



Digitized Automation for a Changing World

Delta Smart Sensors



www.deltaww.com





Sensing for Smart Manufacturing

In the new era of Smart Manufacturing, the demand for different types of sensors is accelerating automation production line processes with an emphasis on product quality. By obtaining environmental and product data quickly and precisely, smart manufacturing increases productivity as well as manual yield.

Delta's smart sensors feature a slim design with different exteriors and can be applied to a wide range of applications, such as logistics, packaging, components, woodworking, warehousing, machine tool industries, and other industrial automation production lines. All types of sensors offer stable quality and superior performance, and provide a brilliant solution for smart manufacturing.



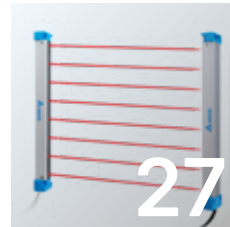
**Inductive Proximity
Sensor**



**Photoelectric
Sensor**



Laser Displacement



Area Sensor



**Multifunction
Pressure Sensor**



Gas Flow Meter



**Timer/Counter/
Tachometer**

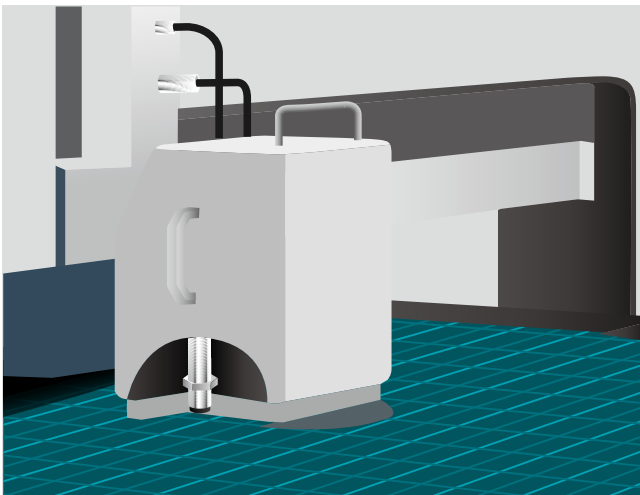
Inductive Proximity Sensor ISE

Senses magnetic substances for positioning, counting, and presence / absence detection, applicable to all industries

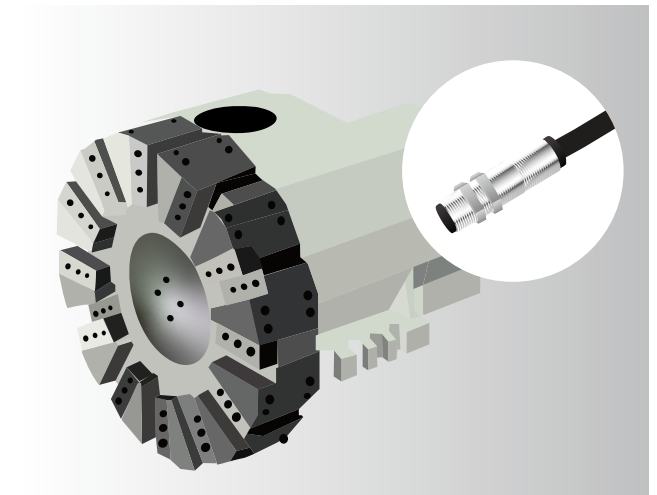
- Nickel coated brass / stainless steel
- Presence / absence detection of magnetic substance
- IP67
- CE certification
- Reverse voltage protection (RVP)



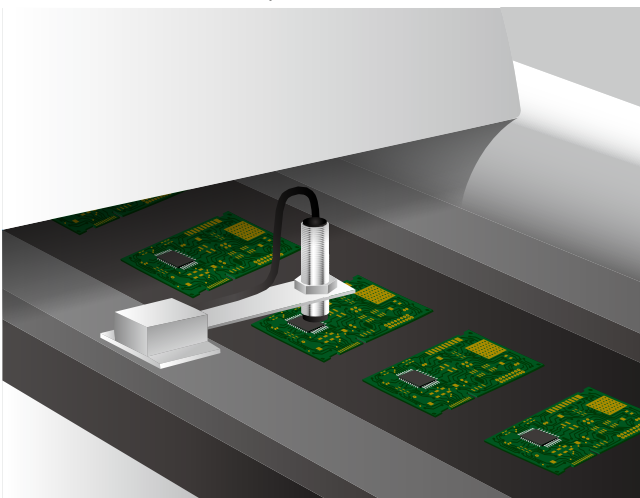
Applications



Vertical adjustment for high-speed mobile platform



Turret tool positioning



PCB solder inspection



Can-counting for the food industry

Cable Type Specifications

Standard Distance

Model	ISE-E0815-B__B2*	ISE-E1202-B__B2*	ISE-E1805-B__B2*	ISE-E3010-B__B2*	ISE-N0802-B__B2*	ISE-N1204-B__B2*	ISE-N1808-B__B2*	ISE-N3015-B__B2*
Type	Isolation				Non-isolation			
Size	M8	M12	M18	M30	M8	M12	M18	M30
Sensing Distance	1.5mm ± 10%	2mm ± 10%	5mm ± 10%	10mm ± 10%	2mm ± 10%	4mm ± 10%	8mm ± 10%	15mm ± 10%
Case Material	Stainless	Nickel coated brass			Stainless	Nickel coated brass		
Operating Voltage	12 ~ 24 V _{DC} ± 10%							
Residual Voltage	< 2.0V							
Consuming Current	< 10mA							
Max. Load Current	150mA							
Leakage Current	< 0.01mA							
Response Frequency	2 KHz	1KHz		300Hz	1KHz	800Hz	500Hz	150Hz
Repeatability	< 10% (Sr)							
Hysteresis	< 15% (Sr)							
Sensing Surface	PBT							
Operating Temperature	- 25 ~ + 75 °C							
Circuit Protection	Short-circuit protection							
Rating	IP67							

* Note: Customers can choose from NPN normal open: NO, NPN normal close: NC, PNP normal open: PO, PNP normal close: PC, depending on the requirements

Extended Distance

Model	ISE-E0802-B__B2*	ISE-E1204-B__B2*	ISE-E1808-B__B2*	ISE-E3016-B__B2*	ISE-N0804-B__B2*	ISE-N1208-B__B2*	ISE-N1816-B__B2*	ISE-N3025-B__B2*
Type	Isolation				Non-isolation			
Size	M8	M12	M18	M30	M8	M12	M18	M30
Sensing Distance	2mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	4mm ± 10%	8mm ± 10%	16mm ± 10%	25mm ± 10%
Case Material	Stainless	Nickel coated brass			Stainless	Nickel coated brass		
Operating Voltage	12 ~ 24 V _{DC} ± 10%							
Residual Voltage	< 2.0V							
Consuming Current	< 10mA							
Max. Load Current	150mA							
Leakage Current	< 0.01mA							
Response Frequency	1KHz	800Hz	500Hz	150Hz	800Hz	500Hz	150Hz	100Hz
Repeatability	< 10% (Sr)							
Hysteresis	< 15% (Sr)							
Sensing Surface	PBT							
Operating Temperature	- 25 ~ + 75 °C							
Circuit Protection	Short-circuit protection							
Rating	IP67							

* Note: Customers can choose from NPN normal open: NO, NPN normal close: NC, PNP normal open: PO, PNP normal close: PC, depending on the requirements

** Note: The sensing side of the ISE-E1808-B__B2 requires a 1mm reveal from the hexagon nut while mounting

Connector Type Specifications

Standard Distance

Model	ISE-E0815-B__BA*	ISE-E1202-B__BC*	ISE-E1805-B__BC*	ISE-E3010-B__BC*	ISE-N0802-B__BA*	ISE-N1204-B__BC*	ISE-N1808-B__BC*	ISE-N3015-B__BC*
Mounting	Isolation				Non-isolation			
Size	M8	M12	M18	M30	M8	M12	M18	M30
Sensing Distance	1.5 mm ± 10 %	2 mm ± 10 %	5 mm ± 10 %	10 mm ± 10 %	2 mm ± 10 %	4 mm ± 10 %	8 mm ± 10 %	15 mm ± 10 %
Case Material	Stainless	Nickel coated brass			Stainless	Nickel coated brass		
Operating Voltage	12 ~ 24 V _{DC} ± 10 %							
Residual Voltage	< 1.5 V							
Consuming Current	< 10 mA							
Max. Load Current	150 mA							
Leakage Current	< 0.01 mA							
Response Frequency	2 KHz		1 KHz	300 Hz	2 KHz	1 KHz	500 Hz	150 Hz
Repeatability	< 10 % (Sr)							
Hysteresis	< 15 % (Sr)							
Sensing Surface	PBT							
Operating Temperature	- 25 ~ + 75 °C							
Circuit Protection	Short-circuit protection							
Rating	IP67							

* **Note:** Customers can choose from NPN normal open: NO, NPN normal close: NC, PNP normal open: PO, PNP normal close: PC, depending on the requirements

Extended Distance

Model	ISE-E0802-B__BA*	ISE-E1204-B__BC*	ISE-E1808-B__BC*	ISE-E3016-B__BC*	ISE-N0804-B__BA*	ISE-N1208-B__BC*	ISE-N1816-B__BC*	ISE-N3025-B__BC*
Mounting	Isolation				Non-isolation			
Size	M8	M12	M18	M30	M8	M12	M18	M30
Sensing Distance	2 mm ± 10 %	4 mm ± 10 %	8 mm ± 10 %	16 mm ± 10 %	4 mm ± 10 %	8 mm ± 10 %	16 mm ± 10 %	25 mm ± 10 %
Case Material	Stainless	Nickel coated brass			Stainless	Nickel coated brass		
Operating Voltage	12 ~ 24 V _{DC} ± 10 %							
Residual Voltage	< 1.5 V							
Consuming Current	< 10 mA							
Max. Load Current	150 mA							
Leakage Current	< 0.01 mA							
Response Frequency	2 KHz	1 KHz		500 Hz	1 KHz	500 Hz	150 Hz	100 Hz
Repeatability	< 10 % (Sr)							
Hysteresis	< 15 % (Sr)							
Sensing Surface	PBT							
Operating Temperature	- 25 ~ + 75 °C							
Circuit Protection	Short-circuit protection							
Rating	IP67							

* **Note:** Customers can choose from NPN normal open: NO, NPN normal close: NC, PNP normal open: PO, PNP normal close: PC, depending on the requirements

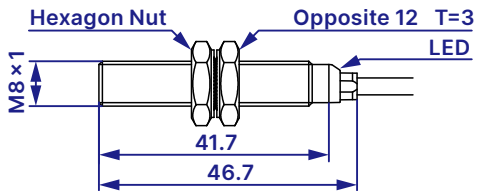
** **Note:** The sensing side of the ISE-E1808-B__BC requires a 1mm reveal from the hexagon nut while mounting

Dimensions: Cable Type (Standard / Extended Distance)

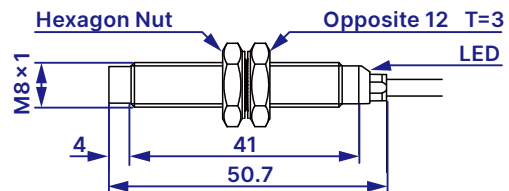
Unit: mm

M8

ISE-E0815-B__B2 /
ISE-E0802-B__B2

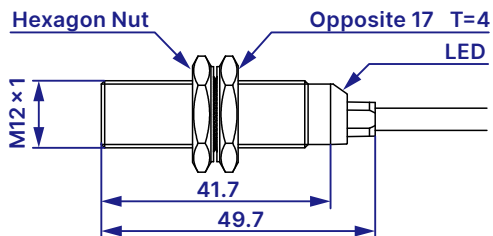


ISE-N0802-B__B2 /
ISE-N0804-B__B2

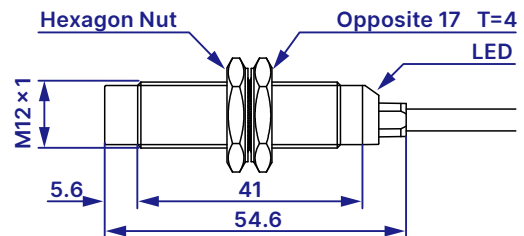


M12

ISE-E1202-B__B2 /
ISE-E1204-B__B2

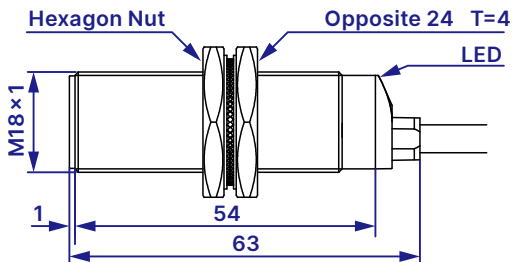


ISE-N1204-B__B2 /
ISE-N1208-B__B2

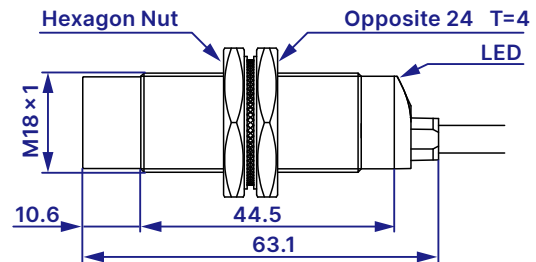


M18

ISE-E1805-B__B2 /
ISE-E1808-B__B2

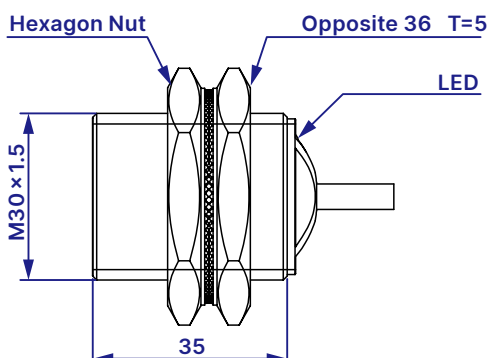


ISE-N1808-B__B2 /
ISE-N1816-B__B2

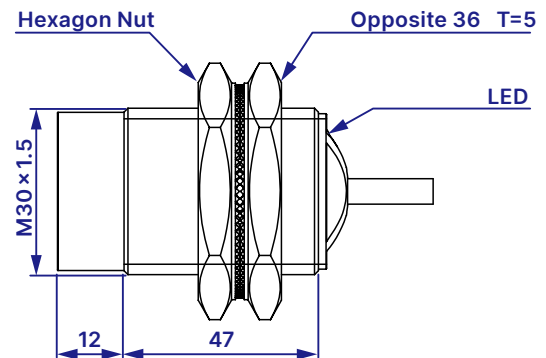


M30

ISE-E3010-B__B2 /
ISE-E3016-B__B2



ISE-N3015-B__B2 /
ISE-N3025-B__B2

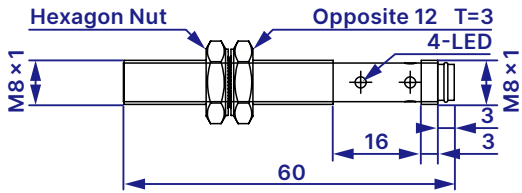


Dimensions: Connector Type

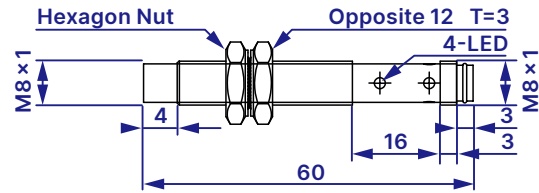
Unit: mm

M8

ISE-E0815-B__BA /
ISE-E0802-B__BA

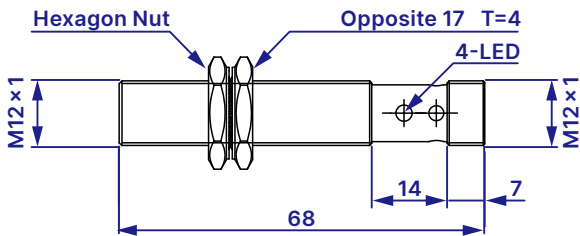


ISE-N0802-B__BA /
ISE-N0804-B__BA

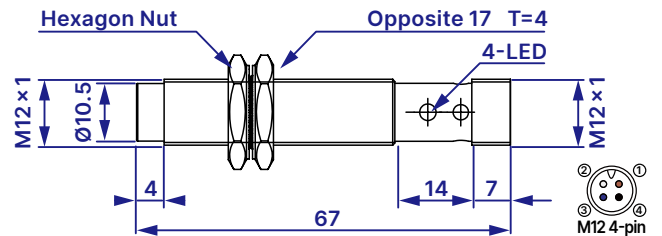


M12

ISE-E1202-B__BC /
ISE-E1204-B__BC

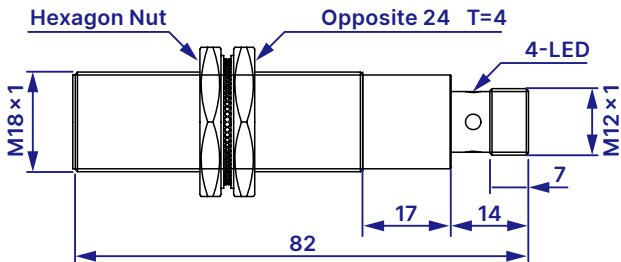


ISE-N1204-B__BC

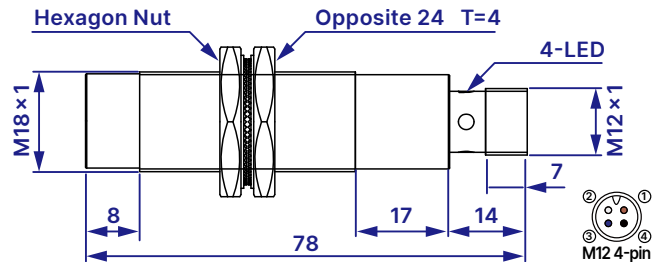


M18

ISE-E1805-B__BC /
ISE-E1808-B__BC

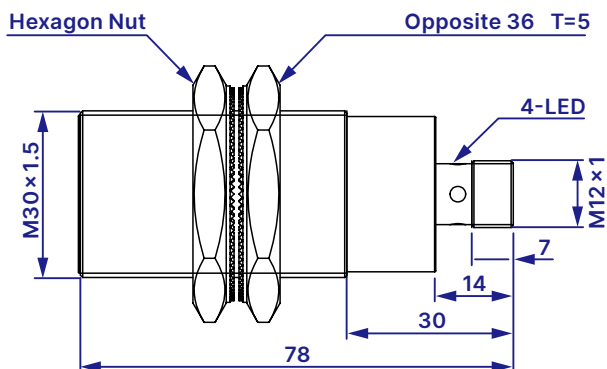


ISE-N1808-B__BC

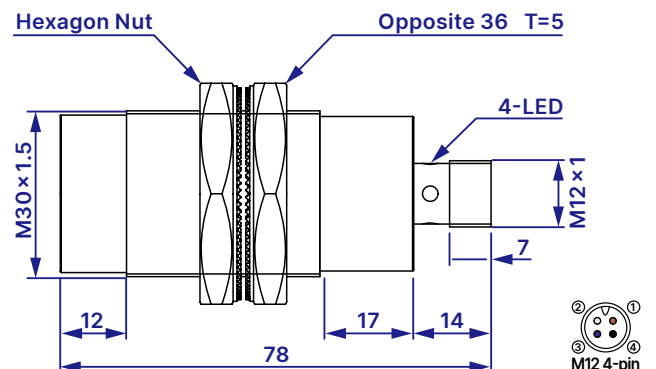


M30

ISE-E3010-B__BC /
ISE-E3016-B__BC

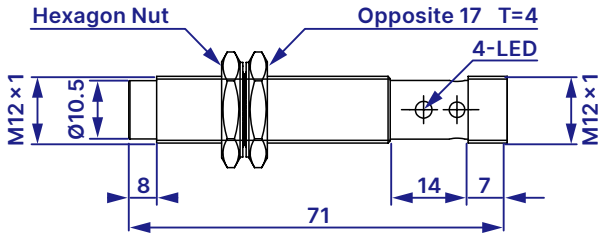


ISE-N3015-B__BC



M12

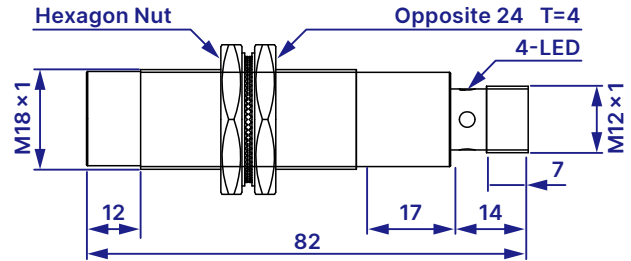
ISE-N1208-B__BC



M18

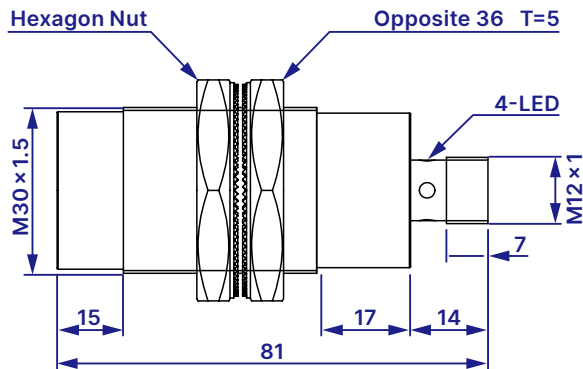
ISE-N1816-B__BC

Unit: mm



M30

ISE-N3025-B__BC



Ordering Information

ISE - N0802 - B NO B2

Product Name _____
Inductive Proximity Sensor

Mounting _____
N: Non-isolation
E: Isolation

Diameter Size _____
08: 8 mm 18: 18 mm
12: 12 mm 30: 30 mm

Type
B2: 2 m Cable
BA: M8 3Pin Connector
BC: M12 4Pin Connector

Output
NO: NPN N/O PO: PNP N/O
NC: NPN N/C PC: PNP N/C



Sensing Distance
02: 2 mm 08: 8 mm 16: 16 mm
04: 4 mm 10: 10 mm 25: 25 mm
05: 5 mm 15: 1.5 mm (M8) or 15 mm

Rectangular Inductive Proximity Sensor IS-R Series

Senses magnetic substances for positioning, and counting; robust IP67 rating for stable sensing applications

- IP67
- 2 installation methods available
- Applicable for high-speed rotation control



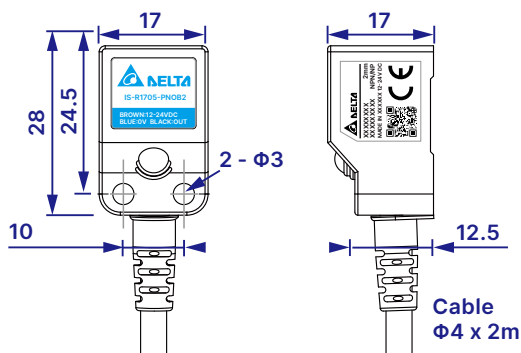
Appearance	Dimensions (mm)	Sensing Distance (mm)	Min. Sensing Capability (mm)	Model			
				NPN		PNP	
				NO	NC	NO	NC
	17 × 17	5	17 × 17 × 1.0 (Iron)	IS-R1705-PNOB2	IS-R1705-PNCB2	IS-R1705-PPOB2	IS-R1705-PPCB2
	18 × 18	4	18 × 18 × 1.0 (Iron)	IS-R1804-PNOB2	IS-R1804-PNCB2	IS-R1804-PPOB2	IS-R1804-PPCB2

Influence of Sensing Material

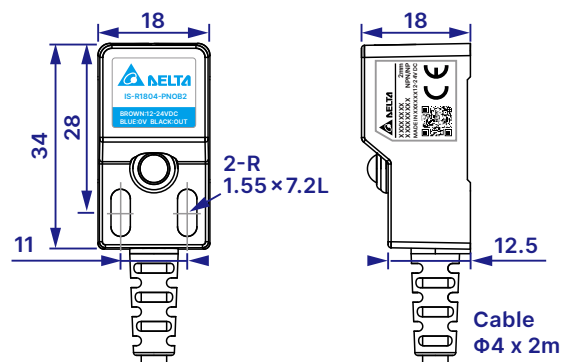
Material	Iron	Stainless Steel	Aluminum	Brass	Copper
Decrement Value (%)	100	Approx. 70	Approx. 30	Approx. 30	Approx. 20

Dimensions

IS-R1705-P__B_



IS-R1804-P__B_



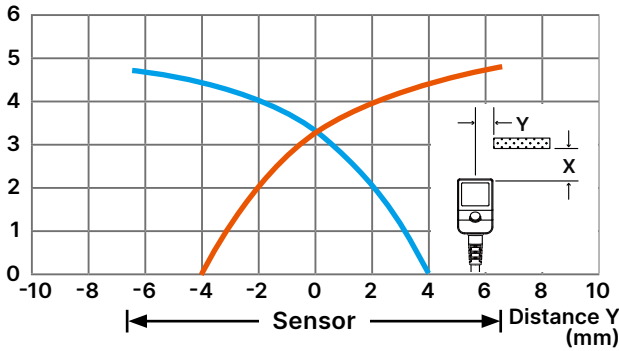
Unit: mm

Specifications

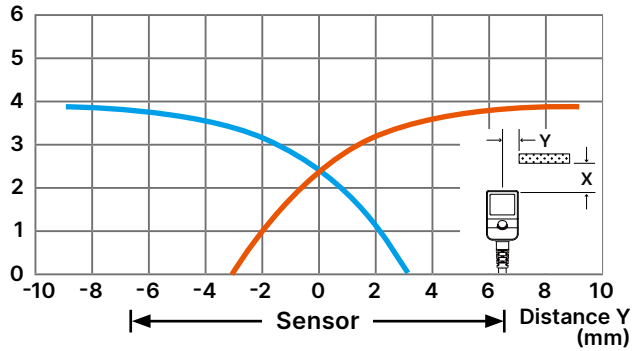
Rectangular Inductive Proximity Sensor IS-R Series			
Response Frequency	600 Hz	Residual Voltage	< 1.0 V _{bc}
Hysteresis	< 10 % of sensing distance	Operating Temperature	-20 ~ 70 °C
Operating Voltage	12 ~ 24 V _{bc} ± 10 %	Material	ABS/PE
Consumption Current	< 8 mA (Unloaded)	Rating	IP67
Load Current	200 mA	Circuit Protection	Reverse Voltage, Short-circuit Output
Drain Voltage	1.1 mA (Unloaded)		

Sensing Range

IS-R1705-P__B_



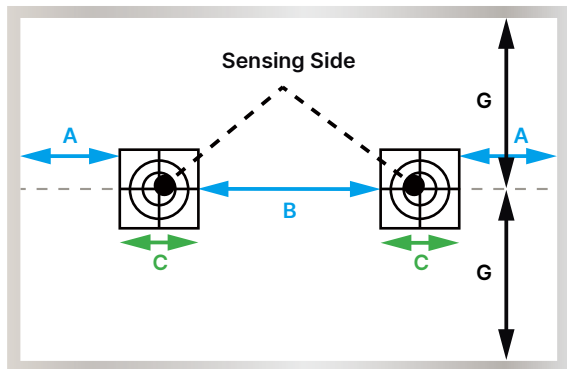
IS-R1804-P__B_



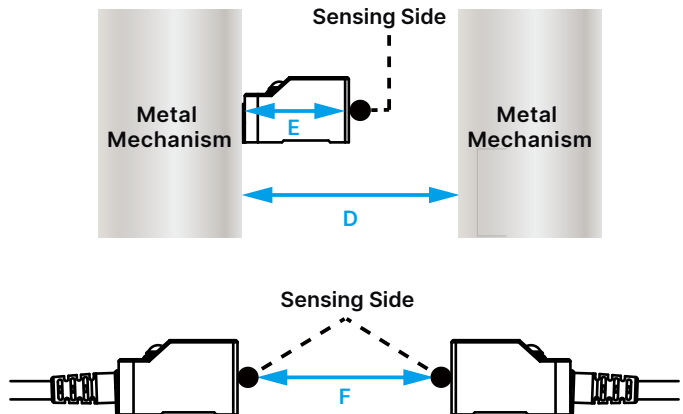
Installation Information

Unit: mm

Model	A	B	C	D	E	F	G
R1705	17	34	17	15	10	40	25
R1804	18	36	18	15	10	40	25



*Note: The grey outline indicates metal mechanisms





Photoelectric Sensor PS-R Series

Standard rectangular design, available in trimmer and TEACH types. Senses light-absorption for positioning, counting and object detection, applicable in all industries

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

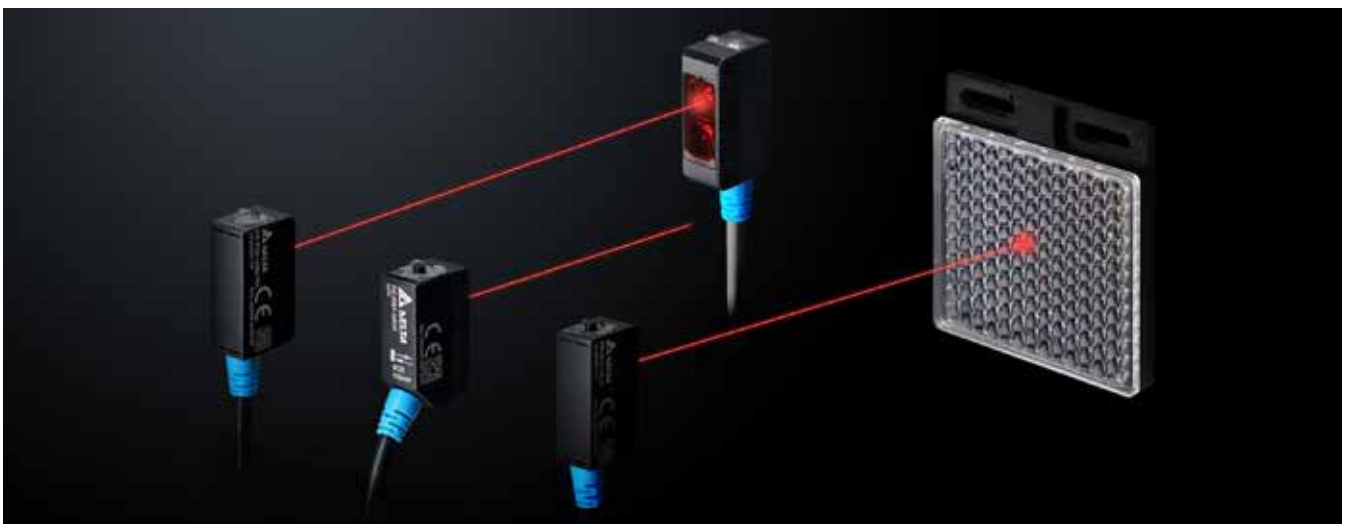


Appearance	Sensing Method	Sensing Distance	NPN	PNP	Connection
 Rectangular Type (Trimmer*1)	Small Spot Reflective*2	5 ~ 100 mm	PS-RS1-NS12	PS-RS1-PS12	2 m cable (3 wires)
	Diffuse Reflective	5 ~ 300 mm	PS-RR3-NS12	PS-RR3-PS12	
		1 m	PS-RR9-NS12	PS-RR9-PS12	
	Retro-reflective*3	4.2 m	PS-RL4-NS12	PS-RL4-PS12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

*Note 1: Trimmer: Standard bracket included; TEACH: Optional bracket available (BK-PSR02)

*Note 2: Minimum spot 5mm in 100mm sensing distance

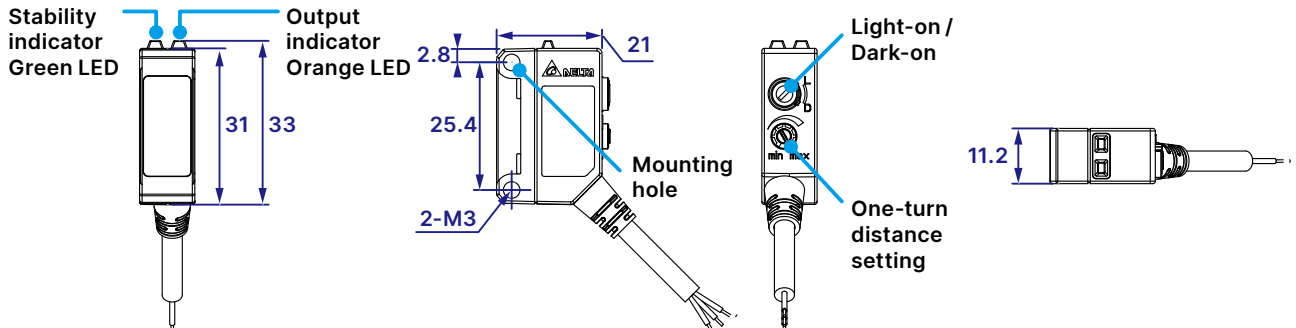
*Note 3: Retro-reflective: reflector included



Dimensions

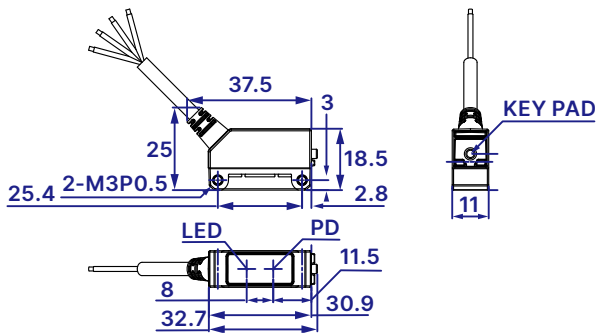
Unit: mm

Trimmer

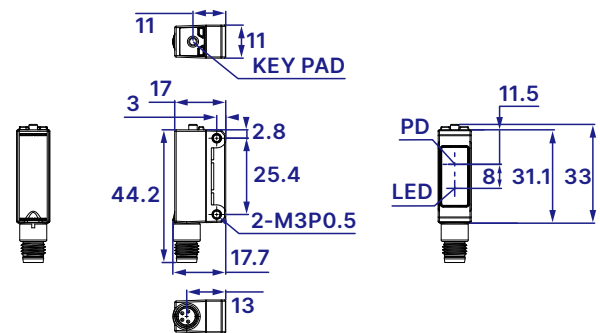


TEACH

Cable Type



Connector Type

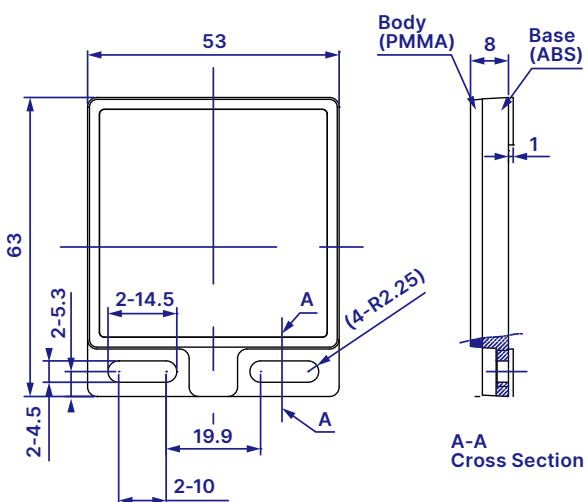


Accessories

Unit: mm

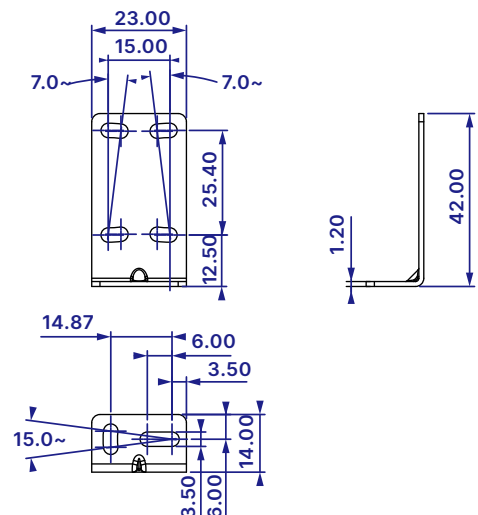
Reflector

Model RM-01



Bracket (Optional)

Model BK-PSR02





Photoelectric Sensor PS-F/PS-L Series

Lateral and flat designs meet the need for installation in small spaces. Senses light-absorption for positioning, counting, and object detection, applicable in all industries

- 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	
	Retro-reflective*	1m	PS-FL3-NLB2	PS-FL3-NDB2	PS-FL3-PLB2	PS-FL3-PDB2	
	Through-beam	1m	PS-FT3-NLB2	PS-FT3-NDB2	PS-FT3-PLB2	PS-FT3-PDB2	
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-LR2-NSB2		PS-LR2-USB2		2 m cable (4 wires)*
	Retro-reflective*	1m	PS-LL3-NSB2		PS-LL3-USB2		
	Through-beam	1m	PS-LT3-NSB2		PS-LT3-USB2		

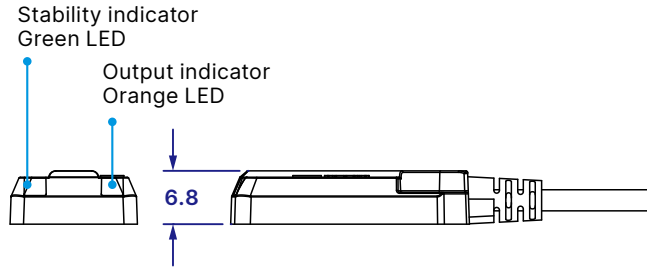
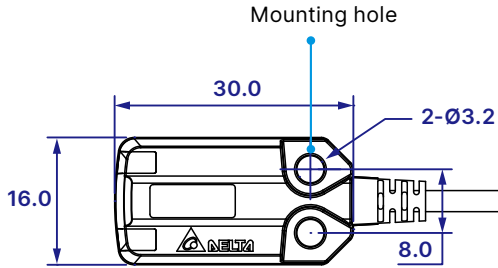
*Note: Retro-reflective: reflector included

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

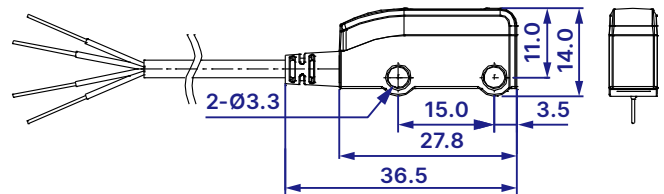
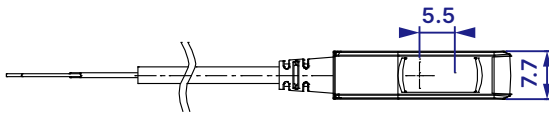
Dimensions

Unit: mm

Flat Type (PS-F)



Lateral Type (PS-L)

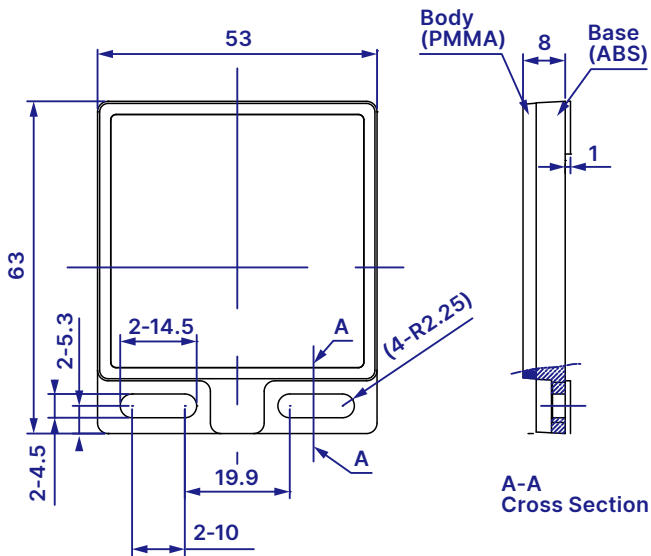


Accessories

Unit: mm

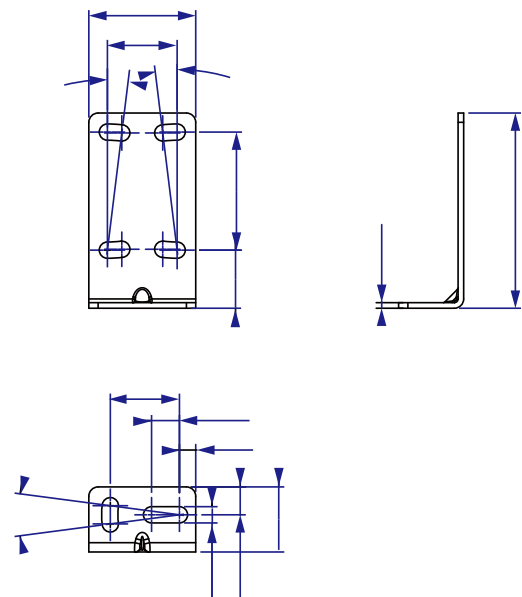
Reflector

Model RM-01



Bracket (Optional)

Model BK-PSR02




Photoelectric Sensor PS-M Series

Cylindrical design meets the need for installation in irregular shaped spaces. Senses the light-absorption for positioning, counting and object detection; applicable in all industries

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



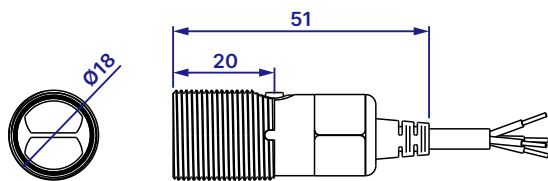
Appearance	Sensing Method	Sensing Distance	NPN	Push-pull	Connection
 Cylindrical Type (TEACH)	Diffuse Reflective	5 ~ 100 mm (Fixed)	PS-MR1-NSB2	PS-MR1-USB2	2 m cable (4 wires)*
			PS-MR1-NSBD	PS-MR1-USB2	M12 connector
		5 ~ 300 mm	PS-MR3-NS22	PS-MR3-US22	2 m cable (4 wires)*
			PS-MR3-NS2D	PS-MR3-US2D	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-USB2	M12 connector

*Note: Retro-reflective: reflector included
 *Note: 4 wires: Light-on, dark-on are switched by white wire.

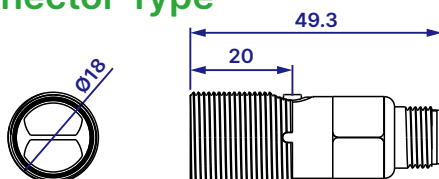
Dimensions

Unit: mm

Cable Type



Connector Type

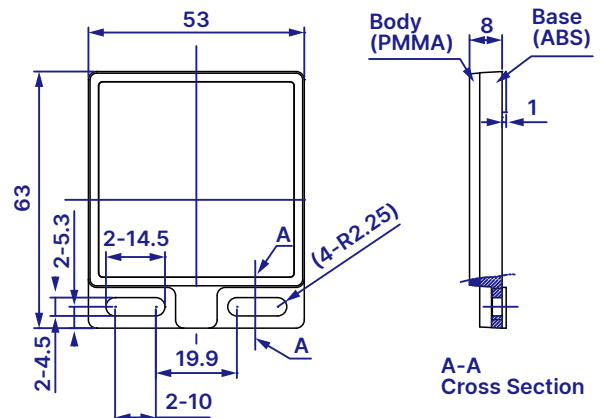


Accessories

Unit: mm

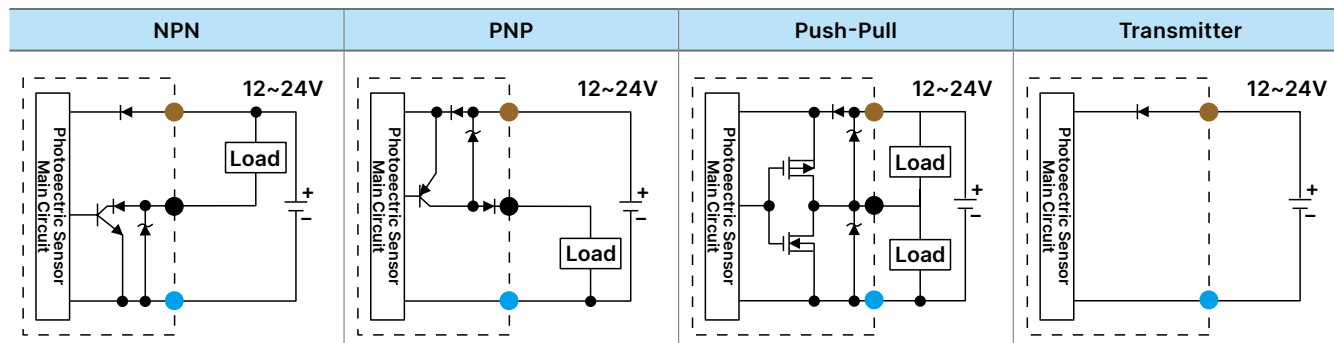
Reflector

Model RM-01

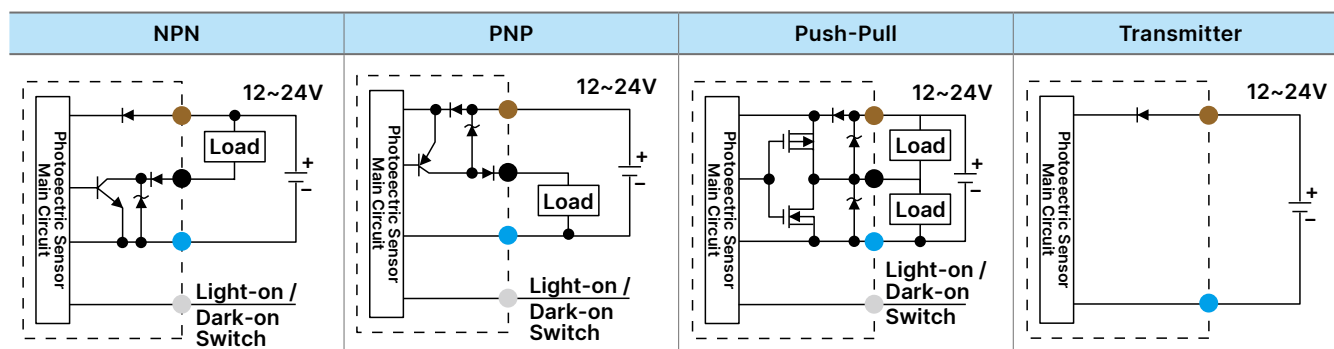


Input / Output Circuits

3 Wires



4 Wires





General Specifications


Model	PS-R	PS-M	PS-F	PS-L
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 ~ 55 °C			
Storage Temperature	-25 ~ 75 °C			
Ambient Humidity	30 ~ 85 %			
Enclosure Rating	IP67			
Ambient Light Resistance	5,000lux or less			
Vibration Resistance	10~55Hz, 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	> 20MΩ (500 V _{DC})			
Withstand Voltage	1,000 V _{AC} 50/60 Hz, 1 min			
Certifications	CE			

Photoelectric Sensor Specifications


Rectangular Type PS-R

Sensing Method			Diffuse Reflective			Retro-reflective	Through-beam
Type	Connection	Output	Small Spot	Standard	Long Distance	Standard	Standard
 Rectangular Type (Trimmer)	Cable	NPN	PS-RS1-NS12	PS-RR3-NS12	PS-RR9-NS12	PS-RL4-NS12	PS-RT9-NS12
		PNP	PS-RS1-PS12	PS-RR3-PS12	PS-RR9-PS12	PS-RL4-PS12	PS-RT9-PS12
 Rectangular Type (TEACH)	Cable	NPN	PS-RS1-NS22	PS-RR3-NS22	PS-RR9-NS22	PS-RL4-NS22	PS-RT9-NSB2 (Infrared)
		Push-pull	PS-RS1-US22	PS-RR3-US22	PS-RR9-US22	PS-RL4-US22	PS-RT9-USB2 (Infrared)
Sensing Distance			5 ~ 100 mm	5 ~ 300 mm	5 ~ 1,000 mm	4.2 m	10 m
Output			Light-on/Dark-on				
Lighting Source			Red LED	Red LED	Infrared	Red LED	Red LED/Infrared
Power Consumption			Max. 20 mA				Transmitter: Max. 6 mA Receiver: Max. 14 mA
Material			Lens: PC ; Case: PBT				
Cable			PS-R Trimmer: 3 wires 2 m PVC Cable (Through-beam: transmitter- 2 wires 2 m PVC Cable) PS-R TEACH: 4 wires 2 m PVC Cable (Through-beam: transmitter- 2 wires 2 m PVC Cable), M8 water-proof connector				
Dimensions			Trimmer: 11.2 × 21 × 33 mm TEACH (Cable Type): 11 × 17 × 41.5 mm TEACH (M8 Connector Type): 11 × 17 × 44.2 mm				
Weight			55 g				


Cylindrical Type PS-M

Sensing Method			Diffuse Reflective			Retro-reflective	Through-beam
Type	Connection	Output	Small Spot	Standard	Long Distance	Standard	Standard
 Cylindrical Type (TEACH)	Cable	NPN	PS-MR1-NSB2	PS-MR3-NS22	PS-MR9-NS22	PS-ML4-NS22	PS-MT5-NSB2
		Push-pull	PS-MR1-USB2	PS-MR3-US22	PS-MR9-US22	PS-ML4-US22	PS-MT5-USB2
	M12 Connector	NPN	PS-MR1-NSBD	PS-MR3-NS2D	PS-MR9-NS2D	PS-ML4-NS2D	PS-MT5-NSBD
		Push-pull	PS-MR1-USBD	PS-MR3-US2D	PS-MR9-US2D	PS-ML4-US2D	PS-MT5-USBD
Sensing Distance			5 ~ 100 mm	5 ~ 300 mm	5 ~ 1,000 mm	4.2 m	5 m
Output			Light-on/Dark-on				
Lighting Source			Infrared (850 nm)				Red LED (630 nm)
Power Consumption			Max. 20 mA				Transmitter: Max. 6 mA Receiver: Max. 14 mA
Material			Lens: PC ; Case: PBT				
Cable			4 wires 2 m PVC Cable (Through-beam: transmitter - 2 wires 2 m PVC Cable), M12 water-proof connector				
Dimensions			Cable: M18 × 51.0 mm M12 Connector: M18 × 49.3 mm				
Weight			Cable Connection: 67 g; M8 Connector: 19 g				

Flat Type PS-F

Sensing Method			Diffuse Reflective				Retro-reflective		Through-beam	
Type	Connection	Output	Standard		Background Suppression		Standard		Standard	
 Flat Type (Fixed)	Cable	NPN	PS-FR2- NLB2	PS-FR2- NDB2	PS-FB1- NLB2	PS-FB1- NDB2	PS-FL3- NLB2	PS-FL3- NDB2	PS-FT3- NLB2	PS-FT3- NDB2
		PNP	PS-FR2- PLB2	PS-FR2- PDB2	PS-FB1- PLB2	PS-FB1- PDB2	PS-FL3- PLB2	PS-FL3- PDB2	PS-FT3- PLB2	PS-FT3- PDB2
Sensing Distance			5 ~ 50 mm		5 ~ 30 mm		25 ~ 1,000 mm		1 m	
Output			Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on	Light-on	Dark-on
Lighting Source			Red LED (630 nm)							
Power Consumption			Max. 20 mA		Max. 30 mA		Max. 20 mA		Transmitter: Max. 6 mA Receiver: Max. 14 mA	
Material			Lens: PC ; Case: PBT							
Cable			3 wires 2m PVC Cable (Through-beam: transmitter - 2 wires 2m PVC Cable)							
Dimensions			16 × 30 × 6.8 mm							
Weight			25 g							

Lateral Type PS-L

Sensing Method			Diffuse Reflective	Retro-reflective	Through-beam
Type	Connection	Output	Standard	Standard	Standard
 Lateral Type (Fixed)	Cable	NPN	PS-LR2-NSB2	PS-LL3-NSB2	PS-LT3-NSB2
		Push-pull	PS-LR2-USB2	PS-LL3-USB2	PS-LT3-USB2
Sensing Distance			5 ~ 50 mm	25 ~ 1,000 mm	1 m
Output			Light-on/Dark-on	Light-on/Dark-on	Light-on/Dark-on
Lighting Source			Red LED (630 nm)		
Power Consumption			Max. 20 mA		Transmitter: Max. 6 mA Receiver: Max. 14 mA
Material			Lens: PC ; Case: PBT		
Cable			4 wires 2m PVC Cable (Through-beam: transmitter - 2 wires 2m PVC Cable)		
Dimensions			14 × 27 × 7 mm		
Weight			26 g		

Laser Displacement Sensor LD-E

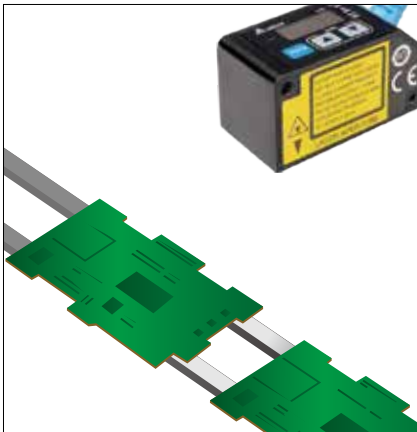
Senses the distance to objects using triangular reflection with a high-resolution CMOS sensor.

Measures the thickness and width of the objects to detect height, gradient, position, flatness, gap, distance, and runout

- 5 models of sensing ranges: 500 ± 200 mm / 220 ± 100 mm / 100 ± 35 mm / 50 ± 15 mm / 30 ± 5 mm
- 7-segment display
- Digital I/O / Analog 4 ~ 20 mA / Modbus RS-485 communication
- Linearity $\pm 0.1\%$ ~ $\pm 0.3\%$



Applications



PCB parts presence or absence detection



Overlap detection



Electric parts front back detection



Completion review



O-ring presence or absence review



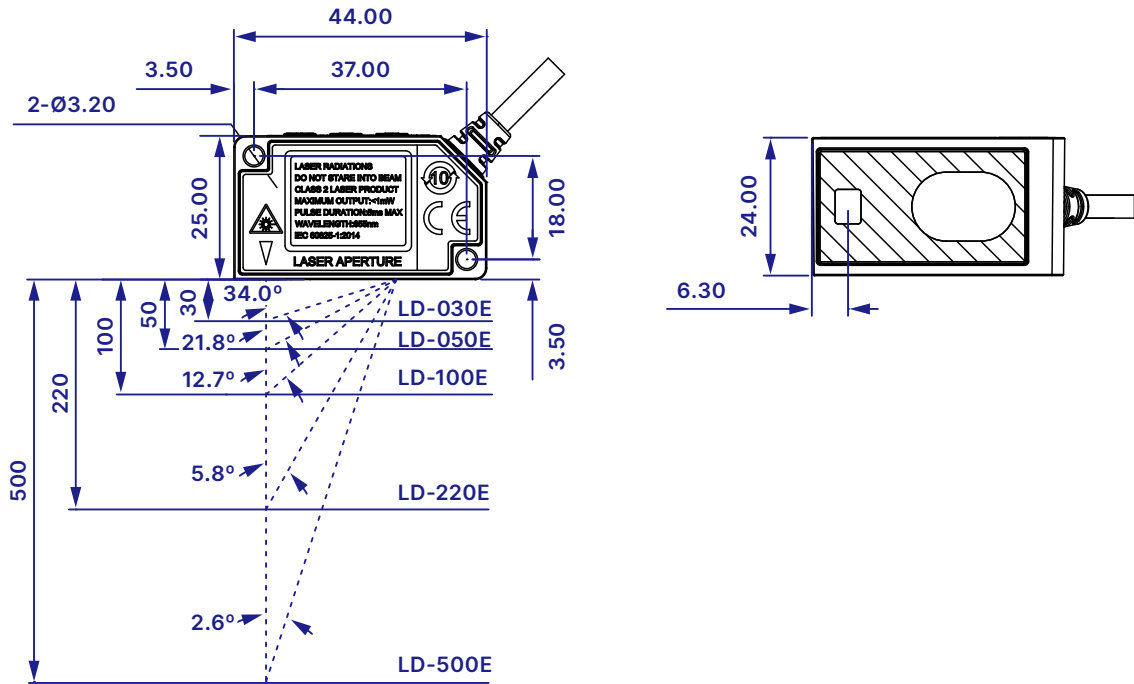
Joint gap detection

Specifications

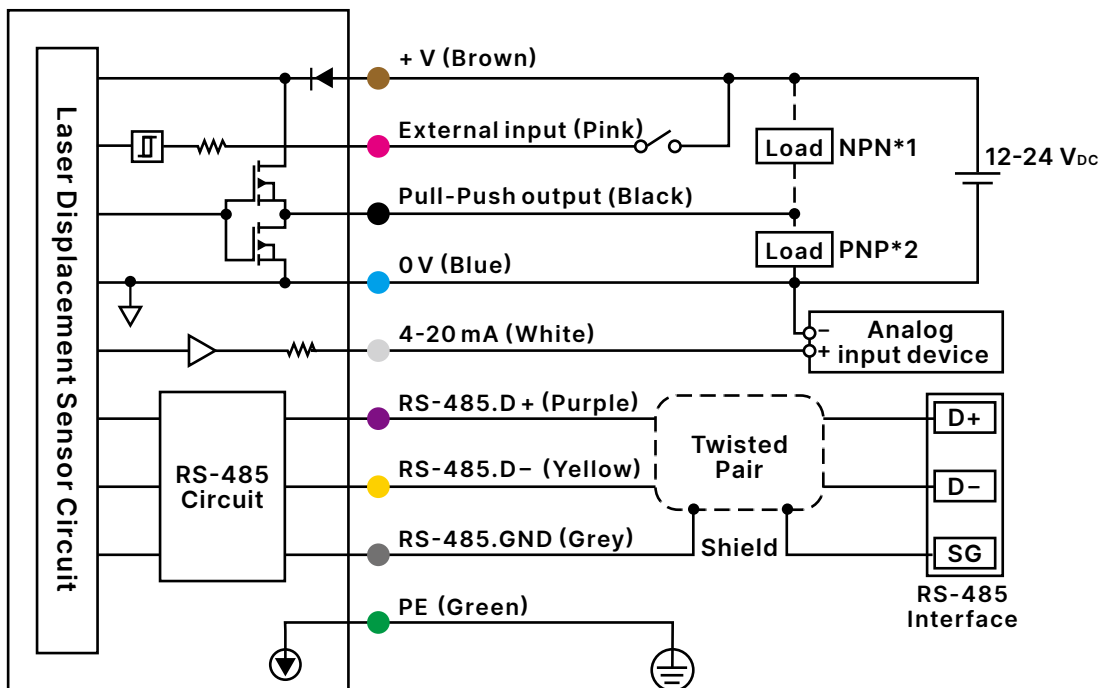
Model	LD-030E-M22	LD-050E-M22	LD-100E-M22	LD-220E-M22	LD-500E-M22
Detection method	Triangular measurement				
Reference Distance (mm)	30	50	100	220	500
Measurement Range (mm)	± 5	± 15	± 35	± 100	± 200
Light spot diameter (center position)	Approx. 100 × 100 μm	Approx. 80 × 70 μm	Approx. 136 × 110 μm	Approx. 290 × 238 μm	Approx. 541 × 330 μm
Interface	Digital I/O/Modbus Communication (RS-485)				
	Support 9,600/14,400/19,200/38,400/57,600/115,200 bps (Factory default:115,200 bps)				
	Support RTU/ASCII 8,N,1 8,N,2 8,O,1 8,O,2 8,E,1 8,E,2 7,O,1 7,E,1 7,O,2 7,E,2				
Light Source	Laser CLASS 2				
Input Voltage	12 ~ 24 V _{DC} ± 10% , 1W				
Analog Output	Current range: 4 ~ 20 mA, load impedance: ≤ 300 Ω				
Digital Output	Optional function: Measuring range /Comparison output, Push-Pull Output ,<100 mA				
Digital Input	Optional function: Zero point /Teaching, High-level ≥ 2V, Low-level ≤ 0.8V				
Repeatability	5 μm	15 μm	70 μm	200 μm	300 μm (300 ~ 500 mm) 800 μm (500 ~ 700 mm)
Linearity	± 0.1% F.S	± 0.1% F.S	± 0.1% F.S	± 0.2% F.S	± 0.2% F.S (300 ~ 500 mm) ± 0.3% F.S (500 ~ 700 mm)
Sampling Rate (ms)	1.5 / 3 / 5 (Default: 1.5)				
Indicator	Laser ON: blue, DO: green, DI: yellow				
Protection Circuit	Protection against reverse power protection, output overcurrent, power supply surge, output surge				
Operating Temperature	-10 ~ 50 °C				
Storage Temperature	-25 ~ 65 °C				
Ambient Humidity	30 ~ 85 %				
Enclosure Rating	IP67				
Ambient Light Resistance	3,000 lux or less				
Vibration Resistance	10 ~ 55 Hz, 1.5 mm, 3 axes for 2 hours				
Insulating Resistance	> 20 MΩ (500 V _{DC})				
Withstand Voltage	500 V _{AC} 50/60 Hz, 1 min				
Certification	CE				
Materials	Optical window: PC; Case: Aluminum; Cable: PVC				
Cables	Length: 2 m				
Dimensions	44 × 25 × 24 mm				

Dimensions

Unit: mm



Wiring Instructions

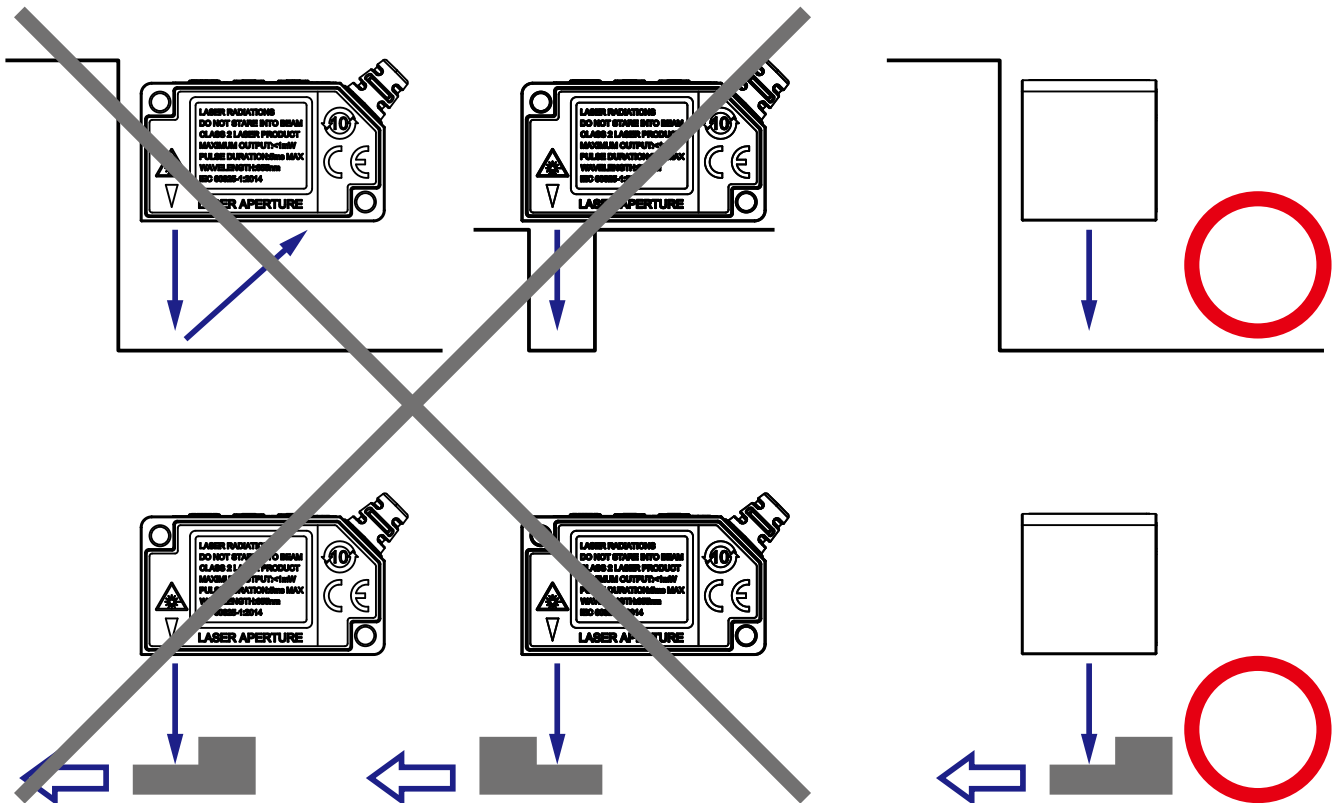


- *Note 1: In case of NPN connection, please connect the load between black and brown pin (+ V)
- *Note 2: In case of PNP connection, please connect the load between black and blue pin (0 V)

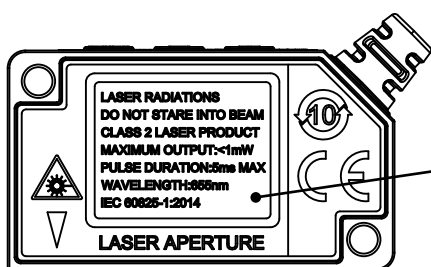
Caution on Mounting Direction

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 extrudes, ensure the product's lighting route is vertical to the inspection object's path to assure product performance



Laser Label Description



Laser Radiations: Class 2 Product
 Maximum Output: <1mW, Pulse
 Width: 0.5 ms max.
 Wave Length: 655 nm, IEC 60825-1:2014

Laser Displacement LD Series

Senses the distance to objects using triangular reflection with a high-resolution CCD sensor. Measures the thickness and width of the objects to detect height, gradient, position, flatness, gap, distance and runout

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

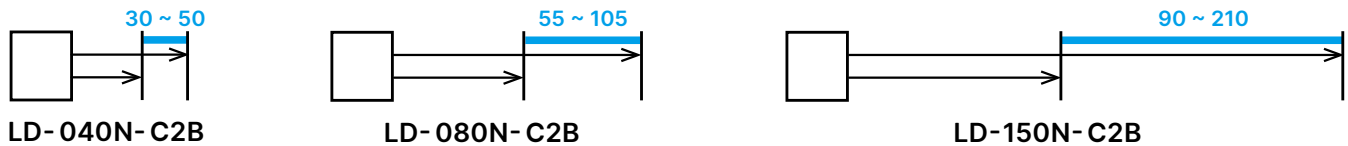


Model	Sensing Distance (mm)	Repeatability (μm)*	Interface
LD-040N-C2B	30 ~ 50	2	Digital I/O / Modbus Communication (RS-485)
LD-080N-C2B	55 ~ 105	5	
LD-150N-C2B	90 ~ 210	15	

*Note: Repeatability: Average value of continuous measurement 100 times to a fixed point.

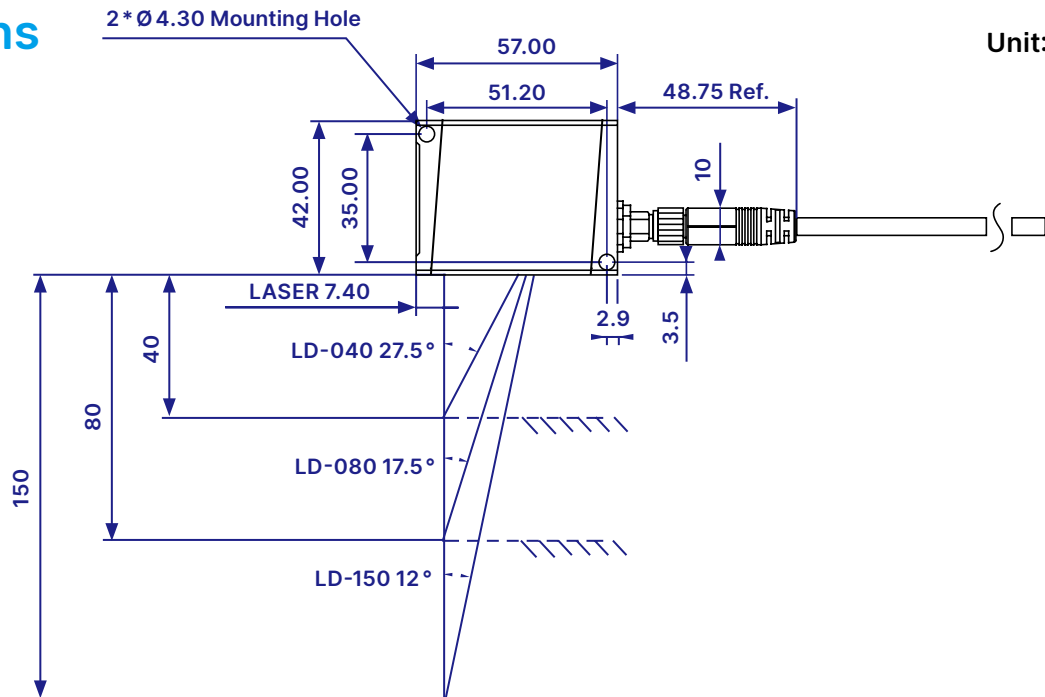
Sensing Distance

Unit: mm



Dimensions

Unit: mm



Specifications

Model	LD-040N	LD-080N	LD-150N
Sensing Method	Triangulation		
Reference Distance (mm)	40	80	150
Measurement Range (mm)	± 10	± 25	± 60
Interface	Digital I/O/Modbus Communication (RS-485)		
Spot Size (µm)	50×15	95×25	168×40
Light Source	Laser CLASS 2		
Input Voltage	12 ~ 24 V _{DC} ± 10%		
Repeatability* (µm)	2	5	15
Linearity (%)	± 0.1%		
Sampling Rate	> 1ms		
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 ~ 50 °C		
Storage Temperature	-20 ~ 75 °C		
Ambient Humidity	30 ~ 85 %		
Enclosure Rating	IP67		
Ambient Light Resistance	5,000lux or less		
Vibration Resistance	10 ~ 55 Hz, 1.5 mm, 3 axes for 2 hours		
Insulating Resistance	20 MΩ > (500 V _{DC})		
Withstand Voltage	500 V _{AC} 50/60Hz, 1min		
Certifications	CE		
Materials	Optical window: PMMA; Case: Aluminium; Cable: PVC		
Cables	8 Pin M8 waterproof connector		
Dimensions	57 × 42 × 24 mm		
Weight	113 g		

*Note: Repeatability: Average value of continuous measurement 100 times to a fixed point.

Laser Label Description



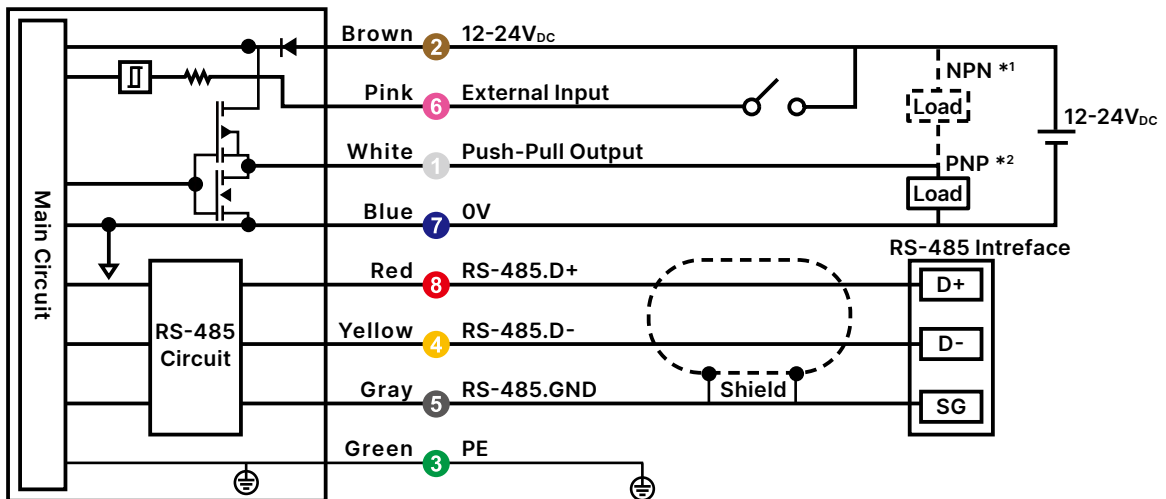
Laser Radiations: Class 2 Product
Maximum Output: <1mW
Pulse Duration: 0.5 ms max.
Wave Length: 635 nm, IEC 60825-1:2014

Input / Output Circuits



Pin	Color	Definition
1	White	DO
2	Brown	12-24V _{DC}
3	Green	PE
4	Yellow	RS485.D-
5	Grey	RS485.GND
6	Pink	DI
7	Blue	0V
8	Red	RS485.D+

Wiring Instructions

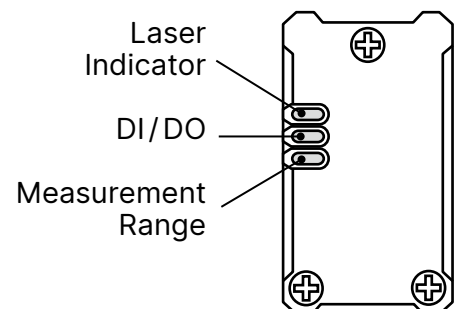


*Note 1: In case of NPN connection, please connect the load between Pin 4 and Pin 1.

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

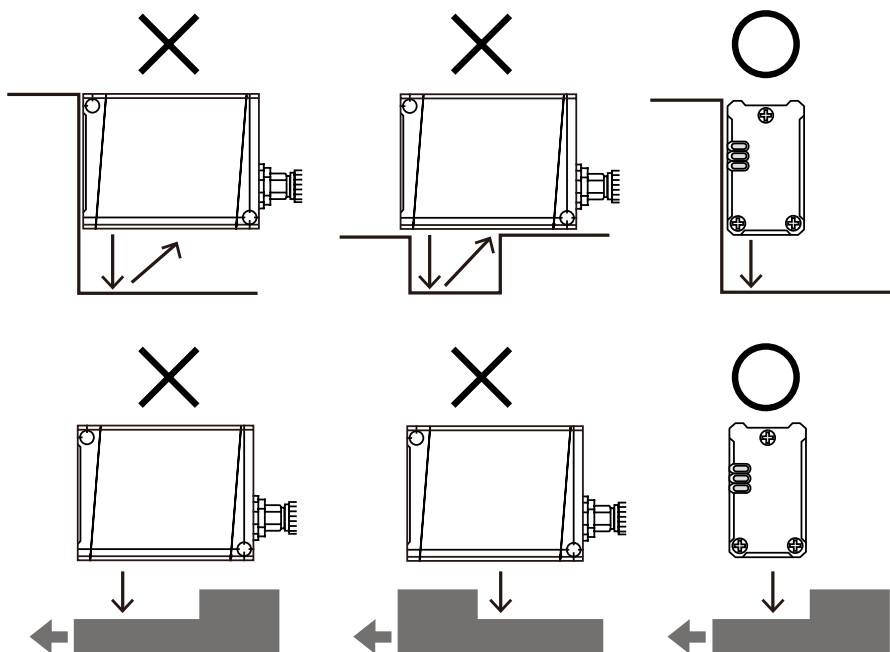
*Note: Repeatability: Average value of continuous measurement 100 times to a fixed point.

Wiring Material	Item (m)	Serial Number
M8 8-pole Straight Connector	1.5	SUC-SB8-E0158
	3	SUC-SB8-E0308
	5	SUC-SB8-E0508
M8 8-pole 90° angle Connector	1.5	SUC-LB8-E0158
	3	SUC-LB8-E0308
	5	SUC-LB8-E0508

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 extrudes, ensure the product's lighting route is vertical to the inspection object's path to assure product performance



Compact Area Sensor AS-E Series

Small connector type sensor for time-saving installation and maintenance. The sensor can be applied to a wide range of applications, such as logistics, packaging, components, woodworking, warehousing industries and other industrial automation production lines

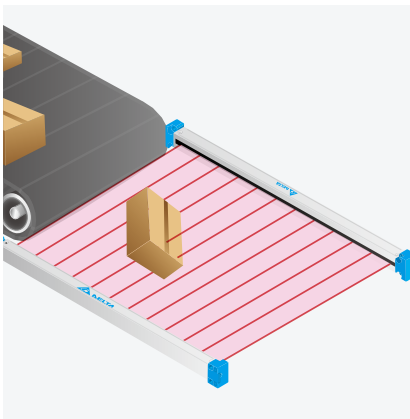
- No need for brackets; Easy installation
- Light aluminum case
- Connector wiring, easy for wiring
- Detection range up to 4 m



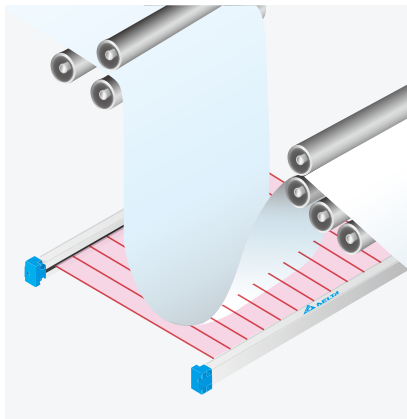
Applications

Area Sensing

Detects objects passing through an arranged area



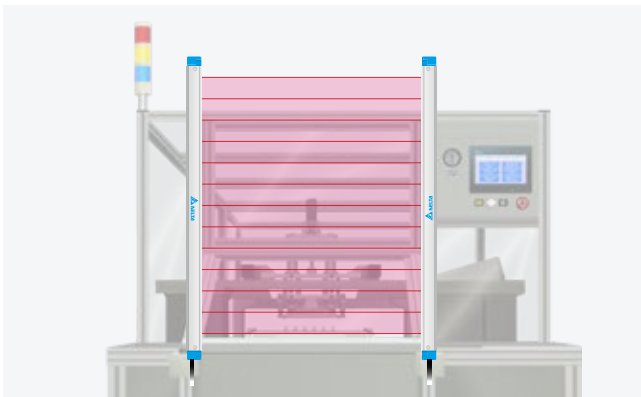
Detects objects that fall off the conveyor or pass through the incorrect path



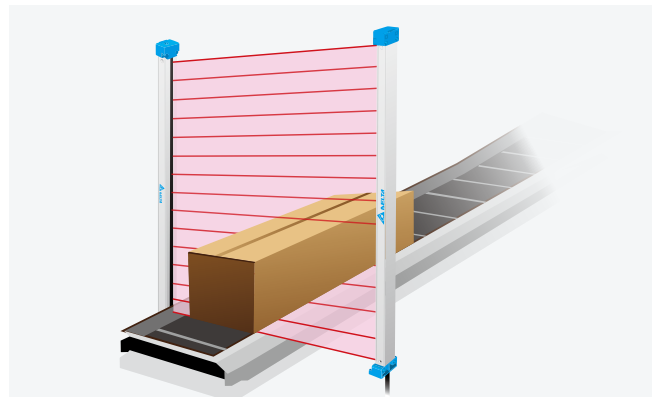
Rolling loop detection



Detects incorrect object pickup



Detects objects passing the detection zone



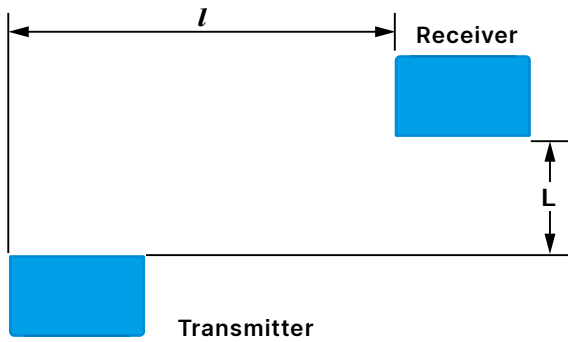
Detects objects during conveyance

 **Warning: Do not use this product as a sensing device for personnel protection.**

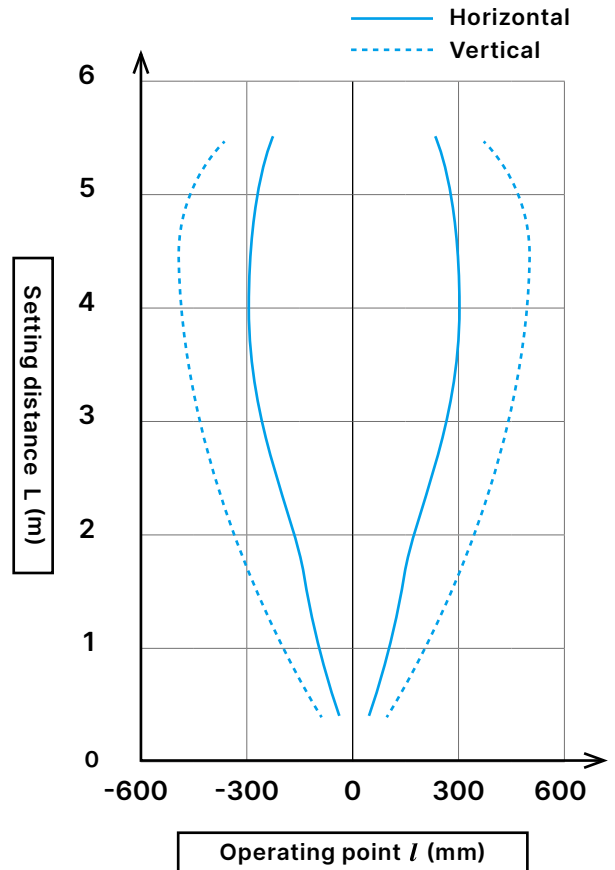
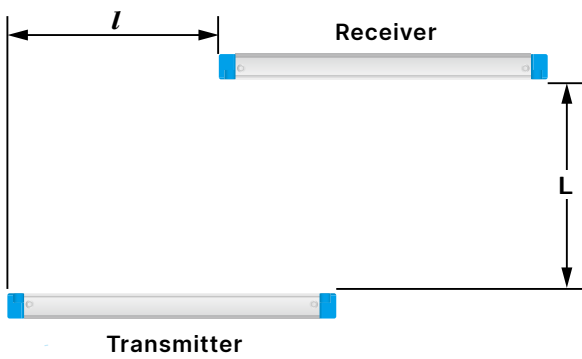
Optical Properties (Typical)

Parallel Deviation

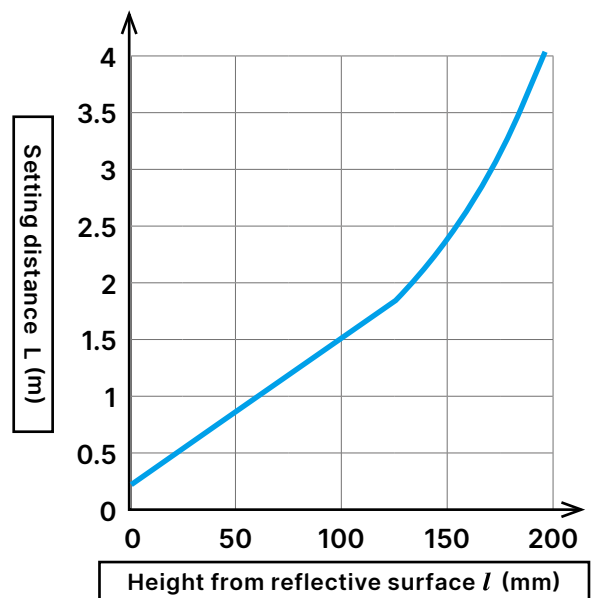
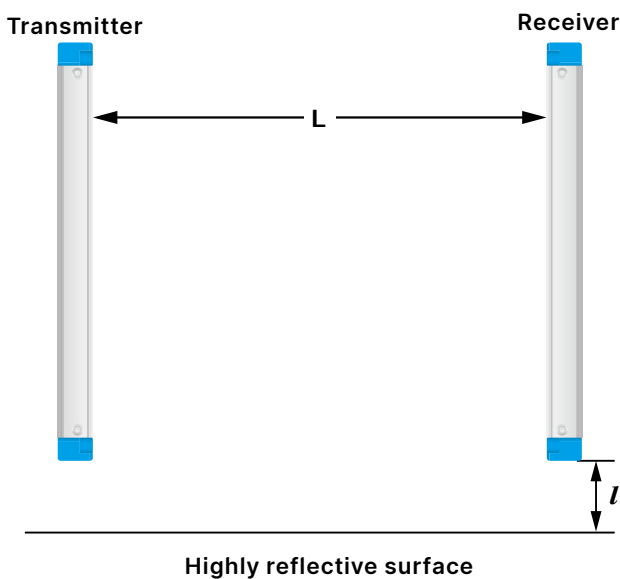
Horizontal direction



Vertical direction



Sensing characteristics for installing on highly reflective surface*



* Operating on highly reflective surface should still be avoided.

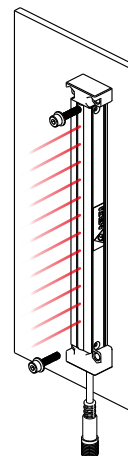
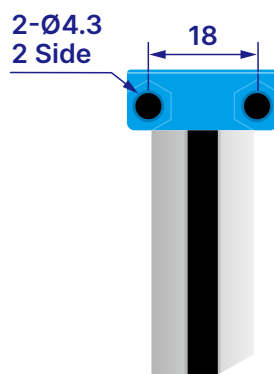
Specifications

Sensing Object	Opaque objects larger than ϕ 30 mm / ϕ 1.18 inch
Beam Pitch	20 mm
Sensing Range	0.6 ~ 4 m
Input Voltage	24 V _{DC} \pm 10 %
Sampling Rate	< 30 ms
Protection Circuit	Protection against reverse voltage, output overcurrent, power supply surges, and output surges
Operating Temperature	-10 ~ 55 °C (non-freezing)
Storage Temperature	-20 ~ 60 °C
Ambient Humidity	35 ~ 85 % (non-condensing)
Enclosure Rating	IP40
Light Source	Infrared (850 nm)
Ambient Light Resistance	Sunlight: Illumination of the light-receiving surface 10,000 lux
Vibration Resistance	10 ~ 55 Hz, 1.5 mm, 3 axes for 2 hours
Shock Resistance	Up to 100 m/S ² , 3 times in each of 3 axes/6 directions
Insulating Resistance	20 M Ω or more (500 V _{DC})
Withstanding Voltage	1,000 V _{AC} 50/60 Hz, 1 min
Material	Case: Aluminum extrusion / Cover Lens: PMMA / Upper / Lower Case: PC + ABS
Cable	150 mm PVC Cable with a connector
Certification	CE

Installation

Front Installation

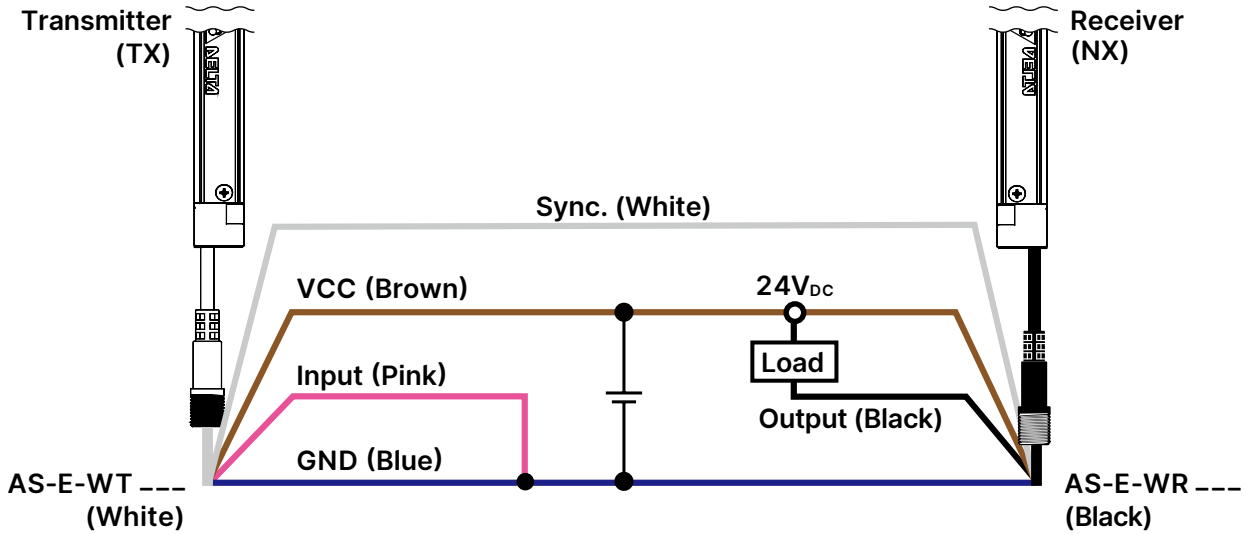
Unit : mm



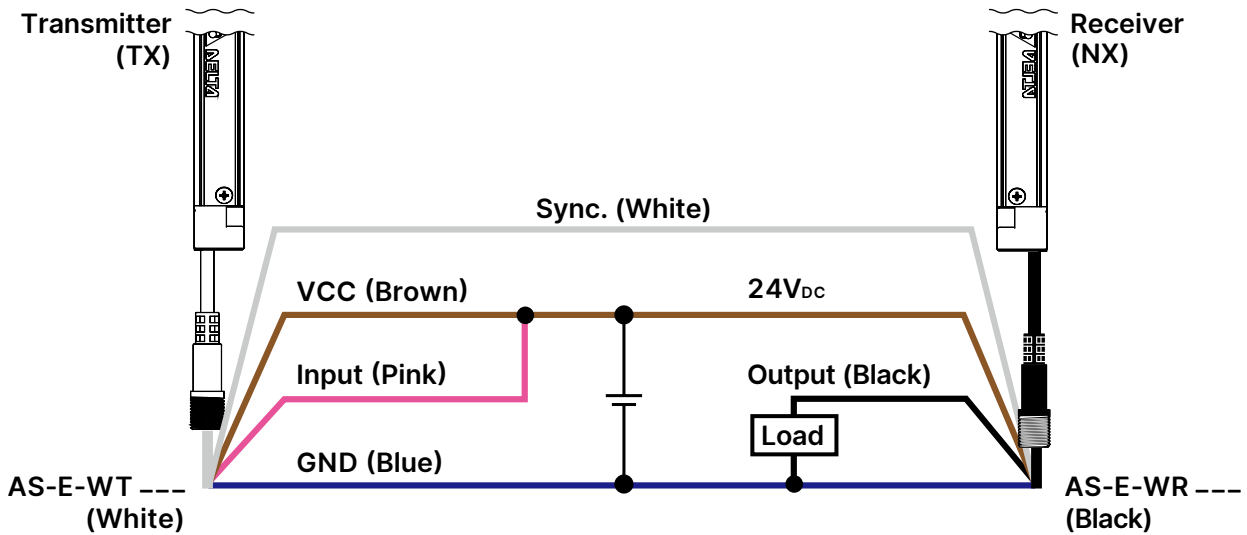
- Cables are not included for the transmitter and receiver. Choose a suitable cable length per wiring requirements. Prepare M4 screws with washers and M4 nuts before installation.
- For front installation, use screws of 12 mm + screwing depth.
- During installation, do not twist or bend the product. Please apply the screw tightening torque of 5.5 ~ 7.5 kfg-cm.

Wiring

NPN Output Connection

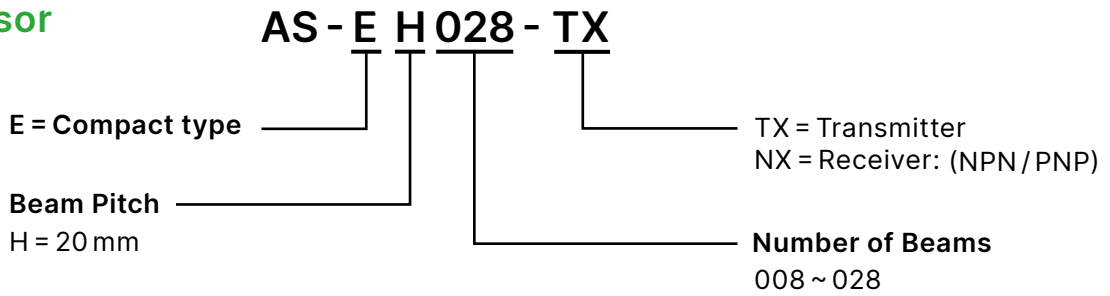


PNP Output Connection

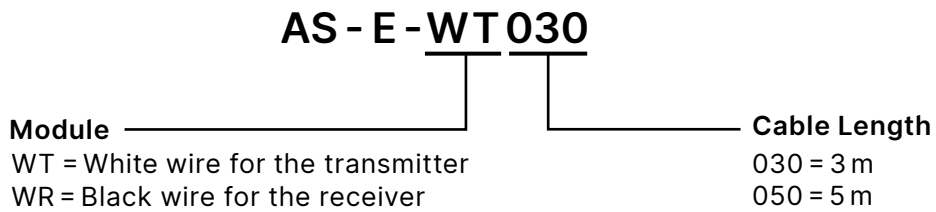


Model Information

Area Sensor

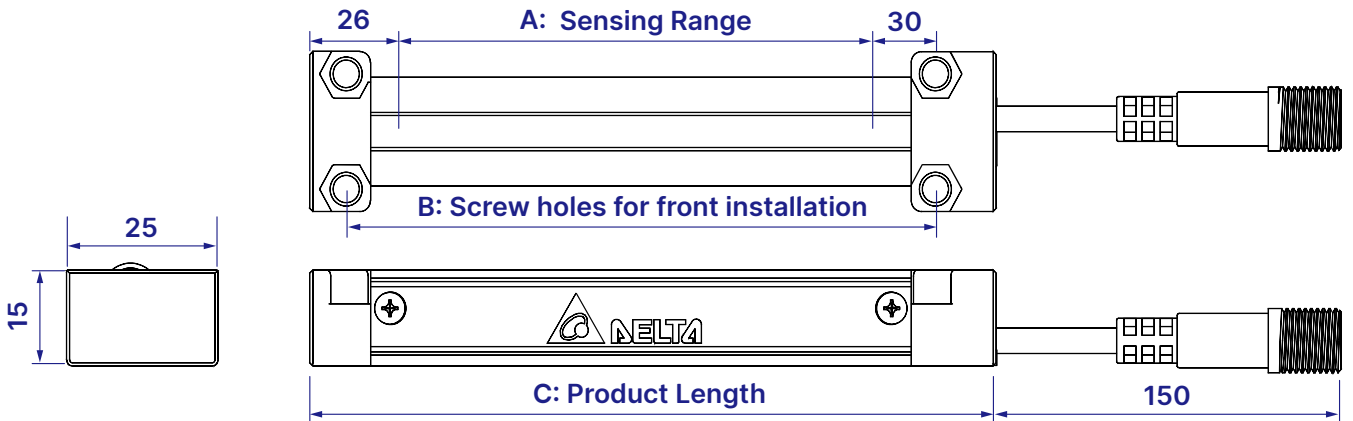


Cable



Dimensions

Unit: mm



Model	A (mm)	B (mm)	C (mm)	Weight (g)
AS-EH008---	140	180	196	68
AS-EH012---	220	260	276	90
AS-EH016---	300	340	356	113
AS-EH020---	380	420	436	135
AS-EH024---	460	500	516	160
AS-EH028---	540	580	596	184

Ordering Information

Area Sensor

Model	Number of Beams	Sensing Height (mm)	Product Length (mm)	Sensing Range (m)
AS-EH008-__	8	140	196	0.6~4
AS-EH012-__	12	220	276	
AS-EH016-__	16	300	356	
AS-EH020-__	20	380	436	
AS-EH024-__	24	460	516	
AS-EH028-__	28	540	596	

*Note 1: __ = TX (Transmitter) / NX (Receiver)

*Note 2: The transmitter and receiver are for sale separately. Please make sure if you need to purchase both.

Accessory Cables

For Transmitter	For Receiver	Length (m)
AS-E-WT030	AS-E-WR030	3
AS-E-WT050	AS-E-WR050	5



Area Sensor AS Series

Available in Standard Type and Communication Type for different beam quantity and length requirements. Measures the thickness and width of the objects to detect height, gradient, position, flatness, gap, distance and runout

*Note: Never use this device in any personnel safety application



Standard Type

Receiver cable: black



- Aluminum case, strong structure
- No dead zone curtains for detection
- Effective aperture angle <math>< 5^\circ</math>
- IP67
- CE certification
- Self-diagnosis

Communication Type

Receiver cable: blue



Standard Features

- Aluminum case, strong structure
- No dead zone curtains for detection
- Effective aperture angle <math>< 5^\circ</math>
- IP67
- CE certification
- Self-diagnosis

Advanced Features

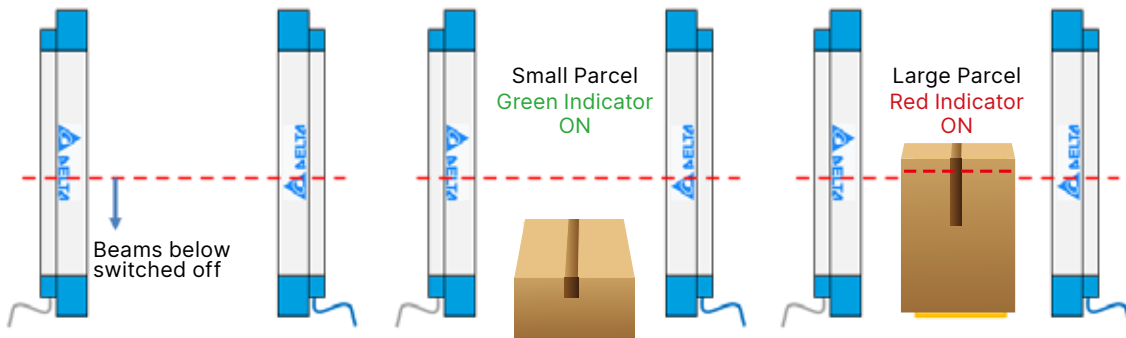
- Fixed / Floating Mask
- Interlock / restart functions
- Energy-saving
- Measurement
- Auto-upload
- Regular scanning cycle

Pitch	10 mm	20 mm	40 mm
Resolution (mm)	16.5	26.5	46.5
Channels	16 ~ 128	8 ~ 96	4 ~ 36
Protection Height (mm)	160 ~ 1,280	160 ~ 1,920	160 ~ 1,440
Sensing Distance (m)	0.1 ~ 10		

Communication Type Advanced Features

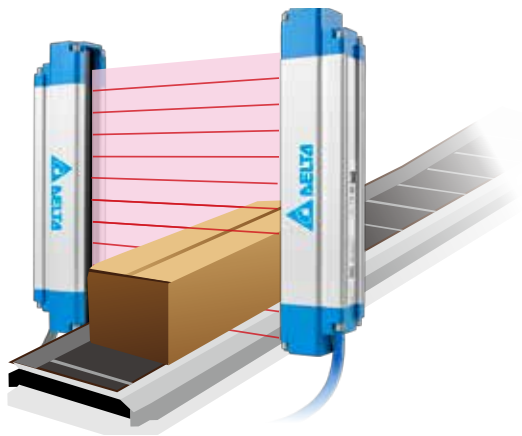
Fix Blanking

Set up a standard height and switch off the beams below. If the parcel is below the height, the green indicator comes on. If the parcel is above the height, the red indicator comes on. It is suitable for the logistics industry to detect the height of parcels for the sorting process



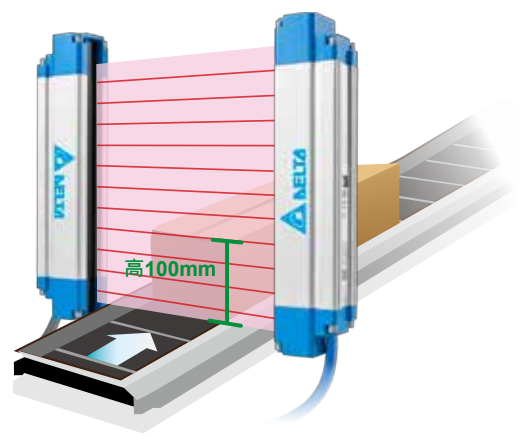
Floating Blanking

Stably detects an object with pre-set floating beam quantities, and is suitable for moving objects with fixed length and height, such as parcels on the conveyor or robotic arms in motion



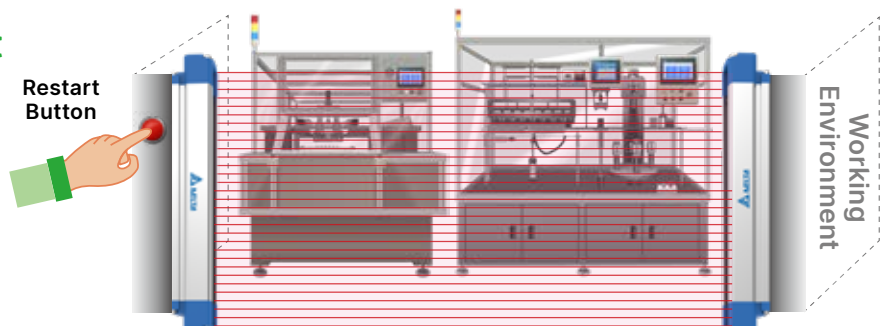
Measurement

Measures the height of objects by sensing the light/shading status of each channel. It also senses the deviation and central position of the object with the blanking beams



Interlock / Manual Restart

Once the area sensor detects the entry of a person/object in the locked working environment, it will stop equipment operation until the Restart button is pressed manually. It is useful for equipment maintenance



Product Specifications

AS-BF Communication Type

Model		Pitch (mm)	Channels	Protection Height (mm)	Brackets	Sensing Distance (m)
Communication Type Receiver	Transmitter					
AS-BF016-CX	AS-BF016-TX	10	16	160	2	0.1~10
AS-BF024-CX	AS-BF024-TX		24	240		
AS-BF032-CX	AS-BF032-TX		32	320		
AS-BF040-CX	AS-BF040-TX		40	400	4	
AS-BF048-CX	AS-BF048-TX		48	480		
AS-BF056-CX	AS-BF056-TX		56	560		
AS-BF064-CX	AS-BF064-TX		64	640		
AS-BF072-CX	AS-BF072-TX		72	720		
AS-BF080-CX	AS-BF080-TX		80	800		
AS-BF088-CX	AS-BF088-TX		88	880		
AS-BF096-CX	AS-BF096-TX		96	960		
AS-BF104-CX	AS-BF104-TX		104	1,040		
AS-BF112-CX	AS-BF112-TX		112	1,120		
AS-BF120-CX	AS-BF120-TX		120	1,200		
AS-BF128-CX	AS-BF128-TX		128	1,280		

***Note:** The transmitter and receiver are for sale separately. Please make sure if you need to purchase both

AS-BF Standard Type

Model		Pitch (mm)	Channels	Protection Height (mm)	Brackets	Sensing Distance (m)
Standard Receiver	Transmitter					
AS-BF016-RX	AS-BF016-TX	10	16	160	2	0.1~10
AS-BF024-RX	AS-BF024-TX		24	240		
AS-BF032-RX	AS-BF032-TX		32	320		
AS-BF040-RX	AS-BF040-TX		40	400	4	
AS-BF048-RX	AS-BF048-TX		48	480		
AS-BF056-RX	AS-BF056-TX		56	560		
AS-BF064-RX	AS-BF064-TX		64	640		
AS-BF072-RX	AS-BF072-TX		72	720		
AS-BF080-RX	AS-BF080-TX		80	800		
AS-BF088-RX	AS-BF088-TX		88	880		
AS-BF096-RX	AS-BF096-TX		96	960		
AS-BF104-RX	AS-BF104-TX		104	1,040		
AS-BF112-RX	AS-BF112-TX		112	1,120		
AS-BF120-RX	AS-BF120-TX		120	1,200		
AS-BF128-RX	AS-BF128-TX		128	1,280		

***Note:** The transmitter and receiver are for sale separately. Please make sure if you need to purchase both

AS-BH Communication Type

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

AS-BH Standard Type

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

AS-BA Communication Type

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

AS-BA Standard Type

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

Accessories for AS-B

Cables

For Transmitter (TX)	For Receiver (RX)	For Receiver (CX)	Length (m)
AS-B-WT035	AS-B-WR035	AS-B-WC035	3.5
AS-B-WT050	AS-B-WR050	AS-B-WC050	5
AS-B-WT100	AS-B-WR100	AS-B-WC100	10

Brackets

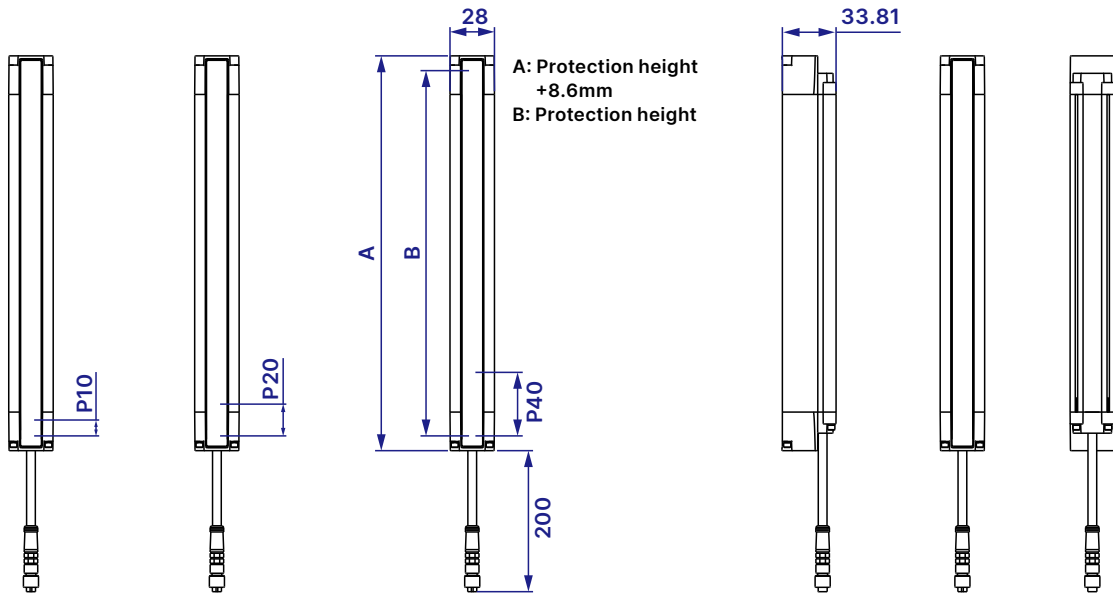
AS-B-BK01	AS-B-BK02	AS-B-BK03	AS-B-BK04
			

Specifications

Area Sensor	
Voltage Range	24V _{DC} ± 10%
Light Source	Infrared LED (850 nm)
Indicator	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 ~ 55 °C (non-freezing)
Storage Temperature	-25 ~ 60 °C
Ambient Humidity	30 ~ 85 % (non-condensing)
Enclosure Rating	IP67
Ambient Light Resistance	20,000 lux or less
Vibration Resistance	10 ~ 55 Hz, 1.5 mm, 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 (500V _{DC})
Withstand Voltage	1,000 V _{AC} 50/60 Hz, 1 min
Material	Case: Aluminum, Cover lens: PMMA, Upper/lower case: Zinc alloy
Cables	M12 connector, 200 mm PVC cable
Certifications	CE

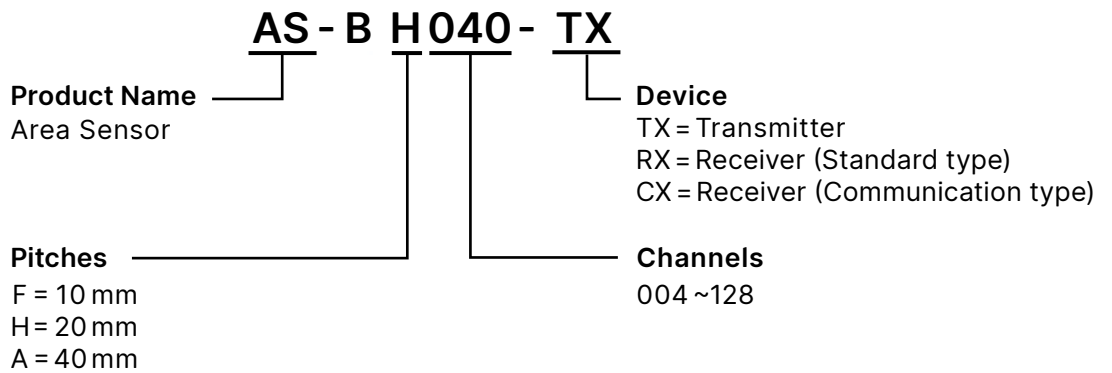
Dimensions

Unit: mm

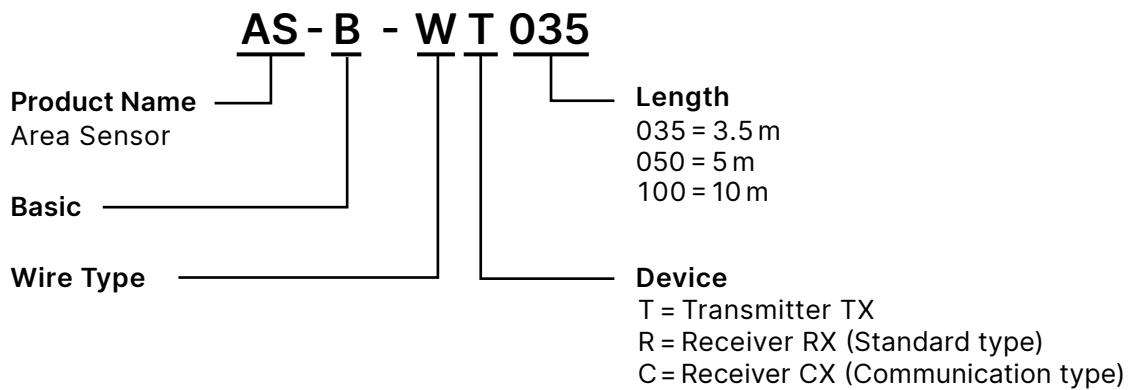


Ordering Information

Light Curtain

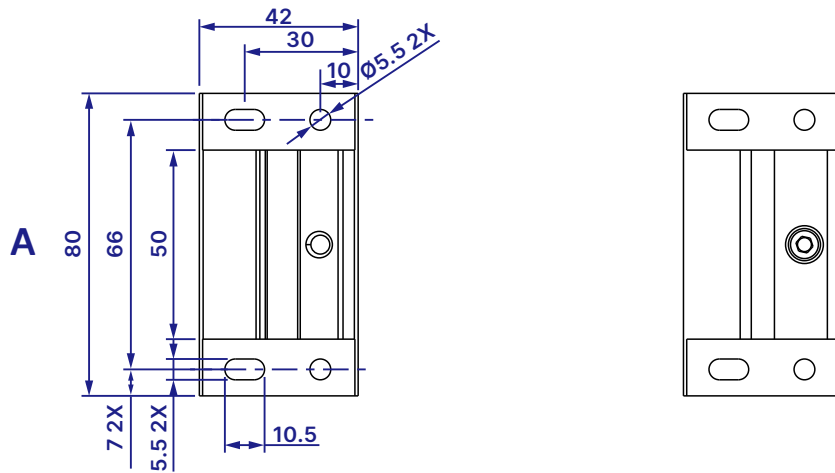


Cable

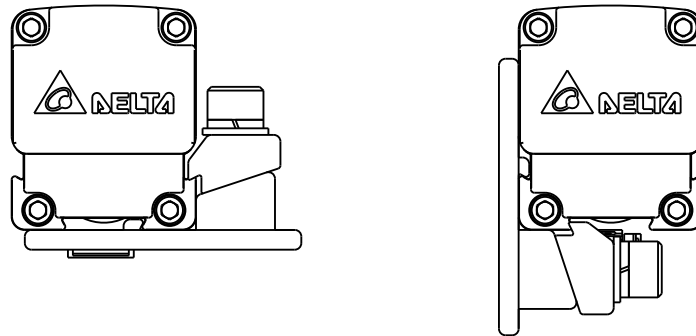


Bracket Dimensions

Unit: mm



Bracket Installation

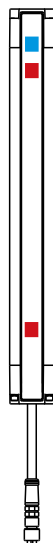


Sensor Calibration After Power-on

1. Power on
Red indicator on when power on



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



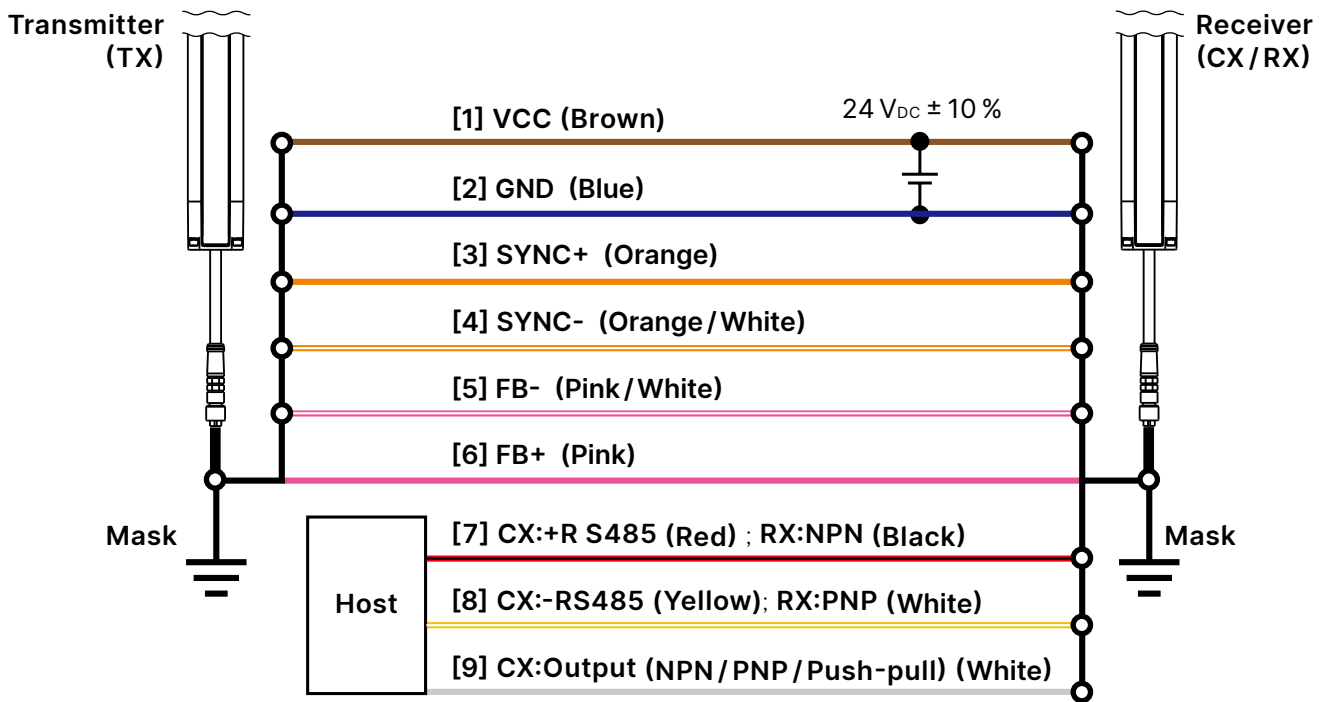
3. Calibration (bottom)
Bottom indicator in blue on when bottom calibration is finished



4. Complete
Green indicator on when calibration is complete



Wiring



*Note: RX: Standard Type Receiver

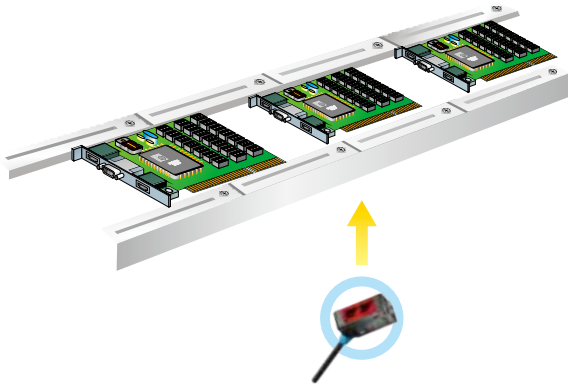
*Note: CX: Communication Type Receiver

Troubleshooting

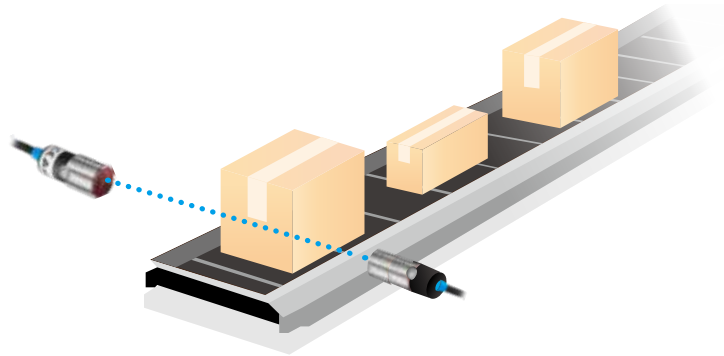
Indicator	Cause	Inspection method
Light is off	Poor power contact	<ul style="list-style-type: none"> Check the power connection and whether or not the connector pin is bent
Irregular flashing of red / green light	Poor beam alignment	<ul style="list-style-type: none"> Check whether it can be switched to green light with near-distance alignment Check whether or not module installation with mounting frame is flat and level Check whether mounting method is susceptible to vibration
	Electrical interference	<ul style="list-style-type: none"> Check whether shielded wire is connected to clean ground Has external high power machine shutdown been improved?
	Light source interference	<ul style="list-style-type: none"> Is there any external glare affecting device? Installation of multiple light curtains should use transmitter/receiver staggered format
Blue / green / red lights are lit simultaneously	Over-current	<ul style="list-style-type: none"> Check load at output end Check output mode setting
Only blue light is lit, and green light is not lit; red light is lit when shielded	Power saving setting	<ul style="list-style-type: none"> Turn off power saving setting
Orange light	Wiring error, or input voltage exceeds specifications	<ul style="list-style-type: none"> Check if wire connection is normal Check if input voltage is within range
	Abnormal internal signal/voltage	<ul style="list-style-type: none"> Contact DELTA service center
Red / green light are lit, and blue light is not lit	Abnormal number of beams	<ul style="list-style-type: none"> Beam number setting error, or abnormal number of internal beams. Contact DELTA service center

Applications

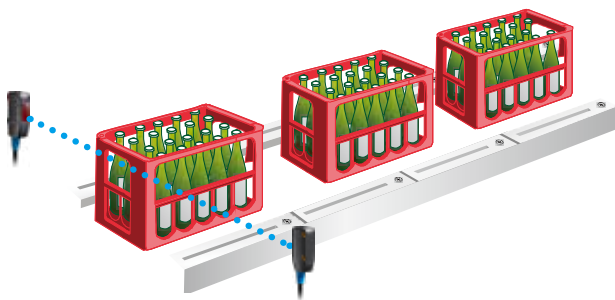
Electronics Industry
Detects PCB boards



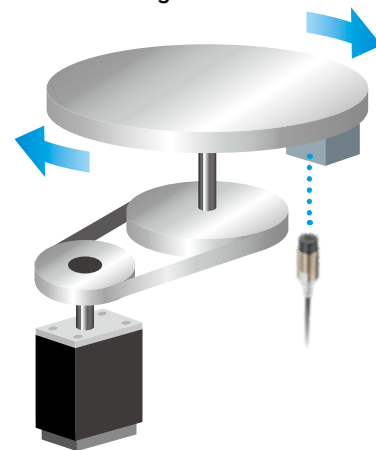
Warehouse / Logistics
Detects cartons



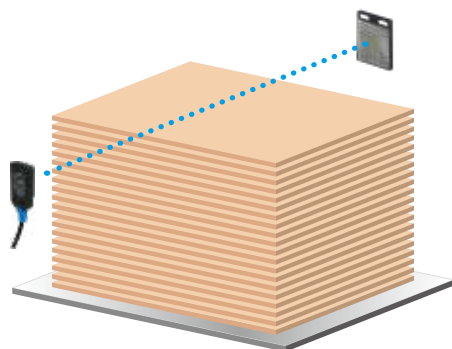
Food and Beverages
Detects boxes of beverages



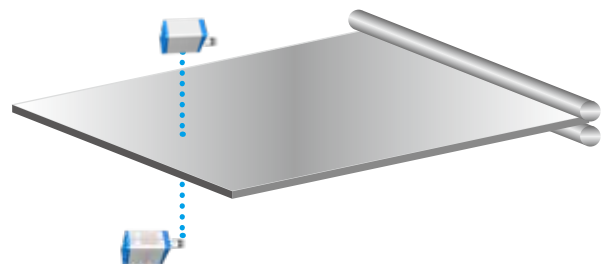
Equipment & Machines
Sensor for position-setting



Wood Industry
Detects wood stacking



Wood and Steel industry
Measures the thickness of wood or steel



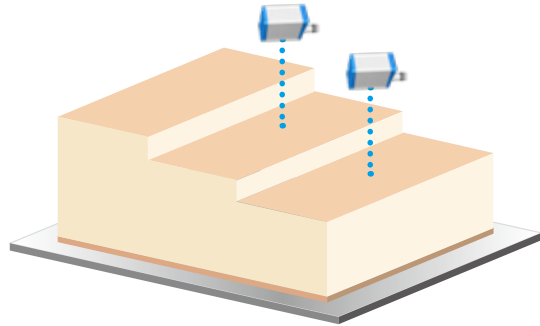
Electronics Industry

Robot arm's reproducibility test



Electronics Industry

Measures the depth / thickness of product



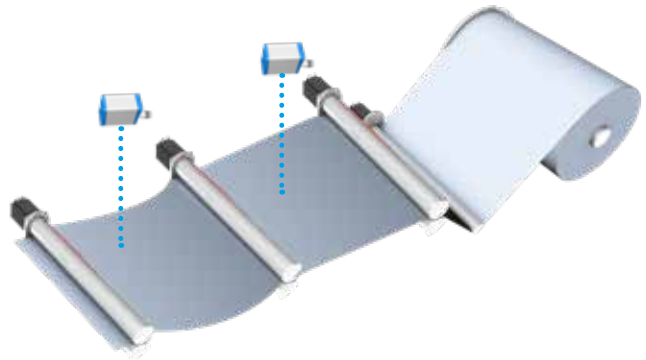
Safety

Marks a dangerous zone and protects operators



Textile Industry

Measures the hoop slack



Multifunction Pressure Sensor DPA /DPB Series

Implements Large LCD and supports multiple globally adopted pressure units.
Capable of fast copying the internal parameters to other slaves and collecting real-time pressure data.
Suitable for mechanical processing, solar energy, electronic components, food packaging, semiconductor and automatic assembly industries



Various Unit Conversion

Offers 6 kinds of globally adopted pressure units for measurement and display



Large 3-Color LCD Display

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 the 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)



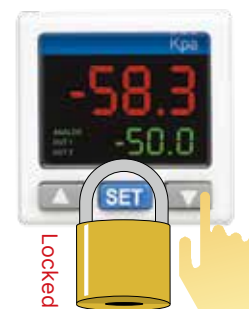
Parameter set up
(orange)



DPA/DPB

Safety Control Mode

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

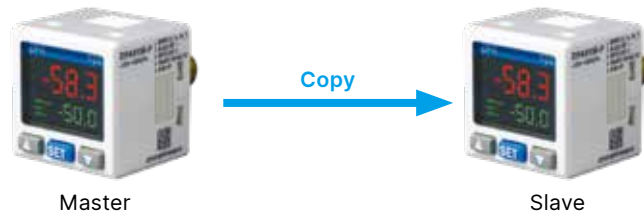


Standard Multifunction Pressure Sensor DPA Series

- Energy-saving mode
- Fast zero reset
- Analog output function
- RS-485 communication
- Various output modes
- Various unit conversions
- 3 sets of color displays
- 10 sets of output response time setup
- Safety control function
- Easy code display
- Parameter copy function

Fast Parameter Copy

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



Collect Real-time Pressure Data through RS-485



Basic Multifunction Pressure Sensor DPB Series

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



Specifications

DPA Series

Power Supply	Voltage range	12 ~ 24 V _{DC} ± 10 % no isolation
	Power consumption	40 mA Max.; current output type 60 mA Max.
Interface	(Only for Communication Type)	RS-485
Pressure Measurement	Pressure type	Non-corrosive gas, gauge type
	Measurable range	DPA01: - 100 ~ 100 kPa
		DPA10: - 100 ~ 1,000 kPa
	Max. durable pressure	DPA01: 200 kPa
		DPA10: 1,100 kPa
Measurement accuracy	± 3 % entire process	
Temperature inaccuracy	± 2 % entire process	
Display	Setup display	2-line LCD display, 4 digits for measured value and 3.5 digits for setup display
	Status display	LCD output status display
	Display mode	3 colors for different modes
	Cycle (ms)	250, 500, 1,000
	Pressure Unit	DPA01 (Low-pressure Type): kPa, kgf/cm ² , bar, psi, mmHg, inchHg DPA10 (High-pressure Type): MPa, kgf/cm ² , bar, psi, cmHg, inchHg Displays to the first decimal place
Output	Number of outputs	Built-in 2 NPN or PNP transistor digital outputs and 1 analog output
	Transistor output	Max. Durable Pressure 30 V/100 mA, Drain Voltage < 1.5 V
	Analog output	1 ~ 5 V: Min. output load resistance 1,000 Ω
		4 ~ 20 mA: Max. output load resistance 400 Ω; linear inaccuracy < 2 % entire process
	Response time (ms)	2, 4, 10, 30, 50, 100, 250, 500, 1,000, 5,000
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 ~ 50 °C	
Storage Temperature	- 20 ~ 65 °C	
Altitude	< 2,000 m	
Operating Relative Humidity	35 % ~ 80 % RH (non-condensing)	

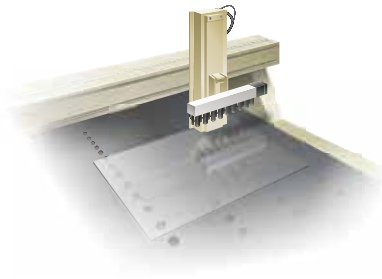
DPB Series

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

Applications

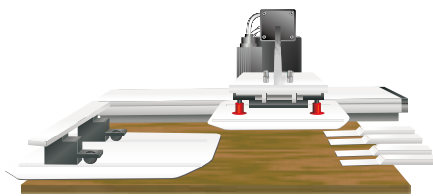
Mechanical Processing Industry

Mechanical product processing and fixing



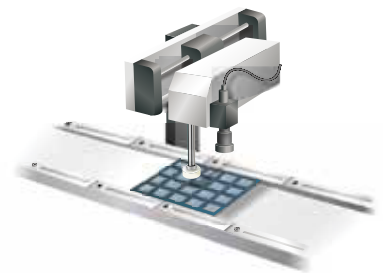
Solar Energy Industry

Turnkey module lines suction



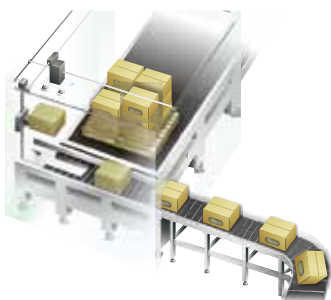
Electronic Components Industry

IC component suction and confirmation



Food Packaging Industry

Drinks, can suction and packaging



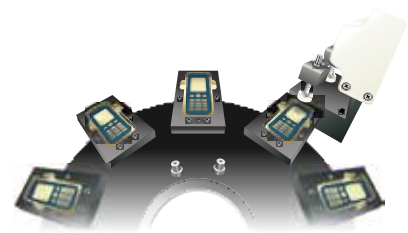
Semiconductor Industry

Wafer suction and loading



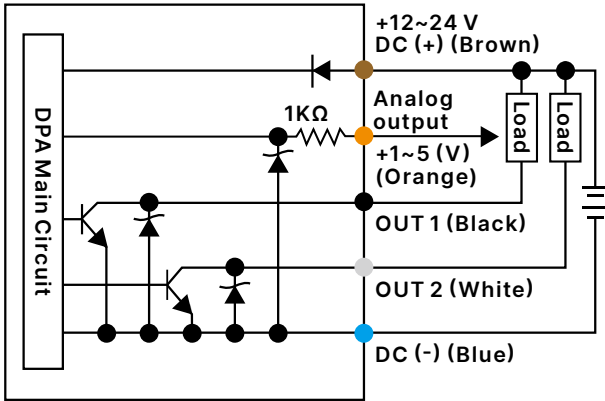
Automatic Assembly Industry

Automation component assembly and confirmation

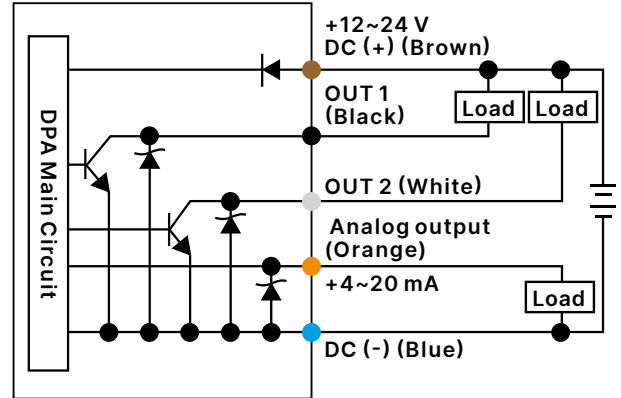


Various Output Control Modes

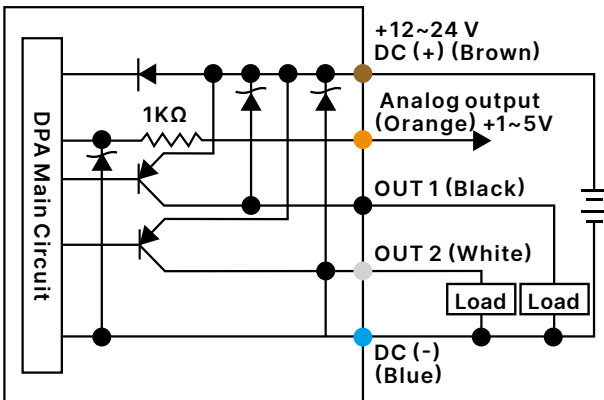
DPA Series



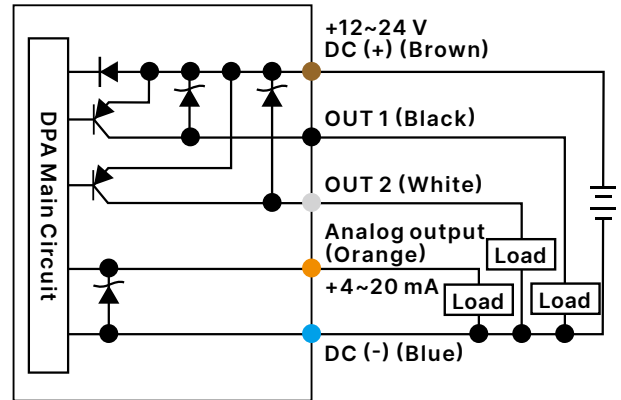
NPN +1 ~ 5V Output



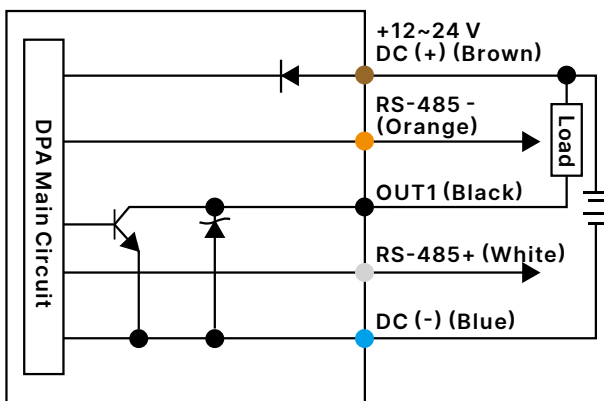
NPN +4 ~ 20mA Output



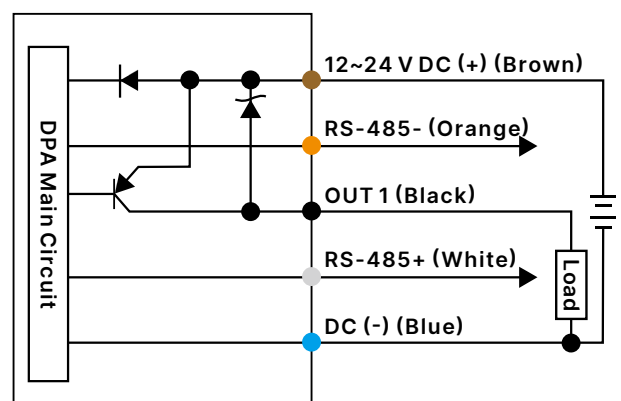
PNP +1 ~ 5V Output



PNP +4 ~ 20mA Output

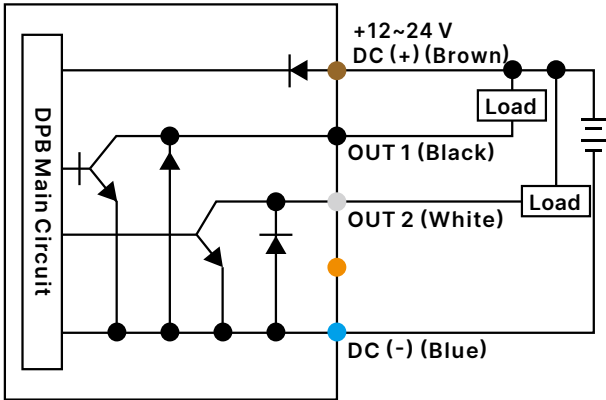


NPN RS-485 Output

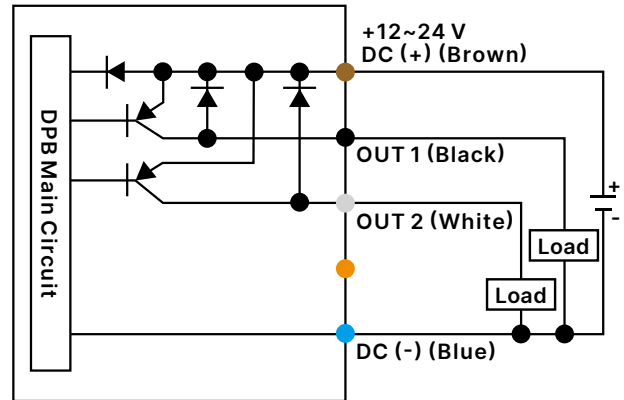


PNP RS-485 Output

DPB Series



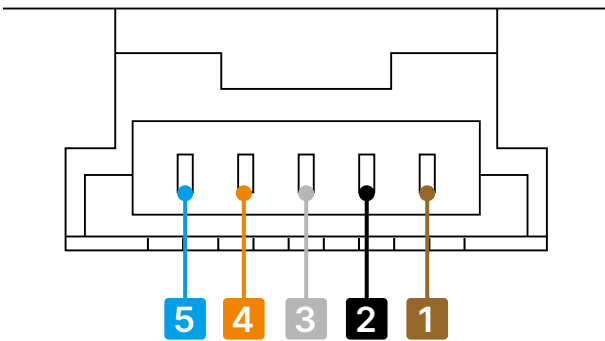
NPN



PNP

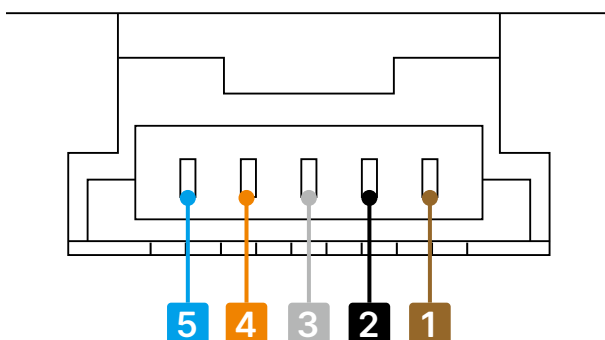
Terminals

DPA Series



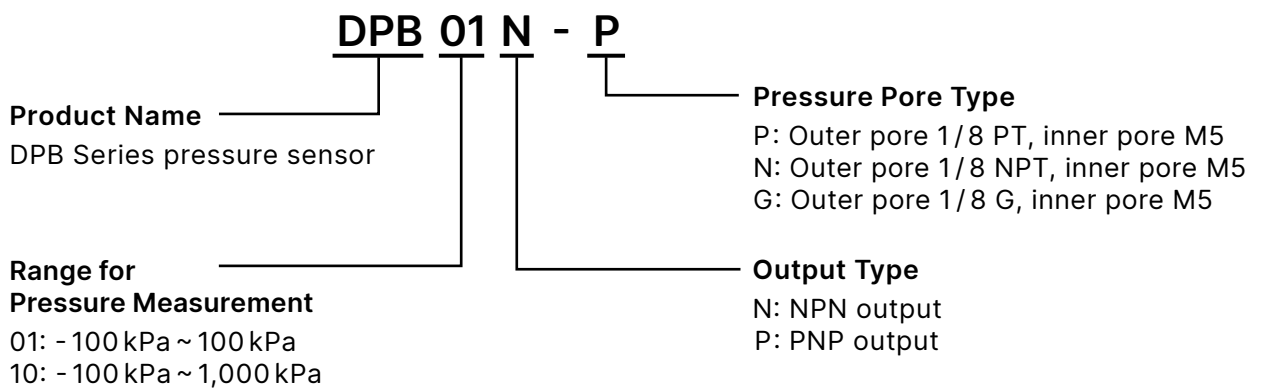
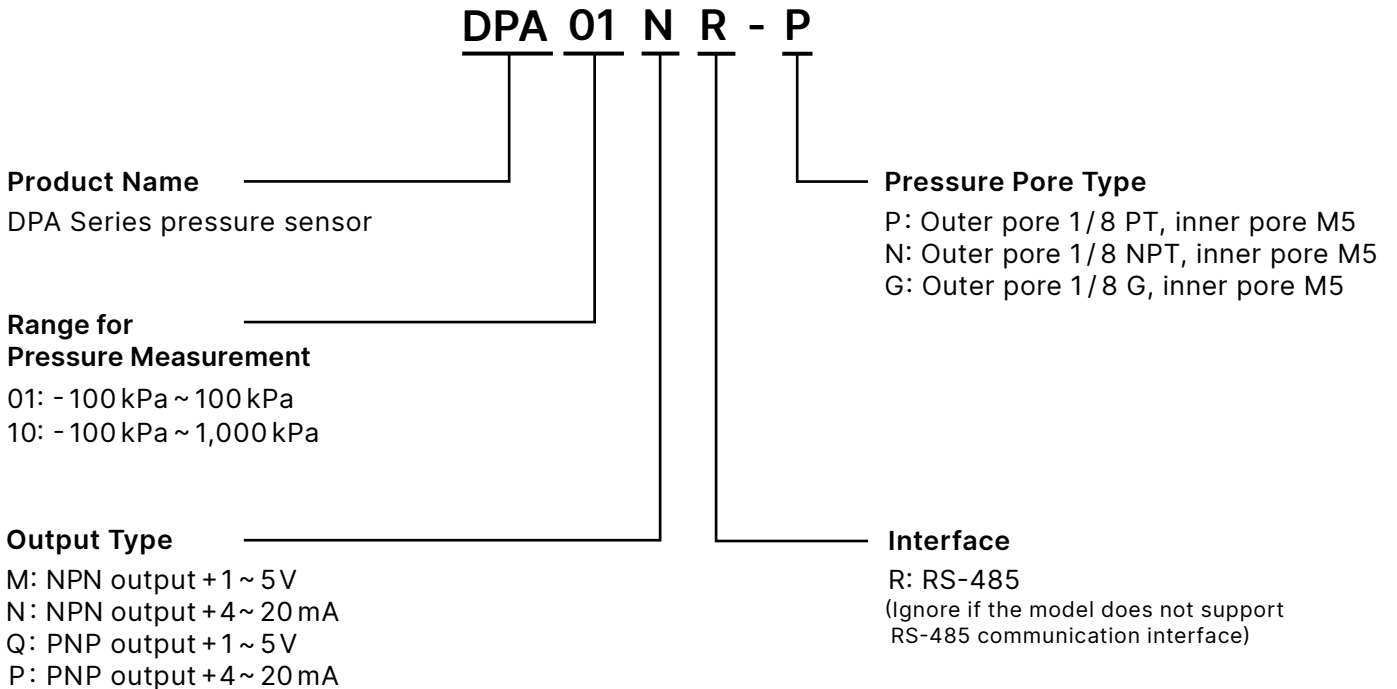
No.	General Model	RS-485 Model
1	Positive power supply input (Brown)	
2	Digital output 1 signal (Black)	
3	Digital output 2 signal (White)	RS-485+ (White)
4	Analog output signal (Orange)	RS-485- (Orange)
5	Negative power supply input (Blue)	

DPB Series



No.	Standard Models
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)

Ordering Information



Models Specifications

DPA Series

-100~100kPa NPN Series Specification	
DPA01M-G	-100~100kPa, NPN, 1~5V output, 1/8G outer port, M5 inner port
DPA01M-N	-100~100kPa, NPN, 1~5V output, 1/8NPT outer port, M5 inner port
DPA01M-P	-100~100kPa, NPN, 1~5V output, 1/8PT outer port, M5 inner port
DPA01N-G	-100~100kPa, NPN, 4~20mA output, 1/8G outer port, M5 inner port
DPA01N-N	-100~100kPa, NPN, 4~20mA output, 1/8NPT outer port, M5 inner port
DPA01N-P	-100~100kPa, NPN, 4~20mA output, 1/8PT outer port, M5 inner port

-100~100kPa PNP Specification	
DPA01Q-G	-100~100kPa, PNP, 1~5V output, 1/8G outer port, M5 inner port
DPA01Q-N	-100~100kPa, PNP, 1~5V output, 1/8NPT outer port, M5 inner port
DPA01Q-P	-100~100kPa, PNP, 1~5V output, 1/8PT outer port, M5 inner port
DPA01P-G	-100~100kPa, PNP, 4~20mA output, 1/8G outer port, M5 inner port
DPA01P-N	-100~100kPa, PNP, 4~20mA output, 1/8NPT outer port, M5 inner port
DPA01P-P	-100~100kPa, PNP, 4~20mA output, 1/8PT outer port, M5 inner port

NPN RS-485 Communication Type Specification	
DPA01NR-P	100~100kPa NPN, outer port 1/8PT Inner port M5
DPA10NR-P	-100~1,000kPa NPN, outer port 1/8PT Inner port M5

-100~1,000kPa NPN Specification	
DPA10M-G	-100~100kPa, NPN, 1~5V output, 1/8G outer port, M5 inner port
DPA10M-N	-100~1,000kPa, NPN, 1~5V output, 1/8NPT outer port, M5 inner port
DPA10M-P	-100~1,000kPa, NPN, 1~5V output, 1/8PT outer port, M5 inner port
DPA10N-G	-100~1,000kPa, NPN, 4~20mA output, 1/8G outer port, M5 inner port
DPA10N-N	-100~1,000kPa, NPN, 4~20mA output, 1/8NPT outer port, M5 inner port
DPA10N-P	-100~1,000kPa, NPN, 4~20mA output, 1/8PT outer port, M5 inner port

-100~1,000kPa PNP Specification	
DPA10Q-G	-100~100kPa, PNP, 1~5V output, 1/8G outer port, M5 inner port
DPA10Q-N	-100~1,000kPa, PNP, 1~5V output, 1/8NPT outer port, M5 inner port
DPA10Q-P	-100~1,000kPa, PNP, 1~5V output, 1/8PT outer port, M5 inner port
DPA10P-G	-100~1,000kPa, PNP, 4~20mA output, 1/8G outer port, M5 inner port
DPA10P-N	-100~1,000kPa, PNP, 4~20mA output, 1/8NPT outer port, M5 inner port
DPA10P-P	-100~1,000kPa, PNP, 4~20mA output, 1/8PT outer port, M5 inner port

PNP RS-485 Communication Type Specification	
DPA01PR-P	-100~100kPa PNP, outer port 1/8PT Inner port M5
DPA10PR-P	-100~1,000kPa PNP, outer port 1/8PT Inner port M5

DPB Series

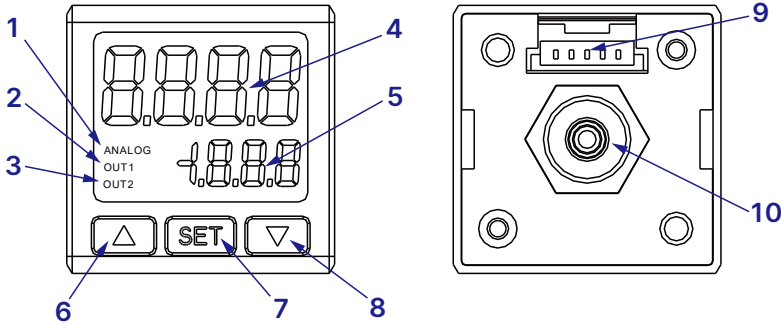
DPB Series	
DPB01N-P	-100~100kPa NPN, outer port 1/8PT Inner port M5
DPB10N-P	-100~1,000kPa NPN, outer port 1/8PT Inner port M5

DPB Series	
DPB01P-P	-100~100kPa PNP, outer port 1/8PT Inner port M5
DPB10P-P	-100~1,000kPa PNP, outer port 1/8PT Inner port M5

DPA / DPB Accessories

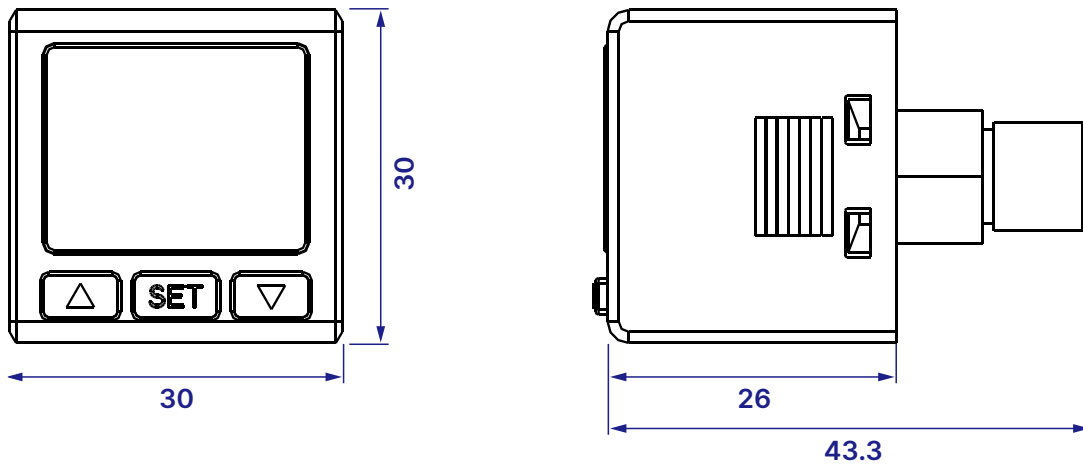
Model	DPA/DPB Accessories
DPA-PFKIT	Panel Installation Accessories
DPA-FMKIT	Bracket Accessories
DPA-FPKIT	Transparent Protection Cover Accessories

Product Profile



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

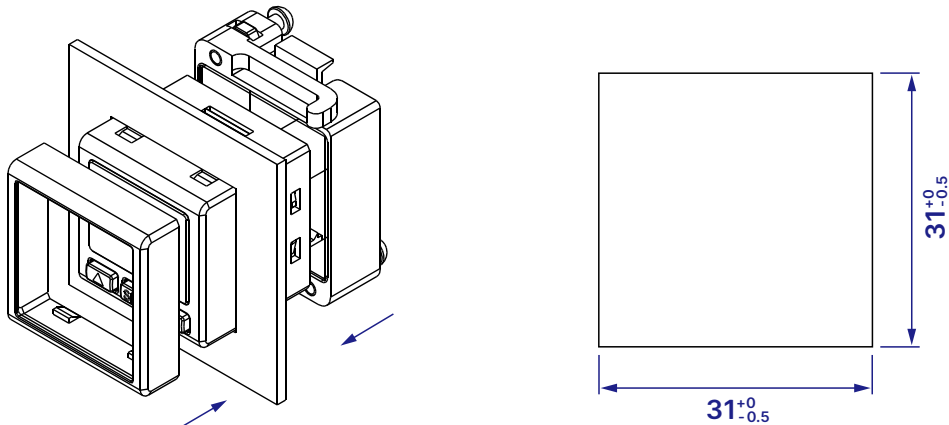
Dimensions (DPA/DPB)



Panel Accessory (DPA/DPB)

Model: DPA-PFKit

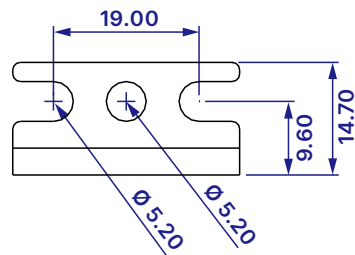
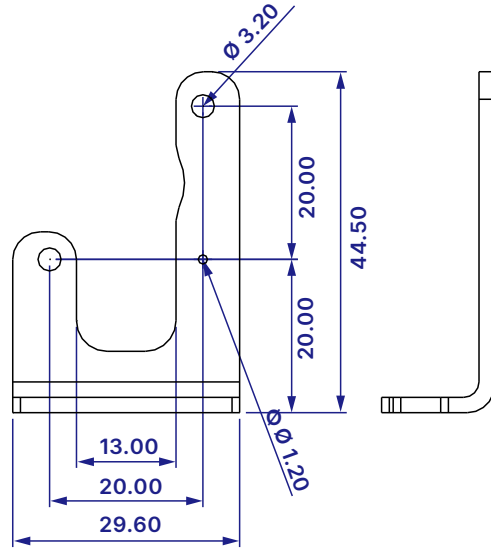
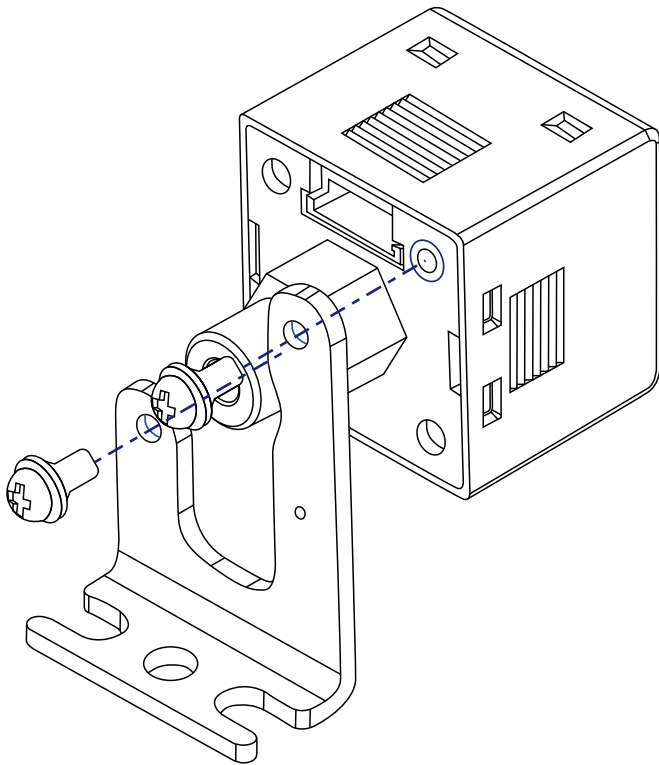
Unit: mm



Shelf Accessory (DPA/DPB)

Model: DPA-FMKit

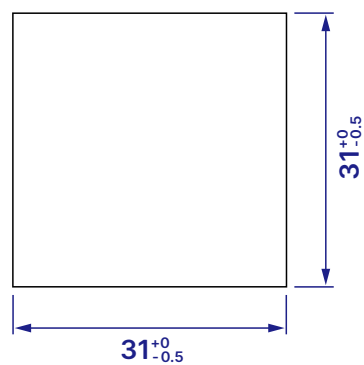
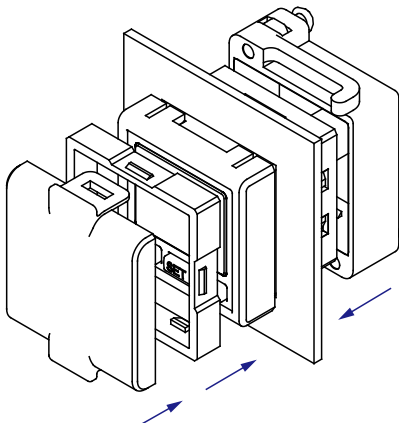
Unit: mm



Transparent Protective Cover (DPA/DPB)

Model: DPA-PFKit

Unit: mm



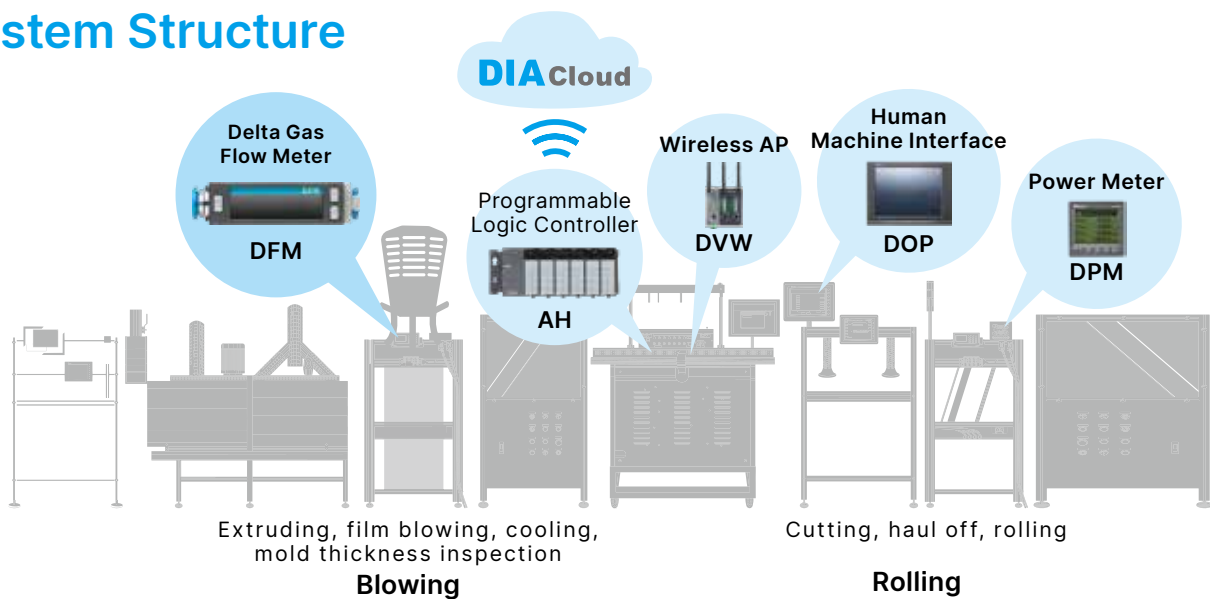
Gas Flow Meter DFM Series

Suitable for various gas flow control and measurement applications, such as forming machines and static eliminators



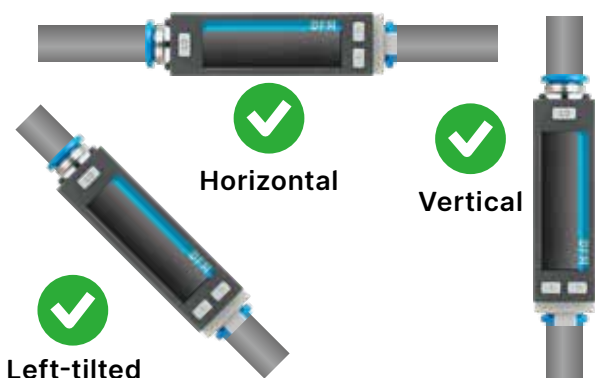
- Thermopile technology
- Bi-direction gas flow measurement
- Maximum and minimum gas flow volume alert settings
- 3-layer embedded tranquilizer
- Supports analog and digital outputs

System Structure



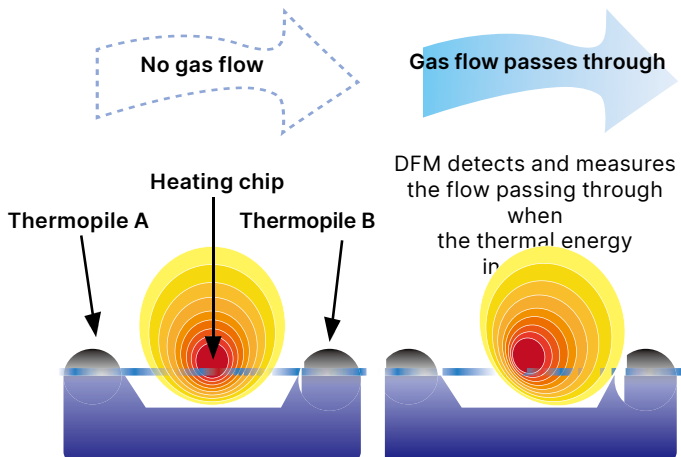
Flexible installation

Vertical, horizontal or tilted installation based on users' needs with a display that faces all directions, providing agile, flexible and easy applications



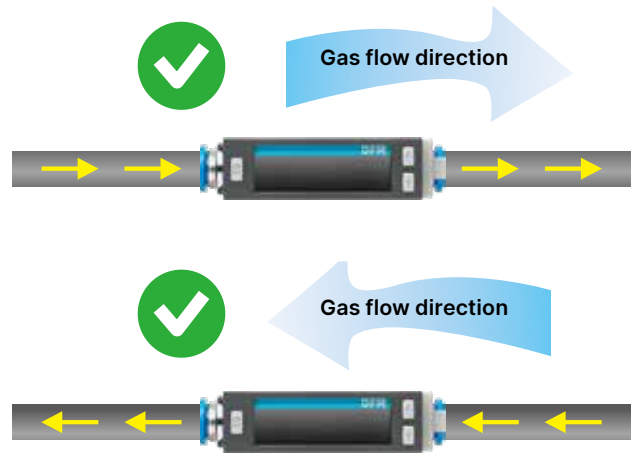
Highly precise gas flow measurement

Adopts Thermopile technology with quick response time to conduct stable and accurate gas flow measurement



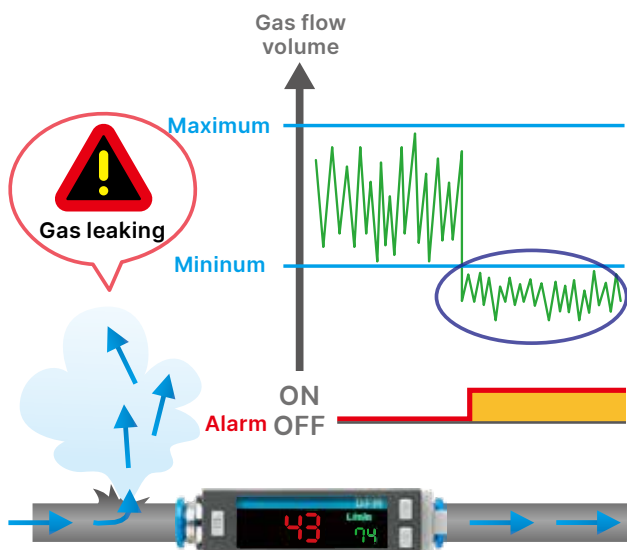
Two-sided gas flow measurement

No need to alternate installation for gas flow direction. Users can flexibly operate based on needs



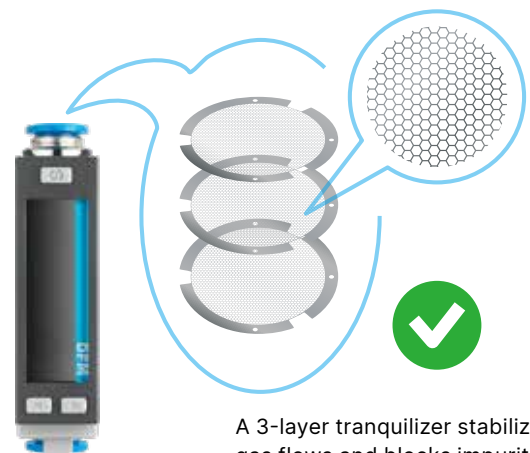
Flow limit setting for safe and reliable operation

Users can set up max. and min. limits of gas flow volume. The system will sound an alarm if the detection exceeds/fails the limits



Embedded tranquilizer to stabilize gas flow

A 3-layer embedded tranquilizer eliminates gas flow chaos in bending pipe, providing stable and convenient gas flow detection



A 3-layer tranquilizer stabilizes gas flows and blocks impurity in gas to protect the device.

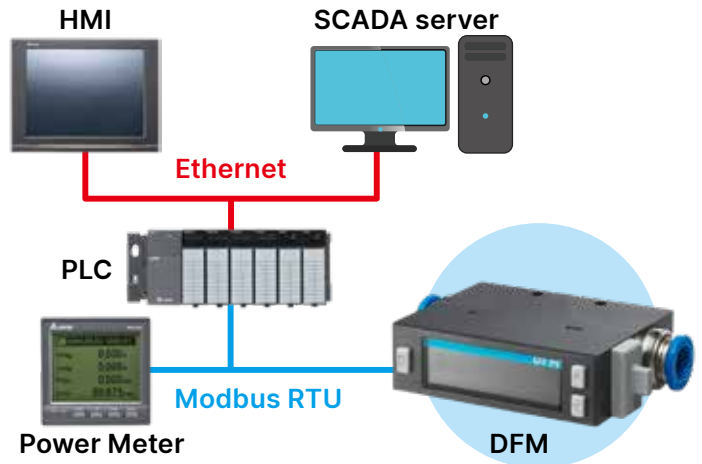
High quality LCD display

Clear characters display for easy device status monitoring in all kinds of environments



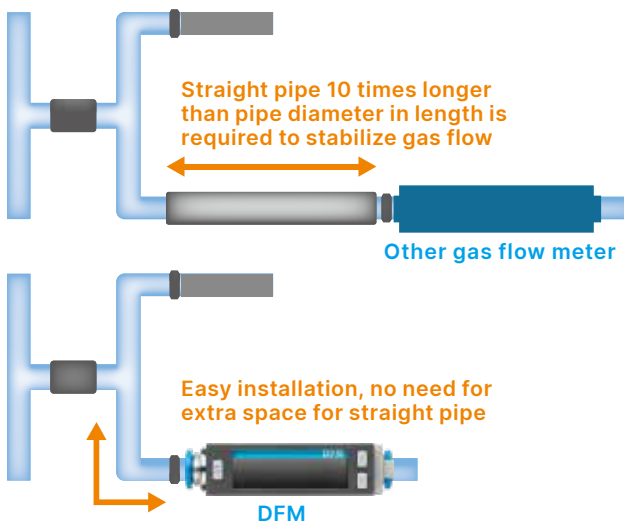
Supports analog and digital output

Fast connection to obtain real-time data; analog voltage, analog current and digital RS-485 outputs available on different models



Built-in stabilizer

Connects with the pipe directly according to the requirements of the installation environment; no need to install 10 times further than the pipe diameter, providing flexibility and space-saving advantages



Optional bracket for easy installation

Optional bracket for easy installation with screws



Applications

Cleaning, gas drying, environment monitoring, cable charging, ventilation inspection in automation equipment, semiconductor, panel and automobile industries.

Cylinder gas flow usage measurement



Gas filling flow control for food packaging



Gas flow / pressure management on production lines



Filling gas flow management



Equipment gas flow consumption management

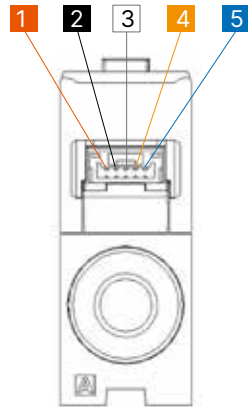


Coating gas flow management



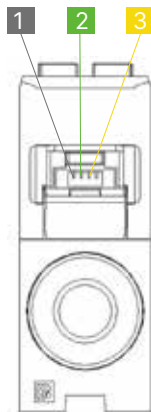
Connection Terminals

Power and I/O terminals (A side)



- 1. Positive power input
- 2. OUT1, first digital output signal
- 3. OUT2 / IN, second digital I/O signal
- 4. Analog output signal
- 5. Negative power input

RS-485 output terminals (B side)

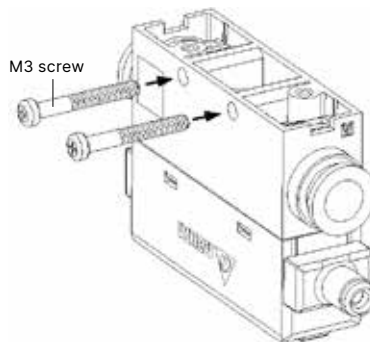
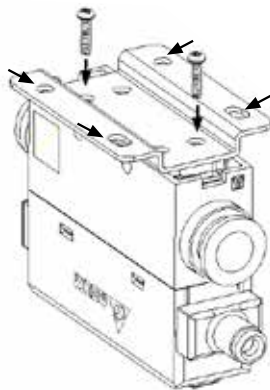


- 1. Anti-jamming grounding
- 2. RS-485 D+ terminal
- 3. RS-485 D- terminal

Installation

Screw with bracket

- 1. Use two screws to fix the bracket onto the DFM
- 2. Screw the bracket into position on the DFM to complete installation.









Screw directly

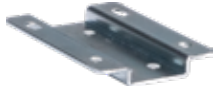
- Screw the M3 screws by the side holes into position and complete installation.

Product Specifications

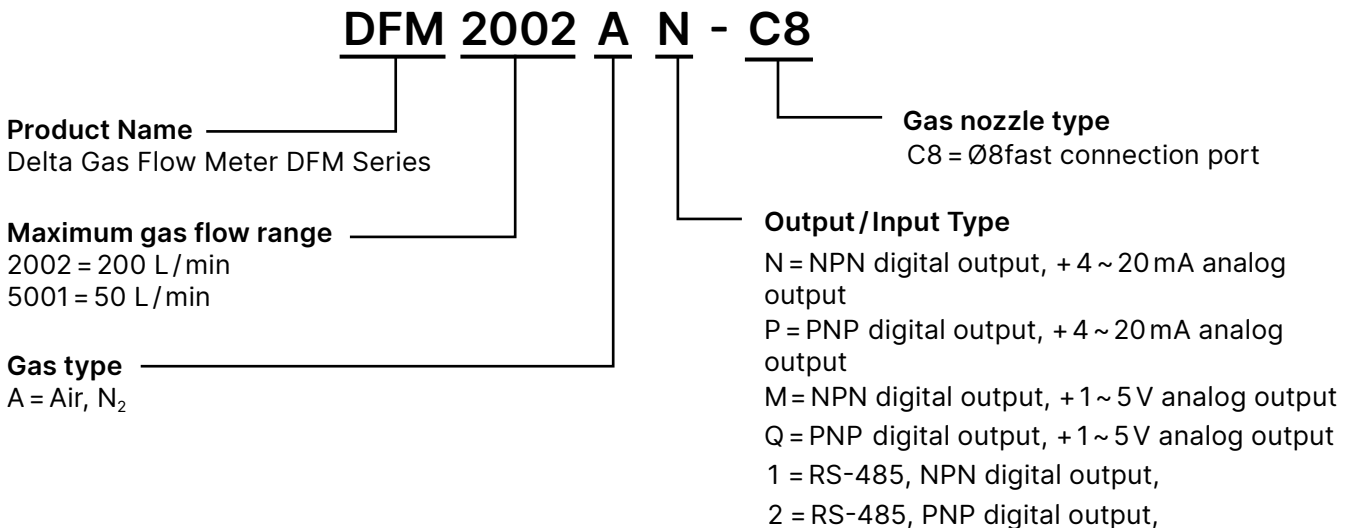
Delta Gas Flow Meter

Model	Product	Model	Output type
DFM2002AM-C8		200L Voltage Output	NPN
DFM2002AQ-C8			PNP
DFM2002AN-C8		200L Current Output	NPN
DFM2002AP-C8			PNP
DFM2002A1-C8		200L RS-485 Output	NPN
DFM2002A2-C8			PNP
DFM5001AM-C8		50L Voltage Output	NPN
DFM5001AQ-C8			PNP
DFM5001AN-C8		50L Current Output	NPN
DFM5001AP-C8			PNP
DFM5001A1-C8		50L RS-485 Output	NPN
DFM5001A2-C8			PNP

Bracket (optional)

Product	Appearance Description Model	Model Name
	DFM bracket	DFM2002-BMKIT

Ordering Information



Technical Specifications

Model	DFM200 Series	DFM50 Series
Input Power	Voltage range	24 V _{DC} +/- 10 % non-isolation
	Power consumption	24 V: - Voltage output and RS-485 models: max. 0.96 W - Current output model: max. 1.2 W
Gas Flow Measurement	Measurement range *1	2 ~ 200 L/min*1 0.5 ~ 50 L/min
	Measurable gas *2	Air, N ₂
	Operation pressure	0 ~ 0.75 MPa
	Max. durable pressure	1 MPa
	Pressure-related inaccuracy	+/- 5 % F.S. (0 ~ 0.75 MPa) entire process The process is based on pressure 0.35 MPa. Pressure can also lead to inaccuracies other than measurement inaccuracy.*3
	Measurement accuracy	+/- 3 % F.S. entire process
	Temperature-related inaccuracy	+/- 5 % F.S. (0 ~ 50 °C) entire process The process is based on temperature 25 °C. Temperature can also lead to inaccuracies other than measurement inaccuracy
Functions	Peak volume display / accumulated volume display / reverse display / zero adjustment / button lockup / energy-saving mode / percentage (analog output) / delay decision	
Display	Flow volume display	Max. 3 digits for peak volume, 8 digits for accumulated volume
	Display modes	2 colors (red and green) display available based on different modes
	Display Figure	1 L/min 0.1 L/min
Output	Output terminals	Built-in 2 NPN or PNP transistor digital outputs and 1 analog output (varies in different models)
	Input terminals	Built-in 1 digital output, shares terminal with 2 nd output
	Output form	NPN: max. durable pressure 30 V/100 mA, residual voltage 1.5 V PNP: max. durable pressure 30 V/100 mA, residual voltage 1.5 V
	Output (varies in different models)	Analog voltage: 1 ~ 5 V, min. output load resistance 50 kΩ Linear inaccuracy < ± 3 % entire process
		Analog current: 4 ~ 20 mA, max. output load resistance 300 Ω Linear inaccuracy < ± 3 % entire process Digital RS-485
Response time	50 ms, 100 ms, 500 ms, 1 sec, 2 sec	
Gas Nozzle Size	C8	Fast connection port Ø8 (8 mm diameter pipe connectable)
Cable Specifications	Connector	Standard 2 m cable included
Operation Temperature	0 ~ 50 °C	
Storage Temperature	-10 ~ 60 °C	
Operation Humidity	35 ~ 85 % RH (Non-condensed)	

*Note 1: Flow transfers into value below. Standard volume std (pre-setting) : 20 °C, AP 101.3 kPa

*Note 2: Dry and clean gas without dirt and oil

*Note 3: Please ensure both sides are connected to pipe when operating. If one side is not connected, pressure will decrease and lead to inaccurate measurement

Timer / Counter / Tachometer CTA Series

- 3-in-1 timer / counter / tachometer
- Mixed timer + counter function
- 6-digit LCD display
- Maximum speed of the counter: 10 Kpps
- NPN or PNP input signals available
- Pre-scale function
- Counting types: 1-stage, 2-stage, batch, total, dual



Specifications

Item	Description
Power input	100 ~ 240 V _{AC} , 50/60Hz or 24 V _{DC} , isolated switching power supply
Input voltage range	85 % ~ 110 %, rated voltage
Power consumption	Less than 10 VA
External power supply	12 V _{DC} ±10 %, 100 mA
Display	Double-line, 6-digit negative transmissive LCD display
Input signal	Non-voltage input (NPN): ON impedance max. 1K Ω ON residual voltage: max. 2 V Voltage input (PNP): High level: 4.5 to 30 V _{DC} , Low level: 0 to 2 V _{DC}
Output 1	Relay: SPST max. 250 V _{AC} , 5 A (resistance load) Transistor: NPN open collector. When 100 mA / 30 V _{DC} , residual voltage = max. 1.5 V _{DC}
Output 2	Relay: SPDT max. 250 V _{AC} , 5 A (resistance load) Transistor: NPN open collector. When 100 mA / 30 V _{DC} , residual voltage = max. 1.5 V _{DC}
Dielectric strength	2,000 V _{AC} 50/60Hz for 1 minute
Vibration resistance	Without damage: 10 ~ 55Hz, amplitude = 0.75mm, 3 axes for 2 hours
Shock resistance	Without damage: drop 4 times, 300 m/s ² , 3 edges, 6 surfaces and 1 corner
Ambient temperature	0 ~ 50 °C
Storage temperature	-20 ~ 65 °C
Altitude	2,000m or less
Ambient humidity	35 % ~ 85 % RH (non-condensing)
Pollution degree	Pollution Degree 2
Communication	RS-485

Ordering Information

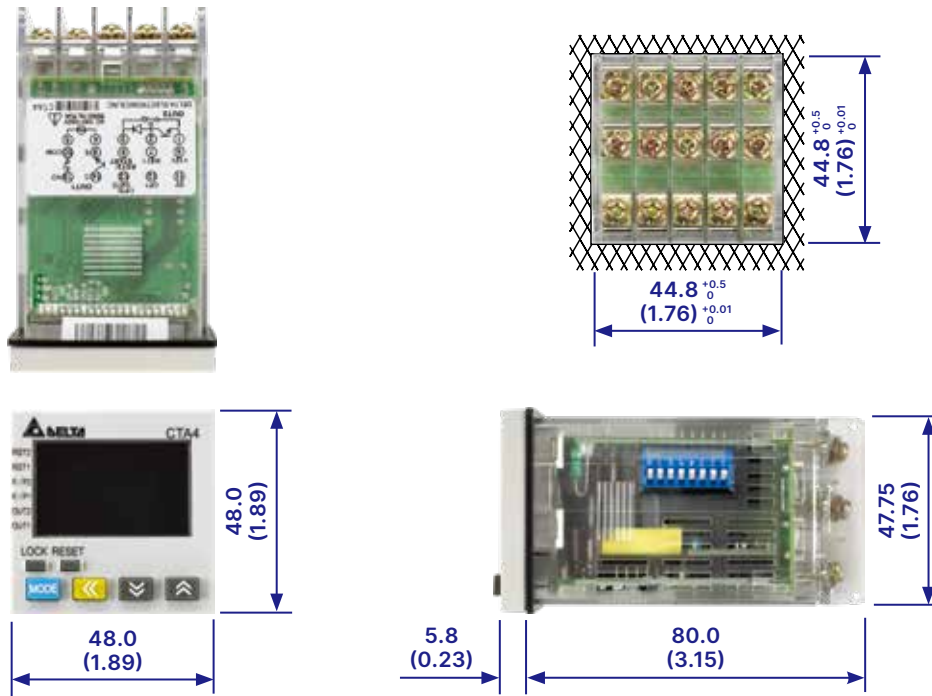
CTA 4 0 0 0 A
① ② ③ ④ ⑤

CTA : Delta Clocking/Metering/Tachometer

① Panel size (mm)	4: 48 × 48
② Output 2	0: Transistor; 1: Relay
③ Preset stage	0: 2 stages
④ Communication	0: None; 1: Communication
⑤ Power supply	A: 100 ~ 240 V _{AC} ; D: 24 V _{DC}

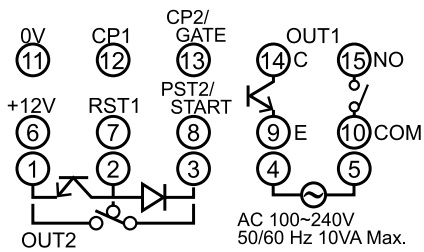
Dimensions

Unit: mm (in)

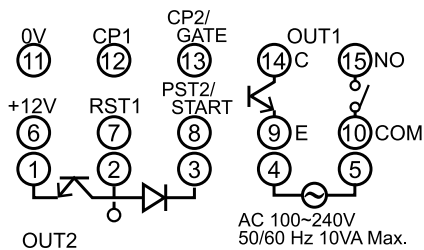


Terminal Definition

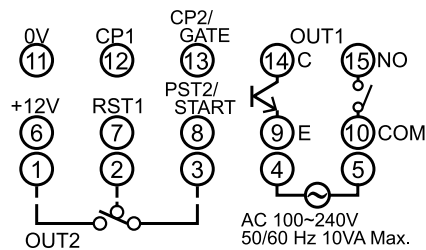
CTA4 Series



Counter	Timer	Tachometer	Timer + Counter
CP1	—	CP1	CP1
CP2	Gate	—	Gate
Reset1	Reset1	Reset1	Reset1
Reset2	Start	—	Start



CTA4000 Series



CTA4100 Series



Smarter. Greener. Together.

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