

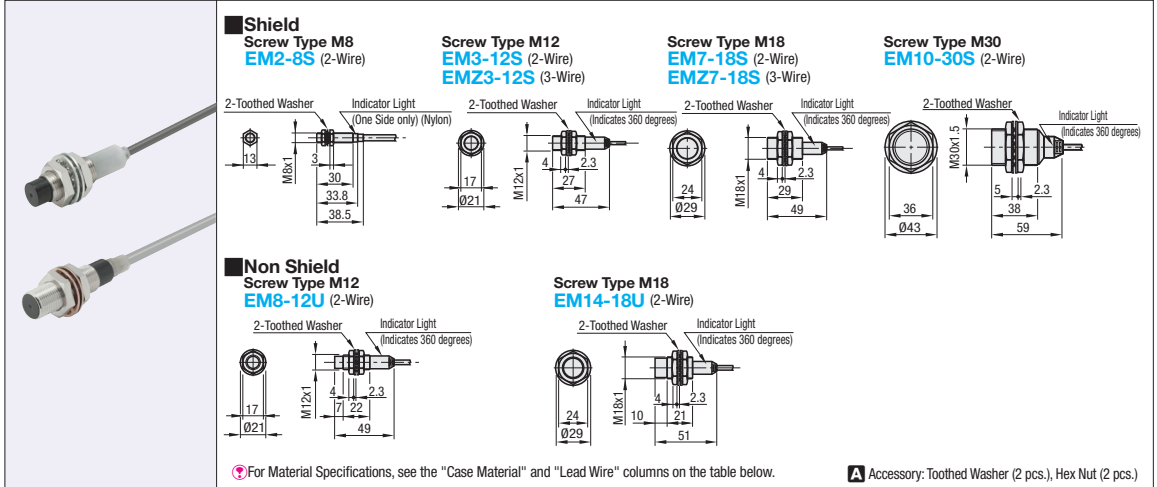
# Proximity Sensors with Built-in Amplifier - Screw

## 2-Wire / 3-Wire, Shield / Non Shield

**Do not use this product as a detection device for human body protection.**  
(For human body protection, use products compliant with the local laws and regulations such as OSHA, ANSI and IEC.)

For Shock Resistant, Heat Resistant and Mini Type, **P2065**

**Features:** Offering General-purpose Photoelectric Sensors with Built-in Amplifier at reasonable prices and short lead times. For Heat Resistant and Ultra-Mini Type, **P2065**



**2-Wire, Shield**

Part Number	Shape	Detection Distance	Output	Connection Method	Unit Price	Volume Discount Rate
<b>EM2-8S</b>	Screw Type M8	2mm	NPN N.O.	Integrated Cable Type 2m (Oil Resistant Cable)	1 ~ 4 pc(s).	5 ~ 10 pcs.
<b>EM3-12S</b>	Screw Type M12	3mm				
<b>EM7-18S</b>	Screw Type M18	7mm				
<b>EM10-30S</b>	Screw Type M30	10mm				

**2-Wire, Non Shield**

Part Number	Shape	Detection Distance	Output	Connection Method	Unit Price	Volume Discount Rate
<b>EM8-12U</b>	Screw Type M12	8mm	NPN N.O.	Integrated Cable Type 2m (Oil Resistant Cable)	1 ~ 4 pc(s).	5 ~ 10 pcs.
<b>EM14-18U</b>	Screw Type M18	14mm				

**3-Wire, Shield**

Part Number	Shape	Detection Distance	Output	Connection Method	Unit Price	Volume Discount Rate
<b>EMZ3-12S</b>	Screw Type M12	3mm	NPN N.O.	Integrated Cable Type 2m (Oil Resistant Cable)	1 ~ 4 pc(s).	5 ~ 10 pcs.
<b>EMZ7-18S</b>	Screw Type M18	7mm				

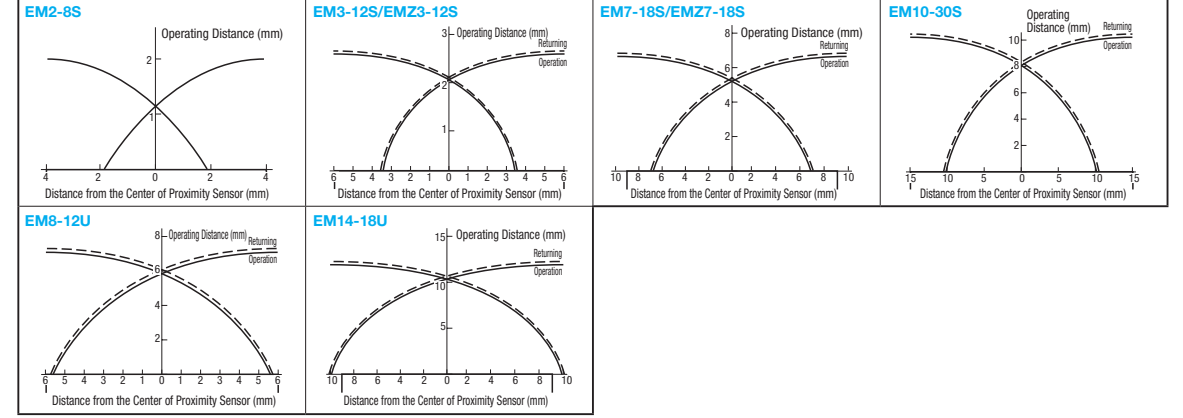
**Ordering Example**

Part Number: **EM7-18S**

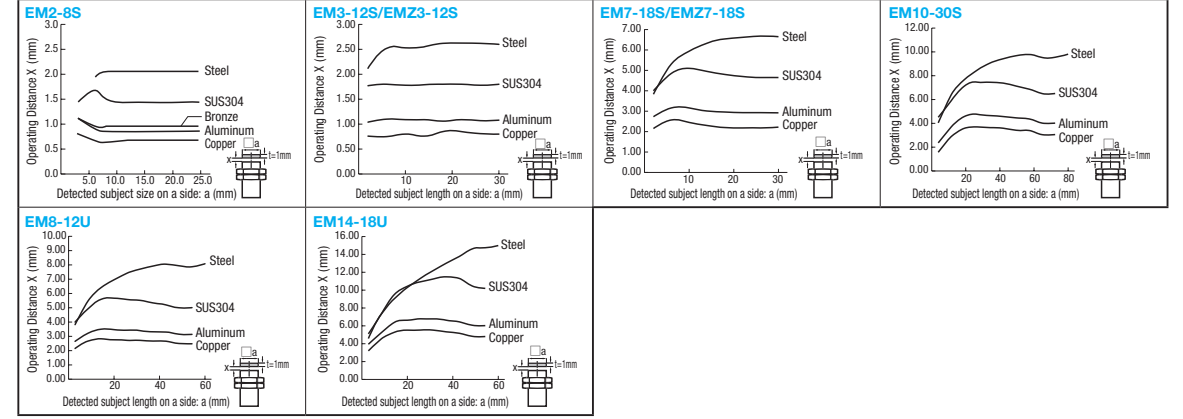
**Specifications**

Type	DC, 2-Wire				Non Shield		DC, 3-Wire	
	M8	M12	M18	M30	M12	M18	M12	M18
Part Number	<b>EM2-8S</b>	<b>EM3-12S</b>	<b>EM7-18S</b>	<b>EM10-30S</b>	<b>EM8-12U</b>	<b>EM14-18U</b>	<b>EMZ3-12S</b>	<b>EMZ7-18S</b>
Rated Operating Voltage	DC12/24V(DC10~30V) Allowable Voltage Ripple 10%p-p or less				DC12/24V(DC10~30V) Allowable Voltage Ripple 10%p-p or less		DC12/24V(DC10~30V) Allowable Voltage Ripple 10%p-p or less	
Standard Detected Subject (mm)	Ferrous 8x8x1t	Ferrous 12x12x1t	Ferrous 18x18x1t	Ferrous 30x30x1t	Ferrous 30x30x1t	Ferrous 30x30x1t	Ferrous 12x12x1t	Ferrous 18x18x1t
Effective Operation Distance	2mm±10%	3mm±10%	7mm±10%	10mm±10%	8mm±10%	14mm±10%	3mm±10%	7mm±10%
Guaranteed Operation Distance	0~1.4mm	0~2.2mm	0~5.6mm	0~8.1mm	0~6.4mm	0~11.3mm	0~2.2mm	0~5.6mm
Reactant Material	Ferrous / Nonferrous Metals (Operation distance vary depending on the material)				Ferrous / Nonferrous Metals (Operation distance vary depending on the material)		Ferrous / Nonferrous Metals (Operation distance vary depending on the material)	
Hysteresis	15% or less	20% or less	20% or less	20% or less	20% or less	20% or less	20% or less	20% or less
Operation Cycle Frequency	2kHz	300kHz	100Hz	100Hz	100Hz	100Hz	300Hz	100Hz
Rated Operating Current	3~100mA				5~100mA		Up to 200mA	
Voltage Drop	3V or less				3V or less		1.5V or less	
Off-state Current	0.55mA or less		1mA or less		1mA or less		0.5mA or less	
Circuit Protection	Load Short Circuit Protection		Load Short Circuit Protection, Surge Absorbing Circuit		Load Short Circuit Protection, Surge Absorbing Circuit		Load Short Circuit Protection, Surge Absorbing Circuit, Reverse Polarity Protection Circuit	
Indicator Light	Operation Indicator				Operation Indicator		Operation Indicator	
Service Ambient Temperature	-25~+70°C				-25~+70°C		-25~+70°C	
Temperature Property	Within ±10% (Operation Temp. +25)		Within ±15% (Operation Temp. +23)		Within ±10% (operation temp. +23)		Within ±15% (Operation Temp. +23)	
Withstand Voltage	AC100V 50/60Hz (1 min.)		AC500V 50/60Hz (1 min.)		AC600V 50/60Hz (1 min.)		AC500V 50/60Hz (1 min.)	
Dielectric Strength	50MQ or more (DC500V)				50MQ or more (DC500V)		50MQ or more (DC500V)	
Vibration Resistance	Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)				Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)		Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)	
Shock Resistance	490m/s <sup>2</sup> Within 11ms (in Respective X, Y, Z Direction each 10 times)				490m/s <sup>2</sup> Within 11ms (in Respective X, Y, Z Direction each 10 times)		490m/s <sup>2</sup> Within 11ms (in Respective X, Y, Z Direction each 10 times)	
IP	IP67				IP67		IP67	
Case Material	Stainless Steel		Metal: Brass Nickel Plating		Metal: Brass Nickel Plating		Metal: Brass Nickel Plating	
Case Material	PBT Resin				PBT Resin		PBT Resin	
Lead Wire	Oil Resistant Cable 2m O.D. (approx. Ø4.1) 0.3mm <sup>2</sup> , 2 Conductors		Oil Resistant Cable 2m O.D. (approx. Ø3.8) 0.3mm <sup>2</sup> , 2 Conductors		Oil Resistant Cable 2m O.D. (approx. Ø3.8) 0.3mm <sup>2</sup> , 2 Conductors		Oil Resistant Cable 2m O.D. (approx. Ø3.8) 0.3mm <sup>2</sup> , 2 Conductors	
Tightening Torque	10mm from the Detecting Surface: 9Nm or less Other Than Above: 12Nm or less		5Nm or less		10Nm or less		5Nm or less	
Mass	Approx. 50g		Approx. 90g		Approx. 150g		Approx. 80g	

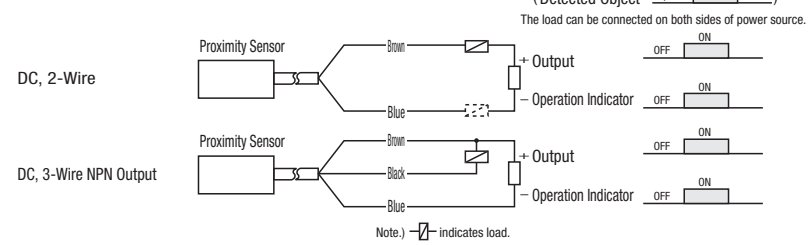
### Detection Range Fig. (Representative Values)



### Shape Properties (Representative Values)



### Connection / Operation



### Effects from Surrounding Metals

In order to avoid effects from surrounding metals, mount each device farther enough than the distance shown on the right table.

Part Number	a	b	c	d	e	f	g	h
<b>EM2-8S</b>	8	—	—	—	16	20	8	4
<b>EM3-12S/EMZ3-12S</b>	8	—	—	—	24	30	9	6
<b>EM7-18S/EMZ7-18S</b>	20	—	—	—	36	50	13.5	9
<b>EM10-30S</b>	40	—	—	—	60	100	20	15
<b>EM8-12U</b>	—	20	40	15	100	120	40	20
<b>EM14-18U</b>	—	40	70	22	110	200	70	35

### Precautions for Use

- Connect lead wires correctly and securely. Improper or insecure connection may damage sensor peripherals.
- Bending radius for lead wires is to be 30mm or more. Avoid bending within 30mm from exit points.
- When shutting down the power, output may turn ON or OFF for a moment. Turning off the load before shutting down the power is recommended.
- When there are big surge sources around such as motors or the sensor's own loads, insert surge absorbers such as varistors.