

Panasonic

ideas for life

NEW

Head-separated · Dual display For gas & liquid

DIGITAL PRESSURE SENSOR

Controller DPC-L100 SERIES

Sensor head DPH-L100 SERIES

CE
Conforming to
EMC Directive

Powerful and Simple

High-precision detection of fluid and air pressure



Featuring exceptional resistance to...



Interference

The DPC-L100 and DPH-L100 comply with EMC directives, ensuring they won't succumb to external interference.

Pressure surges

An integrated throttle prevents damage from sudden bursts of high pressure.

Vibrations and mechanical shock

The DPC-L100 and DPH-L100 are easy to use with devices that are subject to high levels of vibration.

Water and dust

The DPC-L100 and DPH-L100 feature an IP67-compliant protective enclosure. (IEC)

Fluid heat

The DPC-L100 and DPH-L100 can accommodate media at temperatures of up to 125°C (10 MPa and 50 MPa models).

All-stainless-steel construction

- Suitable for use with a wide range of fluids
- Oil-less diaphragm



High-precision pressure control at a system accuracy of within 1% F.S.
The sensor head generates analog voltage output, allowing it to be used in a standalone configuration.

System accuracy: $\pm 1\%$ F.S. (at 23°C)
(Throughout operating ambient temperature range: $\pm 2\%$ F.S.)

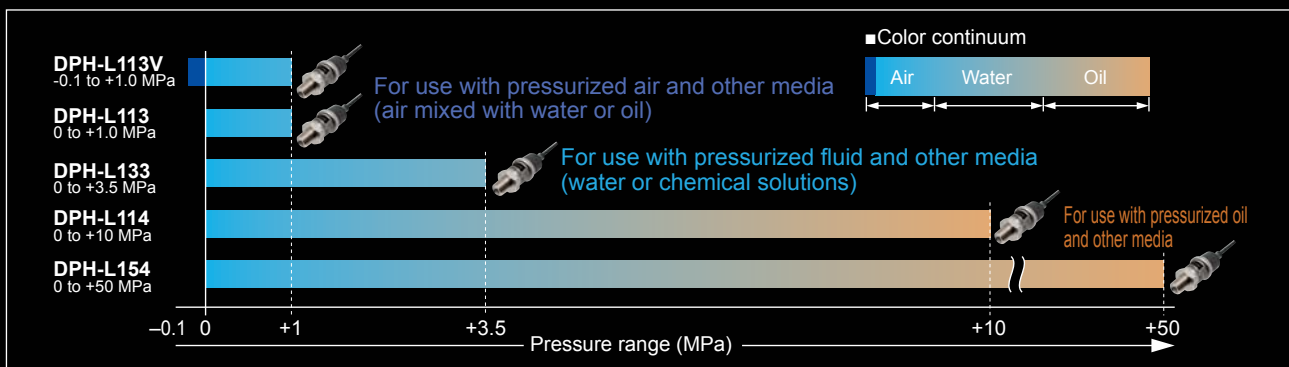
Analog voltage

Within ± 004 V

1 MPa type

Within ± 001 MPa

Product line



Simple

Introducing a controller that's as simple to operate as it is compact



Buttons generate a distinct "click" that can be felt through gloves.

Dual display

Direct setting

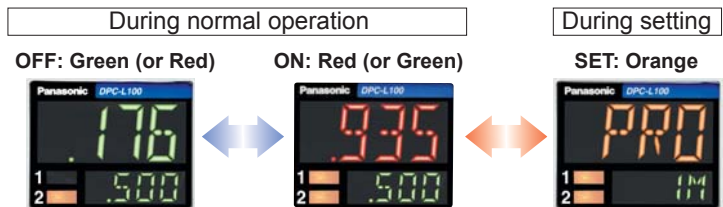
Direct setting of threshold value

"Current value" and "Threshold value" can be checked at the same time. The threshold value can be changed in RUN mode directly.



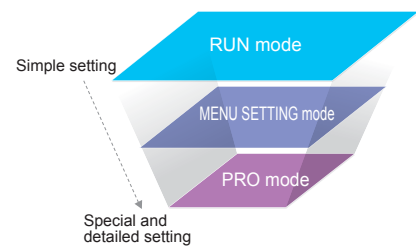
3-color display (Red, Green, Orange)

The main display changes color in line with changes in the status of output ON / OFF operation, and it also changes color while setting is in progress. The sensor status can therefore be understood easily, and operating errors can be reduced.



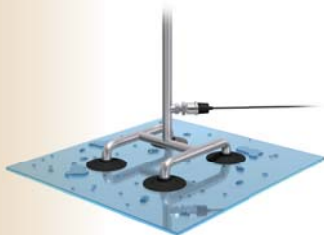
Setting operation mode has a 3-level configuration to suit the frequency of use.

The setting levels are clearly separated into "RUN mode" for operation settings that are carried out daily, "MENU SETTING mode" for basic settings, and "PRO mode" for special and detailed setting. These make setting operations easy to understand and easy to carry out.



Applications

Transport of glass sheets after washing (pressurized air containing water droplets)



Management of plastic filling machine pressure (pressurized fluid)



Management of press pressure (pressurized oil)



Full range of performance and functions in a compact body

1 model to suit a wide variety of applications



Equipped with independent dual output

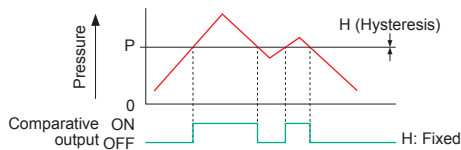
Equipped with two independent comparative outputs, and separate sensing modes can be selected for each of them. Since there are two comparative outputs, one of the comparative outputs can even be used for alarm output. In addition, if an output is not being used, it can be disabled.

Equipped with auto-reference / remote zero-adjustment functions

If the reference pressure of the device changes, the auto-reference function partially shift the comparative output judgment level by the amount that the reference pressure shifts, and the remote zero-adjustment function can reset the display value to zero via external input. These functions are ideal for places where the reference pressure fluctuates wildly, or where fine settings are desired.

1 EASY mode

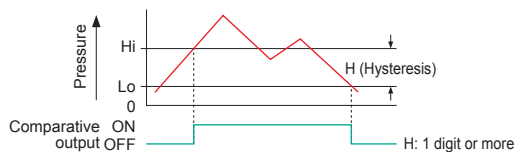
This mode is used for comparative output ON / OFF control.



Notes: 1) Hysteresis can be fixed to one of eight different levels.
2) "P-1" appears in the sub display for comparative output 1, and "P-2" appears for comparative output 2.

2 Hysteresis mode

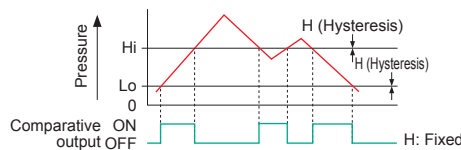
This mode is used for setting comparative output hysteresis to the desired level and for carrying out ON / OFF control.



Note: "Hi-1" or "Lo-1" appears in the sub display for comparative output 1, and "Hi-2" or "Lo-2" appears for comparative output 2.

3 Window comparator mode

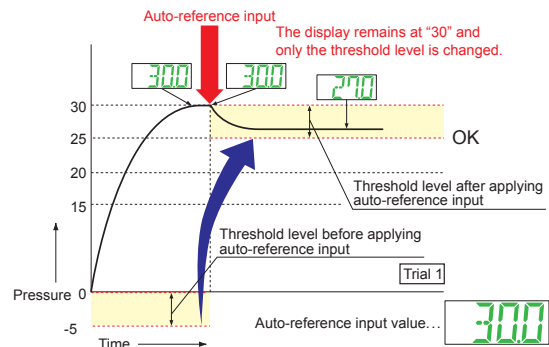
This mode is used for setting comparative output ON and OFF at pressures within the setting range.



Notes: 1) Hysteresis can be fixed to one of eight different levels.
2) "Hi-1" or "Lo-1" appears in the sub display for comparative output 1, and "Hi-2" or "Lo-2" appears for comparative output 2.

With auto-reference function applied

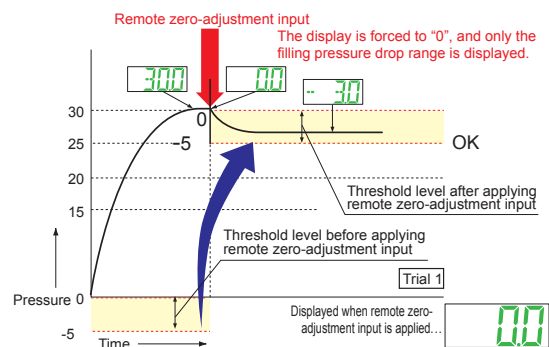
Comparative output: Window comparator mode
Hi-1...0, Lo-1...-5
Sets the absolute threshold level



When auto-reference input is applied, the reference pressure "30" is added to the threshold level. If the reference pressure changes to "20" or "40", the auto-reference input compensates for this every time by changing the threshold level, so any variation in the filling pressure can be ignored.

With remote zero-adjustment function applied

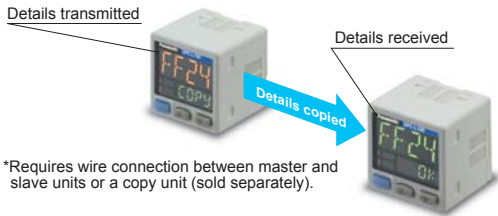
Comparative output: Window comparator mode
Hi-1...0, Lo-1...-5
Sets the absolute threshold level



When remote zero-adjustment input is applied, the reference pressure is forced to "0". If the reference pressure changes to "20" or "40", the remote zero-adjustment input adjusts the reference pressure to "0" every time the reference pressure changes, so any variation in the filling pressure can be ignored.

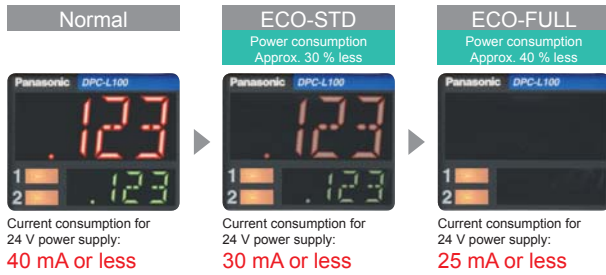
Copy function reduces man-hours and human error

Copy of the setting details for the master sensor can be transmitted as data to the other sensors. If making the same settings for multiple sensors, this prevents setting errors from occurring with the other sensors and also reduces the number of changes required to instruction manuals when equipment designs are changed.



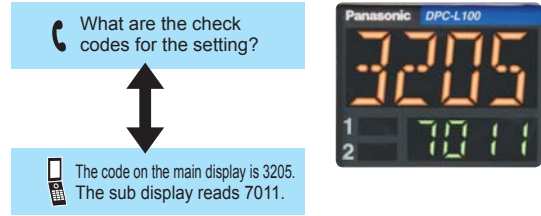
Energy-saving design! Equipped with an ECO mode

This mode lowers the display luminance to cut power consumption.



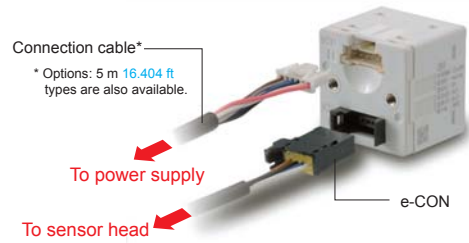
Setting details can be understood at a glance

The setting details (output, response time and external input, etc.) appear in the digital display. Because the settings are in numeric form that can be easily understood.



Power supply cable can be connected with one-touch connection

The accessory connector attached cable (2 m 6.562 ft) can be connected easily with one-touch connection



Hold functions

Peak / Bottom hold 1 (standard)

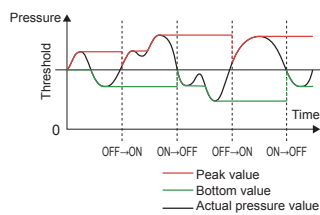
The peak values and bottom values for fluctuating pressures can be displayed using the dual display.

Blinds alternately



Peak / Bottom hold 2 (output-linked) NEW FEATURE

When output turns on (or off), the controller's digital display (current value) is reset and peak / bottom hold operation starts. For example, this functionality could be used to verify the peak pressure for an industrial press each time a workpiece is loaded.



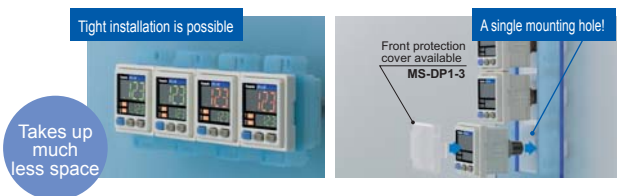
Current value hold NEW FEATURE

The controller's digital display (current value) is held while external input is on. By activating external input the moment you wish to capture the pressure value, you can pause and verify the display.



Tight installation to panels is possible

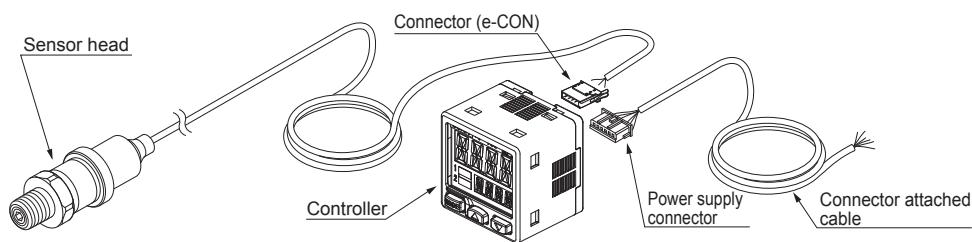
An exclusive mounting bracket **MS-DP1-2** that is suitable for 1 to 6 mm 0.039 to 0.236 in panel thickness is available.



Pressure sensor line-up




PRODUCT CONFIGURATION




ORDER GUIDE

Sensor heads

Type	Appearance	Rated pressure range	Model No.	Pressure port	Applicable fluid
Compound pressure		-0.1 to +1.0 MPa	DPH-L113V	R1/4 male thread	Gases and fluids that do not corrode stainless steel SUS304, SUS630, or SUSXM7
Positive pressure		0 to +1.0 MPa	DPH-L113		
		0 to +3.5 MPa	DPH-L133		
		0 to +10 MPa	DPH-L114		
		0 to +50 MPa	DPH-L154		

Controllers

Appearance	Model No.	Comparative output
 * CN-66A-C2 (Connector attached cable 2 m 6.562 ft) is attached.	DPC-L101	NPN open-collector transistor
	DPC-L101-P	PNP open-collector transistor

Type without connector attached cable

Type without connector attached cable is available. When ordering this type, suffix "-J" to the Model No. (e.g) Type without connector attached cable of **DPC-L101-P** is "**DPC-L101-P-J**".

Accessory

- **CN-66A-C2** (Connector attached cable 2 m 6.562 ft)



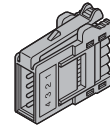
OPTIONS

Designation	Model No.	Description	
Sensor head connector (e-CON)	CN-EP2 (Note 1) 5 pcs. per set	Connector for connecting sensor head controller	
Connector attached cable	CN-66A-C2 (Note 2)	Length 2 m 6.562 ft	Controller power supply / I-O cable. 0.2 mm ² 6-core oil-resistant cabtyre cable with connector
	CN-66A-C5	Length 5 m 16.404 ft	
Power supply connector	CN-66A 5 pcs. per set	Connector for controller power supply / I-O cable.	
Controller mounting bracket	MS-DP1-6	Allows sensors to be installed on the wall. Multiple sensors can also be mounted closely.	
Panel mounting bracket	MS-DP1-2	Allows installation to panels with thickness of 1 to 6 mm 0.039 to 0.236 in. Multiple sensors can also be mounted closely.	
Front protection cover	MS-DP1-3	Protects the adjustment surfaces of controllers. (Can be attached when using the panel mounting bracket)	
Copy unit	SC-SU1	Copies controller setting details to other controllers.	

Notes: 1) One is attached to each sensor head according to standard.
2) The connector attached cable **CN-66A-C2** is supplied with the controller according to standard.

Sensor head connector (e-CON)

- **CN-EP2**



Note: One is attached to each sensor head according to standard.

Connector attached cable

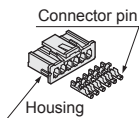
- **CN-66A-C2**
- **CN-66A-C5**



Note: The connector attached cable **CN-66A-C2** is supplied with the controller according to standard.

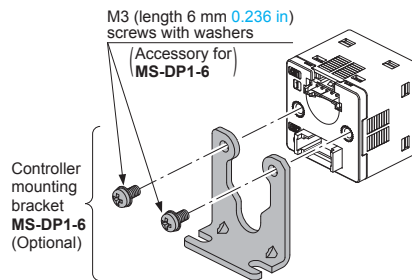
Power supply connector

- **CN-66A**



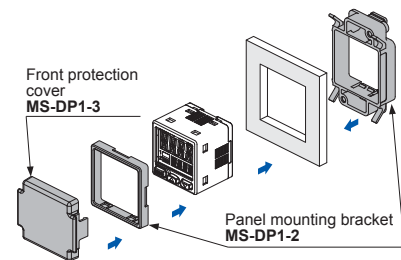
Controller mounting bracket

- **MS-DP1-6**



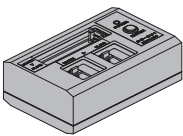
Panel mounting bracket, Front protection cover

- **MS-DP1-2**
- **MS-DP1-3**



Copy unit

- **SC-SU1**



Recommended e-CON

Model No.: 1473562-4 (Manufactured by Tyco Electronics)
Note: Contact the manufacturer for details of the recommended products.

Recommended power supply connector

Contact: SPHD-001T-P0.5, Housing: PAP-06V-S (Manufactured by J.S.T. Mfg. Co., Ltd.)
Note: Contact the manufacturer for details of the recommended products.

Recommended crimping tool

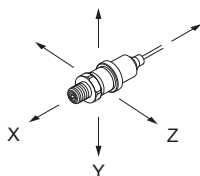
Model No.: YC-610R (Manufactured by J.S.T. Mfg. Co., Ltd.)
Note: Contact the manufacturer for details of the recommended products.

SPECIFICATIONS

Sensor heads

Item	Type Model No.	Compound pressure	Positive pressure			
		-0.1 to 1 MPa type	1 MPa type	3.5 MPa type	10 MPa type	50 MPa type
		DPH-L113V	DPH-L113	DPH-L133	DPH-L114	DPH-L154
Type of pressure	Sealed gauge pressure (Note 4)					
Rated pressure range	-0.1 to +1 MPa	0 to +1 MPa	0 to +3.5 MPa	0 to +10 MPa	0 to +50 MPa	
Pressure withstandability	2 MPa	2 MPa	7 MPa	20 MPa	75 MPa	
Applicable fluid	Gases and fluids that do not corrode SUS630, SUS304, or SUSXM7					
Supply voltage	9 to 36 V DC [9 to 32 V DC when using the attached connector (e-CON)]					
Analog voltage output	Output voltage: 1 to 5 V DC (over rated pressure range) Accuracy: $\pm 1.0\%$ F.S. (at $23 \pm 2\text{ }^\circ\text{C}$ $+73.4 \pm 35\text{ }^\circ\text{F}$) $\pm 2.0\%$ F.S. (at -20 to $70\text{ }^\circ\text{C}$ -4 to $+158\text{ }^\circ\text{F}$) (including linearity, hysteresis and repeatability)			Output voltage: 1 to 5 V DC (over rated pressure range) Accuracy: $\pm 1.0\%$ F.S. (at $23 \pm 2\text{ }^\circ\text{C}$ $+73.4 \pm 35\text{ }^\circ\text{F}$) $\pm 2.0\%$ F.S. (at -20 to $125\text{ }^\circ\text{C}$ -4 to $+158\text{ }^\circ\text{F}$) (including linearity, hysteresis and repeatability)		
Environmental resistance	Protection	IP67 (IEC)				
	Ambient temperature	-20 to +70 °C -4 to $+158\text{ }^\circ\text{F}$ (No dew condensation allowed), Storage: -30 to +70 °C -22 to $+158\text{ }^\circ\text{F}$			-20 to +80 °C (Pressure port: -20 to +125 °C -4 to $+257\text{ }^\circ\text{F}$, No dew condensation allowed), Storage: -30 to +100 °C -22 to $+212\text{ }^\circ\text{F}$ [e-CON connector (accessory): -20 to +75 °C -4 to $+167\text{ }^\circ\text{F}$ (Storage: -30 to +75 °C -22 to $+167\text{ }^\circ\text{F}$)]	
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH				
	Medium temperature range	-20 to +70 °C -4 to $+158\text{ }^\circ\text{F}$			-20 to +125 °C -4 to $+257\text{ }^\circ\text{F}$	
	Voltage withstandability	150 V AC for one min. between all supply terminals connected together and enclosure				
	Insulation resistance	100 M Ω , or more, with 50 V DC megger between all supply terminals connected together and enclosure				
	Vibration resistance	10 to 2000 Hz frequency, acceleration 200 m/s ² , in X direction for four hours, in Y and Z directions for two hours each (Note 5)				
	Shock resistance	1000 m/s ² acceleration in X, Y and Z directions for three times each				
Grounding method	Capacitor earth (Enclosure-supply terminal)					
Pressure port	R1/4 male thread (throttle embedded)					
Material	Diaphragm: Stainless steel (SUS603), Pressure port: Stainless steel (SUS304), Throttle: Stainless steel (SUSXM7)					
Connecting method	Connector					
Cable	0.2 mm ² 3-core heat resistant cabtyre cable 2 m 3.562 ft long					
Cable extension	Extension up to total 10 m 32.808 ft is possible with 0.2 mm ² , or more, cable.					
Weight	Net weight: 100 g approx., Gross weight: 150 g approx.					
Accessory	Connector (e-CON): 1 pc.					

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C $+73.4\text{ }^\circ\text{F}$.
 2) The sensor head can be used independently.
 3) Oil is used in the factory inspection process for models **DPH-L114** and **DPH-L154**. There may be some residual oil inside the pressure port.
 4) The sensor's internal mechanism is sealed based on an air pressure of 1,013 hPa.
 5) The X, Y, and Z directions are defined as follows:



SPECIFICATIONS

Controllers

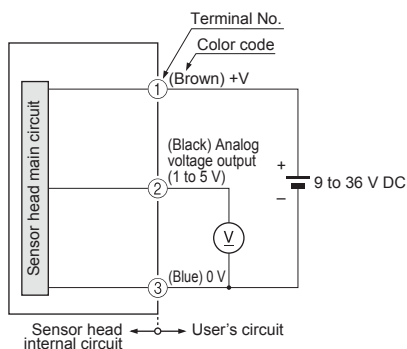
Item	Model No.	NPN output	DPC-L101			
		PNP output	DPC-L101-P			
Applicable sensor head		DPH-L113V	DPH-L113	DPH-L133	DPH-L114	DPH-L154
Rated pressure range		-0.1 to +1 MPa	0 to +1 MPa	0 to +3.5 MPa	0 to +10 MPa	0 to +50 MPa
Set pressure range		-1.177 to +1.177 MPa { -12.00 to +12.00 kgf/cm ² -11.77 to +11.77 bar -170.6 to +170.6 psi }	-1.070 to +1.070 MPa { -10.91 to +10.91 kgf/cm ² -10.70 to +10.70 bar -155.2 to +155.2 psi }	-3.74 to +3.74 MPa { -38.1 to +38.1 kgf/cm ² -37.4 to +37.4 bar -542 to +542 psi }	-10.70 to +10.70 MPa { -109.1 to +109.1 kgf/cm ² -107.0 to +107.0 bar -1552 to +1552 psi }	-53.5 to +53.5 MPa { -545 to +545 kgf/cm ² -535 to +535 bar -1980 to +1980 psi }
Set resolution		0.001 MPa	0.001 MPa	0.01 MPa	0.01 MPa	0.1 MPa
Display		4 digits +4 digits 3-color LCD display (Display refresh rate: 250 ms, 500 ms, 1,000 ms, selectable by key operation)				
Displayable pressure range		-0.155 to +1.022 MPa { -1.58 to +10.42 kgf/cm ² -1.55 to +10.22 bar -22.4 to +148.2 psi }	-0.050 to +1.020 MPa { -0.51 to +10.40 kgf/cm ² -0.50 to +10.20 bar -7.2 to +148.0 psi }	-0.17 to +3.57 MPa { -1.7 to +36.4 kgf/cm ² -1.7 to +35.7 bar -24 to +518 psi }	-0.50 to +10.20 MPa { -5.1 to +104.0 kgf/cm ² -5.0 to +102.0 bar -72 to +1480 psi }	-2.5 to +51.0 MPa { -25 to +520 kgf/cm ² -25 to +510 bar -360 to +7400 psi }
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less				
Power consumption		Normal operation: 960 mW or less (Current consumption 40 mA or less at 24 V supply voltage) ECO mode (STD): 720 mW or less (Current consumption 30 mA or less at 24 V supply voltage) ECO mode (FULL): 600 mW or less (Current consumption 25 mA or less at 24 V supply voltage) Excluding the current consumption of sensor head and analog output current				
Comparative outputs (Comparative output 1, 2)		<NPN output type> NPN open-collector transistor (2 outputs) • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between comparative output and 0 V) • Residual voltage: 1 V or less (at 50 mA sink current)		<PNP output type> PNP open-collector transistor (2 outputs) • Maximum source current: 50 mA • Applied voltage: 30 V DC or less (between comparative output and +V) • Residual voltage: 1 V or less (at 50 mA source current)		
	Output operation	NO / NC, selectable by key operation				
Output modes		EASY mode / Hysteresis mode / Window comparator mode				
Hysteresis		Minimum 1 digit (variable) (however, 2 digits when using psi unit)				
Repeatability		Within ±0.2 % F.S.				
Response time		5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1,000 ms, 5,000 ms, selectable by key operation				
Short-circuit protection		Incorporated				
Analog output		<Analog voltage output> • Output current: 1 to 5 V DC • Zero point: within 1 V ±0.5 % F.S. (excluding DPH-L113V) within 1.364 V ±0.5 % F.S. (DPH-L113V) • Span: within 4 V ±0.5 % F.S. • Linearity: within ±0.1 % F.S. • Output impedance: 1 kΩ approx.		<Analog current output> • Output current: 4 to 20 mA • Zero point: within 4 mA ±1.0 % F.S. (excluding DPH-L113V) within 5.455 mA ±1.0 % F.S. (DPH-L113V) • Span: within 16 mA ±1.5 % F.S. • Linearity: within ±0.1 % F.S. • Load resistance: 250 Ω (max.)		
	Sensor head input	Input voltage range: 1 to 5 V DC (over rated pressure range)				
Inputs	External input	<NPN output type> ON voltage: 0.4 V DC or less OFF voltage: 5 to 30 V DC, or open Input impedance: 10 kΩ approx. Input time: 1 ms or more		<PNP output type> ON voltage: 5 V to +V DC OFF voltage: 0.6 V DC or less, or open Input impedance: 10 kΩ approx. Input time: 1 ms or more		
	Operation indicator	Orange LED (Comparative output 1 operation indicator, comparative output 2 operation indicator: Lights up when each comparative output is ON)				
Environmental resistance	Protection	IP40 (IEC)				
	Ambient temperature	-10 to +50 °C +14 to +122 °F (No dew condensation or icing 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 500 Hz frequency, amplitude 3 mm 0.118 in or maximum acceleration 196 m/s ² , in X, Y and Z directions for two hours each (when panel mounting bracket is mounted: 10 to 150 Hz frequency, amplitude 0.75 mm 0.030 in or maximum acceleration 49 m/s ² , in X, Y and Z directions for two hours each)				
Shock resistance	100 m/s ² acceleration in X, Y and Z directions for three times each					
Temperature characteristics		Within ±0.5 % F.S. (ambient temperature range based on +20 °C +68 °F)				
Material		Enclosure: PBT (glass fiber reinforced), LCD display: Acrylic, Mounting threaded part: Brass (nickel plated), Switch part: Silicone rubber				
Connecting method		Connector				
Cable length		Total length up to 100 m 328.1 ft (less than 30 m 98.4 ft when conforming to CE marking) is possible with 0.3 mm ² , or more, cable.				
Weight		Net weight: 25 g approx. (excluding connector attached cable), Gross weight: 140 g approx.				
Accessories		CN-66A-C2 (Connector attached cable 2 m 6.562 ft), Pressure unit label: 1 set				

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) The values specified above are applied only to the controller.

I/O CIRCUIT AND WIRING DIAGRAMS

DPH-L1□

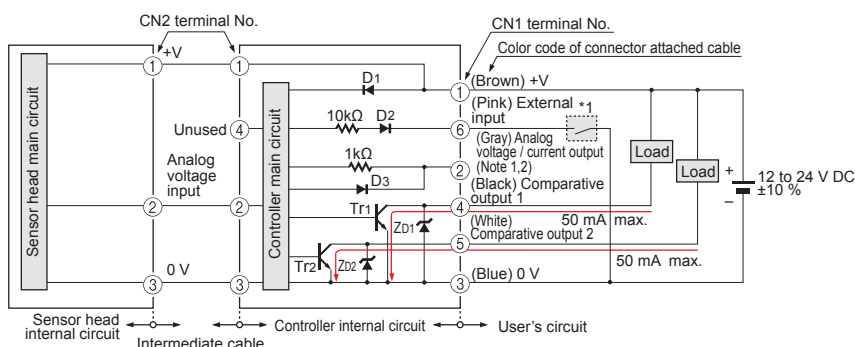
For independent use of sensor head



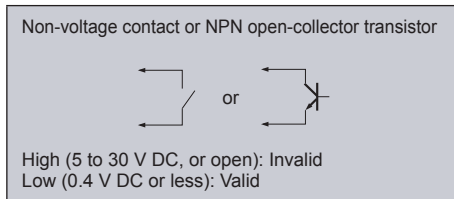
- Notes: 1) When the sensor head is used independently, devices connected to the analog output must have an input impedance set at 10 kΩ or more and load capacity 1,000 pF or less.
 2) No short-circuit protection circuit is provided for analog voltage output. Do not connect directly to a power supply.
 3) The pressure port and internal circuitry are connected by a capacitor. Do not apply voltage in excess of the specifications' dielectric strength between the pressure port and wiring.
 4) The transparent tube attached to the cable is not used and should be cut off at the base.

DPC-L101

NPN output type



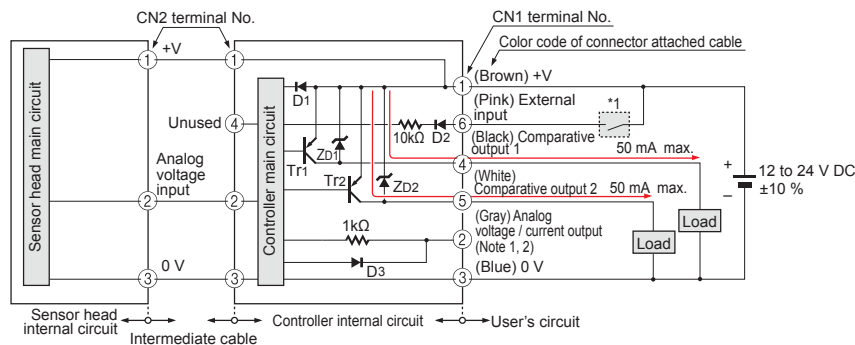
Symbols ...
 D₁ to D₃ : Reverse supply polarity protection diode
 ZD₁, ZD₂ : Surge absorption zener diode
 Tr₁, Tr₂ : NPN output transistor



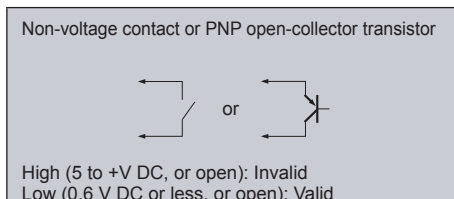
- Notes: 1) Set the output load resistance during analog current output to 250 Ω (max.).
 2) Note that a voltage of 5 V or higher is generated during analog current output.

DPC-L101-P

PNP output type

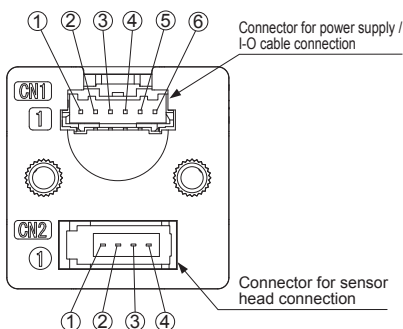


Symbols ...
 D₁ to D₃ : Reverse supply polarity protection diode
 ZD₁, ZD₂ : Surge absorption zener diode
 Tr₁, Tr₂ : PNP output transistor



- Notes: 1) Set the output load resistance during analog current output to 250 Ω (max.).
 2) Note that a voltage of 5 V or higher is generated during analog current output.

Terminal arrangement diagram



Connector for power supply / I-O cable (CN1)

- ① +V
- ② Analog voltage / current output
- ③ 0 V
- ④ Comparative output 1
- ⑤ Comparative output 2
- ⑥ External input
(auto-reference function / remote zero-adjustment function / current value hold function)

Connector for sensor head (CN2)

- ① Sensor head supply voltage
- ② Analog voltage input
- ③ 0 V
- ④ Unused

PRECAUTIONS FOR PROPER USE



- 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 **DPH-L100** series is designed for use with air and non-corrosive gas. It cannot be used with liquid or corrosive and inflammable gases.

Others

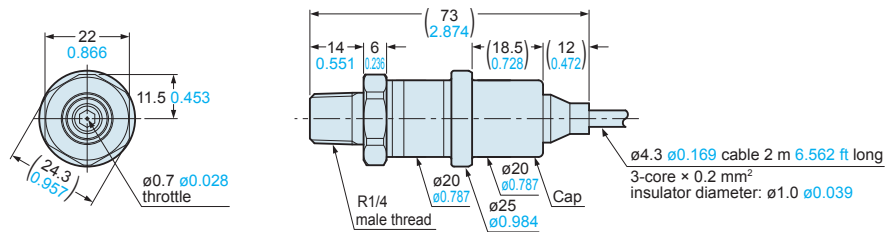
- This product has been developed / produced for industrial use only.
- Never remove the throttle.

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the website: panasonic-electric-works.net/sunx

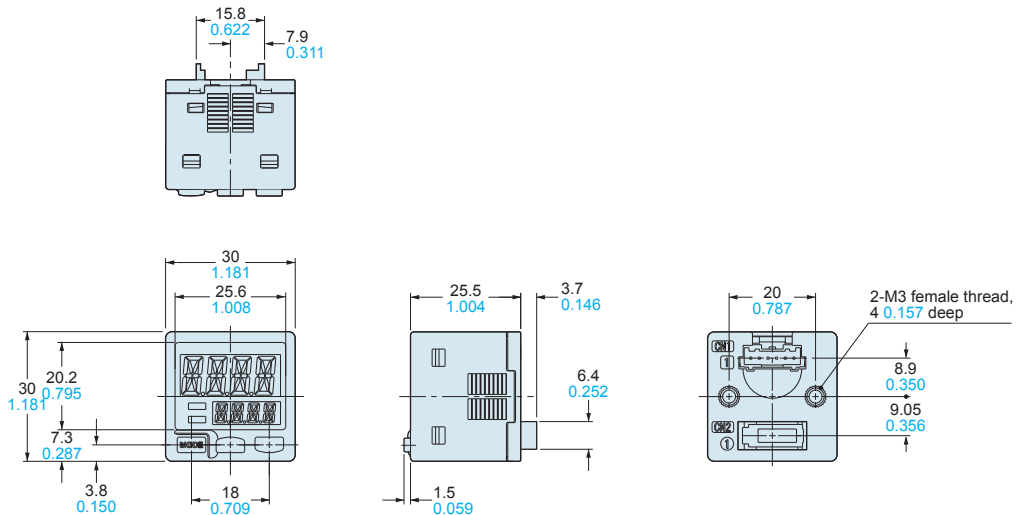
DPH-L1□

Sensor head



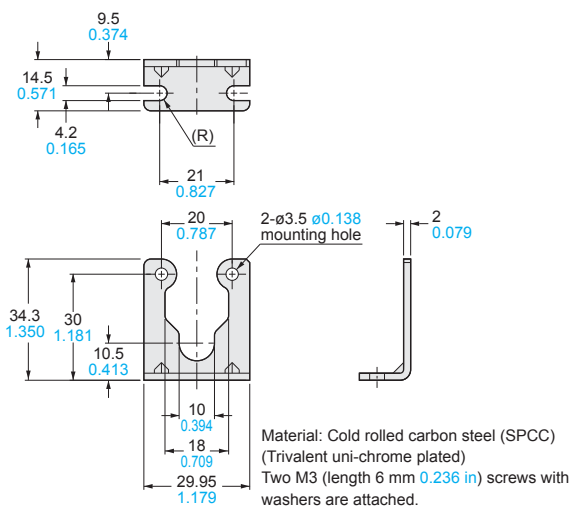
DPC-L101(-P)

Controller

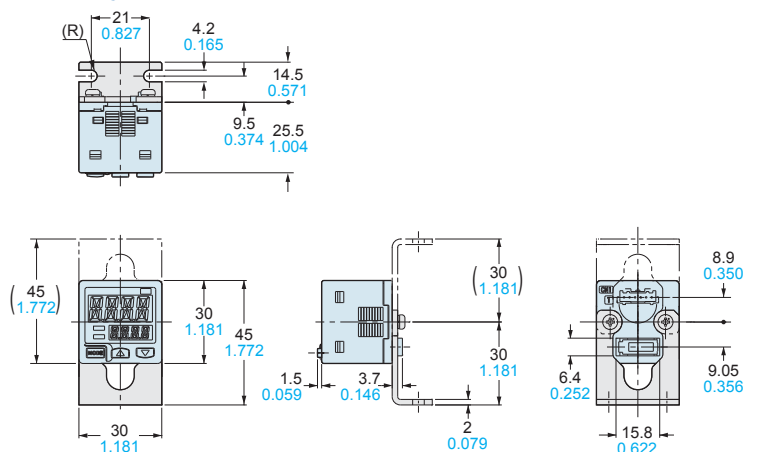


MS-DP1-6

Controller mounting bracket (optional)



Assembly dimensions



DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the website:
panasonic-electric-works.net/sunx

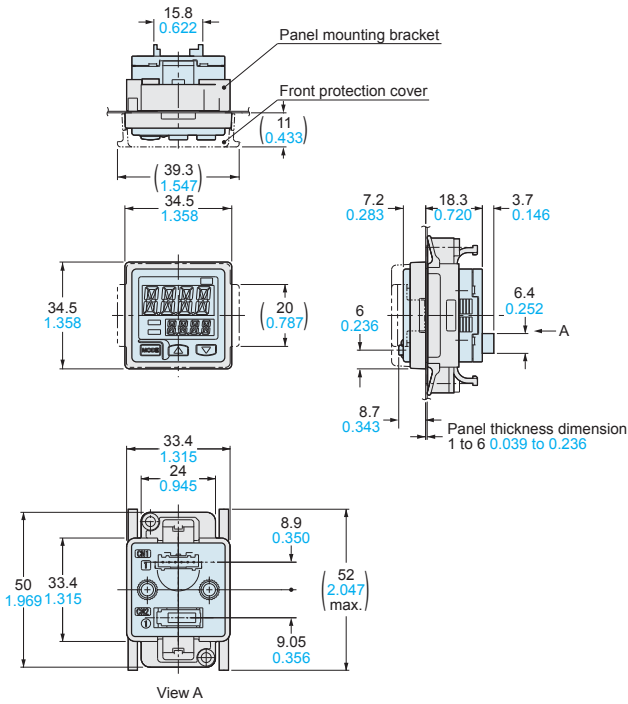
MS-DP1-2 MS-DP1-3

Panel mounting bracket (Optional), Front protection cover (Optional)

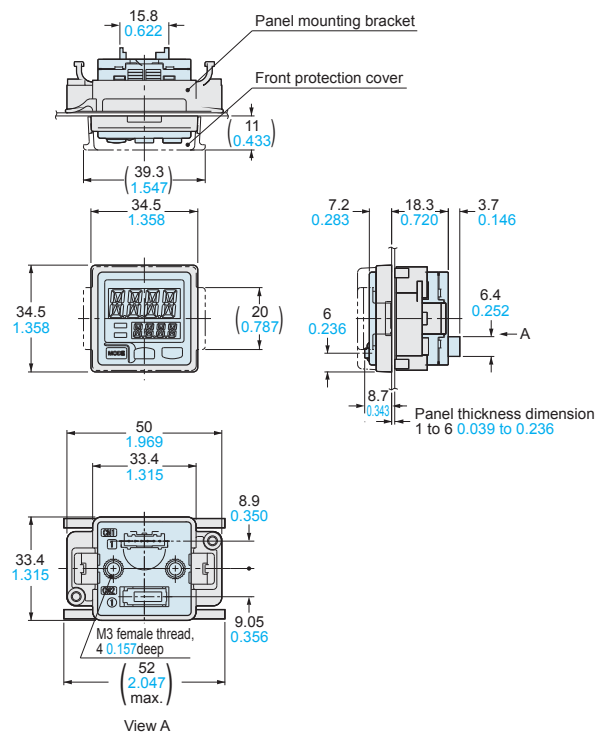
Assembly dimensions

Mounting drawing with DPC-L101(-P)

Vertical mounting

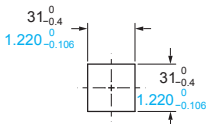


Horizontal mounting

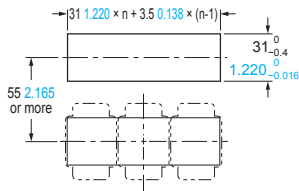


Panel cut-out dimensions

When 1 unit is installed

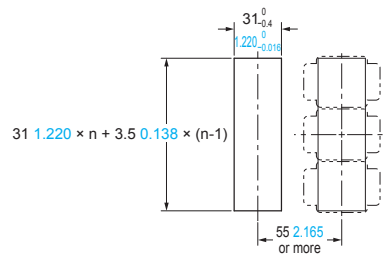


When "n" units are installed horizontally in series



Note: The panel thickness should be 1 to 6 mm 0.039 to 0.236 in.

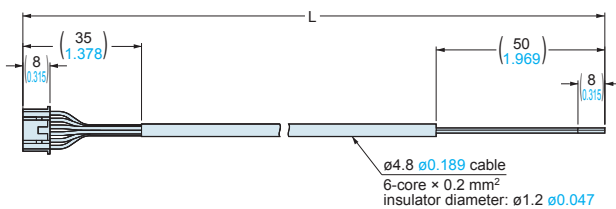
When "n" units are installed vertically in series



Note: The panel thickness should be 1 to 6 mm 0.039 to 0.236 in.

CN-66A-C2 CN-66A-C5

Connector attached cable (Optional, CN-66A-C2 is attached to the controller)



• Length L

Model No.	Length L
CN-66A-C2	2,000 78.740
CN-66A-C5	5,000 196.850

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