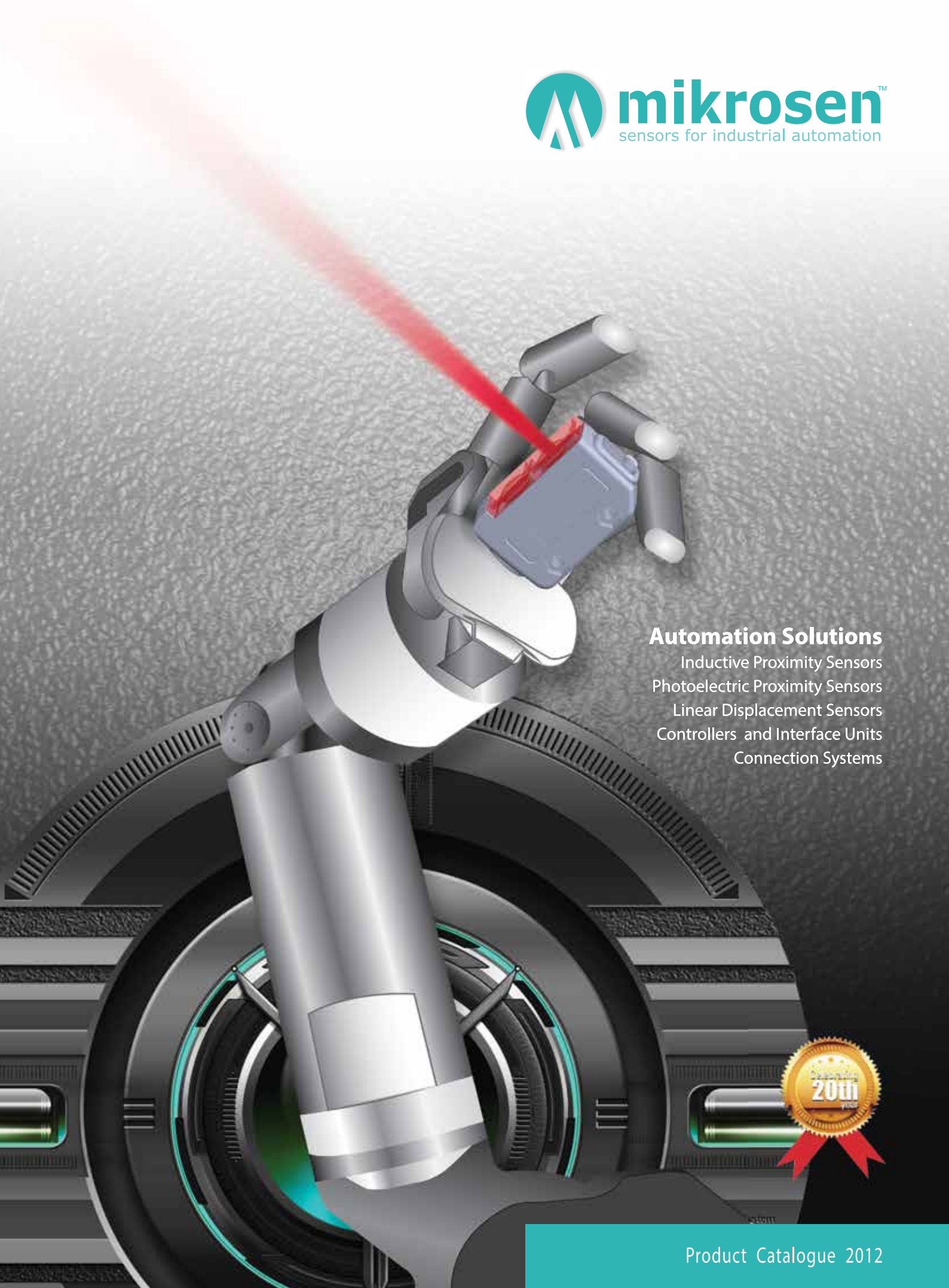
mikrosen™
sensors for industrial automation



Automation Solutions

Inductive Proximity Sensors
Photoelectric Proximity Sensors
Linear Displacement Sensors
Controllers and Interface Units
Connection Systems

Celebrating 20th years

Product Catalogue 2012

THE COMPANY

Mikrosen is the pioneer in the design and manufacture of indigenous proximity sensors in India. The Company was founded in the year 1993 by a Technocrat turned Entrepreneur Mr. P. V. Ramakrishnan, at Coimbatore - a major industrial city in South India. Since its establishment, the company has achieved significant progress in the field of Industrial Automation by providing many competitive sensing and process control solutions for the customers.

The Company has highly qualified & dedicated team of professionals with extensive experience and knowledge. With a strong Research and Development team that adopts the latest innovative cost-effective technologies, the company has obtained good customer delight in terms of quality and reliability. Backed with State-of-art manufacturing facility, a wide range of standard as well as customized products are being manufactured to cater various Industrial segments like Textile, Food processing, Machine tool, Packaging, Robotics and Automated line production.

Recently, Long range photoelectric sensors with operating range up to 80 meters & Extended inductive proximity sensors in M12 & M18 models have been launched to meet the market requirements. The current development activities include Next generation sensors for Industrial Automation like Smart sensors, Long range Laser Photoelectric sensors, Quasi-Flush models, Metal Contamination detection for Textile and Food Processing Industries.

The Company is ISO 9001-2008 Certified and proudly stand by the quality of the products which are produced in accordance with European Norms (EN Standards) and certified for CE Marking.

IP67

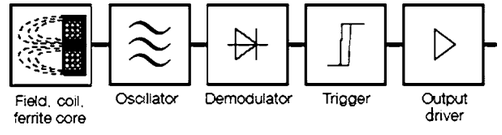
QM011

INDUCTIVE PROXIMITY SENSORS

A proximity sensor detects the presence of objects that are placed in the proximity without any point of contact. Since there is no contact between the sensors and sensed object and lack of mechanical parts, these sensors have a longer functional life and high reliability.

Principle of Operation

These sensors work on the Eddy current principle. An alternating magnetic field emanates from the sensing face. When a conductive, generally metallic object enters into the field, the latter is influenced in a way that can be detected and evaluated by the built-in electronics.



Features

- Variety of tubular sensors from M8……..M30 and Cubicle types
- Flush and Non-Flush mounting options
- Switching frequencies up to 2KHz
- Output configurations with PNP/NPN and NO/NC switching logics
- Comprehensive 110..230VAC & 30VDC models
- Rugged Stainless steel, Brass and Industrial grade plastic housings
- Protection for Short circuit and Polarity reversal
- Extended Sensor versions (almost double the sensing distance than the standard versions)

Applications

- Parts counting
- Speed monitoring
- Position detection and monitoring

In addition to the types detailed in the catalog, a number of special customized products are available with different cable lengths, different cable types (e.g. With oil-resistant, highly flexible PUR insulation).

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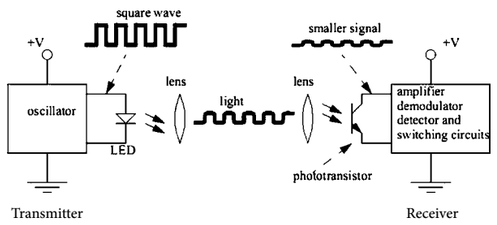
PHOTOELECTRIC PROXIMITY SENSORS

Photoelectric sensors offer a wide variety of sensing options and find a significant place in the industrial automation applications. The sensors can detect any type of object either in a visible or invisible spectrum of light.

Principle of Operation

The sensor contains a pulsed light source and sensing takes place by measuring the light intensity falling on the receiving photo sensitive element.



The target either breaks a beam of light or reflects it back to the detector to activate the sensor output. Depending on this the photoelectric sensors are grouped as Thru beam, Retro-reflex, Diffused Background suppressed models.

Features

- Adjustable sensitivity levels
- Auto-diagnostics & networking options
- Long sensing range up to 80 meters
- Small object detection
- Detection of color, texture and shape variations of the target
- Special alignment indicators for easy installation in long range sensors

Applications

- For checking presence, shape, color, distance and thickness – optimized for robotics automation, assembly and handling
- Part detection and counting, stack height monitoring, through-glass sensing, small parts orientation, marking detection, level detection, etc.
- Finds applications in a wide range of markets including textiles, aerospace, healthcare, Metal fabrication industries, material handling, food processing & packaging etc.

Customized Reflectors are available to cover the different operating ranges in case of Retro-reflex. A new Laser Version assuring a long detection range and minimum object sizes up to 3 mm are currently under development.

LINEAR DISPLACEMENT SENSORS

Linear Displacement Sensors are non-contact devices that determine an object's linear coordinates with respect to a reference point.

Principle of Operation

In Inductive type the displacement is measured by the Eddy Current Principle. When an Object moves in the field of the sensor, the parameters of the sensing coil vary in relation to the displacement of the target with respect to the sensing face. This is detected and processed digitally. The outputs are made available either in the form of Voltage or Current variations.

Features

- Variety of Sensor Heads from M12 to M30
- Linearity of ±1.5% F.S
- Temperature stability up to 0.05% of F.S/°C
- Response Frequency up to 5KHz
- Operating Distance from 0.4 to 10mm
- Outputs in the form of standard 0..10Vdc (or) 4..20mA

Applications

- Measurement of parameters in Process Monitoring applications.
- Gauging & Balancing applications in machine tools
- For confirming the movement in joining, stamping or clamping applications
- For positioning applications such as X-Y positioning, machinery dynamics, profile measurements.

Our new product ranges include sensors with inbuilt amplifier models along with a 7-segment display to view the outputs. Further, Gauging sensors with linearity of ±0. 03% of F.S and with response frequency up to 18 KHz is also under development with auto calibration and Teach-in functions.

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CONTROLLERS AND INTERFACE UNITS

Controllers obtain data from the sensors & other input devices and process them to provide necessary control function of the process/machinery. The type ranges from simple interface units to the complex monitoring systems with communication and networking capability like CAN/Mod-bus/TCP/Ethernet IP/Profi-bus/SPI/i2c. etc and with RS232/RS422/RS485 communication ports.

Industrial process controller

Single Opto-isolated analog input & dual outputs

Two Opto-isolated digital inputs & four outputs

User-friendly keyboard interface

Display interface with MOD-BUS communication

Input voltage monitoring

Rugged aluminum construction

Relay Interface Unit

With 12 Vdc regulated output voltage

4 relay channels output

Relay current output up to 60mA

Relay coil current protection

Din-rail mountable

Faster Relay response time of 30msec

DC-DC Converter

24 Vdc to 12 Vdc supply

Load current up to 60 mA

Din-rail mountable

Various customized equipments have been made so far that finds applications in process monitoring and quality control systems

CONNECTION SYSTEMS

Connection systems mainly comprise of Pre-assembled connectors with cables of specified length in the form of Cord sets, Patch cords and Screw type connectors. Distribution box provides the flexibility in wiring the different sensors and actuators to the controllers or interfaces.

Features

- High grade cables for industrial applications
- Firm connection with gold plated contacts
- Screw type or Plug in options

Wireless communication options which are under development will reduce the wiring cost and facilitates remote sensing applications. In addition to the types detailed in the catalog, we provide custom specific solutions.

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TECHNICAL DATA

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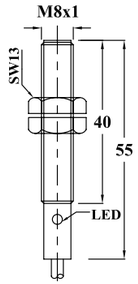
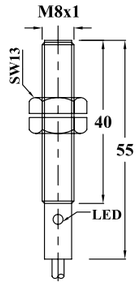
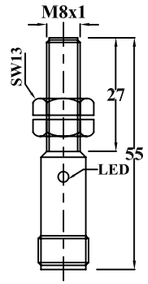
Inductive Proximity Sensors — DC Standard

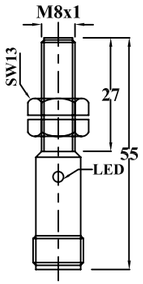




Technical Data	Model	IPS-A02-212L IPS-A02-212N	IPS-A02-222L IPS-A02-222N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	1.5 mm ± 10%	1.5 mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	1.5KHz	1.5KHz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	100 mA	100 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 3 Core - 3 mtrs.	Cable PVC, 3 Core - 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard





Technical Data	Model	IPS-D08-212L IPS-D08-212N	IPS-D08-222L IPS-D08-222N
General specifications			
Switching Output		PNP,N/O PNP, N/C	NPN ,N/O NPN, N/C
Rated Operating Distance	S_n	1.5 mm ± 10%	1.5mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	1.5KHz	1.5KHz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	100 mA	100 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		Stainless Steel	Stainless Steel
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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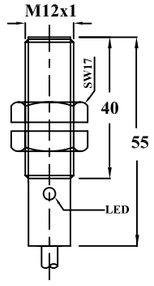
Inductive Proximity Sensors — DC Standard

Dimensions



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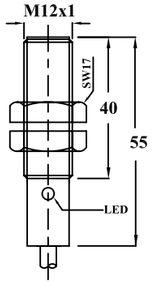
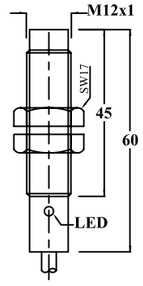


CE

Technical Data	Model	IPS-A12-212L IPS-A12-212N	IPS-A12-222L IPS-A12-222N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	2mm ± 10%	2mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	1000 Hz	1000 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 3 Core - 3 mtrs.	Cable PVC, 3 Core - 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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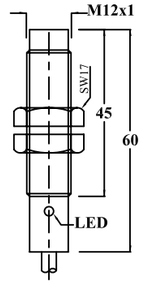

CE

Technical Data	Model	IPS-A13-213L IPS-A13-213N	IPS-A13-223L IPS-A13-223N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	4mm ± 10%	4mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	400 Hz	400 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 3 Core - 3 mtrs.	Cable PVC, 3 Core - 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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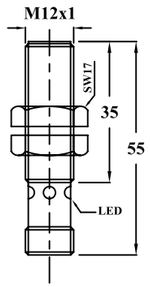

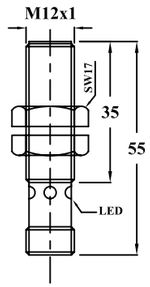

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Technical Data			
Model		**IPS-A18-212L IPS-A18-212N**	**IPS-A18-222L IPS-A18-222N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	2mm ± 10%	2mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	**f**	1KHz	1KHz
Hysteresis/Differential travel	**H**	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	**R**	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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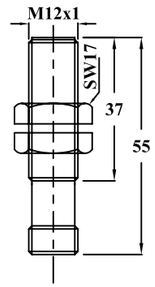

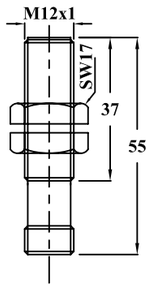

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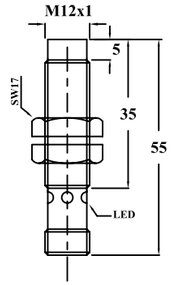
Technical Data			
Model		**IPS-C18-212L IPS-C18-212N**	**IPS-C18-222L IPS-C18-222N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	2mm ± 10%	2mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	**f**	1KHz	1KHz
Hysteresis/Differential travel	**H**	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	**R**	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Back cap		PC-Translucent	PC-Translucent
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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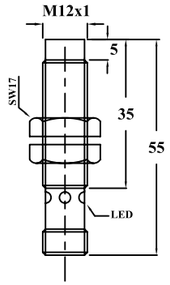

Technical Data

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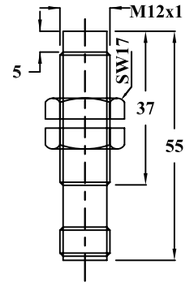
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	4mm ± 10%	4mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	400 Hz	400 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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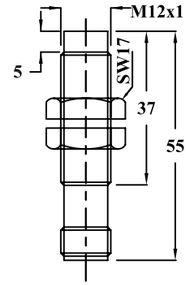

Technical Data

Model		IPS-C19-213L IPS-C19-213N	IPS-C19-223L IPS-C19-223N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	4mm ± 10%	4mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	400 Hz	400 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Back cap		PC-Translucent	PC-Translucent
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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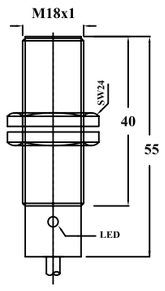
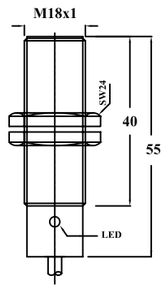
Inductive Proximity Sensors — DC Standard





Technical Data			
Model		**IPS-A22-212L IPS-A22-212N**	**IPS-A22-222L IPS-A22-222N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	5mm ± 10%	5mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	500 Hz	500 HZ
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC,3 Core,-3 mtrs	Cable PVC,3 Core-3 mtrs
Core cross section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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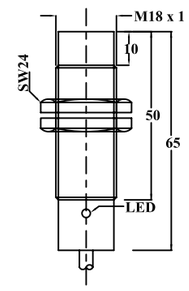
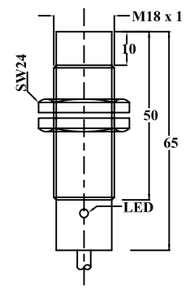
Inductive Proximity Sensors — DC Standard

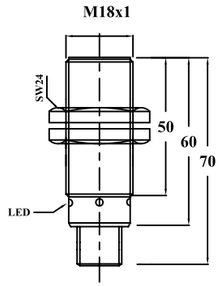




Technical Data			
Model		**IPS-A23-213L IPS-A23-213N**	**IPS-A23-223L IPS-A23-223N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	8 mm ± 10%	8 mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250 Hz	250 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.3 mm	0.3 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 3 mtrs.	Cable PVC, 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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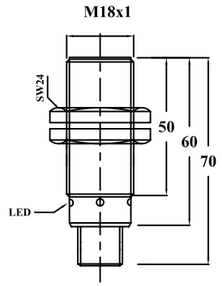
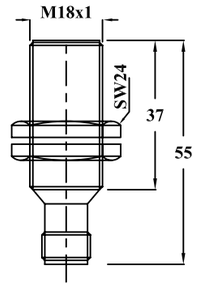


CE

Technical Data	Model	IPS-A28-212L IPS-A28-212N	IPS-A28-222L IPS-A28-222N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	5mm ± 10%	5mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	500 Hz	500 HZ
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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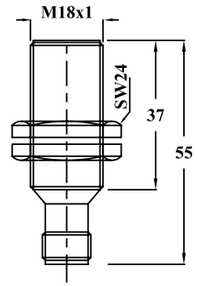
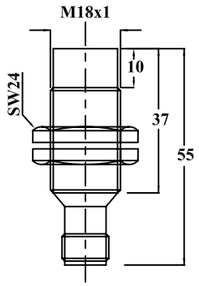


CE

Technical Data	Model	IPS-C28-212L IPS-C28-212N	IPS-C28-222L IPS-C28-222N
General specifications			
Switching output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	Sn	5mm ± 10%	5mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	Ue	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	500 Hz	500 Hz
Hysteresis/Differential travel	H	<10%	<10%
Rated operating current	Ie	200 mA	200 mA
No-load supply current	Io	< 15 mA	< 15 mA
Voltage drop	Ud	< 2.2Vdc	< 2.2Vdc
OFF state current	Ir	< 0.1mA	< 0.1mA
Rated insulation voltage	Ui	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Back cap		PC-Translucent	PC-Translucent
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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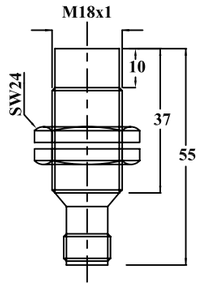

CE

Technical Data			
Model		**IPS-C29-213L IPS-C29-213N**	**IPS-C29-223L IPS-C29-223N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	8mm ± 10%	8mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250 Hz	250 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.3 mm	0.3 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Back cap		PC-Translucent	PC-Translucent
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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Inductive Proximity Sensors — DC Standard

Dimensions

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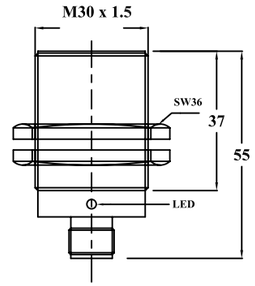
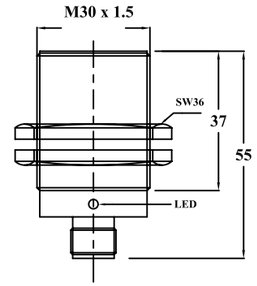


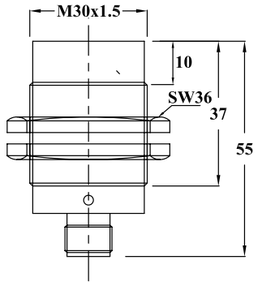


CE

Technical Data			
Model		**IPS-A38-212L IPS-A38-212N**	**IPS-A38-222L IPS-A38-222N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	10mm ± 10%	10mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	300 Hz	300 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 25 mA	< 25 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.3 mm	0.3 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Standard

Dimensions



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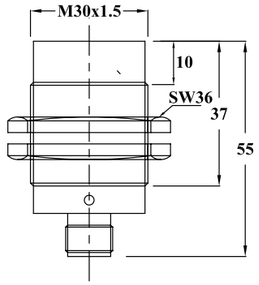

CE

Technical Data

Model		IPS-A39-213L IPS-A39-213N	IPS-A39-223L IPS-A39-223N
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	15mm ± 10%	15mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	100 Hz	100 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 25 mA	< 25 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.3 mm	0.3 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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Inductive Proximity Sensors — DC Standard

Dimensions

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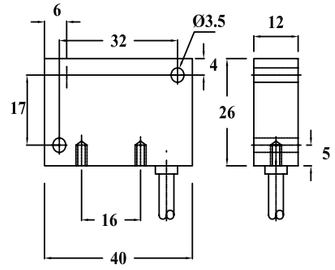

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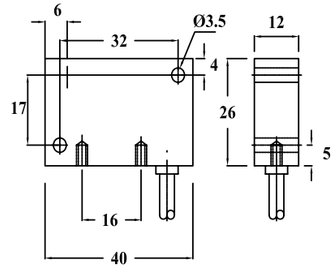


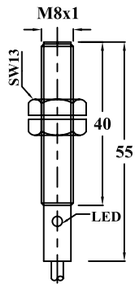
CE

Technical Data

Model		IPS-B50-212L IPS-B50-212N	IPS-B50-222L IPS-B50-222N
General specifications			
Switching Output		PNP,N/O PNP,N/C	NPN,N/O NPN,N/C
Rated Operating Distance	S_n	4 mm ± 10%	4 mm ± 10%
Installation		Non-Flush	Non-Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	800Hz	800Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 3 Core - 3 mtrs.	Cable PVC, 3 Core - 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		Plastic ABS	Plastic ABS
Size		40x26x12mm	40x26x12mm
Degree of protection		IP65	IP65
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensors — DC Extended

Dimensions



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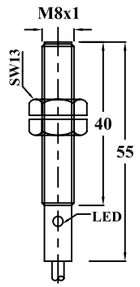

CE

Technical Data

Model	IPX-A02-217L	IPX-D02-217L
General specifications		
Switching Output	PNP, N/O	PNP, N/O
Rated Operating Distance S_n	2 mm ± 10%	2 mm ± 10%
Installation	Flush	Flush
Nominal Ratings		
Supply Voltage U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle f	1.5KHz	1.5KHz
Hysteresis/Differential travel H	±10%	±10%
Rated operating current I_e	100 mA	100 mA
No-load supply current I_o	< 15 mA	< 15 mA
Voltage drop U_d	< 2.2Vdc	< 2.2Vdc
OFF state current I_r	< 0.1mA	< 0.1mA
Rated insulation voltage U_i	75 Vdc	75 Vdc
Utilization category	DC-13	DC-13
Repeatability/ Repeat accuracy R	0.1 mm	0.1 mm
Protection Circuit	Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication	LED	LED
Ambient Conditions		
Operating temperature	-25° C to +70° C	-25° C to +70° C
Mechanical Specifications		
Connection Type	Cable PVC, 3 mtrs.	Cable PUR, 3 mtrs.
Core Cross-section	22 AWG	22 AWG
Housing material	CuZn-Nickel Plated	Stainless steel
Sensing face	Plastic ABS-Grey Color	Plastic ABS-Grey Color
Degree of protection	IP67	IP67
Compliance with Standards and Directives		
Standards Conformity	EN 60947- 5-2	EN 60947- 5-2
Approval	CE	CE

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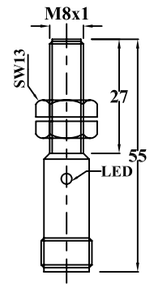
Inductive Proximity Sensors — DC Extended

Dimensions



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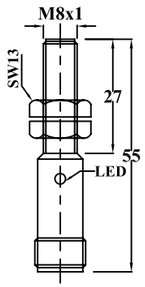

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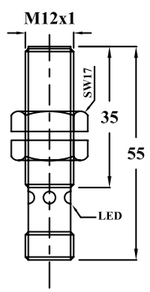
Technical Data

Model	IPX-D08-217L IPX-D08-217N	IPX-D08-227L IPX-D08-227N
General specifications		
Switching Output	PNP,N/0 PNP,N/C	NPN,N/O NPN,N/C
Rated Operating Distance S_n	2mm ± 10%	2mm ± 10%
Installation	Flush	Flush
Nominal Ratings		
Supply Voltage U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle f	1.5KHz	1.5KHz
Hysteresis/Differential travel H	±10%	±10%
Rated operating current I_e	100 mA	100 mA
No-load supply current I_o	< 15 mA	< 15 mA
Voltage drop U_d	< 2.2Vdc	< 2.2Vdc
OFF state current I_r	< 0.1mA	< 0.1mA
Rated insulation voltage U_i	75 Vdc	75 Vdc
Utilization category	DC-13	DC-13
Repeatability/ Repeat accuracy R	0.1 mm	0.1 mm
Protection Circuit	Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication	LED	LED
Ambient Conditions		
Operating temperature	-25° C to +70° C	-25° C to +70° C
Mechanical Specifications		
Connection Type	4 pin Connection M12	4 pin Connection M12
Housing material	Stainless Steel	Stainless Steel
Sensing face	Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection	IP67	IP67
Compliance with Standards and		
Standards Conformity	EN 60947- 5-2	EN 60947- 5-2
Approval	CE	CE

Inductive Proximity Sensors — DC Extended

Dimensions



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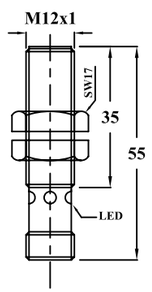

CE

Technical Data			
Model		**IPX-A18-217L IPX-A18-217N**	**IPX-A18-227L IPX-A18-227N**
General specifications			
Switching Output		PNP,N/O PNP,N/C	NPN,N/O NPN,N/C
Rated Operating Distance	S_n	4mm ± 10%	4mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	1000 Hz	1000Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.1 mm	0.1 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

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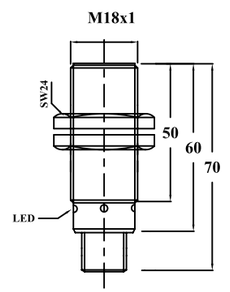
Inductive Proximity Sensors — DC Extended

Dimensions



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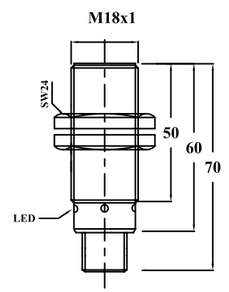
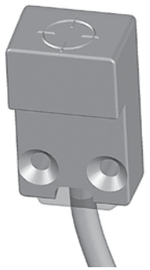


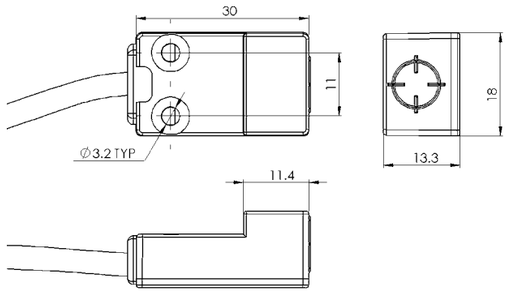
CE

Technical Data			
Model		**IPX-A28-217L IPX-A28-217N**	**IPX-A28-227L IPX-A28-227N**
General specifications			
Switching Output		PNP, N/O PNP, N/C	NPN, N/O NPN, N/C
Rated Operating Distance	S_n	8mm ± 10%	8mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	500 Hz	500 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 15 mA	< 15 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-13	DC-13
Repeatability/ Repeat accuracy	R	0.3 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		4 pin Connection M12	4 pin Connection M12
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Grey Color	Plastic ABS-Green Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Inductive Proximity Sensor — DC Extended

Dimensions





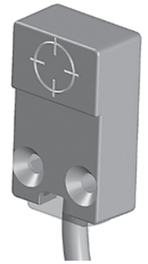
CE

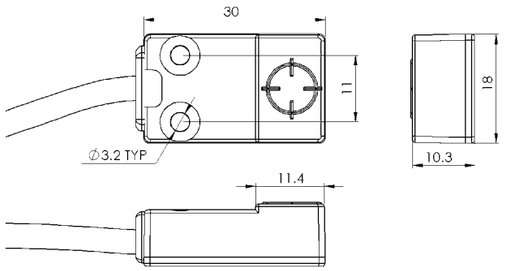
Technical Data

Model		IPX-B51-217L
General Specifications		
Switching Output		PNP, N/O
Rated Operating Distance	S_n	5mm ± 10%
Installation		Non-Flush
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	200Hz
Hysteresis/Differential travel	H	<10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 25 mA
Voltage drop	U_d	< 2.2V
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-13
Repeatability/ Repeat accuracy	R	0.3mm
Protection Circuit		Short circuit & Polarity reversal
Function Indication		LED
Ambient Conditions		
Operating temperature		-25° C to +70° C
Mechanical Specifications		
Connection Type		Cable 3core,
Core Cross-section		22 AWG
Housing material		Plastic ABS
Size		30x18x10mm
Degree of protection		IP67
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

Inductive Proximity Sensor — DC Extended

Dimensions





CE

Technical Data

Model		IPX-B52-217L
General Specifications		
Switching Output		PNP, N/O
Rated Operating Distance	S_n	5mm ± 10%
Installation		Non-Flush
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	200Hz
Hysteresis/Differential travel	H	±10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 25 mA
Voltage drop	U_d	< 2.2V
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-13
Repeatability/ Repeat accuracy	R	0.3mm
Protection Circuit		Short circuit & Polarity reversal
Function Indication		LED
Ambient Conditions		
Operating temperature		-25° C to +70° C
Mechanical Specifications		
Connection Type		Cable 3core,
Core Cross-section		22 AWG
Housing material		Plastic ABS
Size		30x18x10mm
Degree of protection		IP67
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

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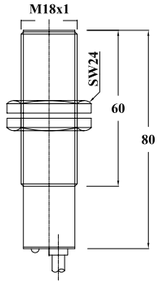
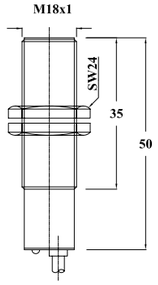
Inductive Proximity Sensors — AC Standard



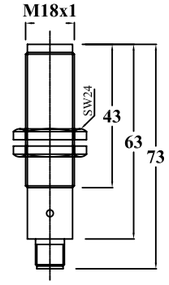


CE

Technical Data

Model		IPS-A20-130L IPS-A20-130N	IPS-A22-130L IPS-A22-130N
General specifications			
Switching Output		N/O N/C	N/O N/C
Rated Operating Distance	S_n	5 mm ± 10%	5 mm ± 10%
Installation		Flush	Flush
Nominal Ratings			
Supply Voltage	U_e	110-230 VAc	110-230 VAc
Frequency of Operating cycle	f	25 Hz	25 Hz
Hysteresis/Differential travel	H	±10%	±10%
Rated operating current	I_e	250 mA	200 mA
Voltage drop	U_d	< 10 V	< 10 V
OFF state current	I_r	< 3 mA	< 3 mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		AC-140	AC-140
Repeatability/ Repeat accuracy	R	0.2 mm	0.2 mm
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		LED	LED
Ambient Conditions			
Operating temperature		-25° C to +70° C	-25° C to +70° C
Mechanical Specifications			
Connection Type		Cable PVC, 2 Core - 3 mtrs.	Cable PVC, 2 Core - 3 mtrs.
Core Cross-section		22 AWG	22 AWG
Housing material		CuZn-Nickel Plated	CuZn-Nickel Plated
Sensing face		Plastic ABS-Red Color	Plastic ABS-Red Color
Degree of protection		IP67	IP67
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Photoelectric Proximity Sensor — DC Standard



CE

Technical Data

Model		PES-O20-P212L
General specifications		
Type		Diffused
Switching Output		PNP, Light Sensing
Rated Operating Distance	S_n	290 mm ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	25 Hz
Hysteresis/Differential travel	H	<10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 50 mA
Voltage drop	U_d	< 2.2Vdc
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-13
Permissible Ambient light		3000Lux.
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Red LED - Output, Green LED - Stability
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		CuZn-Nickel Plated
Degree of protection		IP54
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

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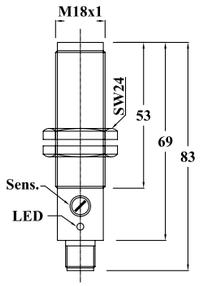
Photoelectric Proximity Sensor — DC Standard

Dimensions



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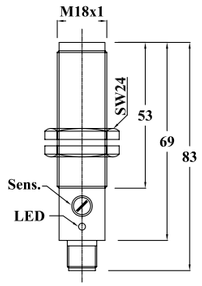

CE

Technical Data

Model	PES-O20-P213S	PES-O20-P223S
General specifications		
Type	Diffused	Diffused
Switching Output	PNP, D/L Selectable	NPN, D/L Selectable
Rated Operating Distance S_n	250 mm ± 10%, Sensitivity adjustable	250 mm ± 10%, Sensitivity adjustable
Nominal Ratings		
Supply Voltage U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle f	25 Hz	25 Hz
Hysteresis/Differential travel H	<10%	<10%
Rated operating current I_e	200 mA	200 mA
No-load supply current I_o	< 50 mA	< 50 mA
Voltage drop U_d	< 2.2Vdc	< 2.2Vdc
OFF state current I_r	< 0.1mA	< 0.1mA
Rated insulation voltage U_i	75 Vdc	75 Vdc
Utilization category	DC-13	DC-13
Permissible Ambient light	3000Lux.	3000Lux.
Protection Circuit	Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication	Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions		
Operating temperature	-5° C to +55° C	-5° C to +55° C
Mechanical Specifications		
Housing Material	CuZn-Nickel Plated	CuZn-Nickel Plated
Degree of protection	IP54	IP54
Connection	M12 Connector	M12 Connector
Compliance with Standards and Directives		
Standards Conformity	EN 60947- 5-2	EN 60947- 5-2
Approval	CE	CE

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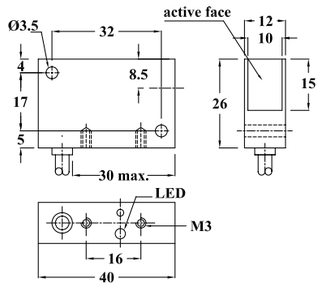
Photoelectric Proximity Sensor — DC Standard

Dimensions



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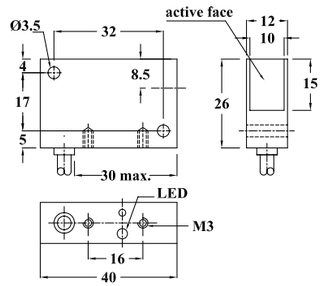


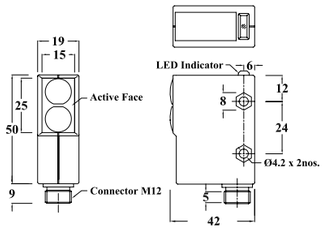
CE

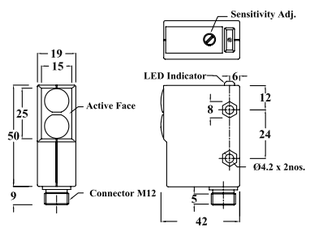
Technical Data

Model	PES-P50-P212L PES-P50-P212N	PES-P50-P222L
General Specifications		
Type	Diffused	Diffused
Switching Output	PNP, Light Sensing PNP,dark sensing	NPN, Light Sensing
Rated Operating Distance S_n	200 mm ± 10%	200 mm ± 10%
Nominal Ratings		
Supply Voltage U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle f	500 Hz	500 Hz
Hysteresis/Differential travel H	<10%	<10%
Rated operating current I_e	200 mA	200 mA
No-load supply current I_o	< 20 mA	< 20 mA
Voltage drop U_d	< 2.2Vdc	< 2.2Vdc
OFF state current I_r	< 0.1mA	< 0.1mA
Rated insulation voltage U_i	75 Vdc	75 Vdc
Utilization category	DC-13	DC-13
Permissible Ambient light	3000Lux.	3000Lux.
Protection Circuit	Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication	Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions		
Operating temperature	-5° C to +55° C	-5° C to +55° C
Mechanical Specifications		
Housing Material	Plastic ABS	Plastic ABS
Size	26x40x12 mm	26x40x12 mm
Degree of protection	IP54	IP54
Connection	Cable PVC, 3 Core - 3 mtrs	Cable PVC, 3 Core - 3 mtrs
Core Size	22 AWG	22 AWG
Compliance with Standards and Directives		
Standards Conformity	EN 60947- 5-2	EN 60947- 5-2
Approval	CE	CE

Photoelectric Proximity Sensor — DC Standard

Dimensions | Dimensions

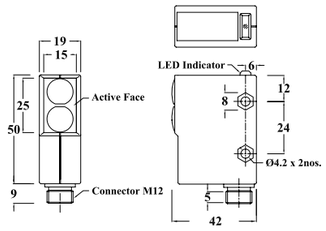


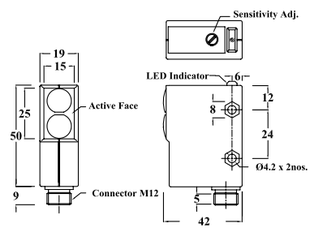


Technical Data	Model	PES-O54-B211L	PES-O54-B213S
General specifications			
Type		Diffused - Background Suppressed	Diffused - Background Suppressed
Switching Output		PNP, Light Sensing	PNP, D/L Selectable
Rated Operating Distance	S_n	100 mm ± 10%	90 mm ± 10%, Sensitivity adjustable
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250 Hz	250 Hz
Hysteresis/Differential travel	H	<10%	<10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 50 mA	< 50 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-12	DC-12
Permissible Ambient light		3000Lux.	3000Lux.
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions			
Operating temperature		-5° C to +55° C	-5° C to +55° C
Mechanical Specifications			
Housing Material		Plastic ABS	Plastic ABS
Size		50x42x19mm	50x42x19mm
Degree of protection		IP54	IP54
Connection		M12 Connector	M12 Connector
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Photoelectric Proximity Sensor — DC Standard

Dimensions | Dimensions

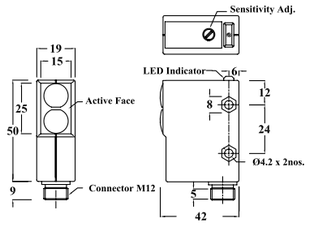


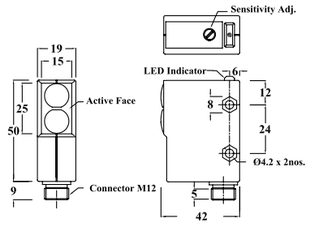


Technical Data	Model	PES-O54-P212S	PES-O54-P214S
General specifications			
Type		Diffused	Diffused
Switching Output		PNP, D/L selectable	PNP, D/L selectable
Rated Operating Distance	S_n	350 mm ± 10%	900 mm ± 10% , Sensitivity adjustable
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250 Hz	250 Hz
Hysteresis/Differential travel	H	<10%	<10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 50 mA	< 50 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-12	DC-12
Permissible Ambient light		3000Lux.	3000Lux.
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions			
Operating temperature		-5° C to +55° C	-5° C to +55° C
Mechanical Specifications			
Housing Material		Plastic ABS	Plastic ABS
Size		50x42x19mm	50x42x19mm
Degree of protection		IP54	IP54
Connection		M12 Connector	M12 Connector
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Photoelectric Proximity Sensor — DC Standard

Dimensions | Dimensions





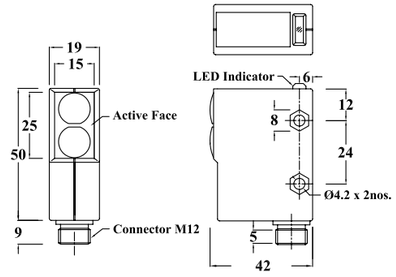
CE

Technical Data

Model		PES-O54-R214S	PES-O54-R216S
General specifications			
Type		Retroreflex	Retroreflex
Switching Output		PNP, D/L selectable	PNP, D/L selectable
Rated Operating Distance	S_n	0.1 - 4 Mtrs ±10%, Sensitivity adj.	0.1-1.2 Mtrs ±10%, Sensitivity adj.
Standard Reflector		Refer Reflector Type	Refer Reflector Type
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250Hz	250Hz
Hysteresis/Differential travel	H	<10%	<10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 50 mA	< 50 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-12	DC-12
Permissible Ambient light		3000Lux.	3000Lux.
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions			
Operating temperature		-5° C to +55° C	-5° C to +55° C
Mechanical Specifications			
Housing Material		Plastic ABS	Plastic ABS
Size		50x42x19mm	50x42x19mm
Degree of protection		IP54	IP54
Connection		M12 Connector	M12 Connector
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE
Reflector Type		R80-PP	R25-PP (0.1-0.8 mtrs) R55-PP (0.1-1.2 mtrs)

Photoelectric Proximity Sensor — DC Standard

Dimensions



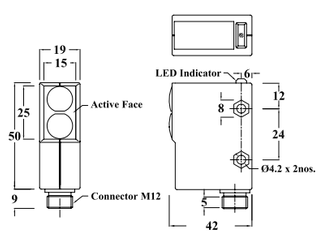
CE

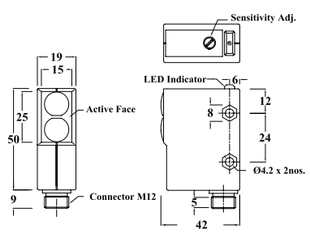
Technical Data

Model		PES-054-T203E
General specifications		
Type		Thrubeam - Emitter
Rated Operating Distance	S_n	10 Mtrs ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Rated operating current	I_e	< 30 mA
Rated insulation voltage	U_i	75 Vdc
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Red LED - Power On
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		50x42x19mm
Degree of protection		IP54
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

Photoelectric Proximity Sensor — DC Standard

Dimensions | Dimensions



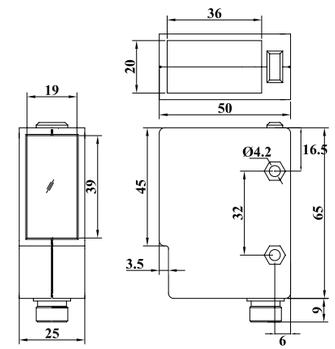


CE

Technical Data	Model	PES-O54-T211S	PES-O54-T213S
General specifications			
Type		Thrubeam - Receiver	Thrubeam - Receiver
Switching Output		PNP, D/L Selectable	PNP, D/L Selectable
Rated Operating Distance	S_n	10 Mtrs ± 10%	10 Mtrs ± 10% , Sensitivity adjustable
Nominal Ratings			
Supply Voltage	U_e	10-30 Vdc	10-30 Vdc
Frequency of Operating cycle	f	250 Hz	250 Hz
Hysteresis/Differential travel	H	<10%	<10%
Rated operating current	I_e	200 mA	200 mA
No-load supply current	I_o	< 50 mA	< 50 mA
Voltage drop	U_d	< 2.2Vdc	< 2.2Vdc
OFF state current	I_r	< 0.1mA	< 0.1mA
Rated insulation voltage	U_i	75 Vdc	75 Vdc
Utilization category		DC-12	DC-12
Permissible Ambient light		3000Lux.	3000Lux.
Protection Circuit		Short circuit & Polarity reversal	Short circuit & Polarity reversal
Function Indication		Red LED - Output, Green LED - Stability	Red LED - Output, Green LED - Stability
Ambient Conditions			
Operating temperature		-5° C to +55° C	-5° C to +55° C
Mechanical Specifications			
Housing Material		Plastic ABS	Plastic ABS
Size		50x42x19mm	50x42x19mm
Degree of protection		IP54	IP54
Connection		M12 Connector	M12 Connector
Compliance with Standards and Directives			
Standards Conformity		EN 60947- 5-2	EN 60947- 5-2
Approval		CE	CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



CE

Technical Data	Model	PES-O55-T202E
General specifications		
Type		Thrubeam - Emitter
Rated Operating Distance	S_n	50 Mtrs
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Rated operating current	I_e	< 30 mA
Rated insulation voltage	U_i	75 Vdc
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Red LED - Power ON
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		65x50x20 mm
Degree of protection		IP 54
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

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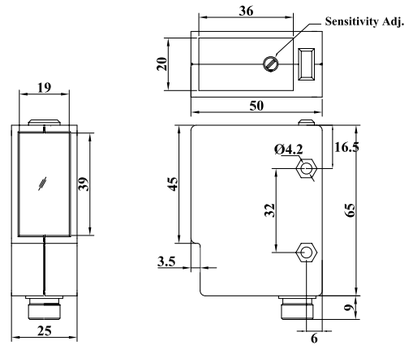
Photoelectric Proximity Sensor — DC Standard

Dimensions

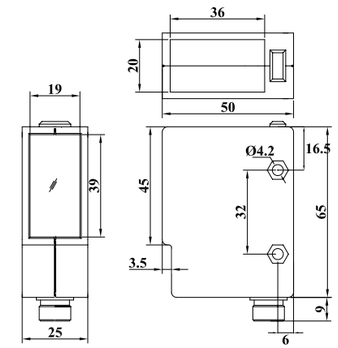


Technical Data

Model	PES-O55-T262M
General specifications	
Type	Thrubeam - Receiver
Rated Operating Distance S_n	50 Mtrs,Sensitivity Adjustable
Switching Output	1 Push-pull output, D/L selectable
Nominal Ratings	
Supply Voltage U_e	10-30 Vdc
Frequency of Operating cycle **f**	250 Hz
Hysteresis/Differential travel **H**	±10%
Rated operating current I_e	200 mA
No-load supply current I_o	< 50 mA
Voltage drop U_d	< 2.2Vdc
OFF state current I_r	< 0.1mA
Rated insulation voltage U_i	75 Vdc
Utilization category	DC-12
Permissible Ambient light	3000Lux.
Protection Circuit	Short circuit & Polarity reversal
Function Indication	Red LED - Output
	Green LED - Stability
Ambient Conditions	
Operating temperature	-5° C to +55° C
Mechanical Specifications	
Housing Material	Plastic ABS
Size	65x50x20 mm
Degree of protection	IP 54
Connection	M12 Connector
Compliance with Standards and Directives	
Standards Conformity	EN 60947- 5-2
Approval	CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



Technical Data

Model	PES-O55-B211S
General specifications	
Type	Diffused - Background Suppressed
Swithching Output	PNP, D/L Selectable
Rated Operating Distance S_n	750mm ± 10%
Nominal Ratings	
Supply Voltage U_e	10-30 Vdc
Frequency of Operating cycle **f**	250 Hz
Hysteresis/Differential travel **H**	±10%
Rated operating current I_e	200 mA
No-load supply current I_o	< 50 mA
Voltage drop U_d	< 2.2Vdc
OFF state current I_r	< 0.1mA
Rated insulation voltage U_i	75 Vdc
Utilization category	DC-12
Permissible Ambient light	3000Lux.
Protection Circuit	Short circuit & Polarity reversal
Function Indication	Red LED - Output Green LED - Stability
Ambient Conditions	
Operating temperature	-5° C to +55° C
Mechanical Specifications	
Housing Material	Plastic ABS
Size	65x50x20 mm
Degree of protection	IP 54
Connection	M12 Connector
Compliance with Standards and Directives	
Standards Conformity	EN 60947- 5-2
Approval	CE

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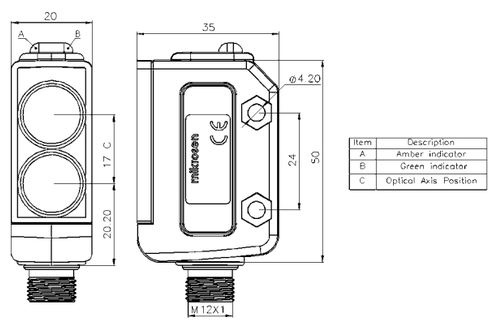
Photoelectric Proximity Sensor — DC Standard

Dimensions



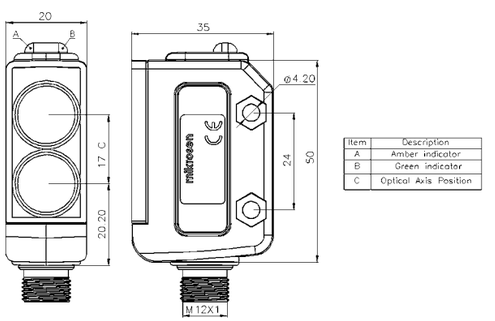
Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

Technical Data

Model		PEV-O64-T201E
General specifications		
Type		Thrubeam - Emitter
Rated Operating Distance	S_n	10 Mtrs ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Rated operating current	I_e	< 30 mA
Rated insulation voltage	U_i	75 Vdc
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Power ON
		Green LED - Ready
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		50 X 35 X 20 mm
Degree of protection		IP 67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval / Marking		CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

Technical Data

Model		PEV-O64-T261M
General specifications		
Type		Thrubeam - Receiver
Switching Output		
Pin4 - OUT 1:		1 Push-pull output, D/L selectable
Rated Operating Distance	S_n	10 Mtrs ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	500 Hz
Hysteresis/Differential travel	H	±10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 50 mA
Voltage drop	U_d	< 2.2Vdc
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-12
Permissible Ambient light		3000Lux.
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Ready, Green LED - Output
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		50 X 35 X 20 mm
Degree of protection		IP 67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval / Marking		CE

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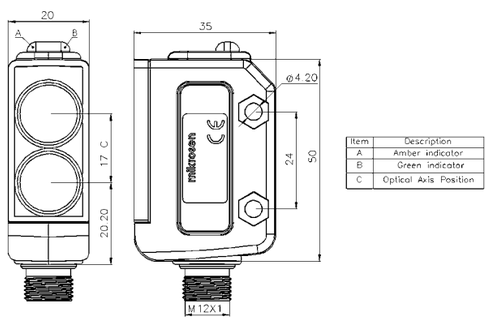
Photoelectric Proximity Sensor — DC Standard

Dimensions



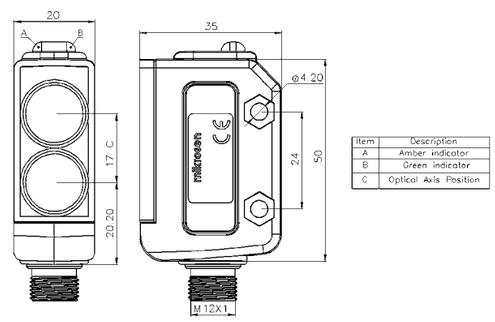
Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

Technical Data

Model		PEV-O64-B263M
General specifications		
Type		Background suppression
Switching Output		1 Push-Pull Switching Output ,D/L Selectable
Rated Operating Distance	S_n	300mm ± 10%
Wavelength	λ	620nm(Visible Red Light)
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	500Hz
Hysteresis/Differential travel	H	±10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 50 mA
Voltage drop	U_d	< 2.2Vdc
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-12
Permissible Ambient light		3000Lux.
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Ready, Green LED - Output
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		50 x 35 x 20mm
Degree of protection		IP67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

Technical Data

Model		PEV 064 R263M
General specifications		
Type		Retroreflex
Switching Output		1 Push-Pull Switching Output ,D/L Selectable
Rated Operating Distance	S_n	30mm - 3Mtrs ±10%, Sensitivity Adjustable
Standard Reflector		Refer Table
Wavelength	λ	620nm(Visible Red Light)
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	500Hz
Hysteresis/Differential travel	H	±10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 50 mA
Voltage drop	U_d	< 2.2Vdc
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-12
Permissible Ambient light		3000Lux.
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Ready, Green LED - Output
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		50x35x20mm
Degree of protection		IP67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

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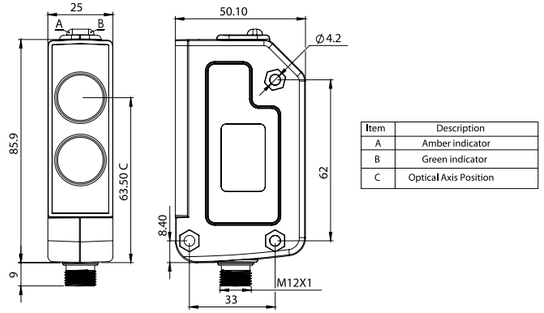
Photoelectric Proximity Sensor — DC Standard

Dimensions



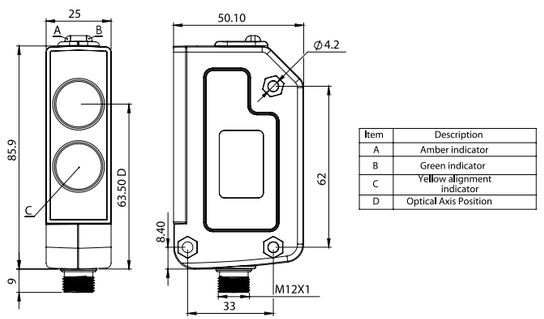
Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

CE

Technical Data		
Model		**PEV-O65-T202E**
General specifications		
Type		Thrubeam - Emitter
Rated Operating Distance	S_n	80 Mtrs ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Rated operating current	I_e	< 30 mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-12
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Power ON
		Green LED - Ready
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		86 X 50 X 25 mm
Degree of protection		IP 67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval / Marking		CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



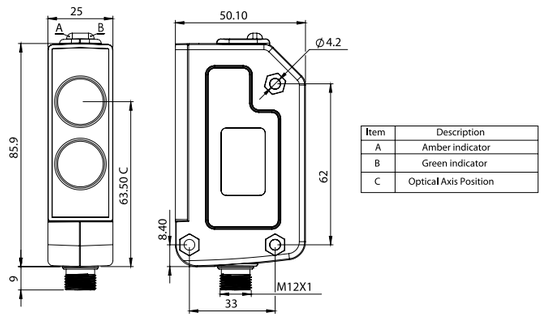
Item	Description
A	Amber indicator
B	Green indicator
C	Yellow alignment indicator
D	Optical Axis Position

CE

Technical Data		
Model		**PEV-O65-T262M**
General specifications		
Type		Thrubeam - Receiver
Output Logic/Switching element function		Push-pull switching Outputs
Pin4 - OUT 1:		PNP light sensing, NPN dark sensing
Pin2 - OUT 2:		PNP dark sensing, NPN light sensing
Rated Operating Distance	S_n	80 Mtrs ± 10%
Nominal Ratings		
Supply Voltage	U_e	10-30 Vdc
Frequency of Operating cycle	f	500 Hz
Hysteresis/Differential travel	H	±10%
Rated operating current	I_e	200 mA
No-load supply current	I_o	< 50 mA
Voltage drop	U_d	< 2.2Vdc
OFF state current	I_r	< 0.1mA
Rated insulation voltage	U_i	75 Vdc
Utilization category		DC-12
Permissible Ambient light		3000Lux.
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Amber LED - Power ON
		Green LED - Light Path Free
		Yellow LED - Alignment Indication
Ambient Conditions		
Operating temperature		-5° C to +55° C
Mechanical Specifications		
Housing Material		Plastic ABS
Size		86 X 50 X 25 mm
Degree of protection		IP 67
Connection		M12 Connector
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval / Marking		CE

Photoelectric Proximity Sensor — DC Standard

Dimensions



Item	Description
A	Amber indicator
B	Green indicator
C	Optical Axis Position

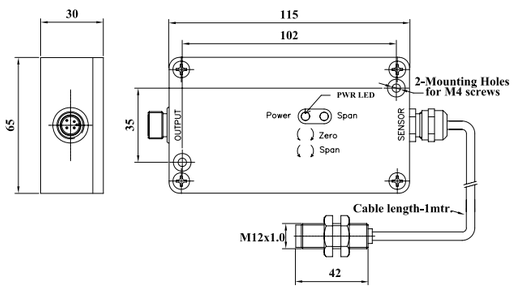
CE

Technical Data

Model	PES-O65-B263M
General specifications	
Type	Diffused - Background Suppressed
Switching Output	Push-Pull switching outputs
Pin2 - OUT 2:	PNP dark sensing, NPN light sensing
Pin4 - OUT 1:	PNP light sensing, NPN dark sensing
Rated Operating Distance S_n	20 - 2000mm ± 10%
Nominal Ratings	
Supply Voltage U_e	10-30 Vdc
Frequency of Operating cycle **f**	250 Hz
Hysteresis/Differential travel **H**	±10%
Rated operating current I_e	200 mA
No-load supply current I_o	< 50 mA
Voltage drop U_d	< 2.2Vdc
OFF state current I_r	< 0.1mA
Rated insulation voltage U_i	75 Vdc
Utilization category	DC-13
Permissible Ambient light	3000Lux.
Protection Circuit	Short circuit & Polarity reversal
Function Indication	Amber LED - Ready
	Green LED - Output
Ambient Conditions	
Operating temperature	-5° C to +55° C
Mechanical Specifications	
Housing Material	Plastic ABS
Size	86 X 50 X 25 mm
Degree of protection	IP 67
Connection	M12 Connector
Compliance with Standards and Directives	
Standards Conformity	EN 60947- 5-2
Approval	CE

Linear Displacement Sensor — DC Standard

Dimensions



CE

Technical Data

Model	LDS-L11-3202A
General specifications	
Rated Operating Distance S_n	0.4 - 2mm
Nominal Ratings	
Supply Voltage U_e	12V DC ± 10 %
Frequency of Operating cycle **f**	5 KHz (-3 dB)
Ripple	< 10% (P-P)
Resolution	0.05% of F.S
Confirmity	± 2% of F.S
Temperature Stability	0.05% of F.S / ° C
No-load supply current I_o	100mA Max
Output Voltage	5V/mm, 10mA Max
Rated insulation voltage U_i	75Vdc
Utilization Categories	DC-12
Protection Circuit	Short circuit & Polarity reversal
Function Indication	RED LED - Power
Output adjustments	R7 for Zero,R9 for Span
Ambient Conditions	
Operating temperature	0 ° C to 60 °C
Mechanical Specifications	
Connection Type	4 pin Connection M12
Housing	Aluminium , 115x65x30 mm
Standard Target	12x12x1mm of S_t
Protection class	IP 65
Compliance with Standards and Directives	
Standards Conformity	EN 60947- 5-2
Approval	CE

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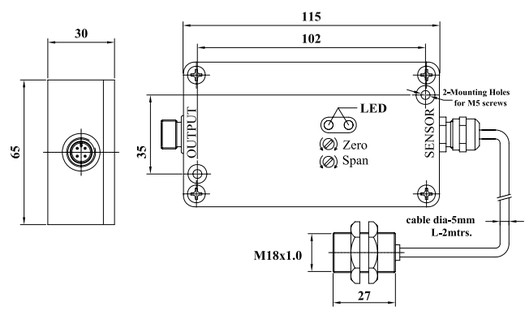
Linear Displacement Sensor — DC Standard

Dimensions



CE

Technical Data

Model		LDS-L20-3105A
General specifications		
Rated Operating Distance	S_n	1-5mm
Nominal Ratings		
Supply Voltage	U_e	12V DC ± 10 %
Frequency of Operating cycle	**f**	3.3 KHz (-3 dB)
Ripple		< 10% (P-P)
Resolution		0.05% of F.S
Confirmity		± 2% of F.S
Temperature Stability		0.05% of F.S/°C
No-load supply current	I_o	100mA Max
Output Current		4-20mA Max. Load Resistance - 250 Ω
Rated insulation voltage	U_i	75Vdc
Utilization Categories		DC-12
Protection Circuit		Short circuit & Polarity reversal
Function Indication		RED LED-Power, Green LED -Span
Output adjustments		Zero& Span
Ambient Conditions		
Operating temperature		0 ° C to 60 °C
Mechanical Specifications		
Connection Type		4 pin Connection M12
Housing		Aluminium , 115x65x30 mm
Standard Target		18X18X1mm of St
Protection class		IP 65
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

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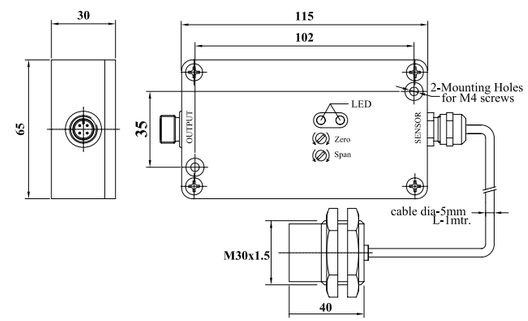
Linear Displacement Sensor — DC Standard

Dimensions



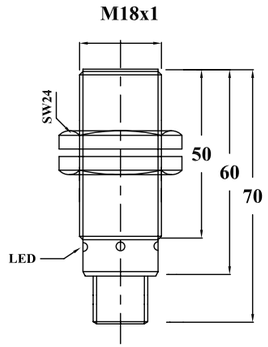
CE

Technical Data

Model		LDS-L31-3210A
General specifications		
Rated Operating Distance	Sn	2-10mm
Nominal Ratings		
Supply Voltage	Ue	12V DC ± 10 %
Response Frequency	f	1KHz (-3 dB)
Ripple		<10% (P-P)
Resolution		0.05% of F.S
Confirmity		± 1.5% of F.S
Temperature Stability		0.05% of F.S /°C
No-load supply current	Io	100 mA Max.
Output Voltage		0-10 V, 20 mA Max.
Rated insulation voltage	Ui	75Vdc
Utilization Categories		DC-12
Protection Circuit		Short circuit & Polarity reversal
Function Indication		RED LED-Power, Green LED -Span
Output adjustments		Potentiometer for Zero& Span
Ambient Conditions		
Operating temperature		0 ° C to 60 °C
Mechanical Specifications		
Connection Type		4 pin Connection M12
Housing		Aluminium , 115x65x30 mm
Standard Target		30X30X1mm of St
Protection class		IP 65
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

Linear Displacement Sensor — DC Standard

Dimensions

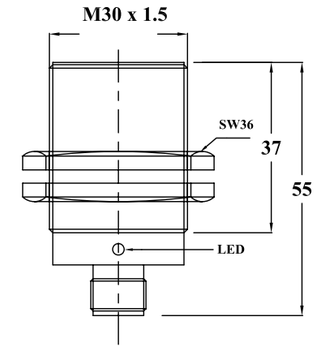


CE

Technical Data	Model	LDS-I20-4205C
General specifications		
Rated Operating Distance	S_n	1...5mm
Nominal Ratings		
Supply Voltage	U_e	15-30 V dc
Response Frequency	f	500HZ (-3db)
Ripple		< 10% (P-P)
Resolution		0.05% of F.S
Confirmity		± 3% of F.S
Temperature Stability		0.15% of F.S / ° C
No-load supply current	I_o	100mA Max
Output Voltage		0...10V
Rated insulation voltage	U_i	75Vdc
Utilization Categories		DC-12
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Red LED - Power
Ambient Conditions		
Operating temperature		0 ° C to 60 °C
Mechanical Specifications		
Type		Cylindrical threaded
Mounting Type		Flush mountable
Connection Type		4 pin Connection M12
Material (sensing face)		Plastic ABS
Housing material		Brass Nickel Plated
Size		M18 x 55
Protection class		IP 67
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

Linear Displacement Sensor — DC Standard

Dimensions

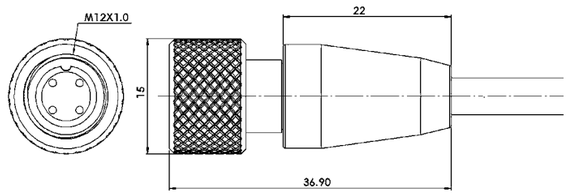


CE

Technical Data	Model	LDS-I30-4210C
General specifications		
Rated Operating Distance	S_n	2...10mm
Nominal Ratings		
Supply Voltage	U_e	15-30 V dc
Response Frequency	f	500HZ (-3db)
Ripple		< 10% (P-P)
Resolution		0.05% of F.S
Confirmity		± 3% of F.S
Temperature Stability		0.15% of F.S/°C
No-load supply current	I_o	100mA Max
Output Voltage		0...10V
Rated insulation voltage	U_i	75Vdc
Utilization Categories		DC-12
Protection Circuit		Short circuit & Polarity reversal
Function Indication		Red LED - Power
Ambient Conditions		
Operating temperature		0 ° C to 60 °C
Mechanical Specifications		
Type		Cylindrical threaded
Mounting Type		Flush mountable
Connection Type		4 pin Connection M12
Material (sensing face)		Plastic ABS
Housing material		Brass Nickel Plated
Size		M30 x 55mm
Protection class		IP 67
Compliance with Standards and Directives		
Standards Conformity		EN 60947- 5-2
Approval		CE

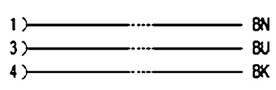
Connection Systems — Cord Set

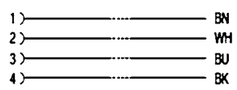
Dimensions



Technical Data	Model	CSA-CA-PXAX	CSA-CC-PXAX
Electrical Data			
Operating Voltage	U_B	250VAC/DC	250VAC/DC
Operating Current		2A	2A
Cable		3Cx 0.34 Sq.mm	4C x 0.34 Sq.mm
Ambient Conditions			
Operating Temperature		-20° C to +70° C	-20° C to +70° C
Mechanical data			
Degree of protection		IP 67	IP 67
Orientation		Straight	Straight
Bending Radius		Min 10 x Dia	Min 10 x Dia
Cable Diameter		4.3 (0.17)mm(in)	4.8(0.19)mm(in)
Material			
Contacts		CuZn	CuZn
Contact Surface		Au	Au
Connector Housing		PA 6	PA 6
Coupling Nut		CuZn-Nickel Plated	CuZn-Nickel Plated
Cable Sheath		PVC Grey Colour	PVC Grey Colour
Construction		Standard M12, Female	Standard M12, Female

Electrical Connection	Non-Shielded 3 Core	Non-Shielded 4 Core





Pin Out

* Standard Cable Lengths of 2m, 5m and 10m are available. Others on request.

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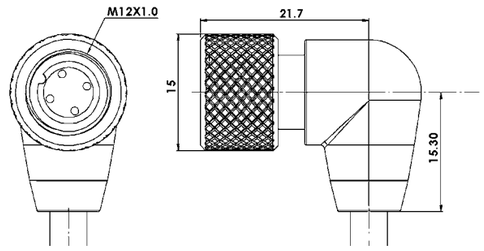
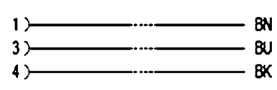
Connection Systems — Cord Set

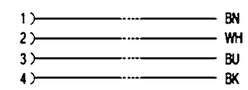
Dimensions



Technical Data	Model	CSA-CB-PXAX	CSA-CD-PXAX
Electrical Data			
Operating Voltage	U_B	250VAC/DC	250VAC/DC
Operating Current		2A	2A
Cable		3Cx 0.34 Sq.mm	4C x 0.34 Sq.mm
Ambient Conditions			
Operating Temperature		-20° C to +70° C	-20° C to +70° C
Mechanical data			
Degree of protection		IP 67	IP 67
Orientation		Straight	Straight
Bending Radius		Min 10 x Dia	Min 10 x Dia
Cable Diameter		4.3 (0.17)mm(in)	4.8(0.19)mm(in)
Material			
Contacts		CuZn	CuZn
Contact Surface		Au	Au
Connector Housing		PA 6	PA 6
Coupling Nut		CuZn-Nickel Plated	CuZn-Nickel Plated
Cable Sheath		PVC Grey Colour	PVC Grey Colour
Construction		Standard M12, Female	Standard M12, Female

Electrical Connection	Non-Shielded 3 Core	Non-Shielded 4 Core



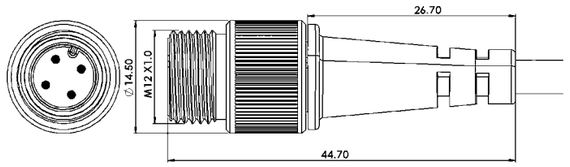


Pin Out

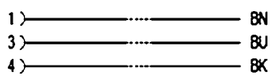
* Standard Cable Lengths of 2m, 5m and 10m are available. Others on request.

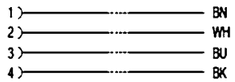
Connection Systems — Cord Set

Dimensions



Technical Data	Model	CSA-DA-PXAX	CSA-DC-PXAX
Electrical Data			
Operating Voltage	U_B	250VAC/DC	250VAC/DC
Operating Current		2A	2A
Cable		3Cx 0.34 Sq.mm	4C x 0.34 Sq.mm
Ambient Conditions			
Operating Temperature		-20° C to +70° C	-20° C to +70° C
Mechanical data			
Degree of protection		IP 67	IP 67
Orientation		Straight	Straight
Bending Radius		Min 10 x Dia	Min 10 x Dia
Cable Diameter		4.3 (0.17) mm(in)	4.8 (0.19) mm(in)
Material			
Contacts		CuZn	CuZn
Contact Surface		Au	Au
Connector Housing		PA 6	PA 6
Coupling Nut		CuZn-Nickel Plated	CuZn-Nickel Plated
Cable Sheath		PVC Grey Colour	PVC Grey Colour
Construction		Standard M12, Male	Standard M12, Male
Electrical Connection		**Non-Shielded 3 Core**	**Non-Shielded 4 Core**





Pin Out

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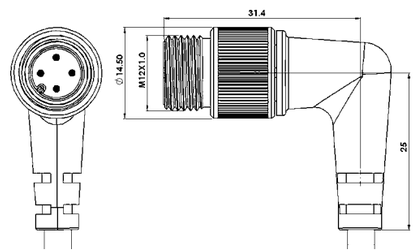
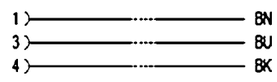
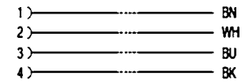
Connection Systems — Cord Set

Dimensions



Technical Data	Model	CSA-DB-PXAX	CSA-DD-PXAX
Electrical Data			
Operating Voltage	U_B	250VAC/DC	250VAC/DC
Operating Current		2A	2A
Cable		3C x 0.34 Sq.mm	4C x 0.34 Sq.mm
Ambient Conditions			
Operating Temperature		-20° C to +70° C	-20° C to +70° C
Mechanical data			
Degree of protection		IP 67	IP 67
Orientation		Right Angle	Right Angle
Bending Radius		Min 10 x Dia	Min 10 x Dia
Cable Diameter		4.3 (0.17)mm (in.)	4.8 (0.19)mm (in.)
Material			
Contacts		CuZn	CuZn
Contact Surface		Au	Au
Connector Housing		PA 6	PA 6
Coupling Nut		CuZn-Nickel Plated	CuZn-Nickel Plated
Cable Sheath		PVC Grey Colour	PVC Grey Colour
Construction		Standard M12, Male	Standard M12, Male
Electrical Connection		**Non-Shielded 3 Core**	**Non-Shielded 4 Core**



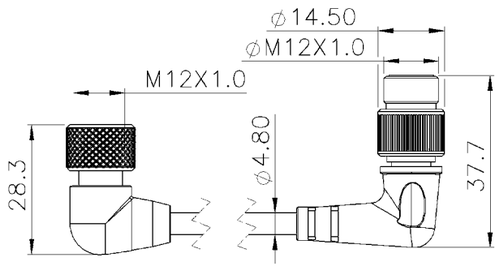


Pin Out

* Standard Cable Lengths of 2m, 5m and 10m are available. Others on request.

Connection System — Patch Cord

Dimensions

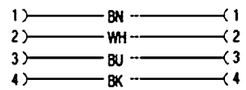


Technical Data

Model	CSB-CDDD-PXAX
Electrical Data	
Operating Voltage U_B	250VAC/DC
Operating Current	2A
Cable	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Straight
Bending Radius	Min 10 x Dia
Cable Diameter	4.8 (0.19)mm (in.)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Coupling Nut	CuZn-Nickel Plated
Cable Sheath	PVC Grey Colour
Construction	Standard M12, (Both ends)

Electrical Connection

Non-Shielded 4 Core



Pin Out

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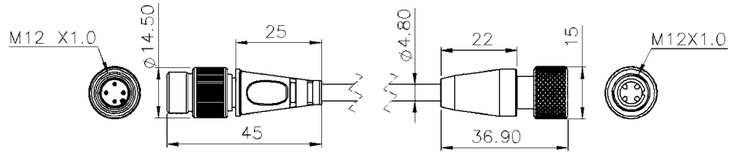
Connection System — Patch Cord

Dimensions

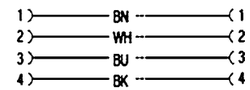


Technical Data

Model	CSB-CCDC-PXAX
Electrical Data	
Operating Voltage U_B	250VAC/DC
Operating Current	2A
Cable	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Straight
Bending Radius	Min 10 x Dia
Cable Diameter	4.8 (0.19)mm (in.)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Coupling Nut	CuZn-Nickel Plated
Cable Sheath	PVC Grey Colour
Construction	Standard M12, (Both ends)

Electrical Connection

Non-Shielded 4 Core

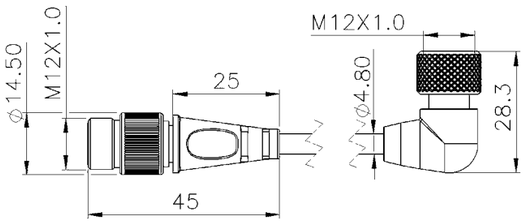


Pin Out

* Standard Cable Lengths of 2m, 5m and 10m are available. Others on request.

Connection System — Patch Cord

Dimensions

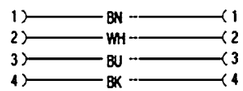


Technical Data

Model	CSB-CDDC-PXAX
Electrical Data	
Operating Voltage U_B	250VAC/DC
Operating Current	2A
Cable	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Straight
Bending Radius	Min 10 x Dia
Cable Diameter	4.8(0.19) mm (in.)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Coupling Nut	CuZn-Nickel Plated
Cable Sheath	PVC Grey Colour
Construction	Standard M12, (Both ends)

Electrical Connection

Non-Shielded 4 Core



Pin Out

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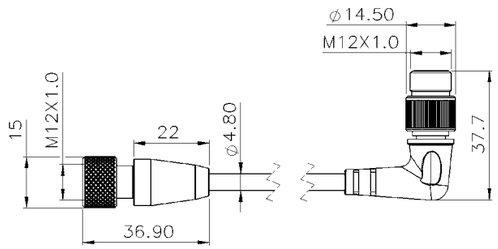
Connection System — Patch Cord

Dimensions

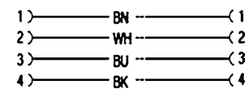


Technical Data

Model	CSB-DDCC-PXAX
Electrical Data	
Operating Voltage U_B	250VAC/DC
Operating Current	2A
Cable	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Right Angle
Bending Radius	Min 10 x Dia
Cable Diameter	4.8(0.19)mm (in.)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Coupling Nut	CuZn-Nickel Plated
Cable Sheath	PVC Grey Colour
Construction	Standard M12, (Both ends)

Electrical Connection

Non-Shielded 4 Core

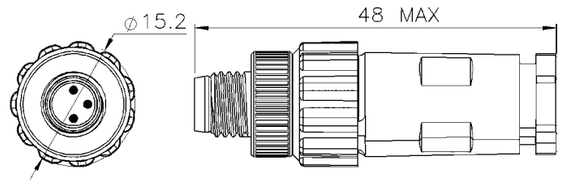


Pin Out

* Standard Cable Lengths of 2m, 5m and 10m are available. Others on request.

Connection System — Screw Type Connector

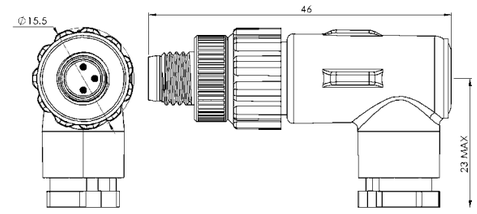
Dimensions



Technical Data		
Model		**CSE-FA**
General Specifications		
Electrical Data		
Operating Voltage	U_b	250VAC/DC
Operating Current		2A
Cable core to be used		3C x 0.34 Sq.mm
Ambient Conditions		
Operating Temperature		-20° C to +70° C
Mechanical data		
Degree of protection		IP 67
Orientation		Straight
Bending Radius		Min 10 x Dia
Max Cable Diameter to be used		4.3(0.17)mm(in)
Material		
Contacts		CuZn
Contact Surface		Au
Connector Housing		PA 6
Body colour		Black
Coupling Nut		CuZn-Nickel Plated
Construction		Standard M8

Connection System — Screw Type Connector

Dimensions



Technical Data		
Model		**CSE-FB**
General Specifications		
Electrical Data		
Operating Voltage	U_b	250VAC/DC
Operating Current		2A
Cable core to be used		3C x 0.34 Sq.mm
Ambient Conditions		
Operating Temperature		-20° C to +70° C
Mechanical data		
Degree of protection		IP 67
Orientation		Right Angle
Bending Radius		Min 10 x Dia
Max Cable Diameter to be used		4.3 (0.17)mm(in)
Material		
Contacts		CuZn
Contact Surface		Au
Connector Housing		PA 6
Body colour		Black
Coupling Nut		CuZn-Nickel Plated
Construction		Standard M8

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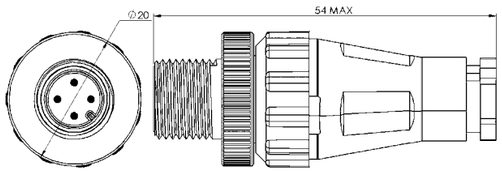
Connection System — Screw Type Connector

Dimensions

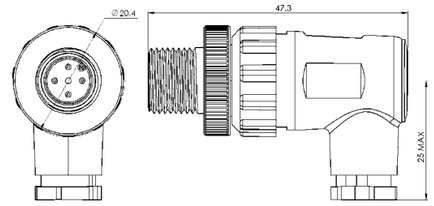


Technical Data

Model	CSE-DC
General Specifications	
Electrical Data	
Operating Voltage U_b	250VAC/DC
Operating Current	2A
Cable core to be used	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Straight
Bending Radius	Min 10 x Dia
Max Cable Diameter to be used	4.8 (0.19) mm(in)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Body colour	Black
Coupling Nut	CuZn-Nickel Plated
Construction	Standard M12

Connection System — Screw Type Connector

Dimensions



Technical Data

Model	CSE-DD
General Specifications	
Electrical Data	
Operating Voltage U_b	250VAC/DC
Operating Current	2A
Cable core to be used	4C x 0.34 Sq.mm
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical data	
Degree of protection	IP 67
Orientation	Right angle
Bending Radius	Min 10 x Dia
Max Cable Diameter to be used	4.8 (0.19) mm(in)
Material	
Contacts	CuZn
Contact Surface	Au
Connector Housing	PA 6
Body colour	Black
Coupling Nut	CuZn-Nickel Plated
Construction	Standard M12

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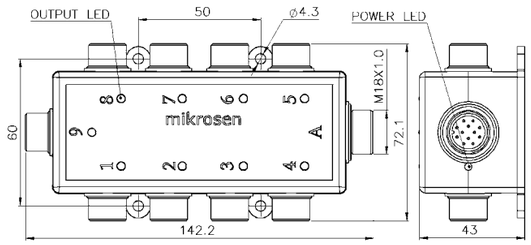
Connection System — Distribution Box

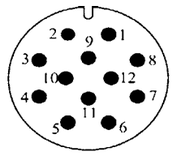
Dimensions



Technical Data

Model	CSD-B01-CB4A
Electrical Data	
Supply Voltage U_e	30 Vdc
Rated operating current I_e	2A
No. of Poles	3
Function Indication	Power LED Green
	Output LED Red
Ambient Conditions	
Operating Temperature	-20° C to +70° C
Mechanical Specifications	
Degree of protection	IP 54
Orientation	Straight
Material	
Contacts	Brass (CuZn)
Contact Surface	Gold plated (Au)
Coupling Nut	Brass-Nickel Plated
Housing Material	Plastic ABS
Body colour	GREY

M18 x 12 Pin Connector Pin Out



CONNECTION DETAILS.

S.No	Connection name	M12 x 4 pin Connector	M18 x 12 pin Connector
1	POWER	C1(1) TO C9(1)	1
2	GROUND	C1(3) TO C9(3)	2
3	I/O	C1(4)	3
4	I/O	C2(4)	4
5	I/O	C3(4)	5
6	I/O	C4(4)	6
7	I/O	C5(4)	7
8	I/O	C6(4)	8
9	I/O	C7(4)	9
10	I/O	C8(4)	10
11	I/O	C9(4)	11
12	NOT USED	---	12

Ordering Code Information — Inductive Proximity Sensor

IPS-A18-212L

VERSION

Inductive Proximity Standard	**IPS**
Inductive Proximity Extended	**IPX**

HOUSING

Brass Nickel Plated	**A**
Plastic ABS	**B**
Brass Nickel Plated with Translucent Rear	**C**
Stainless Steel	**D**

FIRST DIGIT

Tubular M08	**0**
Tubular M12	**1**
Tubular M18	**2**
Tubular M30	**3**
Reserve	**4**
Cubicle	**5**

SECOND DIGIT **

70mm Flush DC / 80mm AC	**0**
70mm, Non-Flush	**1**
55 mm Flush DC /50mm AC	**2**
55mm, Non-Flush	**3**
Shorty, Flush	**4**
Shorty, Non-Flush	**5**
70mm,Metal Rear Housing,Flush	**6**
70mm, Connector, Non-Flush	**7**
55mm, Connector, Flush	**8**
55mm, Connector, Non Flush	**9**

OUTPUT LOGIC

L	N/O
N	N/C

SENSING SPECIFICATION

0	Short Range (Flush) - AC
1	Long Range (Non-Flush) - AC
2	Short Range (Flush) - DC
3	Long Range (Non-Flush) – DC
4	Reserve
5	Reserve
6	Special
7	Extended Range (Flush)
8	Extended Range (Non Flush)

OUTPUT TYPE

1	PNP, 3 Wire
2	NPN, 3 Wire
3	2 Wire

POWER SUPPLY

1	AC
2	DC

**** Note:** For Cubicle Version, Second digit refers to Size/Dimension of the product

Ordering Example:

IPS-A18-212L	Inductive Proximitiy Sensor-Standard Series-With Metal Housing, M12,55mm Flush, DC,PNP-3Wire, Short Range, N/O

Ordering Code Information — Photoelectric Proximity Sensor

PES-054-T213S

VERSION

Standard IR	PES
Standard Visible	PEV

TYPE OF SENSOR

Plug In Type	O
Cable Type	P

HOUSING

FIRST DIGIT

Reserve	0&1
M18	2
Reserve	3&4
Box Type-IR	5
Box Type (Visual)	6

SECOND DIGIT

Overall Dimension	0-9

PRINCIPLE OF OPERATION

Background Suppression	B
Proximity (Diffused)	P
Retroreflex	R
Thru Beam	T
Fixed Focus	F

OUTPUT LOGIC

L	Light Switching
N	Dark Switching
S	Dark/Light Selectable
E	Emitter
M	Multiple functions

SENSING RANGE

1	Short Range, Fixed-10mtrs
2	Long Range, Fixed-50 mtrs
3	Short Range, Adjustable
4	Long Range, Adjustable
5	Extra Long Range
6	Reserve
7	Short Range Fixed -50mm

OUTPUT TYPE

0	Emitter
1	PNP
2	NPN
3	Relay, 1CO& Timing Function
4	Timing Function, PNP
5	Timing Function, NPN
6	PNP/NPN

POWER SUPPLY

1	AC
2	DC

Ordering Example:

PES-O54-T213S	Photoelectric sensor-Plug in type-Box type IR-Thru Beam-DC-PNP Short angle adjustable-Dark light selectable

Ordering Code Information — Linear Displacement Sensor

LDS-L20-3105L

VERSION

Linear Displacement Sensor	LDS

TYPE OF SENSOR

External Amplifier Type	L
Inbuilt Amplifier Type	I

HOUSING

FIRST DIGIT

M08	0
M12	1
M18	2
M30	3

SECOND DIGIT

Flush	0
Non-Flush	1

POWER SUPPLY

10-30 Vdc	2
12 Vdc	3
15-30 Vdc	4

LINEARITY

A	±2%
B	±0.5%
C	±3%

SENSING RANGE

02	2 mm
05	5 mm
10	10 mm
15	15 mm

OUTPUT TYPE

1	Current Output
2	Voltage Output
3	Voltage & Current Output

Ordering Example:

LDS-L20-3105A	Linear Displacement Sensor External Amplifier type with M18 head flush type, Power Supply of 12Vdc with Current Output and a maximum Sensing range of 5mm with Lineraity of 2%

Ordering Code Information — Cord Set/Patch Cord/Screw Type

CSB- C D D D-P XAX

VERSION

Cord Set	CSA
Patch Cord	CSB
Screw type Connector	CSE

CONNECTOR TYPE

M8 4PIN Female	A
M8 4PIN Male	B
M12 4PIN Female	C
M12 4PIN Male	D
M8 3PIN Female	E
M8 3PIN Male	F
M12 5PIN Female	G
M12 5PIN Male	H
M18 12PIN Female	I
Power Lock connector	Z

CABLE CORE & FORMFACTOR

3Core Straight	A
3Core Right Angle	B
4Core Straight	C
4Core Right Angle	D
5Core Straight	E
5Core Right Angle	F
12Core Straight	G

CABLE LENGTH

In Metres(A refers to decimal)

TYPE OF CABLE

P	PVC Non-shielded
S	PVC Shielded
H	PUR-Halogen Free
B	PUR-Halogen Free Shielded

CABLE CORE & FORM FACTOR

A	3CORE Straight
B	3CORE Right Angle
C	4CORE Straight
D	4CORE Right Angle
E	5CORE Straight
F	5CORE Right Angle
G	12CORE Straight

CONNECTOR TYPE

A	M8 4PIN Female
B	M8 4PIN Male
C	M12 4PIN Female
D	M12 4PIN MALE
E	M8 3PIN Female
F	M8 3PIN Male
G	M12 5PIN Female
H	M12 5PIN Male
I	M18 12PIN Female
Z	Power Lock Connector

Ordering Examples:

CSA-CA-P3A5	Cord Set-M12 4 Pin Female-3 Core Straight PVC non shielded Cable with 3.5 Metre Cable
CSB-CDDD-P2A0	Patch Cord - M12 4 Pin Female Right Angle-4 Core-4 Pin M12 Male Right Angle with 2 Metre Cable
CSE-FA	Screw type Connector-M8 3 Pin Male Straight with provision for 3 Core cable

Ordering Code Information — Distribution Box

C S D-B 0 1- C B 4 A

CONNECTION SYSTEM

Distribution Box	CSD

HOUSING MATERIAL

Aluminium	A
Plastic	B

SIZE/FORM FACTOR

60X140X43	01

CONNECTOR TYPE INPUT

M8 4PIN Female	A
M8 4PIN Male	B
M12 4PIN Female	C
M12 4PIN Male	D
M8 3PIN Female	E
M8 3PIN Male	F
M12 5PIN Female	G
M12 5PIN Male	H

INPUT TYPE

A	PNP With LED
B	NPN With LED
C	PNP Without LED
D	NPN Without LED

NO. OF INPUTS

1	4 Way
2	6 Way
3	8 Way
4	9 Way
5	12 Way

CONNECTOR TYPE OUTPUT

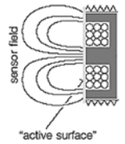
A	12Core Pre-Wired Cable
B	M18 12PIN Male connector
C	Terminal Block

Ordering Example

CSD-B01-CB4A	Distribution Box with Plastic housing-Size 60x140x43-M12 4 Pin Female Input Connector-Output M18 12 Pin Male Connection-9WAY Input-Input PNP with LED

Technical Terms & Definitions

GENERAL PARAMETERS:



Active surface: is the area through which the high-frequency sensor field enters the air gap. It is determined primarily by the base of the shell core and corresponds roughly to the surface area of the shell core cap as in Fig.

Accuracy: The accuracy of the sensor is the maximum difference that will exist between the actual value and the indicated value at the output of the sensor. Again, the accuracy can be expressed either as a percentage of full scale or in absolute terms.

Adjustable Sensitivity: The ability of the sensor to discriminate between different levels of light incidence on the receiver. Used primarily to black out background objects, discriminate between materials, or transparent objects.

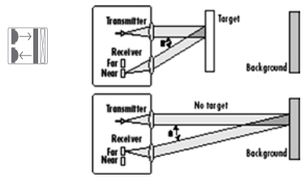
Ambient Light: Light that is present in a given area; e.g., Inside, outside, incandescent, or fluorescent. In some cases, ambient light may affect photoelectric controls.

Ambient Light Rejection: There are basically 3 different ways for the receiver to differentiate the emitter signal from the ambient light. As a practical consideration in setting up a system, it is advised to direct the receiver away from strong external light sources, such as the sun or industrial lighting.

1. Modulation - Pulsed light is different from continuous ambient light.

2. Filters - Filters block most of the visible light spectrum so that a modulated signal is more easily detected.

3. Focal Arrangement - Lenses are used at the emitter and receiver to focus the beam for optimum signal transmission. This lens arrangement actually makes the image of the emitter focus on the receiver just like a camera would focus an image on a sheet of film.



Background Suppression: Proximity (diffuse/technology) sensing mode that eliminates the influence of a background behind the target to be sensed. Also results in practical elimination of the influence of texture and color on the sensing distance as in Fig.

Beam pattern: in the operation of thru-beam and retro reflective sensors, a degree of deviation from absolute alignment of the emitter and receiver (within which the beam intensity is sufficient to activate the receiver) determines the beam pattern.

Calibration: If a meaningful measurement is to be made, it is necessary to measure the output of a sensor in response to an accurately known input. This process is known as calibration, and the devices that produce the input are described as calibration standards.

Complementary Outputs: Sensors with both NPN and PNP Outputs that change state simultaneously.

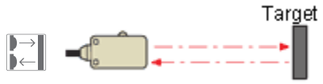
Correction factor: gives the reduction in sensing distances for target materials which are not made of Fe 360 as in Fig.

Material	Factor
Steel	1.0
Cast Iron	0.93 – 1.05
Stainless steel	0.60 – 1.00
Nickel	0.65 – 0.75
Brass	0.35 – 0.50
Aluminum	0.30 – 0.45
Copper	0.25 – 0.45

Current Sinking: NPN output - an output type such that when it is ON, current flow is from the load into the output of the device, then to ground. Output is normally high. The sensor sinks current from the load through the sensor to ground. The load is connected between the positive lead of the supply and the output lead of the sensor.

Current Sourcing: PNP output - an output type such that when it is ON, current flow is from the device into the load. Output is normally low. The sensor sources current to the load. The load is connected between the output lead and the negative ground lead of the supply. Considered safer than NPN outputs due to the way current flows when wired up.

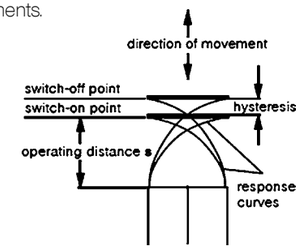
Dark Operation (Mode): Dark mode output is energized when the target is present (proximity output is energized when target is not detected). Output mode that will result in an output from a device when light from the emitter is not being received upon the receiver. The beam is being interrupted, thus creating an output.



Diffused: Where the unit senses the light directly from the target. The emitter and receiver are in the same housing, the same as retro-reflective. However, the receiver is more sensitive to the weaker light that is diffused by the surface of the target. as in Fig.

Emitter: A device that emits light when an electric current is passed through it. Emitters can give off visible light (red, green, blue, white) but the majority used for industrial applications emits invisible electromagnetic waves (infrared).

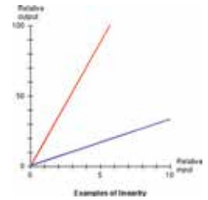
Excess Gain: This is the measure of light energy striking the receiver above the threshold required to activate the receiver. Excess gain is used to predict the performance of optical sensors in various environments.



Hysteresis (H): The distance between the switch-on point and the switch-off point as the target is moving away in order to make a precise determination of target presence without factors of the environment intervening to create a noisy output signal. The operating distance always refers to the switch-on point. Hysteresis (differential travel) causes a defined switching behavior of the device as in Fig.

IR light: IR is the abbreviation of "Infra-Red". This refers to any electromagnetic radiation with a wavelength exceeding that of normal visible light. Wavelengths of approx. 780 to 1500 nm are typically used.

Linearity: Linearity is the behavior of a circuit, particularly an amplifier, in which the output signal strength varies in direct proportion to the input signal strength. In a linear device, the output-to-input signal amplitude ratio is always the same, no matter what the strength of the input signal (as long it is not too strong).



In an amplifier that exhibits linearity, the output-versus-input signal amplitude graph appears as a straight line. Two examples are shown below. The gain, or amplification factor, determines the slope of the line. The steeper the slope, the greater the gain. The amplifier depicted by the red line has more gain than the one depicted by the blue line. Both amplifiers are linear within the input-signal strength range shown, because both lines in the graph are straight as in Fig.

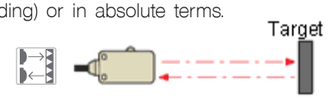
Maximum Load: The maximum current that can flow through a device continually without damaging the device.

Operating Mode: Two possible modes that will cause the sensor to operate and produce an output: Light-ON or Dark-ON mode.

Range: The range of the sensor is the maximum and minimum values of applied parameter that can be measured. Every sensor is designed to work over a specified range. The design ranges are usually fixed, and if exceeded, result in permanent damage/destruction of a sensor.

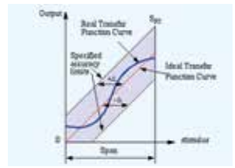
Receiver: A device that changes its electrical characteristic when light is received. Receivers can be photovoltaic cells, photo-transistors, photodiodes, and photo resistors.

Resolution: Resolution is the smallest detectable incremental change of input parameter that can be detected in the output signal. It can be expressed either as a proportion of the reading (or the full-scale reading) or in absolute terms.



Retro reflective: Where the target passes between the sensor and a reflector, blocking the beam to cause the receiver to change states. The emitter and receiver are in the same Housing as in Fig.

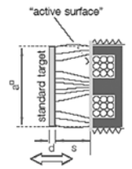
Sensitivity: Sensitivity of a sensor is defined as the change in output of the sensor per unit change in the parameter being measured. The factor may be constant over the range of the sensor (linear), or it may vary (nonlinear).



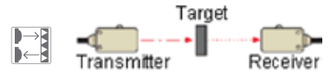
Transfer function, Span and Full Scale Output

Short Circuit Protection: All the sensors are inbuilt with a short circuit protection which prevents damage due to short circuiting of output terminals. The sensor will come into normal working condition once the short circuit of output is removed.

Span (input): A dynamic range of stimuli which may be converted by a sensor id called a span or an input full scale (FS). It represents the highest possible input value which can be applied to the sensor without causing unacceptably large inaccuracy as in Fig.



Standard target: An object with standardized dimensions or characteristics. It is a square plate of Fe 360 (ISO 630), used to define sensing distances as per EN 60947-5-2. The thickness is d = 1 mm. The side length corresponds to the diameter of the circle of the active surface or 3sn, if the value is greater than the given diameter. It is used in the product laboratory to determine benchmark performance characteristics for a sensor as in Fig.



Thru-beam: Where the target passes between an emitting unit and a receiving unit, blocking the beam and causing the receiver to change states. These are separate, independently covered units as in Fig.

Visible Light: Visible light is a range of electromagnetic radiation that can be detected by the human eye. The wavelengths associated with this range from 380 nm to 750 nm.

Zero: When making a measurement it is necessary to start at a known datum, and it is often convenient to adjust the output of the instrument to zero with respect to the datum . It, therefore, is a value ascribed to some defined point in the measured range.

Zero drift: The signal level may vary from its set zero value when the sensor works. This introduces an error into the measurement equal to the amount of variation, or drift as it is usually termed. Zero drift may result from changes of temperature, electronics stabilizing, or aging of the transducer or electronic components.

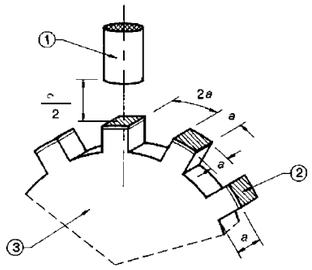
OPERATING PARAMETERS

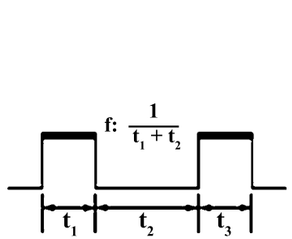
Assured operating distance (S_a): is the distance from the sensing face within which the correct operation of the proximity sensor under specified conditions is assured.

Effective operating distance (S_r): is measured at nominal supply voltage and ambient temperature of 23 □c ± 0.5. It takes into account manufacturing tolerances.

It is max. ±10% of the nominal sensing distance.

Frequency of operating cycles (f): refers to the maximum number of sensing operations per second. Damping is as per IEC 60947-5-2 with standard targets on a rotating, non-conducting disk. The surface area ratio of iron to non-conductor must be 1 : 2 (See Figure below).

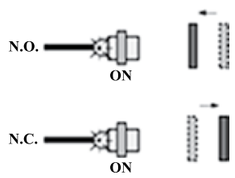




1 = proximity swich

2 = target

3 = disc in non-magnetic and non-conducting material



N/O. (Normally open) output mode: The operating mode that permits the sensor to output an on signal when a target enters the detecting range as in Fig.

N/C. (Normally closed) output mode: The operating mode that permits the sensor to output an on signal when a target goes out of the detecting range as in Fig.

Operating distance (s): is the distance at which a target approaching the active surface of the sensor causes a change in the output.

Operating temperature (t_a): is the temperature range over which the function of the sensor is guaranteed.

Rated operating distance (S_n): is a conventional quantity used to designate the operating distance, which does not take into account manufacturing tolerances, operating temperatures, supply voltages, etc.

Response Time: It is defined as being the duration of time required for the interface to trigger an output. Measure of time lapse between receipt of an input signal by a receiver to the activation of its output.

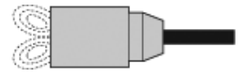
Repeatability (r): is the value of variation of the effective operating distance Sr under specified operating conditions.

Sensing Range: The maximum operating range at which the sensor will reliably detect a standard target under conditions of nominal voltage and temperature. The distance between an emitter and a receiver, reflector, or object in the path of the beam within which nominal operation is achievable.

Usable operating distance (S_u): is the sensing distance of a single proximity sensor under specified temperature and voltage conditions.

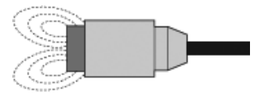
INSTALLATION & MOUNTING PARAMETERS:

Flush: Flush type is normally called as "shielded". Here, the housing extends to the full length of the sensor barrel - all the way to the sensor's face. The housing acts as a "shield" to restrict the sensor's magnetic field so it only radiates out of the face of the sensor as in Fig.



For standard sensing range models, these sensors can typically be mounted "flush" in metal without affecting their sensing distance. This Flush type protects the sensor coil from physical damage and often provides longer sensor life in abusive applications.

Non-flush: Non-flush type is normally called as "non-shielded". A "non-shielded" inductive sensor is a sensor in-which the housing does not extend the full length of the sensor. In most designs the first 5-10mm around the sensing face is actually a plastic cap encapsulating the sensor coil. This allows the sensor's magnetic field to extend farther out of the face of the sensor as well as out of the sides of the sensor "cap" as in Fig.

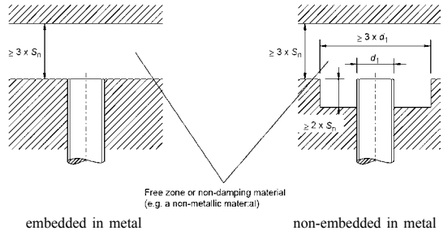


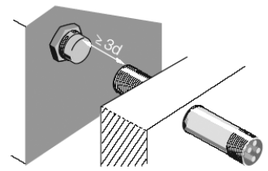
The advantage this housing provides is that it creates a larger magnetic field and achieves a longer sensing range (1.5 to 2 times longer) versus a shielded sensor housing. This larger magnetic field can also balloon down past the sensor housing. For this reason this sensor must be mounted "non-flush" with the plastic cap of the sensor and typically a portion of the metal housing extended out of its metal mount or bracket. If the sensor face is not mounted with this offset distance it can latch on immediately or false trigger in the application. Make sure this offset distance is maintained during the installation process.

Installation of sensors with standard sensing distance in metal:

Flush proximity sensors can be embedded in metal up to the active surface. The distance between opposing metal surfaces must be ≥3Sn and the distance between two proximity sensors (for in-line installation) must be ≥2d.

Non-Flush proximity sensors can be recognized from their "caps", since they have no metal housing surrounding the active surface. The active surface must extend ≥2Sn from the metallic installation medium. The distance between opposing metal surfaces must Be ≥3Sn and the distance between two adjacent proximity sensors must be ≥3d (as in Figure below).





Opposing installation of 2 sensors Installation medium requires a minimum separation of ≥3d between the active surfaces (as in Figure above).

Installation medium:

Ferrous materials: Iron, steel or other magnetizable materials.

Alloys : Brass, aluminum or other non-ferrous materials.

Other materials : Plastics, non-electrical conducting materials.

Tightening torque for metal housing Inductive proximity sensors:

Model	Max. Permissible Torque	Using Material
M8x1	15 Nm	Steel tube
M12x1	15 Nm	Brass tube
	40 Nm	Steel Tube
M18x1	40 Nm	
M30x1	40 Nm	
1 Nm - 0.737561 ft-lbs		
1 ft-lb - 1.35582 Nm		

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ELECTRICAL PARAMETERS:

Current consumption (I_o): is the current consumed by a 3 wire sensor from a power supply when the outputs are not connected to a load.

Leakage current (I_r): is the residual current flowing through the load when a sensor is not conducting (open).

Load current capacity (I_e): is the maximum continuous current that can be drawn by the load.

Push-Pull: This type of output has a low impedance and is immune to interference. The Outputs can be used in connection with both PNP and NPN control systems.

Rated operational voltage (U_e): is the supply voltage used for testing without tolerances.

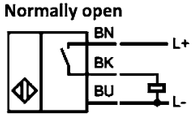
Supply voltage (U_b): is the permissible voltage range, at which the device is designed to be operated continuously(including ripple).

Voltage drop (U_d): is the voltage measured across the load of a closed (conducting) sensor at load current Ie.

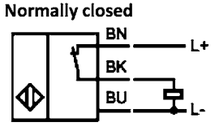
Wiring Diagram: Inductive Proximity Sensors:

PNP (+) Sourcing

Normally open

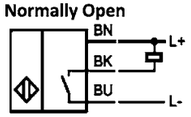


Normally closed

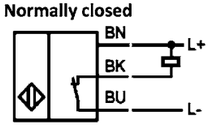


NPN (-) sinking

Normally Open

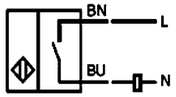


Normally closed

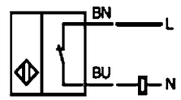


AC Sensors:

Normally open



Normally closed



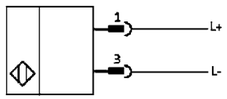
Wire colors: BR-Brown BK-Black BU-Blue

Pin assignment:

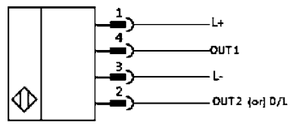
Pin1	DC 10..30V
Pin2	Not Used
Pin3	GND (0V)
Pin4	OUTPUT

Wiring Diagram: Photoelectric Proximity Sensors:

Emitter



Receiver



Pin assignment:

Pin 1	DC 10.... 30V
Pin 2	Output 1
Pin 3	GND (0V)
Pin 4	Output 2 (or) D/L

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Industry Segments

We cater to services in supply of Sensors and Process Controllers to the following Industry segments.

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