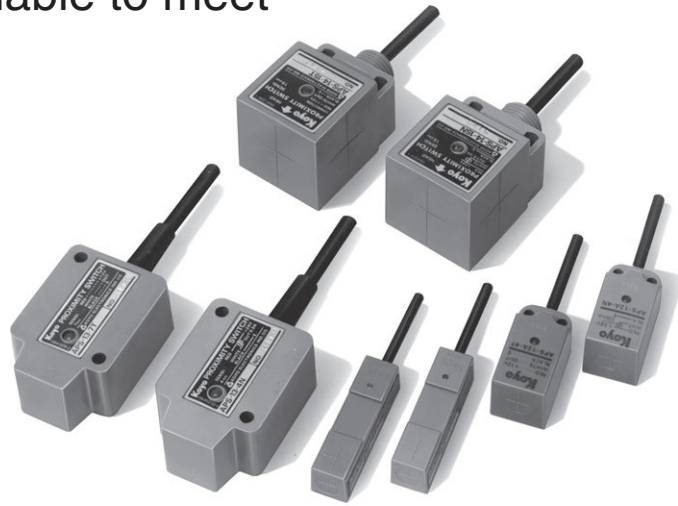


Rectangular type APS-10 to 15 Series

From an ultra-thin design to an operating distance of 15 mm, wide-ranging rectangular types are available to meet diversified requirements.



Types

DC voltage output type/DC 3-wire type

Shape	Operating distance (mm)	Output type	Model number	Remarks	
Non-embedded type	4	DC voltage	APS-10-4T	Front face sensing	
		NPN N.O.	APS-10-4N		
		DC voltage	APS-11-4T	Upper face sensing	
		NPN N.O.	APS-11-4N		
		DC voltage	APS-12A-4T		
		NPN N.O.	APS-12A-4N		
	7	DC voltage	APS-13-4T	Front face sensing Frequency classification model available	
		NPN N.O.	APS-13-4N		
		15	DC voltage	APS-13-7T	
			NPN N.O.	APS-13-7N	
			DC voltage	APS-14-15T	Front face sensing Frequency classification model available ("L" is added at the end of model number)
			NPN N.O.	APS-14-15N	
NPN N.O.	APS-15-15N		Side face sensing Frequency classification model available ("L" is added at the end of model number)		

* Frequency classification models (L) are non-stock products.

APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

APS-F/U

APS-10~15

APS-CU

CS

Rectangular type APS-10 to 15 Series

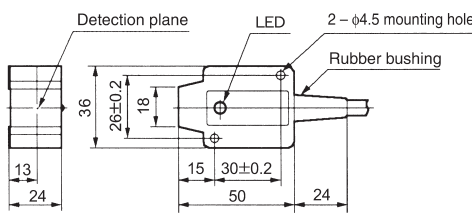
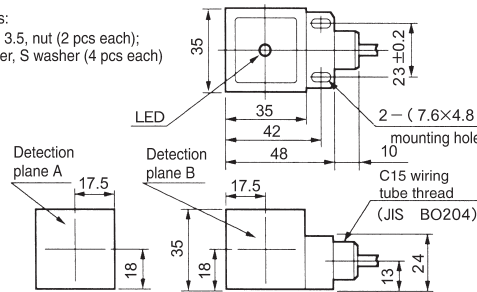
DC Voltage Output Type / DC 3-wire, Non-embedded Type

Effective operating distance	4 mm ±10%	4 mm ±10%	4 mm ±10%	
Dimensions (mm)				
Remarks	Front face sensing	Upper face sensing	Frequency classification model available	
Output type	DC voltage	Model number APS-10-4T Price ¥2,800	Model number APS-11-4T Price ¥2,800	Model number APS-12A-4T Price ¥2,020
	NPN NO	Model number APS-10-4N Price ¥2,800	Model number APS-11-4N Price ¥2,800	Model number APS-12A-4N Price ¥2,500
Rated operating voltage	T type	DC+12 V (+10 to +16 V) Permissible ripple rate: 3%p-p or less		
	N type	Production in/before March 2000: +24 VDC (+20 to +28 V), permissible ripple rate: 3%p-p or less Production in/after April 2000: +12/24 VDC (+10 to +30 V), permissible ripple rate: 3%p-p or less		DC+24 V (+20 to +30 V) Permissible ripple rate: 3%p-p or less
No-load current	15 mA or less		10 mA or less	
Standard target object (mm)	Iron 20 × 20 × 1t			
Rated operating distance	0 to 2.8 mm			
Responding material	Iron/nonferrous metal (operating distance varies with material)			
Differential travel	Approx. 10%			
Switching frequency	T type	300 Hz		1 kHz
	N type	100 Hz		1 kHz
Output	T type	Output impedance: 3.3 kΩ (output standard: 4P4N)		
	N type <small>Rated operating current</small>	Production in/before March 2000: 60 mA max (load voltage: 40 V or less) Production in/after April 2000: 100 mA max at +12 VDC (load voltage: 40 V or less) 200 mA max at +24 VDC (load voltage: 40 V or less)		100 mA (+40°C) 80 mA (+50°C) (load voltage: 50 V or less)
Voltage drop	1.0 V or less			
Leakage current	300 μA or less			
Indicator lamp	Operation indication			
Operating temperature	-10 to +50°C		T type: -25 to +60°C N type: -10 to +50°C	
Temperature characteristics	Within ±20% (of operating distance at +20°C)			
Withstand voltage	500 VAC, 50/60 Hz (1 minute)			
Insulation resistance	5 MΩ or higher (500 VDC)			
Vibration resistance	Double amplitude: 1.5 mm, 10 to 55 Hz (2 hours in each of X, Y and Z directions)			
Impact resistance	300 m/s ² , within 11 ms (10 cycles in each of X, Y and Z directions)			
Protection grade	IP67			
Casing material	PBT resin		Polycarbonate ^{*1}	
Lead wire	Oil-resistant vinyl chloride cable 1.5 m Outer diameter (ø4), 0.3 mm ² 3-wire		Oil-resistant vinyl chloride cable 1 m Outer diameter (ø4), 0.3 mm ² 3-wire	
Tightening torque	0.5 Nm or less		0.4 Nm or less	
Weight	Approx. 50 g			

* The frequency classification models have "L" at the end of its model number (non-stock product).

*1: To be changed to PBT resin.

DC Voltage Output Type / DC 3-wire, Non-embedded Type

Effective operating distance		4 mm ±10%	7 mm ±10%	15 mm ±15%	
Dimensions (mm)		 <p>Accessories: screw M4 x 3.5, plane washer (4 pcs each); nut, S washer (2 pcs each)</p>		 <p>Accessories: screw M4 x 3.5, nut (2 pcs each); plane washer, S washer (4 pcs each)</p>	
Remarks		Frequency classification model available		Front face sensing (detection plane A) Frequency classification model available	Front face sensing (detection plane B) Frequency classification model available
Output type	DC voltage	Model number	APS-13-4T	APS-13-7T	APS-14-15T
		Price	¥3,680	¥3,680	¥5,150
NPN NO		Model number	APS-13-4N	APS-13-7N	APS-14-15N
		Price	¥4,900	¥5,310	¥6,120
Rated operating voltage	T type	DC+12 V (+10 to +16 V) Permissible ripple rate: 3%p-p or less			
	N type	DC+24 V (+20 to +30 V) Permissible ripple rate: 3%p-p or less			
No-load current		T type: 15 mA or less N type: 10 mA or less			
Standard target object (mm)		Iron 20 × 20 × 1t	Iron 30 × 30 × 1t	Iron 50 × 50 × 1t	
Rated operating distance		0 to 2.8 mm	0 to 4.9 mm	0 to 10.5 mm	
Responding material		Iron/nonferrous metal (operating distance varies with material)			
Differential travel		Approx. 10%			
Switching frequency	T type	250 Hz	200 Hz	100 Hz	
	N type	300 Hz	100 Hz		
Output	T type	Output impedance: 1.8 kΩ (output standard: 7P6N)			
	N type <small>Rated operating current</small>	300 mA (+40°C or less) 200 mA (+50°C or less) (load voltage: 50 V or less)			
Voltage drop		2.4 V or less			
Leakage current		800 μA or less		300 μA or less	
Indicator lamp		Operation indication			
Operating temperature		-10 to +50°C			
Temperature characteristics		Within ±20% (of operating distance at +20°C)			
Withstand voltage		500 VAC, 50/60 Hz (1 minute)			
Insulation resistance		5 MΩ or higher (500 VDC)			
Vibration resistance		Double amplitude: 1.5 mm, 10 to 55 Hz (2 hours in each of X, Y and Z directions)			
Impact resistance		300 m/s ² , within 11 ms (10 cycles in each of X, Y and Z directions)			
Protection grade		IP66			
Casing material		PBT resin		Polycarbonate ^{*1}	
Lead wire		Oil-resistant cable 1.5 m Outer diameter (ø6), 0.5 mm ² 3-wire			
Tightening torque		0.8 Nm or less			
Weight		Approx. 150 g			

* The frequency classification models have "L" or "H" ("L" only for APS-1/APS-15) at the end of its model number (non-stock product).

*1: To be changed to PBT resin.

APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

APS-F/U

APS-10~15

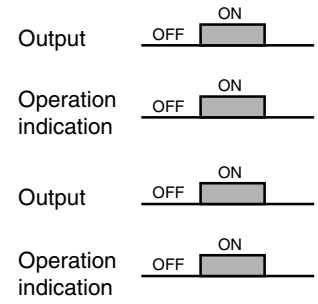
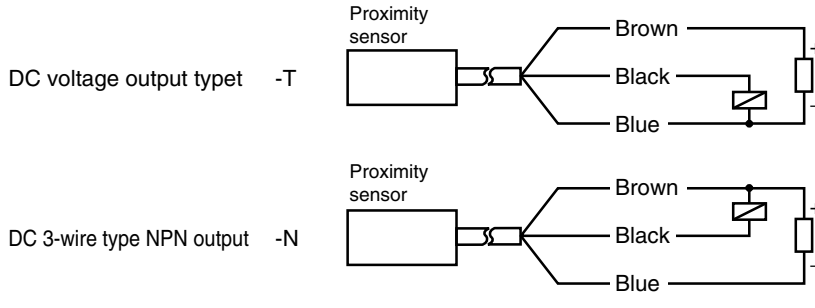
APS-CU

CS

Rectangular type APS-10 to 15 Series

Connection/Operation

(Target object Not present Present)



Note: indicates a load.

Installation and Influence of Surrounding Metals

(in mm)

Installation	● Placed in parallel with a metallic infinite plane	● Placed in parallel with a metallic plane as far as the detection plane	● Placed in the hole of a window-shaped metallic object	● A metallic object is placed in front of the sensor	● Two sensors are placed in parallel with each other	● Placed to face each other
Model number						
APS-10-4...	10	6	25	10	30	40
APS-11-4...	10	6	25	10	30	40
APS-12A-4...	13	10	35	10	40	50
APS-13-4...	13	11	35	10	40	50
APS-13-7...	18	15	50	18	70	90
APS-14-15...	25	17.5	70	35	150	200
APS-15-15...	25	17.5	70	35	150	200

- * Position of the target object for an upper face sensing model
- If a metallic object is present near the proximity sensor, the operating distance changes and the operation becomes unstable. Secure a sufficient distance from the sensor as long as possible.
- The "D" dimension (mm) is the minimum distance from the proximity sensor's detection plane to the metallic body. Secure a sufficient distance longer than the indicated dimension.

Mutual Interference and Classification of Frequencies

When using two or more proximity sensors in close contact with each other, secure an interval between the proximity sensors (center to center) at least 10 times the operating distance. If the interval is inadequate, mutual interference may occur.

In applications where it is impossible to secure adequate intervals, use models classified by frequency. Normally, frequency classification is indicated by an alphabet immediately after the operating distance of the model number.

- Those models classified by frequency have either of the following markings on the cable so that they can easily be distinguished from other models.

For high frequencies (H) : yellow spiral mark

For low frequencies (L) : red spiral mark

Example:








APS-13 - 4T (M) Model with a standard frequency
- 4N (M) (normally, "M" is omitted)

APS-13 - 4TL Model with a lower frequency than the
- 4NL standard frequency

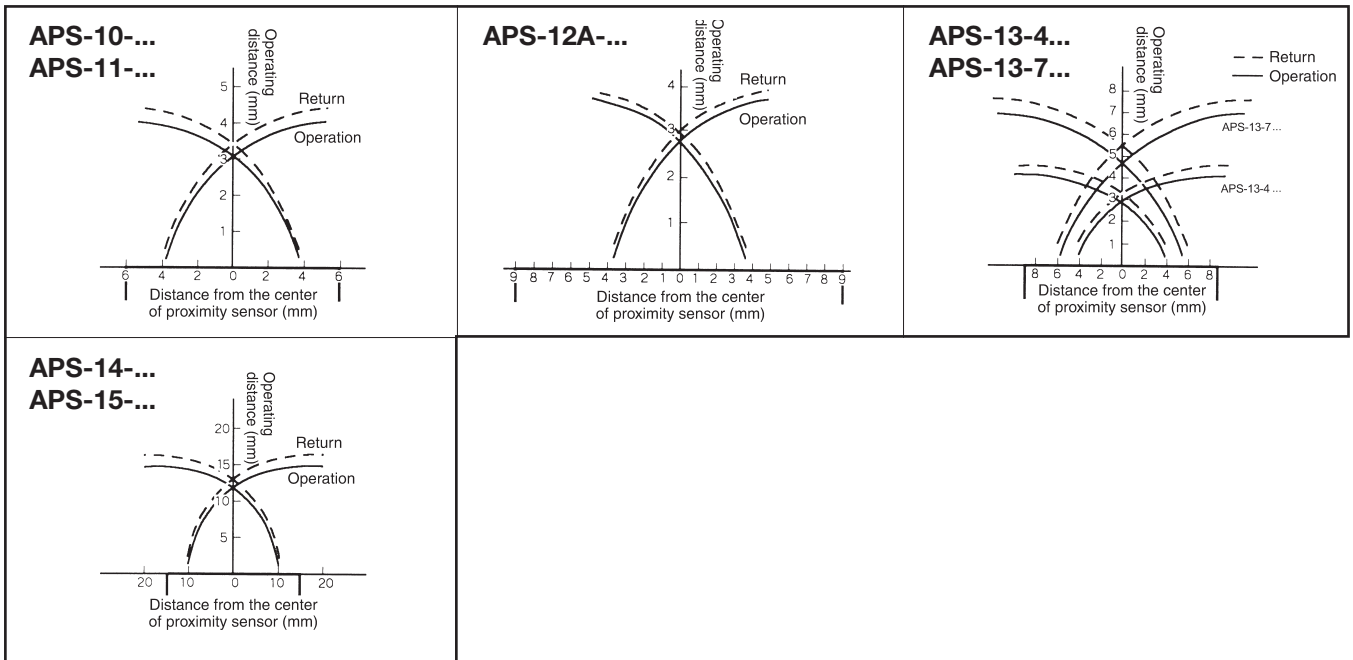
APS-13 - 4TH Model with a higher frequency than
- 7TH the standard frequency

Combinations of models classified by frequency

(can be installed in close contact with each other)

<p>APS-12A-4T(M)LH APS-12A-4N(M)LH APS-13-4T(M)LH</p>	<p>L  (M)  H </p> <p>* To install four or more sensors in close contact, preliminary study is required.</p>
<p>APS-13-4N(M)L APS-13-7T(M)H APS-14-15T(M)L APS-14-15N(M)L APS-15-15N(M)L</p>	<p>L  M)  M)  H) </p> <p>* To install three or more sensors in close contact, preliminary study is required.</p>

Detection Area Diagrams (Representative Examples)



APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

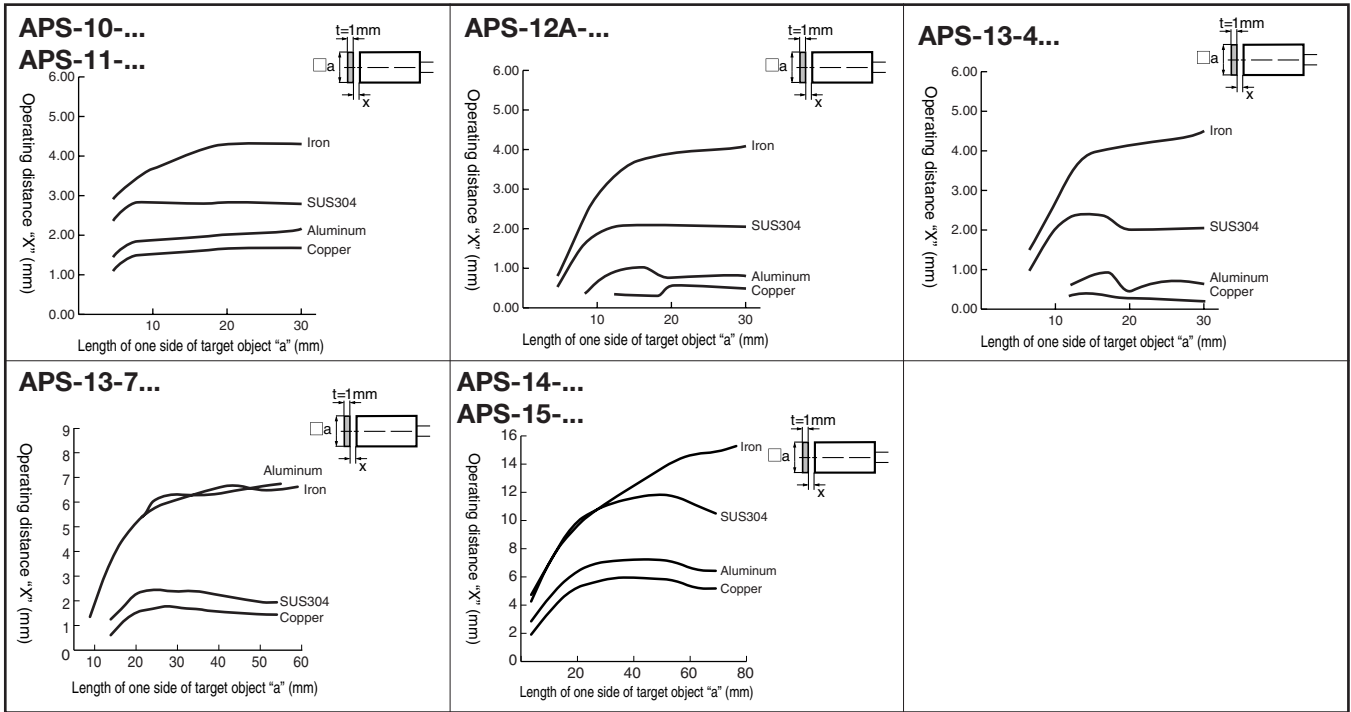
APS-F/U

APS-10~15

APS-CU

CS

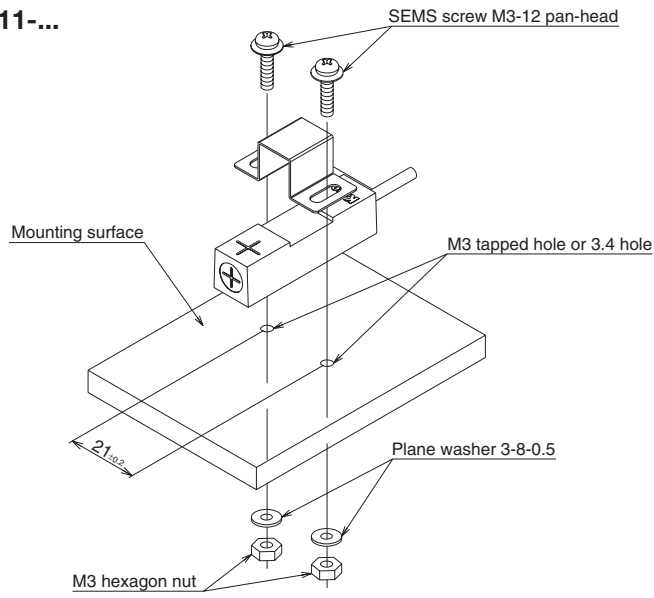
Shape Characteristics (Representative Examples)



Installation

APS-10-...

APS-11-...



APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

APS-F/U

APS-10~15

APS-CU

CS