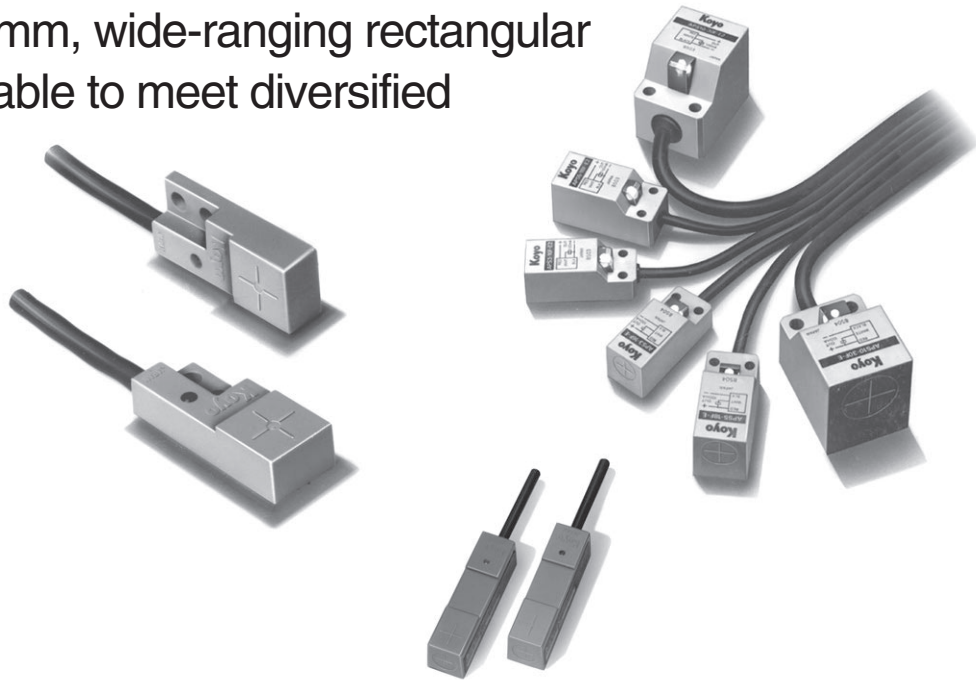


Rectangular type APS-F/U Series

From an ultra-thin design to an operating distance of 10 mm, wide-ranging rectangular types are available to meet diversified requirements.



Types

DC 2-wire type

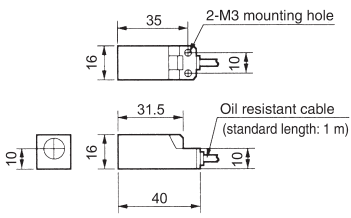
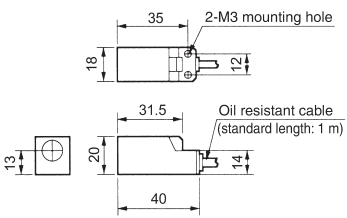
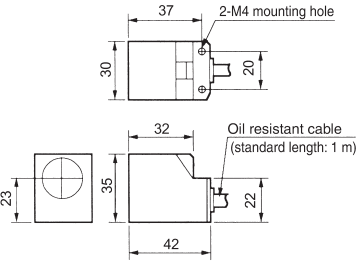
Shape	Operating distance (mm)	Output type	Model number	Remarks
Non-embedded type	3	N.O.	APS3-16F-Z	Front face sensing
	4	N.O.	APS4-12U-Z	Ultra-thin, upper face sensing
			APS4-12BU-Z	Upper face sensing
			APS4-12BF-Z	Front face sensing
	5	N.O.	APS5-18F-Z	Front face sensing
10	N.O.	APS10-30F-Z		

DC 3-wire type

Shape	Operating distance (mm)	Output type	Model number	Remarks
Non-embedded type	3	NPN N.O.	APS3-16F-E	Front face sensing Frequency classification model available ("L" or "H" is added at the end of model number)
		PNP N.O.	APS3-16F-E2	Front face sensing
	4	NPN N.O.	APS4-12U-E	Ultra-thin, upper face sensing
	5	NPN N.O.	APS5-18F-E	Front face sensing Frequency classification model available ("L" or "H" is added at the end of model number)
		PNP N.O.	APS5-18F-E2	Front face sensing Frequency classification model available ("L" or "H" is added at the end of model number)
	10	NPN N.O.	APS10-30F-E	Front face sensing Frequency classification model available ("L" is added at the end of model number)
PNP N.O.		APS10-30F-E2	Front face sensing	

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

DC 2-wire, Non-embedded Type

Effective operating distance		3 mm ±10%	5 mm ±10%	10 mm ±10%	
Dimensions (mm)					
Remarks					
Output type	NO	Model number	APS3-16F-Z	APS5-18F-Z	APS10-30F-Z
		Price	¥2,600	¥2,600	¥3,300
Rated operating voltage		DC+12/+24 V (+10 to +30V) Permissible ripple rate: 10%p-p or less (max peak voltage: 30 V or less)			
Standard target object (mm)		Iron 20 × 20 × 1t	Iron 25 × 25 × 1t	Iron 30 × 30 × 1t	
Rated operating distance		0 to 2.4 mm	0 to 4.0 mm	0 to 8.0 mm	
Responding material		Iron/nonferrous metal (operating distance varies with material)			
Differential travel		20% or less			
Switching frequency		1k Hz	800 Hz	500 Hz	
Rated operating current		5 to 200 mA			
Voltage drop		3 V or less			
Leakage current		TYP 0.8 mA or less (1.0 mA or less max)			
Circuit protection		Surge absorption circuit			
Indicator lamp		Operation indication			
Operating temperature		-25 to +70°C			
Temperature characteristics		Within ±10% (of operating distance at +20°C)			
Withstand voltage		1000 VAC, 50/60 Hz (1 minute)			
Insulation resistance		50 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			
Lead wire		Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø4), 0.3 mm ² 2-wire		Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø6), 0.5 mm ² 2-wire	
Tightening torque		0.5 Nm or less	0.7 Nm or less	1 Nm or less	
Weight		Approx. 35 g	Approx. 45 g	Approx. 100 g	

APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

APS-F/U

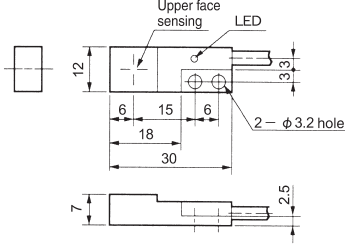
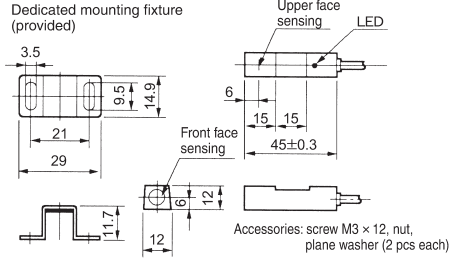
APS-10~15

APS-CU

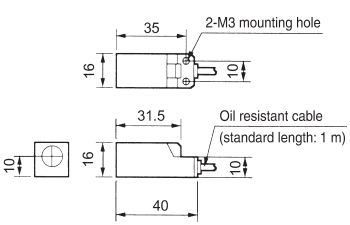
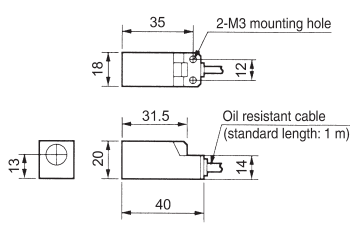
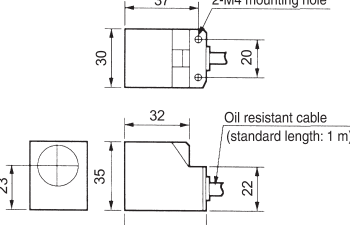
CS

Rectangular type APS-F/U Series

DC 2-wire, Non-embedded Type

Effective operating distance	4 mm ±10%	4 mm ±10%			
Dimensions (mm)					
Remarks	Ultra-thin type, upper face sensing	Upper face sensing	Front face sensing		
Output type	NO	Model number	APS4-12U-Z	APS4-12BU-Z	APS4-12BF-Z
		Price	¥2,800	¥2,800	¥2,800
Rated operating voltage	DC+12/+24 V (+10 to +30V) Permissible ripple rate: 5%p-p or less	DC+12/+24 V (+10 to +30V) Permissible ripple rate: 10%p-p or less			
Standard target object (mm)	Iron 12 × 12 × 1t	Iron 20 × 20 × 1t			
Rated operating distance	0 to 3.2 mm				
Responding material	Iron/nonferrous metal (operating distance varies with material)				
Differential travel	20% or less				
Switching frequency	400 Hz				
Rated operating current	5 to 100mA				
Voltage drop	3 V or less				
Leakage current	TYP 0.8 mA or less (1.0 mA of less max)				
Indicator lamp	Operation indication				
Operating temperature	-25 to +70 °C				
Temperature characteristics	Within ±10% (of operating distance at +20 °C)				
Withstand voltage	1000 VAC, 50/60 Hz (1 minute)				
Insulation resistance	50 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				
Lead wire	Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø3.5), 0.14 mm ² 2-wire	Oil-resistant vinyl chloride cable 1.5 m Outer diameter (approx. ø4), 0.3 mm ² 2-wire			
Tightening torque	0.4 Nm or less	0.5 Nm or less			
Weight	Approx. 30 g	Approx. 50 g			

DC 3-wire, Non-embedded Type

Effective operating distance	3 mm ±10%	5 mm ±10%	10 mm ±10%
Dimensions (mm)			
Remarks	Frequency classification model available	Frequency classification model available	Frequency classification model available
Output type	NPN	Model number	APS3-16F-E
	NO	Price	¥2,600
	PNP	Model number	APS3-16F-E2
		Price	¥2,600
NO	Model number	APS5-18F-E	
	Price	¥2,600	
NO	Model number	APS10-30F-E	
	Price	¥3,300	
Rated operating voltage	DC+12/+24 V (+10 to +30V) Permissible ripple rate: 3%p-p or less		
No-load current	20 mA or less		
Standard target object (mm)	Iron 20 × 20 × 1t	Iron 25 × 25 × 1t	Iron 30 × 30 × 1t
Rated operating distance	0 to 2.4 mm	0 to 4.0 mm	0 to 8.0 mm
Responding material	Iron/nonferrous metal (operating distance varies with material)		
Differential travel	20% or less		
Switching frequency	1 kHz	800 Hz	500 Hz
Rated operating current	100 mA max (12 VDC)/200 mA max (24 VDC)		
Voltage drop	1.5 V or less (1.0 V TYP)		
Leakage current	100 μA or less		
Indicator lamp	Operation indication		
Operating temperature	-25 to +70°C		
Temperature characteristics	Within ±10% (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 for the indicator lamp of APS3, APS5 and APS10)		
Lead wire	Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø4), 0.3 mm ² 3-wire		Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø6), 0.5 mm ² 3-wire
Tightening torque	0.5 Nm or less	0.7 Nm or less	1 Nm or less
Weight	Approx. 35 g	Approx. 45 g	Approx. 100 g

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

APS-GMC

APS-GMD

APS-GM

APS-GK

APS-30/31

APS-CK

APS-S/M

APS-F/U

APS-10~15

APS-CU

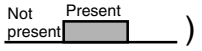
CS

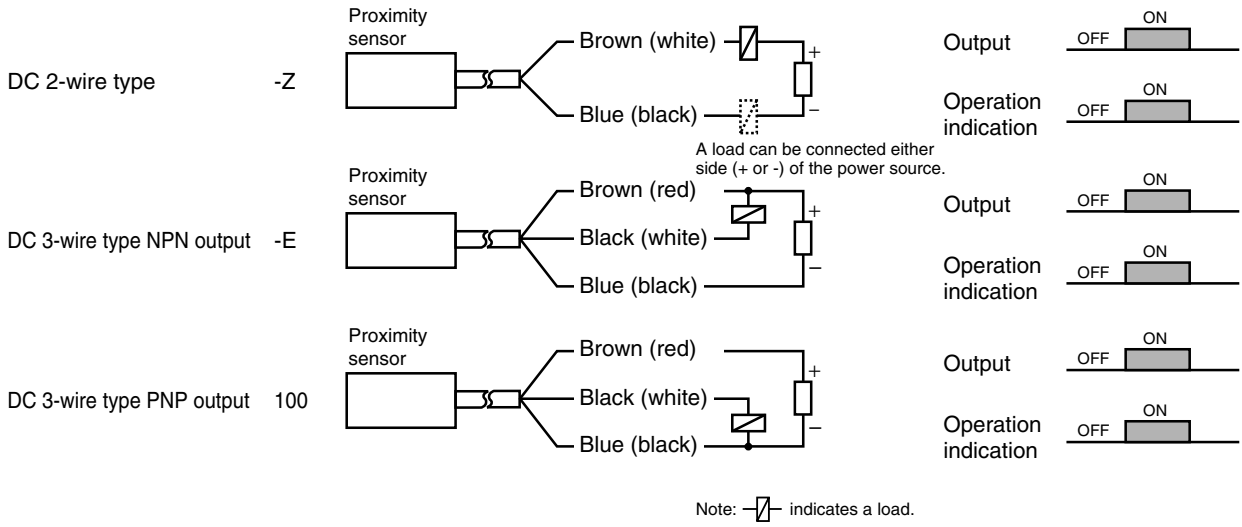
Rectangular type APS-F/U Series

DC 3-wire, Non-embedded Type

Effective operating distance	4 mm ±10%	
Dimensions (mm)		
Remarks	Ultra-thin type, upper face sensing	
Output type	NPN	Model number
	NO	Price
		Model number
		Price
Rated operating voltage	DC+12/+24 V (+10 to +30V) Permissible ripple rate: 10%p-p or less	
No-load current	10 mA or less	
Standard target object (mm)	Iron 12 × 12 × 1t	
Rated operating distance	0 to 3.2 mm	
Responding material	Iron/nonferrous metal (operating distance varies with material)	
Differential travel	20% or less	
Switching frequency	400 Hz	
Rated operating current	100 mA max	
Voltage drop	1.5 V or less (1.0 V TYP)	
Leakage current	100 μA or less	
Indicator lamp	Operation indication	
Operating temperature	-25 to +70°C	
Temperature characteristics	Within ±10% (of operating distance at +20°C)	
Withstand voltage	1000 VAC, 50/60 Hz (1 minute)	
Insulation resistance	50 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	
Lead wire	Oil-resistant vinyl chloride cable 1 m Outer diameter (approx. ø3.5), 0.14 mm ² 3-wire	
Tightening torque	0.4 Nm or less	
Weight	Approx. 30 g	

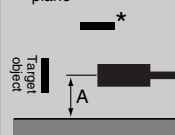
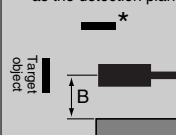
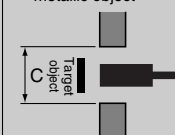
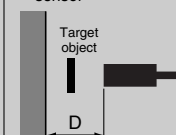
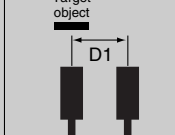
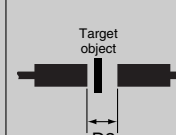
Connection/Operation

(Detection object )



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						
APS3-16F-...	22	10	50	10	40	50
APS5-18F-...	28	13	60	15	50	60
APS10-30F-...	43	23	70	30	100	120
APS4-12U-...	3.5	3.5	52	12	25	35
APS4-12BU-Z	10	6	25	10	30	40
APS4-12BF-Z	10	6	25	10	30	40

- * 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.

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

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

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:

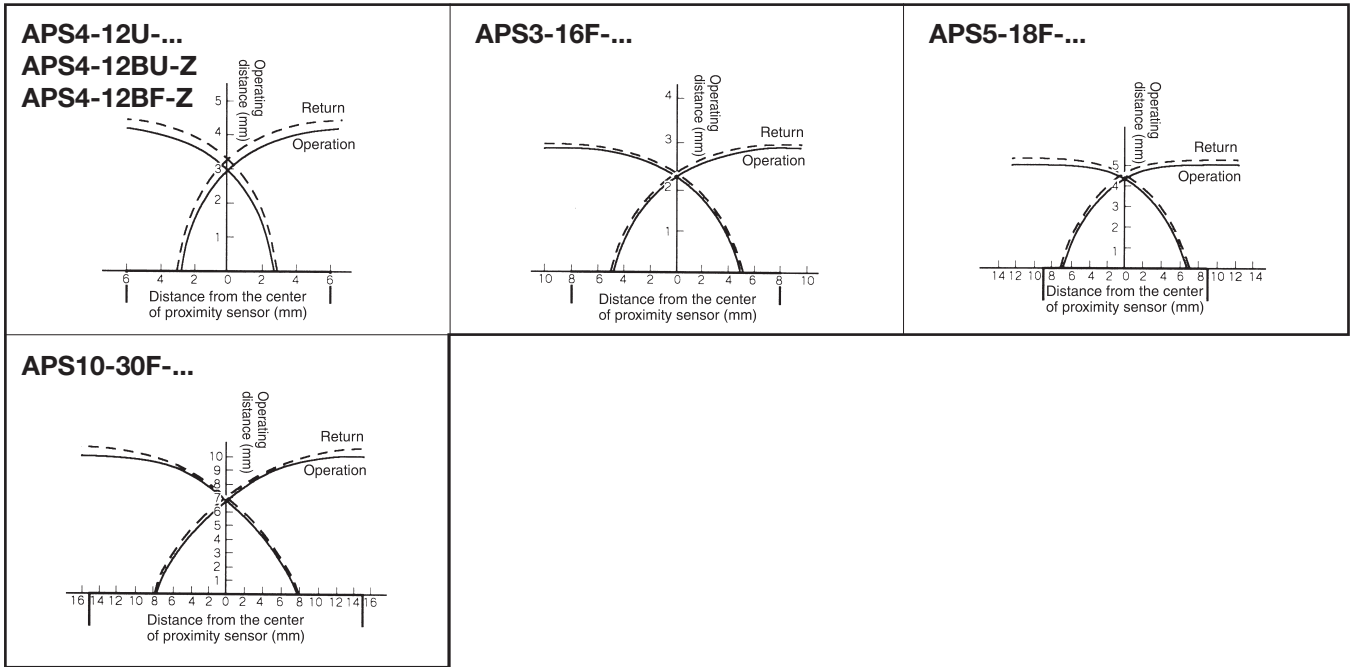
APS3-16F-E(M) Model with a standard frequency
-E2(M) (normally, "M" is omitted)

APS3-16F-EL Model with a lower frequency than the
-E2L standard frequency

APS3-16F-EH Model with a higher frequency than
-E2L the standard frequency

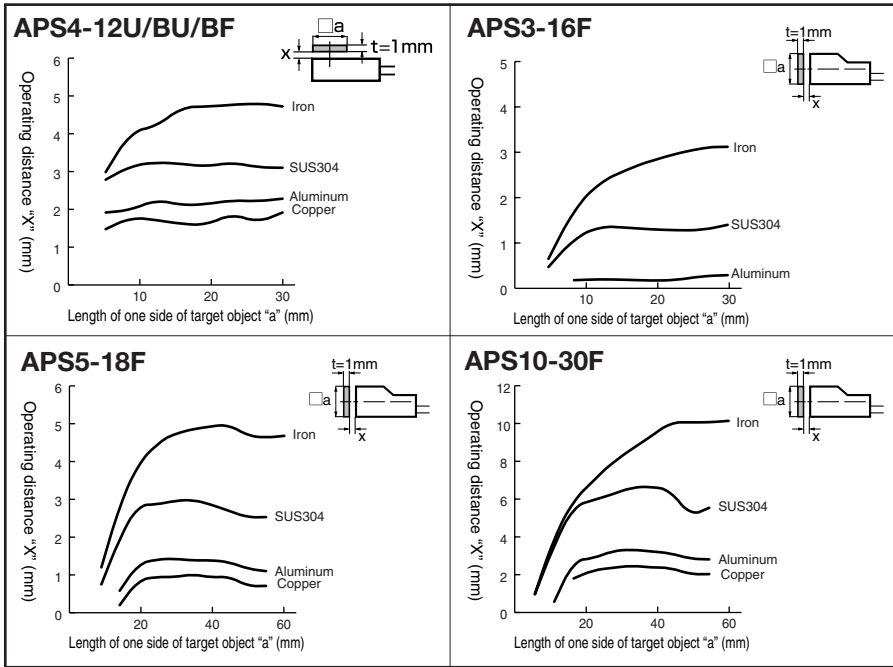
Combinations of models classified by frequency (can be installed in close contact with each other)	
<p>APS3-16F-E(M)LH APS5-18F-E(M)LH APS5-18F-E2(M)LH</p>	<p>L  (M)  H </p> <p>* To install four or more sensors in close contact, preliminary study is required.</p>
<p>APS10-30F-E(M)L</p>	<p>L  (M) </p> <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)



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