APS-S/M Series

SENSOR ENCODER COUNTER

INFORMATION

Proximity Sensor Lineup

Selection Guide

Cylinder Type Square Type

Capacitive Type

APS-S/M

APS-F/U

APS-10 to 15

Outline

PLC

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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

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2-wire DC System

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

Proximity Sensor

PLC

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APS-S/M Series

2-wire DC System Non-flush Mount Type

Effective Operating Distance								
Effective 0)perating L	Distance	4 mm ±10%					
					COUNTER			
Photo			Chinese	and and a second s				
					Proximity			
			Different frequency-classified models are available./With action inc	lication/Provided with mounting brackets	Sensor Lineup			
Remarks			Upper surface detection	Front surface detection	Selection Guide			
	NO	Model Number	APS4-12S-Z	APS4-12M-Z	Outline			
Output Form		Price	Open (Minimum order quantity: 5 pieces)	Open (Minimum order quantity: 5 pieces)				
FUIIII					Cylinder Type			
					Square Type			
Rated Wor		<u> </u>	12/24 V DC (10 to 30 V DC) Allowable ripple rate: 3% p-p or less					
Standard T		,	lron 20 x 20 x 1 t		Capacitive Type			
Guarantee Distance	d Operatir	ng	0 to 2.8 mm					
Reaction M	Naterial		Iron/Non ferrous metal (Operating distance changes depending on materials.)					
Hysteresis			Approx. 20% or less					
Operating	Cycle Free	quency	Up to 200 Hz					
Rated Wor	king Curre	ent	5 to 50 mA					
Voltage Dr	ор		3 V or lower					
Off-state C	Current		1.0 mA or lower					
Indicator L	amp		Operation indication					
Use Ambie	ent Tempe	erature	-10 to +50°C					
Temperatu	ire Charac	cteristics	Within \pm 20% (At the operating distance at +23°C)					
Withstand	Voltage		500 V AC 50/60 Hz (1 minute)					
Insulation I	Resistanc	e	50 MΩ or higher (500 V DC)					
Vibration Resistance		э	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	APS-S/M				
Lead Wire			Oil-resistant cable 1 m Outside diameter (ϕ 3) 0.18 mm ² , 2 core					
Tightening Torque			0.4 Nm or less					

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



APS-S/M Series

3-wire DC System Non-flush Mount Type



H M I 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

Photo With operation indication / Excluding mounting bracket (APS-KNG8, option) Different frequency-classified models are available. (Excluding E1 type With action indication// Excluding mounting bracket (APS-KNG8, option) 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 NPN NO Model Number APS2.5-8S-E APS2.5-8M-E APS4-12S-E APS4-12M-E Price Open (Minimum order quantity: 10 units) Open (Minimum order quantity: 10 units) Open (Minimum order quantity: 5 units) Open (Minimum order quantity: 5 units) Open (Minimum order quantity: 5 units) Output Form Model Number Model Number APS4-12S-E1 APS4-12M-E1 PNP NO Number Model Number APS4-12S-E2 APS4-12M-E1 PNP NO Number Model Number APS4-12S-E2 APS4-12M-E2	Effective Operating Distance		istance	2.5 mm ±15%		4 mm ±10%				
Amema Evoluting mander (APS-VSB, option) With action indication/Provided view invasions of the start of						Cisto				
NPN NO Model Number APS2.5-8S-E APS2.5-8M-E APS4-12S-E APS4-12M-E Output Form Open Minimum order quantity: 10 units) Open Minimum order quantity: 5 units) Open Minimum order quantity: 5 units) Open Minimum order quantity: 5 units) APS4-12S-E1 APS4-12M-E1 Price Price Image: Comparison of the price of	Remarks				NG8, option)					
Press Number Press Open Minimum order quantity: 10 units Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units APSA-12M-E1 NPN N Nomber Nomber Nomber Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units Rate/W=V Nomber 1024 VIC 10 10 30 VIC / 100 VIC / 100 VIC Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units Open Minimum order quantity: 5 units Statut 1024 VIC 10 10 30 VIC / 100 VIC / 100 VIC / 100 VIC 100 VIC / 100 VIC I00 VIC / 100 VIC I00 VIC / 100 VIC Statut 101 A r fore 101 A r fore 100 VIC / 100 VIC / 100 VIC I00 VIC / 100 VIC I00 VIC / 100 VIC VIC VIC VIC VIC VIC VIC VIC VIC VIC VIC				Upper surface detection	Front surface detection	Upper surface detection	Front surface detection			
Image: Market state				APS2.5-8S-E	APS2.5-8M-E	APS4-12S-E	APS4-12M-E			
Output Form Nome Number Index Index <thindex< th=""> Index Index</thindex<>		NPN NU	Price				Open (Minimum order quantity: 5 units)			
Prom Price Index Price Index Index <thi< td=""><td>Output</td><td></td><td></td><td></td><td></td><td>APS4-12S-E1</td><td>APS4-12M-E1</td></thi<>	Output					APS4-12S-E1	APS4-12M-E1			
NumberNumberImageNumberNumberNet ControlNet Control <td>Form</td> <td></td> <td>Price</td> <td></td> <td></td> <td></td> <td>Open (Minimum order quantity: 5 units)</td>	Form		Price				Open (Minimum order quantity: 5 units)			
Price Open (Minimum order quantity: 5 units) Rated Working Vorter 12/24 V DC (10 to 30 V DC) Allowable inple rate: 3% p-p or less No-load Current 20 m A or lower 10 m A or lower Standard Target Object Im Inn 15 x 15 x 1 t 10 m A or lower Standard Target Object Im Inn 15 x 15 x 1 t Inn 15 x 15 x 1 Guaranteed Operating Distance 0 to 1.7 mm 0 to 2.8 mm Reaction Material Inn/Non ferrous metal (Detection distance changes depending on materials) Hysteresiz 20% or less 0 to 2.8 mm Operating Cycle Frequency Up to 500 Hz Up to 200 Hz Voltage Dry 10 to 50 MZ Up to 200 Hz Indication Carrent 0 to 4.50°C Up to 200 Hz Indicator Lamp 0 pot sold Up to 500 Hz Up to 200 Hz Indicator Lamperature 0 to 4.50°C Up to 200 Hz Up to 200 Hz Indicator Lamperature 0 to 4.50°C Up to 200 Hz Up to 200 Hz Indicator Lamperature 50 MQ or higher (500 V DC) Up to 200 Hz Up to 200 Hz Indicator Lamperature 50 MQ or higher (500 V DC) Up to 200 Hz Up to 200 Hz Indicator Lamperature 50 MQ or higher (500 V DC) Up to 200 Hz Up to 200 Hz Inditator News 50 MQ or higher (500 V DC)						APS4-12S-E2	APS4-12M-E2			
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 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 Operating distance at +23°C) Within ±20% (At the operating distance at +23°C) Iron 10 to 55 Hz Insulaton Resistance 500 WAC Ston W Or Nigher (500 VDC) Iron 10 to 55 Hz Impact Resistance Double amplitude: 1.5 mm 10 to 55 Hz Impact Resistance 294 m/s², within 11 ms (10 times each for X, Y and Z direction) Protection Level IP67 Case Material Polycarbonate Lead Wire Olliprof cable 1 m Outside diameter (\$03) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less			Price				Open (Minimum order quantity: 5 units)			
Standard Target Object (mm)Iron 15 x 15 x 1 tIron 20 x 20 x 1 tGuaranteed Operating Distance0 to 1.7 mm0 to 2.8 mmBeaction MaterialIron/Non ferrous metal (Detection distance changes depending on material- Jeversis0 to 2.8 mmOperating Cycle FrequencyUp to 500 HzUp to 200 HzBated Working CurrentUp to 50 mAUp to 200 HzOff-state Current0.1 mA or lowerUp to 70 werOff-state Current0.1 m A or lowerUn to 4.50°CIndicator LampOperation indicationUse Ambient Temperature10 to 4.50°C10 V or S00 AD (At the operating distance at +23°C)Vertage 500 V AC 50/60 Hz (1 minute)Insulation Resistance50 MΩ or higher (500 V DC)Voltage TemperatureVibratand Voltage50 MΩ or higher (500 V DC)Up to 200 HzVibratand Resistance20 win/s², within 11 ms (10 times each for X, Y and Z direction)TemperatureProtection LevelPolycarbonateIP 60Lead WireObjerof cable 1 m outside diameter (\$03 0.18 mm², 3 coreLing Ling Ling Ling Ling Ling Ling Ling	Rated Working Voltage		je	12/24 V DC (10 to 30 V DC) Allowab	le ripple rate: 3% p-p or less					
Guaranteed Operating Distance0 to 1.7 mm0 to 2.8 mmReaction MaterialIron/Non ferrous metal (Detection distance changes depending on materials.)Hysteresis20% or lessOperating Cycle FrequencyUp to 500 HzUp to 500 HzUp to 200 HzRated Working CurrentUp to 50 mAVoltage Drop1.0 V or lowerOff-state Current0.1 m A or lowerIndicator LampOperation indicationUse Ambient Temperature-10 to +50°CTemperature CharacteristicsWithin ±20% (At the operating distance at +23°C)Withstand Voltage500 V AC50 MQ or higher (500 V DC)Vibration Resistance294 m/s ² , within 11 ms (10 times each for X, Y and Z direction)Protection LevelIP67Case MaterialPolycarbonateLead WireOilproof cable 1 m Outside diameter (\$0,3) 0.18 mm², 3 coreTightening Torque0.4 Nm or less	No-load C	Current		20 mA or lower		10 mA or lower				
Distance 0 00 1.7 mm 0 00 2.8 mm 4 mm	Standard	Target Obje	ect (mm)	lron 15 x 15 x 1 t		Iron 20 x 20 x 1 t				
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Voltage Drop1.0 V or lowerOff-state Current0.1 mA or lowerIndicator LampOperation indicationUse Ambient Temperature-10 to +50°CTemperature CharacteristicsWithin ±20% (At the operating distance at +23°C)Withstand Voltage500 V AC 50/60 Hz (1 minute)Insulation Resistance50 MΩ or higher (500 V DC)Vibration ResistanceDouble amplitude: 1.5 mm 10 to 55 HzImpact Resistance294 m/s², within 11 ms (10 times each for X, Y and Z direction)Protection LevelIP67Case MaterialPolycarbonateLead WireOliproof cable 1 m Outside diameter (φ3) 0.18 mm², 3 coreTightening Torque0.4 Nm or less	Operating	Cycle Freq	uency	Up to 500 Hz		Up to 200 Hz				
Off-state Current0.1 mA or lowerIndicator LampOperation indicationUse Ambient Temperature-10 to +50°CTemperature CharacteristicsWithin ±20% (At the operating distance at +23°C)Withstand Voltage500 V AC 50/60 Hz (1 minute)Insulation Resistance50 MΩ or higher (500 V DC)Vibration ResistanceDouble amplitude: 1.5 mm 10 to 55 HzImpact Resistance294 m/s², within 11 ms (10 times each for X, Y and Z direction)Protection LevelIP67Case MaterialPolycarbonateLead WireOliproof cable 1 m Outside diameter (φ3) 0.18 mm², 3 coreTightening Torque0.4 Nm or less	Rated Wo	rking Curre	nt	Up to 50 mA						
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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/s², 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 (\$\phi\$3 0.18 mm², 3 core Tightening Torque 0.4 Nm or less	Off-state	Current		0.1 mA or lower						
Temperature CharacteristicsWithin ±20% (At the operating distance at +23°C)Withstand Voltage500 V AC 50/60 Hz (1 minute)Insulation Resistance50 MΩ or higher (500 V DC)Vibration ResistanceDouble amplitude: 1.5 mm 10 to 55 HzImpact Resistance294 m/s², within 11 ms (10 times each for X, Y and Z direction)Protection LevelIP67Case MaterialPolycarbonateLead WireOilproof cable 1 m Outside diameter (\$\phi\$3 0.18 mm², 3 coreTightening Torque0.4 Nm or less	Indicator Lamp									
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/s², 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 (\$\phi\$3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less	Use Ambient Temperature		ature	-10 to +50°C						
Insulation Resistance 50 MΩ or higher (500 V DC) Vibration Resistance Double amplitude: 1.5 mm 10 to 55 Hz Impact Resistance 294 m/s², 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 (\$\varphi\$3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less			eristics							
Vibration Resistance Double amplitude: 1.5 mm 10 to 55 Hz Impact Resistance 294 m/s², within 11 ms (10 times each for X, Y and Z direction) Protection Level IP67 Case Material Polycarbonate Lead Wire Oliproof cable 1 m Outside diameter (\$\phi\$3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less										
Impact Resistance 294 m/s², 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 (\$\phi\$3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less										
Protection Level IP67 Case Material Polycarbonate Lead Wire Oilproof cable 1 m Outside diameter (φ3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less										
Case Material Polycarbonate Lead Wire Oilproof cable 1 m Outside diameter (\$\phi\$3) 0.18 mm ² , 3 core Tightening Torque 0.4 Nm or less										
Lead Wire Oilproof cable 1 m Outside diameter (\$\phi\$3) 0.18 mm ² , 3 core Tightening Torque 0.4 Nm or less										
Utside diameter (\$\phi\$3) 0.18 mm², 3 core Tightening Torque 0.4 Nm or less	Case Material			Polycarbonate						
	Lead Wire				core					
Weight (g) Approx. 19 Approx. 20	Tightening	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.

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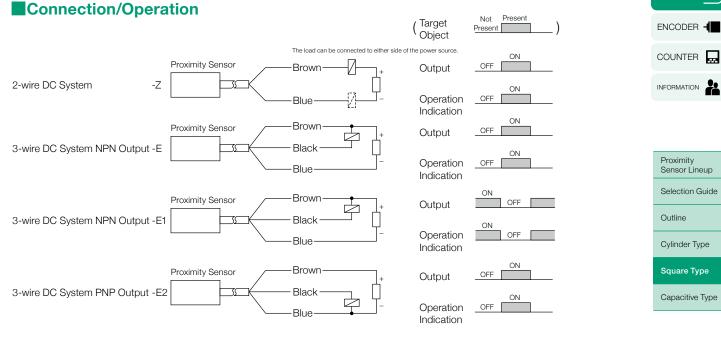
SENSOR

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APS-S/M Series

Connection and Operation



Installation / Effects of Surrounding Metal

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

			,,,	<u>.</u>			(Unit: mm)
Installation	 Parallel arrangement of infinite plane metal 	 Parallel arrangement of plane metal body to 	 Arrangement to fenestrate metal body 	 Arrangement of metal body at the front 	- Parallel arrangement	 Opposing arrangement	 Opposing arrangement «Top detection type»
Model Number	Tarpet Object	Target Object		Target Object	Target Object	Target Object	Target Object
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.



APS-S/M

APS-F/U



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.

Sensor Lineup
Selection Guide
Outline
Cylinder Type
Square Type

Capacitive Type

Drovimity

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

(Example)

(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

Iron

SUS304

Aluminum

Copper

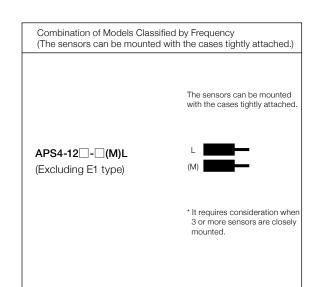
1

30

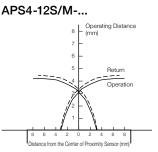
20

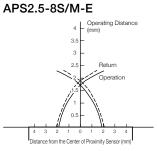
Dimensions of One Side of the Target Object "a" (mm)

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Detection Range Diagram (Representative Examples)





APS-S/M

APS-F/U

APS-10 to 15

Operating Distance X (mm)

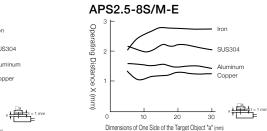
4

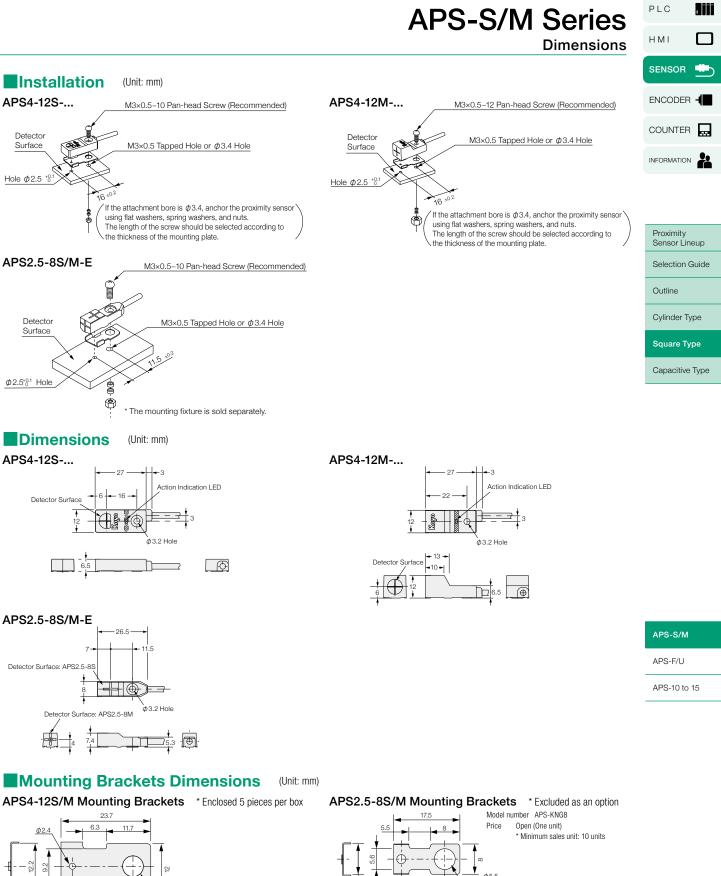
3

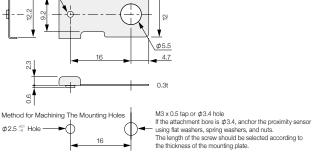
2

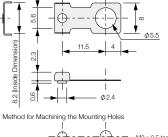
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Shape Based Characteristics (Representative Examples) APS4-12S/M-...









φ2.5^{+0.1}₋₋₀ Hole

M3 x 0.5 tap or Ø3.4 hole If the attachment bore is Ø3.4, anchor the proximity sensor using flat washers, spring washers, and nuts. The length of the screw should be selected according to the thickness of the mounting plate. KOYO BLECTRONICS INDUSTRIES CO., LTD. GENERAL CATALOG 2016

The specifications and prices described in this catalog were valid when the catalog was issued. For the latest information, contact our sales persons or see our website.