



Automation for a Changing World

Delta Smart Sensors



www.deltaww.com

 **DELTA**
Smarter. Greener. Together.



Sensing for Smart Manufacturing

Delta's smart sensors feature a slim design with different exteriors and can be applied to a wide range of applications, such as food and beverages, packaging, pharmaceuticals, electronic component equipment, rubber and plastics, warehouses, machine tool industries, and other industrial automation production lines. All types of sensors have stable quality and superior performance, to provide a best solution for smart manufacturing.



Inductive Proximity Sensor

Features
Dimensions
Specifications



Photoelectric Sensor

Features
Dimensions
Specifications
Accessories
Input / Output Circuits



Fiber Amplifier

Features
Dimensions
Specifications
Input / Output Circuits



Laser Displacement

Features
Dimensions
Specifications
Input / Output Circuits



Area Sensor

Features
Dimensions
Specifications
Input / Output Circuits



Multifunction Pressure Sensor

Features
Dimensions
Specifications
Accessories

Inductive Proximity Sensor M12 / M18 Series

- ▶ Nickel coated brass
- ▶ Standard sensors for detecting ferrous metals
- ▶ IP67
- ▶ CE certification
- ▶ Electrical circuit protection

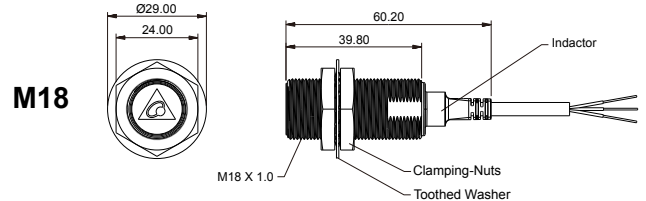
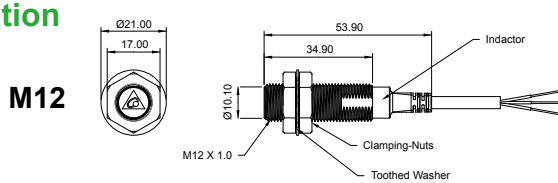


Appearance	Sensing Distance	NPN		PNP	
		NO	NC	NO	NC
M12 Isolation	2mm	IS-E1202-BNOB2	IS-E1202-BNCB2	IS-E1202-BPOB2	IS-E1202-BPCB2
	4mm	IS-E1204-BNOB2	IS-E1204-BNCB2	IS-E1204-BPOB2	IS-E1204-BPCB2
M12 Non-isolation	4mm	IS-N1204-BNOB2	IS-N1204-BNCB2	IS-N1204-BPOB2	IS-N1204-BPCB2
	8mm	IS-N1208-BNOB2	IS-N1208-BNCB2	IS-N1208-BPOB2	IS-N1208-BPCB2
M18 Isolation	5mm	IS-E1805-BNOB2	IS-E1805-BNCB2	IS-E1805-BPOB2	IS-E1805-BPCB2
	8mm	IS-E1808-BNOB2	IS-E1808-BNCB2	IS-E1808-BPOB2	IS-E1808-BPCB2
M18 Non-isolation	8mm	IS-N1808-BNOB2	IS-N1808-BNCB2	IS-N1808-BPOB2	IS-N1808-BPCB2
	12mm	IS-N1812-BNOB2	IS-N1812-BNCB2	IS-N1812-BPOB2	IS-N1812-BPCB2

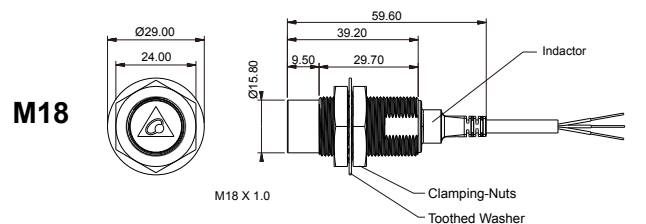
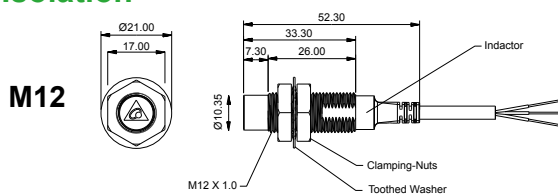
Dimensions

Unit : mm

• Isolation



• Non-Isolation



Specifications

Inductive Proximity Sensor	M12				M18			
	Isolation		Non-Isolation		Isolation		Non-Isolation	
Type	Isolation		Non-Isolation		Isolation		Non-Isolation	
Model	IS-E1202	IS-E1204	IS-N1204	IS-N1208	IS-E1805	IS-E1808	IS-N1808	IS-N1812
Sensing Distance	2 mm ± 10%	4 mm ± 10%	4 mm ± 10%	8 mm ± 10%	5 mm ± 10%	8 mm ± 10%	8 mm ± 10%	12 mm ± 10%
Standard Target	Iron, 12 × 12 × 1 mm		Iron, 24 × 24 × 1 mm		Iron, 18 × 18 × 1 mm		Iron, 24 × 24 × 1 mm	
Response Frequency	1.0 kHz	1.0 kHz	1.0 kHz	1.0 kHz	1.0 kHz	1.0 kHz	1.0 kHz	1.0 kHz
Weight	65 g				85 g			

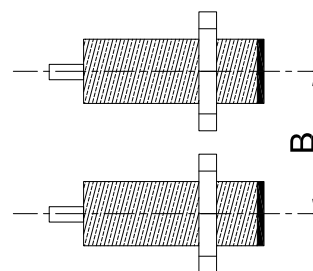
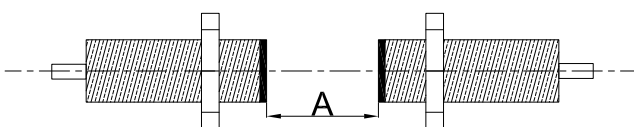
Inductive Proximity Sensor	M12 / M18 Common Specifications				
	Voltage Range	12 ~ 24 V _{DC} ± 10%			
Different Travel	10% max. of sensing distance	Detectable Object	Ferrous metal (the sensing distance decreases with no-ferrous metal)		
Current Consumption	15 mA max.	Vibration Resistance	10 ~ 55 Hz, 1.5mm, 3 axes for 2 hours		
Control Output	Load Current	200 mA max.	Shock Resistance	Max. 1000 m/s ² , 3 axes, 6 directions and 3 times in each	
	Residual Voltage	2 V max. (load current: 200 mA, cable length: 2m)	Insulating Resistance	50 MΩ or more (500VDC) between current-carrying parts and case	
Indicators	Operation indicator (red)		Withstand Voltage	1,000 V _{AC} 50 / 60 Hz 1 min	
Operation Mode	NPN: NO / NC; PNP: NO / NC		Cables	3 Wires 2m PVC cable M12 connector with 200mm cable	
Protection Circuits	Protection against reverse power connection, output overcurrent, power supply surge, output surge		Materials	Case	Nickel coated brass
Ambient Temperature	Operating: -25 ~ 70 °C / Storage: -40 ~ 80 °C (with no icing or condensation)			Sensing Surface	PBT
Ambient Humidity	≤ 50% RH (at 70 °C)			Clamping Nuts	Nickel coated brass
Temperature Influence	±10% max. of sensing distance at + 23°C in the temperature range of -25 ~ +70°C			Toothed Washer	Zinc-plated iron
Enclosure Rating	IP67		Certifications	CE	

Mutual Interference

	Isolation	Non-Isolation
A	≥ 3d	≥ 5d
B	≥ 3d	≥ 5d

▶ When installing sensors face to face or in parallel, be sure to maintain the minimum distances in the following table to avoid mutual interference.



d: Outside DIM. Sn: Sensing distance Units: mm



Photoelectric Sensor PS-R Series

- ▶ Different range adjustment (Trimmer or TEACH)
- ▶ M3 mounting hole, easy to assemble
- ▶ IP67
- ▶ CE certification
- ▶ Electrical circuit protection



Appearance	Sensing Method	Sensing Distance	NPN	PNP / Push-pull	Connection
 Rectangular Type (Trimmer)	Small Spot Reflective	5 ~ 100 mm	PS-RS1-NS12	PS-RS1-PS12	2 m cable (3 wires)
	Diffuse Reflective	5 ~ 300 mm	PS-RR3-NS12	PS-RR3-PS12	2 m cable (3 wires)
		1 m	PS-RR9-NS12	PS-RR9-PS12	
	Retro-reflective	4.2 m	PS-RL4-NS12	PS-RL4-PS12	2 m cable (3 wires)
Through-beam	12 m	PS-RT9-NS12	PS-RT9-PS12	2 m cable (3 wires)	
 Rectangular Type (TEACH)	Small Spot Reflective	5 ~ 100 mm	PS-RS1-NS22	PS-RS1-US22	2 m cable (4 wires)
			PS-RS1-NS2B	PS-RS1-US2B	M8 connector
	Diffuse Reflective	5 ~ 300 mm	PS-RR3-NS22	PS-RR3-US22	2 m cable (4 wires)
			PS-RR3-NS2B	PS-RR3-US2B	M8 connector
		5 ~ 1,000 mm	PS-RR9-NS22	PS-RR9-US22	2 m cable (4 wires)
			PS-RR9-NS2B	PS-RR9-US2B	M8 connector
	Retro-reflective	4.2 m	PS-RL4-NS22	PS-RL4-US22	2 m cable (4 wires)
			PS-RL4-NS2B	PS-RL4-US2B	M8 connector
	Through-beam	10 m (Fixed)	PS-RT5-NSB2	PS-RT5-USB2	2 m cable (4 wires)
			PS-RT5-NSBB	PS-RT5-USBB	M8 connector

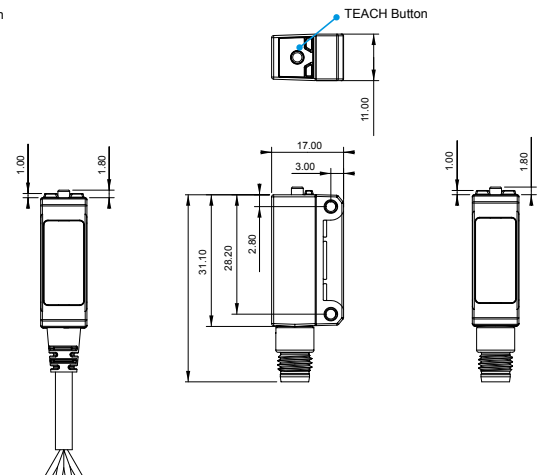
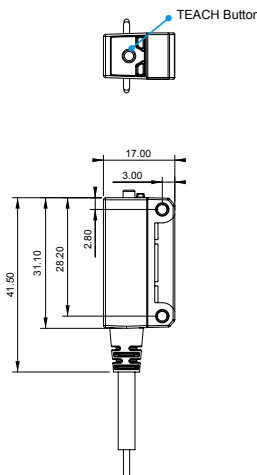
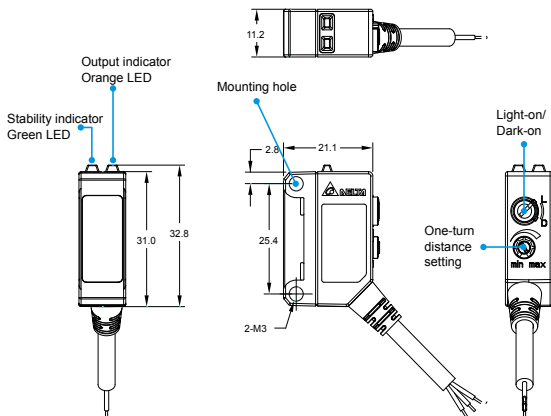
Dimensions Unit : mm

• Trimmer

• TEACH

Cable Type



Connector Type



Photoelectric Sensor PS-F / PS-L Series

- ▶ Slim and small, easy to assemble
- ▶ IP67
- ▶ CE certification
- ▶ Electrical circuit protection



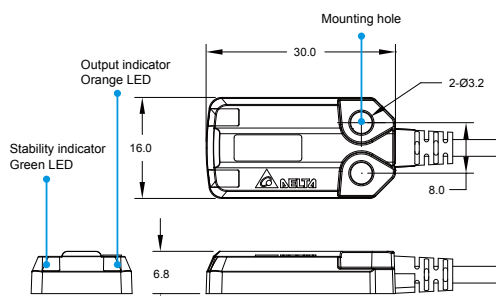
Appearance	Sensing Method	Sensing Distance (Fixed)	NPN		PNP		Connection
			Light-on	Dark-on	Light-on	Dark-on	
 Flat Type	Diffuse Reflective	5~50 mm	PS-FR2-NLB2	PS-FR2-NDB2	PS-FR2-PLB2	PS-FR2-PDB2	2 m cable (3 wires)
	Diffuse Reflective BGS	5~30 mm	PS-FB1-NLB2	PS-FB1-NDB2	PS-FB1-PLB2	PS-FB1-PDB2	2 m cable (3 wires)
	Retro-reflective	1 m	PS-FL3-NLB2	PS-FL3-NDB2	PS-FL3-PLB2	PS-FL3-PDB2	2 m cable (3 wires)
	Through-beam	1 m	PS-FT3-NLB2	PS-FT3-NDB2	PS-FT3-PLB2	PS-FT3-PDB2	2 m cable (3 wires)
Appearance	Sensing Method	Sensing Distance (Fixed)	NPN		Push-pull		Connection
			Light-on	Dark-on	Light-on	Dark-on	
 Lateral Type	Diffuse Reflective	5~50 mm	PS-LR2-NSB2		PS-LR2-USB2		2 m cable (4 wires)*
	Retro-reflective	1 m	PS-LL3-NSB2		PS-LL3-USB2		2 m cable (4 wires)*
	Through-beam	1 m	PS-LT3-NSB2		PS-LT3-USB2		2 m cable (4 wires)*

* 4 wires: Light-on, dark-on are switched by white wire.

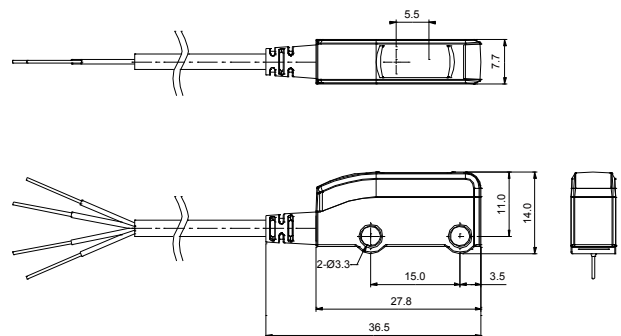
Dimensions

Unit : mm

Flat Type (PS-F)



Lateral Type (PS-L)



Photoelectric Sensor PS-M Series

- ▶ Standard size for mounting (M18)
- ▶ Setting via button
- ▶ IP67
- ▶ CE certification
- ▶ Electrical circuit protection



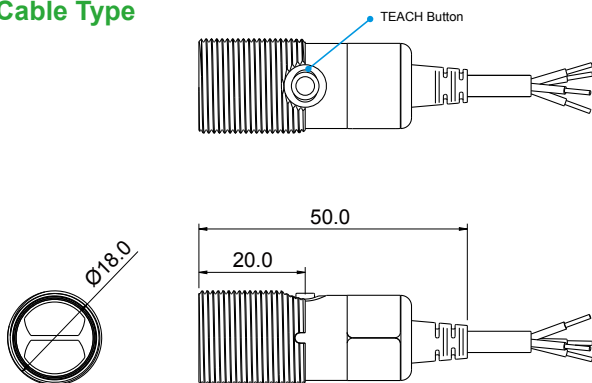
Appearance	Sensing Method	Sensing Distance	NPN	Push-pull	Connection
 Cylindrical Type (TEACH)	Diffuse Reflective	5 ~ 100 mm (Fixed)	PS-MR1-NSB2	PS-MR1-USB2	2 m cable (4 wires)*
			PS-MR1-NSBD	PS-MR1-USBD	M12 connector
		5 ~ 300 mm	PS-MR3-NS22	PS-MR3-US22	2 m cable (4 wires)*
			PS-MR3-NS2D	PS-MR3-US2D	M12 connector
		5 ~ 1,000 mm	PS-MR9-NS22	PS-MR9-US22	2 m cable (4 wires)*
			PS-MR9-NS2D	PS-MR9-US2D	M12 connector
	Retro-reflective	4.2 m	PS-ML4-NS22	PS-ML4-US22	2 m cable (4 wires)*
			PS-ML4-NS2D	PS-ML4-US2D	M12 connector
	Through-beam	5 m (Fixed)	PS-MT5-NSB2	PS-MT5-USB2	2 m cable (4 wires)*
			PS-MT5-NSBD	PS-MT5-USBD	M12 connector

* 4 wires: Light-on, dark-on are switched by white wire.

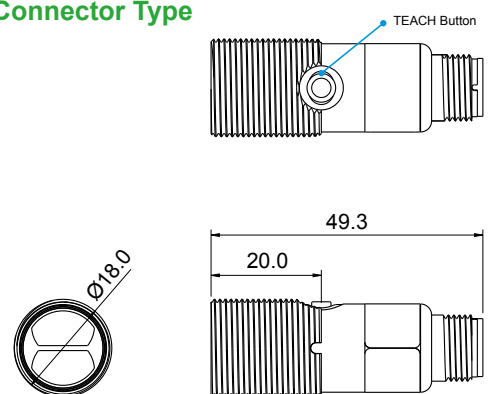
Dimensions

Unit : mm

• Cable Type

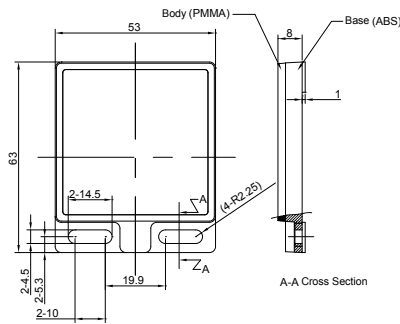


• Connector Type

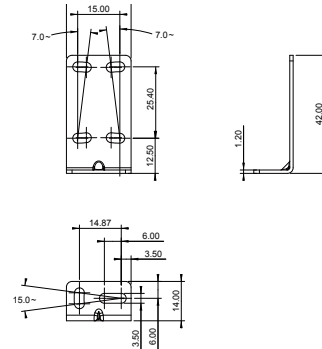


Accessories

- Reflector

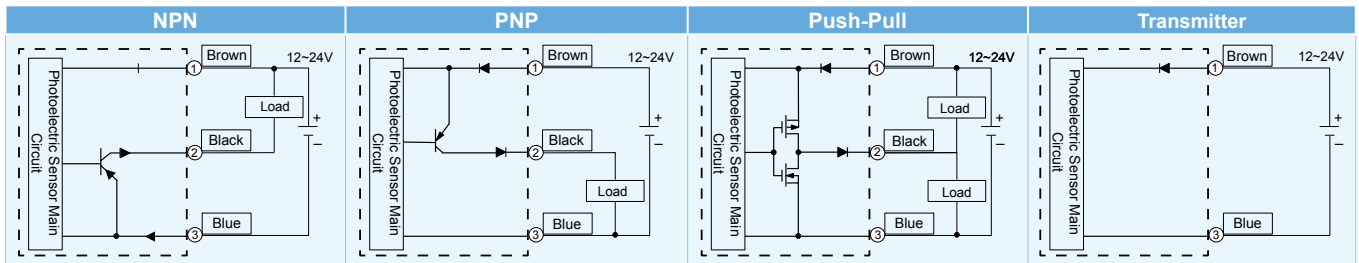


- Bracket (Rectangular type)

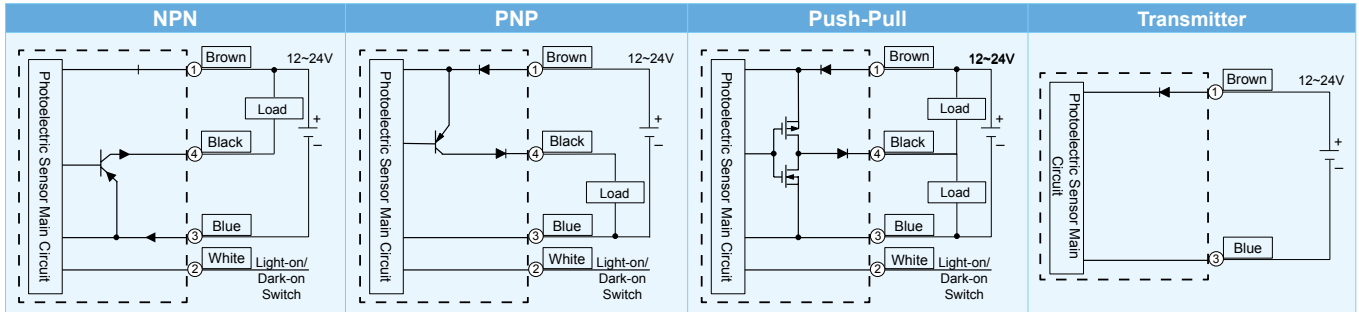


Input / Output Circuits

- 3 Wires




- 4 Wires





Common Specifications


Photoelectric Sensor	
Voltage Range	12 ~ 24 V _{DC} ± 10%
Response Time	ON → OFF: 0.5ms; OFF → ON: 0.5ms
Indicator	Output indicator (orange), stable operation indicator (green)
Protection Circuit	Protection against reverse power connection, output overcurrent, power supply surge, output surge
Operating Temperature	-25 °C ~ 55°C
Storage Temperature	-25 °C ~ 75°C
Ambient Humidity	30 ~ 85%
Enclosure Rating	IP67
Ambient Light Resistance	5,000 lux or less
Vibration Resistance	10~55 Hz, 1.5mm, 3 axes for 2 hours
Shock Resistance	Max. 1,000 m/s ² , 3 axes, 6 directions and 3 times in each.
Insulating Resistance	20 MΩ or more (500V _{DC})
Withstand Voltage	1,000 VAC 50 / 60 Hz 1min
Certifications	CE


Photoelectric Sensor Specifications

Appearance		Small Spot Reflective				Diffuse Reflective					
	Sensing Method	Small Spot Reflective				Diffuse Reflective					
	Model	2 m Cable	PS-RS1-NS12	PS-RS1-PS12	PS-RR3-NS12	PS-RR3-PS12					
	Sensing Distance	5 ~ 100 mm				5 ~ 300 mm					
	Operation Output	NPN		PNP		NPN		PNP			
		Light-on / Dark-on				Light-on / Dark-on					
	Light Source	Red LED (630 nm)									
	Power Consumption									20 mA MAX	
	Material										
	Cables	3 Wires 2 m PVC Cable (Through)									
	Dimensions										
Weight											

Appearance		Small Spot Reflective				Diffuse Reflective					
	Sensing Method	Small Spot Reflective				Diffuse Reflective					
	Model	2 m Cable	PS-RS1-NS22	PS-RS1-US22	PS-RR3-NS22	PS-RR3-US22					
		M8 Connector	PS-RS1-NS2B	PS-RS1-US2B	PS-RR3-NS2B	PS-RR3-US2B					
	Sensing Distance	5 ~ 100 mm				5 ~ 300 mm					
	Operation Output	NPN		Push-pull		NPN		Push-pull			
		Light-on / Dark-on				Light-on / Dark-on					
	Light Source	Red LED (630 nm)									
	Power Consumption									20 mA MAX	
	Material										
	Cables	4 Wires 2 m PVC Cable									
Dimensions	Cable Type: 3										
Weight											

Appearance		Diffuse Reflective				Diffuse Reflective - Background Suppress					
	Sensing Method	Diffuse Reflective				Diffuse Reflective - Background Suppress					
	Model	2 m Cable	PS-FR2-NLB2	PS-FR2-NDB2	PS-FR2-PLB2	PS-FR2-PDB2	PS-FB1-NLB2	PS-FB1-NDB2	PS-FB1-PLB2	PS-FB1-PDB2	
	Sensing Distance	5 ~ 50 mm				5 ~ 30 mm					
	Operation Output	NPN		PNP		NPN		PNP			
		Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on		
	Light Source										
	Power Consumption	20 mA MAX				30 mA MAX					
	Material										
	Cables	3 Wires 2 m PVC Cable (Through)									
	Dimensions										
Weight											

Appearance		Diffuse Reflective			
	Sensing Method	Diffuse Reflective			
	Model	2 m Cable (4 Wires)	PS-LR2-NSB2	PS-LR2-USB2	PS-LR2-NSB2
	Sensing Distance	5 ~ 50 mm			
	Operation Output	NPN		Push-pull	
		Light-on / Dark-on			
	Light Source				
	Power Consumption	20 mA MAX			
	Material				
	Cables	4 Wires 2 m PVC Cable			
	Dimensions				
Weight					

Appearance		Diffuse Reflective				
	Sensing Method	Diffuse Reflective				
	Model	2 m Cable	PS-MR1-NSB2	PS-MR1-USB2	PS-MR3-NS22	PS-MR3-US22
		M12 Connector	PS-MR1-NSBD	PS-MR1-USBD	PS-MR3-NS2D	PS-MR3-US2D
	Sensing Distance	5 ~ 100 mm		5 ~ 300 mm		
	Operation Output	NPN		Push-pull		
		Light-on / Dark-on		Light-on / Dark-on		
	Light Source					
	Power Consumption	20 mA MAX				
	Material					
	Cables	4 Wires 2 m PVC Cable				
Dimensions	M18, Cable					
Weight						

Rectangular Type (Trimmer) PS-R									
Active		Retro-reflective				Through-beam			
PS-RR9-NS12	PS-RR9-PS12	PS-RL4-NS12	PS-RL4-PS12		PS-RT9-NS12	PS-RT9-PS12			
5 ~ 1,000 mm		4.2 m				5 m			
NPN	PNP	NPN	PNP		NPN	PNP			
Light-on / Dark-on		Light-on / Dark-on				Light-on / Dark-on			
Infrared LED (850 nm)		Red LED (630 nm)				Transmitter: 6 mA Max; Receiver: 14 mA Max			
Lens: PC; Case: PBT; Wire: PC									
Through-beam: Transmitter- 2 Wires 2 m PVC Cable), M8 Connector (200 mm Cable)									
32.8 × 11.2 × 21.1 mm									
55g									
Rectangular Type (TEACH) PS-R									
Active		Retro-reflective				Through-beam			
PS-RR9-NS22	PS-RR9-US22	PS-RL4-NS22	PS-RL4-US22		PS-RT5-NSB2	PS-RT5-USB2			
PS-RR9-NS2B	PS-RR9-US2B	PS-RL4-NS2B	PS-RL4-US2B		PS-RT5-NSBB	PS-RT5-USBB			
5 ~ 1,000 mm		4.2 m				5 m			
NPN	Push-pull	NPN	Push-pull		NPN	Push-pull			
Light-on / Dark-on		Light-on / Dark-on				Light-on / Dark-on			
Infrared LED (850 nm)		Red LED (630 nm)				Infrared LED (850 nm)			
					Transmitter: 6 mA Max; Receiver: 14 mA Max				
Lens: PC; Case: PBT; Wire: PC									
(Through-beam: Transmitter- 2 Wires 2 m PVC Cable), M8 Connector									
32.8 × 11.2 × 17 mm; Connector Type: 32.8 × 11.2 × 17 mm									
Cable Type: 67g; Connector Type: 19g									
Flat Type (Fixed)									
Position		Retro-reflective				Through-beam			
PS-FB1-PDB2	PS-FL3-NLB2	PS-FL3-NDB2	PS-FL3-PLB2	PS-FL3-PDB2	PS-FT3-NLB2	PS-FT3-NDB2	PS-FT3-PLB2	PS-FT3-PDB2	
		25 ~ 1,000 mm				1 m			
NPN		PNP		NPN		PNP			
Dark-on	Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on	
Red LED (630nm)					Transmitter: 6 mA Max; Receiver: 14 mA Max				
20 mA MAX									
Lens: PC; Case: PBT; Wire: PC									
Through-beam: Transmitter- 2 Wires 2 m PVC Cable), M8 Connector (200mm Cable)									
16 × 30 × 6.8mm									
25g									
Lateral Type (Fixed)									
Retro-reflective				Through-beam					
PS-L3-NSB2	PS-LL3-USB2			PS-LT3-NSB2			PS-LT3-USB2		
25 ~ 1,000 mm				1 m					
NPN		Push-pull		NPN			Push-pull		
Light-on / Dark-on				Light-on / Dark-on					
Red LED (630 nm)				Transmitter: 6 mA Max; Receiver: 14 mA Max					
Lens: PC; Case: PBT									
Through-beam: Transmitter- 2 Wires 2 m PVC Cable)									
14 × 27 × 7 mm									
26g									
Cylindrical Type (TEACH)									
Active		Retro-reflective				Through-beam			
PS-MR9-NS22	PS-MR9-US22	PS-ML4-NS22	PS-ML4-US22		PS-MT5-NSB2	PS-MT5-USB2			
PS-MR9-NS2D	PS-MR9-US2D	PS-ML4-NS2D	PS-ML4-US2D		PS-MT5-NSBD	PS-MT5-USBD			
5 ~ 1,000 mm		4.2 m				5 m			
NPN	Push-pull	NPN	Push-pull		NPN	Push-pull			
Light-on / Dark-on		Light-on / Dark-on				Light-on / Dark-on			
Infrared LED (850 nm)						Transmitter: 6 mA Max; Receiver: 14 mA Max			
Lens: PC; Case: PBT; Wire: PC									
Through-beam: Transmitter- 2 Wires 2 m PVC Cable), M12 Connector									
Cable Type (Length): 50 mm; Connector Type (Length):50 mm									
Cable Type: 67g ; Connector Type: 19g									

Fiber Amplifier FA Series

- ▶ Concise and slim, easy to assemble
- ▶ Dual display, visualization for setting
- ▶ SET button makes operation easy
- ▶ CE certification

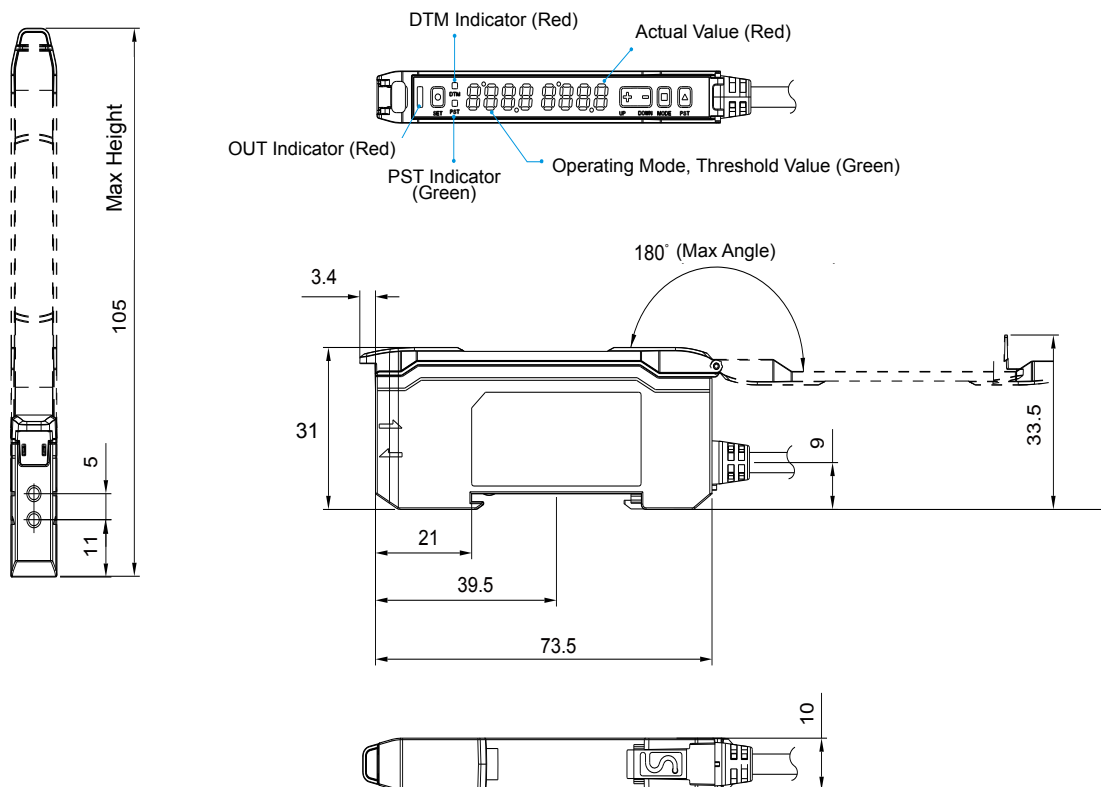


* To be launched

Appearance	Display	Model Name	Output 1	Output 2 / Input	Connection
Standard	Dual (7-Segments x 2)	FA-HS21-R2	1	1	2 m cable (4 wires)
	Dual (7-Segments x 2)	FA-HS1B-R2	1	1	2 m cable (4 wires)

Dimensions

Unit : mm

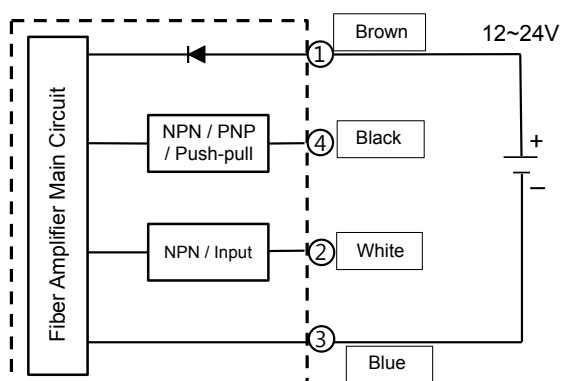


Specifications

Fiber Amplifier	
Appearance	Standard
Display	7-Segment (dual)
Model Name	FA-HS21-R2
Output 1	1
Output 2/ Input	1
Connection Method	Cable 2 m (4 wires)
Light Source	Red LED
Voltage Range	12 ~ 24 V _{DC} ± 10%
Output Selection	Light-on / Dark-on (system-selectable)
Response Time	50 μs (high speed), 200 μs (normal speed)
Display Indicator	Sub digital display: green, Main digital display: red Display direction: switchable between normal and reversed
Indicator	Output: red, PST: green, DTM: red
Protection Circuit	Protection against reverse power connection, output overcurrent, power supply surge, output surge
Operating Temperature	-10 °C ~ 55°C
Storage Temperature	-25 °C ~ 75°C
Ambient Humidity	30 ~ 85%
Enclosure Rating	IP50
Ambient Light Resistance	5,000 lux or less
Vibration Resistance	10 ~ 55 Hz, 1.5mm, 3 axes for 2 hours
Shock Resistance	Max. 1,000 m/s ² , 3 axes, 6 directions and 3 times in each.
Insulating Resistance	20 MΩ or more (500 V _{DC})
Withstand Voltage	1,000 V _{AC} 50 / 60 Hz 1min
Materials	Case: PC, Cover: PC, Angle of cover: 180°
Cable	4 wires 2 m PVC cable
Dimensions	73.5 mm x 10 mm x 33.5 mm
Certification	CE

Input / Output Circuits

- 4 Wires



Laser Displacement LD Series

- ▶ Aluminum case, strong structure
- ▶ Slim and small, easy to assemble
- ▶ High precision, average time setting
- ▶ IP67
- ▶ CE certification

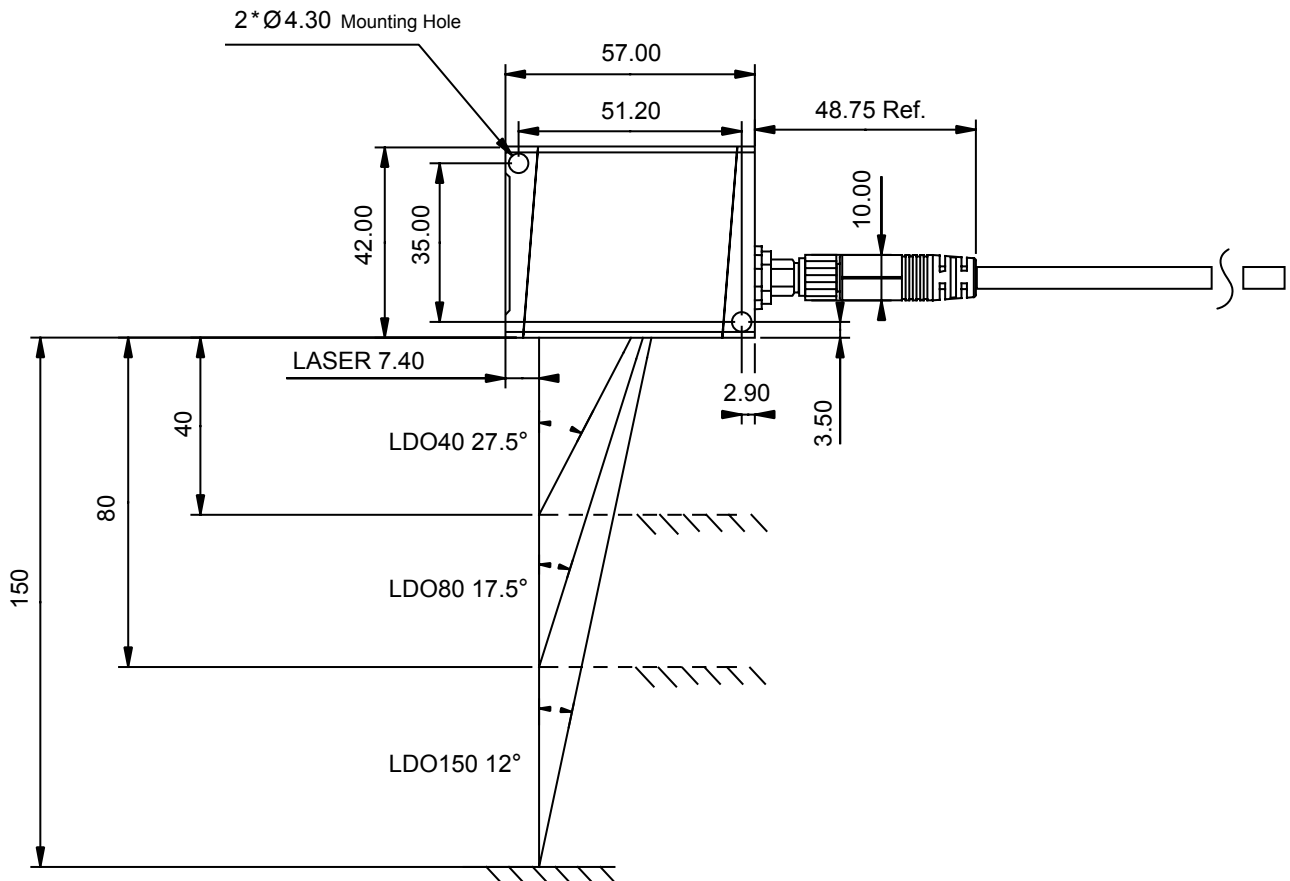


Model Name	Sensing Distance	Repeatability	Interface
LD-040N	30 ~ 50 mm	2 μm*	Digital I/O / MODBUS Communication (RS-485)
LD-080N	55 ~ 105 mm	5 μm	Digital I/O / MODBUS Communication (RS-485)
LD-150N	90 ~ 210 mm	15 μm	Digital I/O / MODBUS Communication (RS-485)

* For an average count of 100. The value is ±2 μm for an average count of 100 (Sensing objective: white ceramic substrate).

Dimensions

Unit : mm



Specifications

Laser Displacement			
Sensing Method	Triangulation		
Model Name	LD-040N	LD-080N	LD-150N
Reference Distance	40 mm	80 mm	150 mm
Measurement Range	± 10 mm	± 25 mm	± 60 mm
Interface	Digital IO / MODBUS RS-485	Digital IO / MODBUS RS-485	Digital IO / MODBUS RS-485
	RS-485		
Light Source	Laser CLASS 2		
Input Voltage	12 ~ 24 V _{DC} ± 10%		
Repeatability*	2 μm	5 μm	15 μm
Linearity	± 0.1%	± 0.1%	± 0.1%
Sampling Rate	1 ms		
Indicator	Laser ON: blue, Measurement range: green, Out of measurement range: orange, DO: yellow, DI: red		
Protection Circuit	Protection against reverse power connection, output overcurrent, power supply surge, output surge		
Operating Temperature	10 °C ~ 50 °C		
Storage Temperature	-20 °C ~ 75 °C		
Ambient Humidity	30 ~ 85%		
Enclosure Rating	IP67		
Ambient Light Resistance	5,000 lux or less		
Vibration Resistance	10 ~ 55 Hz, 1.5 mm, 3 axes for 2 hours		
Insulating Resistance	20 MΩ or more (500 V _{DC})		
Withstand Voltage	1,000 V _{AC} 50 / 60 Hz 1min		
Certifications	CE		
Materials	Optical window: Glass; Case: Aluminium; Cable: PVC		
Cables	M8 Connector (8 Pin)		
Dimensions	55 × 42 × 24 mm		
Weight	113 g		

* For an average count of 100. The value is ±2 μm for an average count of 100 (Sensing objective: white ceramic substrate).

Laser Label Description



Laser Radiations : Class 2 Product

Maximum Output: <math>< 1\text{mW}</math>

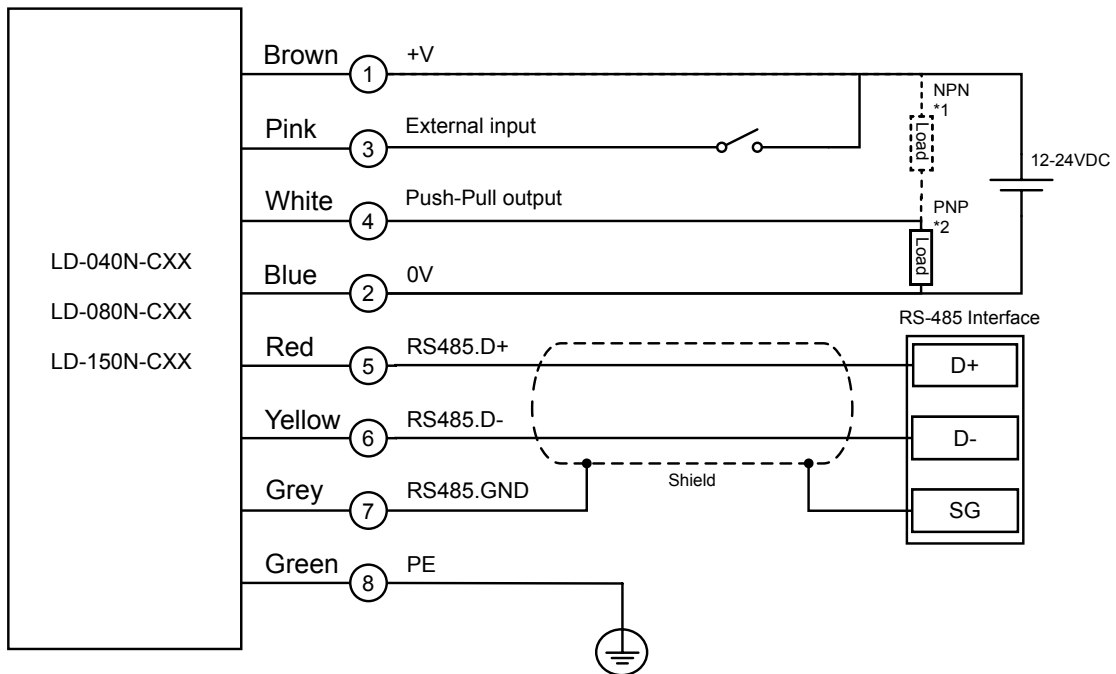
Pulse Duration: 0.5ms max.

Wave Length: 635nm, IEC 60825-1:2014

Input / Output Circuits

Pin	Color	Definition
1	Brown	+24V
2	Blue	PGND
3	Pink	DI
4	White	DO
5	Red	485-D+
6	Yellow	485-D-
7	Grey	485-GND
8	Green	FG

Wiring Instructions

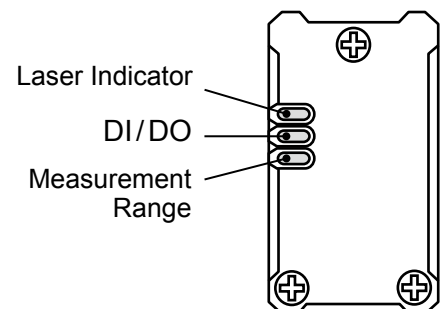


*1. In case of NPN connection, please connect the load between Pin 4 and Pin 1

*2. In case of PNP connection, please connect the load between Pin 4 and Pin 2

Laser Indicator

Indicator	Color	Description
Laser Indicator	Blue light	Start (laser on)
Measurement Range	Green light	Within measurement range
	Orange light	Out of measurement range
DI/DO	Red light	DO
	Green light	DI



Ordering Information

Model Name	Sensing Distance	Repeatability	Interface
LD-040N-C2B	30 ~ 50 mm	2 μm*	Digital I/O / MODBUS Communication (RS-485)
LD-080N-C2B	55 ~ 105 mm	5 μm	Digital I/O / MODBUS Communication (RS-485)
LD-150N-C2B	90 ~ 210 mm	15 μm	Digital I/O / MODBUS Communication (RS-485)

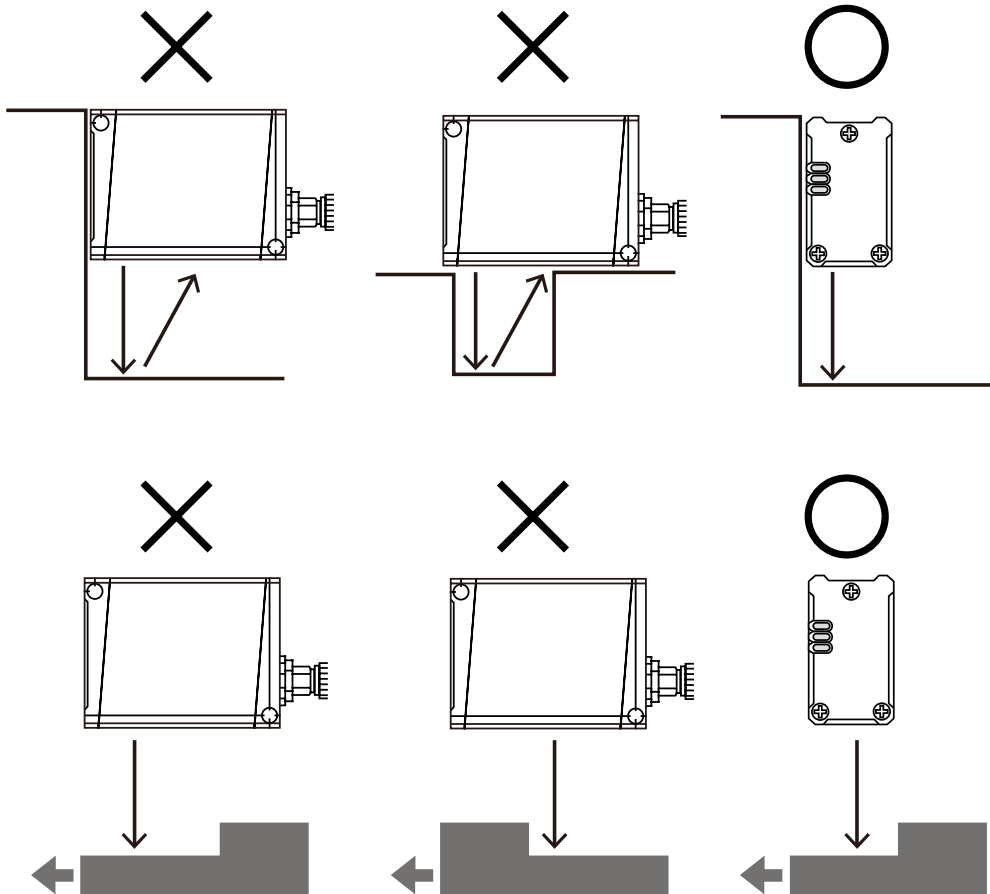
* When measuring for 100 times, the average repeatability rate is 2 μm (inspecting object: white ceramic substrate)

Wiring Material	Item	Serial Number
PUR Cable + M8 Connector	1.5 m PUR cable	UC-S015088
	3 m PUR cable	UC-S030088
	5 m PUR cable	UC-S050088

Caution on Mounting Direction

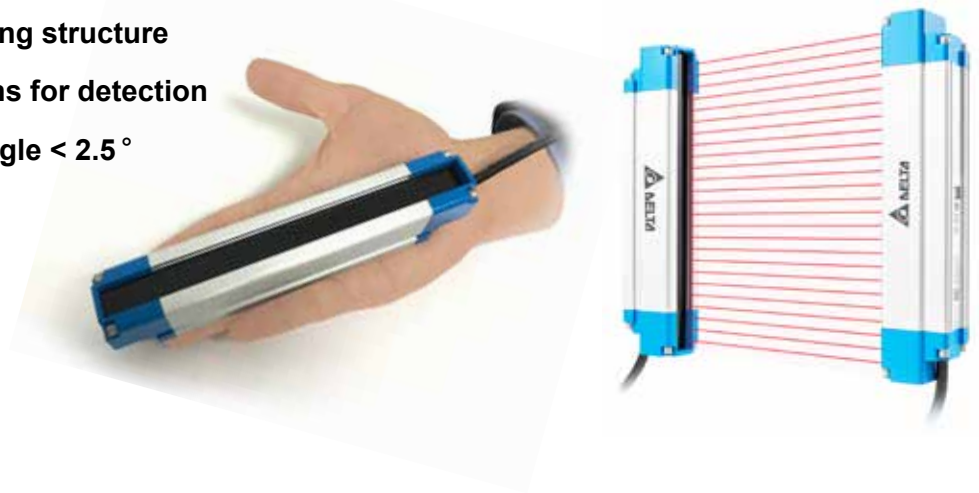
For best product performance, please note the following instructions when installing products:

- ▶ When products cling to devices, install the products in parallel with the devices to assure product performance
- ▶ When the shape of an inspection object is extrusive, ensure the product's lighting route is vertical to the inspection object's path to assure product performance

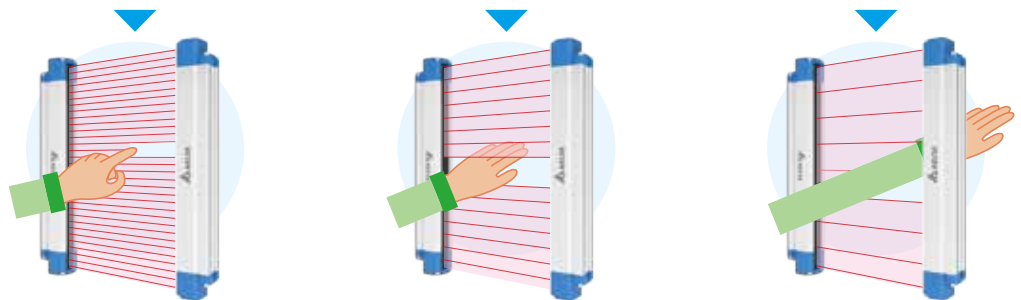


Area Sensor AS Series

- ▶ Aluminum case, strong structure
- ▶ No dead zone curtains for detection
- ▶ Effective aperture angle <math>< 2.5^\circ</math>
- ▶ IP67
- ▶ CE certification

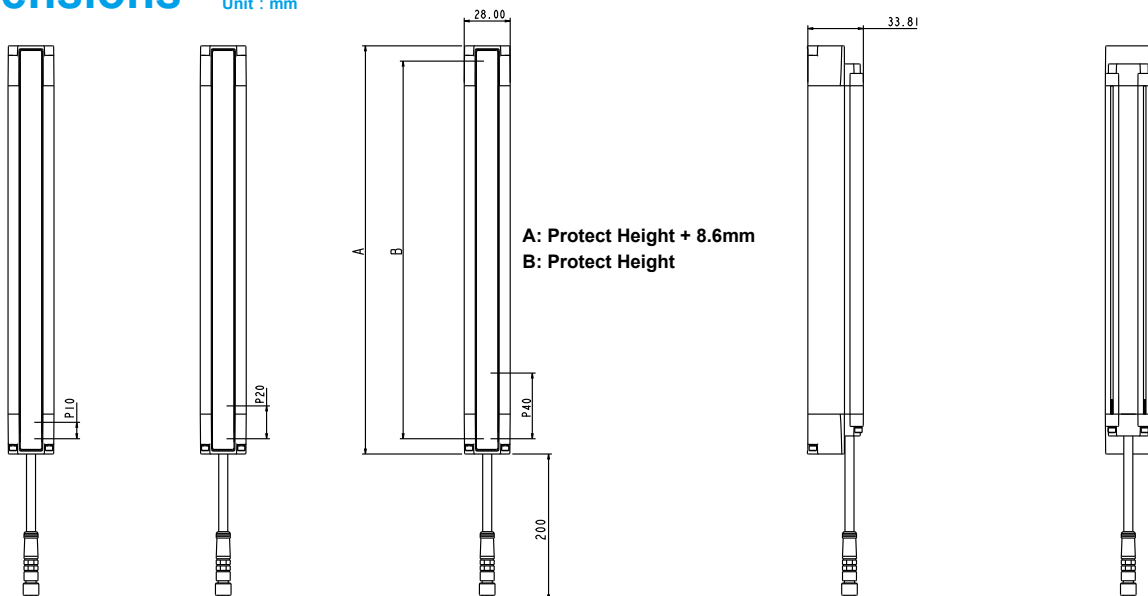


Pitch	10 mm	20 mm	40 mm
Channels	24 ~ 128	8 ~ 96	4 ~ 36
Protect Height	240 ~ 1,280 mm	160 ~ 1,920 mm	160 ~ 1,440 mm
Sensing Distance	0.1 m ~ 5 m	0.1 m ~ 10 m	0.1 m ~ 10 m
Model Name	AS - BF □ □ □	AS - BH □ □ □	AS - BA □ □ □

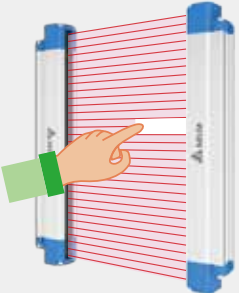



Dimensions

Unit : mm

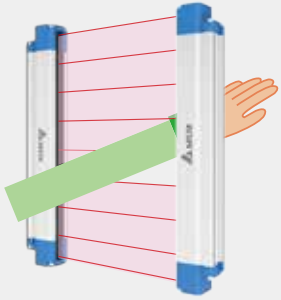


Specifications

Finger Detection (Pitch: 10 mm)					
	Model Name	Channels	Protect Height (B)	Brackets	Sensing Distance
	AS-BF024	24	240	2	0.1m ~ 5m
	AS-BF032	32	320	2	
	AS-BF040	40	400	4	
	AS-BF048	48	480	4	
	AS-BF056	56	560	4	
	AS-BF064	64	640	4	
	AS-BF072	72	720	4	
	AS-BF080	80	800	4	
	AS-BF088	88	880	4	
	AS-BF096	96	960	4	
	AS-BF104	104	1,040	4	
	AS-BF112	112	1,120	4	
	AS-BF120	120	1,200	4	
	AS-BF128	128	1,280	4	

Hand Detection (Pitch: 20 mm)					
	Model Name	Channels	Protect Height (B)	Brackets	Sensing Distance
	AS-BH008	8	160	2	0.1m ~ 10m
	AS-BH012	12	240	2	
	AS-BH016	16	320	2	
	AS-BH020	20	400	4	
	AS-BH024	24	480	4	
	AS-BH028	28	560	4	
	AS-BH032	32	640	4	
	AS-BH036	36	720	4	
	AS-BH040	40	800	4	
	AS-BH044	44	880	4	
	AS-BH048	48	960	4	
	AS-BH052	52	1,040	4	
	AS-BH056	56	1,120	4	
	AS-BH060	60	1,200	4	
	AS-BH064	64	1,280	4	
	AS-BH068	68	1,360	4	
	AS-BH072	72	1,440	4	
	AS-BH076	76	1,520	4	
	AS-BH080	80	1,600	4	
	AS-BH084	84	1,680	4	
AS-BH088	88	1,760	6		
AS-BH092	92	1,840	6		
AS-BH096	96	1,920	6		

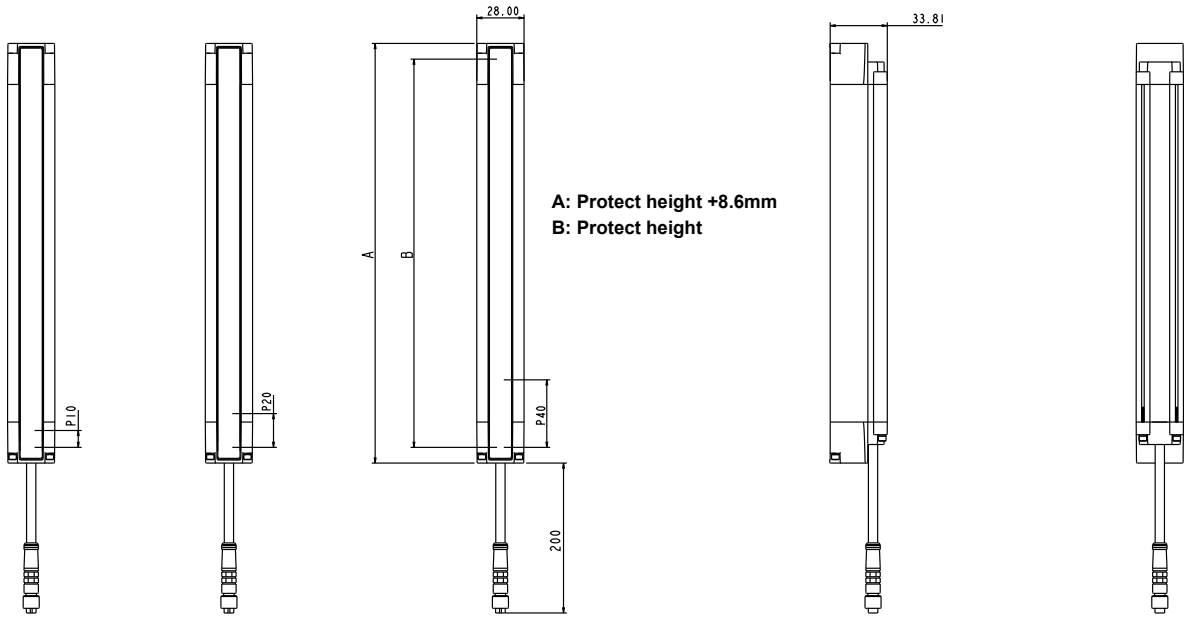
Specifications

Arm Detection (Pitch: 40 mm)					
	Model Name	Channels	Protect Height (B)	Brackets	Sensing Distance
	AS-BA004	4	160	2	0.1 m ~ 10 m
	AS-BA006	6	240	2	
	AS-BA008	8	320	2	
	AS-BA010	10	400	4	
	AS-BA012	12	480	4	
	AS-BA014	14	560	4	
	AS-BA016	16	640	4	
	AS-BA018	18	720	4	
	AS-BA020	20	800	4	
	AS-BA022	22	880	4	
	AS-BA024	24	960	4	
	AS-BA026	26	1,040	4	
	AS-BA028	28	1,120	4	
	AS-BA030	30	1,200	4	
	AS-BA032	32	1,280	4	
	AS-BA034	34	1,360	4	
AS-BA036	36	1,440	4		

Electrical Specifications

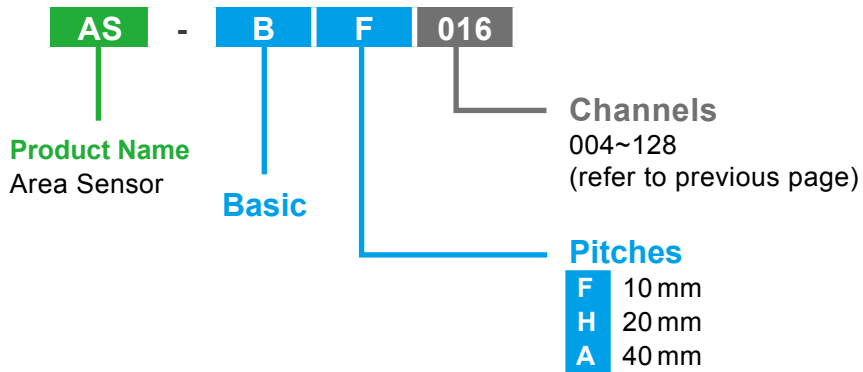
Area Sensor	
Voltage Range	24V _{DC} ± 10%
Light Source	Infrared LED (850nm)
Indicator	<ul style="list-style-type: none"> ▪ Upper / lower indicator (blue light): when the top and bottom are aligned ▪ Green light: all channels are aligned ▪ Red light: any channel is mis-aligned or blocked ▪ Orange light: without synchronization signal
Protection Circuit	Protection against reverse power connection, output overcurrent, power supply surge, output surge
Operating Temperature	-10 °C ~ 55°C , no freezing
Storage Temperature	-25 °C ~ 75°C
Ambient Humidity	30 ~ 85%
Enclosure Rating	IP67
Ambient Light Resistance	5,000 lux or less
Vibration Resistance	10 ~ 55 Hz, 1.5mm, 3 axes for 2 hours
Shock Resistance	Max. 100 m/s ² , 3 axes, 6 directions and 3 times in each
Insulating Resistance	20 MΩ or more (500 V _{DC})
Withstand Voltage	1,000 V _{AC} 50 / 60 Hz 1min
Material	Case: Aluminum, Cover lens: PMMA, Upper / lower case: Zinc alloy
Cables	M12 connector, 200mm PVC cable
Certifications	CE

Dimensions Unit : mm

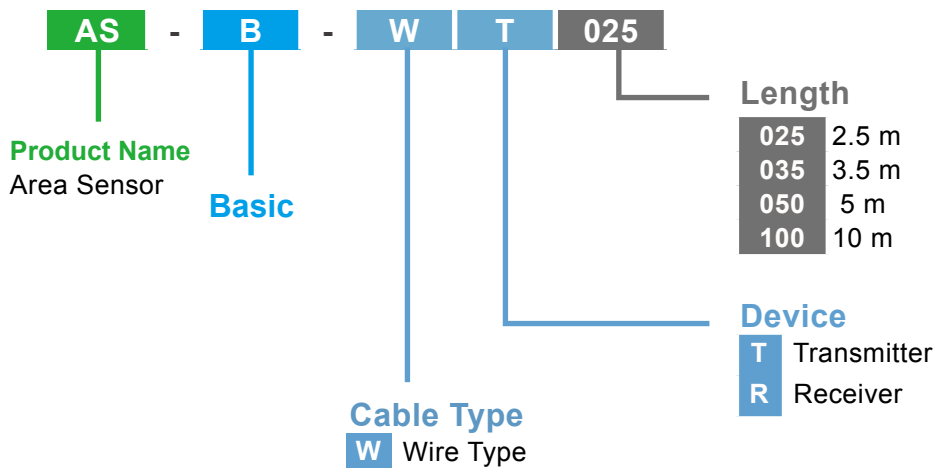


Ordering Information

• Light Curtain

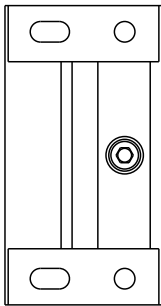
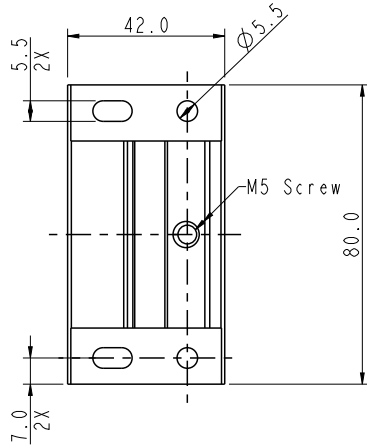


• Cable

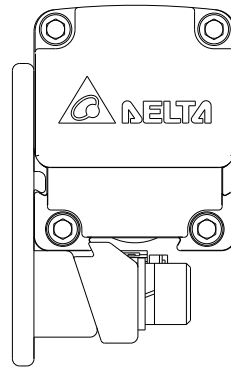
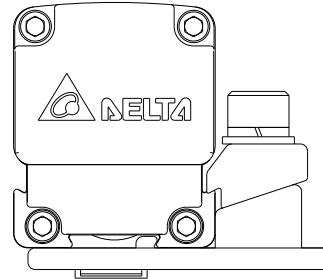


Bracket Dimensions

Unit : mm

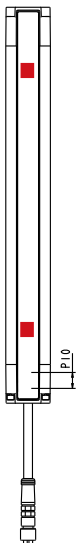


Bracket Installation



Sensor Calibration After Power-on

1. Power on
Red indicator on when power on



2. Calibration (top)
Top indicator in blue on when top calibration is finished



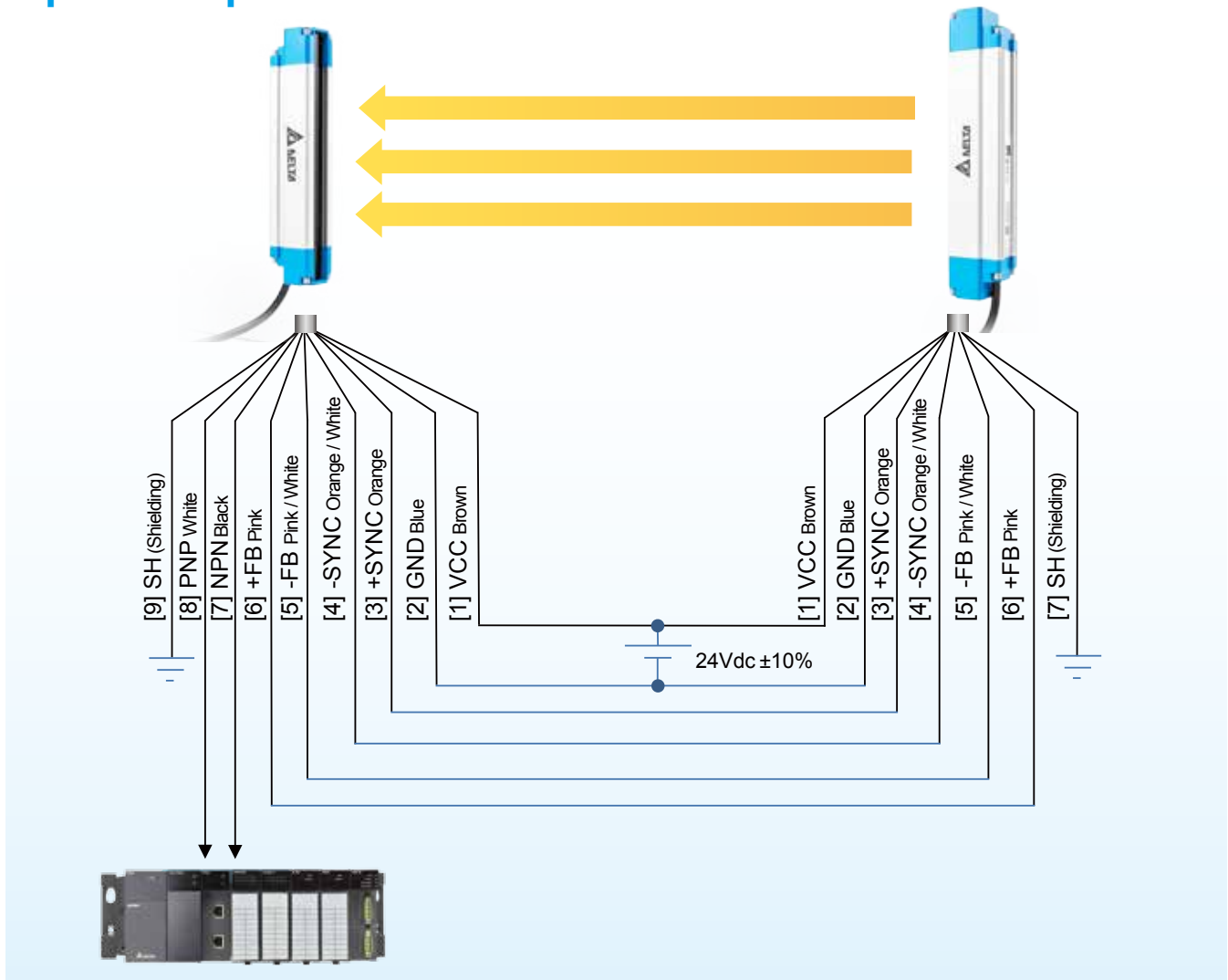
3. Calibration (bottom)
Bottom indicator in blue on when bottom calibration is finished



4. Complete
Green indicator on when calibration is complete



Input / Output Circuits



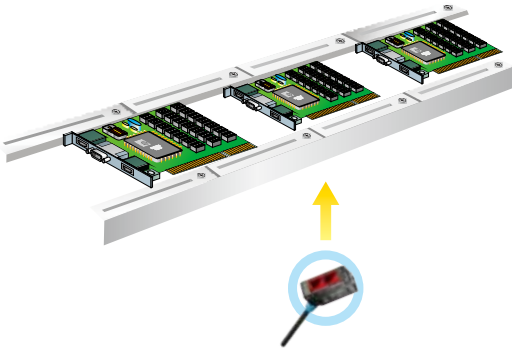
Troubleshooting

Indicator	Description	Solution
All indicators are off	Cables are disconnected or not connected correctly	Check the power connection and reconnect cables if necessary
An indicator on one side is orange, another is off	Cables are not connected correctly or over power supply voltage	Check the power connection and reconnect cables if necessary
Indicators on both receiver and transmitter sides are red	Beam axes are not properly aligned	Perform sensor calibration
Indicators on receiver or transmitter side show 1 blue 1 red, or 2 blue 1 red	Beam axes are not properly aligned	Perform sensor calibration
Indicators on both receiver and transmitter sides are orange	Light channel or internal voltage is not properly functioning	Please inquire with Delta Service Team
All blue, green, and red indicators on both receiver and transmitter sides are on	Overcurrent	Check output loading

Applications

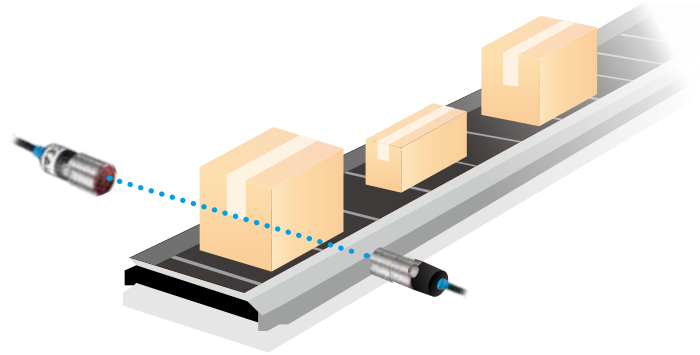
Electronics Industry

Detects PCB boards



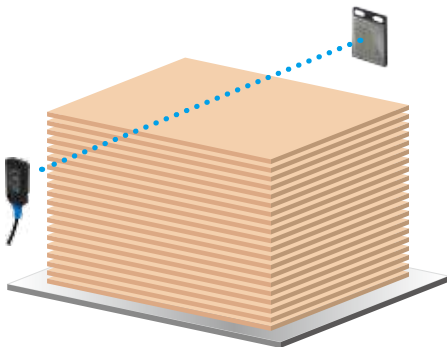
Warehouse / Logistics

Detects cartons



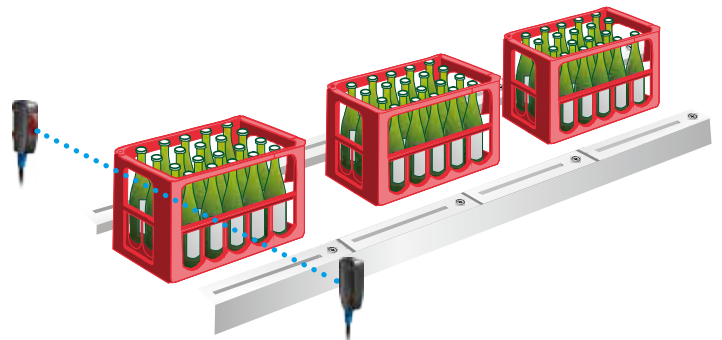
Wood Industry

Detects wood stacking



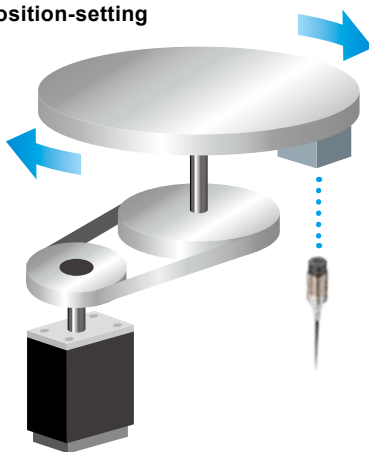
Food and Beverages

Detects boxes of beverages



Equipment & Machines

Sensor for position-setting



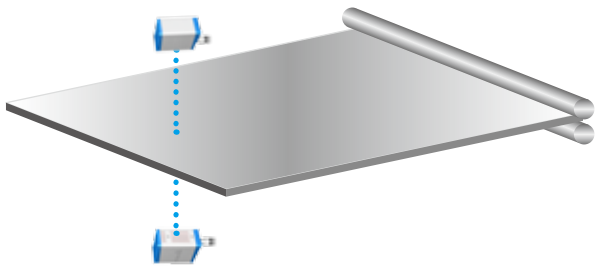
Electronics Industry

Detects IC components



Wood and Steel industry

Measures the thickness of wood or steel



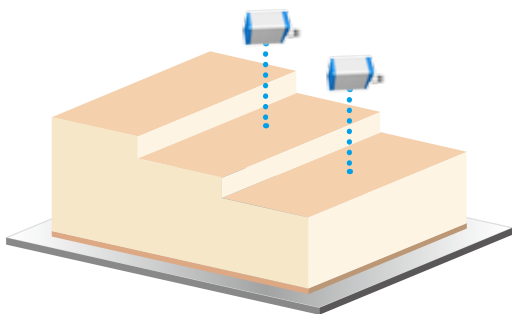
Electronics Industry

Robot arm's reproducibility test



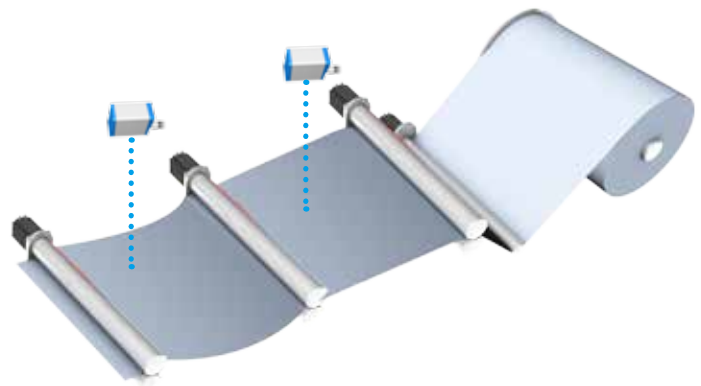
Electronics Industry

Measures the depth/ thickness of product



Textile Industry

Measures the hoop slack



Safety

Marks a dangerous zone and protects operators



Safety

Marks a dangerous zone and protects operators



Multifunction Pressure Sensor DPA Series

- ▶ Energy-saving mode
- ▶ Various unit conversion
- ▶ Analog output function
- ▶ Various output modes
- ▶ 10 sets of output response time setup
- ▶ 3 sets of color displays
- ▶ Fast zero reset
- ▶ Safety control function
- ▶ Easy code display
- ▶ Parameter copy function



Various Unit Conversion

The DPA Series offers 6 kinds of globally adopted pressure units for measurement and display.



Fast Parameter Copy

The DPA Series fast copies the internal parameters to other slaves and saves repeated parameter setup time.



3-Color LCD Display (Green, Red, Orange)

The large LCD with a green, red and orange 3-color LCD display allows users to set the display color according to the ambient environment, such as when the pressure is in normal range or exceeds the tolerance range. The display's color is orange when in parameter setup mode. This makes it easier for reading and reduces operation errors.

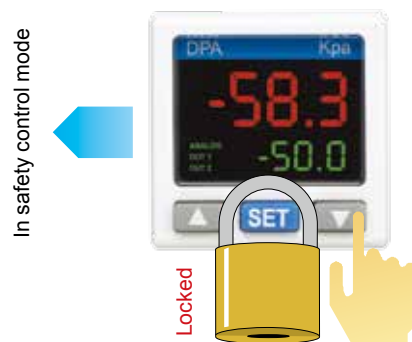


Color for upper / lower limit display (green / red)

Parameter set up (orange)

Safety Control Mode

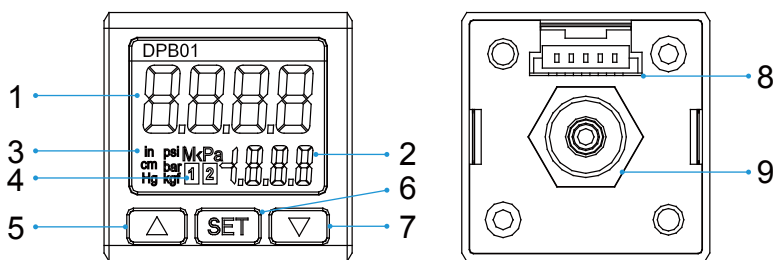
The safety control mode prevents operators from carelessly touching relevant parameters and affecting the operation and production of the equipment.



Specifications

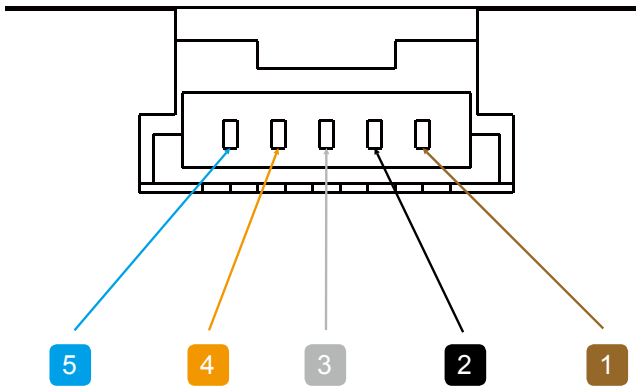
Power Supply	Voltage range	12 ~ 24 V _{DC} ± 10% no isolation
	Power consumption	40 mA Max.; current output type 60 mA Max.
Pressure Measurement	Pressure type	Non-corrosive gas, gauge type
	Measurable range	DPA01: -100 kPa ~ 100 kPa DPA10: -100 kPa ~ 1,000 kPa
	Max. durable pressure	DPA01: 200 kPa DPA10: 1,500 kPa
	Measurement accuracy	± 3% entire process
	Temperature inaccuracy	± 2% entire process
	Display	Setup display
Status display		LCD output status display
Display mode		3 colors for different modes
Cycle		250 ms, 500 ms, 1,000 ms
Output	Number of outputs	Built-in 2 NPN or PNP transistor digital outputs and 1 analog output
	Transistor output	NPN: Max. durable pressure 30V / 100 mA, residual voltage 1.5V PNP: Max. durable pressure 30V / 100 mA, residual voltage 1.5V
	Analog output	1 ~ 5V: Min. output load resistance 1,000 Ω 4 ~ 20 mA: Max. output load resistance 400 Ω; linear inaccuracy < 2% entire process
	Response time	2 ms, 4 ms, 10 ms, 30 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1,000 ms, 5,000 ms
	Output inaccuracy	Linear inaccuracy: < ± 2% entire process
Shock Resistance		10 ~ 550 Hz, 100 mm, 3 axes for 2 hours
Vibration Resistance		Max. 100 m/s ² , 3 axes 6 directions, 3 times each
Operating Ambient Temperature		0°C ~ +50°C
Storage Temperature		-20°C ~ +65°C
Altitude		< 2,000 m
Operating Relative Humidity		35% ~ 80% RH (non-condensing)

Product Profile & Outline



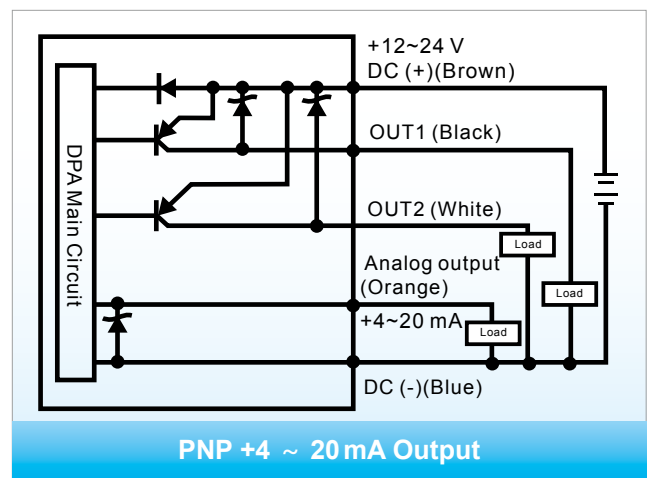
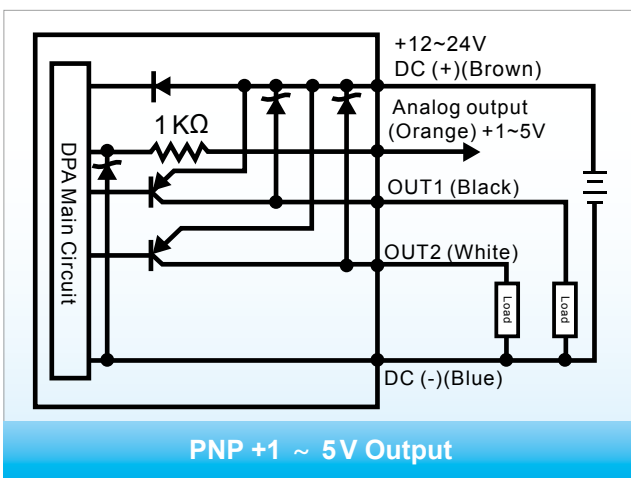
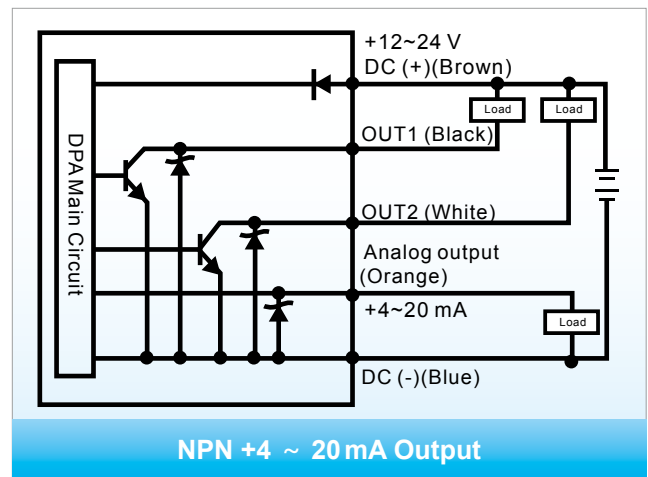
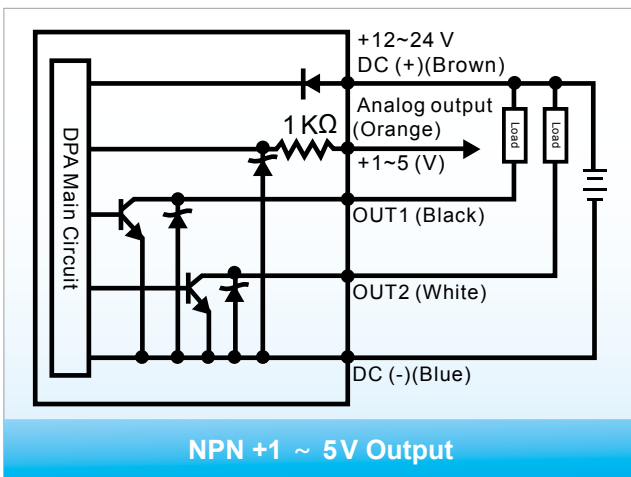
- 1 Analog output indicator
- 2 Digital output 1 indicator
- 3 Digital output 2 indicator
- 4 Pressure / parameter display
- 5 SV / setup item display
- 6 UP key
- 7 SET key
- 8 DOWN key
- 9 Power supply and output terminals
- 10 Pressure input pore

Terminals



- 1 Positive power supply input (Brown)
- 2 Digital output 1 signal (Black)
- 3 Digital output 2 signal (White)
- 4 Analog output signal (Orange)
- 5 Negative power supply input (Blue)

Various Output Control Modes



Ordering Information

DPA 0 1 N - P

Range for Pressure Measurement

01 -100 kPa ~ 100 kPa
10 -100 kPa~1,000 kPa

Pressure Pore Type

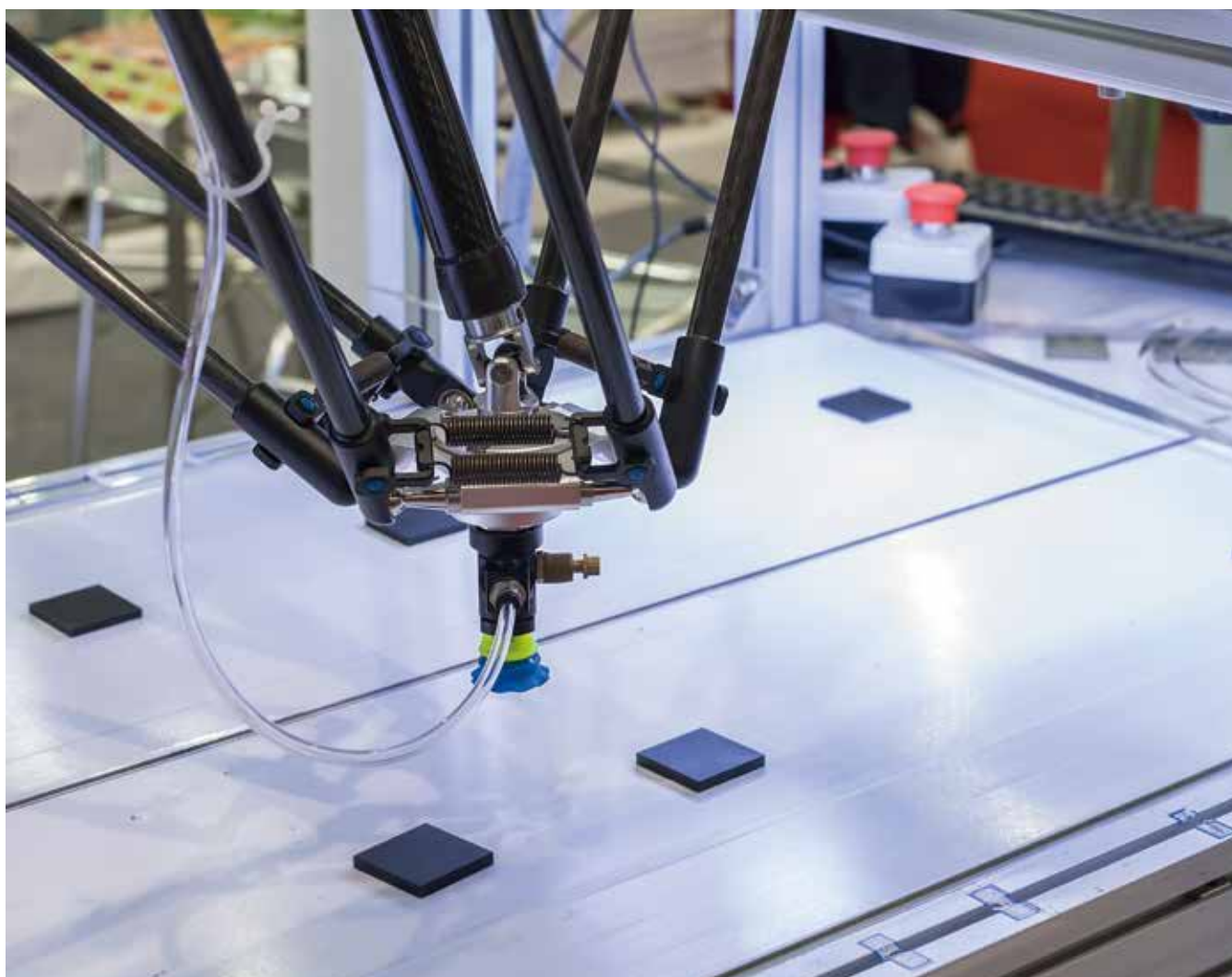
P Outer 1/8 PT, inner pore M5
N Outer 1/8 NPT, inner pore M5

Output Type

N NPN output + 4 ~ 20 mA
M NPN output + 1 ~ 5V
P PNP output + 4 ~ 20 mA
Q PNP output + 1 ~ 5V

Product Name

DPA Series pressure sensor



Cost-efficient Multifunction Pressure Sensor DPB Series

- ▶ Various unit conversion
- ▶ Various output modes
- ▶ 3 sets of color displays
- ▶ 10 sets of output response time setup
- ▶ Fast zero reset
- ▶ Safety control function
- ▶ Easy code display



Various Unit Conversion

The DPB Series offers 6 kinds of globally adopted pressure units for measurement and display.



3-Color LCD Display (Green, Red, Orange)

The large LCD with a green, red and orange 3-color LCD display allows users to set the display color according to the ambient environment, such as when the pressure is in normal range or exceeds the tolerance range. The display's color is orange when in parameter setup mode. This makes it easier for reading and reducing operation errors.



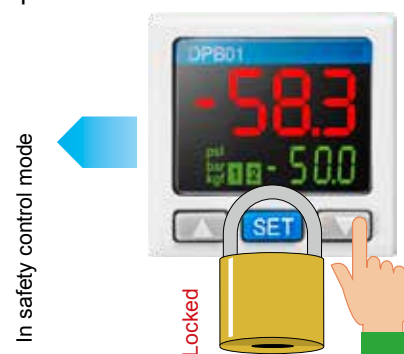
Color for upper / lower limit display (green / red)



Parameter set up (orange)

Safety Control Mode

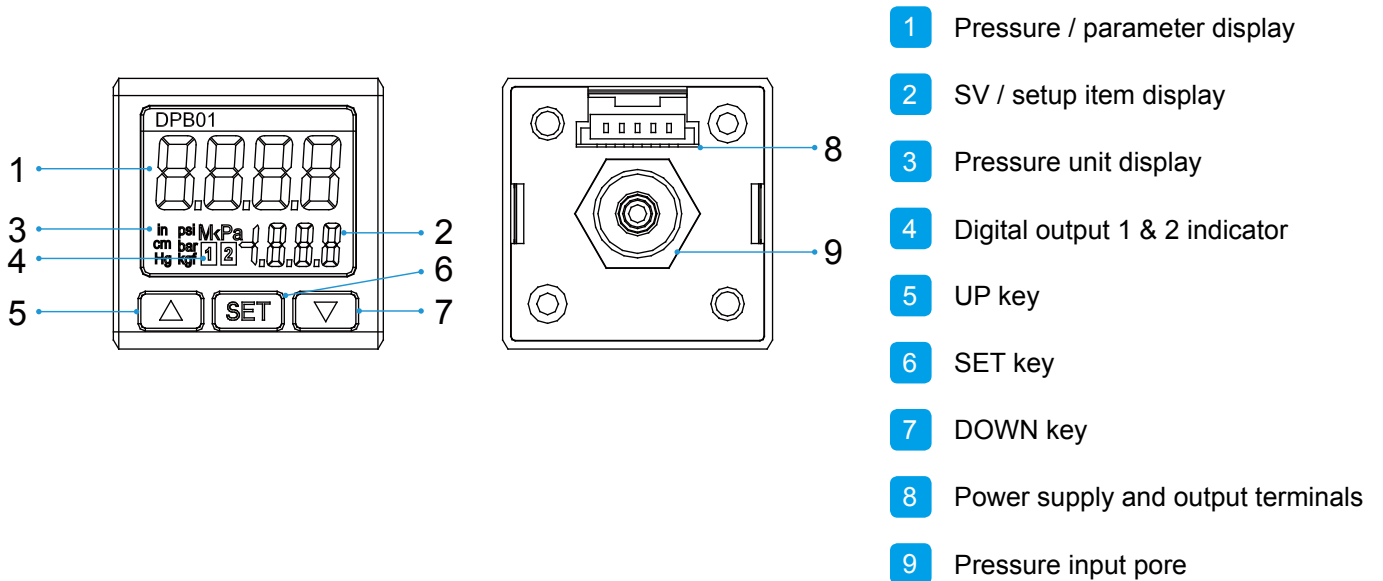
The safety control mode prevents operators from carelessly touching relevant parameters and affecting the operation and production of the equipment.



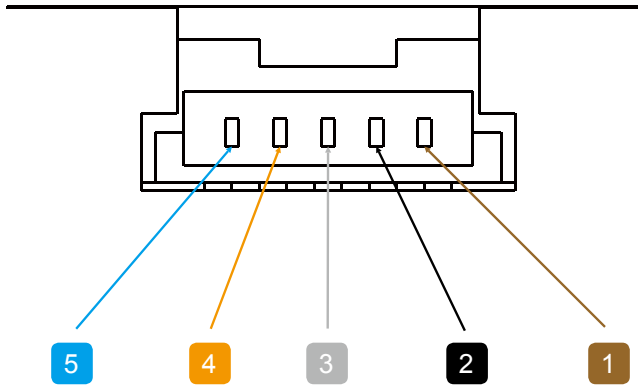
Specifications

Power Supply	Voltage range	12 ~ 24 V _{DC} ± 10% no isolation
	Power consumption	40 mA Max.
Pressure Measurement	Pressure type	Non-corrosive gas, gauge type
	Measurable range	DPB01: -100 kPa ~ 100 kPa; DPB10: -100 kPa ~ 1,000 kPa
	Max. durable pressure	DPB01: 200 kPa; DPB10: 1,500 kPa
	Accuracy	± 3% entire process
Display	Setup display	2-line LCD display, 4 digits for measured value and 3.5 digits for setup display
	Cycle	100ms, 250ms, 500ms, 1,000ms
Output	Number of outputs	Built-in 2 NPN or PNP transistor digital outputs
	Transistor output	Max. durable pressure 30V / 100mA, residual voltage 1.5V
	Response time	2ms, 4ms, 10ms, 30ms, 50ms, 100ms, 250ms, 500ms, 1,000ms, 5,000ms
Temperature	Ambient: 0°C ~ +50°C; Storage: -20°C ~ +65°C	
Ambient humidity	35% ~ 80% RH (non-condensing)	

Product Profile & Outline

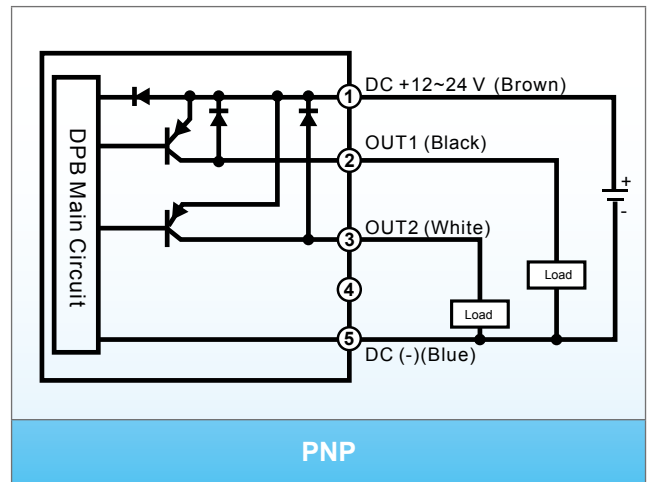
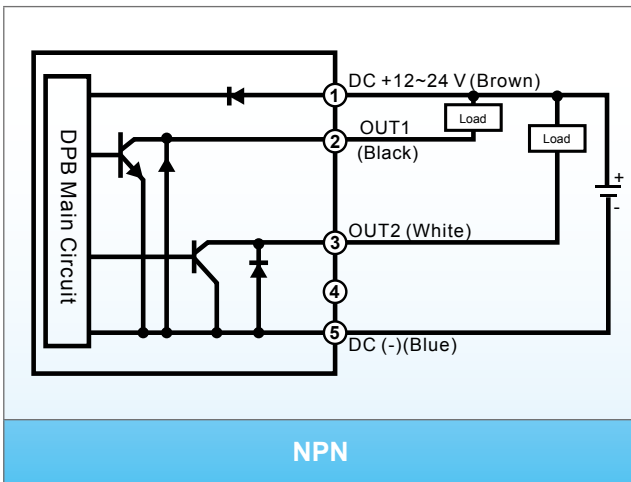


Terminals



- 1 Positive power supply input (Brown)
- 2 Digital output 1 signal (Black)
- 3 Digital output 2 signal (White)
- 4 No function (Orange)
- 5 Negative power supply input (Blue)

Various Output Control Modes



Ordering Information

DPB **0** **1** **N** - **P**

Range for Pressure Measurement

- 01** -100 kPa ~ 100 kPa
- 10** -100 kPa ~ 1,000 kPa

Product Name

DPB Series pressure sensor

Pressure Pore Type

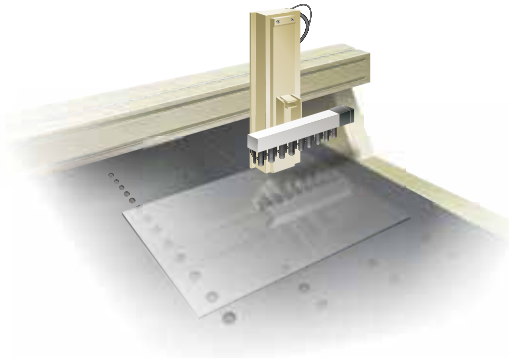
- P** Outer pore 1/8 PT, inner pore M5
- N** Outer pore 1/8 NPT, inner pore M5
- G** Outer pore 1/8 G, inner pore M5

Output Type

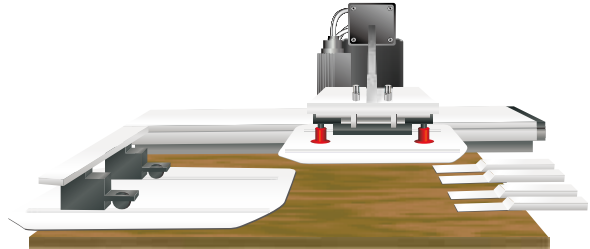
- N** NPN output
- P** PNP output

Applications

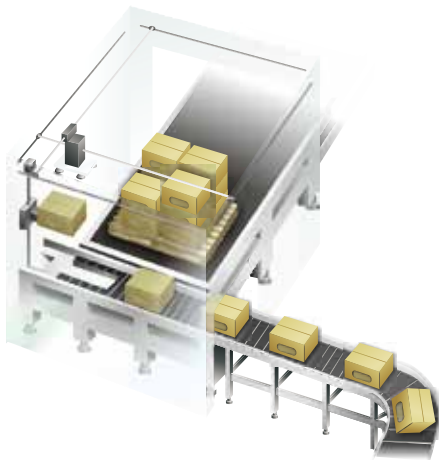
- **Mechanical Processing Industry**
Mechanical product processing and fixing



- **Solar Energy Industry**
Turnkey module lines suction



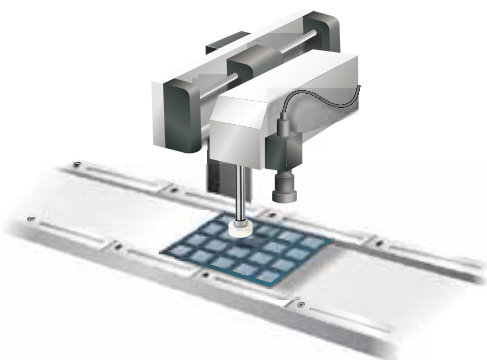
- **Food Packaging Industry**
Drinks, cans suction and packaging



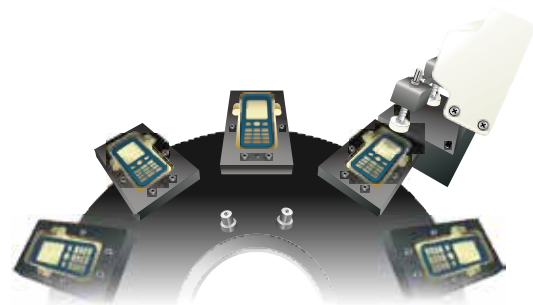
- **Semiconductor Industry**
Wafer suction and loading



- **Electronic Components Industry**
IC component suction and confirmation

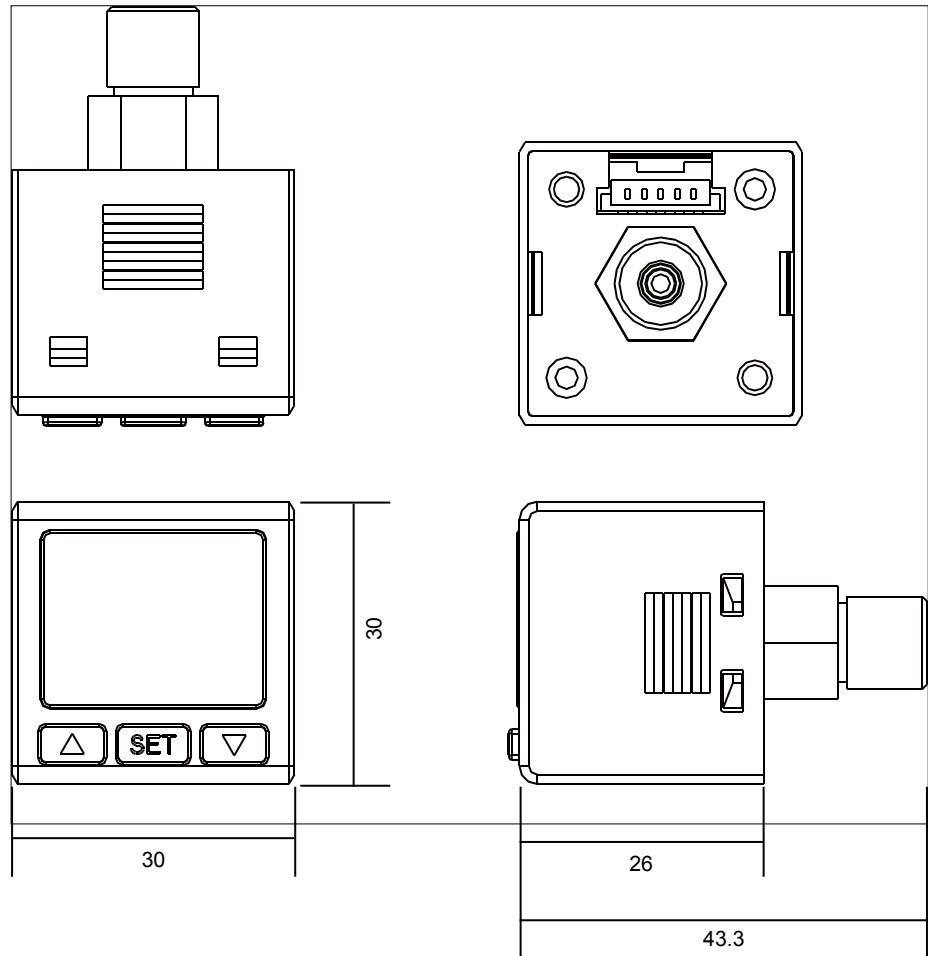


- **Automatic Assembly Industry**
Automation component assembly and confirmation



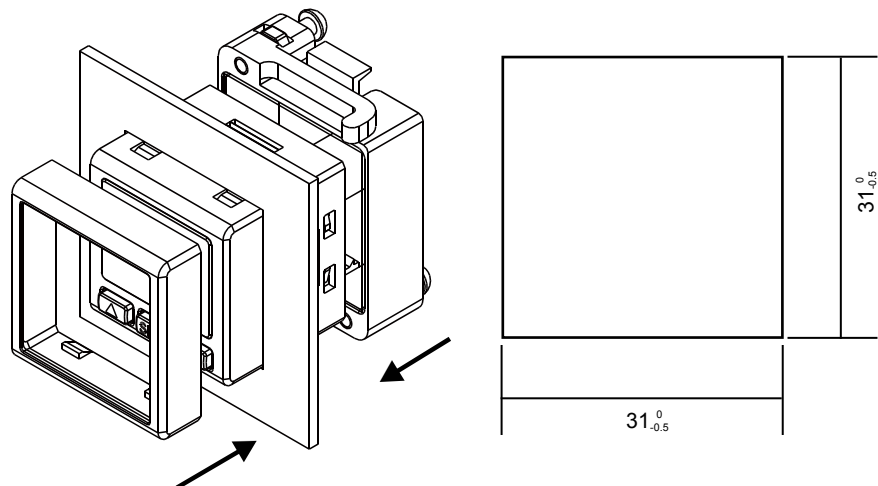


Dimensions (DPA / DPB) Unit : mm



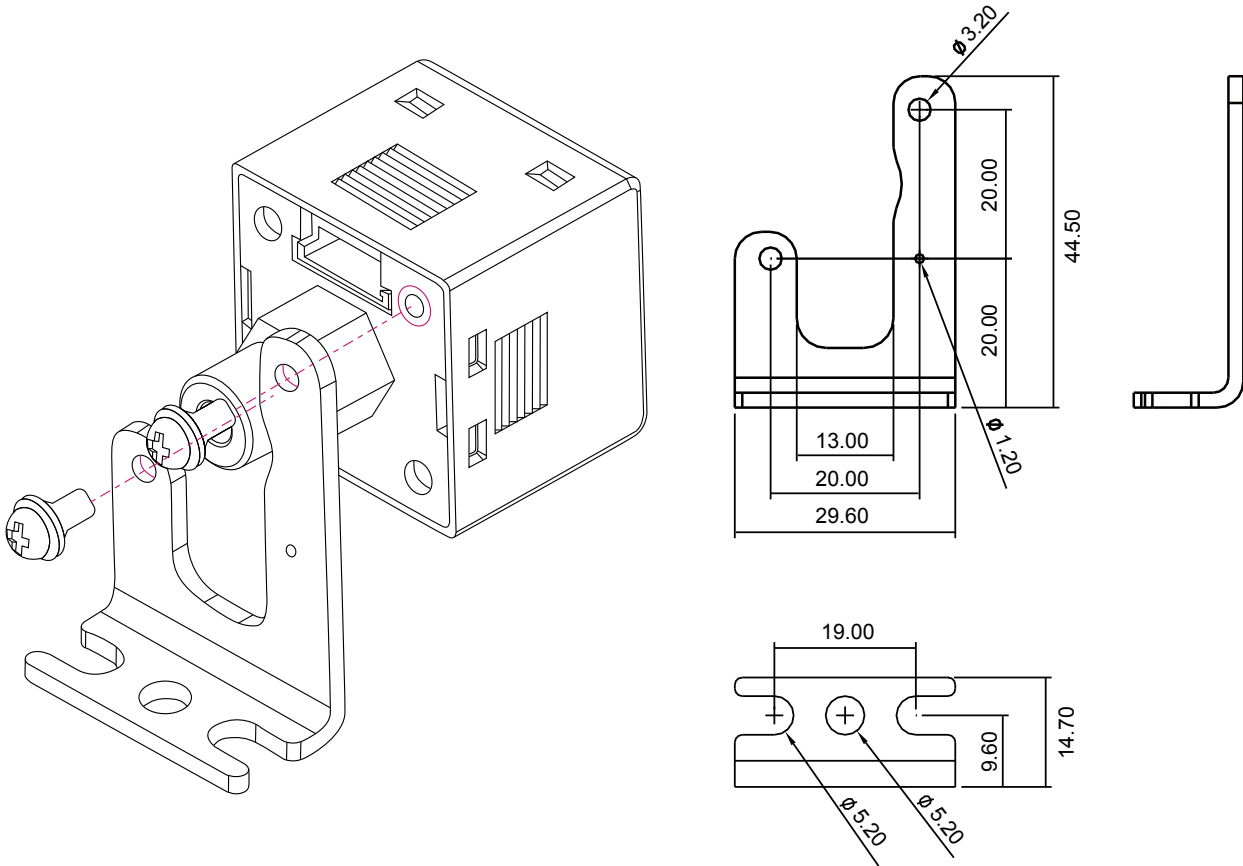
Panel Accessory (DPA / DPB) Unit : mm

Model: DPA-PFKit



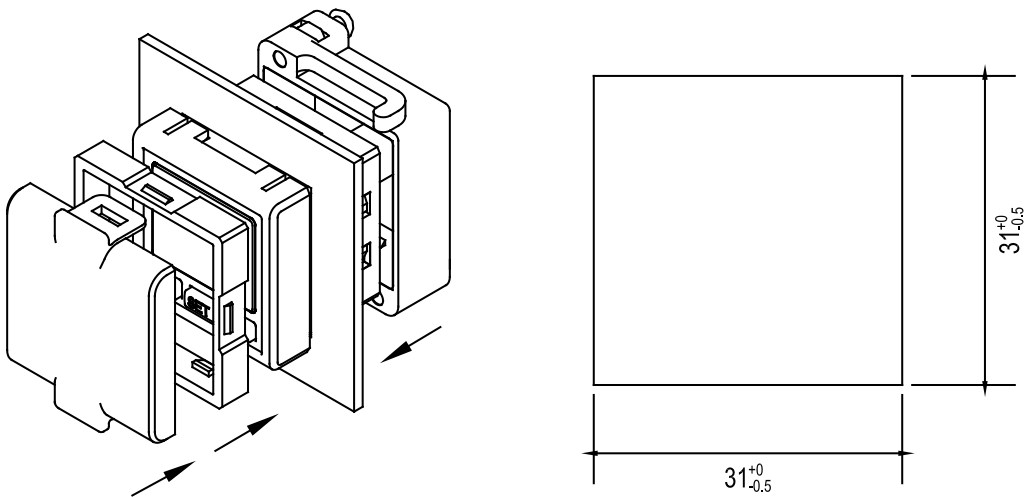
Shelf Accessory (DPA / DPB) Unit : mm

Model: DPA-FMKit



Transparent Protective Cover (DPA / DPB) Unit : mm

Model: DPA-FPCKIT





Smarter. Greener. Together.

Industrial Automation Headquarters

Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia

Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: 86-21-6872-3988 / FAX: 86-21-6872-3996
Customer Service: 400-820-9595

Delta Electronics (Japan), Inc.

Tokyo Office
Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: 81-3-5733-1155 / FAX: 81-3-5733-1255

Delta Electronics (Korea), Inc.

Seoul Office
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: 91-124-4874900 / FAX : 91-124-4874945

Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: 66-2709-2800 / FAX : 662-709-2827

Delta Energy Systems (Australia) Pty Ltd.

Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia
TEL: 61-3-9543-3720

Americas

Delta Products Corporation (USA)

Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

Delta Greentech (Brasil) S/A

São Paulo Office
Rua Itapeva, 26 – 3° Andar - Bela Vista
CEP: 01332-000 – São Paulo – SP - Brasil
TEL: 55-11-3530-8642 / FAX: 55-11-3530-8640

Delta Electronics International Mexico S.A. de C.V.

Mexico Office
Vía Dr. Gustavo Baz No. 2160, Colonia La Loma,
54060 Tlalnepantla Estado de Mexico
TEL: 52-55-2628-3015 #3050/3052

EMEA

Delta Electronics (Netherlands) BV

Eindhoven Office
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
MAIL: Sales.IA.EMEA@deltaww.com
MAIL: Sales.IA.Benelux@deltaww.com

Delta Electronics (France) S.A.

ZI du bois Chaland 2 15 rue des Pyrénées,
Lisses 91056 Evry Cedex, France
MAIL: Sales.IA.FR@deltaww.com

Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1° Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
C/Llull, 321-329 (Edificio CINC) | 22@Barcelona, 08019 Barcelona
MAIL: Sales.IA.Iberia@deltaww.com

Delta Electronics (Italy) Srl

Ufficio di Milano Via Senigallia 18/2 20161 Milano (MI)
Piazza Grazioli 18 00186 Roma, Italy
MAIL: Sales.IA.Italy@deltaww.com

Delta Electronics (Netherlands) BV

Coesterweg 45, D-59494 Soest, Germany
MAIL: Sales.IA.DACH@deltaww.com

Delta Energy Systems LLC (CIS)

Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow, Russia
MAIL: Sales.IA.RU@deltaww.com

Delta Greentech Ltd. (Turkiye)

Serifali Mevkii Barboros Bulvari Soylesi Sok
No 19 34775, Y.Dudullu-Umraniye/Istanbul
MAIL: Sales.IA.Turkey@delta-emea.com

Delta Energy Systems AG (Dubai BR)

P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre,
Dubai, United Arab Emirates
MAIL: Sales.IA.MEA@deltaww.com

*We reserve the right to change the information in this catalogue without prior notice.