







-  P L C
-  H M I
-  **SENSOR**
-  E N C O D E R
-  C O U N T E R
-  I N F O R M A T I O N

APS-S/M Series

Features

Polycarbonate Resin Square Type, 2-wire/3-wire DC System

- Front Surface / Upper Surface detection
- Models of different frequency are available for adjacent installation.
- Conformity with UL standard / CE mark
- NO/NPN/PNP output



- Proximity Sensor Lineup
- Selection Guide
- Outline
- Cylinder Type
- Square Type**
- Capacitive Type

Type

2-wire DC System

Output Form	Operating Distance (mm)			Output Form	Model Number	Remarks
Non-flush Mount Type	4			NO	APS4-12M-Z	Different frequency-classified models are available. ("L" is attached to the end of model number.) Provided with mounting brackets
	4			NO	APS4-12S-Z	Different frequency-classified models are available. ("L" is attached to the end of model number.) Provided with mounting brackets

* Different frequency-classified models (L) are made-to-order products.





3-wire DC System

Output Form	Operating Distance (mm)			Output Form	Model Number	Remarks
Non-flush Mount Type	2.5			NPN NO	APS2.5-8M-E	
	4			NPN NO	APS4-12M-E	Different frequency-classified models are available. ("L" is attached to the end of model number.) (Excluding E1 type) Provided with mounting brackets
				NPN NC	APS4-12M-E1	
				PNP NO	APS4-12M-E2	
	2.5			NPN NO	APS2.5-8S-E	
	4			NPN NO	APS4-12S-E	Different frequency-classified models are available. ("L" is attached to the end of model number.) (Excluding E1 type) Provided with mounting brackets
NPN NC				APS4-12S-E1		
PNP NO				APS4-12S-E2		

- APS-S/M**
- APS-F/U
- APS-10 to 15

APS-S/M Series

2-wire DC System Non-flush Mount Type

PLC HMI SENSOR ENCODER COUNTER INFORMATION Proximity
Sensor Lineup

Selection Guide

Outline

Cylinder Type

Square Type

Capacitive Type

APS-S/M

APS-F/U

APS-10 to 15

Effective Operating Distance		4 mm \pm 10%	
Photo			
Remarks		Different frequency-classified models are available./With action indication/Provided with mounting brackets	
		Upper surface detection	Front surface detection
Output Form	NO	Model Number	APS4-12S-Z
		Price	Open (Minimum order quantity: 5 pieces)
			APS4-12M-Z
			Open (Minimum order quantity: 5 pieces)
Rated Working Voltage		12/24 V DC (10 to 30 V DC) Allowable ripple rate: 3% p-p or less	
Standard Target Object (mm)		Iron 20 x 20 x 1 t	
Guaranteed Operating Distance		0 to 2.8 mm	
Reaction Material		Iron/Non ferrous metal (Operating distance changes depending on materials.)	
Hysteresis		Approx. 20% or less	
Operating Cycle Frequency		Up to 200 Hz	
Rated Working Current		5 to 50 mA	
Voltage Drop		3 V or lower	
Off-state Current		1.0 mA or lower	
Indicator Lamp		Operation indication	
Use Ambient Temperature		-10 to +50°C	
Temperature Characteristics		Within \pm 20% (At the operating distance at +23°C)	
Withstand Voltage		500 V AC 50/60 Hz (1 minute)	
Insulation Resistance		50 M Ω or higher (500 V DC)	
Vibration Resistance		Double amplitude: 1.5 mm, 10 to 55 Hz (2 h each for X, Y and Z direction)	
Impact Resistance		294m/s ² , within 11 ms (10 times each for X, Y and Z direction)	
Protection Level		IP67	
Case Material		Polycarbonate	
Lead Wire		Oil-resistant cable 1 m Outside diameter (ϕ 3) 0.18 mm ² , 2 core	
Tightening Torque		0.4 Nm or less	
Weight (g)		Approx. 20	

* "L" is attached to the end of model number of the various frequency-classified models. (Made-to-order product)

PLC

HMI

SENSOR

ENCODER

COUNTER

INFORMATION

APS-S/M Series

3-wire DC System Non-flush Mount Type

Effective Operating Distance		2.5 mm ±15%		4 mm ±10%		
Photo						
Remarks		With operation indication / Excluding mounting bracket (APS-KNG8, option)		Different frequency-classified models are available. (Excluding E1 type) With action indication/Provided with mounting brackets		
		Upper surface detection	Front surface detection	Upper surface detection	Front surface detection	
Output Form	NPN NO	Model Number	APS2.5-8S-E	APS2.5-8M-E	APS4-12S-E	
		Price	Open (Minimum order quantity: 10 units)	Open (Minimum order quantity: 10 units)	Open (Minimum order quantity: 5 units)	
	NPN NC	Model Number			APS4-12S-E1	APS4-12M-E1
		Price			Open (Minimum order quantity: 5 units)	Open (Minimum order quantity: 5 units)
	PNP NO	Model Number			APS4-12S-E2	APS4-12M-E2
		Price			Open (Minimum order quantity: 5 units)	Open (Minimum order quantity: 5 units)
Rated Working Voltage		12/24 V DC (10 to 30 V DC) Allowable ripple rate: 3% p-p or less				
No-load Current		20 mA or lower		10 mA or lower		
Standard Target Object (mm)		Iron 15 x 15 x 1 t		Iron 20 x 20 x 1 t		
Guaranteed Operating Distance		0 to 1.7 mm		0 to 2.8 mm		
Reaction Material		Iron/Non ferrous metal (Detection distance changes depending on materials.)				
Hysteresis		20% or less				
Operating Cycle Frequency		Up to 500 Hz		Up to 200 Hz		
Rated Working Current		Up to 50 mA				
Voltage Drop		1.0 V or lower				
Off-state Current		0.1 mA or lower				
Indicator Lamp		Operation indication				
Use Ambient Temperature		-10 to +50°C				
Temperature Characteristics		Within ±20% (At the operating distance at +23°C)				
Withstand Voltage		500 V AC 50/60 Hz (1 minute)				
Insulation Resistance		50 MΩ or higher (500 V DC)				
Vibration Resistance		Double amplitude: 1.5 mm 10 to 55 Hz				
Impact Resistance		294 m/s ² , within 11 ms (10 times each for X, Y and Z direction)				
Protection Level		IP67				
Case Material		Polycarbonate				
Lead Wire		Oilproof cable 1 m Outside diameter (φ) 0.18 mm ² , 3 core				
Tightening Torque		0.4 Nm or less				
Weight (g)		Approx. 19		Approx. 20		

* "L" is attached to the end of model number of the various frequency-classified models.

APS-S/M

APS-F/U

APS-10 to 15

APS-S/M Series

Connection and Operation

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- APS-S/M
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- APS-10 to 15

Connection/Operation

The load can be connected to either side of the power source.

2-wire DC System		<p>(Target Object)</p> <p>Not Present: OFF, Present: ON</p> <p>Output: OFF, ON</p> <p>Operation Indication: OFF, ON</p>
3-wire DC System NPN Output -E		<p>Not Present: OFF, Present: ON</p> <p>Output: OFF, ON</p> <p>Operation Indication: OFF, ON</p>
3-wire DC System NPN Output -E1		<p>Not Present: ON, Present: OFF</p> <p>Output: ON, OFF</p> <p>Operation Indication: ON, OFF</p>
3-wire DC System PNP Output -E2		<p>Not Present: OFF, Present: ON</p> <p>Output: OFF, ON</p> <p>Operation Indication: OFF, ON</p>

Note: indicates a load.

Installation / Effects of Surrounding Metal

Since the proximity sensor is affected by surrounding metal, install it remotely enough from the described dimensions.

(Unit: mm)

Installation	- Parallel arrangement of infinite plane metal body	- Parallel arrangement of plane metal body to the detector surface	- Arrangement to fenestrate metal body	- Arrangement of metal body at the front	- Parallel arrangement	- Opposing arrangement (Front detection type)	- Opposing arrangement (Top detection type)
Model Number							
APS2.5-8S-...	3.7	3.7	14	8	18	—	20
APS2.5-8M-...	10	7	14	8	18	20	—
APS4-12S-...	3.25	3.25	30	10	32	—	20
APS4-12M-...	20	15	30	10	32	20	—

* Position of the target body in the top detection models

- When there is metal around the proximity sensor, the operating distance changes and makes operation unstable. Therefore, place the surrounding metal as remotely as possible from the proximity sensor.
- Since the D dimension (mm) is the minimum value from the proximity sensor's detector surface to the surrounding metal body, place the metal more remotely than the numeric values shown in the table above.
- When the B dimension of the APS2.5 to the 8M is 3.7 mm (tight installation), place the proximity sensor's detector surface at least 3 mm away from the surrounding metal.

[Precautions when handing the product]

Before Using the Product

Note that this product may output detection signals for approx. 25 ms when there are no objects detected and for approx. 100 ms when there is a detected object nearby after the power is turned on.

Precautions in Installation

The screws should be tightened so that no stress is applied to the sensor.

*Tightening torque specifications: If the screws are tightened with a force 0.4 Nm or more, the sensor may break.

UL Certification

If you use the proximity sensor as a UL certification product, use a Class2 power source.

UL certification products receive recognition on condition that the Class2 power source is used.

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APS-S/M Series

Connection and Operation

Mutual Interference and Frequency Classification

When two or more proximity sensors are closely installed, the installation interval of the sensors should be more than 10 times the operating distance (between centers).

If the interval is too short, mutual interference may occur.

If the interval cannot be sufficiently secured, use modes with differently classified frequency.

The frequency classification is represented by the alphabet after the operating distance in the normal model number.

- Models with a classified frequency are shown by the mark on the cable.
L-band mark

(Example)

APS4-12S-E (M) Model of standard frequency

-E2 (M is not normally indicated.)

APS4-12S-EL Model with lower frequency than the standard

Combination of Models Classified by Frequency
(The sensors can be mounted with the cases tightly attached.)

The sensors can be mounted with the cases tightly attached.

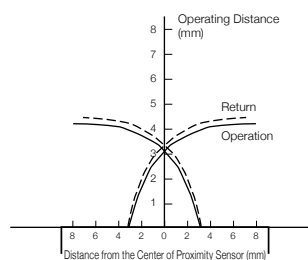
APS4-12□-□(M)L
(Excluding E1 type)



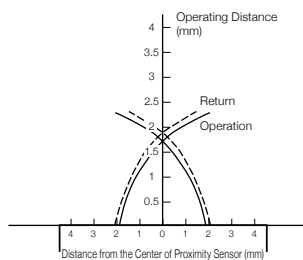
* It requires consideration when 3 or more sensors are closely mounted.

Detection Range Diagram (Representative Examples)

APS4-12S/M-...

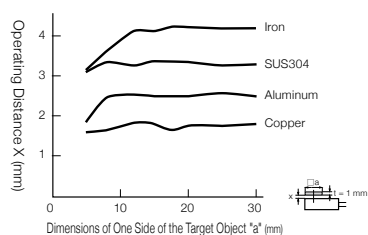


APS2.5-8S/M-E

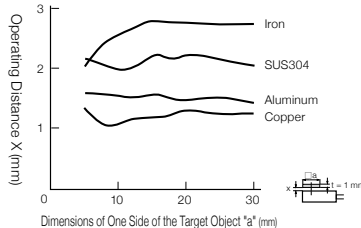


Shape Based Characteristics (Representative Examples)

APS4-12S/M-...



APS2.5-8S/M-E



APS-S/M

APS-F/U

APS-10 to 15

APS-S/M Series

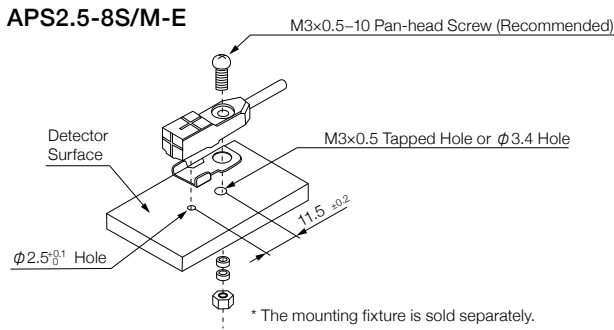
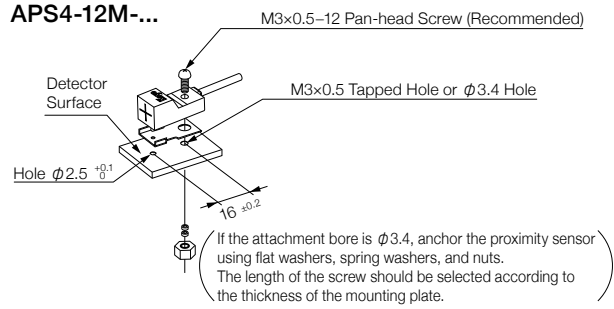
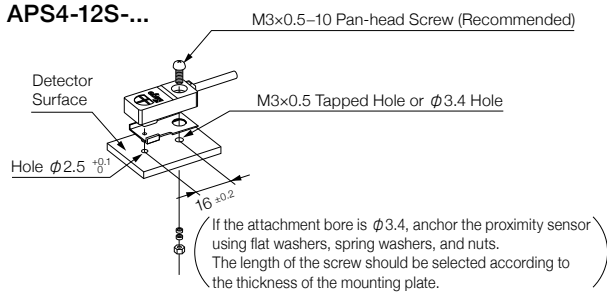
Dimensions

- PLC
- HMI
- SENSOR
- ENCODER
- COUNTER
- INFORMATION

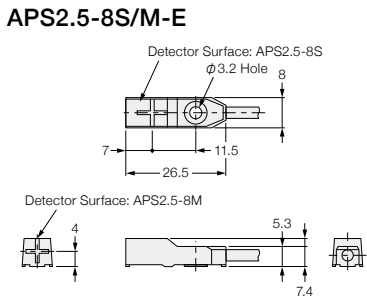
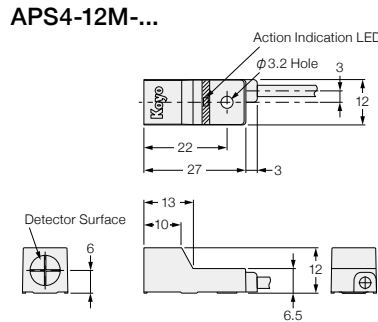
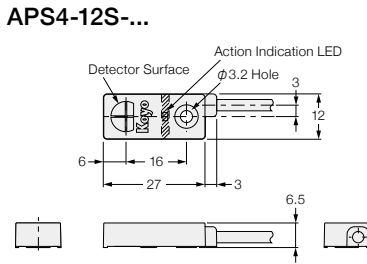
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Installation (Unit: mm)

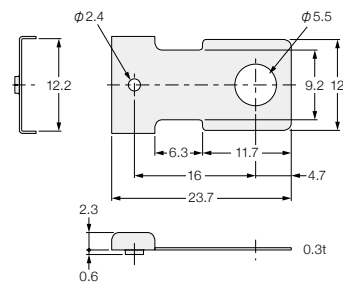


Dimensions (Unit: mm)

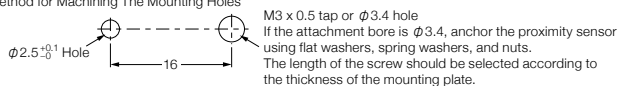


Mounting Brackets Dimensions (Unit: mm)

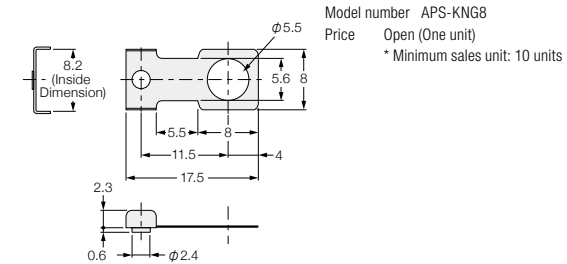
APS4-12S/M Mounting Brackets * Enclosed 5 pieces per box



Method for Machining The Mounting Holes



APS2.5-8S/M Mounting Brackets * Excluded as an option



Method for Machining the Mounting Holes

