

Miniature Inductive Prox

TL-W

Subminiature, Flat-Pack DC Sensor
Fits Tight Spaces

- Watertight construction conforms to IP67
- Space-saving mounting area, as small as 10 x 27 mm (0.39 x 1.06 in), is ideal for conveyor wall mounting
- Mounts directly onto metal base or rail
- Rugged diecast metal or low-profile plastic housing models available
- Choose NPN or PNP output models
- Ready to use: Prewired with 2 m (6.56 ft) length cable and mounting bracket included with TL-W3M sensors



Ordering Information

Body type		Shielded	Unshielded		
Body material		Diecast aluminum	ABS plastic		
Nominal detecting distance		5 mm (0.20 in)	3 mm (0.12 in)	5 mm (0.20 in)	20 mm (0.79 in)
Part number	NPN-NO output	TL-W5E1	TL-W3MC1	TL-W5MC1	TL-W20ME1
	NPN-NC output	TL-W5E2	TL-W3MC2	TL-W5MC2	TL-W20ME2
	PNP-NO output	TL-W5F1	TL-W3MB1	TL-W5MB1	—
	PNP-NC output	TL-W5F2	—	—	—

Specifications

■ UNSHIELDED, PLASTIC BODY SENSORS

Part number			TL-W3M□□	TL-W5M□□	TL-W20ME□
Sensor type			Inductive		
Body		Size	Flat, rectangular		
		Type	Unshielded		
Supply voltage			10 to 30 VDC, maximum ripple 10% peak-to-peak		
Current consumption			15 mA max.	10 mA max.	15 mA max.
Detectable object type			Metal objects		
Effective maximum detecting distance (with standard object)			0 to 2.7 mm (0 to 0.11 in)	0 to 4.5 mm (0 to 0.18 in)	0 to 16 mm (0 to 0.63 in)
Standard target size (mild steel, LxWxH)			12 x 12 x 1 mm (0.47 x 0.47 x 0.04 in)	18 x 18 x 1 mm (0.71 x 0.71 x 0.04 in)	50 x 50 x 1 mm (1.97 x 1.97 x 0.04 in)
Differential travel			10% max. of effective maximum detecting distance		
Control output	DC solid-state	Type	NPN-NO (TL-W□MC1) PNP-NO (TL-W□MB1)		NPN-NO (TL-W20ME1) with pull-up resistor NPN-NC (TL-W20ME2) with pull-up resistor
		Max. load	100 mA max.	50 mA max. at 12 VDC, 100 mA max. at 24 VDC	100 mA max. at 12 VDC 200 mA max. at 24 VDC
		Max. on-state voltage drop	1.0 V max.		
Response frequency			600 Hz	500 Hz	40 Hz
Circuit protection		Output short-circuit	Not provided		
		DC power supply reverse polarity	Provided		
Indicators			Target present (red LED)		
Materials		Housing	Plastic (ABS)		
		Sensing face	Plastic (ABS)		
		Cable sheath	Oil-proof vinyl		
Mounting			Bottom surface with 1 through hole, or mounting bracket supplied	Bottom surface with 2 through holes	
Connections	Prewired		3-conductor cable, 2 m (6.56 ft) length		
Weight with cable			30 g (1.06 oz.)	45 g (1.59 oz.)	180 g (6.35 oz.)
Enclosure ratings		UL	—		
		NEMA	1, 2, 3, 4X, 6, 12, 13		
		IEC 144	IP67		
Approvals		UL	—		
		CSA	—		
Ambient operating temperature			-25° to 70°C (-13° to 158°F)		
Vibration			10 to 55 Hz, at 1.5 mm in X, Y, and Z directions, double amplitude for 2 hours		
Shock			Approx. 50 G, three times		

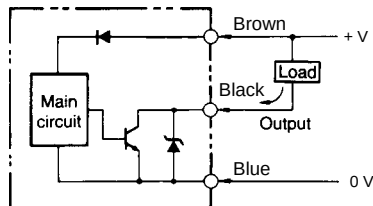
■ SHIELDED, METAL BODY SENSORS

Part number			TL-W5E□□	TL-W5F□
Sensor type			Inductive	
Body	Size		Flat, rectangular	
	Type		Shielded	
Supply voltage			10 to 30 VDC, maximum ripple 10% peak-to-peak	
Current consumption			15 mA max. at 24 VDC	
Detectable object type			Metal objects	
Effective maximum detecting distance (with standard object)			0 to 4 mm (0 to 0.16 in)	
Standard target size (mild steel, LxWxH)			18 x 18 x 1 mm (0.71 x 0.71 x 0.04 in)	
Differential travel			10% max. at effective maximum detecting distance	
Control output	DC solid-state	Type	NPN-NO (TL-W5E1) with pull-up resistor NPN-NC (TL-W5E2) with pull-up resistor	PNP-NO (TL-W5F1) with pull-down resistor PNP-NC (TL-W5F2) with pull-down resistor
		Max. load	200 mA max.	
		Max. on-state voltage drop	2.0 V max.	
Response frequency			300 Hz	
Circuit protection	Output short-circuit		Not provided	
	DC power supply reverse polarity		Provided	
Indicators			Target present (red LED)	
Materials	Housing		Diecast aluminum	
	Sensing face		Plastic (ABS)	
	Cable sheath		Oil-proof vinyl	
Mounting			Bottom surface with 2 through holes	
Connections	Prewired		3-conductor cable, 2 m (6.56 ft) length	
Weight with cable			70 g (2.5 oz.)	
Enclosure ratings	UL		—	
	NEMA		1, 2, 3, 4X, 6, 12, 13	
	IEC 144		IP67	
Approvals	UL		—	
	CSA		—	
Ambient operating temperature			-25° to 70°C (-13° to 158°F)	
Vibration			10 to 55 Hz, at 1.5 mm in X, Y, and Z directions, double amplitude for 2 hours	
Shock			Approx. 50 G, three hours	

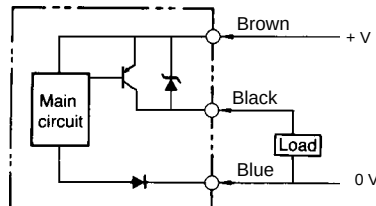
Operation

■ OUTPUT CIRCUIT DIAGRAMS

NPN Output TL-W□MC□

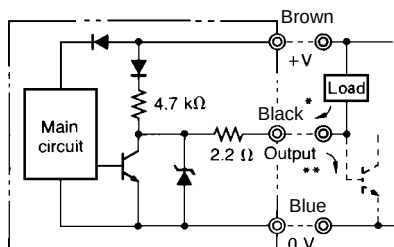


PNP Output TL-W□MB□



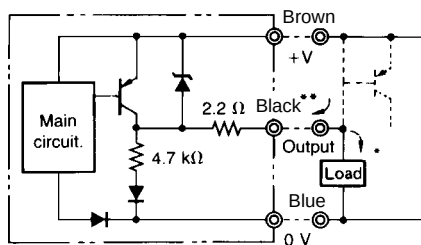
OUTPUT CIRCUIT DIAGRAMS (continued)

NPN Output TL-W5E□, TL-W20ME□



* 200 mA max. (load current)
** When a transistor is connected

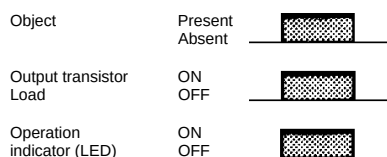
PNP Output TL-W5F□



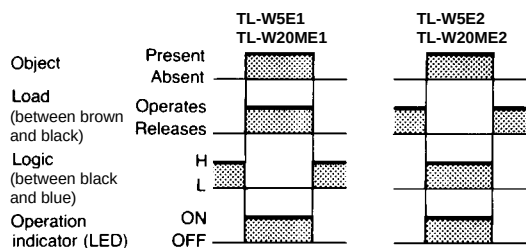
* 200 mA max. (load current)
** When a transistor is connected

TIMING CHARTS

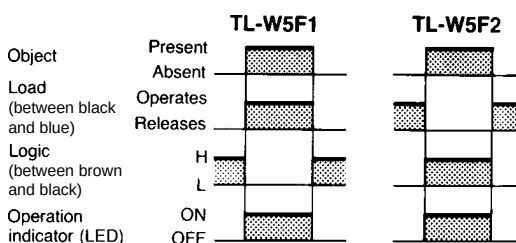
TL-W3M, TL-W5M



NPN Output TL-W5E□, TL-W20ME□



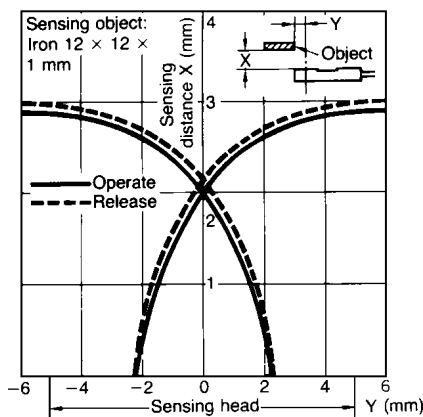
PNP Output TL-W5F□



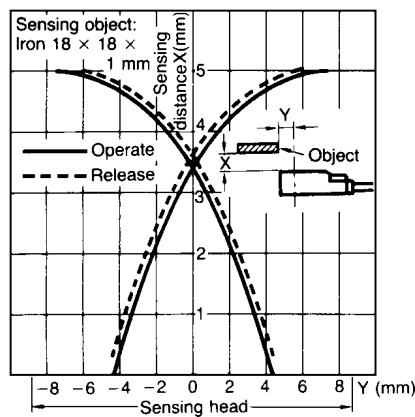
Engineering Data

OPERATING RANGE

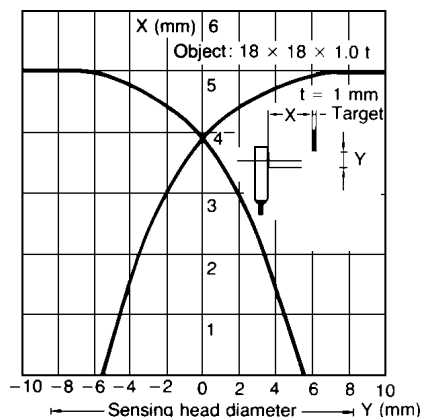
TL-W3M□



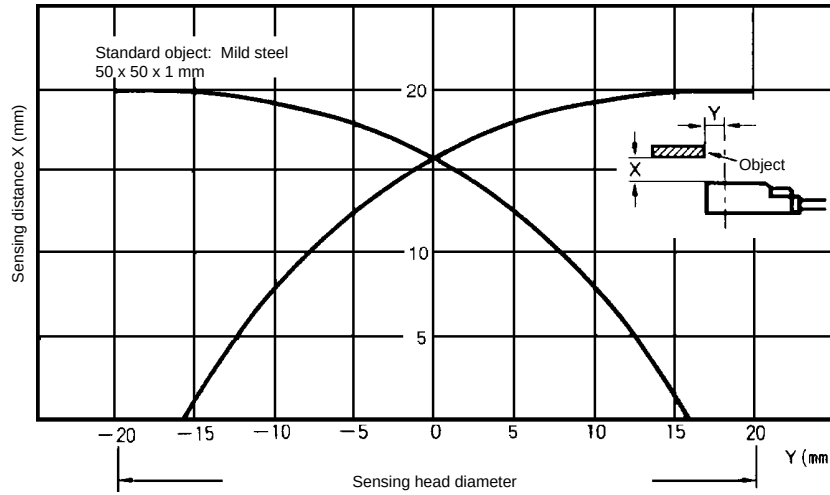
TL-W5M□



TL-W5□□

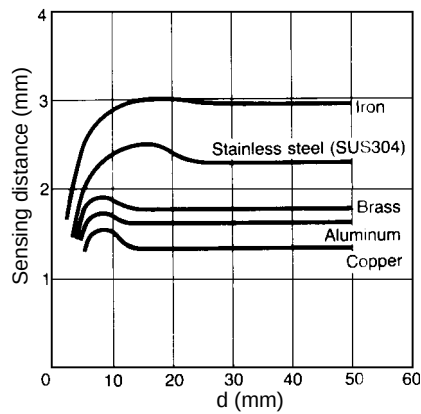


TL-W20M□□

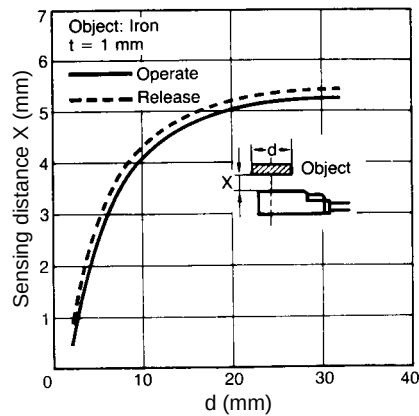


■ SENSITIVITY

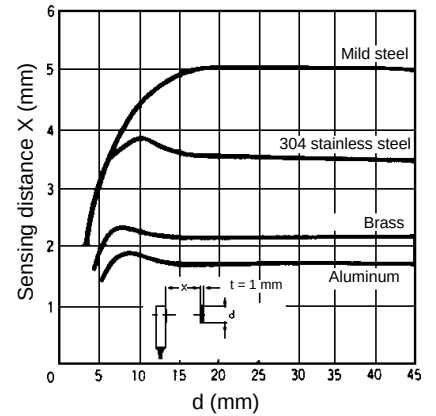
TL-W3M□1



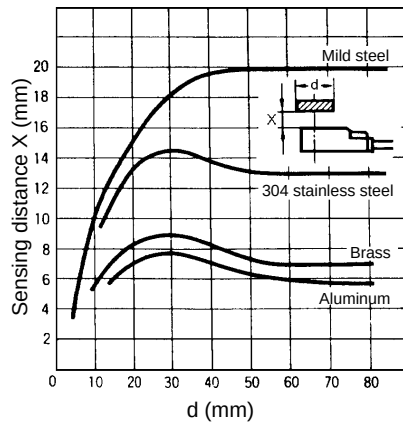
TL-W5M□1



TL-W5□



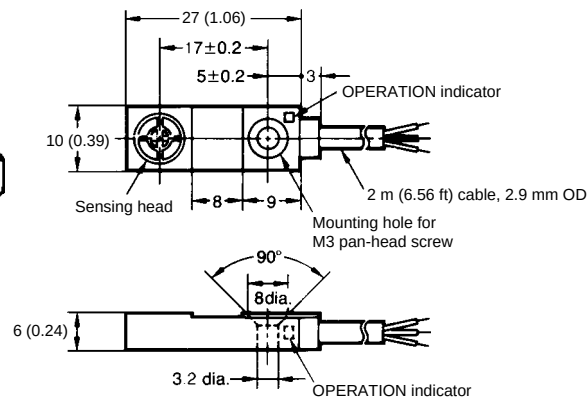
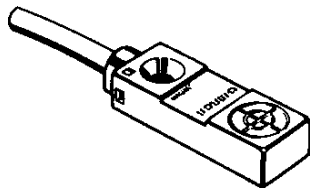
TL-W20M□



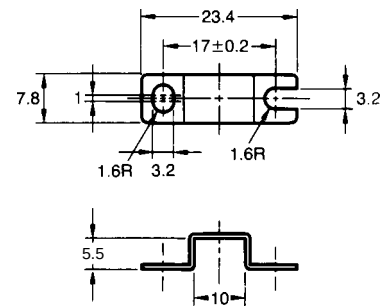
Dimensions

Unit: mm (inch)

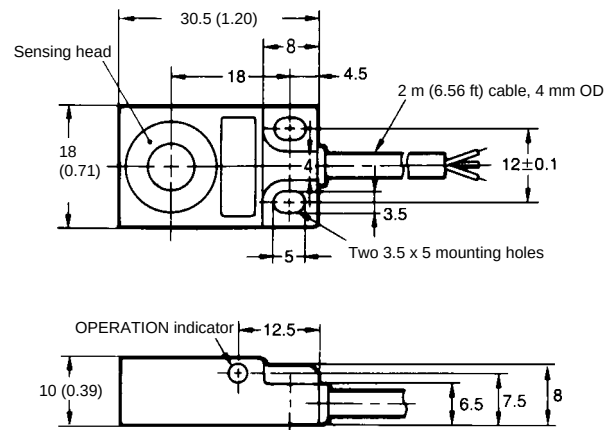
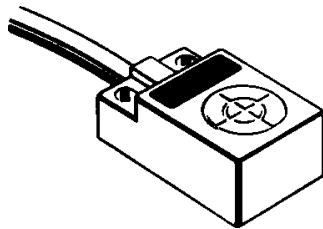
TL-W3M□1



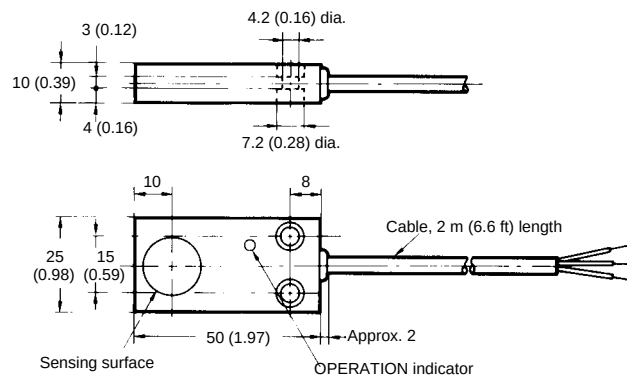
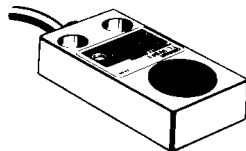
Mounting bracket (included)



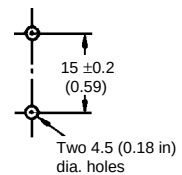
TL-W5M□1



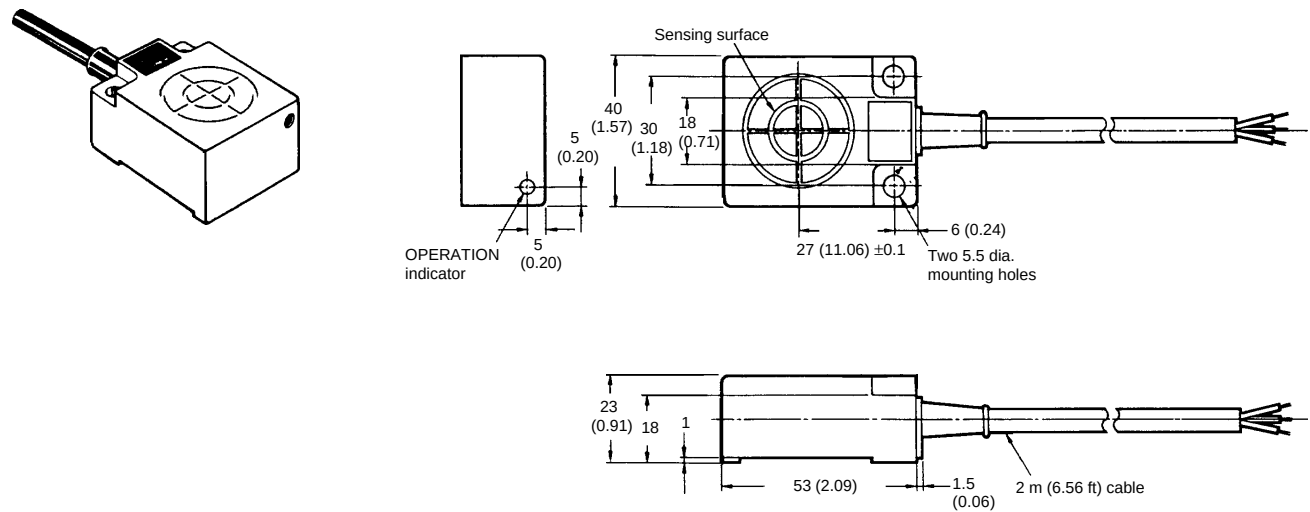
TL-W5E, TL-W5F



Mounting holes



TL-W20ME□

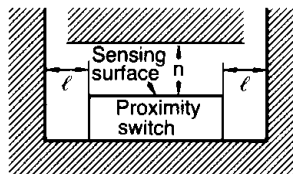


Precautions

INFLUENCE OF SURROUNDING METALS

When mounting the proximity sensor flush with a metallic panel, be sure to allow a minimum distance as shown in the table below. If the other side is open, the value of "ℓ" is zero.

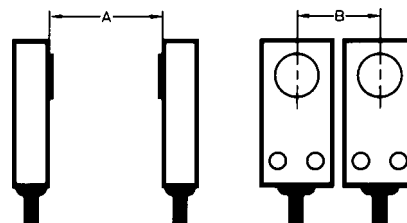
Distance	" ℓ "	n
TL-W3M	3 mm (0.12 in)	12 mm (0.47 in)
TL-W5M	5 mm (0.20 in)	20 mm (0.79 in)
TL-W20M	25 mm (0.98 in)	100 mm (0.34 in)



MUTUAL INTERFERENCE

When mounting two or more sensors of the same type face to face or side by side, be sure to provide a minimum distance as shown in the table below.

Distance	A	B
TL-W3M	90 mm (3.54 in)	30 mm (1.18 in)
TL-W5M	120 mm (4.72 in)	60 mm (2.36 in)
TL-W5□	50 mm (1.97 in)	35 mm (1.38 in)
TL-W20M	200 mm (7.87 in)	200 mm (7.87 in)



NOTE: DIMENSIONS ARE SHOWN IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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