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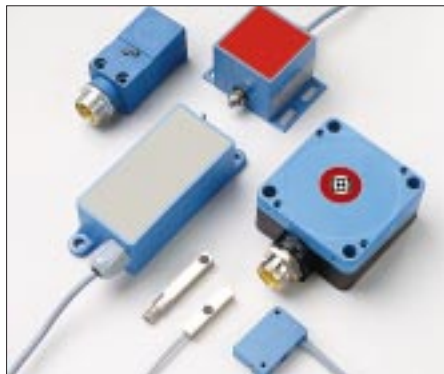
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Introduction

The Inductive Proximity Sensor (IPS) is a solid state device that generates an output signal when metal objects are either inside or entering into its sensing area from any direction. No physical contact is required nor desired. IPS's work best with ferrous metals, however, they also work well with non-ferrous metals (aluminum, brass, copper, etc.) at reduced sensing distances, see **Figure 1**.

Fig. 1

Rated Operating Distance Correction Factors

Target Material	Correction Factor
Mild Steel	1.0 x Sn
Nickel Chromium	0.9 x Sn
Stainless Steel	0.85 x Sn
Brass	0.5 x Sn
Aluminum	0.45 x Sn
Copper	0.40 x Sn

Other Factors

- Flat targets are preferable
- Targets larger than the sensing face may increase the sensing distance

First introduced in the mid 60's, Inductive Proximity Sensors were designed as an alternative to mechanical limit switches for many applications. Initially, IPS's were made with housing similar in size and dimension to the limit switch, but had short sensing distances. Following very good results with these new devices, market pressure led to the development of larger sensors with increased sensing distances.

Inductive Proximity Sensors have no moving parts, operate very fast, are extremely reliable, require no

maintenance, and operate under extreme environmental conditions. They typically interface with Programmable Logic Controllers (PLC), process, and personal computers with appropriate hardware and software. They also can control relays, solenoids, valves, etc., up to their maximum output current.

Altech Inductive Proximity Sensors are manufactured by Pulsotronic in Germany. Pulsotronic, a well known European manufacturer, has been designing and manufacturing IPS's for over 30 years using state-of-the-art technology and is an ISO 9001 certified company. Altech is Pulsotronic's North American marketing partner. Our Inductive Proximity Sensors meet National and International Standards and carry the CE Mark. (See page 7 for information on CE marking).

Altech offers 4 Inductive Proximity Sensor families.

Cylindrical Inductive Proximity Sensors represent the most popular device, and are available in diameters from 4mm (.159 in.) to 30mm (1.18in.) and sensing distances up to 40mm (1.57in.). Typically, Cylindrical models have low sensing distances and are used in applications requiring compact sizes that are easily mountable. Please refer to selection guide on pages 12-14 for more information.

Limit style (Versa-Prox) Inductive Proximity Sensors are physically larger than Cylindrical IPS's and have sensing distances up to 40mm(1.59in.). These units feature a unique 17 position rotating sensing head with snap and lock construction (no screws). Versa-Prox IPS's are used to replace mechanical limit switches and for applica-

tions where adjustment of the sending head is desired. Please refer to selection guide on page 71 for more information.

Block Inductive Proximity Sensors feature models with adjustable sensing distances up to 70mm (2.78in.). The largest Block is 100 x 50 x 40 mm (3.9 x 2 x 1.6 in.). Block sensors are used for applications where maximum sensing distances are required.

Please refer the selection guide on pages 82-83 for more information.

Ring Inductive Proximity Sensors are special devices that detect metal objects passing through the ring. Altech offers a wide range of ring diameters from 12mm (.47in.) to 300mm (11.91 in.). Our Ring IPS's are available in normal and high sensitivity models. Typical application are in stamping operations and detection for unwanted metals. Please refer the selection guide on page 100-101 for more information.

Altech/Pulsotronic Inductive Proximity Sensors, (except Ring & Flat-pack), offer a lifetime warranty subject to completing the registration form (see page 143), and the terms and conditions as specified on page 141.

Note: We have attempted to make this catalog as comprehensive as possible. However, not shown in this catalog are other Altech Proximity Sensors which are available. Details on request.

Operation

An Inductive Proximity Sensor consists of an oscillator, a ferrite core with coil, a detector circuit, an output circuit, housing, and a cable or connector, (see **Figure 2**). The oscillator generates a sine wave of a fixed frequency. This signal is used to drive the coil. The coil in conjunction with ferrite core induces a electromagnetic field. When the field lines are interrupted by a metal object, the oscillator voltage is reduced, proportional to the size and distance of the object from the coil. The reduction in the oscillator voltage is caused by eddy currents induced in the metal interrupting the field lines. This reduction in voltage of the oscillator is detected by the detecting circuit. In standard sensors, when the oscillator voltage drops below a present level, an output signal is generated. In an Analog Proximity Sensor, a pre-set level is not used. The Analog sensor circuitry utilizes the change of the oscillator output voltage to generate a DC output voltage proportional to the distance the metal object is from the sensing head.

OPERATING VOLTAGES

Most Altech Inductive Proximity Sensors are available in DC (10-30

VDC), AC (90-250VAC), AC/DC (20-250VAC/DC). Please refer to each product specification page for specific operating voltages.

OUTPUT CURRENT

Altech offers a range of IPS's with different output ratings from 5mA to 500mA. Please refer to each product specification page for specific output current.

OUTPUT CONFIGURATION

Outputs may be Normally Open (NO) or Normally Closed (NC). Some models feature both a normally open (NO) and normally closed (NC) output which is called a complementary output. Limit style Versa-Prox sensors feature a programmable Normally Open (NO) and Normally Closed (NC) output.

DC Inductive Proximity Sensors may be 2-wire, 3-wire or 4-wire. A 3-wire or 4-wire DC sensor can be an NPN or PNP output transistor. If the output load is connected to the negative power source then a sensor with a PNP output transistor is required. A PNP sensor is also known as a source sensor. If the output load is connected to the positive power source, then a sensor with an NPN output transistor is required. An NPN sensor is also known as a sink sensor.

Please see **Figure 3** for PNP and NPN electronic output circuits.

AC Inductive Proximity Sensors are 2-wire devices, except when using a sensor with a metal housing where a third wire is available for connection to system ground.

HOUSING MATERIALS

Altech Inductive Proximity Sensors use a variety of metal and non-metallic housing materials. Please refer to each product specification for specific information on housing materials, and page 136 of this catalog.

CONNECTIONS

Altech offers Inductive Proximity Sensors that feature either 2 meter fixed PVC cable or a variety of quick disconnects. All quick disconnect models require an optional matching cable assembly. Custom cable lengths and material choices are also available. For more information, please refer to each product specification or the cable assemblies section on pages 116-121.

FLUSH MOUNT AND NON-FLUSH MOUNT

Flush Mount sensors are sometimes called Shielded or Embeddable. A metal band surrounds the sensing head which contains a coil wound around a ferrite core as in **Figure 4**.

Fig. 2

SENSOR CONFIGURATION

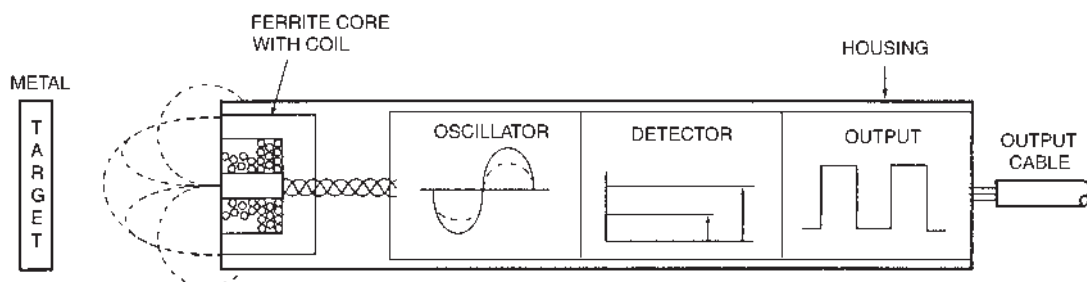


Fig. 3 ELECTRONIC OUTPUT CIRCUITS

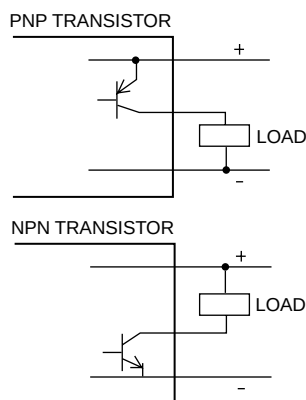
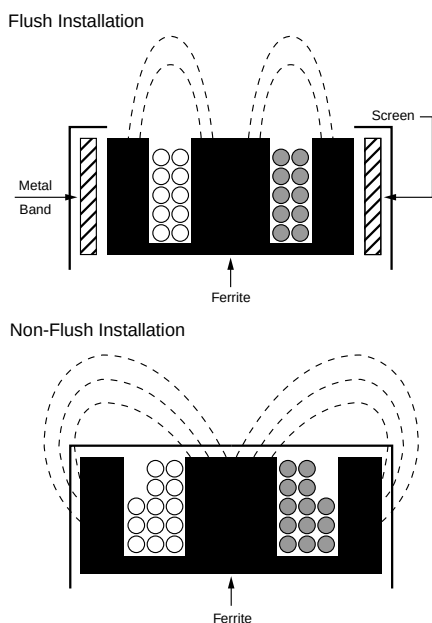


Fig. 4 SENSOR ELECTRO-MAGNETIC FIELD



The resulting electromagnetic field is directed in front of the sensor face. Flush sensors have a narrow sensing field which may be desirable in certain applications. In a Non-Flush (Non-shielded or Non-embeddable) sensor, (**Figure 4**), there is no metal band and the resulting electromagnetic field lines are much wider than the sensor face. Non-Flush sensors have a larger sensing distance than Flush sensors.

OTHER CONSIDERATIONS:

SENSORS IN SERIES AND PARALLEL

Sensors may be wired in series or parallel. Please contact Altech for more information.

PROTECTION (Electrical)

Most of the Inductive Proximity Sensors Altech offers have short circuit, overload, reverse polarity, and wire break protection. Please refer to the Technical Glossary pages 135-136, and the product specification for more information.

PROTECTION (Sensor Housing)

All Altech sensors are rated in accordance with IEC Publication 529 which describes degrees of protection that enclosures or sensor housings are designed to provide, the degree of protection is indicated by two letters (IP) and two numerals, for additional information see the product specification and pages 132-133.

All Inductive sensors meet the following shock and vibration requirements: 30g's/11ms, and 10-55 Hz/mm.

SENSING DISTANCE

There are several sensing distance definitions used in industry. The

nominal sensing distance (S_n), is the conventional quantity to designate the operational distance, it is specified in the ordering pages, and does not include variations in production tolerances, supply voltage tolerances, and ambient temperature tolerances.

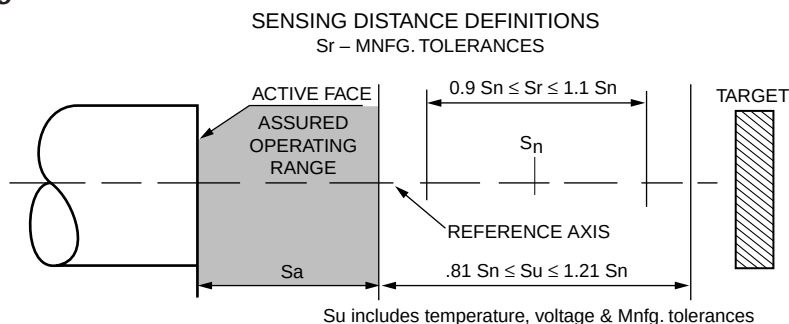
A standard target used to specify sensing distance is a square piece of mild steel having a thickness of 1mm (0.04 in.). The sides of the square are equal to the diameter of the circle inscribed on the sensor face or three times the rated operating distance S_n , whichever is greater.

The assured operation distance (S_a) is the smallest useful sensing distance which guarantees operation under variations in temperature, voltage and manufacture. It is given as 81% of S_n . See **Figure 5**. $0 < S_a < .81 S_n$.

The effective sensing distance (S_r), is measured at nominal supply voltage and nominal ambient temperature and takes into account manufacturing tolerances: $0.9 S_n \leq S_r \leq 1.1 S_n$

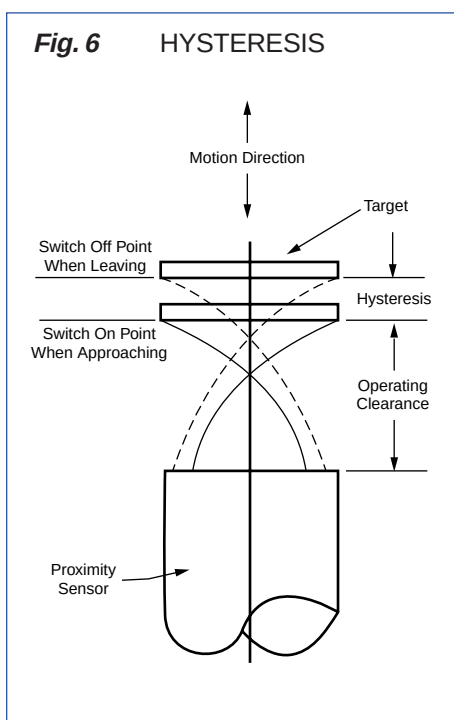
The usable sensing distance, (S_u), takes into account temperature, voltage variations and manufacturing tolerances: $.81 S_n \leq S_u \leq 1.21 S_n$

Fig. 5



HYSTERESIS

Hysteresis is the switch-on point when the object approaches the sensor's active surface, and switch-off point, when the object is moving away from the sensor's active surface. Without sufficient Hysteresis, an Inductive Proximity Sensor would chatter (continuously switching on and off), so it is designed into the sensor circuitry. The differential travel (Hysteresis) is given as a percent of the expected rated operating distance S_r . (See **Figure 6**).

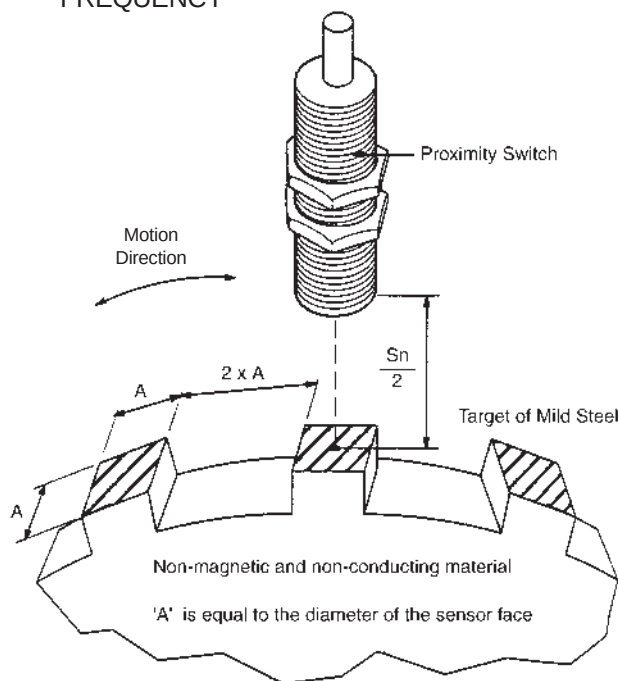


MAXIMUM SWITCHING FREQUENCY

The switching frequency indicates the maximum number of switching operations of a sensor per second. The value listed in the product specifications is achieved with the conditions shown in **Figure 7**. The value is always dependent on target size, distance from sensing face and speed of target. Using a smaller target or space may result in a reduction of a specific sensor maximum switching frequency.

Fig. 7

SWITCHING FREQUENCY



ACCESSORIES

Altech offers a full range of accessory products including quick disconnect cable assemblies, mounting clamps and brackets, liquid tight strain reliefs, amplifiers, switching units, etc. Please refer to each product specification and the accessory chapter starting on page 113.

and European Economic Area (EEA). Products manufactured in the USA that are exported to the EU and EEA should have the CE marking and utilize components also having the CE marking.

CE MARK



GENERAL INFORMATION

The CE Mark is a compliance symbol, which means that the product meets the standards set by the European Committee for Electrotechnical Standardization (CENELEC), and the International Electrotechnical Commission (IEC).

Products containing the CE mark are allowed to have free movement within the European Union (EU),



Cylindrical Sensors

CYLINDRICAL INDUCTIVE PROXIMITY SENSORS

Altech Cylindrical sensors are available in diameters ranging from 4mm (.16 in.) to 30mm (1.18 in.) with sensing distances up to 40mm (1.57 in.). Most models feature nickel plated brass (BN) housing, but stainless steel (SS) and non-metallic versions are available. Both flush mount and non-flush mount sensors are available. Flush mount versions are often called shielded or embeddable. Non-flush mount sensors are also called non-shielded or non-embeddable. Non-flush sensors have larger sensing distances than their flush mount counterparts. All Inductive sensors meet IP67 (NEMA1, 3, 4, 6, 12, 13) protection levels. Please refer to pages 132-133 of this catalog for more information.

FLUSH MOUNT CYLINDRICAL SENSORS

Flush Mounted, sometimes called embedded or shielded sensors, have electromagnetic fields concentrated directly in front of the sensing heads and may be mounted directly into metal mounting brackets or embedded directly into metal without causing a false output. **Figure 8** also illustrates that on Cylindrical Flush Mount sensors there should be at least 1 diameter of distance between adjacent sensors, and no non-target metal surfaces should be less than 3 times the sensing distance S_n directly across from the sensing head. Also, two directly opposite sensors mounted in metal should be greater than 6 times the sensing distance apart.

Sensing Distances – AC, DC, Cylindrical Style Sensors

Type	Voltage	Flush*	Non-Flush*
L Series - Short Body	DC	1.5 - 10	2 - 15
GL Series - 2 LED	DC	2 - 10	4 - 15
Standard Series	AC, DC	1.5 - 10	2 - 15
Extended Sensing Range	DC	2 - 15	3
High Speed	DC	2	
Plastic & Metal Housing	AC, DC	2 - 10	4 - 15
Mini Housing	DC	0.8 - 1.5	
Complementary Output	DC	2 - 10	4 - 15
Extended Temperature Range	DC	2 - 10	4 - 15
Weld Immune	AC, DC	2 - 10	4 - 15
Analog Output	DC	0.5 - 4	7 - 14
Extended Range Plus	DC	3 - 22	6 - 40
2-Wire	DC	2 - 10	4 - 15
Namur	DC	2 - 10	4 - 15

*All Sensing Distances in mm.

Operating Voltages – AC, DC Cylindrical Style

AC	90 - 250VAC	20 - 250VAC	
DC	18 - 30VDC	10 - 30VDC	10 - 60VDC

Operating Current– AC, DC Cylindrical Style

AC	180 mA	500 mA		
DC	5 mA	120 mA	200mA	400 mA

Sensor Wiring Systems – AC, DC Cylindrical Style

AC	2-Wire		
DC	2-Wire	3-Wire	4-Wire

NON-FLUSH CYLINDRICAL SENSORS

Sometimes called non-embedded or non-shielded, non-flush sensors have electromagnetic fields with a wide sensing angle and are unshielded (no metal surrounding the sensing head). Care must be taken to insure that no non-target metal comes in near proximity to the sensing head. Distances are demonstrated in **Figure 8**. Adjacent sensors should be separated by at least 2 times the diameter. Non-target metal should be at least 3 times the sensing distance directly across from the sensing head. Two directly opposite sensors should be at least 6 times the sensing distance apart.

OUTPUT CONNECTIONS

AC,DC – Normally Open (NO),
and Normally Closed (NC).

DC Namur – Special interface
Circuits required.

DC Analog – Analog Output 1 to 9V.

OUTPUT CABLES

Cylindrical Sensors are provided with 2 meter PVC fixed cables. 5 meter PVC, 2 and 5 meter PUR cables are optional and specified by selection of the last two digits of the part number. See chart below.

Cable Length & Material	Part No. Last Digits
2m PVC	00
5m PVC	02
2m PUR	10
5m PUR	12

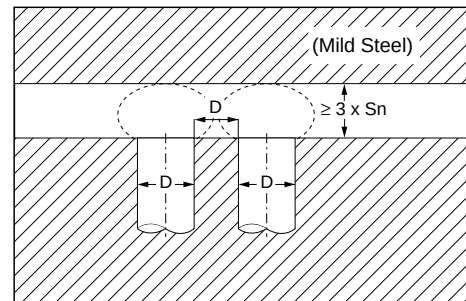
QUICK DISCONNECT CONNECTORS

Pulsonic sensors are available in a wide selection of Quick Disconnect styles for DC and AC circuits. While virtually any sensor can be custom manufactured with a Quick Disconnect connector, Altech offers one of the largest selection of standard Quick Disconnect models.

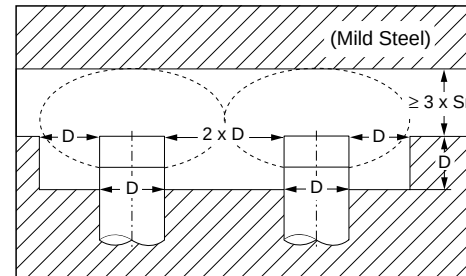
Fig. 8

CYLINDRICAL SENSOR INSTALLATION

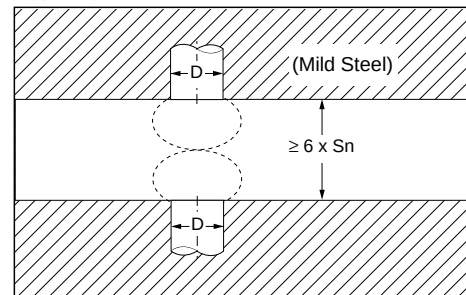
Flush Mount Installation



Non-Flush Mount Installation



Opposing Installation

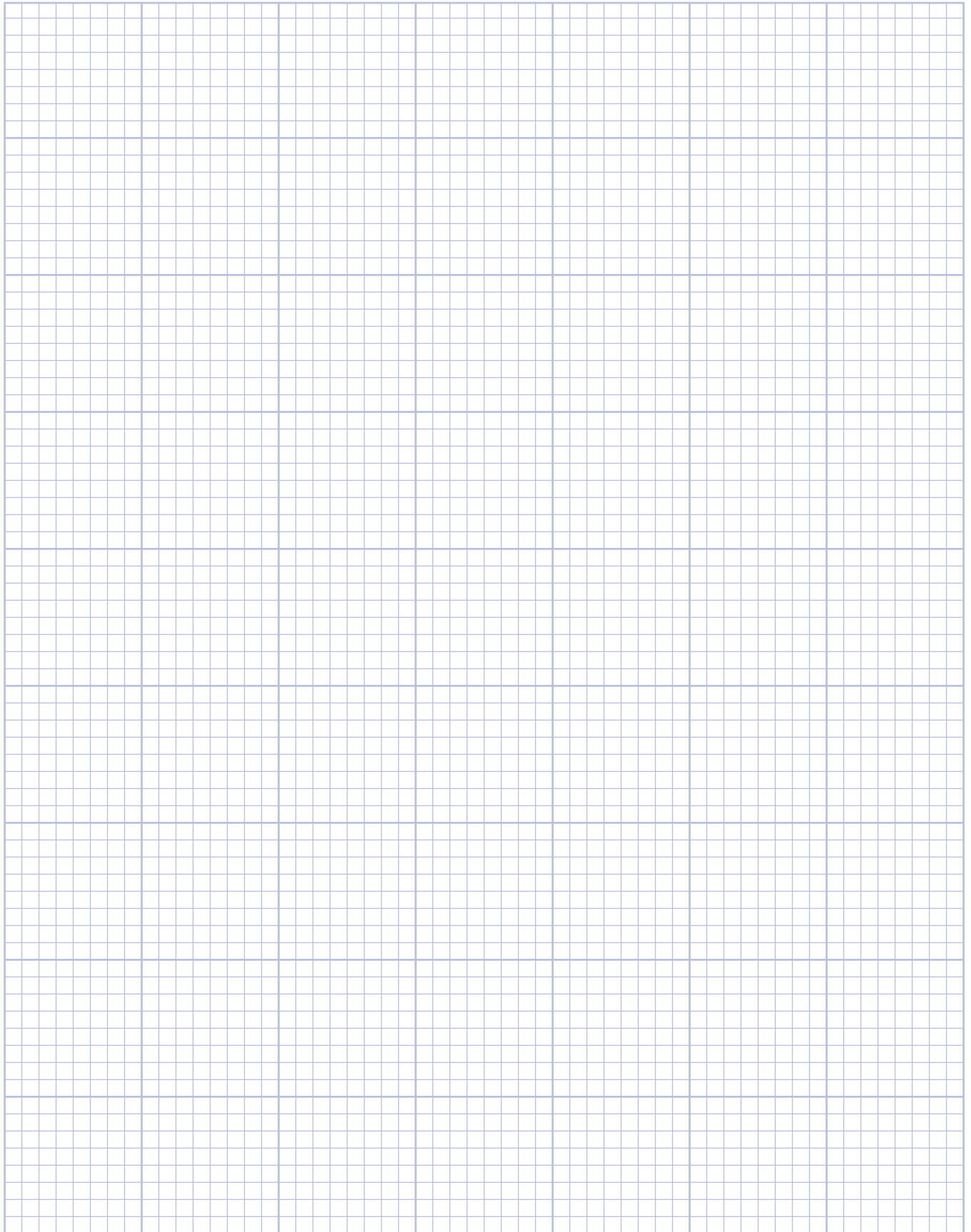


Quick Disconnect models are designed to be user-friendly and to simplify installations.

Please see the product specification for sensors with quick disconnect connectors and matching cable assemblies on pages 116 to 121 in the accessory section.

HOUSING MATERIALS

- AC – Nickel Plated Brass
- Trogamid T
- Teflon Plated Brass
- DC – Nickel Plated Brass
- Trogamid T
- Teflon Plated Brass
- Stainless Steel



DC CYLINDRICAL SENSORS – SELECTION GUIDE

Series	Size (mm)	Sensing Distance mm (in.)													
		0.8mm (.03 in.)	1.0mm (.04 in.)	1.5mm (.06 in.)	2.0mm (.08 in.)	2.5mm (.10 in.)	3.0mm (.12 in.)	4.0mm (.16 in.)	5.0mm (.20 in.)	6.0mm (.23 in.)	7.0mm (.28 in.)	8.0mm (.32 in.)	10.0mm (.40 in.)	12.0mm (.47 in.)	
L Series 18-30V DC, 120mA • Short Body • Economically priced	M8			•	•										
	M12				•			•							
	M18								•			•			
	M30												•		
GL Series 10-60V DC, 400mA • 2 LED's • NO & NC models	M12				•			•							
	M18								•			•			
	M30												•		
Standard Series 10-30V DC, 200mA • Most quick disconnects • Industry standard • NO & NC models	M8			•	•										
	M12				•			•							
	M18								•			•			
	M30												•		
Extended Sensing 10-30V DC, 200mA • Up to 2x improvement over Standard	M8				•		•								
	M12							•							
	M18											•			
	M30														
Metal & Plastic 10-30V DC, 400mA • Extended Length • Higher Current Output	M12				•			•							
	M18								•			•			
	M30												•		
Mini Housing 10-30V DC, 200mA • 4, 5, 6.5mm diameter • Includes LED	4mm Dia.	•													
	M5	•													
	6.5mm Dia.			•			•								
Complementary Switching Output 10-30V DC, 200mA • NO & NC Outputs	M12				•			•							
	M18								•			•			
	M30												•		
High Speed 10-30V DC, 200mA • 4,000 Hz Switching Frequency	M12				•										
Extended Temperature 10-30V DC, 200mA • -40°C to 100°C	M12				•			•							
	M18										•	•			

						Mounting		Output Configuration				Connection				No. of Wires	Housing Material		No. of LED's	Page	
	14.0mm (.55 in.)	15.0mm (.59 in.)	20.0mm (.78 in.)	22.0mm (.86 in.)	40.0mm (1.5 in.)	Flush	Non-Flush	NPN	PNP	NO	NC	Cable 2m (6ft.6in.)	Quick Disconnect				Metal (BN) Brass Nickel Plated	Non-Metallic			
													62	63	64						65
						•	•	•	•	•		•			•	•	3	•		1	16
						•	•	•	•	•		•			•	•	3	•		1	17
						•	•	•	•	•		•				•	3	•		1	18
		•				•	•	•	•	•		•				•	3	•		1	19
						•	•	•	•	•	•	•			•	•	3	•		2	20
						•	•	•	•	•	•	•				•	3	•		2	21
		•				•	•	•	•	•	•	•				•	3	•		2	22
						•	•	•	•	•	•	•		•	•	•	3	•		1	24
						•	•	•	•	•	•	•		•	•	•	3	•		1	25
						•	•	•	•	•	•	•		•	•	•	3	•		1	26
		•				•	•	•	•	•	•	•		•		•	3	•		1	27
						•	•		•	•		•			•	•	3	•		1	28
						•			•	•		•				•	3	•		1	29
						•			•	•		•				•	3	•		1	29
		•				•			•	•		•				•	3	•		1	30
						•	•	•	•	•		•					3	•	•	1	32
						•	•	•	•	•		•					3	•	•	1	32/33
		•				•	•	•	•	•		•					3	•	•	1	33
						•		•	•	•		•			•		3	•		1	34
						•		•	•	•		•			•		3	•		1	34
						•	•		•	•		•			•		3	• (SS)		1	35
									•	•	•	•				•	4	•		1	36
									•	•	•	•				•	4	•		1	37
		•							•	•	•	•				•	4	•		1	
						•			•	•		•				•	3	•		1	31
						•	•		•	•		•				•	3	•		1	38
						•	•		•	•		•				•	3	•		1	39

Continued on Page 14/15

DC CYLINDRICAL SENSORS – SELECTION GUIDE (Cont.)

Series	Size (mm)	Sensing Distance mm (in.)													
		0.8mm (.03 in.)	1.0mm (.04 in)	1.5mm (.06 in.)	2.0mm (.08 in.)	2.5mm (.10 in.)	3.0mm (.12 in.)	4.0mm (.16 in.)	5.0mm (.20 in.)	6.0mm (.23 in.)	7.0mm (.28 in.)	8.0mm (.32 in.)	10.0mm (.40 in.)	12.0mm (.47 in.)	
Weld-Immune 10-30V DC, 200mA • Resistant to Electro-magnetic Interference • Teflon Plated	M12				•			•							
	M18								•			•			
	M30												•		
2-Wire 5-30V DC, 100mA 10-55V DC, 200mA • Reduce Wiring • Lower Cost	M12				•			•							
	M18								•			•			
	M30												•		
Extended Range Plus 10-30V DC, 200mA • Up to 3 times improvement over Standard	M8						•			•					
	M12									•			•		
	M18													•	
	M30														
Namur Requires External Amplifier • Low Energy Device • Operates in Hazardous Areas	M8		•		•										
	M12				•			•							
	M18								•			•			
	M30												•		
Analog 18-30V DC, 5mA • 1-9V Linear Output • Detects Target Distance	M12					•									
	M18							•							
	M30														

AC CYLINDRICAL SENSORS – SELECTION GUIDE

Series	Size	Sensing Distance (mm/in.)												Mounting		Output Configuration	
		0.8mm (.03 in.)	1.5mm (.06 in.)	2.0mm (.08 in.)	2.5mm (.10 in.)	4.0mm (.16 in.)	5.0mm (.20 in.)	7.0mm (.28 in.)	8.0mm (.32 in.)	10mm (.40 in.)	14.0mm (.55 in.)	15.0mm (.59 in.)	Flush	Non-Flush	NO	NC	
Standard Series 90-250V AC, 180 mA • Large Selection of Quick Disconnects • NO or NC Outputs	M12			•		•							•	•	•	•	
	M18						•		•				•	•	•	•	
	M30									•		•	•	•	•	•	
Extended Voltage, Metal 20-250V AC, 500 mA • High Current Output • NO or NC Outputs	M12			•		•							•	•	•	•	
	M18						•		•				•	•	•	•	
	M30									•		•	•	•	•	•	
Extended Voltage, Plastic 20-250V AC, 500 mA • High Current Output • NO or NC Outputs	M12			•		•							•	•	•	•	
	M18						•		•				•	•	•	•	
	M30									•		•	•	•	•	•	
Weld Immune 20-250V AC, 300/ 500 mA • Resistance to Electro - magnetic interference • Teflon Plated	M12			•		•							•	•	•		
	M18						•		•				•	•	•		
	M30									•		•	•	•	•		

						Mounting		Output Configuration				Connection					No. of Wires	Housing Material		No. of LED's	Page
	14.0mm (.55 in.)	15.0mm (.59 in.)	20.0mm (.78 in.)	22.0mm (.86 in.)	40.0mm (1.5 in.)	Flush	Non-Flush	NPN	PNP	NO	NC	Cable 2m (6ft.6in.)	Quick Disconnect					Metal (BN) Brass Nickel Plated	Non-Metallic		
													62	63	64	65					
						•	•		•	•		•				•	3	•		1	40
						•	•		•	•		•				•	3	•		1	41
		•				•	•		•	•		•				•	3	•		1	42
						•	•			•		•				•	2	•		1	54
						•	•			•		•				•	2	•		1	54
		•				•	•			•		•				•	2	•		1	55
						•	•		•	•		•			•	•	3	•		1	46
						•	•		•	•		•				•	3	•		1	47
			•			•	•		•	•		•				•	3	•		1	48
				•	•	•	•		•	•		•				•	3	•		1	49
						•	•					•				•	2	•		0	50
						•	•					•				•	2	•		0	51
						•	•					•				•	2	•		0	52
		•				•	•					•				•	2	•		0	53
						•						•				•	3	•		0	44
						•						•				•	3	•		0	44
	•						•					•				•	3	•		0	45

	Connection					No. of Wires ⁽¹⁾	Housing Material		No. of LED's	Page
	Cable	62	66	67	68		Metal (BN)	Plastic		
	•	•	•	•	•	2	•		1	56
	•	•	•	•	•	2	•		1	57
	•	•	•	•	•	2	•		1	58/59
	•				•	2	•		1	60
	•				•	2	•		1	61
	•				•	2	•		1	62/63
	•					2		•	1	60
	•					2		•	1	61
	•					2		•	1	62/63
	•				•	2	•		1	64
	•				•	2	•		1	65
	•				•	2	•		1	66

(1) All metal sensors have a 3rd wire for optional system ground.

DC - 3 WIRE – L SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
M8 – 10-30V DC, 200mA
M12-M30 – 18-30V DC, 120mA
1 LED for Output Energized

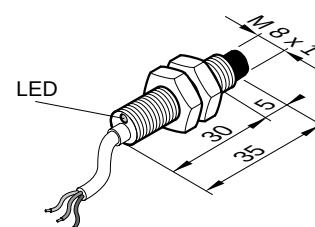
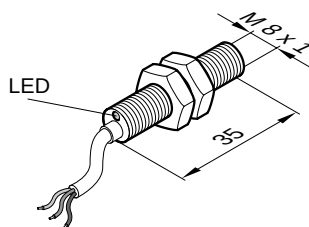
- **Short Body Sensors**
- **Economically priced**
- **Connector options**
- **Carries C mark**

- IEC (529)IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M8 Flush Mount					M8 Non-Flush Mount		
Sensing Distance		1.5mm (.06 in.)			2mm (.08 in.)		
Cable or Connector Style Cat. No.		Cable	64	65	Cable	64	65
PNP	Normally Open	9981-2000	9981-2064	9981-2065	9981-2200	9981-2264	9981-2265
	Normally Closed						
NPN	Normally Open	9981-2100	9981-2164	9981-2165	9981-2300	9981-2364	9981-2365
	Normally Closed						
Ripple Voltage		≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range		10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V
Supply Current		≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current		200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor		≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current		≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency		2000Hz	2000Hz	2000Hz	2000Hz	2000Hz	2000Hz
Hysteresis		≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift		≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability		.15mm (.006 in.)	.15mm (.006 in.)	.15mm (.006 in.)	.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)
Front Cap Material		PBTP	PBTP	PBTP	PBTP	PBTP	PBTP

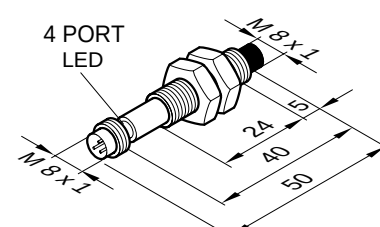
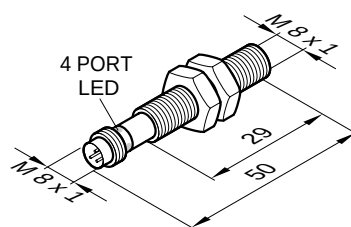
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



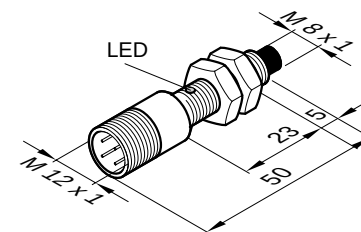
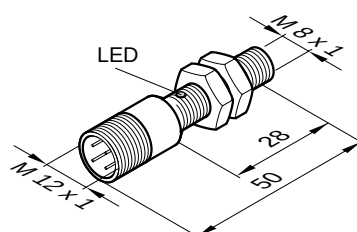
64 Style Connector

3-pin, Pico style, 8mm (.31 in.) supplied with non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



Metric/in. Conversion Table

1.0 mm = .04 in.	30.0 mm = 1.18 in.
5.0 mm = .20 in.	34.0 mm = 1.34 in.
6.0 mm = .23 in.	35.0 mm = 1.37 in.
8.0 mm = .31 in.	39.0 mm = 1.53 in.
12.0 mm = .47 in.	40.0 mm = 1.57 in.
23.0 mm = .91 in.	50.0 mm = 1.96 in.
24.0 mm = .94 in.	
28.0 mm = 1.10 in.	
29.0 mm = 1.14 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Page 114-115

M12 Flush Mount

2mm (.08 in.)

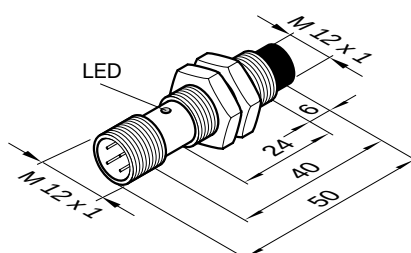
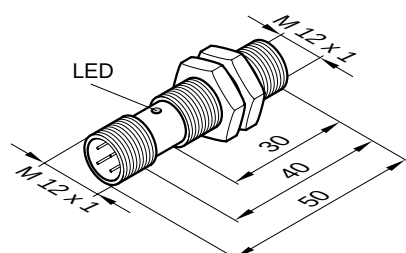
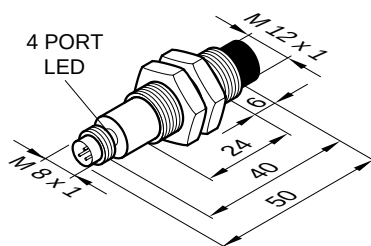
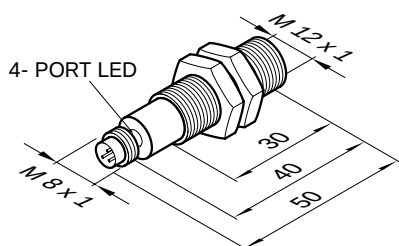
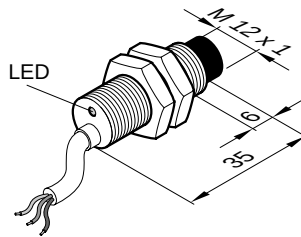
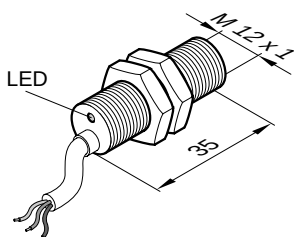
Cable	64	65
9982-2000	9982-2064	9982-2065
9982-2100	9982-2164	9982-2165
≤10%	≤10%	≤10%
18V - 30V	18V - 30V	18V - 30V
≤10 mA	≤10 mA	≤10 mA
120 mA	120 mA	120 mA
≤1.5V	≤1.5V	≤1.5V
≤10 μA	≤10 μA	≤10 μA
2000Hz	2000Hz	2000Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)
PBTP	PBTP	PBTP

M12 Non-Flush Mount

4mm (.16 in.)

Cable	64	65
9982-2200	9982-2264	9982-2265
9982-2300	9982-2364	9982-2365
≤10%	≤10%	≤10%
18V - 30V	18V - 30V	18V - 30V
≤10 mA	≤10 mA	≤10 mA
120 mA	120 mA	120 mA
≤1.5V	≤1.5V	≤1.5V
≤10 μA	≤10 μA	≤10 μA
1000Hz	1000Hz	1000Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.40mm (.016 in.)	.40mm (.016 in.)	.40mm (.016 in.)
PBTP	PBTP	PBTP

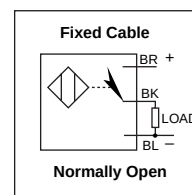
Note: Sensor dimensions in mm.



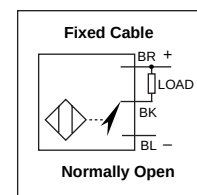
Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech.

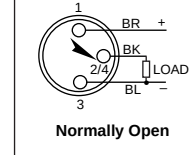
PNP



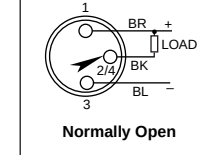
NPN



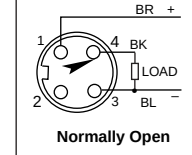
64 Connector



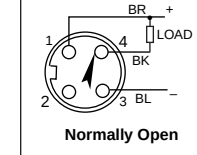
64 Connector



65 Connector



65 Connector



DC - 3 WIRE – L SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
18-30V DC, 120mA
1 LED for Output Energized

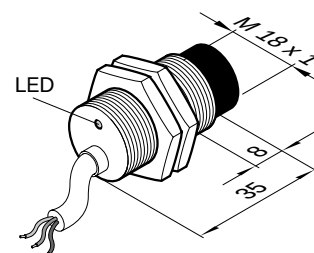
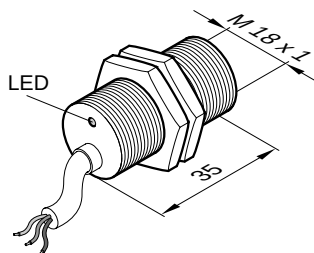
- **Short Body Sensors**
- **Economically priced**
- **Connector options**
- **Carries C mark**

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M18 Flush Mount			M18 Non-Flush Mount	
Sensing Distance			8mm (.31in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
PNP	Normally Open 	9984-2000	9984-2200	9984-2265
	Normally Closed 			
NPN	Normally Open 	9984-2100	9984-2300	9984-2365
	Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	18V - 30V	18V - 30V	18V - 30V	18V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	120 mA	120 mA	120 mA	120 mA
Voltage Drop Across Sensor	≤1.5V	≤1.5V	≤1.5V	≤1.5V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	1000Hz	1000Hz	500Hz	500Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.50mm (.02 in.)	.50mm (.02 in.)	.80mm (.031in.)	.80mm (.031 in.)
Front Cap Material	PBTP	PBTP	PBTP	PBTP

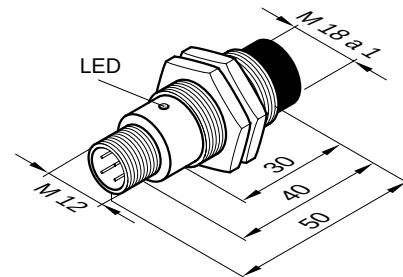
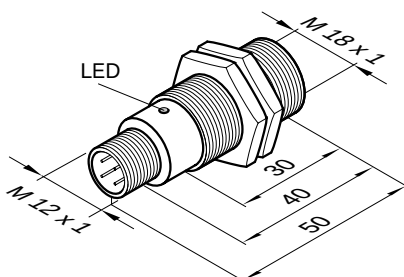
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.5 mm = .06 in.	23.0 mm = .91 in.
2.0 mm = .08 in.	28.0 mm = 1.10 in.
4.0 mm = .16 in.	30.0 mm = 1.18 in.
5.0 mm = .20 in.	32.0 mm = 1.26 in.
6.0 mm = .23 in.	34.0 mm = 1.38 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
10.0 mm = .39 in.	50.0 mm = 1.97 in.
12.0 mm = .47 in.	51.0 mm = 2.01 in.
15.0 mm = .59 in.	60.0 mm = 2.36 in.
18.0 mm = .70 in.	80.0 mm = 3.12 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

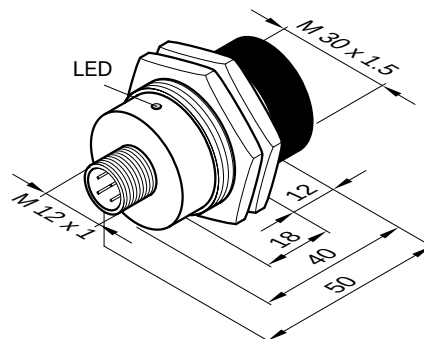
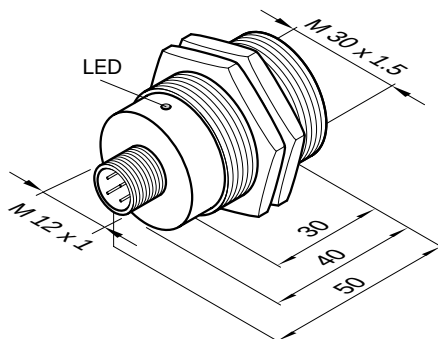
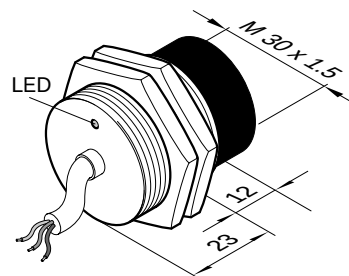
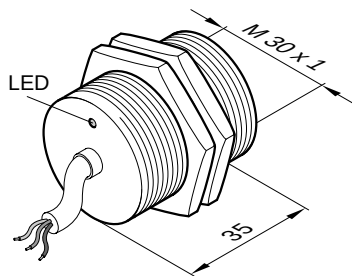
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M30 Flush Mount 10mm (.39 in.)		M30 Non-Flush Mount 15mm (.59 in.)	
Cable	65	Cable	65
9986-2000	9986-2065	9986-2200	9986-2265
9986-2100	9986-2165	9986-2300	9986-2365
≤10%	≤10%	≤10%	≤10%
18V - 30V	18V - 30V	18V - 30V	18V - 30V
≤10 mA	≤10 mA	≤10 mA	≤10 mA
120 mA	120 mA	120 mA	120 mA
≤1.5V	≤1.5V	≤1.5V	≤1.5V
≤10 μA	≤10 μA	≤10 μA	≤10 μA
500Hz	500Hz	300Hz	300Hz
≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%
1.0mm (.039 in.)	1.0mm (.039 in.)	1.5mm (.059 in.)	1.5mm (.059 in.)
PBTP	PBTP	PBTP	PBTP

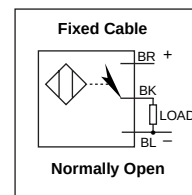
Note: Sensor dimensions in mm.



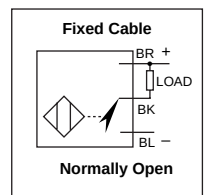
Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

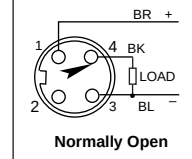
PNP



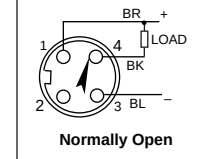
NPN



65 Connector



65 Connector



DC - 3 WIRE – GL SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-60V DC, 400mA,
2 LED's for Operating Voltage
and Output Energized

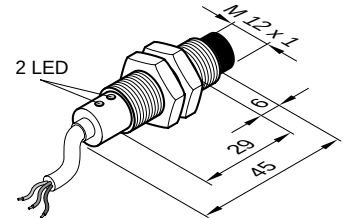
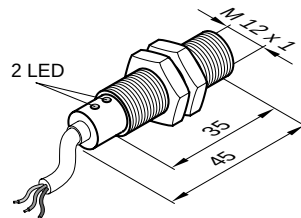
- **Higher Current Output**
- **Higher Voltage Range**
- **Carries $\text{C}\epsilon$ mark**

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount				M12 Non-Flush Mount			
Sensing Distance 2mm (.08 in.)				4mm (.16 in.)			
Cable or Connector Style Cat. No.		Cable	64	65	Cable	64	65
PNP	Normally Open 	9982-4000	9982-4064	9982-4065	9982-4200	9984-4264	9982-4265
	Normally Closed 	9982-4400	9982-4464	9982-4465	9982-4600	9982-4664	9982-4665
NPN	Normally Open 	9982-4100	9982-4164	9982-4165	9982-4300	9982-4364	9982-4365
	Normally Closed 	9982-4500	9982-4564	9982-4565	9982-4700	9982-4764	9982-4765
Ripple Voltage		≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range		10V - 60V	10V - 60V	10V - 60V	10V - 60V	10V - 60V	10V - 60V
Supply Current		≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current		400 mA	400 mA	400 mA	400 mA	400 mA	400 mA
Voltage Drop Across Sensor		≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current		≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA
Switching Frequency		2000Hz	2000Hz	2000Hz	1000Hz	1000Hz	1000Hz
Hysteresis		≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift		≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability		.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material		PBTP	PBTP	PBTP	PBTP	PBTP	PBTP

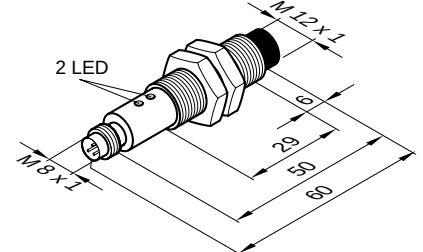
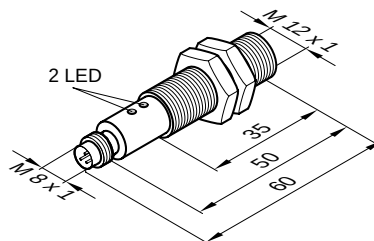
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



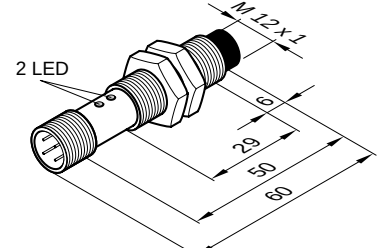
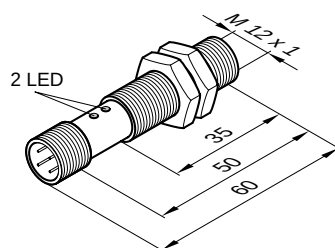
64 Style Connector

3-pin, Pico style, 8mm (.31 in.) supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connectors

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	29.0 mm = 1.14 in.
6.0 mm = .23 in.	35.0 mm = 1.37 in.
8.0 mm = .31 in.	45.0 mm = 1.77 in.
12.0 mm = .47 in.	50.0 mm = 1.97 in.
18.0 mm = .70 in.	60.0 mm = 2.36 in.
.27.0 mm = 1.06 in.	80.0 mm = 3.15 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

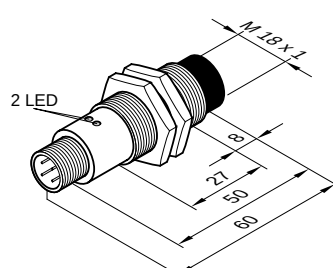
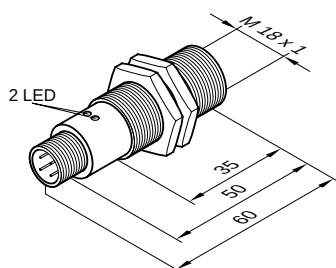
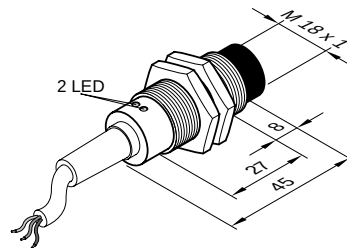
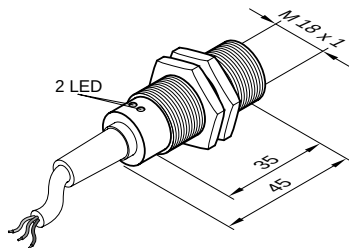
M18 Flush Mount 5mm (.20 in.)

Cable	65
9984-4000	9984-4065
9984-4400	9984-4465
9984-4100	9984-4165
9984-4500	9984-4565
≤10%	≤10%
10V - 60V	10V - 60V
≤10 mA	≤10 mA
400 mA	400 mA
≤2.4V	≤2.4V
≤10 μA	≤10 μA
1000Hz	1000Hz
≤15%	≤15%
≤10%	≤10%
.25mm (.01 in.)	.25mm (.01 in.)
PBTP	PBTP

M18 Non-Flush Mount 8mm (.31 in.)

Cable	65
9984-4200	9984-4265
9984-4600	9984-4665
9984-4300	9984-4365
9984-4700	9984-4765
≤10%	≤10%
10V - 60V	10V - 60V
≤10 mA	≤10 mA
400 mA	400 mA
≤2.4V	≤2.4V
≤10 μA	≤10 μA
500Hz	500Hz
≤15%	≤15%
≤10%	≤10%
.40mm (.016 in.)	.40mm (.016 in.)
PBTP	PBTP

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, NPN
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN

65 Connectors, 4 PIN - 3 Wire cable (PIN 1, 3, 4) :

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, NPN

65 Connectors, 4 PIN - 4 Wire cable (PIN 1, 2, 3, 4) :

65 Connector	8000-5280	PVC Right Angle
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Change last digit of connector number to 5 for 5 meter cable

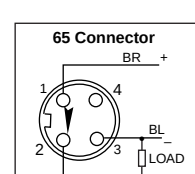
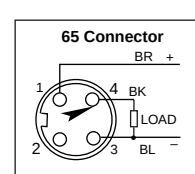
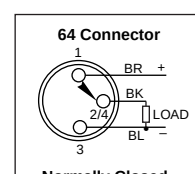
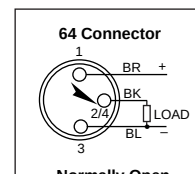
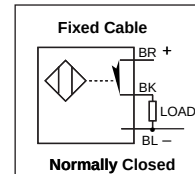
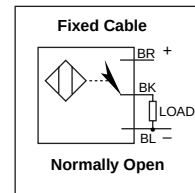
Refer to pages 116-121 for more cable information

Mounting Brackets - see Pages 114-115

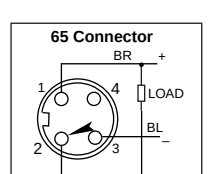
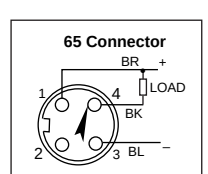
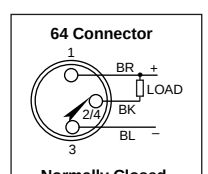
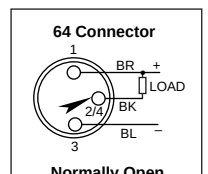
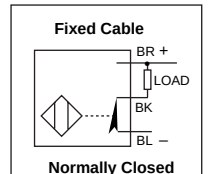
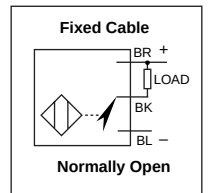
Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

PNP



NPN



DC - 3 WIRE – GL SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-60V DC, 400mA
2 LED's for Operating Voltage
and Output Energized

- **Higher Current Output**
- **Higher Voltage Range**
- **Carries CE mark**

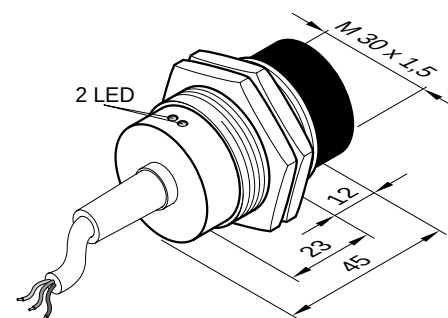
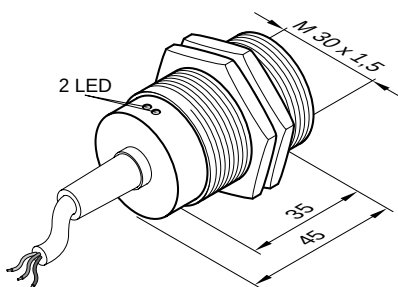
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M30 Flush Mount			M30 Non-Flush Mount	
Sensing Distance			15mm (.59 in.)	
10mm (.39 in.)				
Cable or Connector Style Cat. No.	Cable	65	Cable	65
PNP	Normally Open 	9986-4000	9986-4065	9986-4265
	Normally Closed 	9986-4400	9986-4465	9986-4665
NPN	Normally Open 	9986-4100	9986-4165	9986-4365
	Normally Closed 	9986-4500	9986-4565	9986-4765
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-60V	10V - 60V	10V - 60V	10V - 60V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	400 mA	400 mA	400 mA	400 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	500 Hz	500 Hz	300 Hz	300 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.50mm (.020 in.)	.50mm (.020 in.)	.75mm (.030 in.)	.75mm (.030 in.)
Front Cap Material	PBTP	PBTP	PBTB	PBTB

Note: Sensor dimensions in mm.

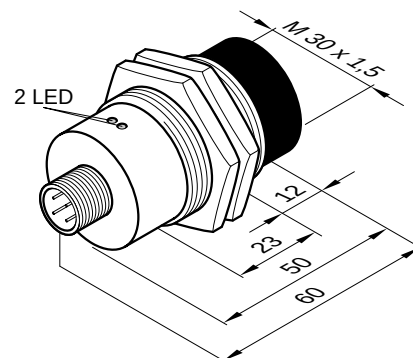
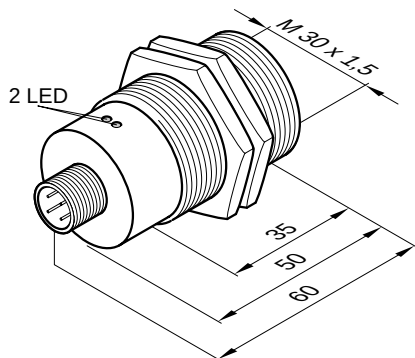
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connectors, 4 PIN – 3 Wire cable (PIN 1, 3, 4) :

65 Connector 8000-5110 PVC, Straight
 65 Connector 8000-5120 PVC, Right Angle
 65 Connector 8000-5150 PVC, Right Angle, 2LED, NPN
 65 Connector 8000-5160 PVC, Right Angle, 2LED, PNP

65 Connectors, 4PIN – 4 Wire cable (PIN 1, 2, 3, 4) :

65 Connectors 8000-5280 PVC, Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Metric/in. Conversion Table

1.5 mm = .06 in.	45.0 mm = 1.77 in.
12.0 mm = .47 in.	50.0 mm = 1.96 in.
23.0 mm = .90 in.	60.0 mm = 2.36 in.
35.0 mm = 1.37 in.	

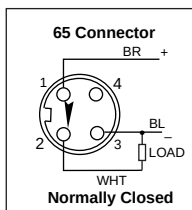
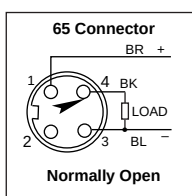
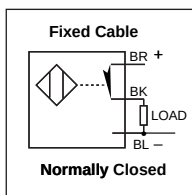
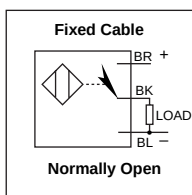
This table converts millimeters to inches in reference to the illustrations included on these pages

Mounting Brackets – see Pages 114-115

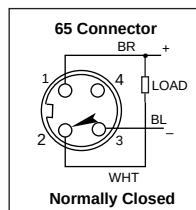
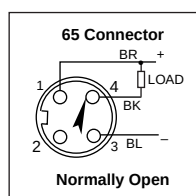
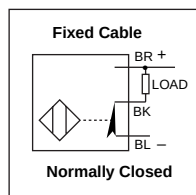
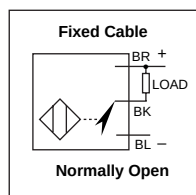
Wiring Diagrams

Note: Wire colors are applicable on cable purchased from Altech

PNP



NPN



DC - 3 WIRE STANDARD
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200 mA,
1 LED for Output Energized

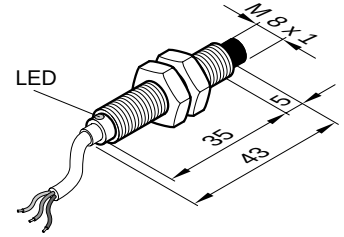
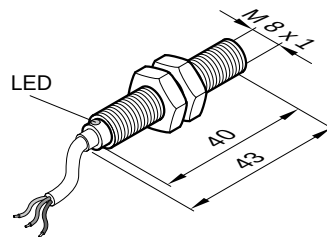
- **Most complete range of Fixed Cable and Quick Disconnect Styles**
- **Available in normally open (N.O.) and normally closed (N.C.) output configuration**
- **Industry standard 10-30V DC operating voltage and 200mA output current**
- **Carries $\text{C}\epsilon$ mark**

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range:
-25 to 70°C (-13 to 158°F)

M8 Flush Mount					M8 Non-Flush Mount					
Sensing Distance		1.5mm (.06 in.)			2mm (.08 in.)					
Cable or Connector Style Cat. No.			Cable	63	64	65	Cable	63	64	65
PNP	Normally Open		9961-0200	9961-0263	9961-0264	9961-0265	9961-0400	9961-0463	9961-0464	9961-0465
	Normally Closed		9961-4400		9961-4464	9961-4465	9961-4600		9961-4664	9961-4665
NPN	Normally Open		9961-0300	9961-0363	9961-0364	9961-0365	9961-0500	9961-0563	9961-0564	9961-0565
	Normally Closed		9961-4500		9961-4564	9961-4565	9961-4700		9961-4764	9961-4765
Ripple Voltage			≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range			10V-30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V
Supply Current			≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current			200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor			≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current			≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA	≤10 μA
Switching Frequency			2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz
Hysteresis			≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift			≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability			.15mm (.006 in.)	.15mm (.006 in.)	.15mm (.006 in.)	.15mm (.006 in.)	.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)
Front Cap Material			PBTP	PBTP	PBTP	PBTP	PBTP	PBTP	PBTP	PBTP

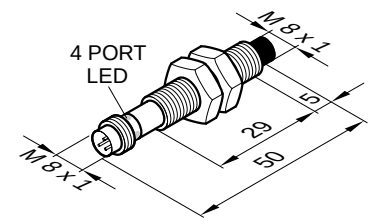
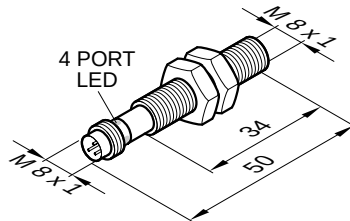
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



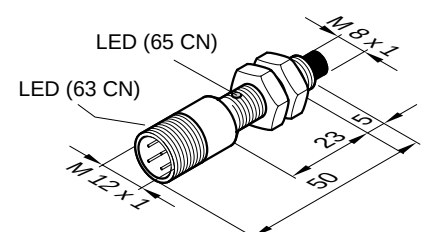
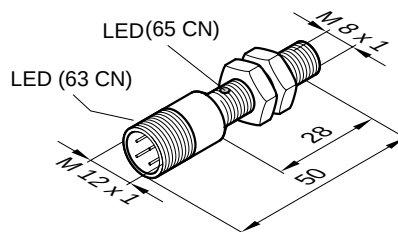
64 Style Connector

3-pin, Pico style, 8mm (.31 in.) supplied with non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



63 and 65 Style Connectors

4-pin, Micro style, 12mm (.47 in.) supplied with Non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30. The 63 Connector is clear, offering 360° LED viewing.



Metric/in. Conversion Table

1.0 mm = .04 in.	29.0 mm = 1.14 in.
5.0 mm = .20 in.	34.0 mm = 1.34 in.
6.0 mm = .23 in.	35.0 mm = 1.37 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
12.0 mm = .47 in.	43.0 mm = 1.69 in.
23.0 mm = .90 in.	50.0 mm = 1.47 in.
28.0 mm = 1.10 in.	60.0 mm = 2.36 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

M12 Flush Mount

2mm (.08 in.)

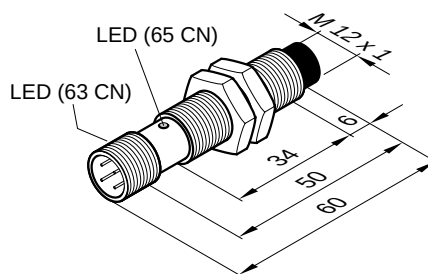
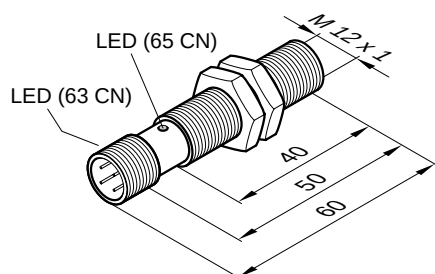
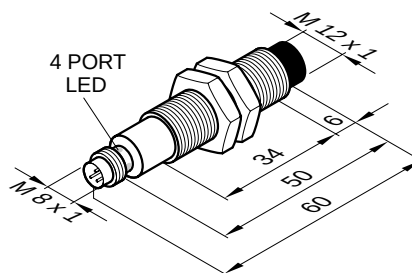
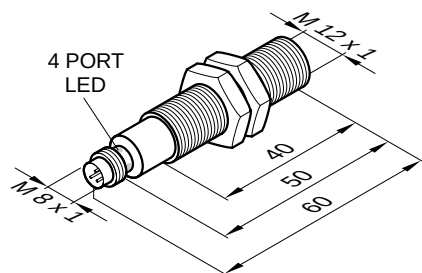
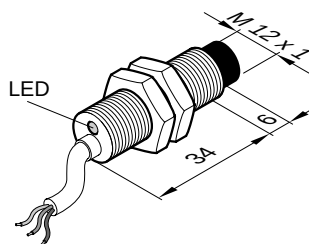
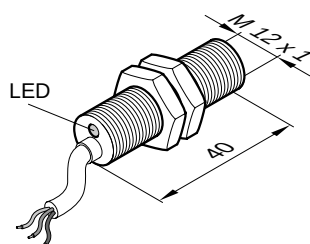
Cable	63	64	65
9962-4000	9962-4063	9962-4064	9962-4065
9962-4400		9962-4464	9962-4465
9962-4100	9962-4163	9962-4164	9962-4165
9962-4500		9962-4564	9962-4565
≤10%	≤10%	≤10%	≤10%
10V - 30V	10V - 30V	10V - 30V	10V - 30V
≤10 mA	≤10 mA	≤10 mA	≤10 mA
200 mA	200 mA	200 mA	200 mA
≤2.4V	≤2.4V	≤2.4V	≤2.4V
≤10 μA	≤10 μA	≤10 μA	≤10 μA
2000 Hz	2000 Hz	2000 Hz	2000 Hz
≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%
.20mm (.008in.)	.20mm (.008in.)	.20mm (.008in.)	.20mm (.008in.)
PBTB	PBTB	PBTB	PBTB

M12 Non-Flush Mount

4mm (.16 in.)

Cable	63	64	65
9962-4200	9962-4263	9962-4264	9962-4265
9962-4600		9962-4664	9962-4665
9962-4300	9961-4363	9962-4364	9962-4365
9962-4700		9962-4764	9962-4765
≤10%	≤10%	≤10%	≤10%
10V - 30V	10V - 30V	10V - 30V	10V - 30V
≤10 mA	≤10 mA	≤10 mA	≤10 mA
200 mA	200 mA	200 mA	200 mA
≤2.4V	≤2.4V	≤2.4V	≤2.4V
≤10 μA	≤10 μA	≤10 μA	≤10 μA
1000 Hz	1000 Hz	1000 Hz	1000 Hz
≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%
.40mm (.016in.)	.40mm (.016in.)	.40mm (.016in.)	.40mm (.016in.)
PBTB	PBTB	PBTB	PBTB

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN

63/65 Connectors, 4 PIN - 3 Wire cable (PIN 1, 3, 4):

63/65 Connector	8000-5110	PVC, Straight
63/65 Connector	8000-5120	PVC, Right Angle
63/65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
63/65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

63/65 Connectors, 4PIN - 4 Wire cable (PIN 1, 2, 3, 4):

63/65 Connectors	8000-5280	PVC, Right Angle
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Change last digit of connector number to 5 for 5 meter cable

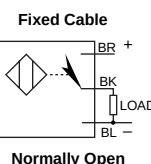
Refer to pages 116-121 for more cable information

Mounting Brackets - See Pages 114-115

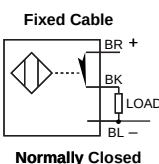
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

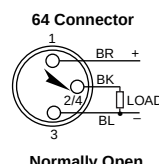
PNP



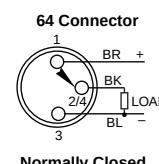
Normally Open



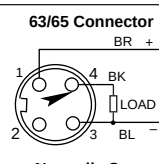
Normally Closed



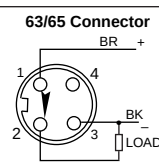
Normally Open



Normally Closed

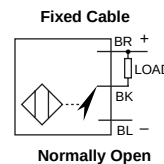


Normally Open

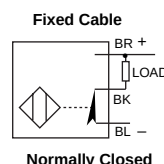


Normally Closed

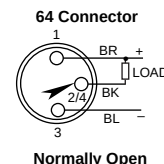
NPN



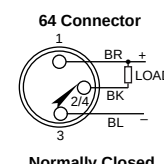
Normally Open



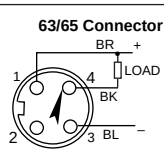
Normally Closed



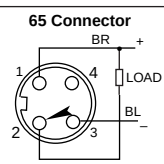
Normally Open



Normally Closed



Normally Open



Normally Closed

**DC - 3 WIRE – STANDARD
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA,
1 LED for Output Energized**

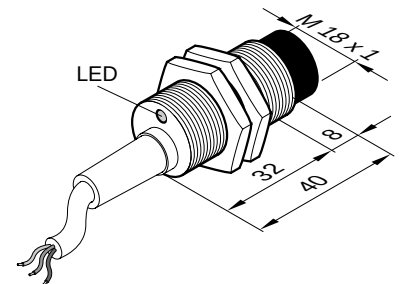
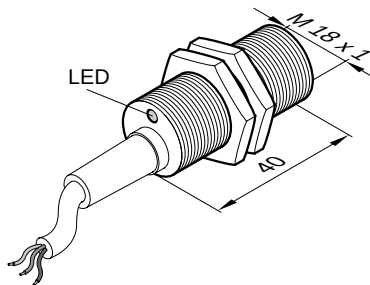
- *Most complete range of Fixed Cable and Quick Disconnect Styles*
- *Available in normally open (N.O.) and normally closed (N.C.) output configuration*
- *Industry standard 10-30V DC operating voltage and 200mA output current*
- *Carries C€ mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range:
-25 to 70°C (-13 to 158°F)

M18 Flush Mount					M18 Non-Flush Mount			
Sensing Distance			5mm (.20 in.)		8mm (.31 in.)			
Cable or Connector Style Cat. No.			Cable	63	65	Cable	63	65
PNP	Normally Open		9964-4000	9964-4063	9964-4065	9964-4200	9964-4263	9964-4265
	Normally Closed		9964-4400		9964-4465	9964-4600		9964-4665
NPN	Normally Open		9964-4100	9964-4163	9964-4165	9964-4300	9964-4363	9964-4365
	Normally Closed		9964-4500		9964-4565	9964-4700		9964-4765
Ripple Voltage			≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range			10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V
Supply Current			≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current			200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor			≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current			≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency			1000 Hz	1000 Hz	1000 Hz	500 Hz	500 Hz	500 Hz
Hysteresis			≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift			≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability			.25mm (.01 in.)	.25mm (.01 in.)	.25mm (.01 in.)	.40mm (.016 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material			PBTP	PBTP	PBTP	PBTB	PBTB	PBTB

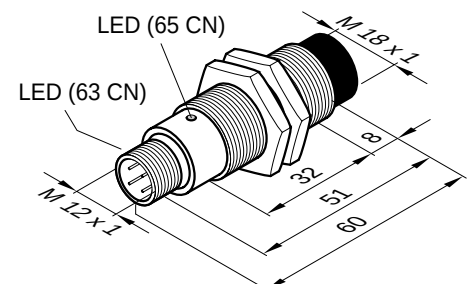
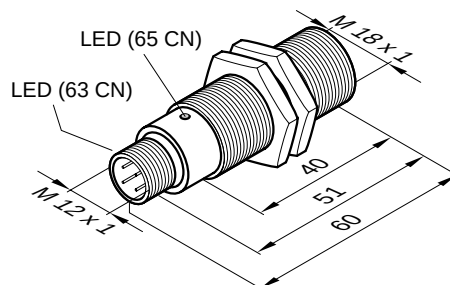
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



63 and 65 Style Connectors

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts. The 63 Connector is clear, offering 360° LED viewing.



Metric/in. Conversion Table

1.5 mm = .06 in.	23.0 mm = .91 in.
2.0 mm = .08 in.	28.0 mm = 1.10 in.
4.0 mm = .16 in.	30.0 mm = 1.18 in.
5.0 mm = .20 in.	32.0 mm = 1.26 in.
6.0 mm = .23 in.	34.0 mm = 1.34 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
10.0 mm = .39 in.	50.0 mm = 1.97 in.
12.0 mm = .47 in.	51.0 mm = 2.01 in.
15.0 mm = .59 in.	60.0 mm = 2.36 in.
18.0 mm = .70 in.	80.0 mm = 3.12 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

M30 Flush Mount

10mm (.39 in.)

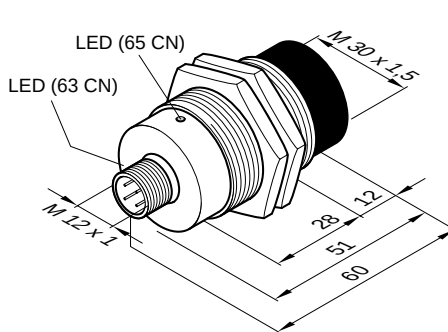
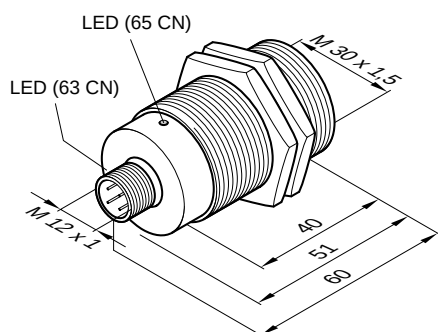
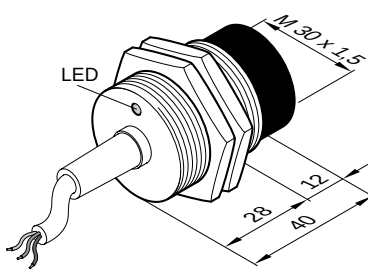
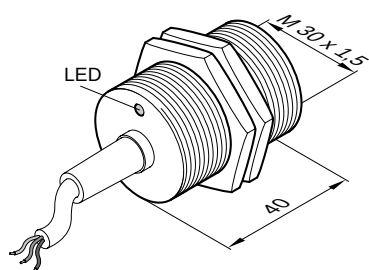
Cable	63	65
9966-4000	9966-4063	9966-4065
9966-4400		9966-4465
9966-4100	9966-4163	9966-4165
9966-4500		9966-4565
≤10%	≤10%	≤10%
10V - 30V	10V - 30V	10V - 30V
≤10 mA	≤10 mA	≤10 mA
200 mA	200 mA	200 mA
≤2.4V	≤2.4V	≤2.4V
≥10 μA	≥10 μA	≥10 μA
500 Hz	500 Hz	500 Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.50mm (.02 in.)	.50mm (.02 in.)	.50mm (.02 in.)
PBTB	PBTB	PBTB

M30 Non-Flush Mount

15mm (.59 in.)

Cable	63	65
9966-4200	9966-4263	9966-4265
9966-4600		9966-4665
9966-4300		9966-4365
9966-4700		9966-4765
≤10%	≤10%	≤10%
10V - 30V	10V - 30V	10V - 30V
≤10 mA	≤10 mA	≤10 mA
200 mA	200 mA	200 mA
≤2.4V	≤2.4V	≤2.4V
≥10 μA	≥10 μA	≥10 μA
300 Hz	300 Hz	300 Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.75mm (.03 in.)	.75mm (.03 in.)	.75mm (.03 in.)
PBTB	PBTB	PBTB

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

63/65 Connectors, 4 PIN – 3 Wire cable (PIN 1, 3, 4) :

- 63/65 Connector 8000-5110 PVC, Straight
- 63/65 Connector 8000-5120 PVC, Right Angle
- 63/65 Connector 8000-5150 PVC, Right Angle, 2LED, NPN
- 63/65 Connector 8000-5160 PVC, Right Angle, 2LED, PNP

63/65 Connectors, 4PIN – 4 Wire cable (PIN 1, 2, 3, 4) :

- 63/65 Connectors 8000-5280 PVC, Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

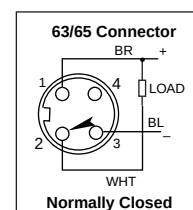
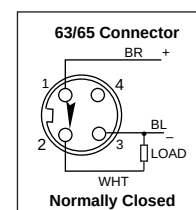
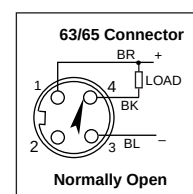
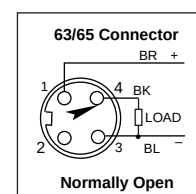
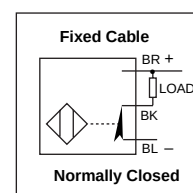
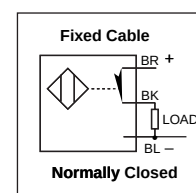
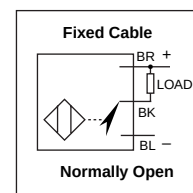
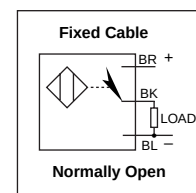
Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP

NPN



DC - 3 WIRE – EXTENDED SENSING DISTANCE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

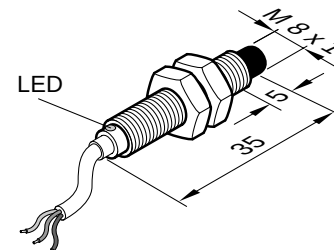
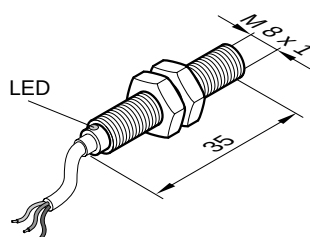
- *Up to 2 times sensing distance over standard sensors*
- *Reduces accidental collisions*
- *Ideal for applications where larger sensing distance is required but mounting space is tight*
- *Carries C mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M8 Flush Mount				M8 Non-Flush Mount		
Sensing Distance 2mm (.08 in.)				3mm (.12 in.)		
Cable or Connector Style Cat. No.	Cable	64	65	Cable	64	65
PNP	Normally Open 	9981-4000	9981-4064	9981-4200	9981-4264	9981-4265
	Normally Closed 					
NPN	Normally Open 	9981-4100	9981-4164	9981-4300	9981-4364	9981-4365
	Normally Closed 					
Ripple Voltage	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤12 mA	≤12 mA	≤12 mA	≤12 mA	≤12 mA	≤12 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz	2000 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability	.2mm (.008 in.)	.2mm (.008 in.)	.2mm (.008 in.)	.3mm (.012 in.)	.3mm (.012 in.)	.3mm (.012 in.)
Front Cap Material	PBTP	PBTP	PBTP	PBTB	PBTB	PBTB

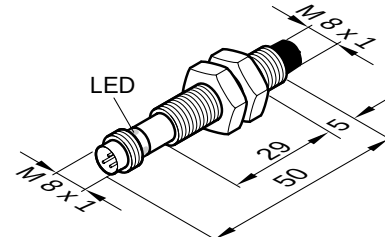
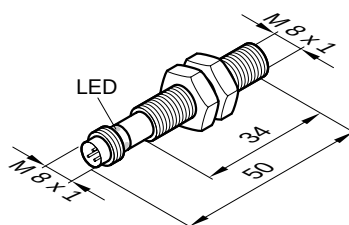
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



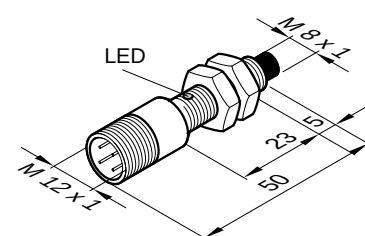
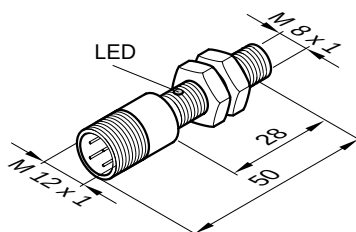
64 Style Connector

3-pin, Pico style, 8mm (.31 in.) supplied with non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



50/65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Non-Metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



Metric/in. Conversion Table

1.0 mm = .04 in.	29.0 mm = 1.14 in.
5.0 mm = .20 in.	30.0 mm = 1.18 in.
8.0 mm = .31 in.	34.0 mm = 1.33 in.
12.0 mm = .47 in.	35.0 mm = 1.37 in.
23.0 mm = .90 in.	40.0 mm = 1.57 in.
27.0 mm = 1.06 in.	50.0 mm = 1.96 in.
28.0 mm = 1.10 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

M12 Flush Mount

4mm (.16 in.)

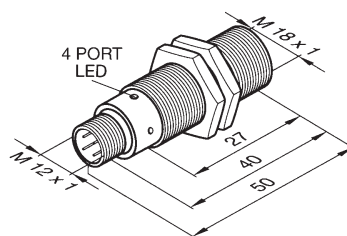
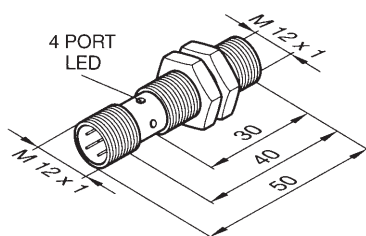
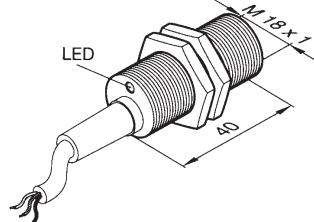
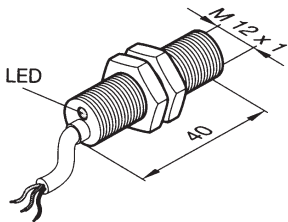
Cable	65
9982-4900	9982-4950
≤10%	≤10%
10V - 30V	10V - 30V
≤12mA	≤12 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
1500 Hz	1500 Hz
≤15%	≤15%
≤10%	≤10%
.40mm (.016 in.)	.40mm (.016 in.)
PBTB	PBTB

M18 Flush Mount

8mm (.31 in.)

Cable	65
9984-4900	9984-4950
≤10%	≤10%
10V - 30V	10V - 30V
≤12 mA	≤12 mA
200 mA	200 mA
≤2.4V	≤2.4V
10μA	10μA
500 Hz	500 Hz
≤15%	≤15%
≤10%	≤10%
.80mm (.03 in.)	.80mm (.03 in.)
PBTB	PBTB

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN

50/65 Connector	8000-5110	PVC, Straight
50/65 Connector	8000-5120	PVC, Right Angle
50/65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
50/65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

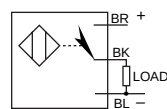
Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

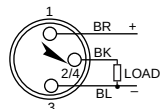
PNP

Fixed Cable



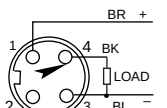
Normally Open

64 Connector



Normally Open

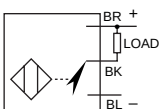
50/65 Connector



Normally Open

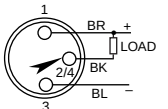
NPN

Fixed Cable



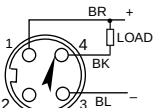
Normally Open

64 Connector



Normally Open

50/65 Connector



Normally Open

DC - 3 WIRE – EXTENDED SENSING DISTANCE

Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

- Up to 2 times sensing distance over standard sensors
- Reduces accidental collisions
- Ideal for applications where larger sensing distance is required but mounting space is tight
- Carries CE mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

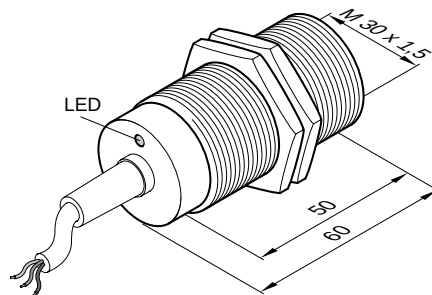
M30 Flush Mount

Sensing Distance		15mm (.59 in.)	
Cable or Connector Style Cat. No.		Cable	65
PNP	Normally Open	9966-3900	9966-3965
	Normally Closed		
NPN	Normally Open		
	Normally Closed		
Ripple Voltage		≤10%	≤10%
Voltage Range		10V-30V	10V - 30V
Supply Current		≤12 mA	≤12 mA
Max. Load Current		200 mA	200 mA
Voltage Drop Across Sensor		≤2.4V	≤2.4V
Max. Leakage Current		≤10 µA	≤10 µA
Switching Frequency		200 Hz	200 Hz
Hysteresis		≤15%	≤15%
Temperature Drift		≤10%	≤10%
Repeatability		1.5mm (.06 in.)	1.5mm (.06 in.)
Front Cap Material		PBTP	PBTP

Note: Sensor dimensions in mm.

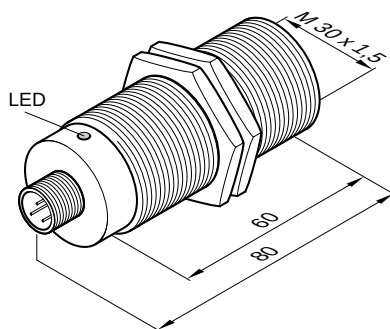
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.5 mm	=	.06 in.
30.0 mm	=	1.20 in.
50.0 mm	=	1.47 in.
60.0 mm	=	2.36 in.
80.0 mm	=	3.12 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

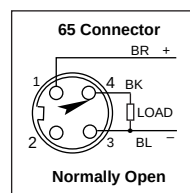
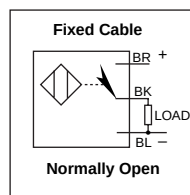
Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



**DC - 3 WIRE
HIGH SPEED
Brass, Nickel Plated (BN),
Cylindrial, Threaded,
10-30V DC, 200mA
1 LED for Output Energized**

- **Switching frequency of 4000 Hz**
- **Standard body length**
- **Carries $\text{C}\epsilon$ mark**

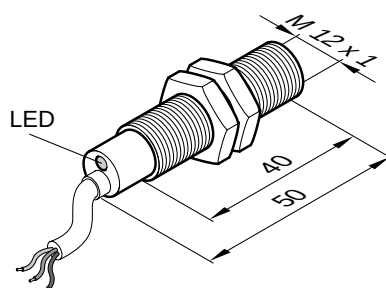
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount		
2mm (.08 in.)		
Sensing Distance		
Cable or Connector Style Cat.No.	Cable	65
PNP Normally Open 	9962-2300	9962-2365
		
		
Ripple Voltage	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V
Supply Current	≤10 mA	≤10 mA
Max. Load Current	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V
Max. Leakage Current	≤10 μ A	≤10 μ A
Switching Frequency	4000 Hz to DIN 500 10	4000 Hz to DIN 500 10
Hysteresis	≤15%	≤15%
Temperature Drift	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)
Front Cap Material	PBTP	PBTP

Note: Sensor dimensions in mm.

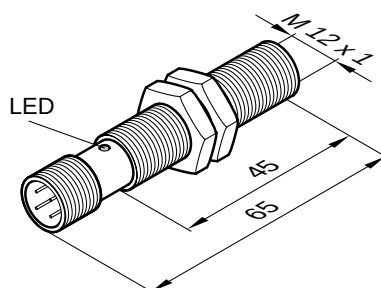
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm	=	.04 in.
12 mm	=	.47 in.
40.0 mm	=	1.57 in.
45.0 mm	=	1.77 in.
50.0 mm	=	1.96 in.
65.0 mm	=	2.55 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

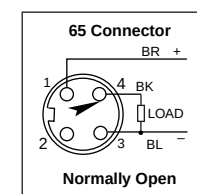
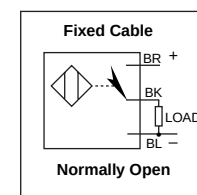
Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



DC - 3 WIRE – PLASTIC & METAL HOUSING – Brass, Nickel Plated (BN), and Plastic (TROGAMID T) Cylindrical, Threaded, 10-30V DC, 400mA 1 LED for Output Energized

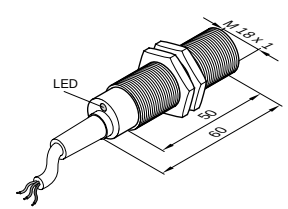
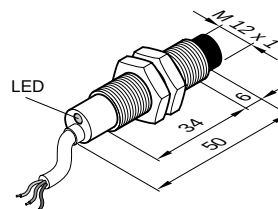
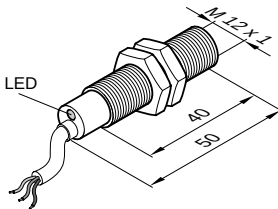
- *Metal and plastic housings*
- *Higher output currents, 400mA*
- *Long body length*
- *Carries C mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount				M12 Non-Flush Mount		M18 Flush Mount		
Sensing Distance		2mm (.08 in.)		4mm (.16 in.)		5mm (.20 in.)		
Cable or Connector Cat. No.		Cable		Cable		Cable		
PNP	Normally Open		9962-3100	9962-1400	9962-3300	9962-1600	9964-3100	9964-1500
	Normally Closed							
NPN	Normally Open		9962-3200	9962-1500	9962-3400	9962-1700	9964-3200	9964-1600
	Normally Closed							
Ripple Voltage			≥10%	≥10%	≥10%	≥10%	≥10%	≥10%
Voltage Range			10-30V	10-30V	10-30V	10-30V	10-30V	10-30V
Supply Current			≥10 mA	≥10 mA	≥10 mA	≥10 mA	≥10 mA	≥10 mA
Max. Load Current			400 mA	400 mA	400 mA	400 mA	400 mA	400 mA
Voltage Drop Across Sensor			≥2.4V	≥2.4V	≥2.4V	≥2.4V	≥2.4V	≥2.4V
Max. Leakage Current			≥10 µA	≥10 µA	≥10 µA	≥10 µA	≥10 mA	≥ 10mA
Switching Frequency			2000Hz	2000Hz	1000Hz	1000Hz	1000Hz	1000Hz
Hysteresis			≥15%	≥15%	≥15%	≥15%	≥15%	≥15%
Temperature Drift			≥10%	≥10%	≥10%	≥10%	≥10%	≥10%
Repeatability			.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)	.5mm (.02 in.)	.5mm (.02 in.)
Front Cap Material			PBTB	PBTB	PBTB	PBTB	PBTB	PBTB
Housing Material			Trogamid T	Nickel Plated Brass	Trogamid T	Nickel Plated Brass	Trogamid T	Nickel Plated Brass

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with non-metallic locknuts for Trogamid T housings, and Brass, Nickel Plated (BN) locknuts for Nickel Plated Brass housings.



Metric/in. Conversion Table

1 mm = .04 in.	34.0 mm = 1.31 in.
1.5 mm = .06 in.	38.0 mm = 1.50 in.
6.0 mm = .23 in.	40.0 mm = 1.57 in.
8.0 mm = .31 in.	42.0 mm = 1.65 in.
12.0 mm = .47 in.	50.0 mm = 1.97 in.
18.0 mm = .70 in.	60.0 mm = 2.36 in.
30.0 mm = 1.20 in.	

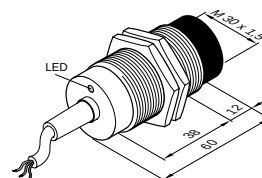
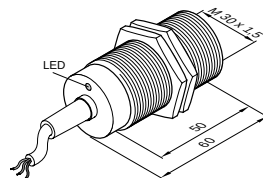
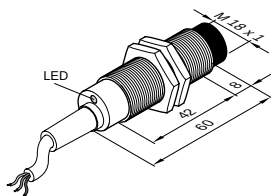
This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

Mounting Brackets – see Pages 114-115

M18 Non-Flush Mount 8mm (.31 in.)		M30 Flush Mount 10mm (.39 in.)		M30 Non-Flush Mount 15mm (.59 in.)	
Cable		Cable		Cable	
9964-3300	9964-1700	9966-3100	9966-1100	9966-3300	9966-1300
9964-3400	9964-1800	9966-3200	9966-1200	9966-3400	9966-1400
≥10%	≥10%	≥10%	≥10%	≥10%	≥10%
10-30V	10-30V	10-30V	10-30V	10-30V	10-30V
≥10 mA	≥10 mA	≥10 mA	≥10 mA	≥10 mA	≥10 mA
400 mA	400 mA	400 mA	400 mA	400 mA	400 mA
≥2.4V	≥2.4V	≥2.4V	≥2.4V	≥2.4V	≥2.4V
≥ 10mA	≥ 10mA	≥ 10mA	≥ 10mA	≥ 10mA	≥ 10mA
500Hz	500Hz	500Hz	500Hz	300Hz	300Hz
≥15%	≥15%	≥15%	≥15%	≥15%	≥15%
≥10%	≥10%	≥10%	≥10%	≥10%	≥10%
.8mm (.03 in.)	.8mm (.03 in.)	1.0mm (.04 in)	1.0mm (.04 in)	1.5mm (.06 in)	1.5mm (.06 in)
PBTB	PBTB	PBTB	PBTB	PBTB	PBTB
Trogamid T	Nickel Plated Brass	Trogamid T	Nickel Plated Brass	Trogamid T	Nickel Plated Brass

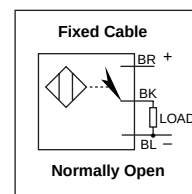
Note: Sensor dimensions in mm.



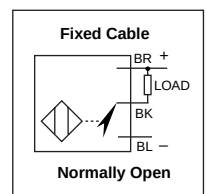
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



NPN



DC - 3 WIRE
MINI METAL HOUSING
Cylindrical, 10-30V DC, 200mA
LED for Output Energized

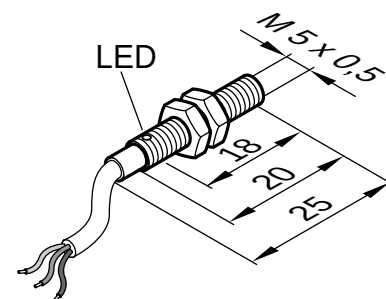
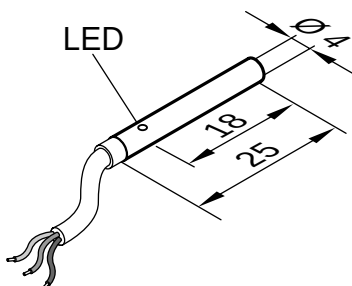
- 4mm, 5mm, and 6.5mm diameter
- Economically Priced
- Non-connector models feature polyurethane (PUR) cables
- Carries CE mark

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Ø 4 Flush Mount			M5 Flush Mount	
Sensing Distance 0.8mm (0.03 in.)			0.8mm (0.03 in.)	
Cable or Connector Style Cat. No.	Cable	64	Cable	64
PNP	Normally Open 	9980-1010	9980-2010	9980-2064
	Normally Closed 			
NPN	Normally Open 	9980-1110	9980-2110	9980-2164
	Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2V	≤2V	≤2V	≤2V
Max. Leakage Current	≤100 µA	≤100 µA	≤100 µA	≤100 µA
Switching Frequency	5000 Hz	5000 Hz	5000 Hz	5000 Hz
Hysteresis	Typ. 5%	Typ. 5%	Typ. 5%	Typ. 5%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.04mm (.003 in.)	.04mm (.003 in.)	.04mm (.003 in.)	.04mm (.003 in.)
Front Cap Material	PBTP	PBTP	PBTB	PBTB
Housing Material	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass

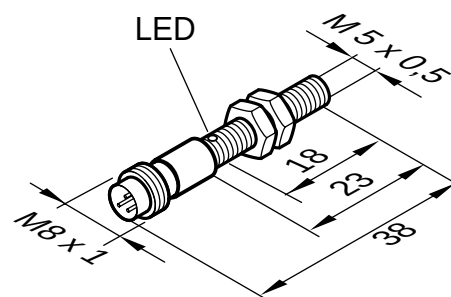
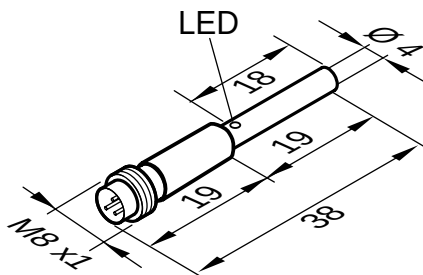
Fixed Cable

PUR 2m (6 ft. 6 in.). Supplied with Brass, Nickel Plated (BN) locknuts for M5 model.



64 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts for M5 model.



Metric/in. Conversion Table

.5 mm = .019 in.	19.0 mm = .74 in.
1.0 mm = .04 in.	20.0 mm = .78 in.
3.5 mm = .13 in.	23.0 mm = .90 in.
4.0 mm = .15 in.	25.0 mm = .94 in.
5.0 mm = .19 in.	35.0 mm = 1.37 in.
6.5 mm = .25 in.	40.0 mm = 1.57 in.
8.0 mm = .31 in.	43.0 mm = 1.69 in.

This table converts millimeters to inches in reference to the illustrations included in this catalog

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Ø 6.5 Flush Mount

1.5mm (0.06 in.)

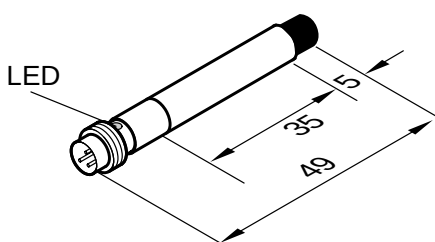
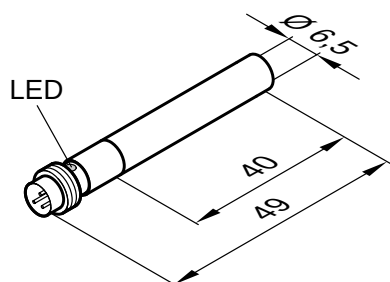
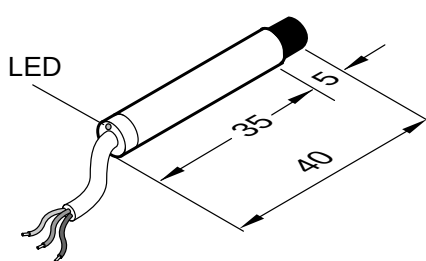
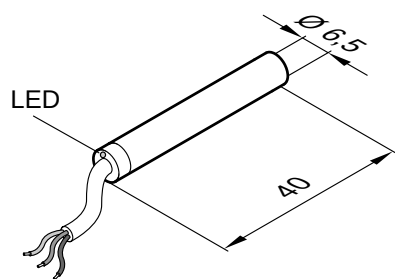
Cable	65
9961-1200	9961-1264
≤10%	≤10%
10V - 30V	10V - 30V
≤8 mA	≤8 mA
200 mA	200 mA
≤2.4V	≤2.4V
≤10 µA	≤10 µA
2000 Hz	2000 Hz
≤15%	≤15%
≤10%	≤10%
.15mm (.006in.)	.15mm (.006in.)
PBTB	PBTB
Stainless Steel	Stainless Steel

Ø 6.5 Non-Flush Mount

3.0mm (0.11 in.)

Cable	65
9961-1300	9961-1364
≤10%	≤10%
10V - 30V	10V - 30V
≤8 mA	≤8 mA
200 mA	200 mA
≤2.4V	≤2.4V
≤10 µA	≤10 µA
2000 Hz	2000 Hz
≤15%	≤15%
≤10%	≤10%
.15mm (.006in.)	.15mm (.006in.)
PBTB	PBTB
Stainless Steel	Stainless Steel

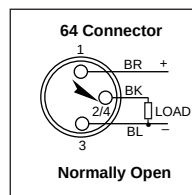
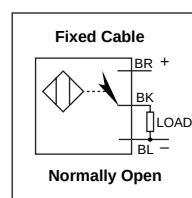
Note: Sensor dimensions in mm.



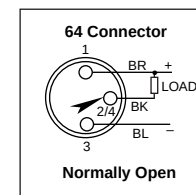
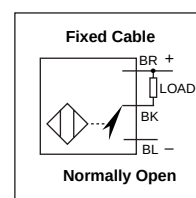
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



NPN



**DC - 4 WIRE – COMPLEMENTARY
OUTPUTS (N.O. & N.C.)**
**Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA**
1 LED for Output Energized

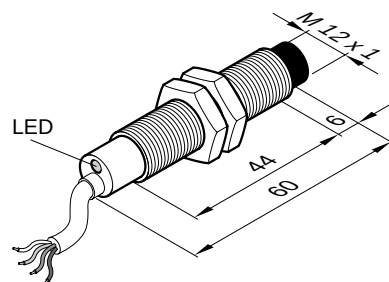
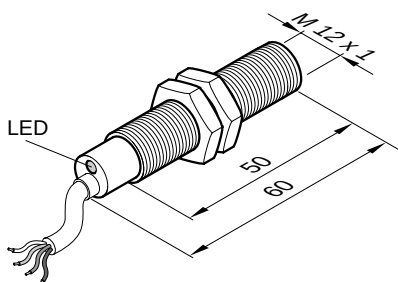
• Carries  mark

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

	M12 Flush Mount		M12 Non-Flush Mount	
Sensing Distance	2mm (.08 in.)		4mm (.16 in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
PNP (Complementary NO/NC)	9962-6200	9962-6265	9962-6300	9962-6365
NPN (Complementary NO/NC)				
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤15 mA	≤15 mA	≤15 mA	≤15 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	2000 Hz	2000 Hz	1000 Hz	1000 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material	PBTP	PBTP	PBTB	PBTB

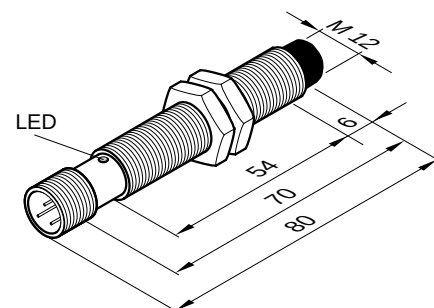
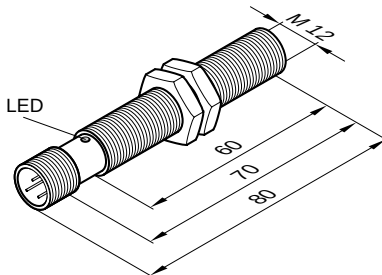
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	44.0 mm = 1.73 in.
6.0 mm = .23 in.	50.0 mm = 1.96 in.
8.0 mm = .31 in.	51.0 mm = 2.0 in.
10.0 mm = .39 in.	54.0 mm = 2.12 in.
12.0 mm = .47 in.	60.0 mm = 2.36 in.
18.0 mm = .70 in.	70.0 mm = 2.75 in.
32.0 mm = 1.26 in.	80.0 mm = 3.12 in.
42.0 mm = 1.65 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connectors, 4PIN – 4 Wire cable (PIN 1, 2, 3, 4) :
65 Connectors 8000-5280 PVC, Right Angle

Change last digit of connector number for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount

5mm (.2 in.)

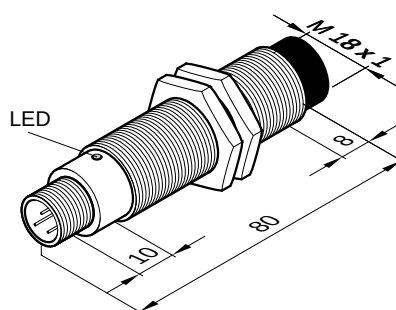
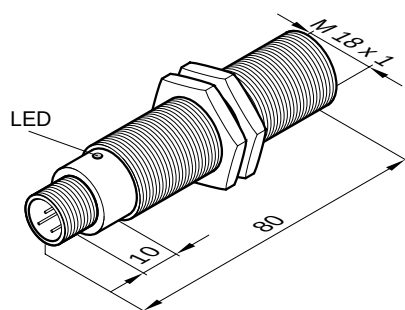
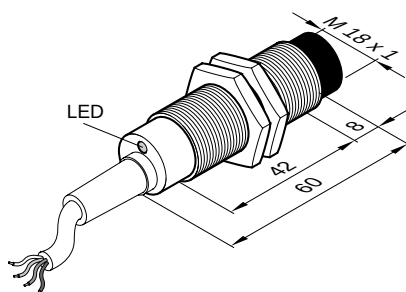
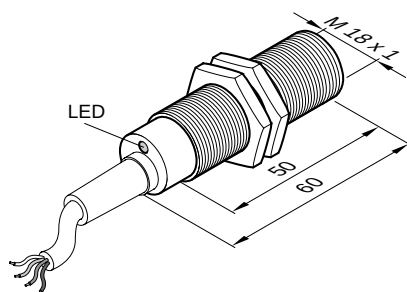
Cable	65
9964-6200	9964-6265
≤10%	≤10%
10V - 30V	10V - 30V
≤15 mA	≤15 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
1000 Hz	1000 Hz
≤15%	≤15%
≤10%	≤10%
.5mm (.02 in.)	.5mm (.02 in.)
PBTB	PBTB

M18 Non-Flush Mount

8mm (.31 in.)

Cable	65
9964-6300	9964-6365
≤10%	≤10%
10V - 30V	10V - 30V
≤15 mA	≤15 mA
200 mA	200 mA
≤2.4V	≤2.4 V
10μA	10μA
500 Hz	500 Hz
≤15%	≤15%
≤10%	≤10%
.8mm (.031 in.)	.8mm (.031 in.)
PBTB	PBTB

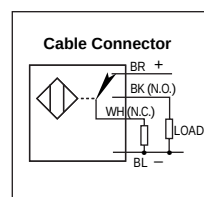
Note: Sensor dimensions in mm.



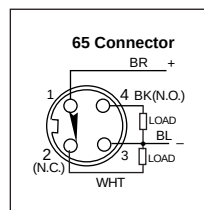
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



PNP



**DC - 3 WIRE – EXTENDED
TEMPERATURE RANGE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized**

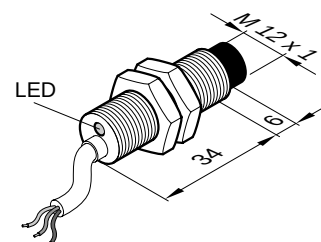
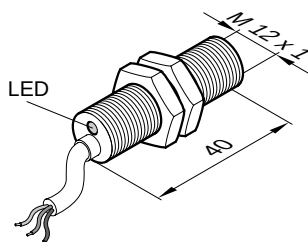
- **Temperature Range:**
-40 to 100°C
(104 to 212°F)
- **Carries C mark**

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance

M12 Flush Mount			M12 Non-Flush Mount	
Sensing Distance 2mm (.08 in.)			4mm (.16 in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
PNP	Normally Open 	9962-6010	9962-6110	9962-6165
	Normally Closed 			
NPN	Normally Open 			
	Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 μA	≤10 μA	≤10 μA	≤10 μA
Switching Frequency	2000 Hz	2000 Hz	1000 Hz	1000 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material	PBTP	PBTP	PBTB	PBTB

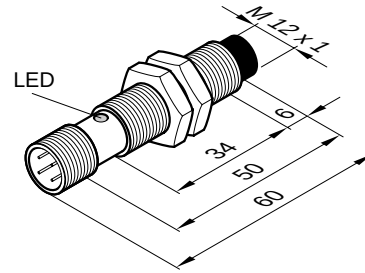
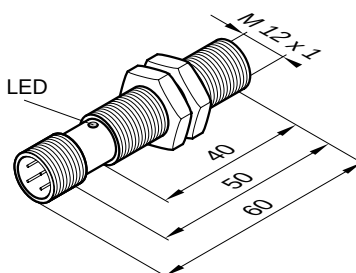
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	32.0 mm = 1.23 in.
6.0 mm = .23 in.	34.0 mm = 1.31 in.
8.0 mm = .31 in.	40.0 mm = 1.39 in.
12.0 mm = .47 in.	50.0 mm = 1.47 in.
18.0 mm = .70 in.	51.0 mm = 1.59 in.
	60.0 mm = 2.36 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount

5mm (.20 in.)

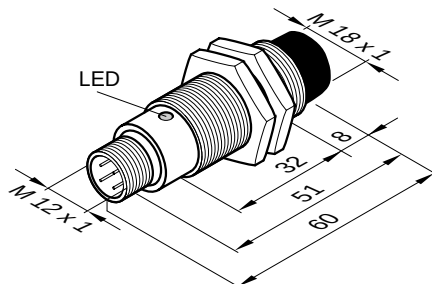
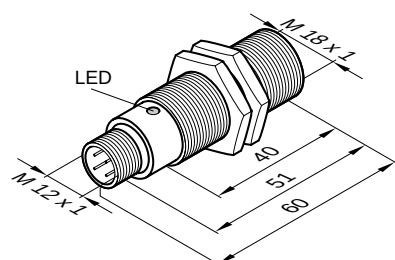
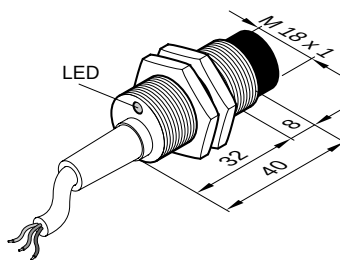
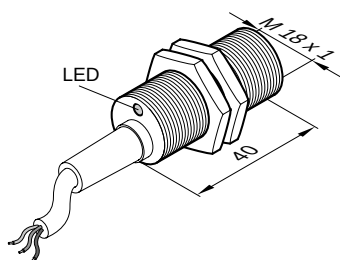
Cable	65
9964-6010	9964-6065
≤10%	≤10%
10V - 30V	10V - 30V
≤10 mA	≤10 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
1000 Hz	1000 Hz
≤15%	≤15%
≤10%	≤10%
.50mm (.02 in.)	.50mm (.02 in.)
PBTB	PBTB

M18 Non-Flush Mount

8mm (.31 in.)

Cable	65
9964-6110	9964-6165
≤10%	≤10%
10V - 30V	10V - 30V
≤25 mA	≤25 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
500 Hz	500 Hz
≤15%	≤15%
≤10%	≤10%
.80mm (.03 in.)	.80mm (.03 in.)
PBTB	PBTB

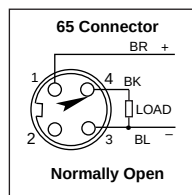
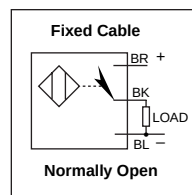
Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



DC - 3 WIRE – WELD IMMUNE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

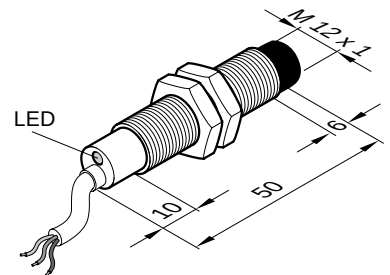
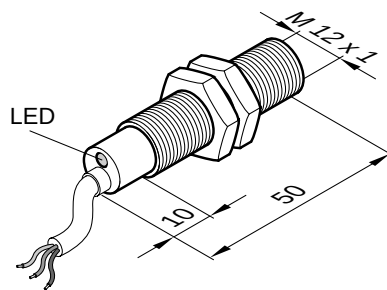
- *Circuitry that protects for electro-magnetic interference*
- *Flush models have teflon ceramic coatings to protect for weld slag*
- *Carries C ϵ mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount 2mm (.08 in.)			M12 Non-Flush Mount 4mm (.16 in.)	
Sensing Distance	2mm (.08 in.)		4mm (.16 in.)	
Cable or Connector Style Cat. No.	Cable	45	Cable	65
PNP	Normally Open 	9962-5840	9962-5900	9962-5965
	Normally Closed 			
NPN	Normally Open 			
	Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	15 Hz	15 Hz	15Hz	15 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material	Teflon	Teflon	PBTB	PBTB
Housing Material	Teflon Plated Brass	Teflon Plated Brass	Nickel Plated Brass	Nickel Plated Brass

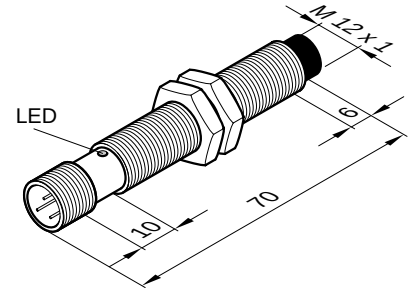
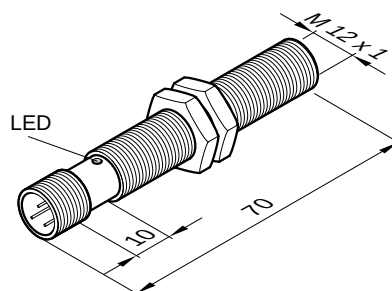
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



45/65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	50.0 mm = 1.47 in.
6.0 mm = .23 in.	52.0 mm = 2.04 in.
8.0 mm = .31 in.	60.0 mm = 2.36 in.
10.0 mm = .39 in.	70.0 mm = 2.75 in.
12.0 mm = .47 in.	80.0 mm = 3.12 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

45/65 Connector 8000-5110	PVC, Straight
45/65 Connector 8000-5120	PVC, Right Angle
45/65 Connector 8000-5150	PVC, Right Angle, 2LED, NPN
45/65 Connector 8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount

5mm (.20 in.)

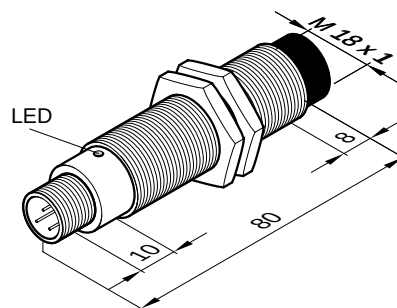
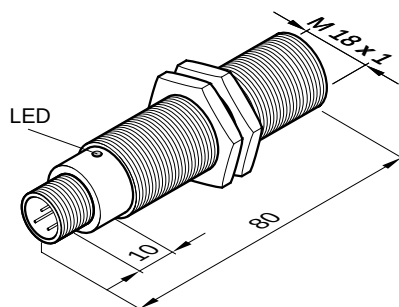
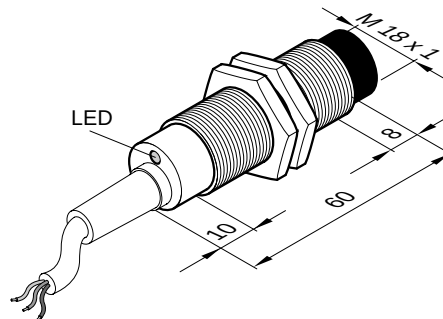
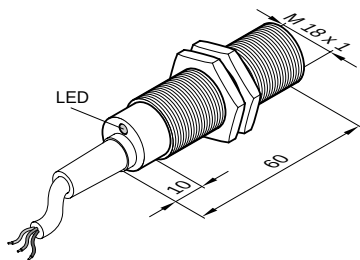
Cable	45
9964-5840	9964-5845
≤10%	≤10%
10V - 30V	10V - 30V
≤10 mA	≤10 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
15 Hz	15 Hz
≤15%	≤15%
≤10%	≤10%
.50mm (.02 in.)	.50mm (.02 in.)
Teflon	Teflon
Teflon Plated Brass	Teflon Plated Brass

M18 Non-Flush Mount

8mm (.31 in.)

Cable	65
9964-5900	9964-5965
≤10%	≤10%
10V - 30V	10V - 30V
≤10 mA	≤10 mA
200 mA	200 mA
≤2.4V	≤2.4V
10 μA	10 μA
15 Hz	15 Hz
≤15%	≤15%
≤10%	≤10%
.80mm (.03 in.)	.80mm (.03 in.)
PBTB	PBTB
Nickel Plated Brass	Nickel Plated Brass

Note: Sensor dimensions in mm.

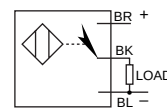


Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

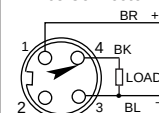
PNP

Fixed Cable



Normally Open

65 Connector



Normally Open

DC - 3 WIRE – WELD IMMUNE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

- *Circuitry that protects for electro-magnetic interference*
- *Flush models have teflon ceramic coatings to protect for weld slag*
- *Carries $\text{C}\epsilon$ mark*

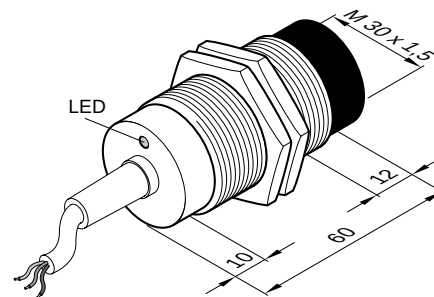
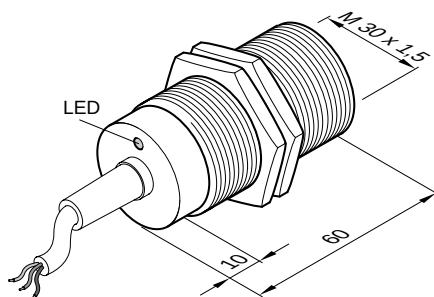
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M30 Flush Mount			M30 Non-Flush Mount	
10mm (.39 in.)			15mm (.59 in.)	
Sensing Distance				
Cable or Connector Style Cat. No.	Cable	45/65	Cable	65
PNP	Normally Open 	9966-5840	9966-5900	9966-5965
	Normally Closed 			
NPN	Normally Open 			
	Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 μA	≤10 μA	≤10 μA	≤10 μA
Switching Frequency	15 Hz	15 Hz	15 Hz	15Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	1.0mm (.039 in.)	1.0mm (.039 in.)	1.5mm (.059 in.)	1.5mm (.059 in.)
Front Cap Material	Teflon	Teflon	PBTB	PBTB
Housing Material	Teflon Plated Brass	Teflon Plated Brass	Nickel Plated Brass	Nickel Plated Brass

Note: Sensor dimensions in mm.

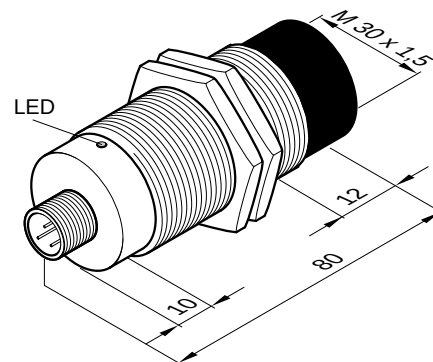
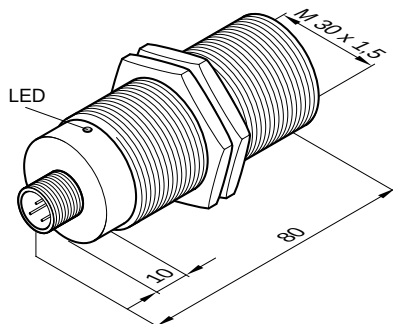
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



45/65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.5 mm	=	.06 in.
10.0 mm	=	.39 in.
12.0 mm	=	.47 in.
30.0 mm	=	1.20 in.
60.0 mm	=	2.36 in.
80.0 mm	=	3.15 in.

This table
converts millimeters
to inches in reference
to the illustrations
included on these
pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

45/65 Connector 8000-5110	PVC, Straight
45/65 Connector 8000-5120	PVC, Right Angle
45/65 Connector 8000-5150	PVC, Right Angle, 2LED, NPN
45/65 Connector 8000-5160	PVC, Right Angle, 2LED, PNP

*Change last digit of connector number to 5
for 5 meter cable*

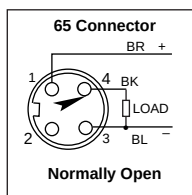
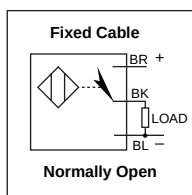
*Refer to pages 116-121 for more
cable information*

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable
purchased from Altech

PNP

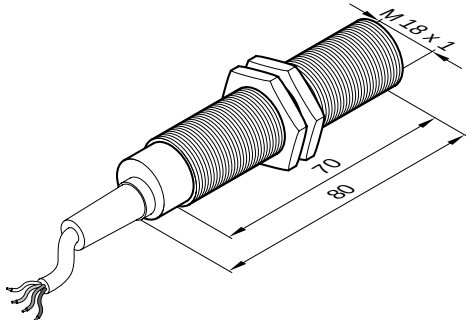
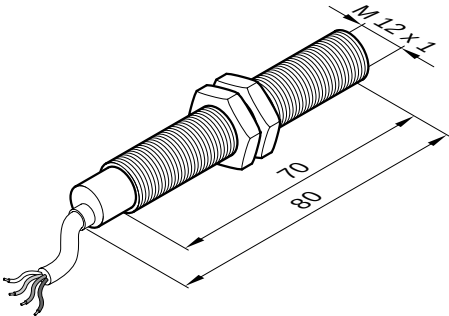


DC ANALOG SENSORS
Cylindrical, Threaded
Brass, Nickel Plated (BN),
18-30V DC
Analog Output 1V - 9V M12, M18, M30
M30 4 Bit Digital & Analog Output

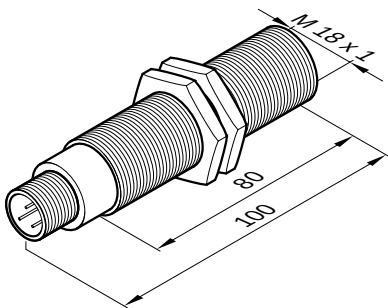
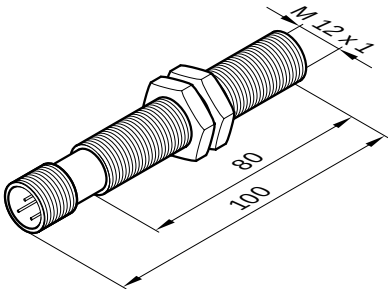
- *Output voltage proportional to target distance*
- *Ideal for determining position information*
- *Excellent linearity ± 3%*
- *Shielded cable ouputs on cable models*
- *Carries C mark*
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount			M18 Flush Mount		
Sensing Distance			Sensing Distance		
0.5mm (.02 in.) to 2.5mm (0.1 in.)			1mm (.04 in.) to 4mm (.16 in.)		
Cable or Connector Style Cat. No.	Cable	65	Cable	65	
	9914-0800	9914-0865	9914-0900	9914-0965	
Voltage Range	18V-30V	18V - 30V	18V - 30V	18V - 30V	
Supply Current	≤10 mA	≤10 mA	≤10 mA	≤10 mA	
Max. Load Current	5 mA	5 mA	5 mA	5 mA	
Max. Switching Frequency	100 Hz	100 Hz	100 Hz	100 Hz	
Temperature Drift	±0.3V	±0.3V	±0.3V	±0.3V	
Repeatability	1%	1%	1%	1%	
Front Cap Material	PBTP	PBTP	PBTB	PBTB	
Output Voltage Range	1-9V DC	1-9V DC	1-9V DC	1-9V DC	

Fixed Cable
PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector
4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	58.0 mm = 2.28 in.
1.5 mm = .06 in.	70.0 mm = 2.75 in.
10.0 mm = .40 in.	80.0 mm = 3.12 in.
12.0 mm = .47 in.	100.0 mm = 3.94 in.
18.0 mm = .70 in.	
30.0 mm = 1.20 in.	

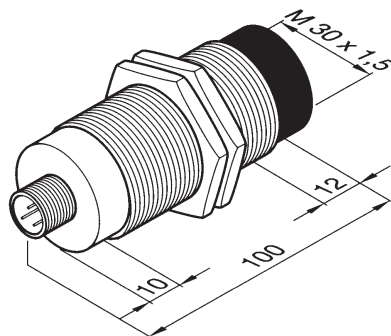
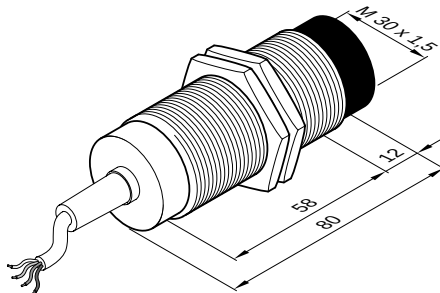
This table converts millimeters to inches in reference to the illustrations included on these pages

M30 Non-Flush Mount

7mm (.28 in.) to 14mm (.55 in.)

Cable	Cable	65
9914-1000	9914-0500	9914-0565
18V - 30V	18V - 30V	18V - 30V
≤10 mA	≤10 mA	≤10 mA
5 mA	5 mA	5 mA
30 Hz	30 Hz	30 Hz
±0.3V	±0.3V	±0.3V
1%	1%	1%
PBTB	PBTB	PBTB
1-9V DC & 4 Bit Digital	1-9V DC	1-9V DC

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connectors, 4PIN - 4 Wire cable (PIN 1, 2, 3, 4) :
65 Connectors 8000-5280 PVC, Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

The analog output voltage can be digitized by the 8100-2100 switching unit and 8100-2400/2500 modules.

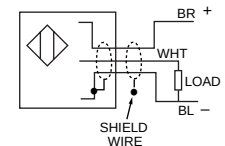
(Separate Accessory items - refer to pages 125 & 126 for more information.)

Mounting Brackets – see Pages 114-115

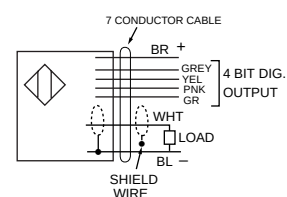
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

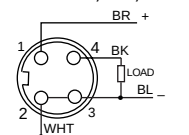
Fixed Cable M12, M18, M30



Fixed Cable M30



65CN M12, M18, M30



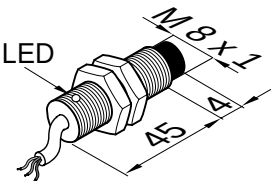
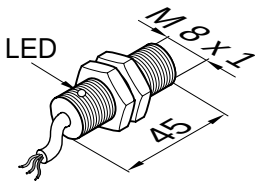
Pin 2 connected internally to Pin 3. (Can be used as shield with shielded cable)

DC - 3WIRE
EXTENDED RANGE PLUS
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

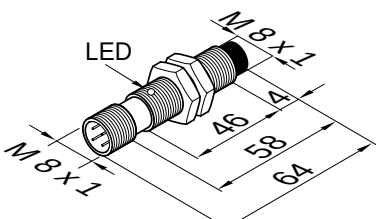
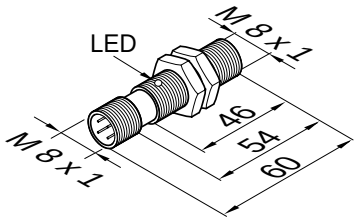
- Up to 3 times the sensing distance
- Ideal for applications where large sensors will not fit
- Carries $\text{C}\epsilon$ mark
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Sensing ranges from 3mm (.12 in.) to 40mm (1.57 in.)
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M8 Flush Mount				M8 Non-Flush Mount			
Sensing distance		3mm (0.1 in.)		6mm (0.2 in.)			
Cable or Connector Style Cat. No.		Cable	64	65	Cable	64	65
PNP	Normally Open	9981-5000	9981-5064	9981-5065	9981-5200	9981-5264	9981-5265
	Normally Closed						
NPN	Normally Open						
	Normally Closed						
Ripple Voltage		≤20%	≤20%	≤20	≤20%	≤20%	≤20%
Voltage Range		10-30V	10-30V	10-30V	10-30V	10-30V	10-30V
Supply Current		≤20mA	≤20mA	≤20mA	≤20mA	≤20mA	≤20mA
Max. Load Current		200mA	200mA	200mA	200mA	200mA	200mA
Voltage Drop Across Sensor		≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Currrent		≤100μA	≤100μA	≤100μA	≤100μA	≤100μA	≤100μA
Switching Frequency		1000Hz	1000Hz	1000Hz	500Hz	500Hz	500Hz
Hysteresis		10%	10%	10%	10%	10%	10%
Temperature Drift		≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Housing Material		Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass
Repeatability		.15mm (.005 in.)	.15mm (.005 in.)	.15mm (.005 in.)	.3mm (.01 in.)	.3mm (.01 in.)	.3mm (.01 in.)

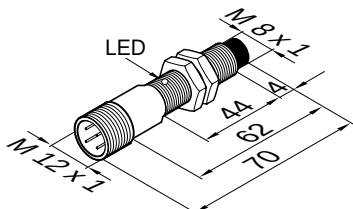
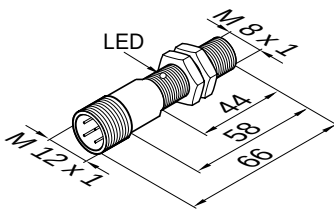
Fixed Cable
PVC 2m (6 ft. 6 in.). Supplied with Brass, Nickel Plated (BN) locknuts.



64 Connector
3-pin, Pico style, 8mm (.31 in.) supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connectors
4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



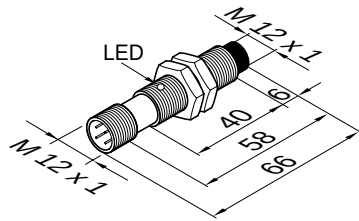
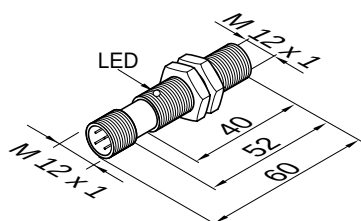
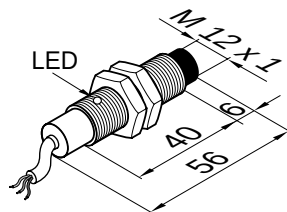
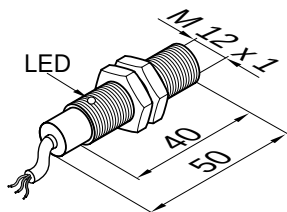
Metric/in. Conversion Table

1.0 mm = .04 in.	52.0 mm = 2.04 in.
4.0 mm = .16 in.	54.0 mm = 2.12 in.
6.0 mm = .23 in.	56.0 mm = 2.20 in.
8.0 mm = .31 in.	58.0 mm = 2.28 in.
12.0 mm = .47 in.	60.0 mm = 2.36 in.
40.0 mm = 1.39 in.	62.0 mm = 2.44 in.
44.0 mm = 1.73 in.	66.0 mm = 2.60 in.
45.0 mm = 1.77 in.	70.0 mm = 2.75 in.
50.0 mm = 1.97 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

M12 Flush Mount 6mm (0.2 in.)		M12 Non-Flush Mount 10mm (0.4 in.)	
Cable	65	Cable	65
9982-5000	9982-5065	9982-5200	9982-5265
≤20%	≤20%	≤20%	≤20%
10-30V	10-30V	10-30V	10-30V
≤20mA	≤20mA	≤20mA	≤20mA
200mA	200mA	200mA	200mA
≤2.4V	≤2.4V	≤2.4V	≤2.4V
≤100μA	≤100μA	≤100μA	≤100μA
800Hz	800Hz	400Hz	400Hz
10%	10%	10%	10%
≤10%	≤10%	≤10%	≤10%
Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass
.3mm (.01 in.)	.3mm (.01 in.)	.5mm (.02 in.)	.5mm (.02 in.)

Note: Sensor dimensions in mm.



Accessories

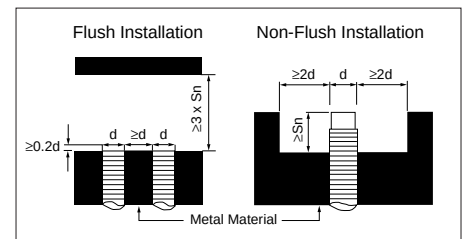
2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	PVC, Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2 LED, NPN
65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

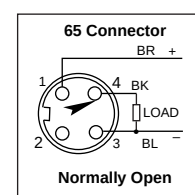
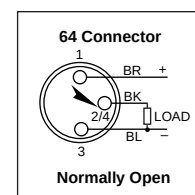
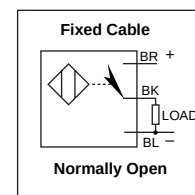


General Mounting – You must maintain minimum distance between adjacent and opposite sensors in addition to non-target metals as specified in the drawings above. Flush mount sensors must extend at least 0.2 times the sensor diameter above the adjacent metal housing. Non-flush mount sensors must extend a distance greater than the sensing distance (Sn). Please contact Altech for any installation assistance

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP

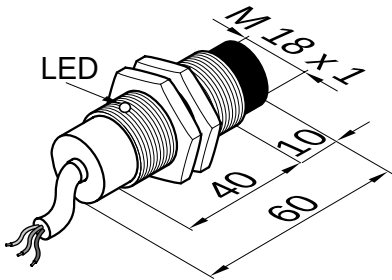
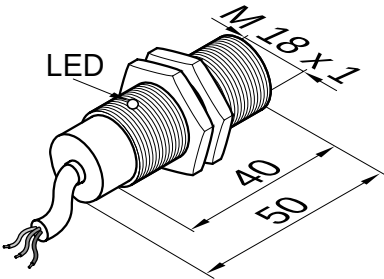


DC - 3WIRE
EXTENDED RANGE PLUS
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
10-30V DC, 200mA
1 LED for Output Energized

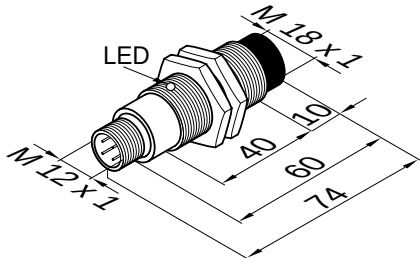
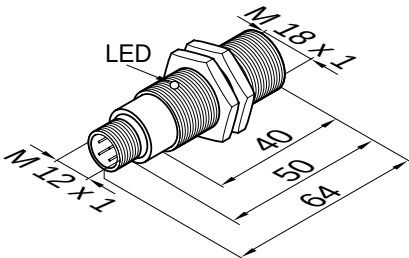
- Up to 3 times the sensing distance
- Ideal for applications where large sensors will not fit
- Carries $\text{C}\epsilon$ mark
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Sensing ranges from 3mm (.12 in.) to 40mm (1.57 in.)
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

M18 Flush Mount			M18 Non-Flush Mount	
Sensing Distance 12mm (0.4 in.)			20mm (0.8 in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
PNP	Normally Open 	9984-5000	9984-5200	9984-5265
	Normally Closed 			
NPN	Normally Open 			
	Normally Closed 			
Ripple Voltage	≤20%	≤20%	≤20%	≤20%
Voltage Range	10V-30V	10V - 30V	10V - 30V	10V - 30V
Supply Current	≤20 mA	≤20 mA	≤20 mA	≤20 mA
Max. Load Current	200 mA	200 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤100 µA	≤100 µA	≤100 µA	≤100 µA
Switching Frequency	500 Hz	500 Hz	200 Hz	200 Hz
Hysteresis	≤10%	≤10%	≤10%	≤10%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Housing Material	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass
Repeatability	0.6mm (.02 in.)	0.6mm (.02 in.)	1mm (.04 in.)	1mm (.04 in.)

Fixed Cable
PVC 2m (6 ft. 6 in.). Supplied with
Brass, Nickel Plated (BN) locknuts.



65 Style Connectors
4-pin, Micro style, 12mm (.47 in.) supplied
with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	52.0 mm = 2.04 in.
4.0 mm = .16 in.	54.0 mm = 2.12 in.
6.0 mm = .23 in.	56.0 mm = 2.20 in.
8.0 mm = .31 in.	58.0 mm = 2.28 in.
12.0 mm = .47 in.	60.0 mm = 2.36 in.
40.0 mm = 1.57 in.	62.0 mm = 2.44 in.
44.0 mm = 1.73 in.	66.0 mm = 2.60 in.
45.0 mm = 1.77 in.	70.0 mm = 2.75 in.
50.0 mm = 1.97 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

M30 Flush Mount

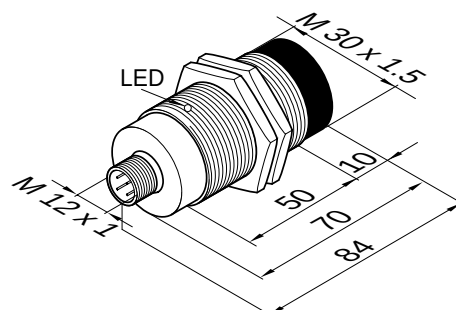
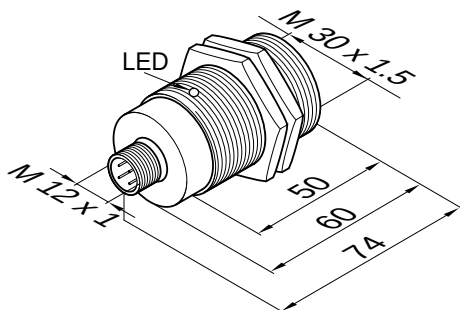
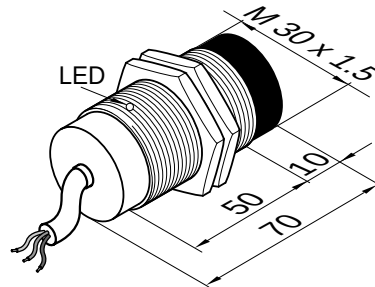
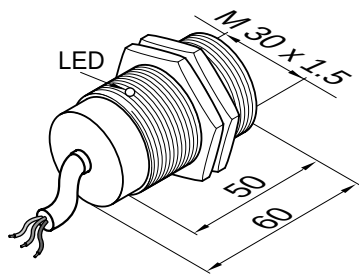
22mm (0.9 in.)

M30 Non-Flush Mount

40mm (1.57 in.)

Cable	65	Cable	65
9986-5000	9986-5065	9986-5200	9986-5265
≤20%	≤20%	≤20%	≤20%
10V - 30V	10V - 30V	10V - 30V	10V - 30V
≤20 mA	≤20 mA	≤20 mA	≤20 mA
200 mA	200 mA	200 mA	200 mA
≤2.4V	≤2.4V	≤2.4V	≤2.04V
100 μA	100 μA	100μA	100μA
300 Hz	300 Hz	100 Hz	100 Hz
≤10%	≤10%	≤10%	≤15%
≤10%	≤10%	≤10%	≤10%
Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass	Nickel Plated Brass
1.1mm (.045 in.)	1.1mm (.045 in.)	2mm (.078 in.)	2mm (.078 in.)

Note: Sensor dimensions in mm.



Accessories

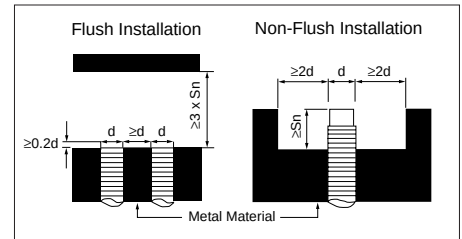
2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED PNP

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

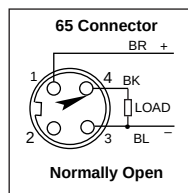
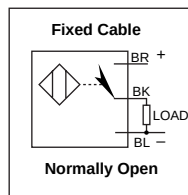


General Mounting – You must maintain minimum distance between adjacent and opposite sensors in addition to non-target metals as specified in the drawings above. Flush mount sensors must extend at least 0.2 times the sensor diameter above the adjacent metal housing. Non-flush mount sensors must extend a distance greater than the sensing distance (Sn). Please contact Altech for any installation assistance

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



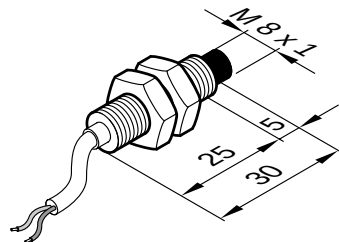
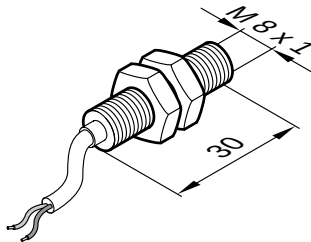
DC - 2 WIRE NAMUR
Brass, Nickel Plated (BN),
and Plastic (TROGAMID-T)
Cylindrical, Threaded

- Low energy device
- Operates in hazardous areas with external amplifier
- Meets NAMUR regulations and DIN 19234 specifications
- Carries C mark
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Reverse Polarity Protection
- Plastic and Metal Housing according to NAMUR Regulations and DIN 19234
- Temperature Range: -25 to 70°C (-13 to 158°F)
(For extended temperature models of -40°C to +125°C, consult Altech.)

M8 Flush Mount			M8 Non-Flush Mount	
Sensing Distance	1mm (.04 in.)		2mm (.08 in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
Nickel Plated Brass (BN)	9932-0100	9932-0165	9932-0200	9932-0265
Plastic (TROGAMID T)			9932-1600	
Ripple Voltage	≤5%	≤5%	≤15%	≤5%
Voltage Range (supplied by Pulsotronic 8100-2200 Unit)	8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ
Output Current (with target detection)	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Output Current (no target detection)	3.5 mA	3.5 mA	3.5 mA	3.5 mA
Switching Frequency	2000 0Hz	2000 Hz	1000 Hz	1000 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.1mm (.004 in.)	.1mm (.004 in.)	.2mm (.008 in.)	.2mm (.008 in.)
Front Cap Material	PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)

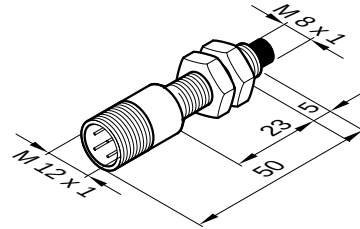
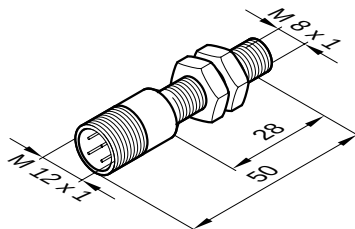
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with non-metallic locknuts for M8 and Brass, Nickel Plated (BN) locknuts for M12 through M30.



Metric/in. Conversion Table

1.0 mm = .04 in.	24.0 mm = .94 in.
5.0 mm = .20 in.	25.0 mm = 1.0 in.
6.0 mm = .23 in.	28.0 mm = 1.16 in.
8.0 mm = .31 in.	30.0 mm = 1.20 in.
12.0 mm = .47 in.	40.0 mm = 1.57 in.
23.0 mm = .91 in.	50.0 mm = 1.97 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connectors, 4 PIN – 4 Wire cable (PIN 1, 2, 3, 4) :
65 Connector 8000-5280 PVC Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Remote Amplifier –
Use 8100-2200, see page 123

Mounting Brackets – see Pages 114-115

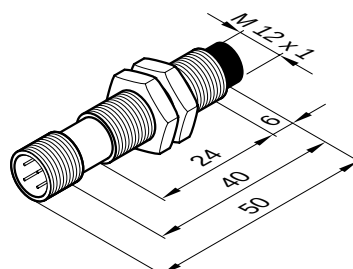
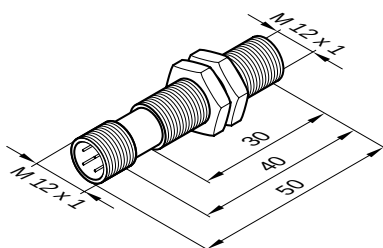
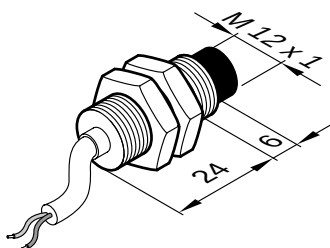
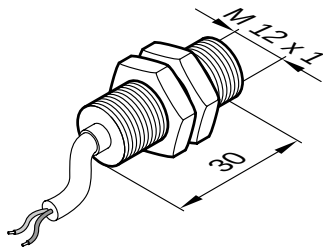
M12 Flush Mount 2mm (.08 in.)

Cable	65
9932-0300	9932-0365
9932-1100	
≤15%	≤5%
8.2V DC at 1KΩ	8.2V DC at 1KΩ
0.5 mA	0.5 mA
3.5 mA	3.5 mA
2000 Hz	2000 Hz
≤15%	≤15%
≤10%	≤10%
.2mm (.008 in.)	.2mm (.008 in.)
PBTP (Metal Housing)	PBTP (Metal Housing)

M12 Non-Flush Mount 4mm (.16 in.)

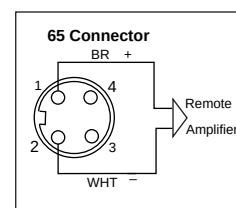
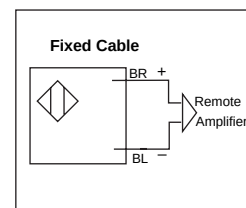
Cable	65
9932-0400	9932-0465
9932-1000	
≤5%	≤5%
8.2V DC at 1KΩ	8.2V DC at 1KΩ
0.5 mA	0.5 mA
3.5 mA	3.5 mA
1000 Hz	1000 Hz
≤15%	≤15%
≤10%	≤10%
.4mm (.016 in.)	.4mm (.016 in.)
PBTP (Metal Housing)	PBTP (Metal Housing)

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



DC - 2 WIRE NAMUR
Brass, Nickel Plated (BN),
and Plastic (TROGAMID-T)
Cylindrical, Threaded

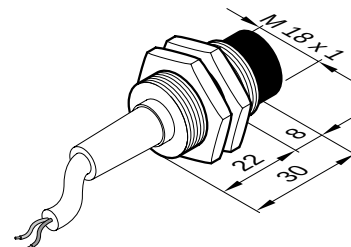
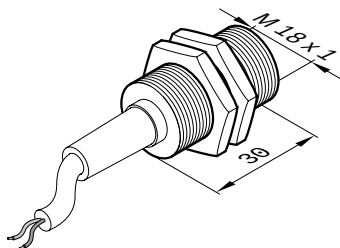
- **Low energy device**
- **Operates in hazardous areas with external amplifier**
- **Meets NAMUR regulations and DIN 19234 specifications**
- **Carries C mark**

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Reverse Polarity Protection
- Plastic and Metal Housing according to NAMUR Regulations and DIN 19234
- Temperature Range: -25 to 70°C (-13 to 158°F)

M18 Flush Mount			M18 Non-Flush Mount	
Sensing Distance	5mm (.20 in.)		8mm (.31 in.)	
Cable or Connector Style Cat. No.	Cable	65	Cable	65
Nickel Plated Brass (BN)	9932-0500	9932-0565	9932-0600	9932-0665
Plastic (TROGAMID T)	9932-1300		9932-1200	
Ripple Voltage	≤5%	≤5%	≤5%	≤5%
Voltage Range (supplied by Pulsotronic 8100-2200 Unit)	8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ
Output Current (with target detection)	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Output Current (no target detection)	3.5 mA	3.5 mA	3.5 mA	3.5 mA
Switching Frequency	1000 0Hz	1000 Hz	500 Hz	500 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.5mm (.02 in.)	.5mm (.02 in.)	.8mm (.03 in.)	.8mm (.03 in.)
Front Cap Material	PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)

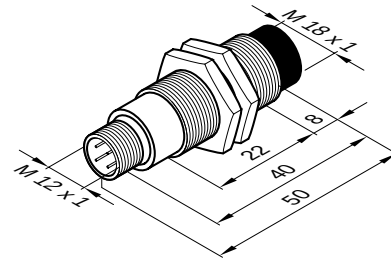
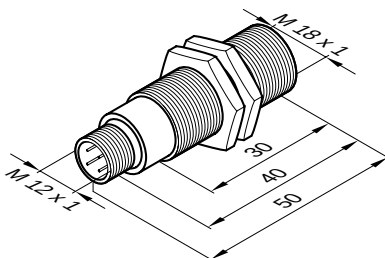
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	28.0 mm = 1.16 in.
1.5 mm = .06 in.	30.0 mm = 1.20 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
12.0 mm = .47 in.	50.0 mm = 1.96 in.
18.0 mm = .70 in.	51.0 mm = 2.00 in.
22.0 mm = .86 in.	60.0 mm = 2.36 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connectors, 4 PIN – 4 Wire cable (PIN 1, 2, 3, 4) :
65 Connector 8000-5280 PVC Right Angle

Change last digit of connector number to 5 for 5 meter cable

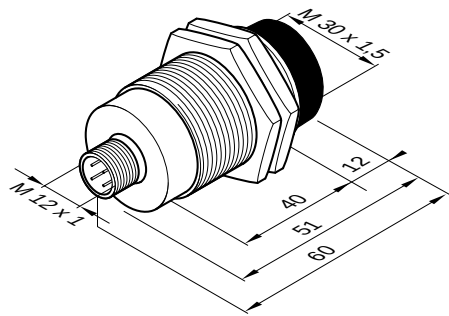
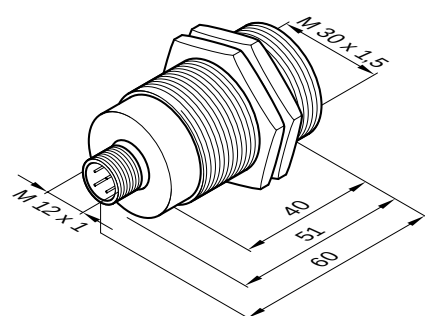
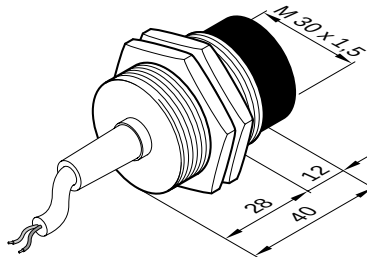
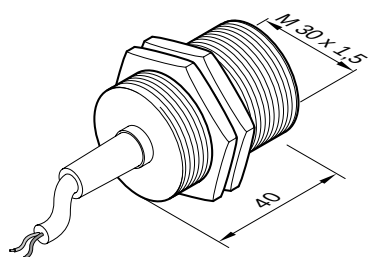
Refer to page s 116-121 for more cable information

Remote Amplifier –
Use 8100-2200, see page 123

Mounting Brackets – see Pages 114-115

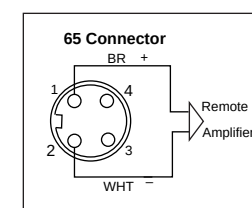
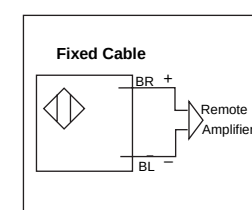
M30 Flush Mount 10mm (.39 in.)		M30 Non-Flush Mount 15mm (.59 in.)	
Cable	65	Cable	65
9932-0700	9932-0765	9932-0800	9932-0865
9932-1500		9932-1400	
≤5%	≤5%	≤5%	≤5%
8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ	8.2V DC at 1KΩ
0.5 mA	0.5 mA	0.5 mA	0.5 mA
3.5 mA	3.5 mA	3.5 mA	3.5 mA
500 Hz	500 Hz	300 Hz	300 Hz
≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%
.1mm (.039 in.)	.1mm (.039 in.)	1.5mm (.059 in.)	1.5mm (.059 in.)
PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)	PBTP (Metal Housing)

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



DC - 2 WIRE SENSORS
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
M12 – 5-30V DC, 100mA
M18, M30 – 10-55V DC, 200 mA
1 LED for Output Energized

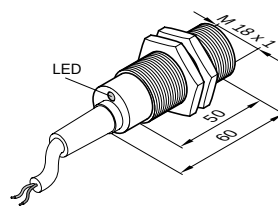
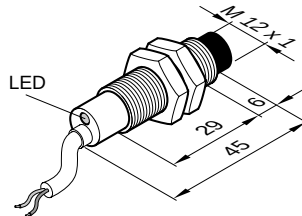
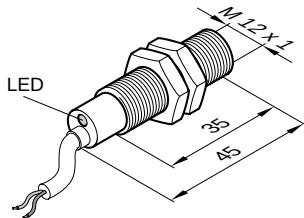
- **2 Wire devices reduce wiring requirements**
- **Economically Priced**
- **Carries C mark**

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Reverse Polarity Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

	M12 Flush Mount		M12 Non-Flush Mount		M18 Flush Mount
Sensing distance	2mm (.08 in.)		4mm (.16 in.)		5mm (0.2 in.)
Cable or Connector Style Cat. No.	Cable	65	Cable	65	Cable
Normally Open 	9962-5600	9962-5665	9962-5700	9962-5765	9964-5400
Normally Closed 					
Ripple Voltage	≤10%	≤10%	≤10%	≤10%	≤10%
Voltage Range	5V-30V	5V-30V	5V-30V	5V-30V	10V-55V
Supply Current	≤3mA	≤3mA	≤3mA	≤3mA	≤5mA
Max. Load Current	100mA	100mA	100mA	100mA	200mA
Voltage Drop Across Sensor	≤5V	≤5V	≤5V	≤5V	≤6.5V
Max. Leakage Current	≤0.5mA	≤0.5mA	≤0.5mA	≤0.5mA	≤1.5mA
Switching Frequency	500Hz	500Hz	500Hz	500Hz	1000Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material	PBTP	PBTP	PBTP	PBTP	PBTP

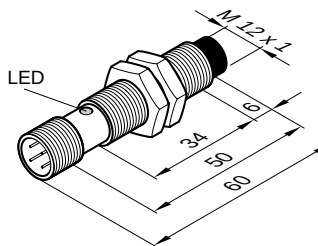
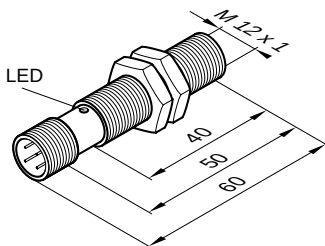
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



65 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.5 mm = .06 in.	23.0 mm = .08 in.
2.0 mm = .08 in.	28.0 mm = 1.10 in.
4.0 mm = .16 in.	30.0 mm = 1.18 in.
5.0 mm = .20 in.	32.0 mm = 1.26 in.
6.0 mm = .23 in.	34.0 mm = 1.34 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
10.0 mm = .39 in.	50.0 mm = 1.97 in.
12.0 mm = .47 in.	51.0 mm = 2.01 in.
15.0 mm = .59 in.	60.0 mm = 2.36 in.
18.0 mm = .70 in.	80.0 mm = 3.12 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector 8000-5110 PVC, Straight
65 Connector 8000-5120 PVC, Right Angle

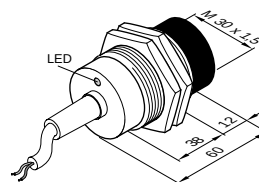
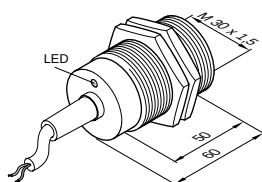
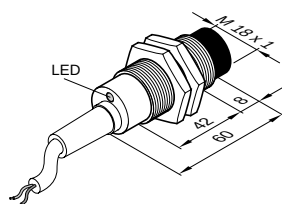
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

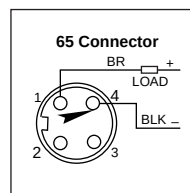
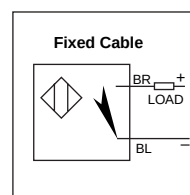
M18 Non-Flush Mount 8mm (.31 in.)	M30 Flush Mount 10mm (.39 in.)	M30 Non-Flush Mount 15mm (.59 in.)
Cable	Cable	Cable
9964-5500	9966-5400	9966-5500
≤10%	≤10%	≤10%
10V-55V	10V-55V	10V-55V
≤5mA	≤5mA	≤5mA
200mA	200mA	200mA
≤6.5V	≤6.5V	≤6.5V
≤1.5mA	≤1.5mA	≤1.5mA
500Hz	500Hz	300Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.80mm (.03 in.)	1mm (.039 in.)	1.5mm (.059 in.)
PBTP	PBTP	PBTP

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



AC - 2 WIRE
STANDARD SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
90-250V AC, 180 mA,
1 LED for Output Energized

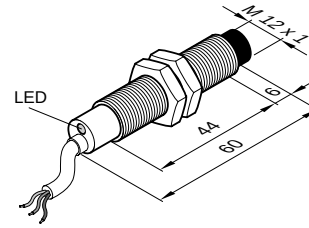
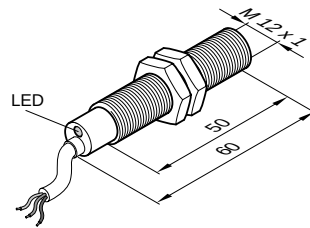
- **Most complete range of Fixed Cable and Quick Disconnect Styles**
- **Available in normally open (N.O.) and normally closed (N.C.) output configuration**
- **This series features the 360° LED viewing connector type "67"**
- **Carries C mark**

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount					M12 Non-Flush Mount			
Sensing Distance 2mm (.08 in.)					4mm (.16 in.)			
Cable or Connector Style Cat. No.	Cable	62	66/67	68	Cable	62	66/67	68
Normally Open 	9952-0500	9952-0562	9952-0566 9952-0567	9952-0568	9952-0400	9952-0462	9952-0466 9952-0467	9952-0468
Normally Closed 	9952-0900		9952-0966 9952-0967	9952-0968	9952-0800		9952-0866 9952-0867	9952-0868
Voltage Range	90V-250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V
Operating Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Supply Current	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA
Max. Load Current	180 mA	100 mA	180 mA	180 mA	180 mA	180 mA	180 mA	180 mA
Voltage Drop Across Sensor	≤8V	≤8V	≤8V	≤8V	≤8V	≤8V	≤8V	≤8V
Max. Leakage Current	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V	≤3mA/220V ≤1.5mA/110V
Short Term Current (20ms 1Hz)	1A	1A	1A	1A	1A	1A	1A	1A
Switching Frequency	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V
Hysteresis	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability	.2mm (.008in.)	.2mm (.008in.)	.2mm (.008in.)	.2mm (.008in.)	.4mm (.016in.)	.4mm (.016in.)	.4mm (.016in.)	.4mm (.016in.)
Front Cap Material	PBTP	PBTP	PBTP	PBTP	PBTB	PBTB	PBTB	PBTB

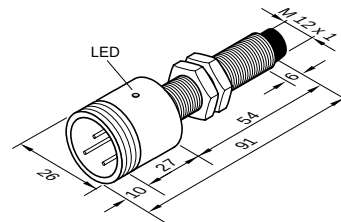
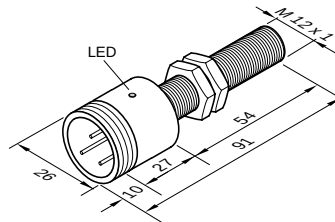
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



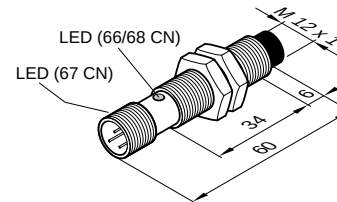
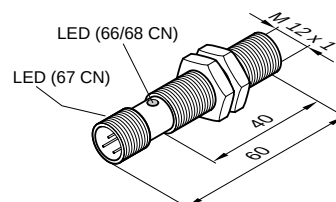
62 Style Connector

3-pin, Mini style, 25mm (1.0 in.) supplied with Brass, Nickel Plated (BN) locknuts.



66/67/68 Style Connectors

The 66/67 connectors are 4-pin, (68 connector, 3-pin), Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts. The 67 Connector is clear, offering 360° LED viewing.



Metric/in. Conversion Table

1.0 mm = .04 in.	29.0 mm = 1.14 in.
5.0 mm = .20 in.	34.0 mm = 1.34 in.
6.0 mm = .23 in.	35.0 mm = 1.37 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
12.0 mm = .47 in.	43.0 mm = 1.69 in.
23.0 mm = .90 in.	50.0 mm = 1.47 in.
28.0 mm = 1.10 in.	60.0 mm = 2.36 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

62 Connector	8000-5030	PVC, Straight
66/67 Connector	8000-5060	PVC, Right Angle
66/67 Connector	8000-5070	PVC, Straight
68 Connector	8000-5130	PVC Straight
68 Connector	8000-5140	Right Angle

Change last digit of connector number to 5 for 5 meter cable

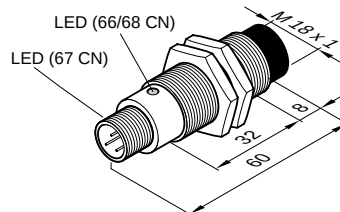
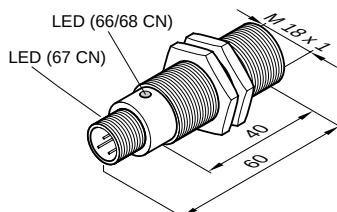
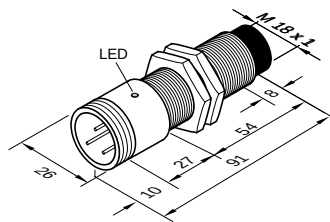
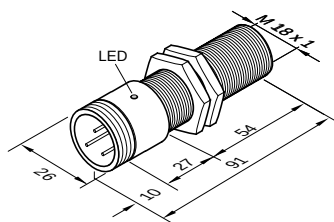
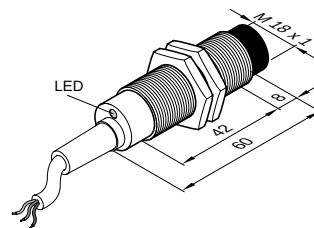
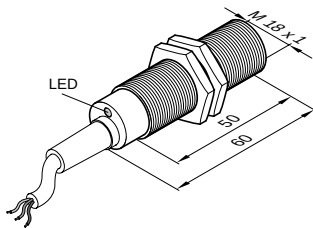
Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount 5mm (.02 in.)

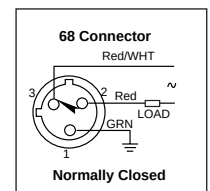
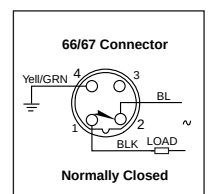
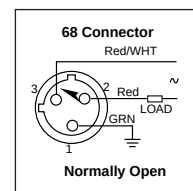
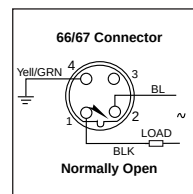
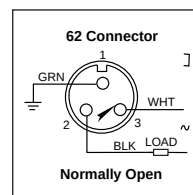
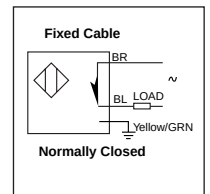
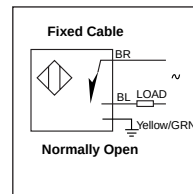
Cable	62	66/67	68	Cable	62	66/67	68
9954-2200	9954-2262	9954-2266 9954-2267	9954-2268	9954-1900	9954-1962	9954-1966 9954-1967	9954-1968
9954-2600		9954-2666 9954-2667	9954-2668	9954-2500			9954-2568
90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V
50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA
180 mA	180 mA	180 mA	180 mA	180 mA	180 mA	180 mA	180 mA
≤8V	≤8V	≤8V	≤8V	≤8V	≤8V	≤8V	≤8V
≤3mA/220V	≤3mA/220V	≤3mA/220V	≤3mA/220V	≤3mA/220V	≤3mA/220V	≤3mA/220V	≤3mA/220V
≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V
1A	1A	1A	1A	1A	1A	1A	1A
15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V
≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
.5mm (.02in.)	.5mm (.02in.)	.5mm (.02in.)	.5mm (.02in.)	.8mm (.03in.)	.8mm (.03in.)	.8mm (.03in.)	.8mm (.03in.)
PBTB	PBTB	PBTB	PBTB	PBTB	PBTB	PBTB	PBTB

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



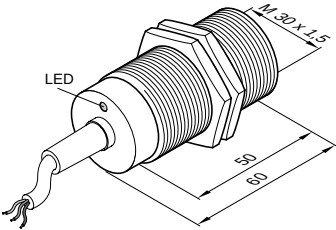
AC - 2 WIRE
STANDARD SERIES
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
90-250V AC, 180 mA,
1 LED for Output Energized

- Most complete range of Fixed Cable and Quick Disconnect Styles
 - Available in normally open (N.O.) and normally closed (N.C.) output configuration
 - This series features the 360° LED viewing connector type "67"
 - Carries Ⓢ mark
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
 - Temperature Range: -25 to 70°C (-13 to 158°F)

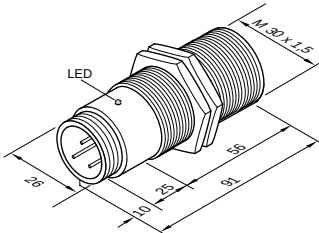
M30 Flush Mount
10mm (.39 in.)

Sensing Distance		10mm (.39 in.)				
Cable or Connector Style	Cat. No.	Cable	62	66	67	68
Normally Open		9956-1500	9956-1562	9956-1566	9956-1567	9956-1568
Normally Closed		9956-1900				9956-1968
Voltage Range		90V - 250V	90V - 250V	90V - 250V	90V - 250V	90V - 250V
Operating Frequency		50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Supply Current		5 mA	5 mA	5 mA	5 mA	5 mA
Max. Load Current		180 mA	100 mA	180 mA	180 mA	180 mA
Voltage Drop Across Sensor		≤8V	≤8V	≤8V	≤8V	≤8V
Max. Leakage Current		≤3A/220V ≤1.5mA/110V	≤3A/220V ≤1.5mA/110V	≤3A/220V ≤1.5mA/110V	≤3A/220V ≤1.5mA/110V	≤3A/220V ≤1.5mA/110V
Short Term Current (20ms 1Hz)		1A	1A	1A	1A	1A
Switching Frequency		15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V
Hysterisis		≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift		≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability		1mm (.039 in.)	1mm (.039 in.)	1mm (.039 in.)	1mm (.039 in.)	1mm (.039 in.)
Front Cap Material		PBTP	PBTP	PBTP	PBTP	PBTB

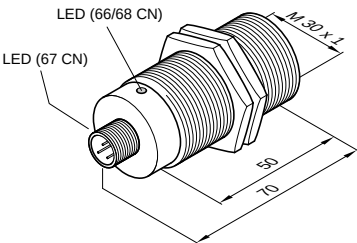
Fixed Cable
PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



62 Style Connector
3-pin, Mini style, 25mm (1.0 in.) supplied with Brass, Nickel Plated (BN) locknuts.



66/67/68 Style Connectors
The 66/67 connectors are 4-pin, (68 connector, 3-pin), Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts . The 67 Connector is clear, offering 360° LED viewing.



Metric/in. Conversion Table

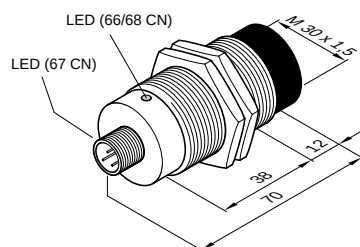
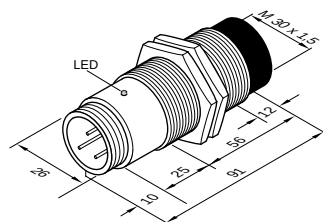
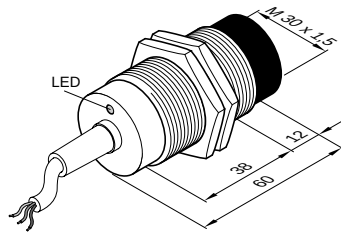
1.0 mm = .04 in.	29.0 mm = 1.14 in.
5.0 mm = .20 in.	34.0 mm = 1.34 in.
6.0 mm = .23 in.	35.0 mm = 1.37 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
12.0 mm = .47 in.	43.0 mm = 1.69 in.
23.0 mm = .90 in.	50.0 mm = 1.97 in.
28.0 mm = 1.10 in.	60.0 mm = 2.36 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

M30 Non-Flush Mount 15mm (0.59 in.)

Cable	62	66	67	68
9956-1400	9956-1462	9956-1466	9956-1467	9956-1468
9956-1800				9956-1868
90V - 250V	90V - 250V	90V - 250V	90V - 250	90V - 250V
50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
5 mA	5 mA	5 mA	5 mA	5 mA
180 mA	180 mA	180 mA	180 mA	180 mA
≤8V	≤8V	≤8V	≤8V	≤8V
≤3A/220V	≤3A/220V	≤3A/220V	≤3A/220V	≤3A/220V
≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V	≤1.5mA/110V
1A	1A	1A	1A	1A
15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V	15Hz/220V
≤15%	≤15%	≤15%	≤15%	≤15%
≤10%	≤10%	≤10%	≤10%	≤10%
1.5mm (.059in.)	1.5mm (.059 in.)	.4mm (.016in.)	.4mm (.016in.)	.5mm (.02in.)
PBTB	PBTB	PBTB	PBTB	PBTB

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

62 Connector	8000-5030	PVC, Straight
66/67 Connector	8000-5060	PVC, Right Angle
66/67 Connector	8000-5070	PVC, Straight
68 Connector	8000-5130	PVC Straight
68 Connector	8000-5140	Right Angle

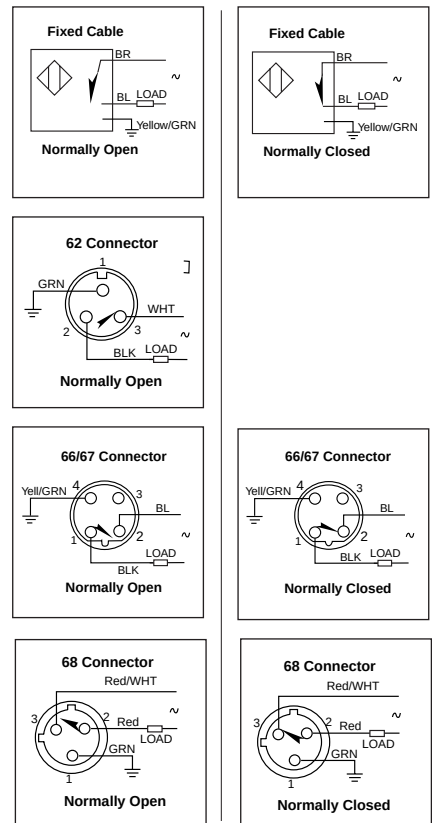
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



**AC - 2 WIRE - EXTENDED
VOLTAGE RANGE – Brass, Nickel
Plated (BN), and TROGAMID T
Cylindrical, Threaded,
20-250V AC, 500 mA,
1 LED for Output Energized**

- **Higher Current Rating**
- **Wider Voltage Range**
- **Carries ζ mark**

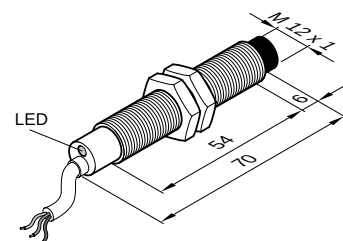
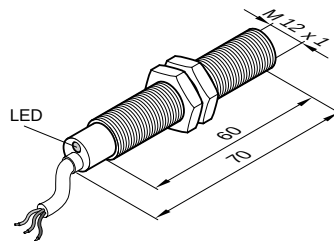
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range:
-25 to 70°C (-13 to 158°F)

M12 Flush Mount				M12 Non-Flush Mount		
Sensing Distance 2mm (.08 in.)				4mm (.16 in.)		
Cable or Connector Style Cat. No.	Cable	Cable	68	Cable	Cable	68
Normally Open 	9924-0500	9924-1100	9924-0568	9924-0700	9924-1000	9924-0768
Normally Closed 	9924-0400	9924-1300	9924-0468	9924-0900	9924-1200	9924-0968
Voltage Range	20V-250V	20V - 250V	20V - 250V	20V - 250V	20V - 250V	20V - 250V
Operating Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Supply Current	2 mA	2 mA	2 mA	2 mA	2 mA	2 mA
Max. Load Current	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA
Voltage Drop Across Sensor	≤5V	≤5V	≤5V	≤5V	≤5V	≤5V
Max. Leakage Current	≤2mA	≤2mA	≤2mA	≤2mA	≤2mA	≤2mA
Short Term Current (20 ms, 1Hz)	2A	2A	2A	2A	2A	2A
Switching Frequency	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%	≤10%	≤10%
Repeatability	.20mm (.008 in.)	.20mm (.008 in.)	.20mm (.008 in.)	.40mm (.016 in.)	.40mm (.016 in.)	.40mm (.016 in.)
Front Cap Material	PBTP	PBTP	PBTP	PBTB	PBTB	PBTB
Housing Material	Nickel Plated Brass	Trogamid T	Nickel Plated Brass	Nickel Plated Brass	Trogamid T	Nickel Plated Brass

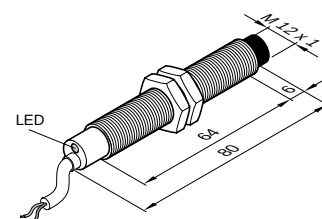
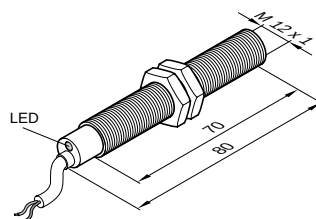
Nickel Plated Brass Housings

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with non-metallic locknuts for Trogamid T housings and Nickel Plated (BN) locknuts for Nickel Plated Brass housings.

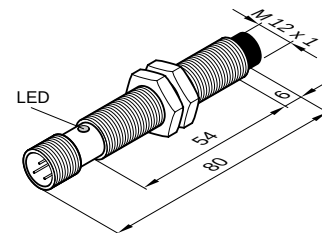
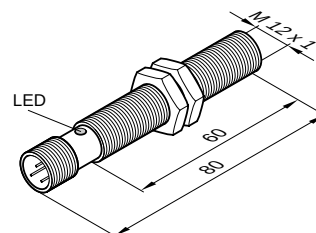


Trogamid T Housings



68 Style Connectors

3-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm = .04 in.	60.0 mm = 2.36 in.
6.0 mm = .23 in.	64.0 mm = 2.52 in.
8.0 mm = .31 in.	70.0 mm = 2.75 in.
12.0 mm = .47 in.	80.0 mm = 3.15 in.
54.0 mm = 2.12 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

68 Connector 8000-5130 PVC Straight
68 Connector 8000-5140 Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount

5mm (0.2 in.)

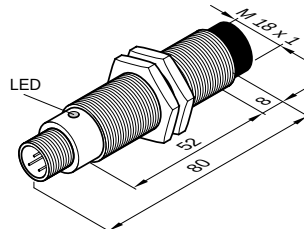
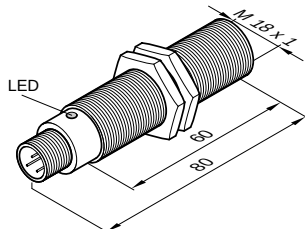
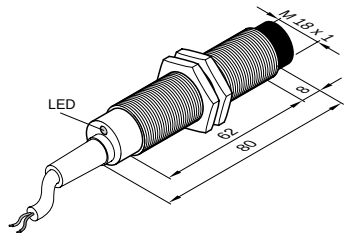
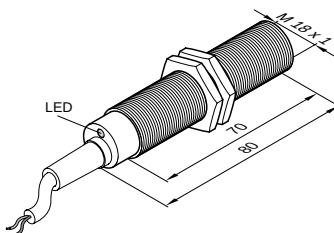
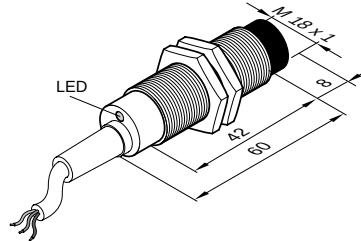
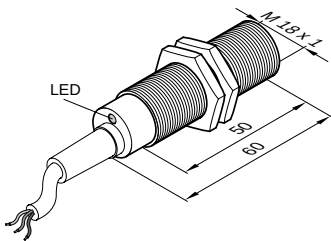
Cable	Cable	68
9921-1200	9921-2000	9921-1268
9921-1300	9921-2100	9921-1368
20V - 250V	20V - 250V	20V - 250V
50/60Hz	50/60Hz	50/60Hz
2 mA	2 mA	2 mA
500 mA	500 mA	500 mA
≤5V	≤5V	≤5V
≤2mA	≤2mA	≤2mA
8A	8A	8A
15Hz	15Hz	15Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.50mm (.02 in.)	.50mm (.02 in.)	.50mm (.02 in.)
PBTB	PBTB	PBTB
Nickel Plated Brass	Trogamid T	Nickel Plated Brass

M18 Non-Flush Mount

8mm (0.3 in.)

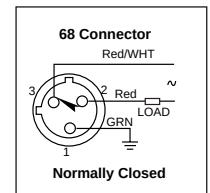
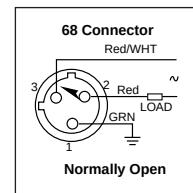
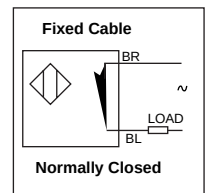
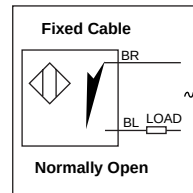
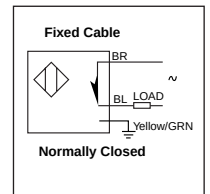
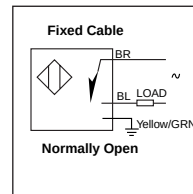
Cable	Cable	68
9921-1500	9921-2200	9921-1568
9921-1700	9921-2300	9921-1768
20V - 250V	20V - 250V	20V - 250V
50/60Hz	50/60Hz	50/60Hz
2 mA	2 mA	2 mA
500 mA	500 mA	500 mA
≤5V	≤5V	≤5V
≤2mA	≤2mA	≤2mA
8A	8A	8A
15Hz	15Hz	15Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
.8mm (.039 in.)	.8mm (.039 in.)	.8mm (.039 in.)
PBTB	PBTB	PBTB
Nickel Plated Brass	Trogamid T	Nickel Plated Brass

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



AC - 2 WIRE - EXTENDED
VOLTAGE RANGE – Brass, Nickel
Plated (BN), and TROGAMID T
Cylindrical, Threaded,
20-250V AC, 500 mA,
1 LED for Output Energized

- Higher Current Rating
- Wider Voltage Range
- Carries C€ mark
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range:
-25 to 70°C (-13 to 158°F)

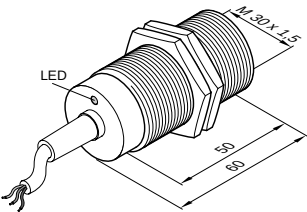
M30 Flush Mount

Sensing Distance		10mm (0.39 in.)		
Cable or Connector Style Cat. No.		Cable	Cable	68
Normally Open		9916-2600	9916-2900	9916-2668
Normally Closed		9916-2100	9916-2400	9916-2168
Voltage Range		20V-250V	20V - 250V	20V - 250V
Operating Frequency		50/60Hz	50/60Hz	50/60Hz
Supply Current		2 mA	2 mA	2 mA
Max. Load Current		500 mA	500 mA	500 mA
Voltage Drop Across Sensor		≤5V	≤5V	≤5V
Max. Leakage Current		≤2mA	≤2mA	≤2mA
Short Term Current (20 ms, 1Hz)		8A	8A	8A
Switching Frequency		15Hz	15Hz	15Hz
Hysteresis		≤15%	≤15%	≤15%
Temperature Drift		≤10%	≤10%	≤10%
Repeatability		1mm (.039 in.)	1mm (.039 in.)	1mm (.039 in.)
Front Cap Material		PBTP	PBTP	PBTP
Housing Material		Nickel Plated Brass	Trogamid T	Nickel Plated Brass

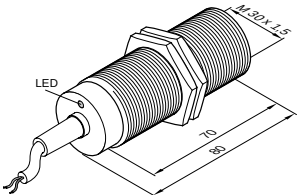
Nickel Plated Brass Housings

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with non-metallic locknuts for Trogamid T housings and Brass, Nickel Plated (BN) locknuts for Nickel Plated Brass housings.

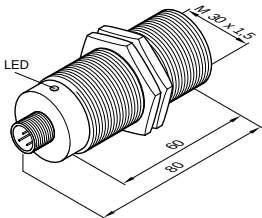


Trogamid T Housings



68 Style Connectors

3-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

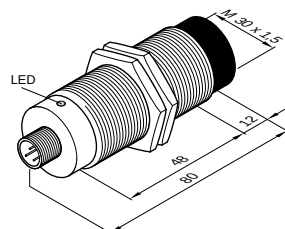
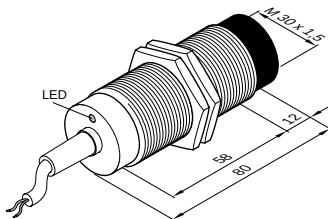
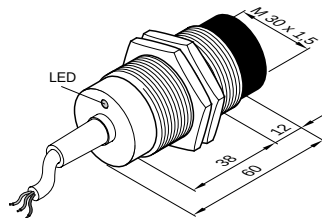
1.5 mm = .06 in.	50.0 mm = 1.96 in.
12.0 mm = .47 in.	58.0 mm = 2.28 in.
30.0 mm = 1.18 in.	60.0 mm = 2.36 in.
38.0 mm = 1.50 in.	80.0 mm = 3.15 in.
48.0 mm = 1.89 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

M30 Non-Flush Mount 15mm (0.59 in.)

Cable	Cable	68
9916-2700	9916-3000	9916-2768
9916-2300	9916-2500	9916-2368
20V - 250V	20V - 250V	20V - 250V
50/60Hz	50/60Hz	50/60Hz
2 mA	2 mA	2 mA
500 mA	500 mA	500 mA
≤5V	≤5V	≤5V
≤2mA	≤2mA	≤2mA
8A	8A	8A
15Hz	15Hz	15Hz
≤15%	≤15%	≤15%
≤10%	≤10%	≤10%
1.5mm (.059 in.)	1.5mm (.059 in.)	1.5mm (.059 in.)
PBTB	PBTB	PBTB
Nickel Plated Brass	Trogamid T	Nickel Plated Brass

Note: Sensor dimensions in mm.



Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

68 Connector 8000-5130 PVC Straight
68 Connector 8000-5140 Right Angle

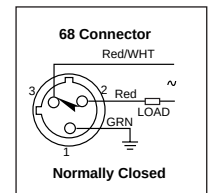
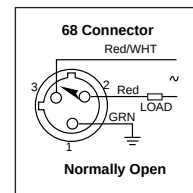
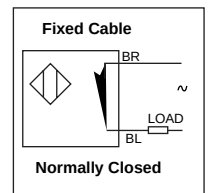
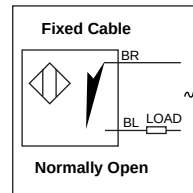
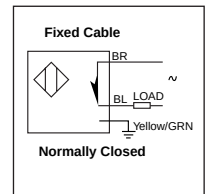
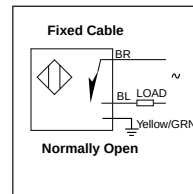
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



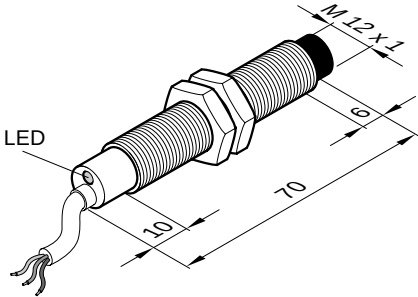
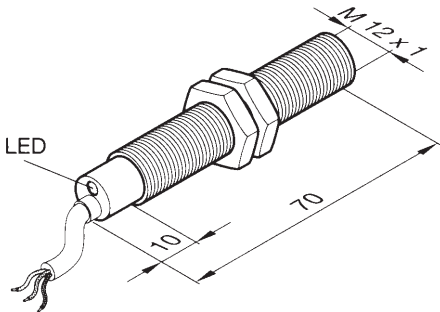
AC - 2 WIRE – WELD IMMUNE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
20-250V AC, 300mA/500mA
1 LED for Output Energized

- *Circuitry that protects for electro-magnetic interference*
- *Flush models have teflon ceramic coatings to protect for weld slag*
- *Carries Ⓢ mark*
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

M12 Flush Mount			M12 Non-Flush Mount	
Sensing Distance	2mm (.08 in.)		4mm (.16 in.)	
Cable or Connector Style Cat. No.	Cable	48	Cable	68
Normally Open 	9952-5840	9952-5848	9952-5900	9952-5968
Normally Closed 	9952-5640	9952-5648	9952-5700	9952-5768
Voltage Range	20V-250V	20V - 250V	20V - 250V	20V - 250V
Operating Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Supply Current	2 mA	2 mA	2 mA	2 mA
Max. Load Current	300 mA	300 mA	300 mA	300 mA
Voltage Drop Across Sensor	≤5V	≤5V	≤5V	≤5V
Max. Leakage Current	≤2 mA	≤2 mA	≤2 mA	≤2 mA
Short Term Current (20 ms, 1Hz)	2A	2A	2A	2A
Switching Frequency (at Resistance Load of 150 mA)	15 Hz	15 Hz	15Hz	15 Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.10mm (.004 in.)	.10mm (.004 in.)	.2mm (.008 in.)	.2mm (.008 in.)
Front Cap Material	Teflon	Teflon	PBTB	PBTB
Housing Material	Teflon Plated Brass	Teflon Plated Brass	Nickel Plated Brass	Nickel Plated Brass

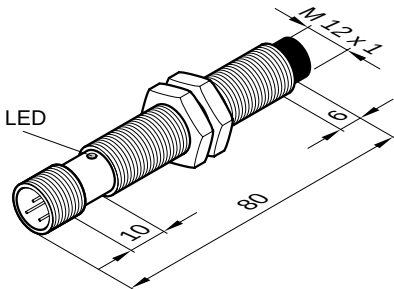
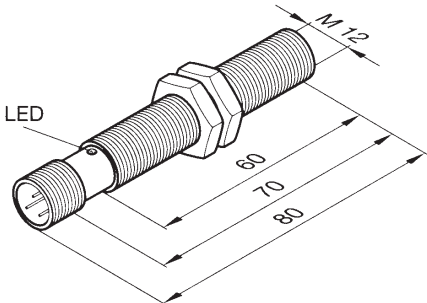
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



48/68 Style Connector

3-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.0 mm	= .04 in.
6.0 mm	= .23 in.
8.0 mm	= .31 in.
10.0 mm	= .39 in.
12.0 mm	= .47 in.
18.0 mm	= .70 in.
60.0 mm	= 2.36 in.
70.0 mm	= 2.75 in.
80.0 mm	= 3.15 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

48/68 Connector 8000-5130 PVC, Straight
48/68 Connector 8000-5140 Right Angle

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

M18 Flush Mount

5mm (.20 in.)

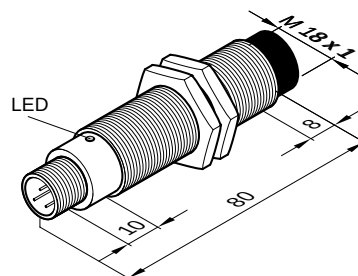
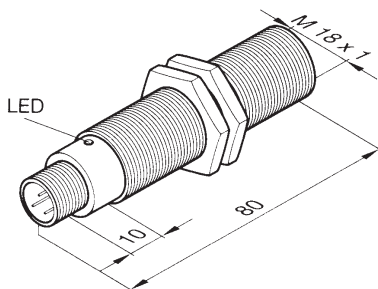
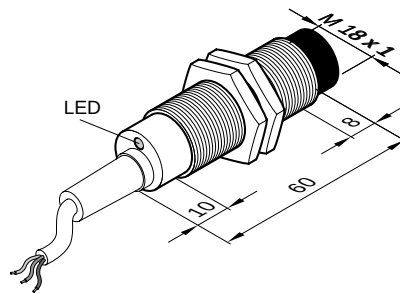
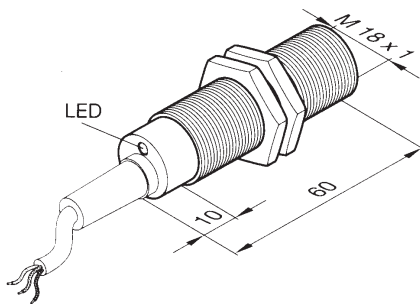
Cable	48
9954-5840	9954-5848
9954-5640	9954-5648
20V - 250V	20V - 250V
50/60Hz	50/60Hz
2 mA	2 mA
500 mA	500 mA
≤5V	≤5V
≤2 mA	≤2 mA
8A	8A
15 Hz	15 Hz
≤15%	≤15%
≤10%	≤10%
.25mm (.01 in.)	.25mm (.01 in.)
Teflon	Teflon
Teflon Plated Brass	Teflon Plated Brass

M18 Non-Flush Mount

8mm (.31 in.)

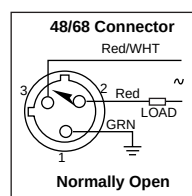
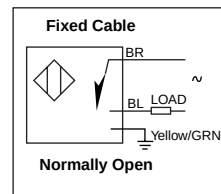
Cable	68
9954-5900	9954-5968
9954-5700	9954-5768
20V - 250V	20V - 250V
50/60Hz	50/60Hz
2 mA	2 mA
500 mA	500 mA
≤5V	≤5V
≤2 mA	≤2 mA
8A	8A
15 Hz	15 Hz
≤15%	≤15%
≤10%	≤10%
.4mm (.016 in.)	.4mm (.016 in.)
PBTB	PBTB
Nickel Plated Brass	Nickel Plated Brass

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



AC - 2 WIRE – WELD IMMUNE
Brass, Nickel Plated (BN),
Cylindrical, Threaded,
20-250V AC, 300/500mA
1 LED for Output Energized

- *Circuitry that protects for electro-magnetic interference*
- *Flush models have teflon ceramic coatings to protect for weld slag*
- *Carries CE mark*

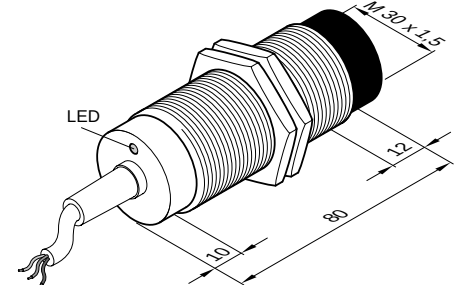
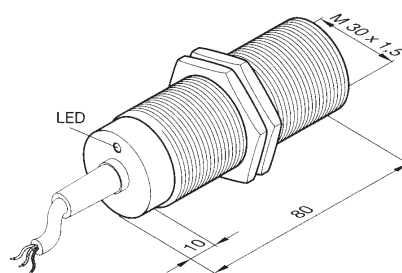
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range:
-25 to 70°C (-13 to 158°F)

M30 Flush Mount			M30 Non-Flush Mount	
Sensing Distance	10mm (.39 in.)		15mm (.59 in.)	
Cable or Connector Style Cat. No.	Cable	48	Cable	68
Normally Open 	9956-5840	9956-5848	9956-5900	9956-5968
Normally Closed 	9956-5640	9956-5648	9956-5700	9956-5768
Voltage Range	20V-250V	20V - 250V	20V - 250V	20V - 250V
Operating Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Supply Current	2 mA	2 mA	2 mA	2 mA
Max. Load Current	500 mA	500 mA	500 mA	500 mA
Voltage Drop Across Sensor	≤5V	≤5V	≤5V	≤5V
Max. Leakage Current	≤2 mA	≤2 mA	≤2 mA	≤2 mA
Short Term Current (20 ms, 1Hz)	8A	8A	8A	8A
Switching Frequency (at Resistance Load of 150 mA)	15 Hz	15 Hz	15 Hz	15Hz
Hysteresis	≤15%	≤15%	≤15%	≤15%
Temperature Drift	≤10%	≤10%	≤10%	≤10%
Repeatability	.5mm (.02 in.)	.5mm (.02 in.)	.75mm (.03 in.)	.75mm (.03 in.)
Front Cap Material	Teflon	Teflon	PBTB	PBTB
Housing Material	Teflon Plated Brass	Teflon Plated Brass	Nickel Plated Brass	Nickel Plated Brass

Note: Sensor dimensions in mm.

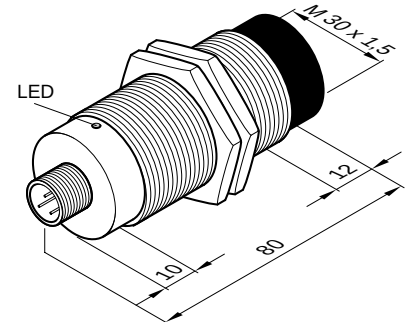
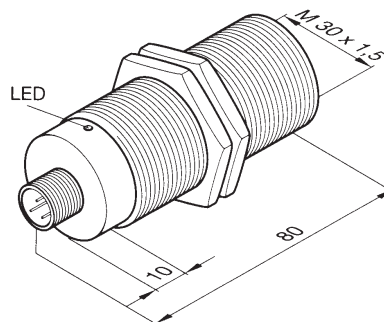
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech. Supplied with Brass, Nickel Plated (BN) locknuts.



48/68 Style Connector

4-pin, Micro style, 12mm (.47 in.) supplied with Brass, Nickel Plated (BN) locknuts.



Metric/in. Conversion Table

1.5 mm	= .06 in.
10.0 mm	= .39 in.
12.0 mm	= .47 in.
30.0 mm	= 1.18 in.
80.0 mm	= 3.15 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

48/68 Connector 8000-5130 PVC, Straight

48/68 Connector 8000-5140 Right Angle

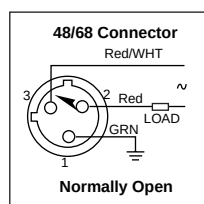
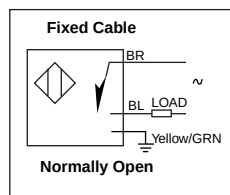
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

**Mounting Brackets –
see Pages 114-115**

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech





Limit Style Sensors

LIMIT STYLE INDUCTIVE PROXIMITY SENSORS

The Limit Style Inductive Proximity Sensor features a housing with a similar outline of a mechanical Limit Switch which it has replaced in many applications. All Altech Limit Style models are 41mm (1.61 in.) x 40mm (1.57 in.) x 121 mm (4.76 in.). The Altech Versa Prox[®] construction features a rugged design that is capable of moving the sensing head into 17 unique positions. Once the positioning is completed, the Versa Prox[®] can be snapped and locked into position with no screws.

For connecting wiring to the Versa Prox[®], the unit separates once the locking mechanism is disengaged, and a terminal strip is available for connections. The hole opening is a threaded 1/2" 14NPT. Please see page 70 for detailed instruction for adjustments.

The Versa Prox[®] has 2 LED and 3 LED models, they have program-mable, Normally Open or Normally Closed outputs, and both Flush or Non-Flush models are available. All sensors meet IP67 (NEMA 1,3,4,6,12,13) protection levels.

FLUSH MOUNT SENSORS

Flush Mounted Sensors have electromagnetic fields concentrated directly in front of the sensing head and may be mounted directly into metal mounting brackets or embedded directly into metal without causing a false output. **Figure 9** illustrates that on Limit Style sensors there should be at least the sensor width separating adjacent sensors. Also, no non-target metal should be less than 3 times the sensing distance S_n directly across the sensor. Two sensors directly across from each other should be greater than 6 times the sensing distance S_n .

Sensing Distances – AC, DC, AC/DC Limit Style Proximity Sensors

Type	Voltage	Flush*	Partially Flush*	Non-Flush*
Versa Prox [®]	AC, DC, AC/DC	20		40
Standard	AC, DC	15		40
Weld Immune	AC, DC	15	25	
Analog	DC			10-20

*All Sensing Distances in mm.

Operating Voltages – Limit Style

AC	20 - 250	
DC	10 - 30	10 - 60
AC/DC	20 - 250	

Operating Current– Limit Style

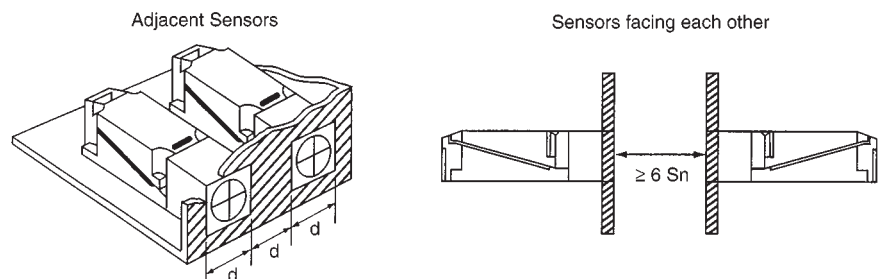
AC	500 mA	500 mA	
DC	120 mA	400 mA	5 mA
AC/DC	400 mA		

Sensor Wiring Systems – Limit Style

AC	2-Wire
DC	3-Wire
AC/DC	2-Wire

Fig. 9

FLUSH MOUNT INSTALLATION



NON-FLUSH MOUNT SENSORS

Non-Flushed Mounted Sensors have electromagnetic fields with a wide sensing angle and are internally unshielded (no metal surrounds the sensing head). Care must be taken to insure that no non-target metal comes in the sensing head area as shown in **Figure 10**. The sensing head must extend 40mm(1.57 in.) in front of metal, two sensors directly across from each other should be greater than 6 times S_n , the sensing distance. Adjacent sensors should be spaced greater than 280 mm (11.02 in.) center-to-center.

OUTPUT CONNECTIONS

- 1/2" - 14NPT Threaded Hole Opening and Terminal Block.
- Micro Style Quick Disconnect Connector.

HOUSING MATERIAL

PA6.6 (GV-30) – Versa Prox® Models.
Trogamid T – Standard Models.

DC VOLTAGE LED FUNCTIONS

L Series

Condition	LED Color
Power	Green
Output	Orange
Overload	Green LED Flashes

GL Series

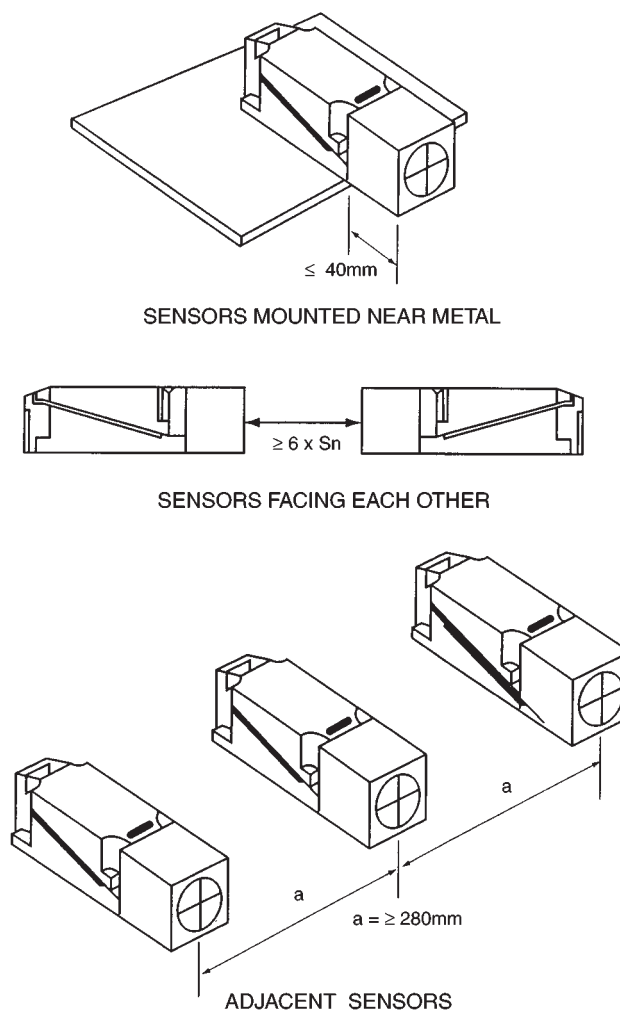
Condition	LED Color
Power	Green
Output	Orange
Adjust	Red
Unsafe Condition	Red (Adjust) LED flashes when target is detected.
Correct Setting	Orange (Output) LED lights when distance is reduced

AC VOLTAGE LED FUNCTIONS

Condition	LED Color
Power	Green
Output	Orange

Fig. 10

NON-FLUSH MOUNT INSTALLATION



AC/DC VOLTAGE LED FUNCTIONS

Condition	LED Color
Power	Green
Output	Orange
Overload/Short Circuit	Green LED flashes. To reset sensor, disconnect supply voltage for 2 seconds.

DC LIMIT SWITCHES – SELECTION GUIDE

Series	Sensing Distance (mm)					Mounting			Function Programmable				No. Wires	Sensing Head Positions	No. LED's	Connection		Page
	10	15	20	25	40	FL	NF	PF	PNP	NPN	NO	NC				Term. Strip	65	
L Series 10-30V DC, 120 mA • Economical • Snap & Lock construction • 17 position sensing head																		
			•		•	•	•		•	•	•		3	17	2	•	•	72
GL Series 10-60V DC, 400 mA • Snap & Lock construction • 17 position sensing head • 3 LED's																		
			•		•	•	•		•	•	•		3	17	3	•	•	73
AC/DC Series 20-250V AC/DC, 400 mA • Snap & Lock construction • 17 position sensing head • Includes short circuit protection																		
			•		•	•	•				•		2	17	2	•		74
Weld Immune 10-30V DC, 200 mA • Protection from electro-magnetic interference • Flush mount units have Teflon coating • 9 position sensing head																		
		•		•		•		•	•		•		3	9	2	•		76
Analog Series 18-30V DC, 5 mA • Output 1-9V proportional to target distance • ±3% linearity																		
	•		•					•					3	9	0	•		75

AC LIMIT SWITCHES – SELECTION GUIDE

Series	Sensing Distance (mm)					Mounting			Function Programmable		No. Wires	Sensing Head Positions	No. LED's	Connection		Page
	10	15	20	25	40	FL	NF	PF	NO	NC				Terminal Strip		
GL Series 20-250V AC, 500 mA • Snap & Lock construction • 17 position sensing head • Extended sensing range																
			•		•	•	•			•	2	17	2	•		77
AC/DC Series 20-250V AC/DC, 400 mA • Snap & Lock construction • 17 position sensing head • Includes short circuit protection																
			•		•	•	•			•	2	17	2	•		74
Weld Immune 20-250V AC, 500 mA • Protection from electro-magnetic interference • Teflon coating on flush mount unit • 9 position sensing head																
		•		•		•		•		•	2	9	2	•		78

DC - 3 WIRE – L SERIES
VERSA PROX LIMIT STYLE
Polyamide (PA 6.6) Housing
10-30V DC, 120mA
2 LEDs for Operating
Voltage & Output Energized

- 17 rotatable sensing head positions
- Programmable NO/NC outputs
- Rugged Housing
- Snap-together construction
- Separable mounting base
- Carries C mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

3.0 mm = .11 in.	41 mm = 1.61 in.
5.0 mm = .20 in.	60 mm = 2.36 in.
7.0 mm = .27 in.	121 mm = 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

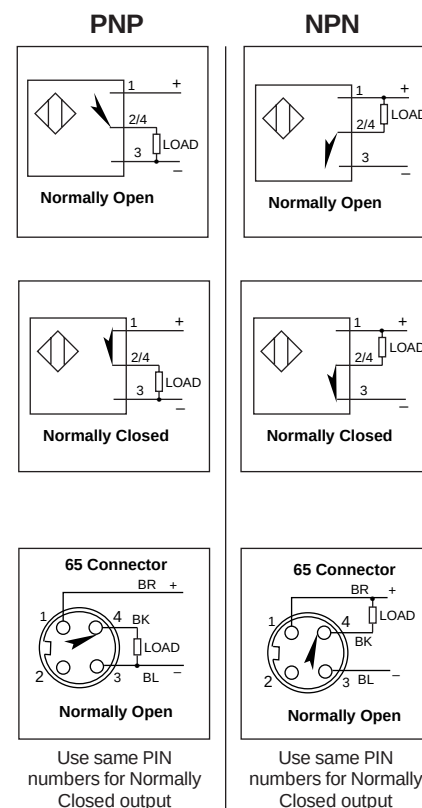
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

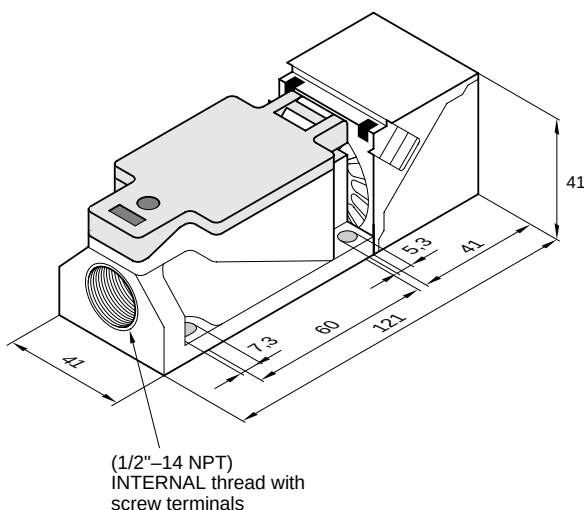


	Flush Mount	Non-Flush Mount
Sensing Distance	20mm (.79 in.)	40mm (1.57 in.)
Cable or Connector Style Cat. No.	Screw Terminal	Screw Terminal
PNP (Programmable NO/NC)	9883-2033	9883-2233
NPN (Programmable NO/NC)	9883-2333	9883-2533
Ripple Voltage	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V
Supply Current	≤10 mA	≤10 mA
Max. Load Current	120 mA	120 mA
Voltage Drop Across Sensor	≤1.5V	≤1.5V
Max. Leakage Current	≤10 µA	≤10 µA
Switching Frequency	100 Hz	50 Hz
Hysteresis	≤20%	≤20%
Temperature Drift	≤10%	≤10%
Repeatability	1.0mm (.04 in.)	2mm (.079 in.)

Note: Sensor dimensions in mm.

Screw Terminals

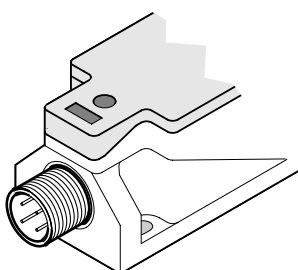
Screw terminals are located internally in housing for wire connections



Alternative Connector Style

65 Style Connector –
 4-pin Micro style, 12mm (.47 in.).

Flush		Non-Flush	
PNP	NPN	PNP	NPN
9883-2065	9883-2365	9883-2265	9883-2565



DC - 3 WIRE – GL SERIES VERSA PROX LIMIT STYLE Polyamide (PA 6.6) Housing 10-60V DC, 400mA 3 LEDs for Operating Voltage, Output Energized, and Set-up aid

- 17 rotatable sensing head positions
- Programmable NO/NC outputs
- Rugged Housing
- Snap-together construction
- Separable mounting base
- Carries C mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

3.0 mm = .11 in.	41 mm = 1.61 in.
5.0 mm = .20 in.	60 mm = 2.36 in.
7.0 mm = .27 in.	121 mm = 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

65 Connector	8000-5110	PVC, Straight
65 Connector	8000-5120	PVC, Right Angle
65 Connector	8000-5150	PVC, Right Angle, 2LED, NPN
65 Connector	8000-5160	PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

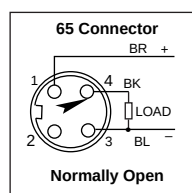
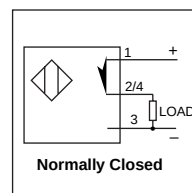
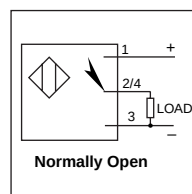
Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

Wiring Diagrams

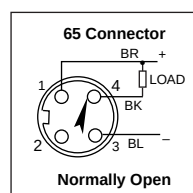
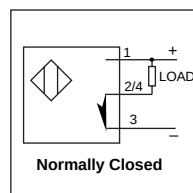
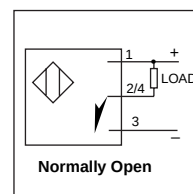
Note: Wire colors are applicable on cables purchased from Altech

PNP



Use same PIN numbers for Normally Closed output

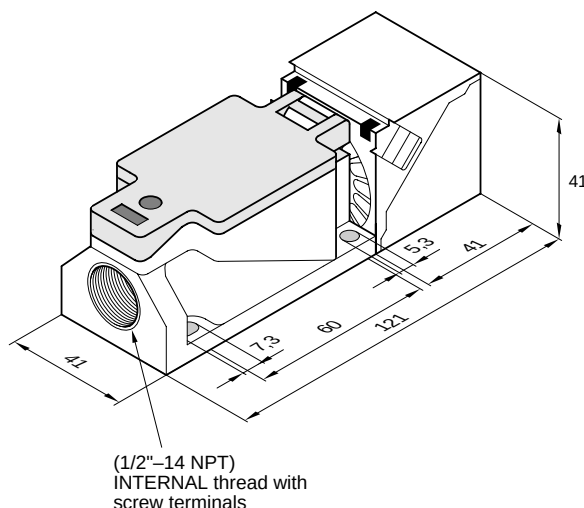
NPN



Use same PIN numbers for Normally Closed output

	Flush Mount	Non-Flush Mount
Sensing Distance	20mm (.79 in.)	40mm (1.57 in.)
Cable or Connector Style Cat. No.	Screw Terminal	Screw Terminal
PNP (Programmable NO/NC)	9883-3033	9883-3233
NPN (Programmable NO/NC)	9883-3333	9883-3533
Ripple Voltage	≤10%	≤10%
Voltage Range	10V-60V	10V - 60V
Supply Current	≤15 mA	≤15 mA
Max. Load Current	400 mA	400 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V
Max. Leakage Current	≤10 μA	≤10 μA
Switching Frequency	150 Hz	70 Hz
Hysteresis	≤20%	≤20%
Temperature Drift	≤10%	≤10%
Repeatability	1.0mm (.04 in.)	2.0mm (.079 in.)

Note: Sensor dimensions in mm.



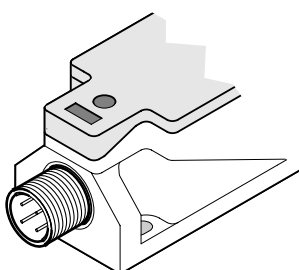
Screw Terminals

Screw terminals are located internally in housing for wire connections

Alternative Connector Style

65 Style Connector –
4-pin Micro style, 12mm (.47 in.).

Flush		Non-Flush	
PNP	NPN	PNP	NPN
9883-3065	9883-3365	9883-3265	9883-3565



**AC/DC - 2 WIRE VERSA-
PROX STANDARD SERIES,
LIMIT STYLE Polyamide
(PA 6.6), Standard Housing
20-250V AC/DC, 400mA
2 LEDs for Operating Voltage
& Output Energized**

- 17 rotatable sensing head positions
- Programmable NO/NC outputs
- Rugged Housing
- Snap-together construction
- Separable mounting base
- Carries € mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

3.0 mm	= .11 in.	41 mm	= 1.61 in.
5.0 mm	= .20 in.	60 mm	= 2.36 in.
7.0 mm	= .27 in.	121 mm	= 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

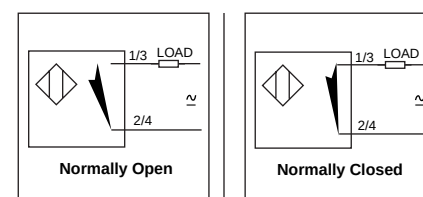
Accessories

Mounting Brackets – see Pages 114-115

Sensing Distance	Flush Mount	Non-Flush Mount
	20mm (.79 in.)	40mm (1.57 in.)
Cable or Connector Style Cat. No.	Screw Terminal	Screw Terminal
(Programmable NO/NC)	9873-0031	9873-0231
Voltage Range	20V-250V AC/DC	20V - 250V AC/DC
Operating Frequency	DC-60Hz	DC-60Hz
Output Current	400 mA	400 mA
Maximum Drop Across Sensor	≤5V	≤5V
Max. Leakage Current	≤2 mA	≤2 mA
Switching Frequency	15 Hz	15 Hz
Hysteresis	≤20%	≤20%
Temperature Drift	≤10%	≤10%
Repeatability	1.0mm (.04 in.)	2.0mm (.079 in.)

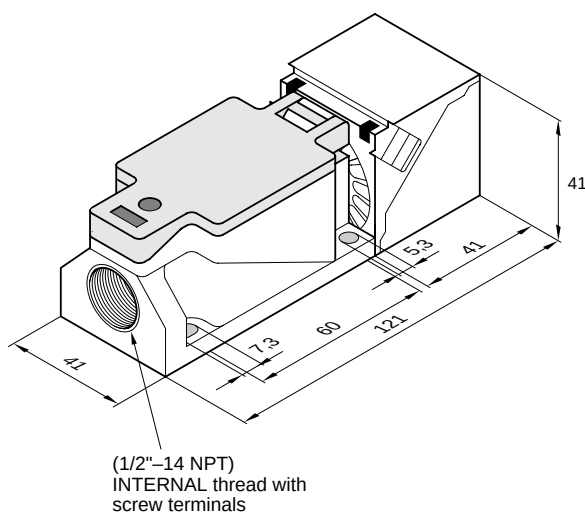
Note: Sensor dimensions in mm.

Wiring Diagrams



Screw Terminals

Screw terminals are located internally in housing for wire connections



DC - 3 WIRE
ANALOG SYSTEM, LIMIT
STYLE, Trogamid T Housing
18-30V DC, 5mA
Analog Output: 1V - 9V

- 9 rotatable sensing head positions
- Output voltage proportional to target distance
- Ideal for determining position information
- Excellent linearity $\pm 3\%$
- Carries ϵ mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Non-Flush Mount

Sensing Distance	10mm (.39 in.) – 20mm (.79 in.)
Cable or Connector Style Cat. No.	Screw Terminals
	9814-1133
Voltage Range	18V - 30V
Supply Current	≤ 10 mA
Maximum Load Current	5 mA
Switching Frequency	25Hz
Temperature Drift	$\pm 3V$
Repeatability	1%
Output Voltage Range	1 - 9V DC

Additional Information

The Analog output voltage can be digitized by means of the 8100-2100 Switching Unit and the Modules 8100-2400/-2500

Metric/in. Conversion Table

3.0 mm = .11 in.	41 mm = 1.61 in.
5.0 mm = .20 in.	60 mm = 2.36 in.
7.0 mm = .27 in.	121 mm = 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

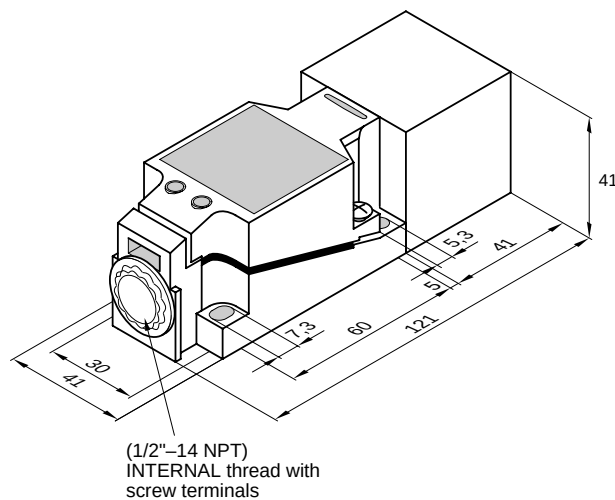
Accessories

Mounting Brackets – see Pages 114-115

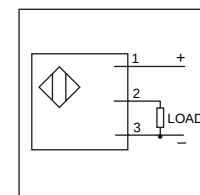
Note: Sensor dimensions in mm.

Screw Terminals

Screw terminals are located internally in housing for wire connections



Wiring Diagrams



DC - 3 WIRE WELD IMMUNE
LIMIT STYLE,
Trogamid T Housing,
10 - 60V DC, 400 mA

- 9 rotatable sensing head positions
- Programmable NO/NC outputs
- Circuitry that protects from electromagnetic interference
- Carries C mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

3.0 mm = .11 in.	41 mm = 1.61 in.
5.0 mm = .20 in.	60 mm = 2.36 in.
7.0 mm = .27 in.	121 mm = 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

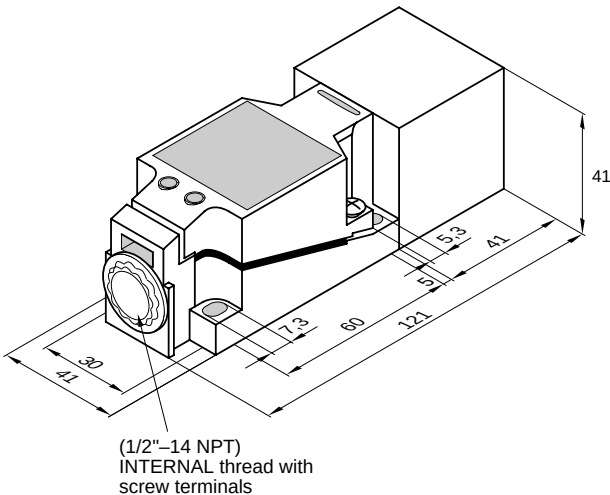
Mounting Brackets – see Pages 114-115

	Flush Mount	Partially Flush Mount
Sensing Distance	15mm (.59 in.)	25mm (.98 in.)
Cable or Connector Style Cat. No.	Screw Terminals	Screw Terminals
PNP (Programmable NO/NC)	9863-5833	9863-5933
Ripple Voltage	≤10%	≤10%
Voltage Range	10V-60V	10V - 60V
Supply Current	≤18 mA	≤18 mA
Max. Load Current	400 mA	400 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA
Switching Frequency	15 Hz	15 Hz
Hysteresis	≤15%	≤15%
Temperature Drift	≤10%	≤10%
Repeatability	1.5mm (.059 in.)	2.5mm (.098 in.)

Note: Sensor dimensions in mm.

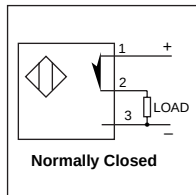
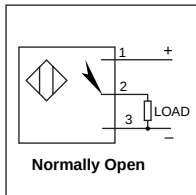
Screw Terminals

Screw terminals are located internally in housing for wire connections



Wiring Diagrams

PNP



AC - 2 WIRE – GL SERIES VERSA PROX LIMIT STYLE Polyamide (PA 6.6) Housing 20-250V AC, 500mA 2 LEDs for Operating Voltage and Output Energized

- 17 rotatable sensing head positions
- Programmable NO/NC outputs
- Rugged Housing
- Snap-together construction
- Separable mounting base
- Carries C mark

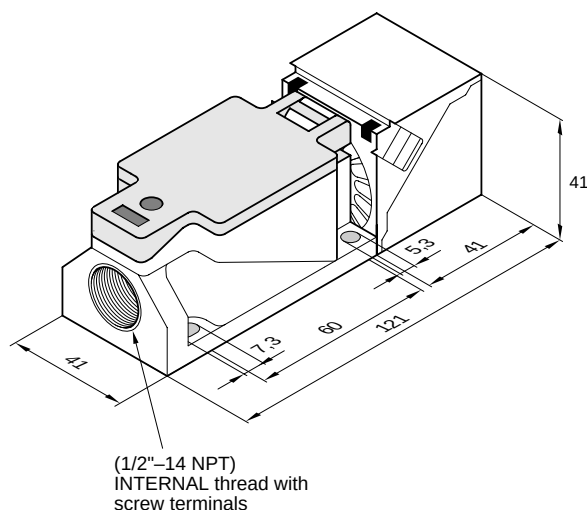
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

	Flush Mount	Non-Flush Mount
Sensing Distance	20mm (.79 in.)	40mm (1.57 in.)
Cable or Connector Style Cat. No.	Screw Terminals	Screw Terminals
(Programmable NO/NC)	9873-3031	9873-3231
Voltage Range	20V - 250V AC	20V - 250V AC
Operating Frequency	50 - 60Hz	50 - 60Hz
Supply Current	≤2 mA	≤2 mA
Maximum Load Current	500 mA	500 mA
Voltage Drop Across Sensor	≤5V	≤5V
Maximum Leakage Current	≤2 mA	≤2 mA
Switching Frequency	15Hz Resistive Load	15Hz Resistive Load
Hysteresis	≤20%	≤20%
Temperature Drift	≤10%	≤10%
Repeatability	1.0mm (.04in.)	2.0mm (.08 in.)

Note: Sensor dimensions in mm.

Screw Terminals

Screw terminals are located internally in housing for wire connections



Metric/in. Conversion Table

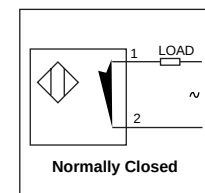
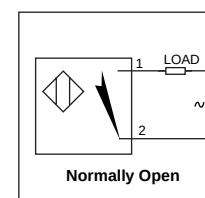
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5.0 mm = .20 in.	60 mm = 2.36 in.
7.0 mm = .27 in.	121 mm = 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

Mounting Brackets – see Pages 114-115

Wiring Diagrams



AC - 2 WIRE WELD IMMUNE LIMIT STYLE

Trogamid T Housing

20-250V AC, 500mA

2 LEDs for Operating Voltage
and Output Energized

- 9 rotatable sensing head positions
- Programmable NO/NC outputs
- Circuitry that protects for electro magnetic performance
- Carries C mark

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

3.0 mm	= .11 in.	41 mm	= 1.61 in.
5.0 mm	= .20 in.	60 mm	= 2.36 in.
7.0 mm	= .27 in.	121 mm	= 4.76 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

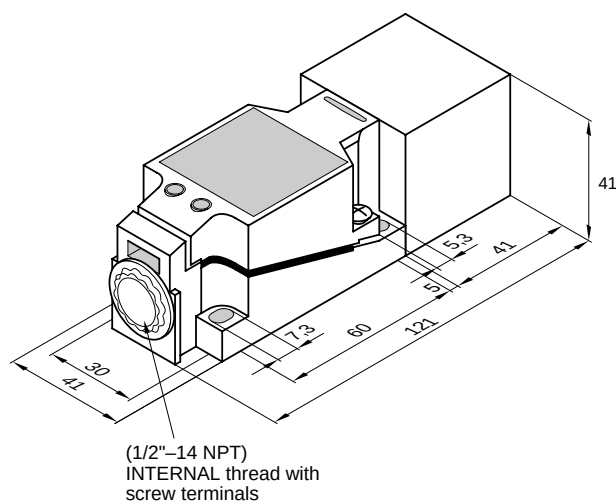
Mounting Brackets – see Pages 114-115

	Flush Mount	Partially Flush Mount
Sensing Distance	15mm (.59 in.)	25mm (.98 in.)
Cable or Connector Style Cat. No.	Screw Terminals	Screw Terminals
(Programmable NO/NC)	9853-5831	9853-5931
Voltage Range	20V - 250V AC	20V - 250V AC
Operating Frequency	50 - 60Hz	50 - 60Hz
Supply Current	≤2 mA	≤2 mA
Maximum Load Current	500 mA	500 mA
Voltage Drop Across Sensor	≤5V	≤5V
Short Term Current (20 ms, 1Hz)	8A	8A
Maximum Leakage Current	≤2 mA	≤2 mA
Switching Frequency	15Hz	15Hz
Hysteresis	≤15%	≤15%
Temperature Drift	≤10%	≤10%
Repeatability	.75mm (.03in.)	1.25mm (.049 in.)

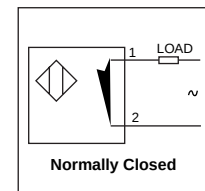
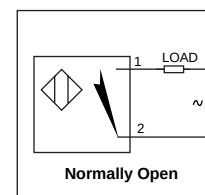
Note: Sensor dimensions in mm.

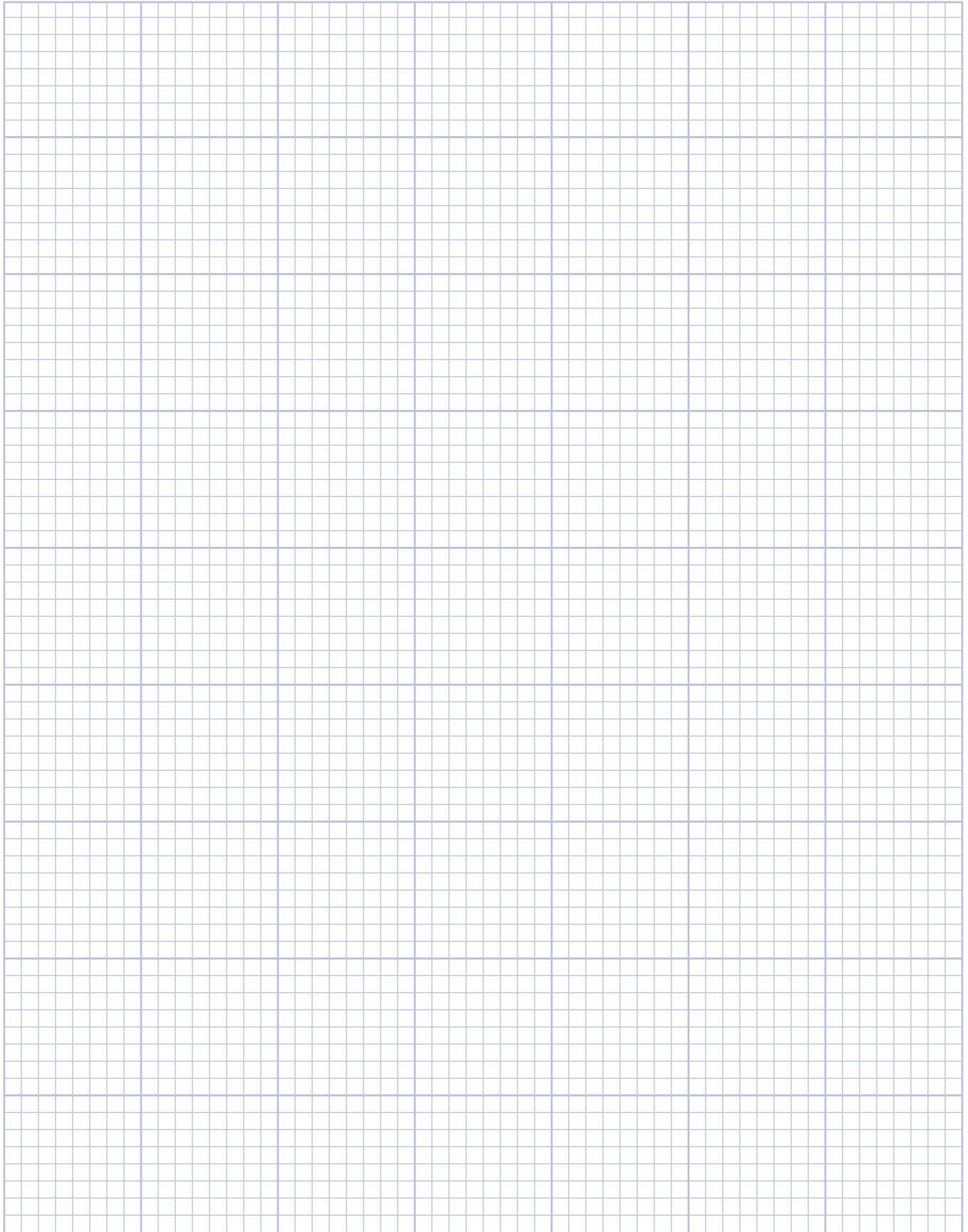
Screw Terminals

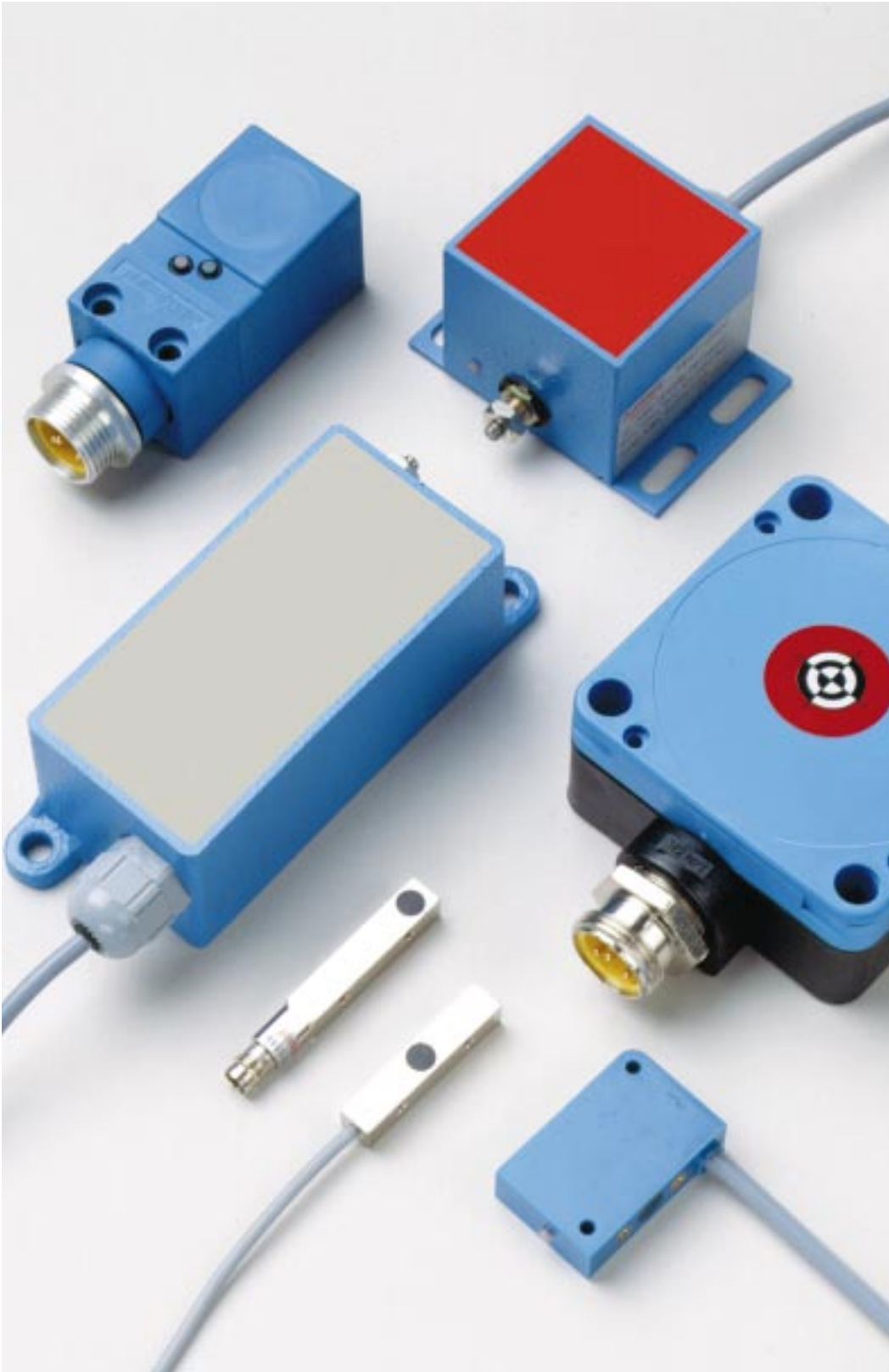
Screw terminals are located internally in housing for wire connections



Wiring Diagrams







Block Sensors

BLOCK INDUCTIVE PROXIMITY SENSORS

The Altech Inductive Proximity Block Sensor family has a wide selection of housings, with both fixed and adjustable sensing range. Units are available in DC, AC and AC/DC operating voltages.

OUTPUTS NORMALLY OPEN (NO) OR NORMALLY CLOSED (NC)

AC – NO, NC. DC– NO, NC

FLUSH MOUNT VS. NON-FLUSH MOUNT

Block Sensors that are flush mount and have electromagnetic fields directly in front of the sensing head may be mounted directly into metal without causing a false output. The sensing head must be clear of any non-target metal.

Block sensors that are Non-Flush mount have electromagnetic fields with a wide sensing angle. Therefore care must be taken to ensure that no non-target metal comes in contact with the sensing head.

See **Figure 11** for mounting details.

OUTPUT CONNECTIONS

Block sensors are available in 2 meter fixed PVC output cables, quick disconnect connector, or 1/2" 14NPT hole opening for wiring to a terminal block. Please see selection guide on pages 82-83 and the product specification for more information.

HOUSING MATERIAL

The following housing materials are used for housings in the Block Sensor family:

Aluminum

PBTP (GV-30)

Trogamid T

Aluminum/Trogamid T

Nickel Plated Brass

Sensing Distances – AC, DC, Block Sensors

Type	Voltage	Flush*	Partially Flush*	Non-Flush*
Mini Block	DC	1.5		
Standard	DC, AC	2		70
Weld Immune	DC, AC		13	2 - 15
Analog	DC			15 - 40

*All Sensing Distances in mm.

Operating Voltages – AC, DC Block Style

AC	20 - 250	90 - 250
DC	10 - 30	18 - 30

Operating Current– AC, DC Block Style

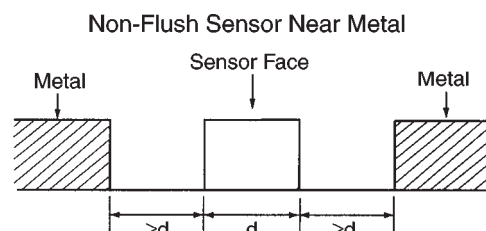
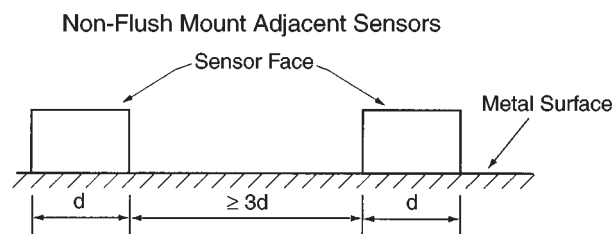
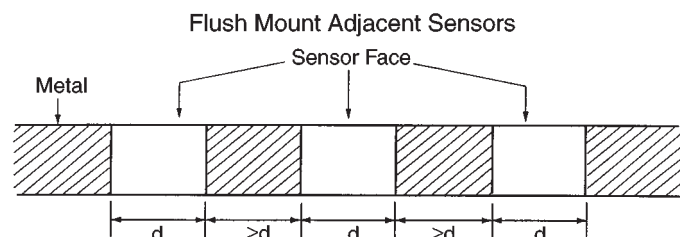
AC	180 mA	500 mA	
DC	5 mA	200 mA	400 mA

Sensor Wiring Systems – AC, DC Block Style

AC	2-Wire	
DC	3-Wire	4-Wire

Fig. 11

BLOCK SENSOR INSTALLATION



DC BLOCK SENSORS – SELECTION GUIDE

Series	Size (mm)	Sensing Distance (mm)										Mounting			Function				
		1.5	2.0	4.0	6.0	13	15	40	50	70	Adjustable	PF	FL	NF	NPN	PNP	NO	NC	
Mini Housing 10-30V, 200 mA • LED on Connector Styles • Sensing Head at end or center	8 x 8 x 40	•											•		•	•	•		
Standard Series 10-30V, 200/400 mA • Plastic and Metal Housing • Large Sensing Distances • Adjustable Sensing for some models	53 x 22 x 9.5				•								•			•	•		
	50 x 50 x 47							•			•		•		•	•	•		
	80 x 80 x 40							•	•				•	•		•	•	•	
	100 x 50 x 40									•	•			•	•	•	•		
	40 x 12 x 26		•	•									•	•	•	•	•	•	
Weld Immune 10-30V, 200 mA • Protection from electro-magnetic interference • 2 LED's	34 x 34 x 80					•							•			•	•		
Analog Sensors 10-30V, 5 mA • Output distance proportional to target distance • Excellent linearity ±3% • Determine target position information	80 x 80 x 40							•			•			•					

AC BLOCK SENSORS – SELECTION GUIDE

Series	Size (mm)	Sensing Distance (mm)						Mounting			Function		Connection			
		2.0	4.0	13.0	20	40	50	PF	FL	NF	NO	NC	Cable	62	Terminal Block	
Standard Series 20-250V AC/ 90-250V • Metal and Plastic Housing • Large Sensing Distance	40 x 26 x 12	•							•		•	•	•			
	34 x 34 x 80			•				•			•	•	•			
	50 x 50 x 41				•				•		•			•		
	70 x 66 x 60					•					•		•			
	80 x 80 x 40						•			•	•	•			•	
Weld Immune 20V-250V, 500 mA • Protection from electro-magnetic interference	34 x 34 x 80			•				•			•	•	•			

	Connection				No. of Wires	Housing Material	No. of LED's	Page
	Cable	Quick Disconnect		Terminal Block				
		59	64					
	•		•		3	Brass, Nickel Plated	1	84
	•				3	Tragamid T	1	88
	•	•			3	Aluminum	1	88
				•	3	PBTP	2	91
	•	•			3	Aluminum	1	90
	•		•	•	3	Trogamid T	1	86
	•				3	PBTP	2	93
				•	3	PBTP	0	92

	No. of Wires*	Housing Construction	No. of LED's	Page
	2	Tragamid T	1	94
	2	PBTP	2	94
	2	Aluminum	2	95
	2	Aluminum	1	95
	2	PBTP	2	95
	2	PBTP	2	96

* A third wire is used for ground on metal sensors

DC - 3 WIRE – MINI BLOCK HOUSING

Brass, Nickel Plated (BN),
Block, 10-30V, 200mA
active surface at front or
centrally located

- Connector styles have **LED for output energized**
- Carries **CE** mark

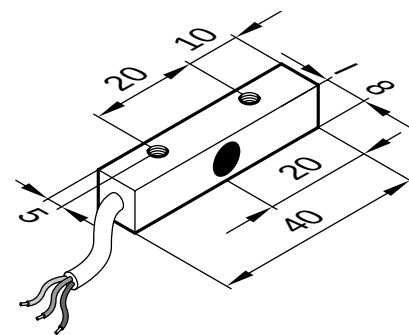
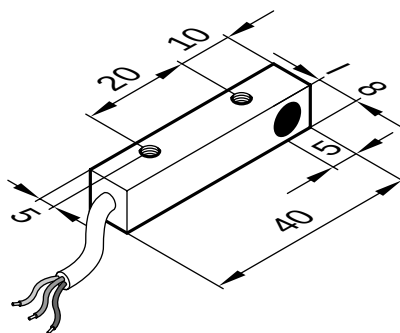
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection for PNP types
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

Flush Mount Active Surface in Front			Flush Mount Active Surface Centered		
Sensing Distance 1.5mm (.059 in.)			Sensing Distance 1.5mm (.059)		
Cable or Connector Style Cat. No.			Cable or Connector Style Cat. No.		
PNP	Normally Open	9861-1000	PNP	Normally Open	9861-1100
	Normally Closed	9861-1064		Normally Closed	9861-1164
NPN	Normally Open		NPN	Normally Open	
	Normally Closed			Normally Closed	
Ripple Voltage			Ripple Voltage		
≤10%			≤10%		
Voltage Range			Voltage Range		
10V - 30V			10V - 30V		
Supply Current			Supply Current		
≤9 mA			≤9 mA		
Max. Load Current			Max. Load Current		
200 mA			200 mA		
Voltage Drop Across Sensor			Voltage Drop Across Sensor		
≤1V			≤1V		
Max. Leakage Current			Max. Leakage Current		
≤10 µA			≤10 µA		
Switching Frequency			Switching Frequency		
2000 Hz			2000 Hz		
Hysteresis			Hysteresis		
≤15%			≤15%		
Temperature Drift			Temperature Drift		
≤10%			≤10%		
Repeatability			Repeatability		
.15mm (.006 in.)			.15mm (.006 in.)		

Note: Sensor dimensions in mm.

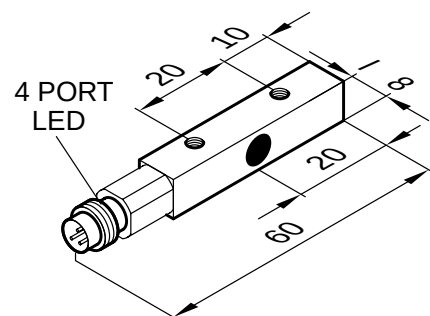
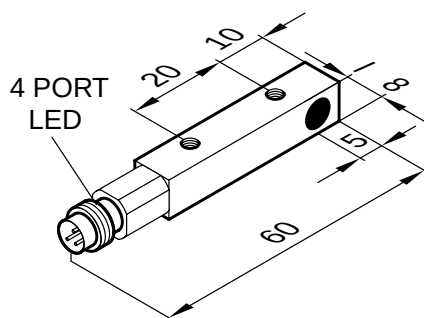
Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



64 Style Connector

3-pin, Pico style, 8mm (.31 in.).



Metric/in. Conversion Table

1.0 mm = .04 in.	20.0 mm = .78 in.
5.0 mm = .19 in.	40.0 mm = 1.57 in.
8.0 mm = .31 in.	60.0 mm = 2.36 in.
10.0 mm = .39 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	Straight
64 Connector	8000-5230	PVC, Right Angle, 2 LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2 LED, NPN

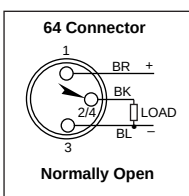
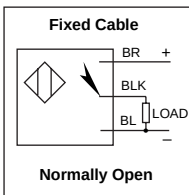
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Wiring Diagrams

Note: Wire colors are applicable on cable purchased from Altech

PNP



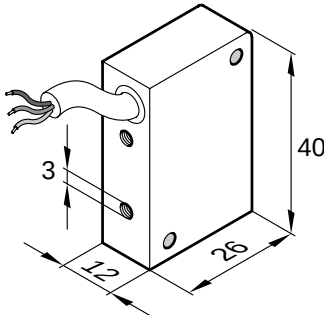
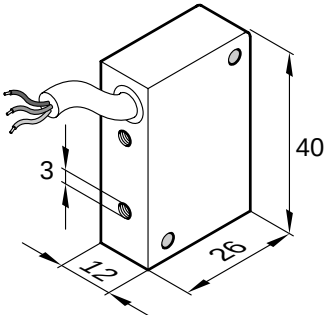
DC - 3 WIRE
PLASTIC BLOCK HOUSING
10-30V, 400mA
LED for Output Energized

- *Block Sensors feature large sensing distances*
 - *Carries € mark*
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
 - Short Circuit Protection
 - Overload Protection
 - Reverse Polarity Protection
 - Wire Break Resistance
 - Temperature Range: -25 to 70°C (-13 to 158°F)

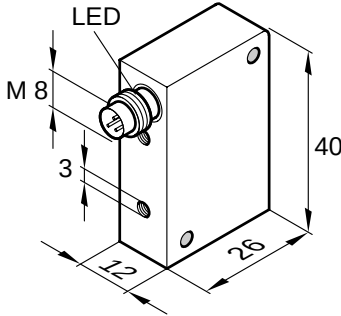
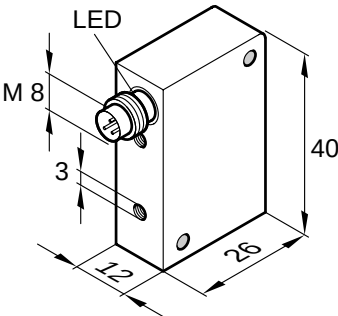
40 x 26 x 12mm Block Flush Mount			40 x 26 x 12mm Block Non-Flush Mount		
Sensing Distance 2mm (.08 in.)			4mm (.16 in.)		
Cable or Connector Style Cat. No.			Cable		64
PNP	Normally Open		9863-0400		9863-0464
	Normally Closed				
NPN	Normally Open		9863-2100		9863-2164
	Normally Closed				
Ripple Voltage			≤10%		
Voltage Range			10v - 30V		
Supply Current			≤18mA		
Maximum Load Current			400 mA (n.o.) 200 mA (n.c.)		
Voltage Drop Across Sensor			≤2.2V		
Maximum Leakage Current			≤10µA		
Switching Frequency			800Hz		
Hysteresis			≤15%		
Temperature Drift			≤10%		
Repeatability			.20mm (.008 in.)		
Housing Material			Trogamid T		

Note: Sensor dimensions in m.

Fixed Cable
PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



64 Style Connector
3-pin, Pico style, 8mm (.310 in.).



Metric/in. Conversion Table

3.0 mm = .11 in.	26.0 mm = 1.02 in.
8.0 mm = .31 in.	40.0 mm = 1.57 in.
12.0 mm = .47 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

64 Connector	8000-5220	Straight
64 Connector	8000-5230	PVC, Right Angle, 2LED, PNP
64 Connector	8000-5240	PVC, Right Angle, 2LED, NPN

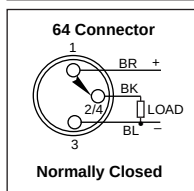
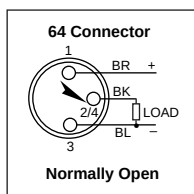
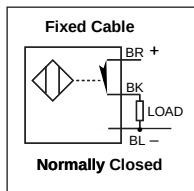
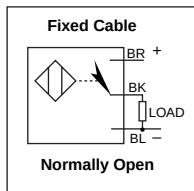
Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

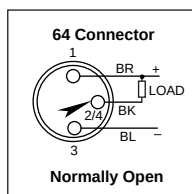
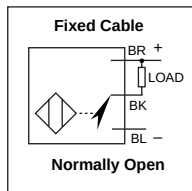
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



NPN



**DC - 3 WIRE – METAL &
PLASTIC BLOCK HOUSING**
10-30V, 400mA
LED for Output Energized

- *Block Sensors feature large sensing distances*
- *Some models feature adjustable sensing distance*
- *Carries C mark*

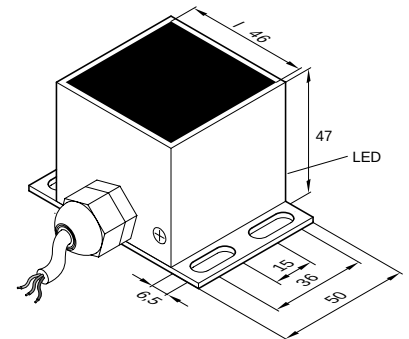
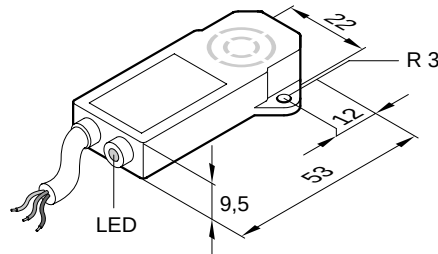
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

53 x 22 x 9.5mm Block Flush Mount				50 x 50 x 47mm Block Flush Mount		
Sensing Distance			6mm (.24 in.)	Adjustable to 40mm (1.57 in.)		
Cable or Connector Style Cat. No.			Cable	Cable	59	65
PNP	Normally Open		9864-0200	9807-0900	9807-0959	9807-0965
	Normally Closed					
NPN	Normally Open			9807-0100	9807-0159	9807-0165
	Normally Closed					
Ripple Voltage			≤10%	≤10%		
Voltage Range			10v - 30V	10v - 30V		
Supply Current			≤18mA	≤18mA		
Maximum Load Current			400 mA	400 mA		
Voltage Drop Across Sensor			≤2.4V	≤2.4V		
Maximum Leakage Current			≤10μ	≤10μ		
Switching Frequency			100Hz	300Hz		
Hysteresis			≤15%	≤15%		
Temperature Drift			≤10%	≤10%		
Repeatability			.3mm (.012 in.)	2mm (.08 in.)		
Housing Material			Trogamid T	Aluminum		

Note: Sensor dimensions in m

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



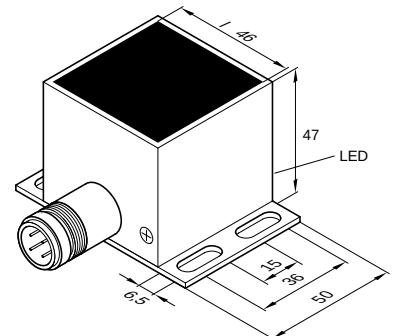
59 Style Connector

4-pin, Metal, 19mm (.75 in.) device.

*** Also available**

in a 65 Style Connector

4-pin Micro style, 12mm (.47 in.). Consult Altech.



Metric/in. Conversion Table

3.0 mm = .11 in.	36.0 mm = 1.41 in.
6.5 mm = .25 in.	46.0 mm = 1.81 in.
9.5 mm = .37 in.	47.0 mm = 1.85 in.
12.0 mm = .47 in.	50.0 mm = 1.96 in.
15.0 mm = .59 in.	53.0 mm = 2.08 in.
22.0 mm = .86 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC, Straight

Change last digit of connector number to 2 for 5 meter cable

65 Connector 8000-5110 PVC, Straight
 65 Connector 8000-5120 PVC, Right Angle
 65 Connector 8000-5150 PVC, Right Angle, 2LED, NPN
 65 Connector 8000-5160 PVC, Right Angle, 2LED, PNP

Change last digit of connector number to 5 for 5 meter cable

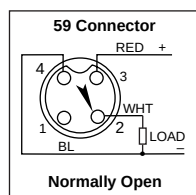
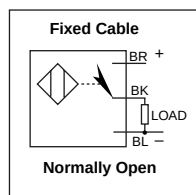
Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

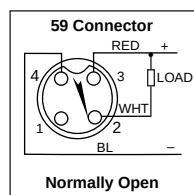
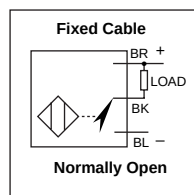
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



NPN



DC - 3 WIRE METAL BLOCK HOUSING 10-30V, 400mA

Selection of operating frequency allows units to be mounted adjacently without interference

- **Block Sensors feature large sensing distances**
- **Some models feature adjustable sensing distance**
- **LED for Output Energized**
- **Carries € mark**

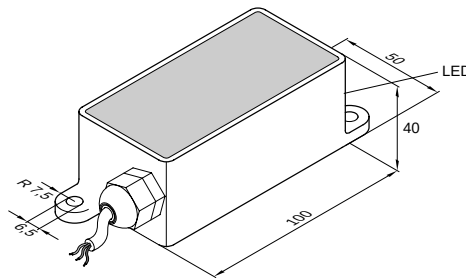
100 x 50 x 40mm Block Non-Flush Mount Sensing Distance Adjustable to 70mm (2.76 in.)

Cable or Connector Style Cat. No.	Cable	59
PNP Normally Open 	9809-0100 (f1)*	9809-0159 (f1)*
	9809-3400 (f2)*	9809-3459 (f2)*
	9809-3500 (f3)*	9809-3559 (f3)*
NPN Normally Open 	9809-0300 (f1)*	9809-0359 (f1)*
	9809-0400 (f2)*	9809-0459 (f2)*
	9809-0500 (f3)*	9809-0559 (f3)*
Ripple Voltage	≤10%	≤10%
Voltage Range	10V - 30V	10V - 30V
Supply Current	≤12 mA	≤12 mA
Maximum Load Current	400 mA	400 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V
Maximum Leakage Current	≤10 µA	≤10 µA
Switching Frequency	300Hz	300Hz
Hysteresis	≤15%	≤15%
Temperature Drift	≤10%	≤10%
Repeatability	7mm (.28 in.)	7mm (.028 in.)
Housing Material	Aluminum	Aluminum
LED	One LED	One LED

Note: Sensor dimensions in mm.

Fixed Cable

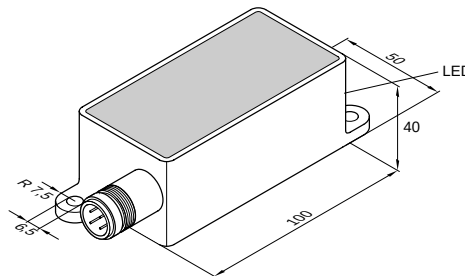
PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



59 Style Connector

4-pin, Metal, 19mm (.75 in.) device

* Also available in a 65 Style Connector
4-pin Micro style, 12mm (.47 in.).
Consult Altech.



- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

* For operation where units will be located adjacently, models with different operating frequencies must be selected

Metric/in. Conversion Table

6.5 mm = .25 in.	50 mm = 1.96 in.
7.5 mm = .29 in.	100 mm = 3.93 in.
40mm = 1.57 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC Straight

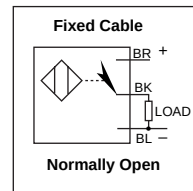
Change last digit of connector number to 2 for 5 meter cable

Refer to pages 116-121 for more cable information

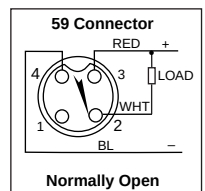
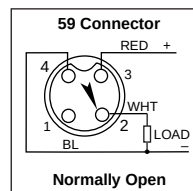
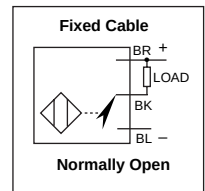
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

PNP



NPN



DC - 3 WIRE PLASTIC BLOCK HOUSING 10-30V, 200mA 2 LEDs for Operating Voltage and Output Energized

- **Block Sensors feature large sensing distances**
- **Complementary Outputs**
- **Carries C mark**

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

80 x 80 x 40mm Block		
Flush Mount		Non-Flush Mount
Sensing Distance	40mm (1.57 in.)	50mm (1.97 in.)
Cable or Connector Style Cat. No.	Screw Terminals	Screw Terminals
PNP (Complementary NO/NC)	9865-1133	9865-1033
NPN (Complementary NO/NC)		
Ripple Voltage	≤10%	≤10%
Voltage Range	10V - 30V	10V - 30V
Supply Current	≤22 mA	≤22 mA
Maximum Load Current	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V
Maximum Leakage Current	≤10 µA	≤10 µA
Switching Frequency	100Hz	300Hz
Hysteresis	≤10%	≤15%
Temperature Drift	≤10%	≤10%
Repeatability	2mm (.08 in.)	2.5mm (.10 in.)
Housing Material	PBTP	PBTP
LED	Two LEDs	Two LEDs

Metric/in. Conversion Table

11 mm	= .43 in.
40 mm	= 1.57 in.
80 mm	= 3.15 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

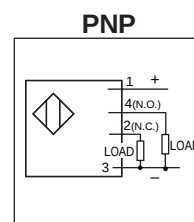
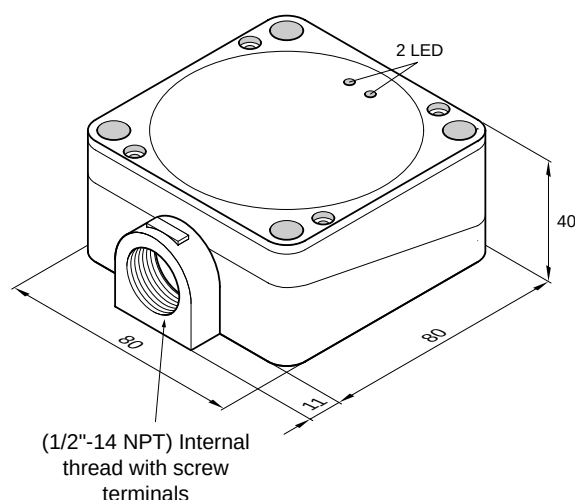
Note: Sensor dimensions in mm.

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech

Screw Terminals

Screw terminals are located internally in housing for wire connections.



DC ANALOG SENSORS
BLOCK SERIES
Plastic (PBTP) Housing
18 - 30V DC
Analog Output 1V - 9V Analog

- Output voltage proportional to target distance
- Ideal for determining position information
- Excellent linearity $\pm 3\%$
- Carries $\text{C}\epsilon$ mark

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Temperature Range:
-25 to 70°C (-13 to 158°F)

Additional Information

The Analog output voltage can be digitized by means of the 8100-2100 Switching Unit and the Modules 8100-2400/-2500

Metric/in. Conversion Table

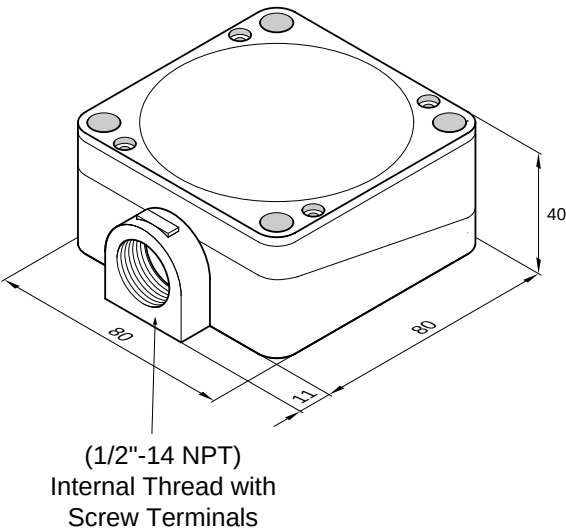
11.0 mm	=	.43 in.
40.0 mm	=	1.57 in.
80.0 mm	=	3.15 in.

This table converts millimeters to inches in reference to the illustrations included on these pages

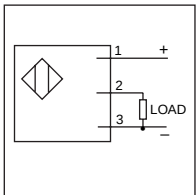
80 x 80 x 40mm Block Non-Flush Mount	
Sensing Distance	15mm (.59 in.) to 40mm (1.57 in.)
Cable or Connector Style Cat. No.	Screw Terminals
	9814-2133
Voltage Range	18V - 30V
Supply Current	≤ 10 mA
Maximum Load Current	5 mA
Maximum Switching Frequency	20Hz
Temperature Drift	$\leq 0.3V$
Repeatability	$\leq 1\%$
Output Voltage Range	1-9V DC
Housing Material	PBTP

Note: Sensor dimensions in mm.

Screw Terminals
Screw terminals are located internally for wire connections.



Wiring Diagrams



DC - 3 WIRE WELD IMMUNE BLOCK, Plastic (PBTP) 10-30V, 200mA 2 LEDs for Operating Voltage and Output Energized

- *Circuitry that protects for electromagnetic interference*
- *Carries CE mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Reverse Polarity Protection
- Wire Break Resistance
- Temperature Range: -25 to 70°C (-13 to 158°F)

34 x 34 x 80mm Block Partially Flush Mount

Sensing Distance		13mm (.51 in.)	
Cable or Connector Style	Cat. No.	Cable	Cable
PNP	Normally Open	9863-3800	9863-3900
	Normally Closed		
NPN	Normally Open		
	Normally Closed		
Ripple Voltage		≤10%	≤10%
Voltage Range		10V - 30V	10V - 30V
Supply Current		≤18 mA	≤18 mA
Maximum Load Current		200 mA	200 mA
Voltage Drop Across Sensor		≤2.4V	≤2.4V
Maximum Leakage Current		≤10 µA	≤10 µA
Switching Frequency		15Hz	15Hz
Hysteresis		≤15%	≤15%
Temperature Drift		≤10%	≤10%
Repeatability		1.3mm (.051 in.)	1.3mm (.051 in.)
Housing Material		PBTP (GV 30)	PBTP (GV 30)
Sensing Head Position		Front	Top/Side Rotatable
LED		Two LEDs	Two LEDs

Metric/in. Conversion Table

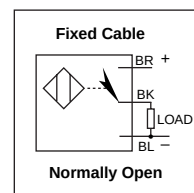
1.0 mm = .04 in.	66.0 mm = 2.6 in.
5.3 mm = .21 in.	80.0 mm = 3.5 in.
34.0 mm = 1.57 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Note: Sensor dimensions in mm.

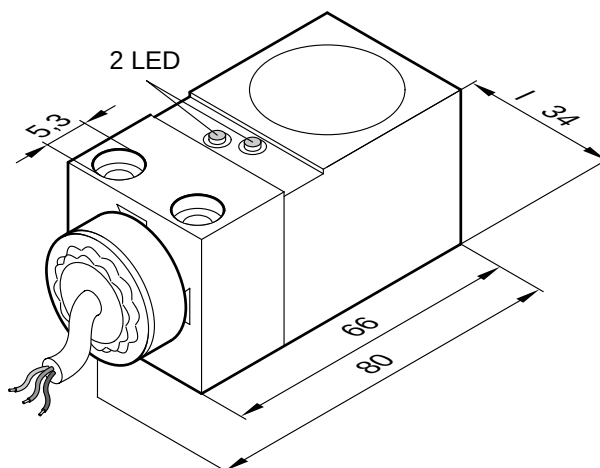
Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



Fixed Cable

PVC 2m (6 ft. 6 in.). Other cable lengths available, please consult Altech.



AC - 2 WIRE BLOCK METAL & PLASTIC HOUSING

Models include:

90-250V AC, 180 mA,

20-250V AC, 500mA

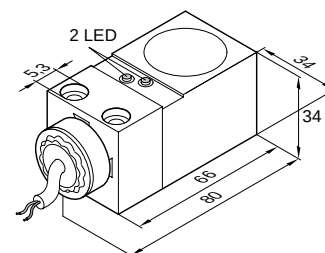
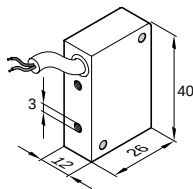
- *One LED models for Output Energized*
- *Two LED models for Operating Voltage and Output Energized*
- *Large sensing distances*
- *Carries C mark*

- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range:
-25 to 50°C (-13 to 122°F)
-25 to 70°C (-13 to 158°F)

	40 x 26 x 12mm Block Flush Mount		34 x 34 x 80mm Block Partially Flush Mount	
Sensing Distance	2mm (.08 in.)		13mm (.51 in.)	
Cable or Connector Style Cat. No.	Cable		Cable	Cable
Normally Open 	9853-2400		9853-3800	9853-3900
Normally Closed 	9853-2500		9853-3600	9853-3700
Voltage Range	90V-250V AC		20V - 250V AC	20V - 250V
Operating Frequency	50/60Hz		50/60Hz	50/60Hz
Supply Current	≤5 mA		≤2 mA	≤2 mA
Max. Load Current	180 mA		500 mA	500 mA
Voltage Drop Across Sensor	≤12V		≤5V	≤5V
Max. Leakage Current	≤3mA/230V ≤1.5mA/110V		≤2mA	≤2mA
Short Term Current (20 ms, 1Hz)	1A		8A	8A
Switching Frequency	25Hz		15Hz	15Hz
Hysteresis	≤15%		≤15%	≤15%
Temperature Drift	≤10%		≤10%	≤10%
Repeatability	.2mm (.008 in.)		1.3mm (.051 in.)	1.3mm (.051 in.)
Housing Material	Trogamid T		PBTP (GV 30)	PBTP (GV 30)
Sensing Head Position	-		Active Surface in Front	Active Surface on Top - Rotatable

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



62 Connector

3-Pin Mini Style, 25.4mm (1.0 in.).

Screw Terminals

Screw terminals are located internally in housing for wire connection.

Metric/in. Conversion Table

3.0 mm = 0.1 in.	50.0 mm = 1.96 in.
5.3 mm = 0.2 in.	60.0 mm = 2.36 in.
6.5 mm = .25 in.	64.0 mm = 2.52 in.
12.0 mm = .47 in.	66.0 mm = 2.59 in.
24.0 mm = .94 in.	70.0 mm = 2.75 in.
26.0 mm = 1.02 in.	80.0 mm = 3.15 in.
34.0 mm = 1.33 in.	90.0 mm = 3.54 in.
40.0 mm = 1.57 in.	110.0 mm = 4.33 in.
41.0 mm = 1.61 in.	
45.0 mm = 1.77 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

2 meter (6 ft. 6 in.) AC Cable Assemblies for Quick Disconnect Sensors

62 Connector 8000-5030 PVC Straight

Change last digit of connector number to 5 for 5 meter cable

Refer to pages 116-121 for more cable information

Mounting Brackets – see Pages 114-115

50 x 50 x 41mm Block Flush Mount

70 x 66 x 60mm Block Flush Mount

80 x 80 x 40mm Block Non-Flush Mount

20mm (.79 in.)

40mm (1.57 in.)

50mm (1.97 in.)

62

Cable

Screw Terminals

9855-0062

9803-3000

9855-1000

9855-1100

20V - 250V

20V - 250V

20V - 250V

50/60Hz

50/60Hz

50/60Hz

≤2 mA

≤2 mA

≤2 mA

500 mA

500 mA

500 mA

≤5V

≤5V

≤5V

≤2 mA

≤2 mA

≤2 mA

8A

8A

8A

15Hz

25Hz

10Hz

≤15%

≤15%

≤15%

≤10%

≤10%

≤10%

2mm (.079 in.)

4mm (.157 in.)

5mm (.197 in.)

Aluminum

Aluminum

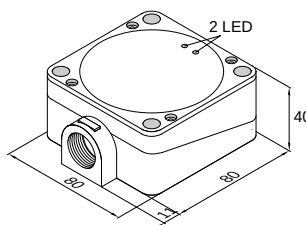
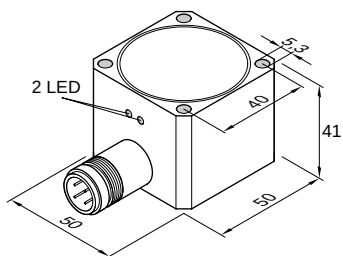
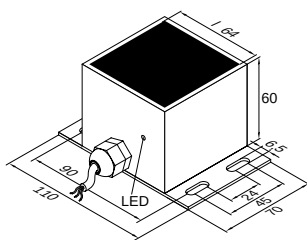
PBTP (GV 30)

-

-

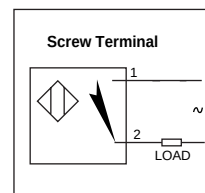
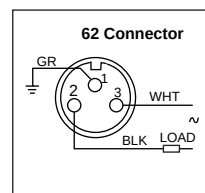
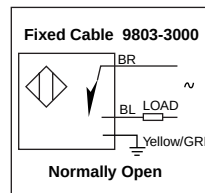
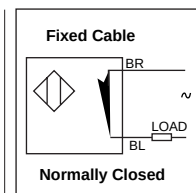
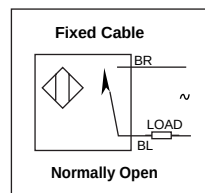
-

Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



**AC - 2 WIRE WELD IMMUNE
BLOCK, Plastic Housing
20-250V AC, 500mA
2 LEDs for Operating
Voltage and Output Energized**

• *Circuitry that protects for
electromagnetic interference*

• *Carries ϵ mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

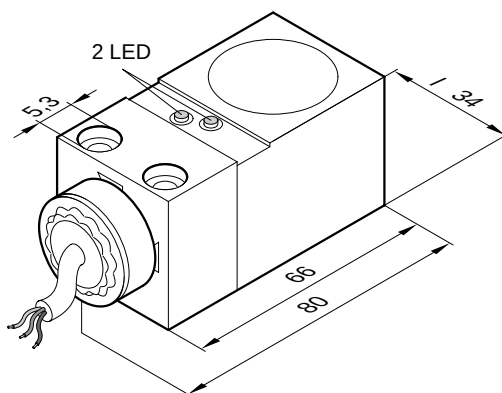
**34 x 34 x 80mm Block
Partially Flush Mount**

Sensing Distance		13mm (.51 in.)	
Cable or Connector Style Cat. No.		Cable	Cable
Normally Open		9853-3800	9853-3900
Normally Closed		9853-3600	9853-3700
Voltage Range		20V - 250V AC	20V - 250V AC
Operating Frequency		50/60Hz	50/60Hz
Supply Current		≤2 mA	≤2 mA
Maximum Load Current		500 mA	500 mA
Voltage Drop Across Sensor		≤5V	≤5V
Maximum Leakage Current		≤2 mA	≤2 mA
Short Term Current (20 ms, 1Hz)		8A	8A
Switching Frequency		15Hz	15Hz
Hysteresis		≤15%	≤15%
Temperature Drift		≤10%	≤10%
Repeatability		.65mm (.026 in.)	.65mm (.026 in.)
Housing Material		PBTP (GV 30)	PBTP (GV 30)
Sensing Head Position		Front	Top/Side Rotatable

Note: Sensor dimensions in mm.

Fixed Cable

PVC 2m (6ft. 6in.). For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



Metric/in. Conversion Table

1.0 mm = .04 in.	66.0 mm = 2.6 in.
5.3 mm = .21 in.	80.0 mm = 3.5 in.
34.0 mm = 1.57 in.	

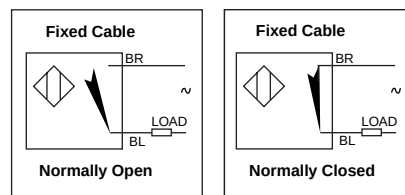
This table converts millimeters to inches in reference to the illustrations included on these pages

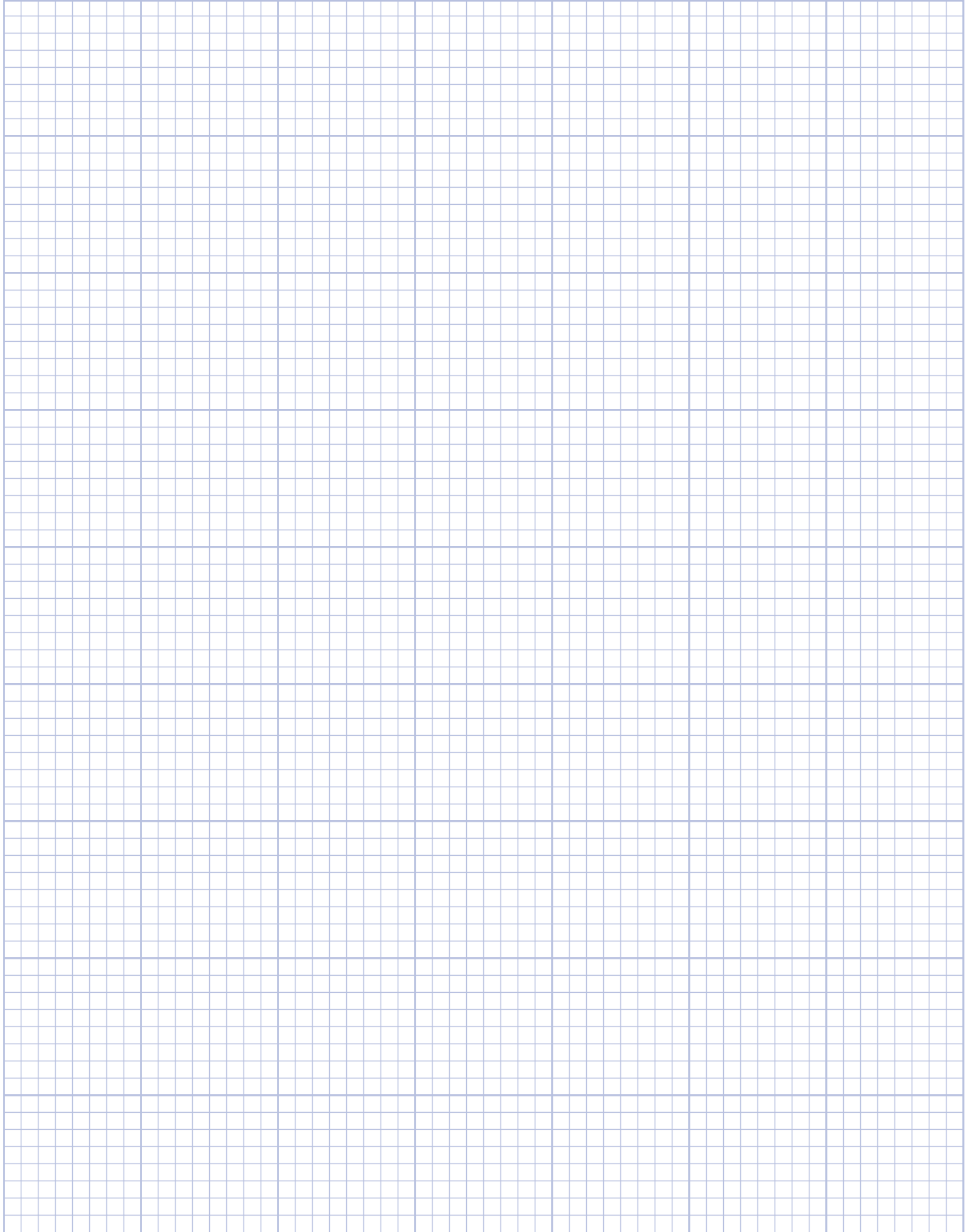
Accessories

Mounting Brackets – see Pages 114-115

Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech







Ring Style Sensors

RING STYLE INDUCTIVE PROXIMITY SENSORS

Altech Ring Sensors are used for variety of applications including punching and stamping operations to detect small metal parts and for the identification of metallic contamination in bulk materials.

The sensitivity of all Altech Ring Sensors is given in terms of a steel metal ball diameter. This is the minimum diameter steel ball that the sensor will detect. Non-ferrous materials will require larger diameter parts for correct sensor detection. See page 4, Figure 1 for rated operating distance correction factors.

OUTPUT CONNECTION

Mini Ring – Normally Open (NO)
Standard Ring – Complementary
High Sensitivity – Complementary
Analog – 1-9 Volt Analog

RING SENSOR MOUNTING

When high sensitivity ring sensors are mounted in or near non-target metal objects, care must be exercised in accordance with the recommendations on the diagram. See **Figure 12**.

Operating Voltages – Ring Style

Mini Ring	10 - 30V DC
Standard Ring	10 - 30V DC
High Sensitivity Ring	20 - 30V DC
Analog Ring	18-30V DC

Operating Current– Ring Style

Mini Ring	200/400 mA
Standard Ring	80 mA
High Sensitivity Ring	50 mA
Analog Ring	5 mA

Sensor Wiring Systems – Ring Style

Mini Ring	3 Wire
Standard Ring	4-Wire
High Sensitivity Ring	4-Wire (must connect to PULSO® 8102-0900 Amplifier)
Analog Ring	3-Wire

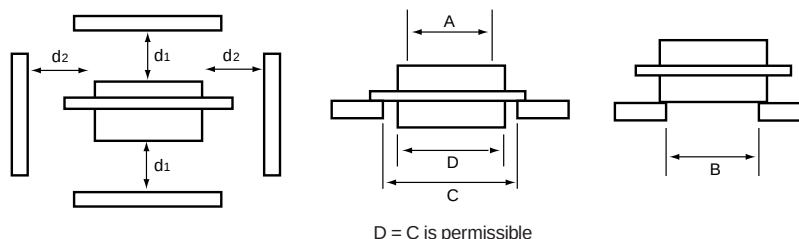
Fig. 12

RING SENSOR INSTALLATION

Ring Sensors installation in Metal Environment (min. permissible values)

SENSOR	Inside diameter SENSOR = A	Metal Plate hole dia. = B*	Side Distances d1	d2
9702-0259	20	30	10	0
9713-0059	35	60	40	0
9701-0259	51	85	60	0
9701-0759	51	85	50	0
9711-0059	71	120	65	0
9700-0159	100	180	100	30
9703-0159	202	260	150	0
9704-0159	294	400	200	0

* Metal plate must not move



DC RING SENSORS – SELECTION GUIDE

Series	Size (mm)	Sensitivity – Mimimum Steel Ball Diam. in mm																Function				
		0.5	0.8	1.0	1.1	1.6	2.5	3.0	5.0	6.0	8.0	9.0	12	15	20	30	NPN	PNP	NO	NC		
Mini Ring 10-30V DC, 200 mA • Static Output • Detect unwanted metal • Detect and count parts	Ø12						•											•	•			
	Ø20									•								•	•			
	Ø43											•						•	•			
Normal Sensitivity Standard Series 10-30V DC, 80 mA • Static Output • Large ring diameters • Complementary Output	Ø50							•									•	•	•	•		
	Ø100										•						•	•	•	•		
	Ø100									•							•	•	•	•		
	Ø200													•			•	•	•	•		
	Ø300															•	•	•	•	•		
High Sensitivity Standard Series 20-30V DC, 50 mA • Dynamic Output • Large ring diameters • Complementary Output	Ø20	•															•		•	•		
	Ø 35	•															•		•	•		
	Ø50		•														•		•	•		
	Ø50			•													•		•	•		
	Ø70				•												•		•	•		
	Ø100					•											•		•	•		
	Ø200							•									•		•	•		
	Ø300								•								•		•	•		
	130 x 130								•								•		•	•		
245 x 290												•				•		•	•			
Analog Ring 18-30V DC, 5 mA • Analog Output proportional to target size	Ø20									•												
	Ø43														•							

	Mounting See Instructions	Connection		No. of Wires	Housing Material	No. of LED's	Page
		Cable	59				
	•	•		3	ABS	1	102
	•	•		3	ABS	1	102
	•	•		3	ABS	1	102
	•		•	4	Aluminum	1	104
	•		•	4	Aluminum	1	104
	•		•	4	Aluminum	1	104
	•		•	4	Aluminum	1	105
	•		•	4	Aluminum	1	105
	•		•	4	Aluminum	1	106
	•		•	4	Aluminum	1	106
	•		•	4	Aluminum	1	107
	•		•	4	Aluminum	1	107
	•		•	4	Aluminum	1	108
	•		•	4	Aluminum	1	108
	•		•	4	Aluminum	1	109
	•		•	4	Aluminum	1	109
	•		•	4	Aluminum	1	110
	•		•	4	Aluminum	1	110
	•	•		3	ABS	0	112
	•	•		3	ABS	0	112

DC - 3 WIRE
MINI RING SENSORS
Plastic Housing,
10 - 30V DC 200mA/400mA,
1 LED for Output Energized

- *Applications include detection and counting parts in punching/pressing systems*
- *Detect unwanted metal in grinding operations*
- *Static Output*
- *Carries C mark*

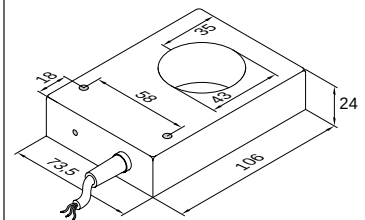
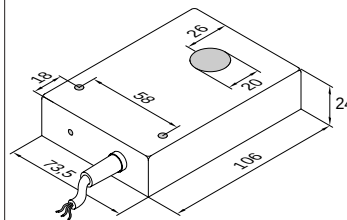
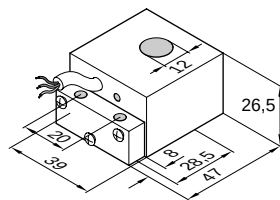
- IEC (529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Reverse Polarity Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Ring Diameter	12mm (.47 in.)	20mm (.79 in.)	43mm (1.69 in.)
Sensitivity (min. dia. steel ball)	2.5mm (.1 in.)	6mm (.24 in.)	9mm (.35 in.)
Cable or Connector Style Cat. No.	Cable	Cable	Cable
PNP Normally Open 	9702-0400	9702-0500	9705-0500
Normally Closed 			
NPN Normally Open 			
Normally Closed 			
Ripple Voltage	≤10%	≤10%	≤10%
Voltage Range	10V-30V	10V - 30V	10V - 30V
Supply Current	≤10 mA	≤10 mA	≤10 mA
Max. Load Current	400 mA	200 mA	200 mA
Voltage Drop Across Sensor	≤2.4V	≤2.4V	≤2.4V
Max. Leakage Current	≤10 µA	≤10 µA	≤10 µA
Switching Frequency	800 Hz	1000 Hz	500 Hz
Housing Material	PBTP (GV 30)	ABS	ABS

Note: Sensor dimensions in mm.

Fixed Cable

PVC 2m (6ft. 6in.).
 For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



Metric/in. Conversion Table

8.0 mm = .31 in.	35.0 mm = 1.37 in.
12.0 mm = .47 in.	39.0 mm = 1.53 in.
18.0 mm = .70 in.	43.0 mm = 1.69 in.
20.0 mm = .78 in.	47.0 mm = 1.85 in.
24.0 mm = .94 in.	58.0 mm = 2.32 in.
26.0 mm = 1.02 in.	73.5 mm = 2.89 in.
26.5 mm = 1.04 in.	106.0mm = 4.17 in.
28.5 mm = 1.12 in.	

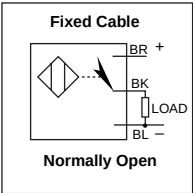
This table
converts millimeters
to inches in reference
to the illustrations
included on these
pages

Accessories

Wiring Diagrams

Note: Wire colors are applicable on cable
purchased from Altech

PNP



DC - 4 WIRE RING SENSORS
ALUMINUM HOUSING
10-30V DC, 80mA
1 LED for Output Energized

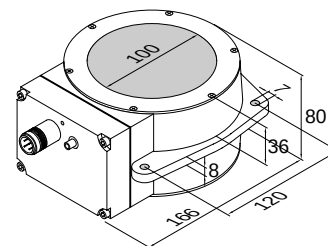
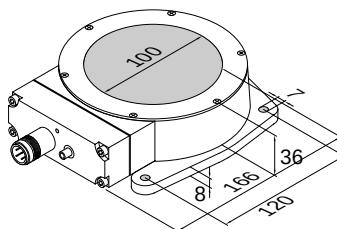
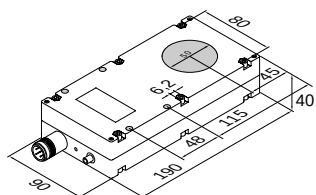
- Applications include the detection and counting of parts in punching/pressing operations
- Detection of unwanted metal in grinding operations
- Complementary outputs available
- Static Output
- Carries $\text{C}\epsilon$ mark

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Ring Diameter	50mm (1.97 in.)	100mm (3.94 in.)	100mm (3.94 in.)
Sensitivity (min. dia. steel ball)	3mm (.12 in.)	8mm (.31 in.)	6mm (.24 in.)
Cable or Connector Style Cat. No.	59	59	59
PNP (Complementary NO/NC)	9705-0659	9708-0559	9708-0659
NPN (Complementary NO/NC)	9705-0259	9708-0059	9708-0159
Ripple Voltage	$\leq 10\%$	$\leq 10\%$	$\leq 10\%$
Voltage Range	10-30V	10-30V	10-30V
Supply Current	≤ 25 mA	≤ 25 mA	≤ 25 mA
Max. Load Current	80 mA	80 mA	80 mA
Voltage Drop Across Sensor	≤ 0.5 V NPN ≤ 1.5 V PNP	≤ 0.5 V NPN ≤ 1.5 V PNP	≤ 0.5 V NPN ≤ 1.5 V PNP
Max. Leakage Current	$\leq 10\mu\text{A}$	$\leq 10\mu\text{A}$	$\leq 10\mu\text{A}$
Switching Frequency	500Hz	500Hz	500Hz

59 Style Connector

4-pin, Metal, 19mm (.75 in.) device



Metric/in. Conversion Table

6.2 mm = .24 in.	80.0 mm = 3.15 in.	202.0mm = 7.94 in.
7.0 mm = .27 in.	90.0 mm = 3.58 in.	260.0mm = 10.23 in.
8.0 mm = .31 in.	100.0mm = 3.93 in.	290.0mm = 11.41 in.
8.5 mm = .33 in.	115.0mm = 4.52 in.	294.0mm = 11.20 in.
36.0 mm =1.41 in.	120.0mm = 4.72 in.	305.0mm = 12.00 in.
40.0 mm =1.57 in.	160.0mm = 6.29 in.	340.0mm = 13.40 in.
45.0 mm =1.77 in.	162.0mm = 6.37 in.	382.0mm = 15.03 in.
48.0 mm =1.89 in.	166.0 mm= 6.52 in.	397.0mm = 15.62 in.
50.0 mm =1.96 in.	190.0 mm= 7.47 in.	

This table converts millimeters to inches in reference to the illustrations included in this catalog

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC, Straight

Change last digit of connector number to 2 for 5 meter cable

Refer to pages 116-121 for more cable information

200mm (7.87 in.)

15mm (.59 in.)

59

9706-0659

9706-0159

≤10%

10-30V

≤25 mA

80 mA

≤0.5V NPN

≤1.5V PNP

≤10μA

300Hz

300mm (11.81 in.)

30mm (1.18 in.)

59

9707-0659

9707-0159

≤10%

10-30V

≤25 mA

80 mA

≤0.5V NPN

≤1.5V PNP

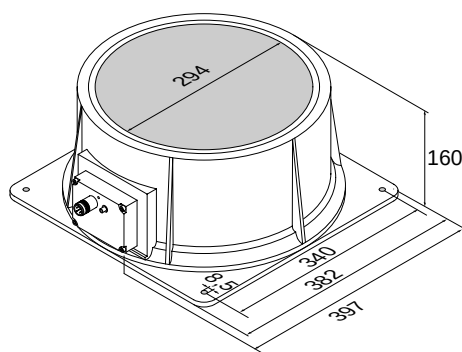
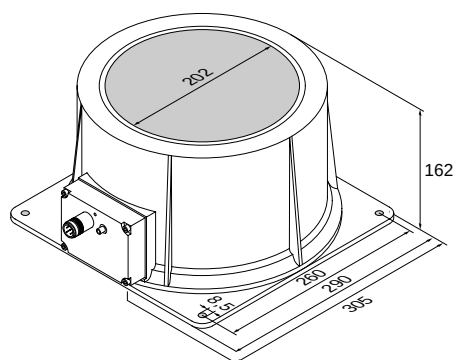
≤10μA

300Hz

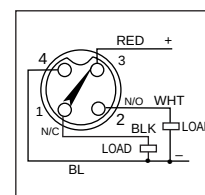
Note: Sensor dimensions in mm.

Wiring Diagrams

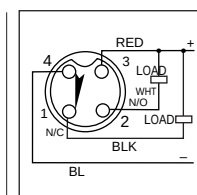
Note: Wire colors are applicable to cable purchased from Altech



PNP



NPN

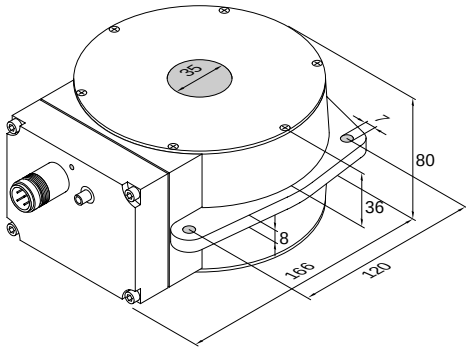
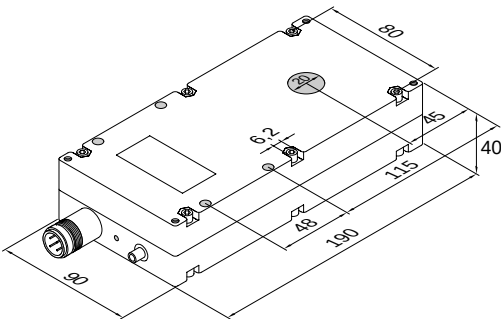


DC - 4 WIRE HIGH SENSITIVITY
RING SENSORS
ALUMINUM HOUSING
20-30V DC, 50mA
1 LED for Output Energized

- Applications include the detection and counting of parts in punching/pressing operations
 - Detection of unwanted metal in grinding operations
 - Complementary outputs available
 - Dynamic output – must be operated with 8102-0900 Unit
 - Carries C mark
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
 - Short Circuit Protection
 - Reverse Polarity Protection
 - Temperature Range: -25 to 70°C (-13 to 158°F)

Ring Diameter	20mm (.79 in.)	35mm (1.38 in.)
Sensiitivity (min. dia. stel ball)	.5mm (.02 in.)	.5mm (.02 in.)
Cable or Connector Style Cat. No.	59	59
PNP (Complementary NO/NC)		
NPN (Complementary NO/NC)	9702-0259	9713-0059
Ripple Voltage	≤10%	≤10%
Voltage Range	20-30V	20-30V
Supply Current	≤35 mA	≤35 mA
Max. Load Current	50 mA	50 mA
Voltage Drop Across Sensor	≤1V at 10 mA ≤3.5V at 50 mA	≤1V at 10 mA ≤3.5V at 50 mA
Max. Leakage Current	≤500μA	≤500μA
Switching Frequency	100Hz	100Hz

59 Style Connector
4-pin, Metal, 19mm (.75 in.)
device



Metric/in. Conversion Table

6.2 mm = .24 in.	80.0 mm = 3.15 in.
7.0 mm = .27 in.	90.0 mm = 3.58 in.
8.0 mm = .31 in.	115.0mm = 4.52 in.
35.0 mm = 1.37 in.	120.0mm = 4.72 in.
36.0 mm = 1.41 in.	166.0 mm= 6.52 in.
40.0 mm = 1.57 in.	190.0 mm= 7.47 in.
45.0 mm = 1.77 in.	
48.0 mm = 1.89 in.	
50.0 mm = 1.96 in.	

This table converts millimeters to inches in reference to the illustrations included in this catalog

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC, Straight

Change last digit of connector number to 2 for 5 meter cable

Refer to pages 116-121 for more cable information

Notes:

High Sensitivity Ring Sensors have a dynamic output – a short output pulse (10 msec) is released during metal detection. The 8102-0900 switching unit must be utilized for proper operation.

50mm (1.97 in.)

.8mm (.03 in.)

59

9701-0759

≤10%

20-30V

≤35 mA

50 mA

≤1V at 10 mA

≤3.5V at 50 mA

≤500μA

100Hz

50mm (1.97 in.)

1.0mm (.04 in.)

59

9701-0259

≤10%

20-30V

≤35 mA

50 mA

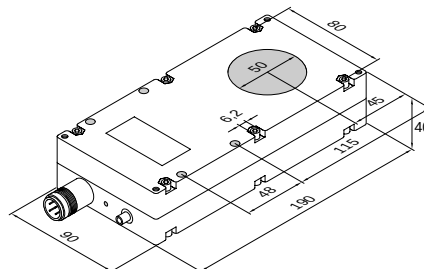
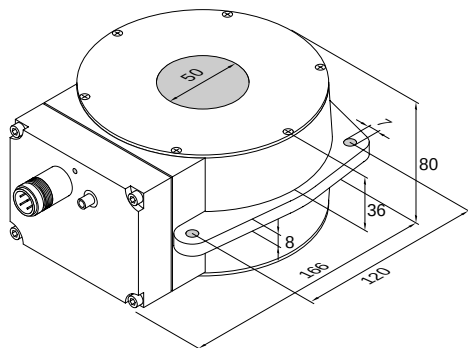
≤1V at 10 mA

≤3.5V at 50 mA

≤500μA

100Hz

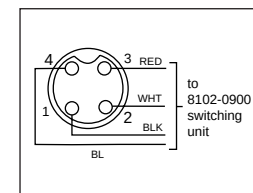
Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

NPN



**DC - 4 WIRE HIGH SENSITIVITY
RING SENSORS
ALUMINUM HOUSING
20-30V DC, 50mA
1 LED for Output Energized**

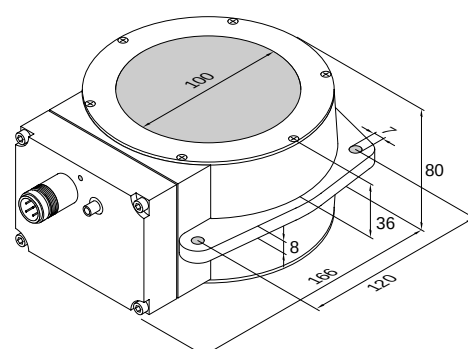
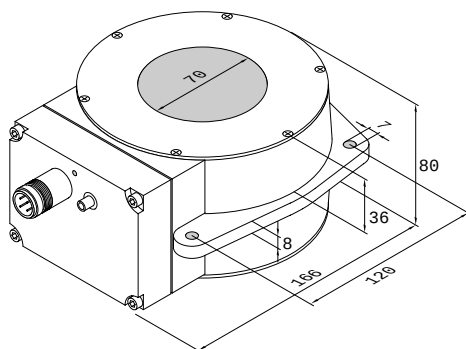
- *Applications include the detection and counting of parts in punching/pressing operations*
- *Detection of unwanted metal in grinding operations*
- *Complementary outputs available*
- *Dynamic output – must be operated with 8102-0900 Unit*
- *Carries C mark*

- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Reverse Polarity Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Ring Diameter	70mm (2.76 in.)	100mm(3.94)
Sensitivity (min. dia. steel ball)	1.1mm (.039 in.)	1.6mm (.059 in.)
Cable or Connector Style Cat. No.	59	59
PNP (Complementary NO/NC)		
NPN (Complementary NO/NC)		
	9711-0059	9700-0159
Ripple Voltage	≤10%	≤10%
Voltage Range	20-30V	20-30V
Supply Current	≤35 mA	≤35 mA
Max. Load Current	50 mA	50 mA
Voltage Drop Across Sensor	≤1V at 10 mA ≤3.5V at 50 mA	≤1V at 10 mA ≤3.5V at 50 mA
Max. Leakage Current	≤500μA	≤500μA
Switching Frequency	100Hz	100Hz

59 Style Connector

4-pin, Metal, 19mm (.75 in.) device



Metric/in. Conversion Table

7.0 mm = .27 in.	120.0mm = 5.50 in.	294.0mm = 11.20 in.
8.0 mm = .31 in.	160.0mm = 6.29 in.	305.0mm = 12.00 in.
8.5 mm = .33 in.	162.0mm = 6.37 in.	340.0mm = 13.81 in.
36.0 mm = 1.41 in.	166.0 mm= 6.52 in.	382.0mm = 15.03 in.
70.0 mm = 2.75 in.	202.0mm = 7.94 in.	397.0mm = 15.62 in.
80.0 mm = 3.15 in.	260.0mm =10.23 in.	
100.0mm = 3.93 in.	290.0mm =11.41 in.	

This table converts millimeters to inches in reference to the illustrations included in this catalog

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC, Straight

Change last digit of connector number to 2 for 5 meter cable

Refer to pages 116-121 for more cable information

Notes:

High Sensitivity Ring Sensors have a dynamic output – a short output pulse (10 msec) is released during metal detection. The 8102-0900 switching unit must be utilized for proper operation.

200mm (7.87 in.)

3.0mm (.118 in.)

59

300mm (11.81 in.)

5.0mm (.196 in.)

59

9703-0159

≤10%

20-30V

≤35 mA

50 mA

≤1V at 10 mA

≤3.5V at 50 mA

≤500μA

100Hz

9704-0159

≤10%

20-30V

≤35 mA

50 mA

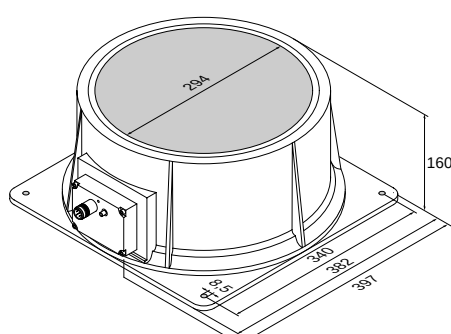
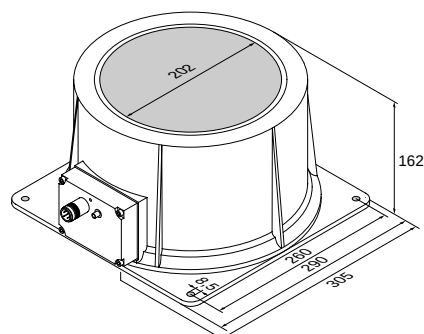
≤1V at 10 mA

≤3.5V at 50 mA

≤500μA

100Hz

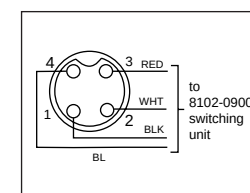
Note: Sensor dimensions in mm.



Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

NPN

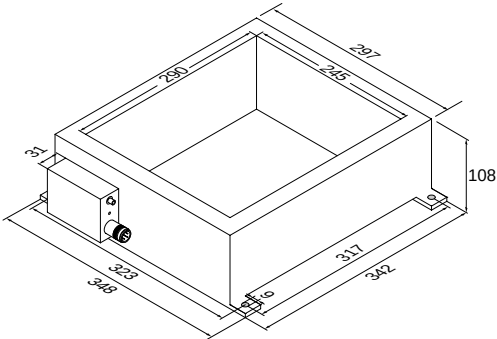
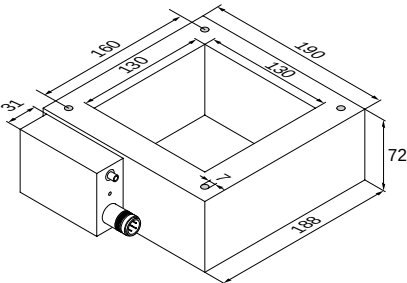


**DC - 4 WIRE HIGH SENSITIVITY
RING SENSORS
ALUMINUM HOUSING
20-30V DC, 50mA
1 LED for Output Energized**

- *Applications include the detection and counting of parts in punching/pressing operations*
 - *Detection of unwanted metal in grinding operations*
 - *Complementary outputs available*
 - *Dynamic output – must be operated with 8102-0900 Unit*
 - *Carries C mark*
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
 - Short Circuit Protection
 - Reverse Polarity Protection
 - Temperature Range: -25 to 70°C (-13 to 158°F)

Ring Diameter	130 x 130mm (5.12 in. x 5.12 in.)	245 x 290mm (9.65 x 11.42 in.)
Sensitivity (min. dia. steel ball)	5mm (.196 in.)	12mm (.472 in.)
Cable or Connector Style Cat. No.	59	59
PNP (Complementary NO/NC)		
NPN (Complementary NO/NC)	9709-0359	9709-0259
Ripple Voltage	≤10%	≤10%
Voltage Range	20-30V	20-30V
Supply Current	≤35 mA	≤35 mA
Max. Load Current	50 mA	50 mA
Voltage Drop Across Sensor	≤1V at 10 mA ≤3.5V at 50 mA	≤1V at 10 mA ≤3.5V at 50 mA
Max. Leakage Current	≤500µA	≤500µA
Switching Frequency	100Hz	100Hz
Note: Sensor dimensions in mm.		

59 Style Connector
4-pin, Metal, 19mm (.75 in.) device



Metric/in. Conversion Table

7.0 mm = .27 in.	188.0 mm = 7.39 in.
9.0 mm = .35 in.	190.0 mm = 7.43 in.
31.0 mm = 1.22 in.	245.0mm = 9.63 in.
72.0 mm = 2.83 in.	297.0mm =11.67 in.
108.0mm = 4.24 in.	317.0mm =12.45 in.
130.0 mm= 5.11 in.	342.0mm =13.44 in.
160.0 mm= 6.29 in.	

This table converts millimeters to inches in reference to the illustrations included in this catalog

Notes:

High Sensitivity Ring Sensors have a dynamic output – a short output pulse (10 msec) is released during metal detection.
The 8102-0900 switching unit must be utilized for proper operation.

Accessories

2 meter (6 ft. 6 in.) DC Cable Assemblies for Quick Disconnect Sensors

59 Connector 9512-0200 PVC, Straight

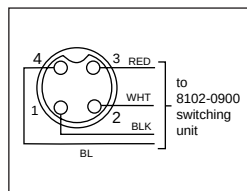
Change last digit of connector number to 2 for 5 meter cable

Refer to pages 116-121 for more cable information

Wiring Diagrams

Note: Wire colors are applicable on cables purchased from Altech

NPN



DC - 3 WIRE ANALOG RING SENSORS 18-30V DC, 5mA 1-9 Volt Analog Output

- *Analog output voltage proportional to metal target size*
- *Carries € mark*
- IEC(529) IP67 (NEMA 1, 3, 4, 6, 12, 13) Protection
- Short Circuit Protection
- Overload Protection
- Temperature Range: -25 to 70°C (-13 to 158°F)

Metric/in. Conversion Table

18.0 mm = .70 in.	43.0 mm = 1.7 in.
20.0 mm = .78 in.	58.0 mm = 2.3 in.
24.0 mm = .94 in.	73.5 mm = 2.9 in.
26.0 mm = 1.02 in.	106.0mm = 4.2 in.
35.0 mm = 1.37 in.	

This table converts millimeters to inches in reference to the illustrations included on these pages

Accessories

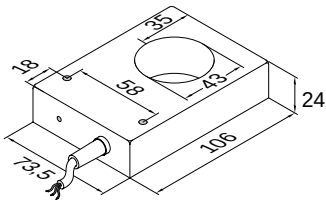
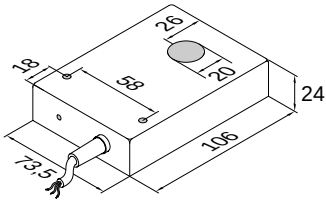
The analog output voltage can be digitized by the 8100-2100 switching unit and 8100-2400/2500 modules.
(Separate Accessory items - refer to pages 125 - 126 for more information.)

Ring Diameter	20mm (.79 in.)	43mm (1.69 in.)
Sensitivity (steel ball dia.)	Ø 0.5mm - Ø6mm	Ø 1mm - Ø20mm
Cable or Connector Style Cat. No.	Cable	Cable
	9714-2000	9714-4300
Voltage Range	18V - 30V DC	18V - 30V DC
Supply Current	≤10 mA	≤10 mA
Maximum Load Current	5mA	5 mA
Switching Frequency	50Hz	50Hz
Temperature Drift	±0.4V	±0.4V
Repeatability	≤1%	≤1%
Housing Material	ABS	ABS
Output Voltage Range	1 - 9V DC	1 - 9V DC

Note: Sensor dimensions in mm.

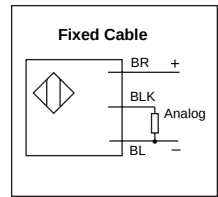
Fixed Cable

PVC 2m (6ft. 6in.).
For 5m (16 ft. 5 in.) cable length, change the last two digits of the part number to 02. For other cable lengths and/or PUR cable, please consult Altech.



Wiring Diagrams

Note: Wire colors are applicable to cable purchased from Altech



Accessories



GENERAL INFORMATION

Altech accessories are available as optional equipment to assist in the use of sensor products.

Some sensor products require specific accessory units in order to perform satisfactory. Please consult the product specification to determine which accessories are essential.

The accessories include mounting brackets, cable assemblies, switching amplifier units, and motion detector systems.

MOUNTING BRACKETS

Several fixtures are available that provide the ability to mount cylindrical and limit style sensors.

CABLE ASSEMBLIES

Altech offers one of the largest Quick Disconnect selection of sensors in the industry and matching cable assemblies. Standard Sensors come with 2 meter fixed PVC cables, but to improve maintenance and mean time to repair (MTTR) quick disconnect sensors with matching cable assemblies are desirable.

For DC Sensors Altech offers a mini- style 4-pin cable assembly, a micro style 3- and 4-pin cable assembly, and a

pico style 3-pin cable assembly. Most are available in straight or 90° molded cable connection, and the micro and pico styles are also available with 2 LED's.

For AC Sensors Altech offers a mini- style 3-pin cable assembly, a micro style 3-pin and 4-pin cable assembly.

SWITCHING/AMPLIFIER UNITS

Altech offers a wide variety of products used in conjunction with Ring Sensors, Analog Sensors, Namur Sensors, testers and power supply modules for all sensor products.

MOTION DETECTOR SYSTEMS

Motion detectors accept impulses from proximity sensors when a repetitious event is occurring. These impulses are measured compared to a standard. The motion detector will "Time Out" between impulses and provide an output for over or under the set speed.

Altech offers completely contained motion detector systems, including built-in proximity sensors or as separate components.

Accessories

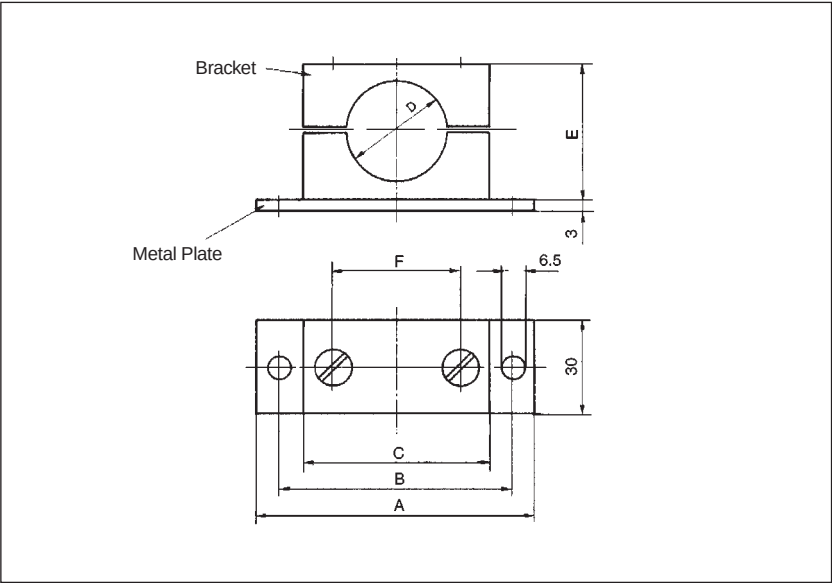
Mounting Brackets

9512-6100/9512-6200

9512-6400/9512-6600



Non-metallic mounting brackets are used for 8mm (.31 in.), 12mm (.47 in.), 18mm (.71 in.), and 30mm (1.18mm) cylindrical sensors.

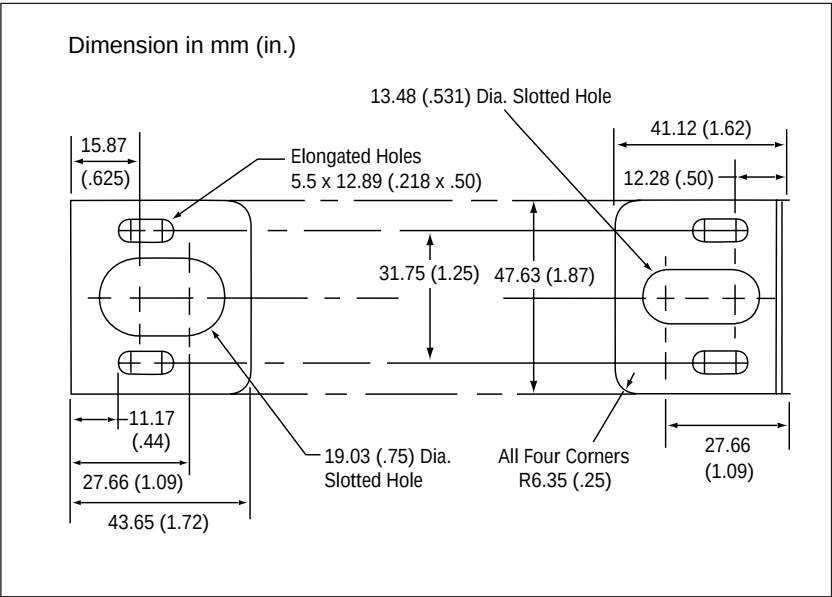


Dimensions in mm (in.)						
D=SENSOR Ø	A	B	C	E	F	Model
8 (0.31)	64 (2.52)	50 (2.0)	37 (1.46)	27 (1.06)	20 (0.79)	9512-6100
12 (0.47in.)	64 (2.52)	50 (2.0)	37 (1.46)	27 (1.06)	20 (0.79)	9512-6200
18 (0.71in.)	70 (2.76)	56 (2.20)	42 (1.65)	33 (1.3)	26 (1.02)	9512-6400
30 (1.18in.)	87 (3.43)	73 (2.87)	58 (2.28)	42 (1.65)	40 (1.57)	9512-6600

Model No. MB 1

A Metallic Mounting Bracket is available for 12mm (.47 in.) and 18mm (.071 in.) cylindrical sensors. Bracket is finished in clear anodized Aluminum.

This bracket allows for adjustment forward, backward, and sensor height.



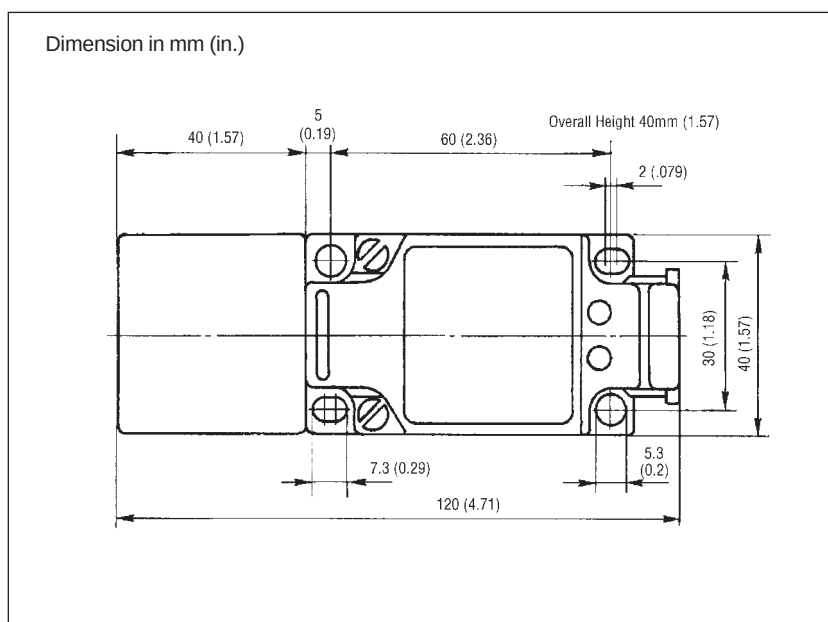
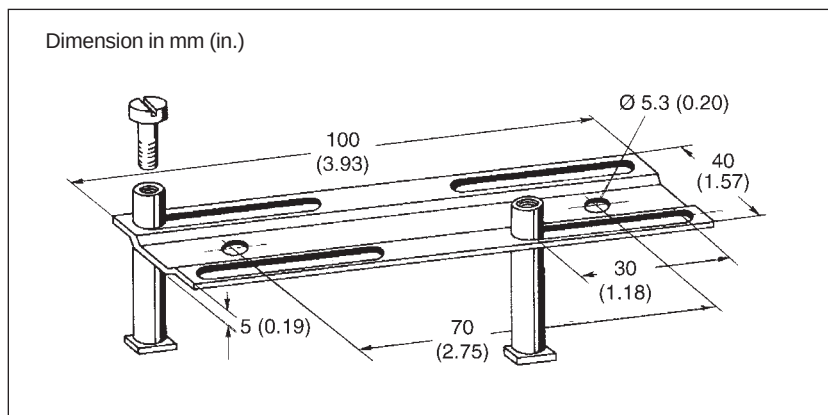
Accessories

9512-8200 Mounting Plate for Limit Style Sensors

Mounting dimensions: According to DIN 50 027/037
Material: VA 1.4301.

This mounting plate is used if the sensing device has to be adjusted after the installation.

This mounting plate is used only for Limit Style Sensors.



Accessories / Cable Assemblies

Model / Description

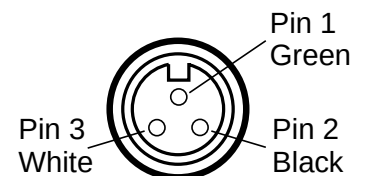
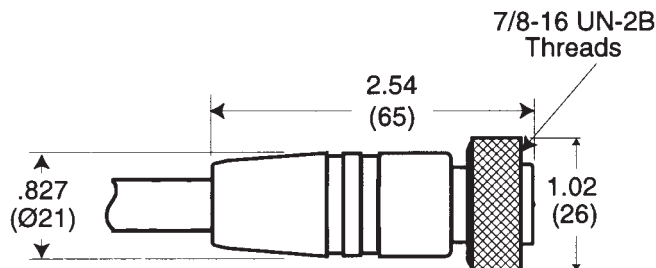
Dimensions

Wire Color Code

8000-5030

2m (6ft.) 3 pin
plug & cable for
AC sensors with
connector 62

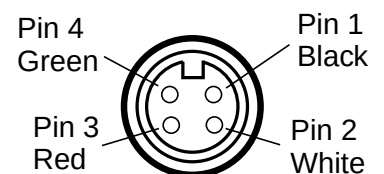
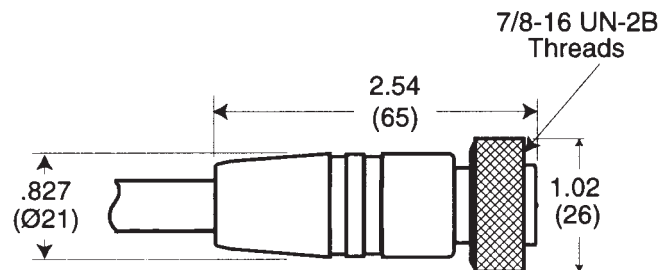
Use 8000-5035
for 5m lengths



8000-5040

2m (6ft.) 4 pin
Cable for DC
sensors with
connector 62

Use 8000-5045
for 5m lengths



Technical Data / Connectors and Receptacles: 8000-5030, 8000-5040

Application Class: -40°C to +90°C

Materials:

Body: PUR, yellow

Contact: Solid-machined Brass,
Gold over Silver Plating

Insert: PUR, yellow

Coupling Nut: Standard: aluminum (black anodized)
Options: nylon (glass reinforced black);
stainless steel (passivated)

Receptacle shell: Aluminum, Clear Anodized
Options: Brass, Electroless Nickel
Plated, Stainless Steel

Mechanical Data:

Protection: IP68, NEMA 6P
(only in fully locked position)

Insertion Force: ≤ 3.0N .67 lbs.

Withdrawal Force: ≥ 1.0N .22 lbs.

Shock: IEC 68-2-27

Vibration: IEC 68-2-6

Electrical Data:

Contact Resistance: ≤ 5mΩ

Current Rating: 8000-5030 - 10A, 8000-5040 - 8A

Working Voltage: 16 AWG cable: 600 VAC-RMS

Dielectric Withstanding
Voltage: 2 & 3 pole _ 2 KVAC RMS/60sec
4 & 5 pole _ 1.5 KVAC RMS/60sec

Insulation Resistance: >10⁹Ω

Cable:

16 AWG: UL-STOW-A; Hi-Flex bare,
65 x 34 copper stranding, yellow jacket

18 AWG: UL-SOOW-A; AWM 2661; Hi-Flex bare
41 x 34 copper stranding, yellow jacket

Agency Approvals:

UL Recognition: E104696

CSA Certified: LR101546-1

Accessories / Cable Assemblies

Model / Description

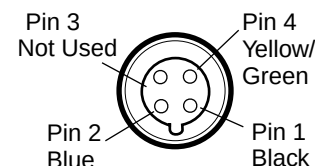
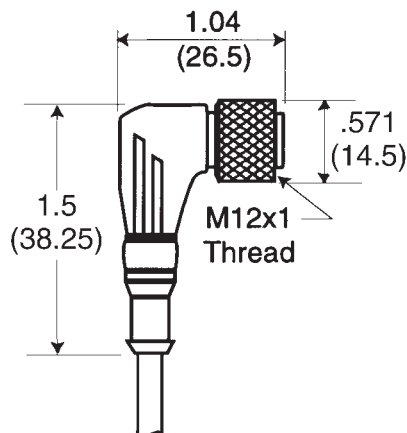
Dimensions

Wire Color Code

8000-5060

2m (6ft.) right angle
4 pin plug & cable
for AC sensors with
connectors 66 & 67

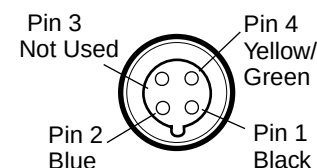
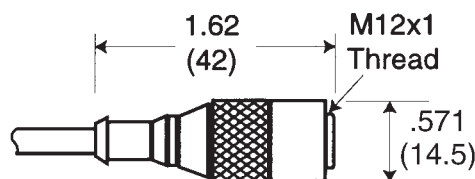
Use 8000-5065
for 5m lengths



8000-5070

2m (6ft.) straight
4 pin plug & cable for
AC sensors with con-
nectors 66 & 67

Use 8000-5075
for 5m lengths



Technical Data / Connectors and Receptacles: 8000-5060, 8000-5070

Application Class: HNE acc. to DIN 40040
-40°C to +90°C

Materials:

Molded Body: PUR (polyurethane)
Contact: Copper alloy, gold over nickel plating
Cable: PVC, self extinguishing, orange
Coupling Nut: Brass, nickel plated

Mechanical Data:

Protection: IP68, NEMA 6P
(only in fully locked position)

Electrical Data:

Contact Rating: ≤5mΩ
Current Rating: 3A
Working Voltage: 250V
Dielectric Withstanding Voltage: 2 KVAC RMS/60 seconds
Insulation Resistance: >10⁹Ω

Cable:

22 AWG: Hi-Flex bare copper stranding,
yellow jacket
18 AWG: Hi-Flex bare copper stranding,
yellow jacket

Agency Approvals:

UL recognition: E104696
CSA Certified: LR101546-1

Accessories / Cable Assemblies

Model / Description

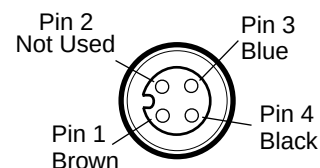
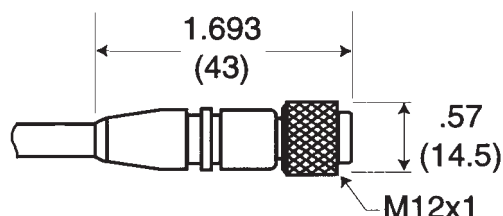
Dimensions

Wire Color Code

8000-5110

2m (6ft.) straight
4 pin plug & cable
for DC sensors
(sink or source) with
connectors 45,50,63 & 65

Use 8000-5115
for 5m lengths

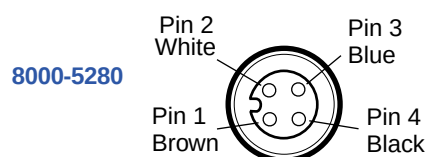
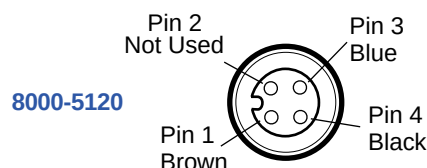
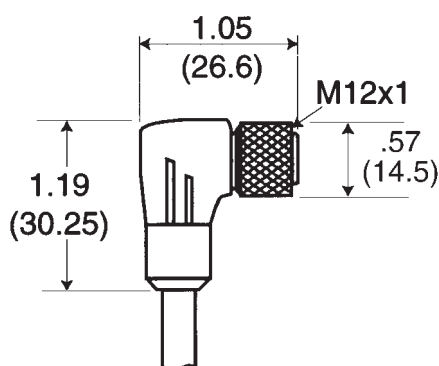


8000-5120 & 8000-5280

2m (6ft.) right angle
4 pin plug & cable
for DC sensors
(sink or source) with
connectors 45,50,63 & 65

8000-5120 – Use 8000-5125
for 5m lengths

8000-5280 – Use 8000-5285
for 5m lengths



Technical Data / Connectors and Receptacles: 8000-5110, 8000-5120, 8000-5280

Application Class: HNE acc. to DIN 40040
-40°C to +90°C

Materials:

Molded Body: PUR (Polyurethane)
Contact: Copper alloy, gold over
nickel plating
Cable: PVC, self extinguishing, yellow
Coupling Nut: Brass, nickel plated

Mechanical Data:

Protection: IP68, NEMA 6P
(only in fully locked position)

Electrical Data:

Contact Resistance: $\leq 5\text{m}\Omega$
Current Rating: 3A
Working Voltage: 250V
Dielectric Withstanding
Voltage: 2 KVAC RMS/60 seconds
Insulation Resistance: $>10^9\Omega$

Cable:

22 AWG: AWM 2661; Hi-Flex bare,
26 x 36 or 22 x 36 copper stranding,
yellow jacket

Agency Approvals:

UL Recognition: E104696
CSA Certified: LR101546-1

Accessories / Cable Assemblies

Model / Description

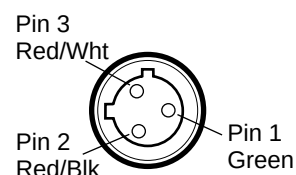
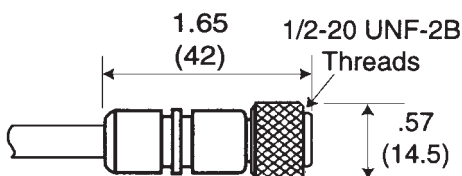
Dimensions

Wire Color Code

8000-5130

2m (6ft.) straight
3 pin plug & cable
for AC sensors with
connector 48,68

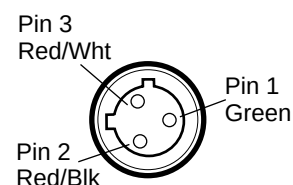
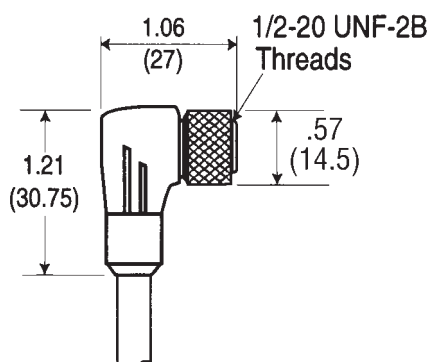
Use 8000-5135
for 5m lengths



8000-5140

2m (6ft.) right angle
3 pin plug & cable
for AC sensors with
conector 48,68

Use 8000-5145
for 5m lengths



Technical Data / Connectors and Receptacles: 8000-5130, 8000-5140

Application Class: HNE acc. to DIN 40040
-40°C to +90°C

Materials:

Molded Body: PUR (Polyurethane)
Contact: Copper alloy, gold over nickel plating
Receptacle: Brass, nickel plated
Cable: PVC, self-extinguishing, yellow
Coupling Nut: Brass, nickel plated

Mechanical Data:

Protection: IP68, NEMA 6P
(only in fully locked position)

Electrical Data:

Contact Resistance: $\leq 5\Omega$
Current Rating: 3A
Working Voltage: 250V
Dielectric Withstanding Voltage: 2 KVAC RSM/60 seconds
Insulation Resistance: $>10^9\Omega$

Cable:

22 AWG: AWM 2661; Hi-Flex bare, 26 x 36 copper stranding, yellow jacket

Agency Approvals:

UL Recognition: E104696
CSA Certified: LR101546-1

Accessories / Cable Assemblies

Model / Description

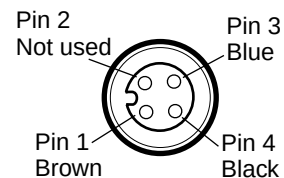
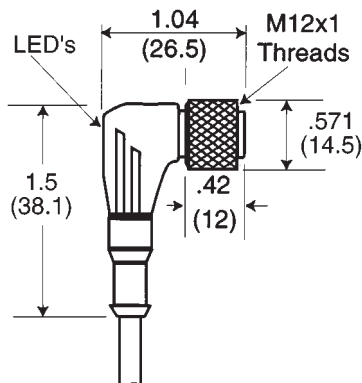
Dimensions

Wire Color Code

8000-5150 & 8000-5160

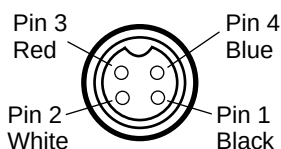
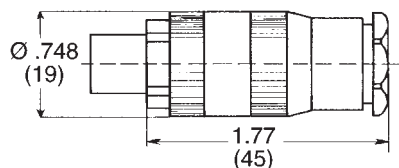
2m (6ft.) 4 pin plug & cable with 2 LED's for DC sensors with connectors 45,50,63 & 65. RP-515 for sink (NPN) output sensor. RP-516 for source (PNP) output sensor.

Use 8000-5155 & 8000-5165 for 5mm lengths



9512-0200

2m (6ft.) straight 4 pin metal plug & cable for connector 59



Technical Data / Connectors and Receptacles: 8000-5150, 8000-5160

Application Class: -40°C to +90°C

Materials:

Molded Body: PUR (Polyurethane)
Contact: Copper Alloy, gold over nickel plating
Insert: PUR (Plugs)
Cable: PVC, self-extinguishing, yellow
Coupling Nut: Brass, nickel plated

Mechanical Data:

Protection: IP68, NEMA 6P (only in fully locked position)
Insertion Force (Contact): ≤ 2N .45 lbs.
≥ .5N .11 lbs.
Shock: IEC 68-2-27
Vibration: IEC 68-2-6

Electrical Data:

Contact Resistance: ≤ 5mΩ
Current Rating: 3A
Working Voltage: 10-30 VDC
Dielectric Withstanding Voltage: 2 KVAC RMS/60 seconds
Insulation Resistance: >10⁹Ω

Cable: .25mm²

Agency Approvals:

UL Recognition: E104696
CSA Certified: LR101546-1

Accessories / Cable Assemblies

Model / Description

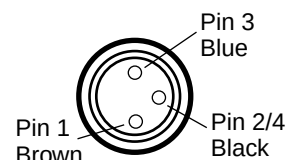
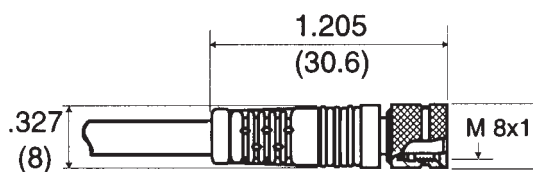
Dimensions

Wire Color Code

8000-5220

2m (6ft.) straight
3 pin plug & cable for DC sensors
with 64 connector

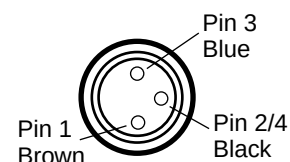
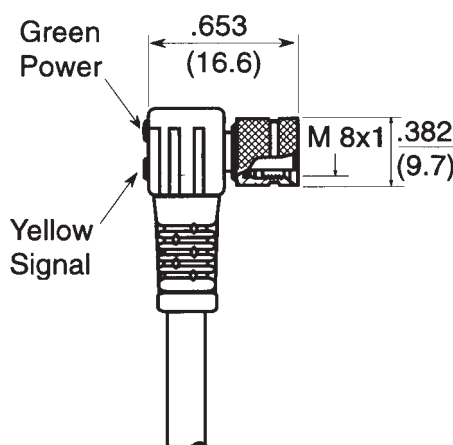
Use 8000-5225 for 5m lengths



8000-5230

2m (6ft.) right angle 3 pin plug &
cable with 2 LED's for DC, PNP
(source) sensors with 64 connector

Use 8000-5235 for 5m lengths



8000-5240

2m (6ft.) right angle 3 pin plug & cable
with 2 LED's for DC, NPN
(sink) sensors with 64 connector

Use 8000-5245 for 5m lengths

Technical Data / Connectors and Receptacles: 8000-5220, 8000-5230, 8000-5240

Application Class: HNE acc. to DIN 40040
-25°C to +90°C ≤75%rF

Materials:

Molded Body: TPU, self-extinguishing (RMS only –
PA 6.6, self extinguishing)

Contact: Solid machined brass, gold
over nickel plating

Receptacle: Brass, nickel plated

O-Ring for Receptacle: Viton

Cable: PVC, self extinguishing, orange

Coupling Nut: Brass, nickel plated

Mechanical Data:

Protection: Snap-In – IP65, NEMA 4
Locking – IP 68 NEMA 6P
(only in fully locked position)

Electrical Data:

Contact Resistance: ≤ 5mΩ

Current Rating: 4A

60 VAC / RMS/75VDC (solder
contacts potted with epoxy for
receptacles)

Working Voltage: 250V

Dielectric Withstanding

Voltage: 2 K VAC RMS/60 seconds

Insulation Resistance: >10⁹Ω

Accessories

8300-0100/0500

Power and Switching Units for NPN and PNP sensors

- *Short circuit protection*
- *Temperature range:*
-10 to 50°C (14 - 122°F)
- *Type 8300-0100: 230V*
- *Type 8300-0500: 110V*
- *LED for Output Energized*

The Universal Power and Switching Unit is used to supply power for sensors and provide a relay output of the sensor status.

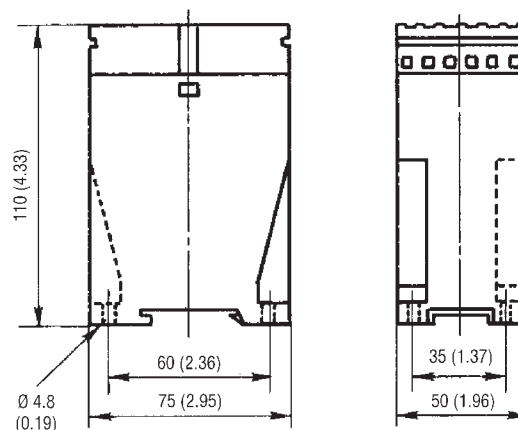
The unit is DIN rail mountable and can supply power for one NPN or PNP sensor.



Standard Data

Cat. No.	8300-0100	8300/0500
Supply Voltage:	230V AC	110V AC
Operating Frequency:	50/60Hz	50/60Hz
Temperature Range:	-10°C up to +50°C	-10°C up to +50°C
Output Voltage: (for sensor supply)	24V, stabilized and short circuit-proof	24V, stabilized and short circuit-proof
Max. Load Current:	120mA	120mA
Relay Output:	SPDT	SPDT
Max. Switching Voltage:	250V AC	250V AC
Max. Switching Current:	5A (ohmic load)	5A (ohmic load)
Max. Switching Capacity:	1100VA	1100VA

Dimensions in mm (in.)



Accessories

8100-2200

Power and Switching Units for Namur sensors

- **Power supply unit**
- **Temperature range:**
-10 to 70°C (14 - 158°F)
- **Amplifier**
- **Relay Output**
- **Drives one Namur sensor**

Namur sensors operate with a supply voltage of 8.2V. Therefore, Namur sensors are mostly operated with switching units (with a current interface according to DIN 19234). The 8100-2200 Namur Switching Unit is equipped with such an interface. The Namur sensor has a low impedance with no metal target detected. When a metal target is detected the impedance is higher. This change in impedance causes current change which is detected by the switching unit.

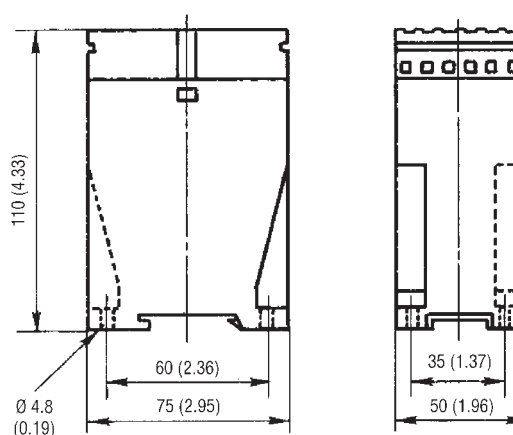
The 8100-2200 switching unit opens up application areas such as standard proximity switches to Namur sensors. This is supported by the small overall dimensions of the Namur sensors.



Standard Data

Cat. No.	8100-2200
Supply Voltage:	220V/110V AC
Operating Frequency:	50/60Hz
Temperature Range:	-10°C up to +70°C (14 to 158°F)
Output Voltage: (for sensor supply)	8.2V
Relay Output:	SPDT
Switching Voltage:	250V AC
Switching Current:	5A (resistive)
Max. Switching Capacity:	1100VA

Dimensions in mm (in.)



Accessories

8102-0900/0930 Power and Switching Units for High Sensitive Ring Sensors

This switching amplifier is used with ALTECH Dynamic Ring Sensors. It can also be used as a time delay for NPN sensors since it contains a delay function. Both a transistor output and relay contact output are available.

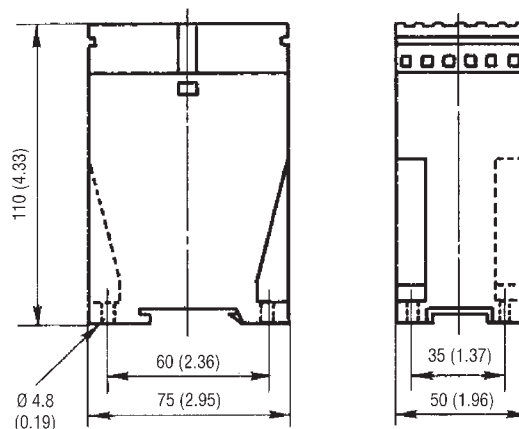


- Adjustable Pulse Duration of the output signal
- Short circuit protection
- Transistor Output and a relay output
- LED for Output Energized
- Type 8102-0900: 220V
- Type 8100-0930: 110V
- Temperature range: -10 to 50°C (14 - 122°F)
- Adjustable Output timing delay of 10 msec to 18 seconds

Standard Data

Cat. No.	8102-0930	8102-0900
Supply Voltage:	220V AC	110V AC
Operating Frequency:	50/60Hz	50/60Hz
Temperature Range:	-10°C up to +50°C	-10°C up to +50°C
Output Voltage: (for sensor supply)	24V, stabilized and short circuit-proof	24V, stabilized and short circuit-proof
Transistor Output:		
Max. Load Current	80mA	80mA
Voltage Drop	0.5V	0.5V
Leakage Current	≤10µA	≤10µA
Relay Output:	SPDT	SPDT
Max. Switching Voltage:	250V AC	250V AC
Max. Switching Current:	5A (ohmic load)	5A (ohmic load)
Max. Switching Capacity:	1100VA	1100VA

Dimensions in mm (in.)



Accessories

8100-2100/2130 Power and Switching Units for Analog Sensors

- Provides 24V DC for Sensors
- Choice of 4 Outputs
 - Analog Voltage
 - Analog Current
 - 4 Bit Digital
 - Relays (3) with LED indicators
- Compatible with all Altech Analog Sensors

The multi-function amplifier Type 8100-2100/2130 operates in conjunction with either one of the analog sensors 9914-0800, 9414-0800, 9414-0900, 9914-1000, 9814-1133, 9814-2133, 9714-2000 or 9714-4300. It contains a power supply for the sensor voltage (24V DC) and converts the analog signal of the sensors to four different outputs.

1. Analog voltage output:
0-10V DC, max 5mA.
2. Analog current output:
0-20mA, max. load resistance 500Ω.
3. Digital Output:
four bit, open collector, npn, "active low".
4. Relay Output:
3 relays for triggering point are built in (change over contact, SPDT).
Load voltage: 220V AC
Load current: 5A (resistive)
Switching capacity: 1100VA
The switching point of each relay can be adjusted by a potentiometer and is indicated by individual LED's.
Settings:
Three Relays with switching thresholds can be chosen by means of three integrated potentiometers. When reaching the switching threshold, the corresponding LED will light up.

In addition to Units 8100-2100 and 8100-2130, there are two Analog Modules available to be mounted onto DIN/EN mounting rails.

- Module 8100-2400 with:
 - Analog voltage output
 - Analog current output
 - 4-bit digital output
- Module 8100-2500 with:
 - 8-bit digital output

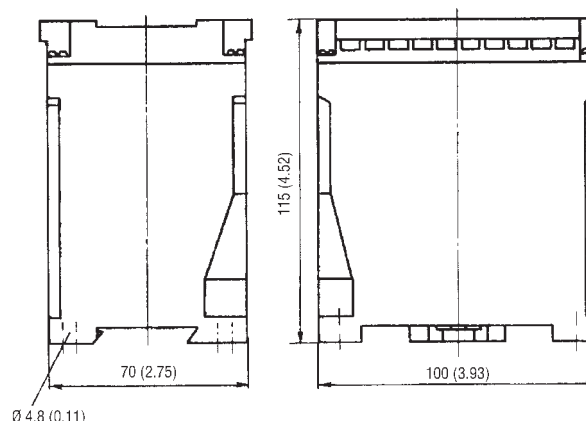
Modules 8100-2400 and 8100-2500 are described on page 126.

Standard Data

Cat. No.	8100-2100	8100/2130
Supply Voltage:	220V AC	110V AC
Operating Frequency:	50/60Hz	50/60Hz
Temperature Range:	-10°C up to +60°C (32 - 140°F)	-10°C up to +60°C (32 - 140°F)
Supply Voltage for Analog Sensor	24V	24V



Dimensions in mm (in.)



Accessories

8100-2400/8100-2500 Analog Input Multi-Function Switching Unit

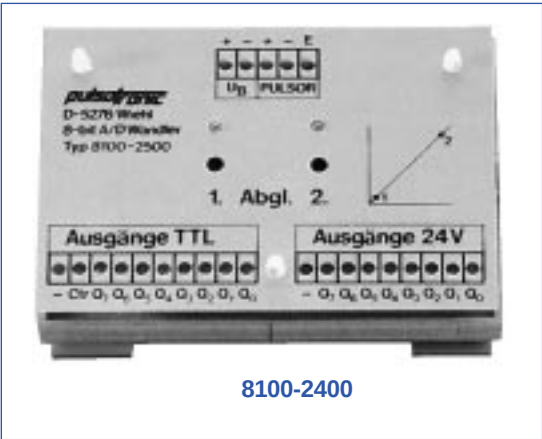
- 8100-2400 has choice of 3 outputs
 - Analog Voltage
 - Analog Current
 - 4 Bit Digital
- 8100-2500 has an 8 bit digital output
- Output protected against short circuits and polarity reversal

The Multifunction Amplifiers Type 8100-2400 and 8100-2500 operate in conjunction with either one of the Analog sensors 9914-0800, 9914-1000, 9914-1133, 9814-2133, 9714-2000 or 9714-4300. It operates with customer supplied DC voltage, 18-30V DC, and converts the analog signal to three (3) different outputs for the 8100-2400. The 8100-2500 has one output, an 8 bit digital output.

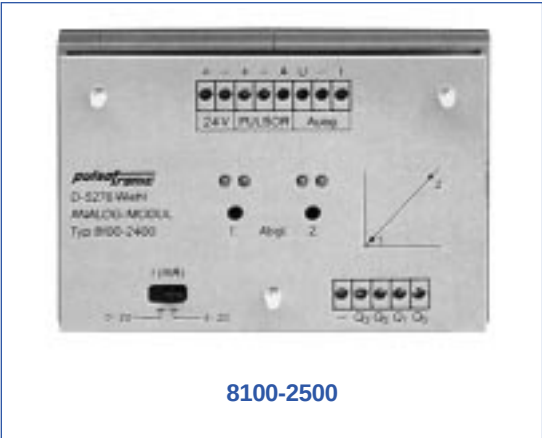
The 8100-2500, 8-bit digital output divides the analog voltage into 256 individual increments which results in a resolution of 10µm/bit (.0004 in./bit). All outputs are protected against short circuits, and the unit is protected from Polarity reversal.

Standard Data

Cat. No.	8100-2400	8100-2500
Supply Voltage:	18-30V DC	18-30V DC
Temperature Range:	0 to 60°C (32 to140°F)	0 to 60°C (32 to140°F)
Analog Voltage Output:	0 to 10V	–
Analog Current Output:	0 to 20mA or 4 to 20mA (jumper)	–
Digital Output 1:	4 bit open collector, PNP	8 bit open collector, PNP
Max. load current:	20mA	20mA
Voltage drop:	≤3.5V at 20mA	≤3.5V at 20mA
Max. Switching Voltage:	30V	30V
Digital Output 2:	–	8 bit TTL output
VQH	–	≤4.5V
IQH	–	≤2mAV
VQL	–	≤0.3V
IQL	–	≤6mA



8100-2400



8100-2500

Accessories

8309-0130/8309-0230

Testers for DC and
AC Sensors

- Tests an inductive sensors field in place, without removing the sensor
- Tests the output circuit
- Identifies the sensor output as either sink (NPN) or source (PNP) for DC sensors

These testers can greatly reduce down-time and maintenance costs by quickly checking the proper function of all kinds of inductive capacitive, or photoelectric sensors.



8309-0130
For DC Sensors



8309-0230
For AC Sensors

Accessories

9863-4300/4400/4600 Motion Detector Systems

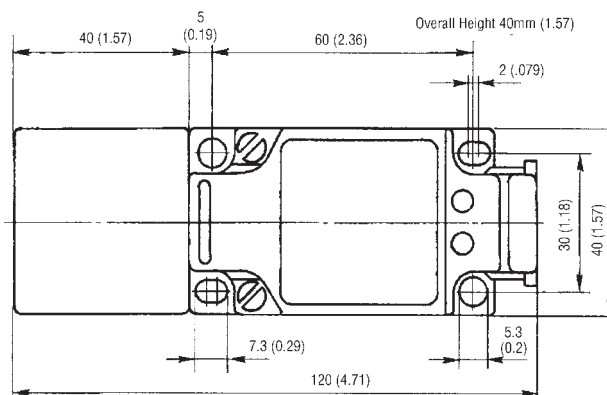
- **9 position sensor head adjustment**
simplifies adaptation to conditions
- **Programmable NO/NC outputs**
- **Speed range of 100 - 3000 pulses per minute**
- **Startup delay 0.5 - 6.0 seconds, adjustable**
- **2 LED's for Output Energized & Operating Voltage**
- **IP67 Protection (NEMA 1,3,4,6,12,13) Protection**

These Motion Detecting Systems in Limit Style housing are used to control the rotational speed of motors, pumps, and conveyor drives. They are completely self-contained, with an integral proximity switch and timing functions to perform over and under speed detection. Typical targets are cam lobes, sprocket teeth, or small tabs.

Standard Data

Cat. No.	9863-4300	9863-4400	9863-4600
Mounting:	Flush	Semi-Flush	Flush
Sensing Distance:	15mm (0.59 in.)	25mm (0.98 in.)	15mm (0.59 in.)
Switching Mode:	PNP	PNP	PNP
Type Sensor:	Overspeed	Overspeed	Underspeed
Speed Range:	100 - 3000 ppm	100 - 3000 ppm	100 - 3000 ppm
Startup Delay:	0.5 - 6 sec	0.5 - 6 sec	0.5 - 6 sec
Voltage Range:	10 - 30V DC	10 - 30V DC	10 - 30V DC
Ripple Voltage:	≤10%	≤10%	≤10%
Voltage Drop Across Sensor:	≤2.4V	≤2.4V	≤2.4V
Max. Load Current:	400mA	400mA	400mA
Supply Current:	≤34mA	≤34mA	≤34mA
Leakage Current:	≤10μA	≤10μA	≤10μA
Repeat Accuracy:	.75mm (0.3 in.)	1.25mm (.049 in.)	.75mm (.03 in.)
Temperature Range:	-25 to +70°C	-25 to +70°C	-25 to +70°C
Housing Material:	Trogamid T	Trogamid T	Trogamid T
Output, all models: If speed is above limit, the output is switched on. If speed is below limit, the output is switched off.			

Dimensions in mm (in.)



Accessories

8303-0430

Motion Detector in Universal Housing

- Operates on DC supply voltage
- 3 Speed Ranges
- System start-up delay adjustable

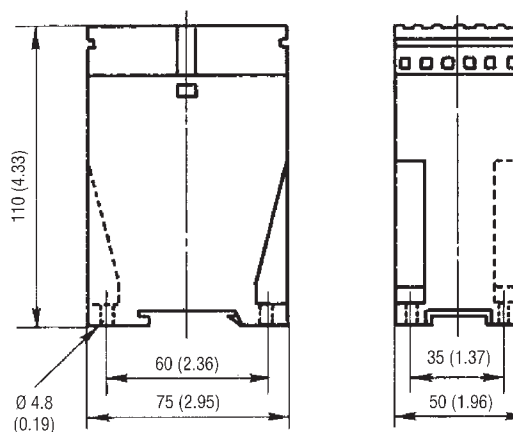
This motion detector detects the rotational speed of actuation, rotating shafts or other movements such as lifting or pushing. The impulse can be given by any PNP or NPN DC-sensor. The impulse is effected by control cams, gears, wheels or other signals. The housing can be mounted on a DIN/EN rail or on a mounting plate.

Standard Data

Cat. No.	8303-0430
Supply Voltage:	18V - 30V
Temperature Range:	-10°C up to +60°C
5 speed range:	6 - 60 rpm 60 - 600 rpm 600 - 6000 rpm
Start-up Delay:	0.5 - 10 sec
Hysteresis	0.5 - 10% adjustable
Relay Output:	SPDT 250V/5A
Function Switch:	Position S — Relay activated for overspeed Position 0 — Relay activated for underspeed
LED - Switching state indication:	Same time as relay contact



Dimensions in mm (in.)



Accessories

8100-2700/2800

Motion Detector in

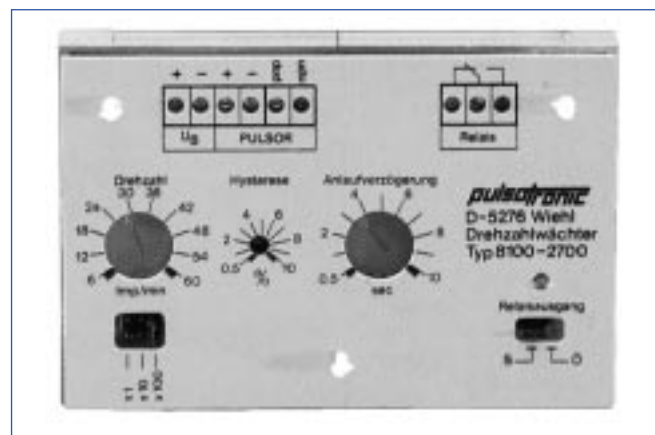
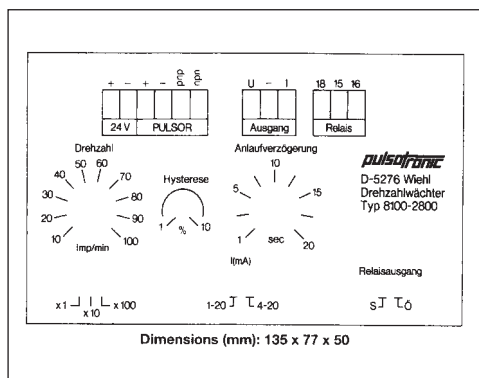
Universal Snap-on Housing

These units monitor/control electronically the speed of drives, rotating shafts or other motions. Both inductive and other three-wire DC voltage proximity switches can be used as pulse generator input to this motion detector. Pulse generation is effected e.g. by rotating control cams, gear-wheels or other signal targets. The housing can be snapped on to DIN/EN mounting rails or threaded to mounting plates.

- *System start-up delay adjustment*
- *3 Speed ranges with adjustment to set speed*
- *DC Supply Voltage*
- *Relay Output*

Standard Data

Cat. No.	8100-2700	8100-2800
Supply voltage (polarity reversal)	18V - 30V DC	18V - 30V DC
Supply Current:	≤50mA at 24V	—
Inputs:	NPN or PNP sensor signal	NPN or PNP sensor signal
Analog Output Voltage:	—	1V - 10V load resistance min 2KΩ
Analog Current Output:	—	adjustable 4-20mA load resistance 0-500Ω
Relay Output:		
Current Carrying Capacity:	250V/5A	250V/5A
Normally Open/Closed		
Selectable via Plug::	In NO position, the relay will be activated, if the set speed is exceeded. In NC position, the relay will be activated if the speed falls below the set	In NO position the relay will be activated, if the set speed is exceeded
Speed Ranges:	6 - 60 rpm 60 - 600 rpm 600 - 6000 rpm	10 - 100 rpm 100 - 1000 rpm 1000 - 10000 rpm
Starting Delay Adjustable:	0.5 - 10 sec.	1 - 10 sec
Hysteresis Adjustable:	5 - 10%	1 - 10%
LED Switching State Indication:	activated same time as relay	activated same time as relay
Temperature Range:	-0°C to +60°C (32-140°F)	-0°C to +60°C (32-140°F)



THE NEWEST ADDITION TO ALTECH'S SENSOR PRODUCTS...

Pulsotronic Capacitive, Photo-electric, and Ultrasonic Sensors.

ALTECH now offers a comprehensive line of Capacitive, Photo-electric, and Ultrasonic Sensors to satisfy the expanding Automation Industry.

These new Sensors are available in DC (PNP & NPN), and AC models. Housing styles are Cylindrical, Limit Style, and Block.

Features:

- **Capacitive** – *Detects Metals, Non-Metals, and Liquids.*
 - **Photo-electric** – *Available in Diffuse Reflection, Retro-Reflection, and Through Beam models.*
 - **Ultrasonic** – *Digital and Analog models available, using sound to detect targets and target distances.*



...Contact Altech for more information

IP Codes (International Protection) Protection Levels - IEC 529/ EN 60529, DIN, VDE 0470 Part 1

IEC 529 outlines an international classification system for the sealing effectiveness of enclosures of electrical equipment against the intrusion into the equipment of foreign bodies (i.e., tools, dust, fingers) and moisture. This classification system utilizes the letter "IP" (International or Ingress Protection) followed by two digits. (An "X" is used for one of the digits if there is only one class of protection; i.e., IP X4 which addresses moisture resistance only.)

First Digit

Degree of protection against contact with moving parts (other than smooth rotating shafts, etc.) and the ingress of solid foreign bodies.

Second Digit

Degree of protection against the harmful entry of various forms of moisture (i.e., dripping, spraying, submersion, etc.).

1st digit	Protection From Solid Objects	2st digit	Protection From Moisture
0	No special protection	0	No special protection
1	Protection from a large part of the body such as a hand (but no protection from deliberate access); from solid objects greater than 50mm in diameter.	1	Protection from dripping water
		2	Protection from vertically dripping water
		3	Protection from sprayed water
2	Protection against fingers or other objects not greater than 80mm in length and 12mm in diameter.	4	Protection from splashed water
		5	Protection from water projected from a nozzle
3	Protection from entry by tools, wires, etc., with a diameter or thickness greater than 2.5mm	6	Protection against heavy seas, or powerful jets of water
		7	Protection against immersion
4	Protection from entry by solid objects with a diameter or thickness greater than 1.0mm	8	Protection against complete continuous submersion in water
5	Protection from the amount of dust that would interfere with the operation of equipment		
6	Dust-tight		

Note: All first digits and second digits up to and including characteristic digit **6**, imply compliance also with the requirements for all lower characteristic digits in their respective series (first or second). Second digits **7** and **8** do **not** imply suitability for exposure to water jets (second characteristic digit **5** or **6**) unless dual coded; i.e., **IP _5/IP _7**.

NEMA Enclosure Standards

The following information is derived from the NEMA Standard #250, dated May 1988. Altech is providing this information as a guideline. Please consult the NEMA Standards for your specific requirements.

NEMA REFERENCE

NON-HAZARDOUS LOCATIONS

TESTS CONDUCTED

TYPE 1 enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment.	<i>Rust entry Rust resistance</i>
TYPE 2 enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.	<i>Rod entry Drip Rust resistance</i>
TYPE 3 enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; and to be undamaged by the formation of ice on the enclosure.	<i>Rain Dust External icing Rust resistance</i>
TYPE 3R enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain; and to be undamaged by the formation of ice on the enclosure.	<i>Rod entry Rain External icing Rust resistance</i>
TYPE 3S enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet, and to provide for operation of external mechanisms when ice laden.	<i>Rain Dust External icing Rust resistance</i>
TYPE 4 enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water.	<i>Hosedown External icing Rust resistance</i>
TYPE 4X enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose -directed water.	<i>Hosedown External icing Corrosion resistance</i>
TYPE 6 enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during temporary submersion at a limited depth.	<i>Submersion External icing Rust resistance</i>
TYPE 6P enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.	<i>Air pressure External icing Corrosion resistance</i>
TYPE 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.	<i>Drip Dust Rust resistance</i>
TYPE 13 enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying water, oil, and non-corrosive coolant.	<i>Oil exclusion Rust resistance</i>

HAZARDOUS LOCATIONS

TESTS CONDUCTED

TYPE 7 enclosures are intended for indoor use in locations classified as Class I, Groups A, B, C, or D, as defined in the <i>National Electrical Code</i> .	<i>Explosion Hydrostatic Temperature</i>
TYPE 9 enclosures are intended for indoor use in locations classified as Class II, Groups E, F or G, as defined in the <i>National Electrical Code</i> .	<i>Dust Penetration Temperature</i>

Conversion Chart from L, R, & T Series Sensors to 8 digit Altech part numbers

The chart below is provided to aid our customers who wish to order Altech/Pulsotronic Sensors that have previously been ordered by part numbers beginning with 'L', 'R' or 'T'. If you have a part with the 'L', 'R' or 'T' designation listed

below, the equivalent Altech/Pulsotronic part number is listed for your convenience. Customer service will accept orders with either number.

Model	Specifications same as	Model	Specifications same as	Model	Specifications same as	Model	Specifications same as
L12-A113	9853-2400	T12-A160	9952-0400	T18-A1180	9954-2267	T30-A118	9956-1566
L12-D313	9863-2100	T12-A161	9952-0462	T18-A160	9954-1900	T30-A1180	9956-1567
L12-D413	9863-0400	T12-A1610	9952-0468	T18-A161	9954-1962	T30-A160	9956-1400
R40-A605	9853-3031	T12-A168	9952-0466	T18-A1610	9954-1968	T30-A161	9956-1462
R40-A655	9853-3131	T12-A1680	9952-0467	T18-A168	9954-1966	T30-A1610	9956-1468
R40-A-675	9853-3231	T12-A210	9952-0900	T18-A1680	9954-1967	T30-A168	9956-1466
R40-D305	9863-3333	T12-A211	9952-0962	T18-A210	9954-2600	T30-A1680	9956-1467
R40-D355	9863-3433	T12-A2110	9952-0968	T18-A211	9954-2662	T30-A210	9956-1900
R40-D375	9863-3533	T12-A218	9952-0966	T18-A2110	9954-2668	T30-A211	9956-1962
R40-D405	9863-3033	T12-A2180	9952-0967	T18-A218	9954-2666	T30-A2110	9956-1968
R40-D455	9863-3133	T12-A260	9952-0800	T18-A2180	9954-2667	T30-A218	9956-1966
R40-D475	9863-3233	T12-A261	9952-0862	T18-A260	9954-2500	T30-A2180	9956-1967
T04-D410	9961-1000	T12-A2610	9952-0868	T18-A261	9954-2562	T30-A260	9956-1800
T05-D410	9961-1100	T12-A268	9952-0866	T18-A2610	9954-2568	T30-A261	9956-1862
T08-D310	9907-1900	T12-A2680	9952-0867	T18-A268	9954-2566	T30-A2610	9956-1868
T08-D310L	9961-0300	T12-D310	9962-1500	T18-A2680	9954-2567	T30-A268	9956-1866
T08-D318	9961-0365	T12-D311	9962-4162	T18-D310	9964-1600	T30-A2680	9956-1867
T08-D3180	9961-0363	T12-D318	9962-4165	T18-D311	9964-4162	T30-D310	9966-1200
T08-D360	9907-2100	T12-D3180	9962-4163	T18-D318	9964-4165	T30-D311	9966-4162
T08-D360L	9961-0500	T12-D360	9962-1700	T18-D3180	9964-4163	T30-D318	9966-4165
T08-D368	9961-0565	T12-D361	9962-4362	T18-D360	9964-1800	T30-D3180	9966-4163
T08-D3680	9961-0563	T12-D368	9962-4385	T18-D361	9964-4362	T30-D360	9966-1400
T08-D410	9907-1800	T12-D3680	9962-4363	T18-D368	9964-4365	T30-D361	9966-4362
T08-D410L	9961-0200	T12-D410	9962-1400	T18-D3680	9964-4363	T30-D368	9966-4365
T08-D418	9961-0265	T12-D411	9962-4062	T18-D410	9964-1500	T30-D3680	9966-4363
T08-D4180	9961-0263	T12-D418	9962-4065	T18-D411	9964-4062	T30-D410	9966-1100
T08-D460	9907-2000	T12-D4180	9962-4063	T18-D418	9964-4065	T30-D411	9966-4062
T08-D460L	9961-0400	T12-D460	9962-1600	T18-D4180	9964-4063	T30-D418	9966-4065
T08-D468	9961-0465	T12-D461	9962-4262	T18-D460	9964-1700	T30-D4180	9966-4063
T08-D4680	9961-0463	T12-D468	9962-4265	T18-D461	9964-4262	T30-D460	9966-1300
T12-A110	9952-0500	T12-D4680	9962-4263	T18-D468	9964-4265	T30-D461	9966-4262
T12-A111	9952-0562	T18-A110	9954-2200	T18-D4680	9964-4263	T30-D468	9966-4265
T12-A1110	9952-0568	T18-A111	9954-2262	T30-A110	9956-1500	T30-D4680	9966-4263
T12-A118	9952-0566	T18-A1110	9954-2268	T30-A111	9956-1562	9803-30	9803-3800
T12-A1180	9952-0567	T18-A118	9954-2266	T30-A1110	9956-1568	9803-38	9803-3862

Glossary of Technical Definitions and Terminology

Active Surface:

Portion of the sensor from which the electromagnetic field radiates.

Analog Output:

The output voltage is proportionately to the distance of the target to the sensor's active surface.

Complementary Outputs (N.O. & N.C.):

A proximity sensor that features both normally open and a normally closed output, which can be used simultaneously.

Correction Factors:

Multiplication factors taking into account variations in the target material composition. When calculating actual sensing distance, this figure should be multiplied by the normal sensing distance, S_n .

Current Sinking: See NPN

Current Sourcing: See PNP

Damping Material:

Material which causes a decrease in the strength of the electromagnetic or electrical field produced by the sensing coil.

Differential Travel: See Hysteresis.

Dynamic Output:

A sensor output that outputs a short pulse of a defined period when a target is detected.

Effective Operating Distance - 'Sr':

The operating distance of an individual proximity switch measured at stated temperature and voltage. It takes into account variations in manufacturing tolerances.

Ferrous Metal: Any metal containing iron.

Flush Mounting:

A shielded or embedded proximity sensor can be flush mounted in metal. It can be surrounded by metal up to the active sensing face.

Hysteresis:

The difference, in percentage (%), of the nominal sensing distance between the operate (switch on) and release point (switch off) when the target is moving away from the sensor's active face. Without sufficient hysteresis a proximity sensor will "chatter" (continuously switch on and off) when there is a significant vibration applied to the target or sensor.

Leakage Current:

Current which flows through the output when the output is in an "off" condition or de-energized.

LED:

Light Emitting Diode used to indicate sensor status.

Load:

A device that consumes power to perform a function.

Maximum Load Current:

The maximum current at which the proximity sensor can be continuously operated.

Minimum Inrush Current:

The maximum current level at which the proximity sensor can be operated for a short period of time.

Minimum Load Current:

The minimum amount of current required by the sensor to maintain reliable operation.

Namur Sensor:

A 2-wire, variable resistance sensor which requires a remote amplifier for operation. Typically used in intrinsically safe applications.

Nominal Sensing Distance:

The distance, S_n , at which an approaching target activates (changes state of) the proximity output. This is also called the rated operating distance.

Non-Ferrous Metal:

Any metal which does not contain iron.

Non-Flush Mounting:

Unshielded, or non-embeddable sensors must have a so called "free zone" around the sensor head, with no non-target metal present to operate satisfactorily.

Normally Closed:

Output opens when an object is detected in the active switching area.

Normally Open:

Output closes when an object is detected in the active switching area.

NPN:

The sensor switches the load to the positive terminal. The load should be connected between the sensor output and positive terminal.

Operating Distance, Assured:

Between 0 and 81% of the rated operating distance for inductive proximity switches. It is specified as S_a .

Operating Distance, Rated:

The operating distance specified by the manufacturer and used as a reference value. Also known as nominal sensing distance, S_n .

Overload Protected:

The ability of a sensor to withstand load currents between continuous load rating and a short circuit condition without any damage.

continued...

Glossary, cont.

PNP:

The sensor switches the load to the negative terminal. The load should be connected between the sensor output and negative terminal.

Programmable Output, (N.O. or N.C.):

Output which can be changed from N.O. to N.C. or N.C. to N.O. by way of a switch or jumper wire. Also known as selectable output.

Rated Operating Distance - 'Sn':

Sometimes called nominal operating distance, it does not take into account manufacturing tolerances or variations in temperature or voltage.

Repeatability:

The repeat accuracy of a sensor to detect an object at the same distance away from the active sensing face. It is expressed as a percentage of the sensing distance, or can be calculated as a specific measurement value.

Residual Voltage:

The voltage across the sensor output while energized and switching the maximum load. It is the voltage drop across the sensor.

Response Time: See Switching Frequency

Reverse Polarity Protection:

Proximity sensors which are protected against a reversal in voltage polarity.

Ripple:

The variance between peak-to-peak values in DC voltage. It is expressed as a percentage of rated voltage.

Sensing Face:

A surface of the proximity sensor parallel to the target, from which the operating distance is measured

Shielded:

Sometimes called Flush or Embedded.

Short Circuit Protection:

Sensor protected from damage when a shorted condition exists for an indefinite period of time without change.

Static Output:

A sensor output that stays energized as long as the target is present.

Supply Current:

The current consumed by the proximity switch when the output transistor is in the off condition.

Switching Frequency:

The maximum number of times per second the sensor can change state, (ON and OFF), usually expressed in Hertz (Hz), as measured by DIN EN 50010.

Target:

Object which activates the sensor.

Temperature Drift:

Specification used to indicate the change in switching point caused by temperature variations within a specified ambient temperature range. Expressed as a percentage of the sensing distance.

Useable Operating Distance - 'Su':

The operating distance measured over a voltage range of 85% to 110% of its rated voltage. It allows for manufacturing tolerances.

Voltage Drop:

The maximum voltage drop across a conducting sensor.

Weld Field Immunity (WFI):

The ability of a sensor not to false trigger in the presence of strong electromagnetic fields.

Wire Break Protection:

The output is off if either power supply wire is broken.

SENSOR HOUSING MATERIALS

Plastics: Trogamid T – Polyamide, used in cylindrical, block and limit style sensors. Hard, rigid, good resistance to chemicals, resists caustic cleaners, approved for food contact.

PBTP: Polybutylene terephthalate, used in block sensors and front caps of cylindrical nickel plated brass units. Excellent mechanical strength and temperature resistance. Self-extinguishing and flame retardant. Weld splash proof.

PA6.6: Polyamid (Nylon), used in limit style sensors. Excellent mechanical strength, temperature resistant, accepted in food industry.

ABS: Acrylonitrile-Butadiene-Styrol. Used in ring sensors. Impact resistant. Rigid.

PUR: Polyurethane, used in cables and cable assemblies. Elastic, abrasion proof, impact resistant, unaffected by oil, grease and solvents.

PVC: Polyvinylchloride, used on cables and cable assemblies. Good mechanical strength, resistant to chemicals.

PTFE – TEFLON: Used on weld immune cylindrical sensors. Highest resistance to high temperature and chemicals.

METALS: Brass, Nickel Plated, used on cylindrical sensors. Rugged, resists thread damage.

Aluminum, used on block and ring sensors. Lightweight, excellent strength to weight ratio. Resistant to corrosion.

Commonly used metric and other useful conversions

Length		
inch [in.]	x25.4	=millimeters
millimeters [mm]	x0.03937	=inches
meters [m]	x3.281	=feet
miles [mi]	x1.609	=kilometers
kilometers [km]	x0.6214	=miles
Torque		
Newtonmeter [Nm]	x0.738	=lb-ft
lb-ft	x1.356	=Nm
lb-in	x0.113	=Nm
oz-in	x0.0071	=Nm
Power		
kilowatt [kW]	x1.341	=hp
hp	x0.7457	=kW
Moment of Inertia (WR²)		
lb-ft ²	x0.042	=kgm ²
kilogrammeter ² [kgm ²]	23.720	=lb-ft ²
Weight Mass and Force		
Newton [N]	x0.02248	=pounds
kilogram [kg]	x2.205	=pounds
pound [lb]	x4.448	=N
pound [lb]	x0.4536	=kg

Metric Cross-Sectional Areas ¹		American Wire Gauge		Metric Cross-Sections Areas ^a		American Wire Gauge	
Cross-Sectional Area	Equivalent Metric Area	AWG or MCM		Cross-Sectional Area	Equivalent Metric Area	AWG or MCM	
mm ²	mm ²			mm ²	mm ²		
0.50	0.519	20 AWG		25.0	21.15	4 AWG	
0.75	0.653	19		35.0	26.67	3	
	0.823	18			33.63	2	
					42.41	1	
	1.04	17		50.0	53.48	1/0	
	1.31	16			67.43	2/0	
1.5	1.65	15		70.0	85.03	3/0	
	2.08	14		95.0			
2.5	2.62	13					
	3.31	12		120.0	107.20	4/0	
4.0	4.17	11		150.0	126.64	250 MCM	
	5.26	10			152.00	300	
6.0				185.0	177.35	350	
	6.63	9			202.71	400	
	8.37	8		240.0	253.35	500	
10.0				300.0			
	10.55	7		400.0	380.00	750	
	13.30	6					
16.0	16.77	5		500.0	506.71	1000	
				625.0			

^aAs per IEC Publ. 228

DEGREES CELCIUS VERSUS DEGREES FAHRENHEIT											
°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-80	-112.0	-20	-4.0	5	41.0	30	86.0	55	131.0	80	176.0
-70	-94.0	-19	-2.2	6	42.8	31	87.8	56	132.8	81	177.8
-60	-65.0	-18	-0.4	7	44.6	32	89.6	57	134.6	82	179.6
-50	-58	-17	+1.4	8	46.4	33	91.4	58	136.4	83	181.4
-45	-49.1	-16	3.2	9	48.2	34	93.2	59	138.2	84	183.2
-40	-40.0	-15	5.0	10	50.0	35	95.0	60	140.0	85	185.0
-39	-38.2	-14	6.8	11	51.8	36	96.8	61	141.8	86	186.8
-38	-36.4	-13	8.6	12	53.6	37	98.6	62	143.6	87	188.6
-37	-34.6	-12	10.4	13	55.4	38	100.4	63	145.4	88	189.4
-36	32.8	-11	12.2	14	57.2	39	102.2	64	147.2	89	192.2
-35	-31.0	-10	14.0	15	59.0	40	104.0	65	149.0	90	194.0
-34	29.2	-9	15.8	16	60.8	41	105.8	66	150.8	91	195.8
-33	-27.4	-8	17.6	17	62.6	42	107.6	67	152.6	92	197.6
-32	-25.6	-7	19.4	18	64.4	43	109.4	68	154.4	93	199.4
-31	-23.8	-6	21.2	19	66.2	44	111.2	69	156.2	94	201.2
-30	-22.0	-5	23.0	20	68.0	45	113.0	70	158.0	95	203.0
-29	-22.0	-4	24.8	21	69.8	46	114.8	71	159.8	96	204.8
-28	-18.4	-3	26.6	22	71.6	47	116.8	72	161.6	97	206.6
-27	-16.6	-2	28.4	23	73.4	48	118.4	73	163.4	98	208.4
-26	-14.8	-1	30.2	24	75.2	49	120.2	74	165.2	99	210.2
-25	-13.0	0	32.0	25	77.0	50	122.0	75	167.0	100	212.0
-24	-11.2	1	33.8	26	78.8	51	123.8	76	168.8	101	213.8
-23	-9.4	2	35.6	27	80.6	52	125.6	77	170.6	102	215.6
-22	-7.6	3	37.4	28	82.4	53	127.4	78	172.4	103	217.4
-21	-5.8	4	39.2	29	84.2	54	129.2	79	174.2	104	219.2

Conversion Formula °F = 9/5°C + 32° °C = 5/9(°F-32°)

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8000-5140	119	9807-0100	88	9873-3231	77	9932-0100	50	9954-2266	57	9961-1364	35
8000-5150	120	9807-0159	88			9932-0165	50	9954-2267	57	9961-4400	24
8000-5160	120	9807-0165	88	9883-2033	72	9932-0200	50	9954-2268	57	9961-4464	24
8000-5220	121	9807-0900	88	9883-2233	72	9932-0265	50	9954-2500	57	9961-4465	24
8000-5230	121	9807-0959	88	9883-2333	72	9932-0300	51	9954-2568	57	9961-4500	24
8000-5240	121	9807-0965	88	9883-2533	72	9932-0365	51	9954-2600	57	9961-4564	24
8000-5280	118	9809-0100	90	9883-3033	73	9932-0400	51	9954-2666	57	9961-4565	24
		9809-0159	90	9883-3233	73	9932-0465	51	9954-2667	57	9961-4600	24
8100-0930	124	9809-0300	90	9883-3333	73	9932-0500	52	9954-2668	57	9961-4664	24
8100-2100	125	9809-0359	90	9883-3533	73	9932-0565	52	9954-5640	65	9961-4665	24
8100-2130	125	9809-0400	90			9932-0600	52	9954-5700	65	9961-4700	24
8100-2200	125	9809-0459	90	9914-0500	44	9932-0665	52	9954-5768	65	9961-4764	24
8100-2400	126	9809-0500	90	9914-0565	44	9932-0700	53	9954-5840	65	9961-4765	24
8100-2500	126	9809-0559	90	9914-0800	44	9932-0765	53	9954-5848	65		
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9512-6400	114	9853-5831	78	9916-2700	63	9952-0467	56	9956-1800	59	9962-4064	25
9512-6600	114	9853-5931	78	9916-2768	63	9952-0468	56	9956-1868	59	9962-4065	25
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		9855-1000	95	9916-3000	63	9952-0562	56	9956-5640	66	9962-4163	25
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9701-0759	106	9861-1000	84	9921-1268	61	9952-0568	56	9956-5768	66	9962-4200	25
9702-0259	106	9861-1064	84	9921-1300	61	9952-0800	56	9956-5840	66	9962-4263	25
9702-0400	102	9861-1100	84	9921-1368	61	9952-0866	56	9956-5848	66	9962-4264	25
9702-0500	102	9861-1164	84	9921-1369	61	9952-0867	56	9956-5900	66	9962-4265	25
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FAXBACK

Thank You

We hope this catalog has helped you in your selection of Altech products. To learn more, please complete this form and fax it to us. If you prefer to mail it, fold and seal with clear tape, we've provided the postage.

Name _____ Title _____

Company _____ Div./MS _____

Address _____

City _____ State _____ Zip _____

Phone () _____ Fax () _____

☐ Please contact me to discuss my application. Our product(s) are exported. ☐ Yes ☐ No

My company is best classified as a(n):

- | | | | |
|---------------------------------------|---|--|--------------------------------------|
| ☐ OEM | ☐ Systems Integrator | ☐ Contractor | ☐ Consultant |
| ☐ End User/MRO | ☐ Distributor | ☐ Government/School | ☐ Other _____ |

My primary job function is:

- | | | | |
|---|--|------------------------------------|--------------------------------------|
| ☐ Product Design | ☐ Sales/Marketing | ☐ Specify | ☐ Purchase |
| ☐ System Design | ☐ Purchasing | ☐ Recommend | ☐ Other _____ |
| ☐ Plant Operations/
Maintenance | ☐ Other _____ | ☐ Authorize | |

Which best describes the end-product produced by your firm?

- | | |
|--|---|
| ☐ Controls & Instrumentation | ☐ Electrical Machinery & Equipment |
| ☐ Electronic Systems & Components | ☐ Specialty Machinery & Equipment |
| ☐ Transportation Equipment | ☐ Other _____ |

Which industry(ies) does your company serve? (Please check all applicable)

- | | | | | |
|--|---|--|--|---------------------------------------|
| ☐ Aerospace | ☐ Construction | ☐ Material Handling | ☐ Pharmaceutical | ☐ Pulp & Paper |
| ☐ Automatic Vending | ☐ Dairy | ☐ Medical & Dental | ☐ Processing | ☐ Specialty |
| ☐ Agricultural | ☐ Defense/Military | ☐ Metalworking | ☐ Power Distribution | ☐ Chemicals |
| ☐ Automotive | ☐ Food Processing | ☐ Mining | ☐ Producing | ☐ Textiles |
| ☐ Chemical Processing | ☐ Industrial Process | ☐ Oil & Gas Field | ☐ Primary Metals | |
| ☐ Commercial | ☐ Furnaces & Ovens | ☐ Packaging | ☐ Printing & Textiles | |
| ☐ Industrial & HVAC | ☐ Machine Tool | ☐ Petrochemical | | |

Please rush literature on products circled below:

TERMINAL BLOCKS

- ☐ DIN Rail
- ☐ Mini DIN Rail
- ☐ Panel
- ☐ Eurostrips®
- ☐ Ceramic
- ☐ Busbar System
- ☐ PCB - Fixed
- ☐ PCB - Pluggable

INTERFACES

- ☐ Interface Modules

CIRCUIT BREAKERS

- ☐ Miniature DIN
- ☐ Motor Controllers
- ☐ Earth Leakage
- ☐ Accessories
- ☐ Power Busbar

ENCLOSURES

- ☐ Industrial
- ☐ Electronic
- ☐ DIN
- ☐ Strain Reliefs

SENSORS

- ☐ Proximity Sensors

In Addition:

- ☐ Inductive Proximity
- ☐ Capacitive Proximity
- ☐ Photoelectric Proximity
- ☐ Ultrasonic Proximity

OTHER

- ☐ Foot Switches
- ☐ Disconnect Switches
- ☐ European Fuses
- ☐ Safety Relays
- ☐ Safety Modules
- ☐ Timers
- ☐ Monitoring and Sensing Devices