0.236 40 13 0.512 52 2.04 3 0.118 Suitable for 35 mm 1.378 in width DIN rail



MS-DP-1

Panel mounting bracket (Accessory)



17 37 ^{+0.5} 1.457 ⁺ 0.020 37 ^{+0.5} 1.457 ^{+0.020} $X_{0}^{+0.5}$ X when "n" unit is installed $X = 20 \times (n-1) + 17 \text{ mm}$ $X = 0.787 \times (n-1) + 0.669 \text{ in}$ Note: The panel thickness should be

1 to 6 mm 0.039 to 0.236 in.

60

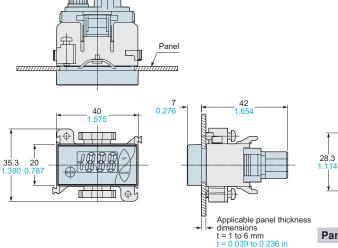
Two M3 (length 15 mm 0.591 in) screws for fitting are attached.

The CAD data in the dimensions can be downloaded from our website.

Panel mounting bracket (Optional)

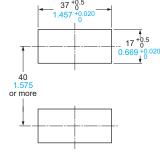
Assembly dimensions

MS-DP-5



Panel fixing screw

Panel cut-out dimensions



17 +0.5 0.669 X when "n" unit is installed $X = 40 \times (n - 1) + 37 \text{ mm}$ $X = 1.575 \times (n - 1) + 1.457$ in (n = 12 or less)

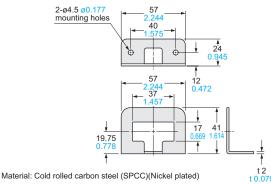
When installed laterally in sequence. Note: The panel thickness should be 1 to

6 mm 0.039 to 0.236 in.

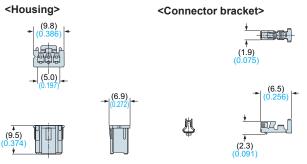
When installing individually

MS-DP-3

Sensor mounting bracket (Optional)



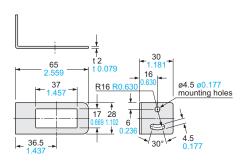
Note: Use with the panel mounting bracket (MS-DP-1) included with the sensor. **CN-63** Connector (Optional)



Mating connector Connector pin: BXA-001T-P0.6 manufactured by J.S.T Mfg. Co., Ltd. Housing: XAP-03V-1 manufactured by J.S.T Mfg. Co., Ltd.

Crimping tool YC-692R manufactured by J.S.T Mfg. Co., Ltd. MS-DP-4

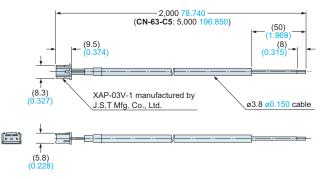
Sensor mounting bracket (Optional)



Material: Cold rolled carbon steel (SPCC)(Nickel plated)

Note: Use with the panel mounting bracket (MS-DP-1) included with the sensor.





LASER SENSORS

PHOTO-ELECTRIC SENSORS

LIGHT CURTAINS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

Selection Guide Pressure/ Digital Display

Flow