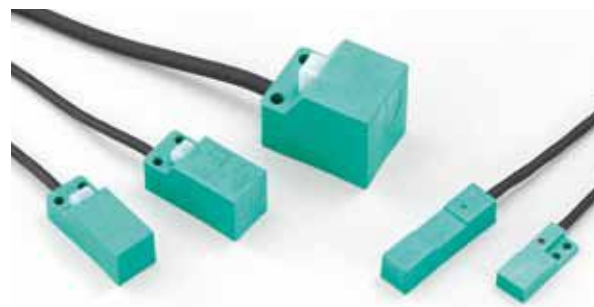


# APS-F/U Series

## Features

### PBT Resin Square Type, 2-wire/3-wire DC System

- Wide variety from thin 7mm model
- Maximum detection distance: 10 mm
- Front Surface / Upper Surface detection
- Models of different frequency are available for adjacent installation
- NO/NPN/PNP output



### Type

#### 2-wire DC System

Output Form	Operating Distance (mm)			Output Form	Model Number	Remarks
Non-flush Mount Type	3			NO	APS3-16F-Z	
	4			NO	APS4-12U-Z	Ultra-thin
					APS4-12BU-Z	
					APS4-12BF-Z	
	5			NO	APS5-18F-Z	
10			NO	APS10-30F-Z		

#### 3-wire DC System

Output Form	Operating Distance (mm)			Output Form	Model Number	Remarks
Non-flush Mount Type	3			NPN NO	APS3-16F-E	Different frequency-classified models are available. ("L" or "H" is attached to the end of model number.)
				PNP NO	APS3-16F-E2	
	4			NPN NO	APS4-12U-E	Ultra-thin
				NPN NO	APS5-18F-E	Different frequency-classified models are available. ("L" or "H" is attached to the end of model number.)
	5			PNP NO	APS5-18F-E2	Different frequency-classified models are available. ("L" or "H" is attached to the end of model number.)
				NPN NO	APS10-30F-E	Different frequency-classified models are available. ("L" is attached to the end of model number.)
	10			PNP NO	APS10-30F-E2	

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

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

# APS-F/U 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		3 mm ±10%	5 mm ±10%	10 mm ±10%
Photo				
Remarks		Front surface detection	Front surface detection	Front surface detection
Output Form	NO	Model Number APS3-16F-Z	APS5-18F-Z	APS10-30F-Z
		Price Open	Open	Open
Rated Working Voltage		12/24 V DC (10 to 30 V DC) Allowable ripple rate: 10% p-p or less (Maximum peak voltage: 30 V or less)		
Standard Target Object (mm)		Iron 20 x 20 x 1 t	Iron 25 x 25 x 1 t	Iron 30 x 30 x 1 t
Guaranteed Operating Distance		0 to 2.4 mm	0 to 4.0 mm	0 to 8.0 mm
Reaction Material		Iron/Non ferrous metal (Operating distance changes depending on materials.)		
Hysteresis		20% or less		
Operating Cycle Frequency		1 kHz	800 Hz	500 Hz
Rated Working Current		5 to 200 mA		
Voltage Drop		3 V or lower		
Off-state Current		TYP0.8 mA or lower (Up to 1.0mA or lower)		
Circuit Protection		Surge absorption circuit		
Indicator Lamp		Operation indication		
Use Ambient Temperature		-25 to +70°C		
Temperature Characteristics		Within ±10% (At the operating distance at +20°C)		
Withstand Voltage		1,000 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 (2 h each for X, Y and Z direction)		
Impact Resistance		300 m/s <sup>2</sup> , within 11 ms (10 times each for X, Y and Z direction)		
Protection Level		IP67		
Case Material		PBT resin		
Lead Wire		Oilproof vinyl chloride cable 1 m Outside diameter (Approx. $\phi$ 4) 0.3 mm <sup>2</sup> , 2 core		Oilproof vinyl chloride cable 1 m Outside diameter (Approx. $\phi$ 6) 0.5 mm <sup>2</sup> , 2 core
Tightening Torque		0.5 Nm or less	0.7 Nm or less	1.0 Nm or less
Weight (g)		Approx. 35	Approx. 45	Approx. 100

# APS-F/U Series

## 2-wire DC System Non-flush Mount Type



HMI



SENSOR




ENCODER



COUNTER



INFORMATION

Effective Operating Distance		4 mm ±10%	4 mm ±10%	
Photo				
Remarks		Upper surface detection		Upper surface detection
Output Form	NO	Model Number	APS4-12U-Z	APS4-12BU-Z
		Price	Open	Open
Rated Working Voltage		12/24 V DC (10 to 30 V DC) Allowable ripple rate: 5% p-p or less		12/24 V DC (10 to 30 V DC) Allowable ripple rate: 10% p-p or less
Standard Target Object (mm)		Iron 12 x 12 x 1 t		Iron 20 x 20 x 1 t
Guaranteed Operating Distance		0 to 3.2 mm		
Reaction Material		Iron/Non ferrous metal (Operating distance changes depending on materials.)		
Hysteresis		20% or less		
Operating Cycle Frequency		400 Hz		
Rated Working Current		5 to 100 mA		
Voltage Drop		3 V or lower		
Off-state Current		TYP0.8 mA or lower (Up to 1.0mA or lower)		
Indicator Lamp		Operation indication		
Use Ambient Temperature		-25 to +70°C		
Temperature Characteristics		Within ±10% (At the operating distance at +20°C)		
Withstand Voltage		1,000 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 (2 h each for X, Y and Z direction)		
Impact Resistance		300 m/s <sup>2</sup> , within 11 ms (10 times each for X, Y and Z direction)		
Protection Level		IP67		
Case Material		PBT resin		
Lead Wire		Oilproof vinyl chloride cable 1 m Outside diameter (Approx. $\phi$ 3.5) 0.14 mm <sup>2</sup> , 2 core		Oilproof vinyl chloride cable 1.5 m Outside diameter (Approx. $\phi$ 4) 0.3 mm <sup>2</sup> , 2 core
Tightening Torque		0.4 Nm or less		0.5 Nm or less
Weight (g)		Approx. 30		Approx. 50






APS-S/M

APS-F/U

APS-10 to 15

# APS-F/U Series

## 3-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		3mm±10%	5 mm ±10%	10 mm ±10%	
Photo					
Remarks		Different frequency-classified models are available. Front surface detection	Different frequency-classified models are available. Front surface detection	Different frequency-classified models are available. Front surface detection	
Output Form	NPN NO	Model Number	APS3-16F-E	APS5-18F-E	APS10-30F-E
		Price	Open	Open	Open
	PNP NO	Model Number	APS3-16F-E2	APS5-18F-E2	APS10-30F-E2
		Price	Open	Open	Open
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			
Standard Target Object (mm)		Iron 20 x 20 x 1 t	Iron 25 x 25 x 1 t	Iron 30 x 30 x 1 t	
Guaranteed Operating Distance		0 to 2.4 mm	0 to 4.0 mm	0 to 8.0 mm	
Reaction Material		Iron/Non ferrous metal (Operating distance changes depending on materials.)			
Hysteresis		20% or less			
Operating Cycle Frequency		1 kHz	800 Hz	500 Hz	
Rated Working Current		Up to 100 mA (12 V DC)/Up to 200 mA (24 V DC)			
Voltage Drop		1.5 V or lower (1.0 V TYP)			
Off-state Current		100 µA or less			
Indicator Lamp		Operation indication			
Use Ambient Temperature		-25 to +70°C			
Temperature Characteristics		Within ±10% (At the operating distance at +20°C)			
Withstand Voltage		500 V AC 50/60 Hz (1 minute)			
Insulation Resistance		5 MΩ 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		300 m/s <sup>2</sup> , within 11 ms (10 times each for X, Y and Z direction)			
Protection Level		IP67			
Case Material		PBT resin (Polycarbonate for the indicator lamp of APS3, APS5 and APS10)			
Lead Wire		Oilproof vinyl chloride cable 1 m Outside diameter (Approx. $\phi$ 4) 0.3 mm <sup>2</sup> , 3 core		Oilproof vinyl chloride cable 1 m Outside diameter (Approx. $\phi$ 6) 0.5 mm <sup>2</sup> , 3 core	
Approx.		0.5 Nm or less	0.7 Nm or less	1.0 Nm or less	
Weight (g)		Approx. 35	Approx. 45	Approx. 100	

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

# APS-F/U Series

## 3-wire DC System Non-flush Mount Type



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 ±10%	
Photo		
Remarks	Upper surface detection	
Output Form	NPN NO	Model Number
		Price
		APS4-12U-E
		Open
Rated Working Voltage	12/24 V DC (10 to 30 V DC) Allowable ripple rate: 10% p-p or less	
No-load Current	10 mA or lower	
Standard Target Object (mm)	Iron 12 x 12 x 1 t	
Guaranteed Operating Distance	0 to 3.2 mm	
Reaction Material	Iron/Non ferrous metal (Operating distance changes depending on materials.)	
Hysteresis	20% or less	
Operating Cycle Frequency	400 Hz	
Rated Working Current	Up to 100 mA	
Voltage Drop	1.5 V or lower (1.0 V TYP)	
Off-state Current	100 μA or less	
Indicator Lamp	Operation indication	
Use Ambient Temperature	-25 to +70°C	
Temperature Characteristics	Within ±10% (At the operating distance at +20°C)	
Withstand Voltage	1,000 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 (2 h each for X, Y and Z direction)	
Impact Resistance	300 m/s <sup>2</sup> , within 11 ms (10 times each for X, Y and Z direction)	
Protection Level	IP67	
Case Material	PBT resin	
Lead Wire	Oilproof vinyl chloride cable 1 m Outside diameter (Approx. φ3.5) 0.14 mm <sup>2</sup> , 3 core	
Tightening Torque	0.4 Nm or less	
Weight (g)	Approx. 30	

# APS-F/U Series

## Connection and Operation

PLC

HMI

SENSOR

ENCODER

COUNTER

INFORMATION

Proximity Sensor Lineup

Selection Guide

Outline

Cylinder Type

Square Type

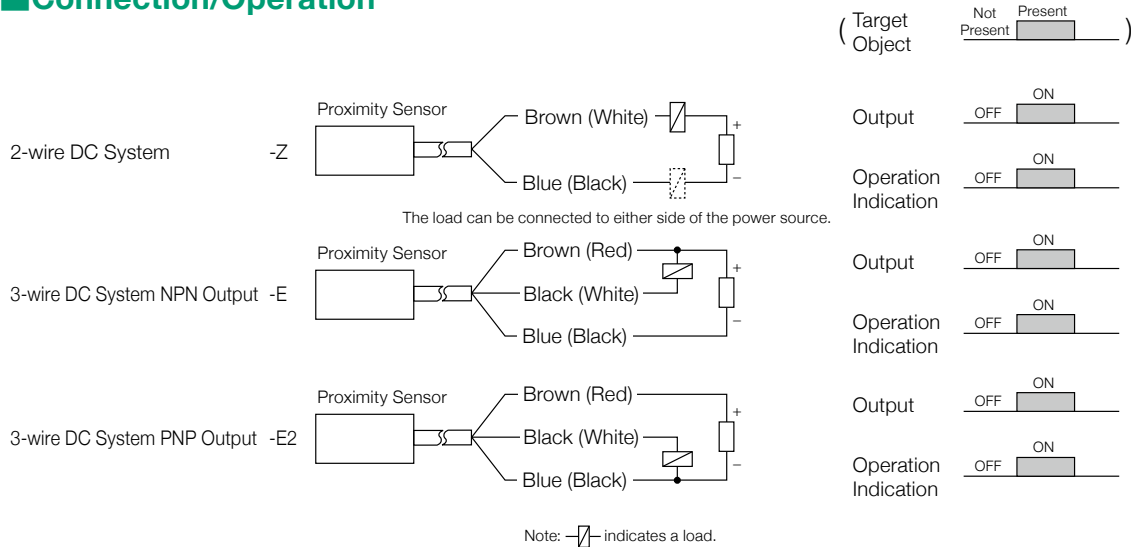
Capacitive Type

APS-S/M

APS-F/U

APS-10 to 15

### Connection/Operation



### 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)
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 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.

### 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.  
H : Yellow spiral  
L : Red spiral

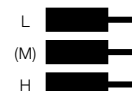
(Example)

APS3-16F-E (M) ..... Model of standard frequency (M is not normally indicated.)  
-E2 (M)

APS3-16F-EL ..... Model with lower frequency than the standard  
APS3-16F-EH ..... Model with higher frequency than the standard

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

APS3-16F-E(M)LH  
APS5-18F-E(M)LH  
APS5-18F-E2(M)LH



\* It requires consideration when 4 or more sensors are closely mounted.

APS10-30F-E(M)L



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

# APS-F/U Series

## Connection and Operation



HMI

SENSOR

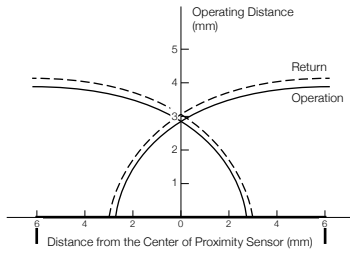
ENCODER

COUNTER

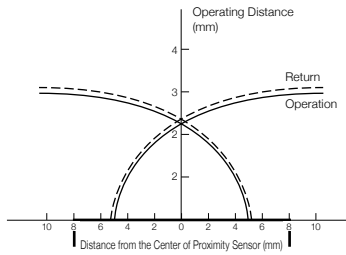
INFORMATION

### Detection Range Diagram (Representative Examples)

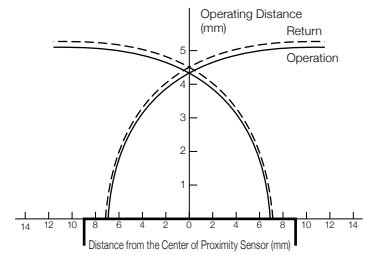
APS4-12U-/BU/BF-...



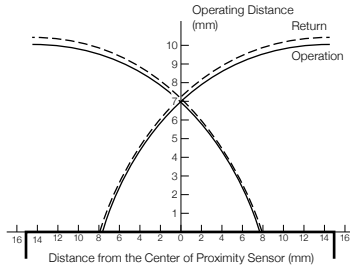
APS3-16F-...



APS5-18F-...



APS10-30F-...



Proximity Sensor Lineup

Selection Guide

Outline

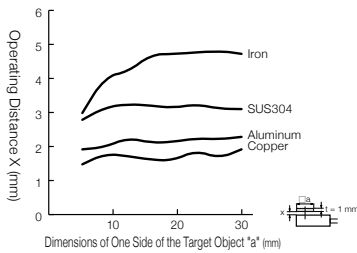
Cylinder Type

Square Type

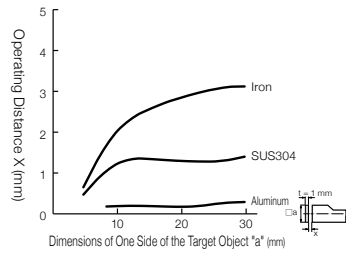
Capacitive Type

### Shape Based Characteristics (Representative Examples)

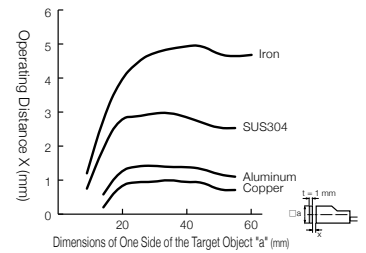
APS4-12U-/BU/BF-...



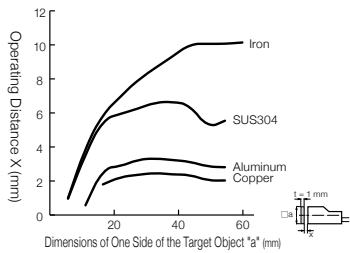
APS3-16F-...



APS5-18F-...



APS10-30F-...









APS-S/M

APS-F/U

APS-10 to 15

# APS-F/U Series

## Dimensions

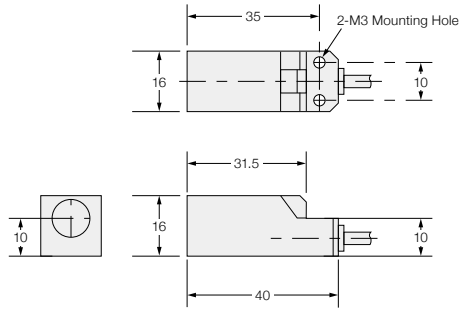
- PLC 
- HMI 
- SENSOR 
- ENCODER 
- COUNTER 
- INFORMATION 

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

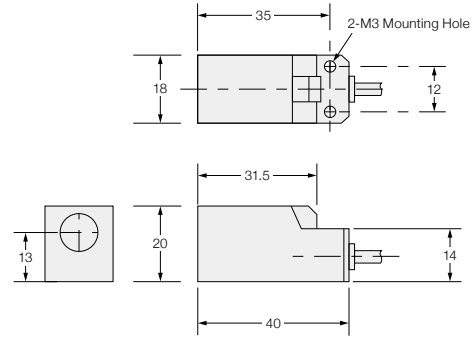
- APS-S/M
- APS-F/U**
- APS-10 to 15

### Dimensions (Unit: mm)

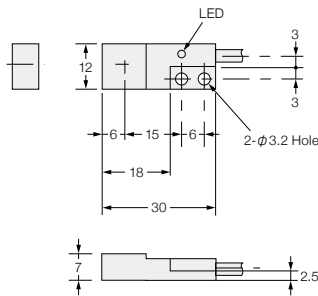
APS3-16F-...



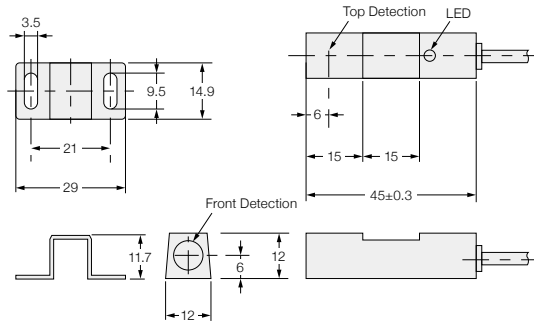
APS5-18F-...



APS4-12U-...



APS4-12BU/BF-...



APS10-30F-...

