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Basic Features	Working principle	Inductive sensor		
	Housing	Ring type		
	Installation type	-		
	Sensing distance	-		
	Thread size	-		
	Sensing surface material	PBT		
	Detected objects	Metal		
	Indicator	Operation Status: LED		
	Sensing range adjustment	None		
Electrical data	Switching output	Normally Open or Normally Closed		
	Output mode	NPN or PNP Open Collector		
	External input	None		
	Switching frequency	2kHz	1.5kHz	1kHz
	Repeatability	2%		
	Hysteresis	15%		
	Operating Voltage	10~30V DC $\pm 10\%$		
	Current consumption	$\leq 15\text{mA}$		
	Residual Voltage	$\leq 1.5\text{V}$		
	Load current	150mA		
	Leakage current	$< 0.01\text{mA}$		
	Insulation resistance	$\geq 50\text{M}\Omega$ with 500V DC between power terminals and enclosure		
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure		
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
Environmental conditions	Circuit Protection	Reverse Polarity Protection/Short Circuit Protection		
	Operating Temperature	$-25\sim+75^{\circ}\text{C}$		
	Operating Humidity	35~85%		
	Enclosure rating	IP67		
Mechanical data	Connection type	2m/3-core Cable		
	Dimension	50.0x30.0x20.0mm	60.0x35.0x20.0mm	90.0x61.0x20.0mm
	Material	ABS+PBT		
	Weight	0.2kg	0.04kg	0.06kg
	Accessories	-		
Model	NPN NO	TH10-20[NIO]	TH15-20[NIC]	TH21-20[NIO]
	Others	[NIO]:NPN Normally open	[NIC]:NPN Normally closed	[NIO]:NPN Normally open [PIC]:PNP Normally closed

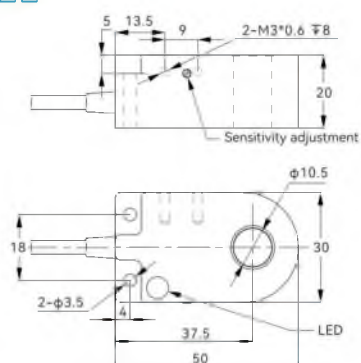
Ring-type-TH Series

Dimensions

Unit:mm

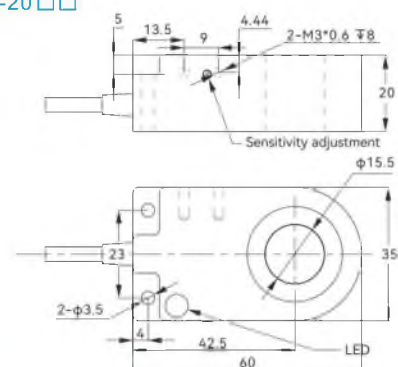
H10

TH10-20□□



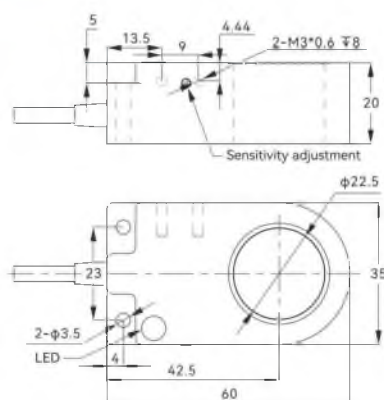
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TH15-20□□



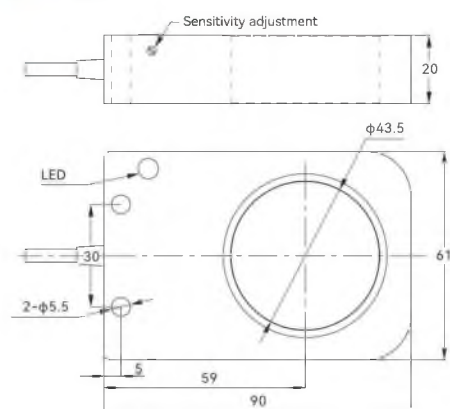
H21

TH21-20□□



H43

TH43-20□□



Temperature Resistance-TG Series

High Temperature (120°C) Resistance Pre-wired Type



Basic Features	Working principle	Inductive sensor					
	Housing	Cylindrical					
	Installation type	Flush			Non-flush		
	Sensing distance	2.0mm ± 10%	5.0mm ± 10%	10mm ± 10%	4.0mm ± 10%	8.0mm ± 10%	15mm ± 10%
	Thread size	M12	M18	M30	M12	M18	M30
	Sensing surface material	-					
	Detected objects	Metal					
	Indicator	Operation Status: LED					
	Sensing range adjustment	None					
Electrical data	Switching output	Normally Open or Normally Closed					
	Output mode	NPN or PNP Open Collector					
	External input	None					
	Switching frequency	1.5kHz	1kHz	0.5kHz	1kHz	0.8kHz	0.3kHz
	Repeatability	5%					
	Hysteresis	1~20%					
	Operating Voltage	10~30V DC ± 10%					
	Current consumption	≤15mA					
	Residual Voltage	≤2.5V					
	Load current	100mA					
	Leakage current	<0.1mA					
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure					
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure					
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions					
	Circuit Protection	Reverse Polarity Protection/Surge Protection					
Environmental conditions	Operating Temperature	-25~+120°C					
	Operating Humidity	35~95%RH					
	Enclosure rating	IP67					
Mechanical data	Connection type	2m/3-core Cable					
	Dimension	M12x51.0mm	M18x52.5mm	M30x51.5mm	M12x51.0mm	M18x52.5mm	M30x51.5mm
	Material	Copper-nickel alloy					
	Weight	0.05kg	0.08kg	0.12kg	0.05kg	0.08kg	0.12kg
	Accessories	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5
Model	NPN NO	TGF12-01(NNO)	TGF18-05(NNO)	TGF30-01(NNO)	TGN12-01(NNO)	TGN18-08(NNO)	TGN30-15(NNO)
	Others	(NNO):NPN Normally open (NOC):NPN Normally closed (PO):PNP Normally open (PC):PNP Normally closed					

Temperature Resistance-TG Series

High Temperature (120℃) Resistance Pre-wired Type



Basic Features	Working principle	Inductive sensor		
	Housing	Cylindrical		
	Installation type	Flush		
	Sensing distance	2.0mm ± 10%	5.0mm ± 10%	10mm ± 10%
	Thread size	M12	M18	M30
	Sensing surface material	PEEK		
	Detected objects	Metal		
	Indicator	Operation Status: LED		
	Sensing range adjustment	None		
Electrical data	Switching output	Normally Open		
	Output mode	NPN or PNP Open Collector		
	External input	None		
	Switching frequency	0.5kHz/220℃	0.5kHz/230℃	0.2kHz/230℃
	Repeatability	3%		
	Hysteresis	3~15%		
	Operating Voltage	10~30V DC ± 10%		
	Current consumption	≤25mA(24VDC)		
	Residual Voltage	≤1.8V		
	Load current	150mA		
	Leakage current	<0.1mA		
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure		
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure		<420V
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
Environmental conditions	Circuit Protection	Reverse Polarity Protection/Surge Protection		
	Operating Temperature	-25~+230℃		
	Operating Humidity	35~85%		
	Enclosure rating	IP66		
Mechanical data	Connection type	3M teflon shielded cable/S12 Connector		
	Dimension	M12x54.0mm	M18x55.0mm	M30x54.0mm
	Material	Stainless Steel+PEEK		
	Weight	0.05kg	0.08kg	0.12kg
	Accessories	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5
Model	NPN NO	TGF12-02NO2	TGF18-05NO2	TGF30-10NO2
	PNP NO	TGF12-02PO2	TGF18-05PO2	TGF30-10PO2

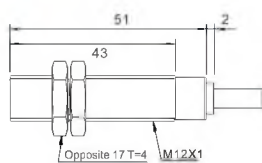
Temperature Resistance-TG Series

Dimensions

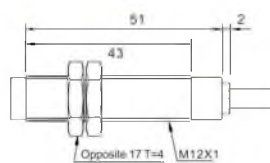
Unit:mm

M12

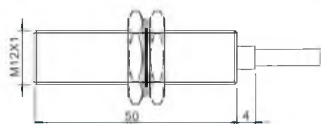
TGF12-02□□



TGN12-04□□

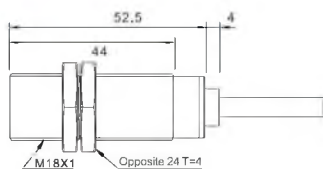


TGF12-02□□2

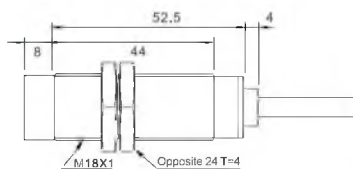


M18

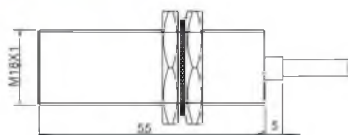
TGF18-05□□



TGN18-08□□

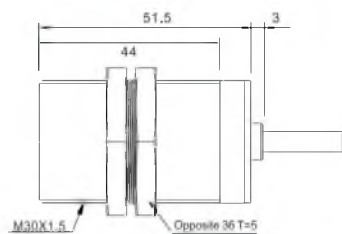


TGF18-05□□2

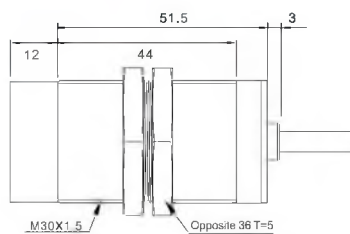


M30

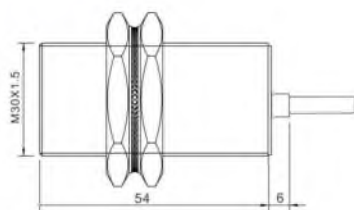
TGF30-10□□



TGN30-15□□



TGF30-10□□2





Basic Features	Working principle	Inductive sensor			
	Housing	Cylindrical			
	Installation type	Flush			
	Sensing distance	1.0mm/2.0mm ± 10%	2.0mm/4.0mm ± 10%	5.0mm/8.0mm ± 10%	10mm/16mm ± 10%
	Thread size	M8	M12	M18	M30
	Sensing surface material	Stainless Steel			
	Detected objects	Metal			
	Indicator	Operation Status: LED			
	Sensing range adjustment	None			
Electrical data	Switching output	Normally Open or Normally Closed			
	Output mode	NPN or PNP Open Collector			
	External input	None			
	Switching frequency	2kHz	1kHz	1kHz/0.5kHz	0.3kHz/0.15kHz
	Repeatability	1%			
	Hysteresis	15%			
	Operating Voltage	10~30V DC ± 10%			
	Current consumption	≤10mA			
	Residual Voltage	≤1.5V			
	Load current	150mA			
	Leakage current	<0.01mA			
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure			
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
Environmental conditions	Circuit Protection	Short circuit protection			
	Operating Temperature	-25~+75℃			
	Operating Humidity	35~85%			
	Enclosure rating	IP67			
Mechanical data	Connection type	2m/3-core Cable			
	Dimension	M8x45.0mm	M12x45.0mm	M18x54.0mm	M30x54.0mm
	Material	Stainless Steel			
	Weight	0.012kg	0.05kg	0.08kg	0.12kg
	Accessories	Nut M8x1.0	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5
Model	NPN NO	TMF08-01[NO] / TMF08-02[NO]	TMF12-02[NO] / TMF12-04[NO]	TMF18-05[NO] / TMF18-08[NO]	TMF30-10[NO] / TMF30-16[NO]
	Others	[NO] NPN Normally open	[NC] NPN Normally closed	[PO] PNP Normally open	[PC] PNP Normally closed

Metal Face-TM Series

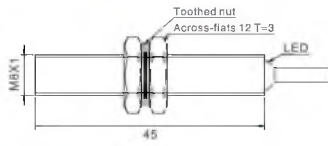
Pre-wired



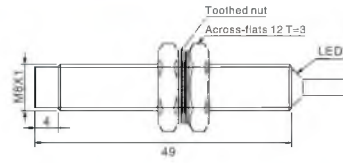
Basic Features	Working principle	Inductive sensor			
	Housing	Cylindrical			
	Installation type	Non-flush			
	Sensing distance	2.0mm/3.0mm ± 10%	4.0mm/8.0mm ± 10%	8.0mm/16mm ± 10%	15mm/25mm ± 10%
	Thread size	M8	M12	M18	M30
	Sensing surface material	Stainless Steel			
	Detected objects	Metal			
	Indicator	Operation Status: LED			
	Sensing range adjustment	None			
Electrical data	Switching output	Normally Open or Normally Closed			
	Output mode	NPN or PNP Open Collector			
	External input	None			
	Switching frequency	2kHz/1kHz	1kHz/0.5kHz	0.5kHz/0.15kHz	0.15kHz/0.1kHz
	Repeatability	1%			
	Hysteresis	15%			
	Operating Voltage	10~30V DC ± 10%			
	Current consumption	≤10mA			
	Residual Voltage	≤1.5V			
	Load current	150mA			
	Leakage current	<0.01mA			
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure			
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
	Circuit Protection	Short circuit protection			
Environmental conditions	Operating Temperature	-25~+75℃			
	Operating Humidity	35~85%			
	Enclosure rating	IP67			
Mechanical data	Connection type	2m/3-core Cable			
	Dimension	M8x49.0mm	M12x54.0mm	M18x62.0mm	M30x66.0mm
	Material	Stainless Steel			
	Weight	0.012kg	0.05kg	0.08kg	0.12kg
	Accessories	Nut M8x1.0	Nut M12x1.0	Nut M18x1.0	Nut M30x1.5
Model	NPN NO	TMN08-02[NO] / TMN08-03[NO]	TMN12-04[NO] / TMN12-08[NO]	TMN18-08[NO] / TMN18-16[NO]	TMN30-15[NO] / TMN30-25[NO]
	Others	[NO]:NPN Normally open [NC]:NPN Normally closed [PO]:PNP Normally open [PC]:PNP Normally closed			

M8

TMF08-01/02 □ □

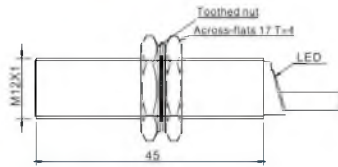


TMN08-02/03 □ □

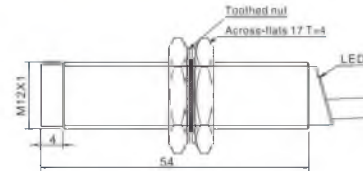


M12

TMF12-02/04 □ □

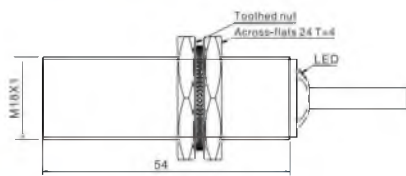


TMN12-04/08 □ □

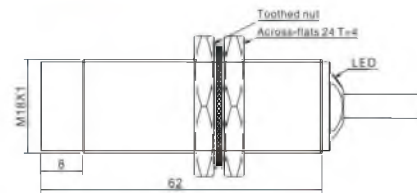


M18

TMF18-05/08 □ □

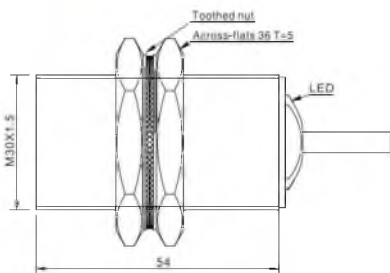


TMN18-08/16 □ □

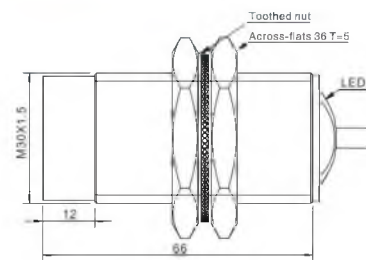


M30

TMF30-10/16 □ □



TMN30-15/25 □ □



IP69K High Protection-TP Series



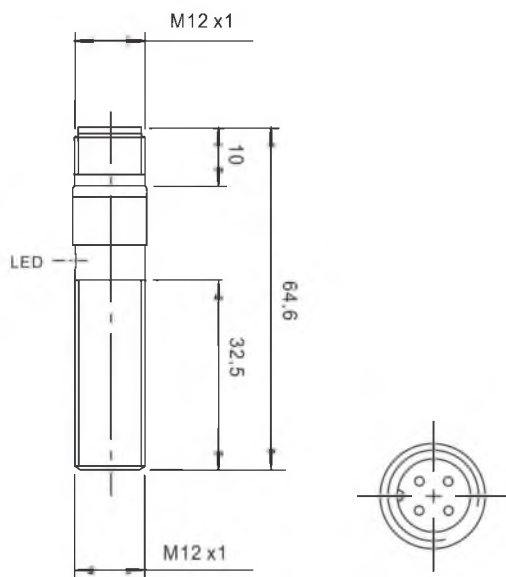
Basic Features	Working principle	Inductive sensor			
	Housing	Cylindrical			
	Installation type	Flush		Non-flush	
	Sensing distance	2.0mm ± 10%	4.0mm ± 10%	8.0mm ± 10%	
	Thread size	M12			
	Sensing surface material	PPS (FDA certified)			
	Detected objects	Metal			
	Indicator	Operating status: LED (only for NC)			
	Sensing range adjustment	Available			
Electrical data	Switching output	Normally Open or Normally Closed			
	Output mode	NPN or PNP Open Collector			
	External input	None			
	Switching frequency	2kHz			
	Repeatability	5%			
	Hysteresis	1~20%			
	Operating Voltage	10~30V DC ± 10%			
	Current consumption	≤15mA			
	Residual Voltage	≤2V			
	Load current	200mA			
	Leakage current	<15μA			
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure			
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
Environmental conditions	Circuit Protection	-			
	Operating Temperature	-40 to 80°C (up to 100°C for ≤15s, ≤10% duty cycle), -25 to 110°C for NC			
	Operating Humidity	35~85%			
	Enclosure rating	IP67, IP68 (1m for 7 days); IP69K (compliant with DIN 40050-9 standard)			
Mechanical data	Connection type	M12/4-pin Connector			
	Dimension	M12x64.6mm			
	Material	Stainless steel + PPS (FDA certified)			
	Weight	0.03kg			
	Accessories	Nut M12x1.0			
Model	NPN	TPF12-02NR-E2	TPF12-04NR-E2	TPN12-04NR-E2	TPN12-08NR-E2
	PNP	TPF12-02PR-E2	TPF12-04PR-E2	TPN12-04PR-E2	TPN12-08PR-E2

IP69K High Protection-TP Series

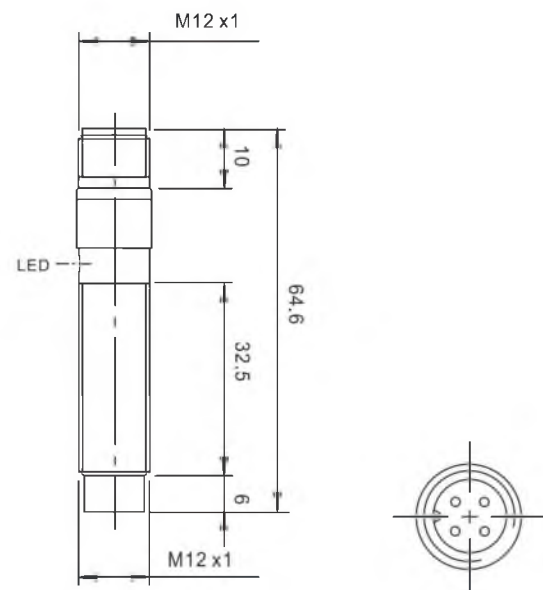


Basic Features	Working principle	Inductive sensor			
	Housing	Cylindrical			
	Installation type	Flush		Non-flush	
	Sensing distance	5.0mm ± 10%	8.0mm ± 10%		12.0mm ± 10%
	Thread size	M18			
	Sensing surface material	PPS (FDA certified)			
	Detected objects	Metal			
	Indicator	Operating status: LED (only for NC)			
	Sensing range adjustment	Available			
Electrical data	Switching output	Normally Open or Normally Closed			
	Output mode	NPN or PNP Open Collector			
	External input	None			
	Switching frequency	15kHz			
	Repeatability	5%			
	Hysteresis	1~20%			
	Operating Voltage	10~30V DC ± 10%			
	Current consumption	≤15mA			
	Residual Voltage	≤2V			
	Load current	200mA			
	Leakage current	<10μA			
	Insulation resistance	≥50MΩ with 500V DC between power terminals and enclosure			
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between power terminals and enclosure			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
Environmental conditions	Circuit Protection	-			
	Operating Temperature	-40 to 80°C (up to 100°C for ≤15s, ≤10% duty cycle), -25 to 110°C for NC			
	Operating Humidity	35~85%			
	Enclosure rating	IP67, IP68 (1m for 7 days); IP69K (compliant with DIN 40050-9 standard)			
Mechanical data	Connection type	M12/4-pin Connector			
	Dimension	M18x63.1mm			
	Material	Stainless steel + PPS (FDA certified)			
	Weight	0.03kg			
	Accessories	Nut M18x1.0			
Model	NPN	TPF18-05NR-E2	TPF18-08NR-E2	TPN18-08NR-E2	TPN18-12NR-E2
	PNP	TPF18-05PR-E2	TPF18-08PR-E2	TPN18-08PR-E2	TPN18-12PR-E2

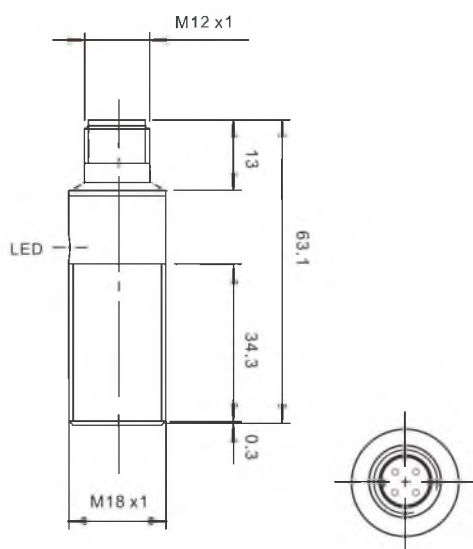
TPF12-02NR-E2(PR)
TPF12-04NR-E2(PR)



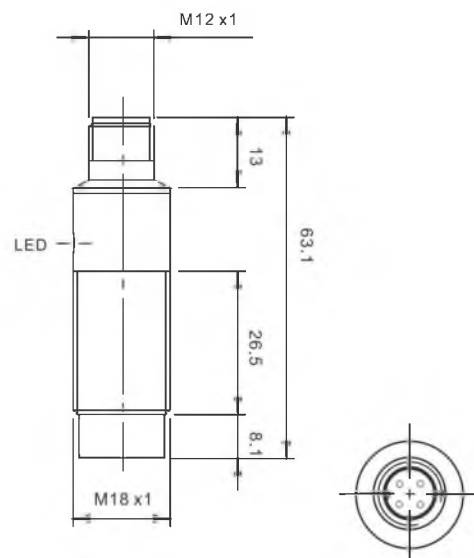
TPN12-04NR-E2(PR)
TPN12-08NR-E2(PR)



TPF18-05NR-E2(PR)
TPF18-08NR-E2(PR)



TPN18-08NR-E2(PR)
TPN18-12NR-E2(PR)



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