

# TECHNICAL DATA SHEET

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## Inductive Proximity Switches Proximity Sensors **M12 Series**

### Contents

- Functional Description
- Application Scenarios
- Technical Parameters
- Size Parameters
- Wiring Diagram



Figure can vary

## Proximity sensors: solutions for multiple scenarios

Proximity sensors are widely used in many fields due to their non-contact detection, high accuracy and fast response.

### Inductive series for oil-resistant and corrosion-resistant machine tool industry

Many times we are faced with harsh operating environments, compact installation spaces, and conditions with both movement and corrosion during use, such as the machine tool manufacturing industry, which has such diverse needs - the number of materials, processes and molds involved is huge and varied. During the production process, cutting fluids and abrasives are required to process workpieces, so various sensor solutions that are not affected by harsh environmental conditions are required. dadisick's product series, which uses different manufacturing processes, can even provide fully suitable sensor solutions for high-speed applications or applications involving corrosive coolants and lubricants.



### All-metal integrated housing anti-washing series



Due to the stainless steel integrated housing, this series of sensors not only has good impact resistance, but also can withstand the corrosion of detergents and solvents. It can be used in environments that require frequent high-pressure washing, and can achieve long-term sealing that meets the IP69K protection level. At the same time, it is compatible with the installation method of conventional sensors, which can be replaced and replaced conveniently and practically. It includes a variety of models with a diameter of 8mm...30mm, all with direct cable output and M12 standard connector. Operating distance 2...8mm.

### Low-temperature -40°C inductive series for wind power generation

Wind power generation has become one of the world's recognized main clean energy generation methods because it does not require the use of fuel and does not produce radiation or air pollution. Different sensors are used in the operation of the variable pitch yaw generator reducer of the wind turbine to detect the correction of the control movement and rotation process. Most of the installation locations of wind turbines are in places with severe temperature changes such as mountains, oceans and plateaus, which require higher temperature environments for sensors. Our low-temperature -40°C product series launched for this use environment is perfectly adapted to the application here.



### Solutions for high-temperature series long-distance products in steelmaking and rolling



Steelmaking and rolling equipment produces complex oil, gas and water erosion and flushing sensors for various raw materials under high temperature of oil and gas in a high-temperature 2000° radiation environment, which puts higher requirements on the stability of sensors. In the position control detection of multiple processes of steel billets, coils and wires, DADISICK has a variety of series of products with high temperature resistance of 250°C, DC two-wire, AC 250V, etc., which are widely used in this complex environment to ensure normal production.

## Anti-welding slag adhesion, high temperature resistance and anti-interference series

Whether it is stamping, welding, painting, or assembly processes in automobile manufacturing, long distance, anti-welding slag adhesion, strong current magnetic field interference, or high temperature environment, DADISICK sensors can be used for fixtures, molds and other equipment. Reliable performance and perfect solutions bring a smooth production process to automobile manufacturing. In the welding of various high-current welding machines, the strong magnetic field interference generated by the current and the high-temperature heat conduction generated by the arc will affect the sensors in the fixture molds. Reliable performance products must be selected to ensure normal operation.



## All-metal integrated housing anti-washing series

A large number of intelligent warehousing and logistics facilities, such as AGV trolleys and rail-to-rail stackers, are equipped with our sensors to realize the control of rotating positioning and lifting devices, etc., providing very stable and durable high-reliability products. Under the high requirements of small installation space and long detection distance, this series of products is the best choice for customers with strict cost control. Choosing this series of products is the best choice for customers with strict cost control.

## High-pressure 1000Bar hydraulic cylinder series

The stable and reliable hydraulic cylinder telescopic more often uses DADISICK's inductive proximity sensors with a high pressure resistance of up to 1000Bar to achieve the control of the origin. Ceramic chips are used as high-voltage products at the induction level and stainless steel integrated housings are used to achieve high-pressure resistant applications. DC10-30V two-wire and three-wire products are also provided.



## Analog output series for position correction and control devices



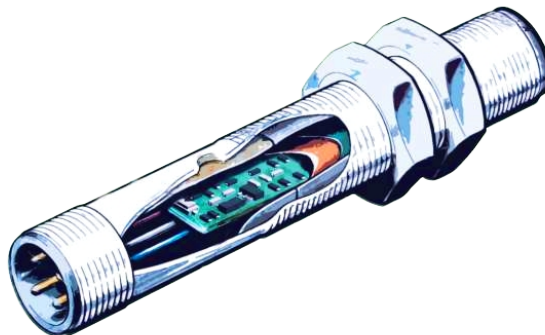
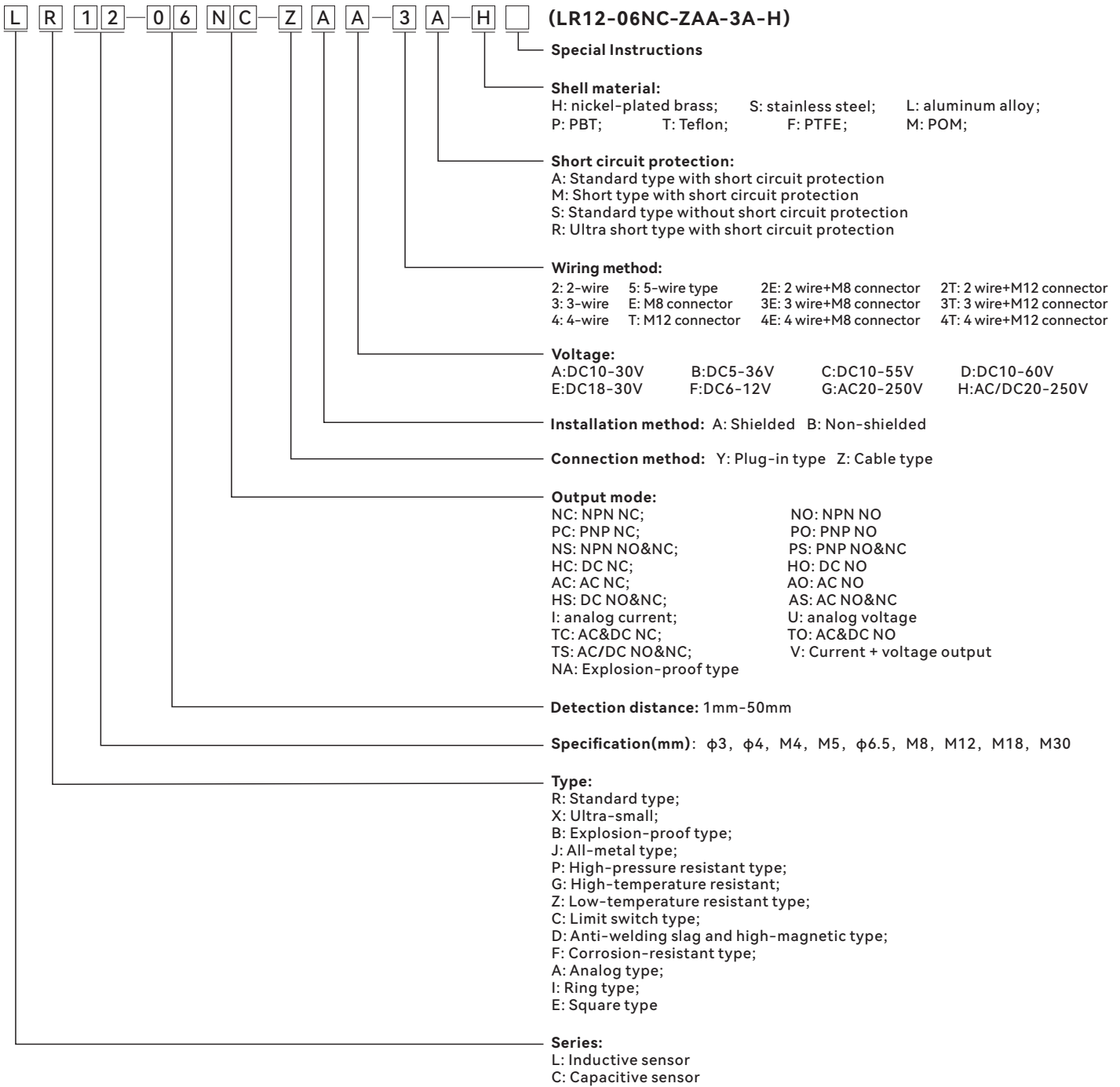
In detecting the offset position of the controlled parts of the fixture, analog output proximity sensors are often used in wire reel correction, and the size of the offset is controlled by the size of the detection distance. This use can be installed and tested in a very small position space. We have successfully provided stable and accurate products for many parts manufacturers and wire rope winding equipment, including 0-10V voltage output and 4-20mA current output and current + voltage output products. The detectable distance can be adjusted between 0-50mm.

## Shoemaking, textile and papermaking machinery series products

Whichever manufacturer of shoemaking machines, textile machines and papermaking machines has long equipped the mechanical equipment they produce with more automated operation technologies, these control technologies are also equipped with high-quality sensors to achieve their control conditions. They require products with higher switching frequency accuracy and better stability, and they need a variety of products with unconventional dimensions. We tailor new outer shell dimensions for them one by one to meet their needs.



# Proximity Sensor Model Specifications



## M12 Series

### Proximity sensors

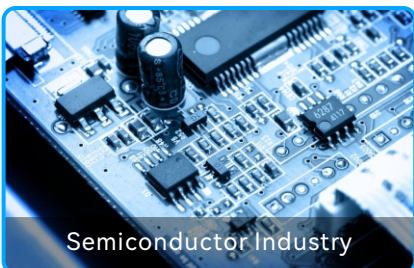
This series features ultra-compact size, long detection distance, and ultra-high precision. It is ideal for small-sized precision instruments and equipment.

### Features:

- Features: wide range, long sensing distance, high accuracy
- Sensing distance: 1-50mm
- Frequency: 2-3 KHZ
- Certificates: CE, ROHS

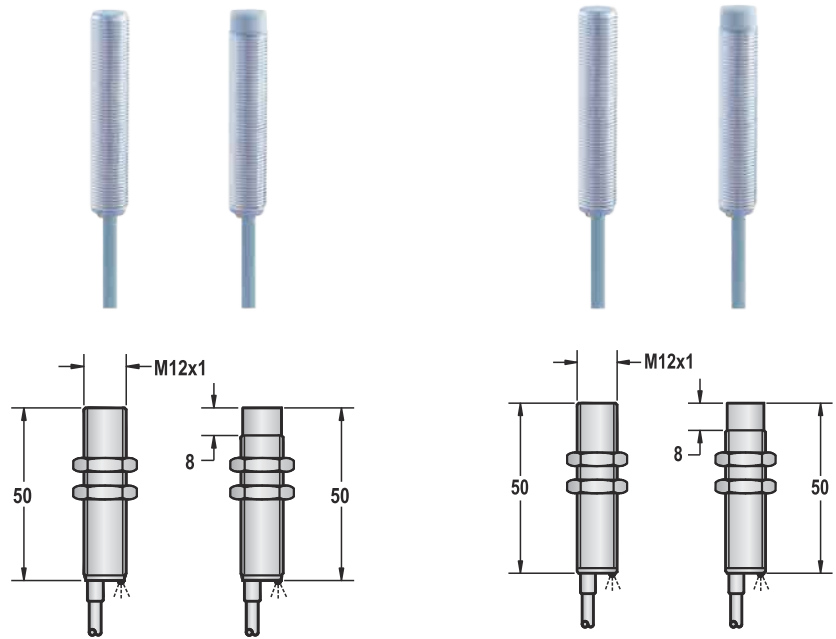


## Application Industry



# Product Parameters

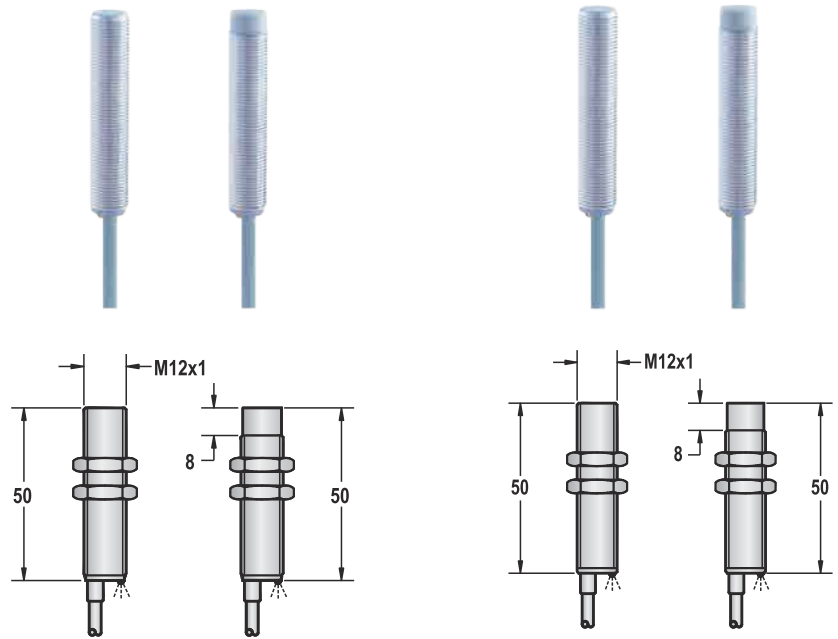
## M12 Series



| Size category  | M12   |                    | M12   |                    |
|--|---|--------------------|---|--------------------|
|  | ● Shielded                                      | ○ Non-shielded     | ●   | ○                  |
| Sn: mm   | 2mm   | 4mm                | 4mm   | 8 mm               |
| Shell material                                       | Stainless steel/nickel-plated brass             |                    | Nickel-plated brass                             |                    |
| ● LED display  | ●   |                    | ●   |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC        |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC        |                    |
| Allowable pulsating voltage                          | <10%  |                    | <10%  |                    |
| No-load current                                      | <10mA   |                    | <10mA   |                    |
| Maximum load current                                 | 200mA   |                    | 200mA   |                    |
| Leakage current                                      | <0.01mA   |                    | <0.01mA   |                    |
| Voltage drop   | <1.5V   |                    | <1.5V   |                    |
| Switching frequency                                  | 2KHZ  | 1KHZ               | 1KHZ  | 500HZ              |
| Response time  | 0.1ms   | 0.2ms              | 0.2ms   | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)  |                    | <15%(Sr)  |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                       |                    | <1.0%(Sr)                                       |                    |
| Protection level                                     | IP67  |                    | IP67  |                    |
| Operating temperature                                | -25°C - +70°C                                   |                    | -25°C - +70°C                                   |                    |
| Temperature drift                                    | <10%(Sr)  |                    | <10%(Sr)  |                    |
| Short circuit protection/reverse polarity protection | Yes   |                    | Yes   |                    |
| Overload protection current                          | 220mA   |                    | 220mA   |                    |
| Sensing surface material                             | PBT   |                    | PBT   |                    |
| Connection method                                    | 2m oil-proof PVC cable<br>4 φ 3x0.15/4 φ 4x0.15 |                    | 2m oil-proof PVC cable<br>4 φ 3x0.15/4 φ 4x0.15 |                    |
| Product Model  |   |                    |   |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-02NO-ZAA-3A-S                              | LR12-04NO-ZBA-3A-H | LR12-04NO-ZAA-3A-H                              | LR12-08NO-ZBA-3A-H |
| DC 3 wire 10-30V NPN NC                              | LR12-02NC-ZAA-3A-S                              | LR12-04NC-ZBA-3A-H | LR12-04NC-ZAA-3A-H                              | LR12-08NC-ZBA-3A-H |
| DC 3 wire 10-30V PNP NO                              | LR12-02PO-ZAA-3A-S                              | LR12-04PO-ZBA-3A-H | LR12-04PO-ZAA-3A-H                              | LR12-08PO-ZBA-3A-H |
| DC 3 wire 10-30V PNP NC                              | LR12-02PC-ZAA-3A-S                              | LR12-04PC-ZBA-3A-H | LR12-04PC-ZAA-3A-H                              | LR12-08PC-ZBA-3A-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-02PS-ZAA-4A-S                              | LR12-04PS-ZBA-4A-H | LR12-04PS-ZAA-4A-H                              | LR12-08PS-ZBA-4A-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-02NS-ZAA-4A-S                              | LR12-04NS-ZBA-4A-H | LR12-04NS-ZAA-4A-H                              | LR12-08NS-ZBA-4A-H |
| DC 2 wire 10-60V NO                                  | LR12-02SO-ZAD-2A-S                              | LR12-04HO-ZBD-2A-H | LR12-04HO-ZAD-2A-H                              | LR12-08HO-ZBD-2A-H |
| DC 2 wire 10-60V NC                                  | LR12-02SC-ZAD-2A-S                              | LR12-04HC-ZBD-2A-H | LR12-04HC-ZAD-2A-H                              | LR12-08HC-ZBD-2A-H |
| DC 3 wire 10-55V NPN NO                              | LR12-02NO-ZAC-3A-S                              | LR12-04NO-ZBC-3A-H | LR12-04NO-ZAC-3A-H                              | LR12-08NO-ZBC-3A-H |
| DC 3 wire 10-55V NPN NC                              | LR12-02NC-ZAC-3A-S                              | LR12-04NC-ZBC-3A-H | LR12-04NC-ZAC-3A-H                              | LR12-08NC-ZBC-3A-H |
| DC 3 wire 10-55V PNP NO                              | LR12-02PO-ZAC-3A-S                              | LR12-04PO-ZBC-3A-H | LR12-04PO-ZAC-3A-H                              | LR12-08PO-ZBC-3A-H |
| DC 3 wire 10-55V PNP NC                              | LR12-02PC-ZAC-3A-S                              | LR12-04PC-ZBC-3A-H | LR12-04PC-ZAC-3A-H                              | LR12-08PC-ZBC-3A-H |
| DC 3 wire 5-36V NPN NO                               | LR12-02NO-ZAB-3A-S                              | LR12-04NO-ZBB-3A-H | LR12-04NO-ZAB-3A-H                              | LR12-08NO-ZBB-3A-H |
| DC 3 wire 5-36V NPN NC                               | LR12-02NC-ZAB-3A-S                              | LR12-04NC-ZBB-3A-H | LR12-04NC-ZAB-3A-H                              | LR12-08NC-ZBB-3A-H |
| DC 3 wire 5-36V PNP NO                               | LR12-02PO-ZAB-3A-S                              | LR12-04PO-ZBB-3A-H | LR12-04PO-ZAB-3A-H                              | LR12-08PO-ZBB-3A-H |
| DC 3 wire 5-36V PNP NC                               | LR12-02PC-ZAB-3A-S                              | LR12-04PC-ZBB-3A-H | LR12-04PC-ZAB-3A-H                              | LR12-08PC-ZBB-3A-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-02PS-ZAB-4A-S                              | LR12-04PS-ZBB-4A-H | LR12-04PS-ZAB-4A-H                              | LR12-08PS-ZBB-4A-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-02NS-ZAB-4A-S                              | LR12-04NS-ZBB-4A-H | LR12-04NS-ZAB-4A-H                              | LR12-08NS-ZBB-4A-H |

# Product Parameters

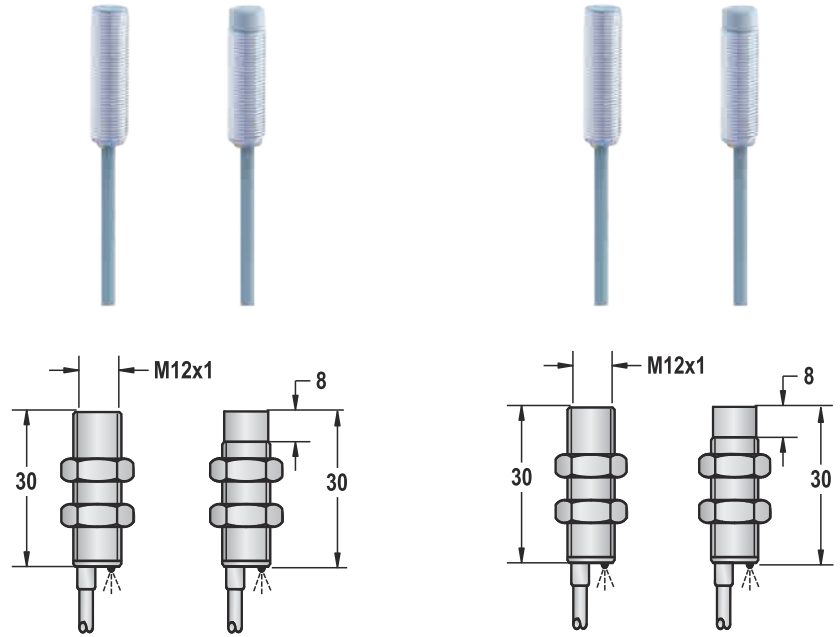
## M12 Series



| Size category  | M12                                      |                    | M12                                      |                    |
|--|--|--------------------|--|--------------------|
| ● Shielded ○ Non-shielded ● Semi-shielded            | ●  | ○                  | ●  | ○                  |
| Sn: mm   | 6 mm                                     | 10mm               | 8 mm                                     | 12 mm              |
| Shell material                                       | Nickel-plated brass                      |                    | Nickel-plated brass                      |                    |
| ● LED display ○ No LED display                       | ●  |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%                                     |                    | <10%                                     |                    |
| No-load current                                      | <10mA                                    |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA                                    |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA                                  |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V                                    |                    | <1.5V                                    |                    |
| Switching frequency                                  | 800HZ                                    | 400HZ              | 800HZ                                    | 400HZ              |
| Response time  | 0.2ms                                    | 0.5ms              | 0.2ms                                    | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)                                 |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67                                     |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                            |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)                                 |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes                                      |                    | Yes                                      |                    |
| Overload protection current                          | 220mA                                    |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT                                      |                    | PBT                                      |                    |
| Connection method                                    | 2m oil-proof PVC cable<br>4 φ 3x0.15     |                    | 2m oil-proof PVC cable<br>4 φ 3x0.15     |                    |
| Product Model  |  |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-06NO-ZAA-3A-H                       | LR12-10NO-ZBA-3A-H | LR12-08NO-ZAA-3A-H                       | LR12-12NO-ZBA-3A-H |
| DC 3 wire 10-30V NPN NC                              | LR12-06NC-ZAA-3A-H                       | LR12-10NC-ZBA-3A-H | LR12-08NC-ZAA-3A-H                       | LR12-12NC-ZBA-3A-H |
| DC 3 wire 10-30V PNP NO                              | LR12-06PO-ZAA-3A-H                       | LR12-10PO-ZBA-3A-H | LR12-08PO-ZAA-3A-H                       | LR12-12PO-ZBA-3A-H |
| DC 3 wire 10-30V PNP NC                              | LR12-06PC-ZAA-3A-H                       | LR12-10PC-ZBA-3A-H | LR12-08PC-ZAA-3A-H                       | LR12-12PC-ZBA-3A-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-06NS-ZAA-4A-H                       | LR12-10NS-ZBA-4A-H | LR12-08NS-ZAA-4A-H                       | LR12-12NS-ZBA-4A-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-06PS-ZAA-4A-H                       | LR12-10PS-ZBA-4A-H | LR12-08PS-ZAA-4A-H                       | LR12-12PS-ZBA-4A-H |
| DC 2 wire 10-60V NO                                  | LR12-06HO-ZAD-2A-H                       | LR12-10HO-ZBD-2A-H | LR12-08HO-ZAD-2A-H                       | LR12-12HO-ZBD-2A-H |
| DC 2 wire 10-60V NC                                  | LR12-06HC-ZAD-2A-H                       | LR12-10HC-ZBD-2A-H | LR12-08HC-ZAD-2A-H                       | LR12-12HC-ZBD-2A-H |
| DC 3 wire 10-55V NPN NO                              | LR12-06NO-ZAC-3A-H                       | LR12-10NO-ZBC-3A-H | LR12-08NO-ZAC-3A-H                       | LR12-12NO-ZBC-3A-H |
| DC 3 wire 10-55V NPN NC                              | LR12-06NC-ZAC-3A-H                       | LR12-10NC-ZBC-3A-H | LR12-08NC-ZAC-3A-H                       | LR12-12NC-ZBC-3A-H |
| DC 3 wire 10-55V PNP NO                              | LR12-06PO-ZAC-3A-H                       | LR12-10PO-ZBC-3A-H | LR12-08PO-ZAC-3A-H                       | LR12-12PO-ZBC-3A-H |
| DC 3 wire 10-55V PNP NC                              | LR12-06PC-ZAC-3A-H                       | LR12-10PC-ZBC-3A-H | LR12-08PC-ZAC-3A-H                       | LR12-12PC-ZBC-3A-H |
| DC 3 wire 5-36V NPN NO                               | LR12-06NO-ZAB-3A-H                       | LR12-10NO-ZBB-3A-H | LR12-08NO-ZAB-3A-H                       | LR12-12NO-ZBB-3A-H |
| DC 3 wire 5-36V NPN NC                               | LR12-06NC-ZAB-3A-H                       | LR12-10NC-ZBB-3A-H | LR12-08NC-ZAB-3A-H                       | LR12-12NC-ZBB-3A-H |
| DC 3 wire 5-36V PNP NO                               | LR12-06PO-ZAB-3A-H                       | LR12-10PO-ZBB-3A-H | LR12-08PO-ZAB-3A-H                       | LR12-12PO-ZBB-3A-H |
| DC 3 wire 5-36V PNP NC                               | LR12-06PC-ZAB-3A-H                       | LR12-10PC-ZBB-3A-H | LR12-08PC-ZAB-3A-H                       | LR12-12PC-ZBB-3A-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-06PS-ZAB-4A-H                       | LR12-10PS-ZBB-4A-H | LR12-08PS-ZAB-4A-H                       | LR12-12PS-ZBB-4A-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-06NS-ZAB-4A-H                       | LR12-10NS-ZBB-4A-H | LR12-08NS-ZAB-4A-H                       | LR12-12NS-ZBB-4A-H |

# Product Parameters

## M12 Series

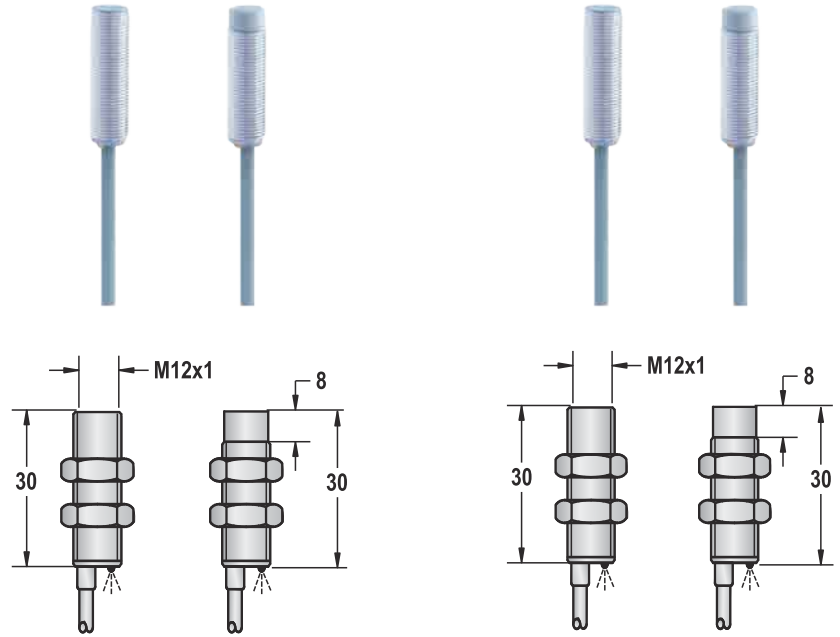


| Size category  | M12   |                    | M12                                      |                    |
|--|---|--------------------|--|--------------------|
|  | ● Shielded                                      | ○ Non-shielded     | ●  | ○                  |
| Sn: mm   | 2mm   | 4mm                | 4mm                                      | 8 mm               |
| Shell material                                       | Stainless steel/nickel-plated brass             |                    | Nickel-plated brass                      |                    |
| ● LED display  | ●   |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC        |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%  |                    | <10%                                     |                    |
| No-load current                                      | <10mA   |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA   |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA   |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V   |                    | <1.5V                                    |                    |
| Switching frequency                                  | 2KHZ  | 1KHZ               | 1KHZ                                     | 500HZ              |
| Response time  | 0.1ms   | 0.2ms              | 0.2ms                                    | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)  |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                       |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67  |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                                   |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)  |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes   |                    | Yes                                      |                    |
| Overload protection current                          | 220mA   |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT   |                    | PBT                                      |                    |
| Connection method                                    | 2m oil-proof PVC cable<br>4 φ 3x0.15/4 φ 4x0.15 |                    | 2m oil-proof PVC cable<br>4 φ 3x0.15     |                    |
| Product Model  |   |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-02NO-ZAA-3M-S                              | LR12-04NO-ZBA-3M-H | LR12-04NO-ZAA-3M-H                       | LR12-08NO-ZBA-3M-H |
| DC 3 wire 10-30V NPN NC                              | LR12-02NC-ZAA-3M-S                              | LR12-04NC-ZBA-3M-H | LR12-04NC-ZAA-3M-H                       | LR12-08NC-ZBA-3M-H |
| DC 3 wire 10-30V PNP NO                              | LR12-02PO-ZAA-3M-S                              | LR12-04PO-ZBA-3M-H | LR12-04PO-ZAA-3M-H                       | LR12-08PO-ZBA-3M-H |
| DC 3 wire 10-30V PNP NC                              | LR12-02PC-ZAA-3M-S                              | LR12-04PC-ZBA-3M-H | LR12-04PC-ZAA-3M-H                       | LR12-08PC-ZBA-3M-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-02NS-ZAA-4M-S                              | LR12-04NS-ZBA-4M-H | LR12-04NS-ZAA-4M-H                       | LR12-08NS-ZBA-4M-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-02PS-ZAA-4M-S                              | LR12-04PS-ZBA-4M-H | LR12-04PS-ZAA-4M-H                       | LR12-08PS-ZBA-4M-H |
| DC 2 wire 10-60V NO                                  | LR12-02SO-ZAD-2M-S                              | LR12-04HO-ZBD-2M-H | LR12-04HO-ZAD-2M-H                       | LR12-08HO-ZBD-2M-H |
| DC 2 wire 10-60V NC                                  | LR12-02SC-ZAD-2M-S                              | LR12-04HC-ZBD-2M-H | LR12-04HC-ZAD-2M-H                       | LR12-08HC-ZBD-2M-H |
| DC 3 wire 10-55V NPN NO                              | LR12-02NO-ZAC-3M-S                              | LR12-04NO-ZBC-3M-H | LR12-04NO-ZAC-3M-H                       | LR12-08NO-ZBC-3M-H |
| DC 3 wire 10-55V NPN NC                              | LR12-02NC-ZAC-3M-S                              | LR12-04NC-ZBC-3M-H | LR12-04NC-ZAC-3M-H                       | LR12-08NC-ZBC-3M-H |
| DC 3 wire 10-55V PNP NO                              | LR12-02PO-ZAC-3M-S                              | LR12-04PO-ZBC-3M-H | LR12-04PO-ZAC-3M-H                       | LR12-08PO-ZBC-3M-H |
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| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-02NS-ZAB-4M-S                              | LR12-04NS-ZBB-4M-H | LR12-04NS-ZAB-4M-H                       | LR12-08NS-ZBB-4M-H |



# Product Parameters

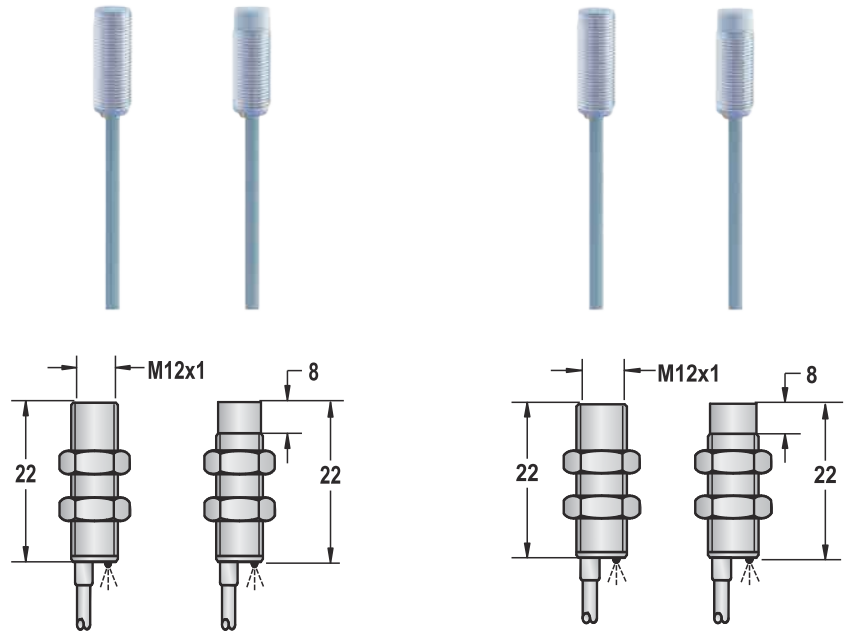
## M12 Series



| Size category  | M12                                      |                    | M12                                      |                    |
|--|--|--------------------|--|--------------------|
| ● Shielded ○ Non-shielded ● Semi-shielded            | ●  | ○                  | ●  | ○                  |
| Sn: mm   | 6 mm                                     | 10mm               | 8 mm                                     | 12 mm              |
| Shell material                                       | Nickel-plated brass                      |                    | Nickel-plated brass                      |                    |
| ● LED display ○ No LED display                       | ●  |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%                                     |                    | <10%                                     |                    |
| No-load current                                      | <10mA                                    |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA                                    |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA                                  |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V                                    |                    | <1.5V                                    |                    |
| Switching frequency                                  | 800HZ                                    | 400HZ              | 800HZ                                    | 400HZ              |
| Response time  | 0.2ms                                    | 0.5ms              | 0.2ms                                    | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)                                 |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67                                     |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                            |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)                                 |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes                                      |                    | Yes                                      |                    |
| Overload protection current                          | 220mA                                    |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT                                      |                    | PBT                                      |                    |
| Connection method                                    | 2m oil-proof PVC cable<br>4 φ 3x0.15     |                    | 2m oil-proof PVC cable<br>4 φ 3x0.15     |                    |
| Product Model  |  |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-06NO-ZAA-3M-H                       | LR12-10NO-ZBA-3M-H | LR12-08NO-ZAA-3M-H                       | LR12-12NO-ZBA-3M-H |
| DC 3 wire 10-30V NPN NC                              | LR12-06NC-ZAA-3M-H                       | LR12-10NC-ZBA-3M-H | LR12-08NC-ZAA-3M-H                       | LR12-12NC-ZBA-3M-H |
| DC 3 wire 10-30V PNP NO                              | LR12-06PO-ZAA-3M-H                       | LR12-10PO-ZBA-3M-H | LR12-08PO-ZAA-3M-H                       | LR12-12PO-ZBA-3M-H |
| DC 3 wire 10-30V PNP NC                              | LR12-06PC-ZAA-3M-H                       | LR12-10PC-ZBA-3M-H | LR12-08PC-ZAA-3M-H                       | LR12-12PC-ZBA-3M-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-06NS-ZAA-4M-H                       | LR12-10NS-ZBA-4M-H | LR12-08NS-ZAA-4M-H                       | LR12-12NS-ZBA-4M-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-06PS-ZAA-4M-H                       | LR12-10PS-ZBA-4M-H | LR12-08PS-ZAA-4M-H                       | LR12-12PS-ZBA-4M-H |
| DC 2 wire 10-60V NO                                  | LR12-06HO-ZAD-2M-H                       | LR12-10HO-ZBD-2M-H | LR12-08HO-ZAD-2M-H                       | LR12-12HO-ZBD-2M-H |
| DC 2 wire 10-60V NC                                  | LR12-06HC-ZAD-2M-H                       | LR12-10HC-ZBD-2M-H | LR12-08HC-ZAD-2M-H                       | LR12-12HC-ZBD-2M-H |
| DC 3 wire 10-55V NPN NO                              | LR12-06NO-ZAC-3M-H                       | LR12-10NO-ZBC-3M-H | LR12-08NO-ZAC-3M-H                       | LR12-12NO-ZBC-3M-H |
| DC 3 wire 10-55V NPN NC                              | LR12-06NC-ZAC-3M-H                       | LR12-10NC-ZBC-3M-H | LR12-08NC-ZAC-3M-H                       | LR12-12NC-ZBC-3M-H |
| DC 3 wire 10-55V PNP NO                              | LR12-06PO-ZAC-3M-H                       | LR12-10PO-ZBC-3M-H | LR12-08PO-ZAC-3M-H                       | LR12-12PO-ZBC-3M-H |
| DC 3 wire 10-55V PNP NC                              | LR12-06PC-ZAC-3M-H                       | LR12-10PC-ZBC-3M-H | LR12-08PC-ZAC-3M-H                       | LR12-12PC-ZBC-3M-H |
| DC 3 wire 5-36V NPN NO                               | LR12-06NO-ZAB-3M-H                       | LR12-10NO-ZBB-3M-H | LR12-08NO-ZAB-3M-H                       | LR12-12NO-ZBB-3M-H |
| DC 3 wire 5-36V NPN NC                               | LR12-06NC-ZAB-3M-H                       | LR12-10NC-ZBB-3M-H | LR12-08NC-ZAB-3M-H                       | LR12-12NC-ZBB-3M-H |
| DC 3 wire 5-36V PNP NO                               | LR12-06PO-ZAB-3M-H                       | LR12-10PO-ZBB-3M-H | LR12-08PO-ZAB-3M-H                       | LR12-12PO-ZBB-3M-H |
| DC 3 wire 5-36V PNP NC                               | LR12-06PC-ZAB-3M-H                       | LR12-10PC-ZBB-3M-H | LR12-08PC-ZAB-3M-H                       | LR12-12PC-ZBB-3M-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-06PS-ZAB-4M-H                       | LR12-10PS-ZBB-4M-H | LR12-08PS-ZAB-4M-H                       | LR12-12PS-ZBB-4M-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-06NS-ZAB-4M-H                       | LR12-10NS-ZBB-4M-H | LR12-08NS-ZAB-4M-H                       | LR12-12NS-ZBB-4M-H |

# Product Parameters

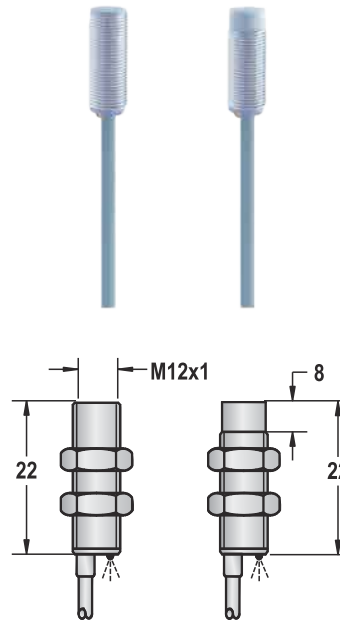
## M12 Series



| Size category  | M12   |                    | M12   |                    |
|--|---|--------------------|---|--------------------|
| ● Shielded ○ Non-shielded                            | ●   | ○                  | ●   | ○                  |
| Sn: mm   | 2mm   | 4mm                | 4mm   | 8 mm               |
| Shell material                                       | Stainless steel/nickel-plated brass             |                    | Nickel-plated brass                             |                    |
| ● LED display ○ No LED display                       | ●   |                    | ●   |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC        |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC        |                    |
| Allowable pulsating voltage                          | <10%  |                    | <10%  |                    |
| No-load current                                      | <10mA   |                    | <10mA   |                    |
| Maximum load current                                 | 200mA   |                    | 200mA   |                    |
| Leakage current                                      | <0.01mA   |                    | <0.01mA   |                    |
| Voltage drop   | <1.5V   |                    | <1.5V   |                    |
| Switching frequency                                  | 2KHZ  | 1KHZ               | 1KHZ  | 500HZ              |
| Response time  | 0.1ms   | 0.2ms              | 0.2ms   | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)  |                    | <15%(Sr)  |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                       |                    | <1.0%(Sr)                                       |                    |
| Protection level                                     | IP67  |                    | IP67  |                    |
| Operating temperature                                | -25°C - +70°C                                   |                    | -25°C - +70°C                                   |                    |
| Temperature drift                                    | <10%(Sr)  |                    | <10%(Sr)  |                    |
| Short circuit protection/reverse polarity protection | Yes   |                    | Yes   |                    |
| Overload protection current                          | 220mA   |                    | 220mA   |                    |
| Sensing surface material                             | PBT   |                    | PBT   |                    |
| Connection method                                    | 2m oil-proof PVC cable<br>4 φ 3x0.15/4 φ 4x0.15 |                    | 2m oil-proof PVC cable<br>4 φ 3x0.15/4 φ 4x0.15 |                    |
| Product Model  |   |                    |   |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-02NO-ZAA-3R-S                              | LR12-04NO-ZBA-3R-H | LR12-04NO-ZAA-3R-H                              | LR12-08NO-ZBA-3R-H |
| DC 3 wire 10-30V NPN NC                              | LR12-02NC-ZAA-3R-S                              | LR12-04NC-ZBA-3R-H | LR12-04NC-ZAA-3R-H                              | LR12-08NC-ZBA-3R-H |
| DC 3 wire 10-30V PNP NO                              | LR12-02PO-ZAA-3R-S                              | LR12-04PO-ZBA-3R-H | LR12-04PO-ZAA-3R-H                              | LR12-08PO-ZBA-3R-H |
| DC 3 wire 10-30V PNP NC                              | LR12-02PC-ZAA-3R-S                              | LR12-04PC-ZBA-3R-H | LR12-04PC-ZAA-3R-H                              | LR12-08PC-ZBA-3R-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             |   |                    |   |                    |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             |   |                    |   |                    |
| DC 2 wire 10-60V NO                                  |   |                    |   |                    |
| DC 2 wire 10-60V NC                                  |   |                    |   |                    |
| DC 3 wire 10-55V NPN NO                              |   |                    |   |                    |
| DC 3 wire 10-55V NPN NC                              |   |                    |   |                    |
| DC 3 wire 10-55V PNP NO                              |   |                    |   |                    |
| DC 3 wire 10-55V PNP NC                              |   |                    |   |                    |
| DC 3 wire 5-36V NPN NO                               |   |                    |   |                    |
| DC 3 wire 5-36V NPN NC                               |   |                    |   |                    |
| DC 3 wire 5-36V PNP NO                               |   |                    |   |                    |
| DC 3 wire 5-36V PNP NC                               |   |                    |   |                    |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              |   |                    |   |                    |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              |   |                    |   |                    |

# Product Parameters

## M12 Series



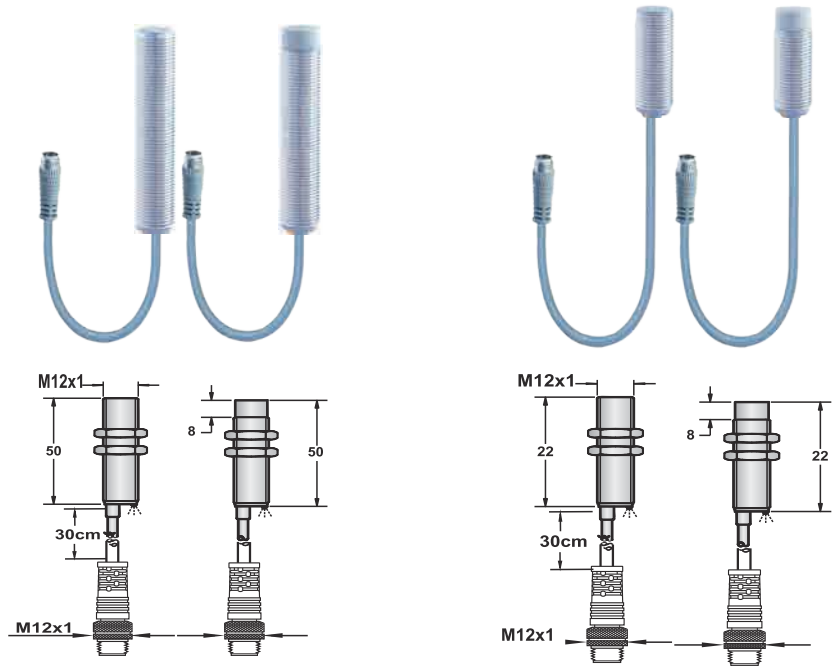
### Size category

### M12

|  |   |
|--|---|
| <input checked="" type="radio"/> Shielded <input type="radio"/> Non-shielded <input type="radio"/> Semi-shielded | <input type="radio"/> 6 mm <input type="radio"/> 10mm |
| Sn: mm   |   |
| Shell material   | Nickel-plated brass                                   |
| <input checked="" type="radio"/> LED display <input type="radio"/> No LED display                                | <input checked="" type="radio"/>                      |
| Operating voltage  | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC              |
| Allowable pulsating voltage  | <10%  |
| No-load current  | <10mA   |
| Maximum load current   | 200mA   |
| Leakage current  | <0.01mA   |
| Voltage drop   | <1.5V   |
| Switching frequency  | 800HZ   400HZ   |
| Response time  | 0.2ms   0.5ms   |
| Switching hysteresis   | <15%(Sr)  |
| Repeat accuracy  | <1.0%(Sr)   |
| Protection level   | IP67  |
| Operating temperature  | -25°C - +70°C   |
| Temperature drift  | <10%(Sr)  |
| Short circuit protection/reverse polarity protection   | Yes   |
| Overload protection current  | 220mA   |
| Sensing surface material   | PBT   |
| Connection method  | 2m oil-proof PVC cable<br>4 φ 3x0.15                  |
| <b>Product Model</b>   |   |
| DC 3 wire 10-30V NPN NO  | LR12-06NO-ZAA-3R-H   LR12-10NO-ZBA-3R-H               |
| DC 3 wire 10-30V NPN NC  | LR12-06NC-ZAA-3R-H   LR12-10NC-ZBA-3R-H               |
| DC 3 wire 10-30V PNP NO  | LR12-06PO-ZAA-3R-H   LR12-10PO-ZBA-3R-H               |
| DC 3 wire 10-30V PNP NC  | LR12-06PC-ZAA-3R-H   LR12-10PC-ZBA-3R-H               |
| DC 4 wire 10-30V Convertible PNP (NO&NC)   |   |
| DC 4 wire 10-30V Convertible NPN (NO&NC)   |   |
| DC 2 wire 10-60V NO  |   |
| DC 2 wire 10-60V NC  |   |
| DC 3 wire 10-55V NPN NO  |   |
| DC 3 wire 10-55V NPN NC  |   |
| DC 3 wire 10-55V PNP NO  |   |
| DC 3 wire 10-55V PNP NC  |   |
| DC 3 wire 5-36V NPN NO   |   |
| DC 3 wire 5-36V NPN NC   |   |
| DC 3 wire 5-36V PNP NO   |   |
| DC 3 wire 5-36V PNP NC   |   |
| DC 4 wire 5-36V Convertible PNP (NO&NC)  |   |
| DC 4 wire 5-36V Convertible NPN (NO&NC)  |   |

# Product Parameters

## M12 Series



### Size category

### M12

### M12

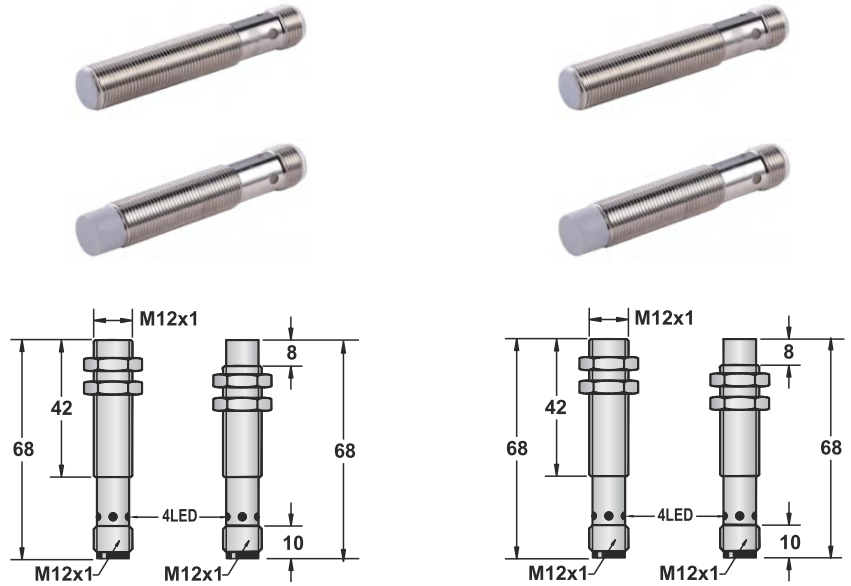
|  | ● Shielded ○ Non-shielded                             |  | ● Shielded ○ Non-shielded |     |   |     |
|--|---|--|---------------------------|-----|---|-----|
|  | Sn: mm  |  | 2mm                       | 4mm | 2mm   | 4mm |
| Shell material                                       | Stainless steel/nickel-plated brass                   |  |                           |     | Stainless steel/nickel-plated brass                   |     |
| ● LED display ○ No LED display                       | ●   |  |                           |     | ●   |     |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC              |  |                           |     | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC              |     |
| Allowable pulsating voltage                          | <10%  |  |                           |     | <10%  |     |
| No-load current                                      | <10mA   |  |                           |     | <10mA   |     |
| Maximum load current                                 | 200mA   |  |                           |     | 200mA   |     |
| Leakage current                                      | <0.01mA   |  |                           |     | <0.01mA   |     |
| Voltage drop   | <1.5V   |  |                           |     | <1.5V   |     |
| Switching frequency                                  | 2KHZ  |  | 1KHZ                      |     | 2KHZ  |     |
| Response time  | 0.1ms   |  | 0.2ms                     |     | 0.1ms   |     |
| Switching hysteresis                                 | <15%(Sr)  |  |                           |     | <15%(Sr)  |     |
| Repeat accuracy                                      | <1.0%(Sr)   |  |                           |     | <1.0%(Sr)   |     |
| Protection level                                     | IP67  |  |                           |     | IP67  |     |
| Operating temperature                                | -25°C - +70°C   |  |                           |     | -25°C - +70°C   |     |
| Temperature drift                                    | <10%(Sr)  |  |                           |     | <10%(Sr)  |     |
| Short circuit protection/reverse polarity protection | Yes   |  |                           |     | Yes   |     |
| Overload protection current                          | 220mA   |  |                           |     | 220mA   |     |
| Sensing surface material                             | PBT   |  |                           |     | PBT   |     |
| Connection method                                    | 0.3m oil-proof PVC cable<br>4 φ 3x0.15+M12 Connectors |  |                           |     | 0.3m oil-proof PVC cable<br>4 φ 3x0.15+M12 Connectors |     |

### Product Model

|  |                     |                     |                     |                     |
|--|---------------------|---------------------|---------------------|---------------------|
| DC 3 wire 10-30V NPN NO                  | LR12-02NO-ZAA-3TA-S | LR12-04NO-ZBA-3TA-H | LR12-02NO-ZAA-3TR-S | LR12-04NO-ZBA-3TR-H |
| DC 3 wire 10-30V NPN NC                  | LR12-02NC-ZAA-3TA-S | LR12-04NC-ZBA-3TA-H | LR12-02NC-ZAA-3TR-S | LR12-04NC-ZBA-3TR-H |
| DC 3 wire 10-30V PNP NO                  | LR12-02PO-ZAA-3TA-S | LR12-04PO-ZBA-3TA-H | LR12-02PO-ZAA-3TR-S | LR12-04PO-ZBA-3TR-H |
| DC 3 wire 10-30V PNP NC                  | LR12-02PC-ZAA-3TA-S | LR12-04PC-ZBA-3TA-H | LR12-02PC-ZAA-3TR-S | LR12-04PC-ZBA-3TR-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC) | LR12-02PS-ZAA-4TA-S | LR12-04PS-ZBA-4TA-H |                     |                     |
| DC 4 wire 10-30V Convertible NPN (NO&NC) | LR12-02NS-ZAA-4TA-S | LR12-04NS-ZBA-4TA-H |                     |                     |
| DC 2 wire 10-60V NO                      | LR12-02SO-ZAD-2TA-S | LR12-04HO-ZBD-2TA-H |                     |                     |
| DC 2 wire 10-60V NC                      | LR12-02SC-ZAD-2TA-S | LR12-04HC-ZBD-2TA-H |                     |                     |
| DC 3 wire 10-55V NPN NO                  | LR12-02NO-ZAC-3TA-S | LR12-04NO-ZBC-3TA-H |                     |                     |
| DC 3 wire 10-55V NPN NC                  | LR12-02NC-ZAC-3TA-S | LR12-04NC-ZBC-3TA-H |                     |                     |
| DC 3 wire 10-55V PNP NO                  | LR12-02PO-ZAC-3TA-S | LR12-04PO-ZBC-3TA-H |                     |                     |
| DC 3 wire 10-55V PNP NC                  | LR12-02PC-ZAC-3TA-S | LR12-04PC-ZBC-3TA-H |                     |                     |
| DC 3 wire 5-36V NPN NO                   | LR12-02NO-ZAB-3TA-S | LR12-04NO-ZBB-3TA-H |                     |                     |
| DC 3 wire 5-36V NPN NC                   | LR12-02NC-ZAB-3TA-S | LR12-04NC-ZBB-3TA-H |                     |                     |
| DC 3 wire 5-36V PNP NO                   | LR12-02PO-ZAB-3TA-S | LR12-04PO-ZBB-3TA-H |                     |                     |
| DC 3 wire 5-36V PNP NC                   | LR12-02PC-ZAB-3TA-S | LR12-04PC-ZBB-3TA-H |                     |                     |
| DC 4 wire 5-36V Convertible PNP (NO&NC)  | LR12-02PS-ZAB-4TA-S | LR12-04PS-ZBB-4TA-H |                     |                     |
| DC 4 wire 5-36V Convertible NPN (NO&NC)  | LR12-02NS-ZAB-4TA-S | LR12-04NS-ZBB-4TA-H |                     |                     |

# Product Parameters

## M12 Series



### Size category

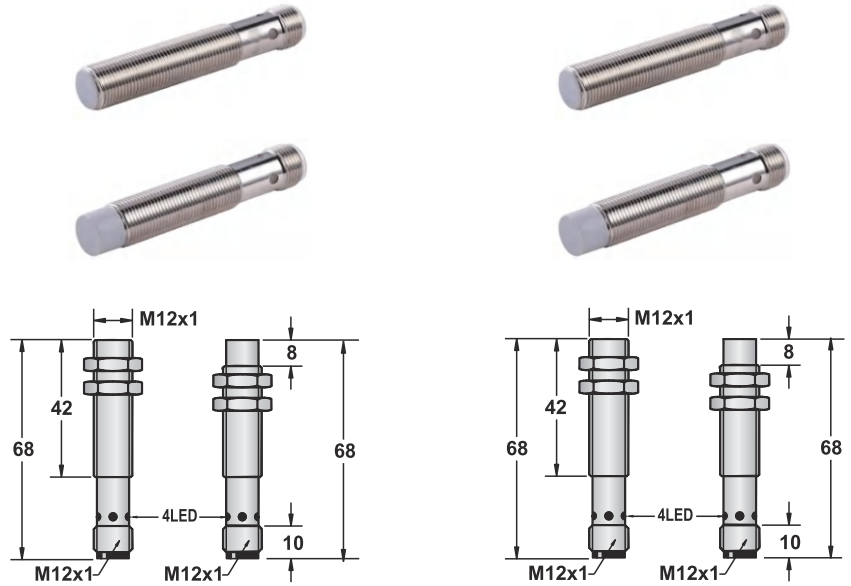
|  | M12                                      |                | M12                                      |       |
|--|--|----------------|--|-------|
|  | ● Shielded                               | ○ Non-shielded | ●  | ○     |
| Sn: mm   | 2mm                                      | 4mm            | 4mm                                      | 8 mm  |
| Shell material                                       | Nickel-plated brass                      |                | Stainless steel/nickel-plated brass      |       |
| ● LED display ○ No LED display                       | ●  |                | ●  |       |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |       |
| Allowable pulsating voltage                          | <10%                                     |                | <10%                                     |       |
| No-load current                                      | <10mA                                    |                | <10mA                                    |       |
| Maximum load current                                 | 200mA                                    |                | 200mA                                    |       |
| Leakage current                                      | <0.01mA                                  |                | <0.01mA                                  |       |
| Voltage drop   | <1.5V                                    |                | <1.5V                                    |       |
| Switching frequency                                  | 2KHZ                                     | 1KHZ           | 1KHZ                                     | 500HZ |
| Response time  | 0.1ms                                    | 0.2ms          | 0.2ms                                    | 0.5ms |
| Switching hysteresis                                 | <15%(Sr)                                 |                | <15%(Sr)                                 |       |
| Repeat accuracy                                      | <1.0%(Sr)                                |                | <1.0%(Sr)                                |       |
| Protection level                                     | IP67                                     |                | IP67                                     |       |
| Operating temperature                                | -25°C - +70°C                            |                | -25°C - +70°C                            |       |
| Temperature drift                                    | <10%(Sr)                                 |                | <10%(Sr)                                 |       |
| Short circuit protection/reverse polarity protection | Yes                                      |                | Yes                                      |       |
| Overload protection current                          | 220mA                                    |                | 220mA                                    |       |
| Sensing surface material                             | PBT                                      |                | PBT                                      |       |
| Connection method                                    | M12 Connectors                           |                | M12 Connectors                           |       |

### Product Model

|  |                    |                    |                    |                    |
|--|--------------------|--------------------|--------------------|--------------------|
| DC 3 wire 10-30V NPN NO                  | LR12-02NO-YAA-TA-H | LR12-04NO-YBA-TA-H | LR12-04NO-YAA-TA-H | LR12-08NO-YBA-TA-H |
| DC 3 wire 10-30V NPN NC                  | LR12-02NC-YAA-TA-H | LR12-04NC-YBA-TA-H | LR12-04NC-YAA-TA-H | LR12-08NC-YBA-TA-H |
| DC 3 wire 10-30V PNP NO                  | LR12-02PO-YAA-TA-H | LR12-04PO-YBA-TA-H | LR12-04PO-YAA-TA-H | LR12-08PO-YBA-TA-H |
| DC 3 wire 10-30V PNP NC                  | LR12-02PC-YAA-TA-H | LR12-04PC-YBA-TA-H | LR12-04PC-YAA-TA-H | LR12-08PC-YBA-TA-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC) | LR12-02NS-YAA-TA-H | LR12-04NS-YBA-TA-H | LR12-04NS-YAA-TA-H | LR12-08NS-YBA-TA-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC) | LR12-02PS-YAA-TA-H | LR12-04PS-YBA-TA-H | LR12-04PS-YAA-TA-H | LR12-08PS-YBA-TA-H |
| DC 2 wire 10-60V NO                      | LR12-02HO-YAD-TA-H | LR12-04HO-YBD-TA-H | LR12-04HO-YAD-TA-H | LR12-08HO-YBD-TA-H |
| DC 2 wire 10-60V NC                      | LR12-02HC-YAD-TA-H | LR12-04HC-YBD-TA-H | LR12-04HC-YAD-TA-H | LR12-08HC-YBD-TA-H |
| DC 3 wire 10-55V NPN NO                  | LR12-02NO-YAC-TA-H | LR12-04NO-YBC-TA-H | LR12-04NO-YAC-TA-H | LR12-08NO-YBC-TA-H |
| DC 3 wire 10-55V NPN NC                  | LR12-02NC-YAC-TA-H | LR12-04NC-YBC-TA-H | LR12-04NC-YAC-TA-H | LR12-08NC-YBC-TA-H |
| DC 3 wire 10-55V PNP NO                  | LR12-02PO-YAC-TA-H | LR12-04PO-YBC-TA-H | LR12-04PO-YAC-TA-H | LR12-08PO-YBC-TA-H |
| DC 3 wire 10-55V PNP NC                  | LR12-02PC-YAC-TA-H | LR12-04PC-YBC-TA-H | LR12-04PC-YAC-TA-H | LR12-08PC-YBC-TA-H |
| DC 3 wire 5-36V NPN NO                   | LR12-02NO-YAB-TA-H | LR12-04NO-YBB-TA-H | LR12-04NO-YAB-TA-H | LR12-08NO-YBB-TA-H |
| DC 3 wire 5-36V NPN NC                   | LR12-02NC-YAB-TA-H | LR12-04NC-YBB-TA-H | LR12-04NC-YAB-TA-H | LR12-08NC-YBB-TA-H |
| DC 3 wire 5-36V PNP NO                   | LR12-02PO-YAB-TA-H | LR12-04PO-YBB-TA-H | LR12-04PO-YAB-TA-H | LR12-08PO-YBB-TA-H |
| DC 3 wire 5-36V PNP NC                   | LR12-02PC-YAB-TA-H | LR12-04PC-YBB-TA-H | LR12-04PC-YAB-TA-H | LR12-08PC-YBB-TA-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)  | LR12-02PS-YAB-TA-H | LR12-04PS-YBB-TA-H | LR12-04PS-YAB-TA-H | LR12-08PS-YBB-TA-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)  | LR12-02NS-YAB-TA-H | LR12-04NS-YBB-TA-H | LR12-04NS-YAB-TA-H | LR12-08NS-YBB-TA-H |

# Product Parameters

## M12 Series

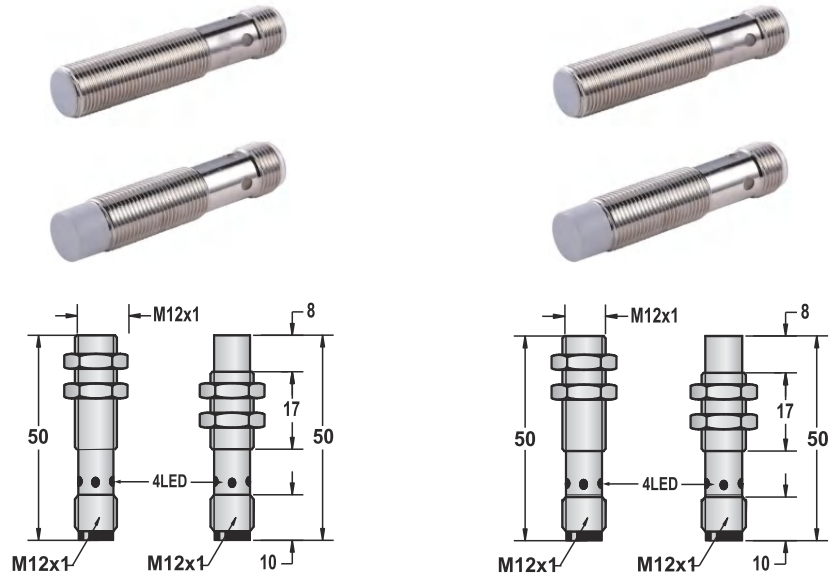


### Size category

|  | M12                                      |                    | M12                                      |                    |
|--|--|--------------------|--|--------------------|
|  | ● Shielded                               | ○ Non-shielded     | ● Shielded                               | ○ Non-shielded     |
| Sn: mm   | 6 mm                                     | 10mm               | 8 mm                                     | 12 mm              |
| Shell material                                       | Nickel-plated brass                      |                    | Nickel-plated brass                      |                    |
| ● LED display  | ●  |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%                                     |                    | <10%                                     |                    |
| No-load current                                      | <10mA                                    |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA                                    |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA                                  |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V                                    |                    | <1.5V                                    |                    |
| Switching frequency                                  | 800HZ                                    | 400HZ              | 800HZ                                    | 400HZ              |
| Response time  | 0.2ms                                    | 0.5ms              | 0.2ms                                    | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)                                 |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67                                     |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                            |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)                                 |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes                                      |                    | Yes                                      |                    |
| Overload protection current                          | 220mA                                    |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT                                      |                    | PBT                                      |                    |
| Connection method                                    | M12 Connectors                           |                    | M12 Connectors                           |                    |
| Product Model  |  |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-06NO-YAA-TA-H                       | LR12-10NO-YBA-TA-H | LR12-08NO-YAA-TA-H                       | LR12-12NO-YBA-TA-H |
| DC 3 wire 10-30V NPN NC                              | LR12-06NC-YAA-TA-H                       | LR12-10NC-YBA-TA-H | LR12-08NC-YAA-TA-H                       | LR12-12NC-YBA-TA-H |
| DC 3 wire 10-30V PNP NO                              | LR12-06PO-YAA-TA-H                       | LR12-10PO-YBA-TA-H | LR12-08PO-YAA-TA-H                       | LR12-12PO-YBA-TA-H |
| DC 3 wire 10-30V PNP NC                              | LR12-06PC-YAA-TA-H                       | LR12-10PC-YBA-TA-H | LR12-08PC-YAA-TA-H                       | LR12-12PC-YBA-TA-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-06NS-YAA-TA-H                       | LR12-10NS-YBA-TA-H | LR12-08NS-YAA-TA-H                       | LR12-12NS-YBA-TA-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-06PS-YAA-TA-H                       | LR12-10PS-YBA-TA-H | LR12-08PS-YAA-TA-H                       | LR12-12PS-YBA-TA-H |
| DC 2 wire 10-60V NO                                  | LR12-06HO-YAD-TA-H                       | LR12-10HO-YBD-TA-H | LR12-08HO-YAD-TA-H                       | LR12-12HO-YBD-TA-H |
| DC 2 wire 10-60V NC                                  | LR12-06HC-YAD-TA-H                       | LR12-10HC-YBD-TA-H | LR12-08HC-YAD-TA-H                       | LR12-12HC-YBD-TA-H |
| DC 3 wire 10-55V NPN NO                              | LR12-06NO-YAC-TA-H                       | LR12-10NO-YBC-TA-H | LR12-08NO-YAC-TA-H                       | LR12-12NO-YBC-TA-H |
| DC 3 wire 10-55V NPN NC                              | LR12-06NC-YAC-TA-H                       | LR12-10NC-YBC-TA-H | LR12-08NC-YAC-TA-H                       | LR12-12NC-YBC-TA-H |
| DC 3 wire 10-55V PNP NO                              | LR12-06PO-YAC-TA-H                       | LR12-10PO-YBC-TA-H | LR12-08PO-YAC-TA-H                       | LR12-12PO-YBC-TA-H |
| DC 3 wire 10-55V PNP NC                              | LR12-06PC-YAC-TA-H                       | LR12-10PC-YBC-TA-H | LR12-08PC-YAC-TA-H                       | LR12-12PC-YBC-TA-H |
| DC 3 wire 5-36V NPN NO                               | LR12-06NO-YAB-TA-H                       | LR12-10NO-YBB-TA-H | LR12-08NO-YAB-TA-H                       | LR12-12NO-YBB-TA-H |
| DC 3 wire 5-36V NPN NC                               | LR12-06NC-YAB-TA-H                       | LR12-10NC-YBB-TA-H | LR12-08NC-YAB-TA-H                       | LR12-12NC-YBB-TA-H |
| DC 3 wire 5-36V PNP NO                               | LR12-06PO-YAB-TA-H                       | LR12-10PO-YBB-TA-H | LR12-08PO-YAB-TA-H                       | LR12-12PO-YBB-TA-H |
| DC 3 wire 5-36V PNP NC                               | LR12-06PC-YAB-TA-H                       | LR12-10PC-YBB-TA-H | LR12-08PC-YAB-TA-H                       | LR12-12PC-YBB-TA-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-06PS-YAB-TA-H                       | LR12-10PS-YBB-TA-H | LR12-08PS-YAB-TA-H                       | LR12-12PS-YBB-TA-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-06NS-YAB-TA-H                       | LR12-10NS-YBB-TA-H | LR12-08NS-YAB-TA-H                       | LR12-12NS-YBB-TA-H |

# Product Parameters

## M12 Series



### Size category

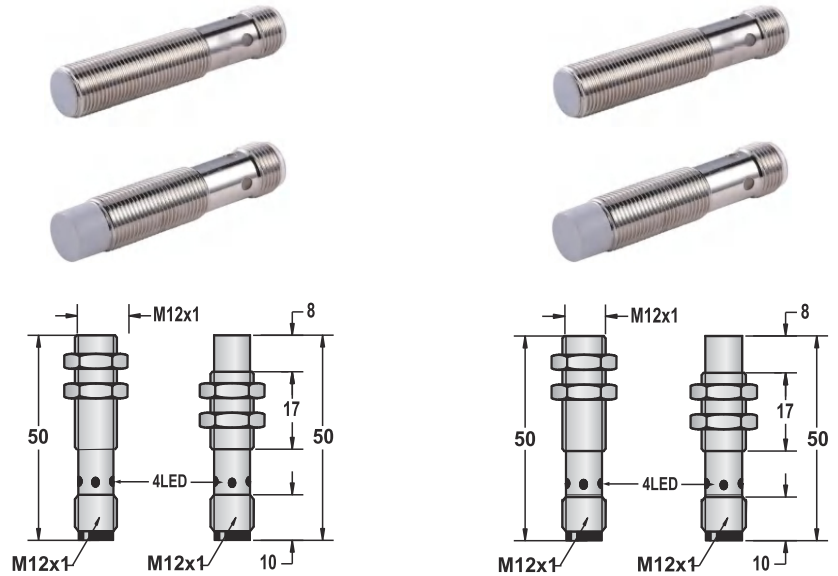
### M12

### M12

|  | ● Shielded ○ Non-shielded                |                    | ● Shielded ○ Non-shielded |                    |  |                    |
|--|--|--------------------|---------------------------|--------------------|--|--------------------|
|  | Sn: mm                                   |                    | 2mm                       | 4mm                | 4mm                                      | 8mm                |
| Shell material                                       | Nickel-plated brass                      |                    |                           |                    | Nickel-plated brass                      |                    |
| ● LED display ○ No LED display                       |  |                    | ●                         |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |                           |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%                                     |                    |                           |                    | <10%                                     |                    |
| No-load current                                      | <10mA                                    |                    |                           |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA                                    |                    |                           |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA                                  |                    |                           |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V                                    |                    |                           |                    | <1.5V                                    |                    |
| Switching frequency                                  | 2KHZ                                     |                    | 1KHZ                      |                    | 1KHZ 500HZ                               |                    |
| Response time  | 0.1ms                                    |                    | 0.2ms                     |                    | 0.2ms 0.5ms                              |                    |
| Switching hysteresis                                 | <15%(Sr)                                 |                    |                           |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                |                    |                           |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67                                     |                    |                           |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                            |                    |                           |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)                                 |                    |                           |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes                                      |                    |                           |                    | Yes                                      |                    |
| Overload protection current                          | 220mA                                    |                    |                           |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT                                      |                    |                           |                    | PBT                                      |                    |
| Connection method                                    | M12 Connectors                           |                    |                           |                    | M12 Connectors                           |                    |
| Product Model  |  |                    |                           |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-02NO-YAA-TM-H                       | LR12-04NO-YBA-TM-H | LR12-04NO-YAA-TM-H        | LR12-08NO-YBA-TM-H | LR12-04NO-YAA-TM-H                       | LR12-08NO-YBA-TM-H |
| DC 3 wire 10-30V NPN NC                              | LR12-02NC-YAA-TM-H                       | LR12-04NC-YBA-TM-H | LR12-04NC-YAA-TM-H        | LR12-08NC-YBA-TM-H | LR12-04NC-YAA-TM-H                       | LR12-08NC-YBA-TM-H |
| DC 3 wire 10-30V PNP NO                              | LR12-02PO-YAA-TM-H                       | LR12-04PO-YBA-TM-H | LR12-04PO-YAA-TM-H        | LR12-08PO-YBA-TM-H | LR12-04PO-YAA-TM-H                       | LR12-08PO-YBA-TM-H |
| DC 3 wire 10-30V PNP NC                              | LR12-02PC-YAA-TM-H                       | LR12-04PC-YBA-TM-H | LR12-04PC-YAA-TM-H        | LR12-08PC-YBA-TM-H | LR12-04PC-YAA-TM-H                       | LR12-08PC-YBA-TM-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-02NS-YAA-TM-H                       | LR12-04NS-YBA-TM-H | LR12-04NS-YAA-TM-H        | LR12-08NS-YBA-TM-H | LR12-04NS-YAA-TM-H                       | LR12-08NS-YBA-TM-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-02PS-YAA-TM-H                       | LR12-04PS-YBA-TM-H | LR12-04PS-YAA-TM-H        | LR12-08PS-YBA-TM-H | LR12-04PS-YAA-TM-H                       | LR12-08PS-YBA-TM-H |
| DC 2 wire 10-60V NO                                  | LR12-02HO-YAD-TM-H                       | LR12-04HO-YBD-TM-H | LR12-04HO-YAD-TM-H        | LR12-08HO-YBD-TM-H | LR12-04HO-YAD-TM-H                       | LR12-08HO-YBD-TM-H |
| DC 2 wire 10-60V NC                                  | LR12-02HC-YAD-TM-H                       | LR12-04HC-YBD-TM-H | LR12-04HC-YAD-TM-H        | LR12-08HC-YBD-TM-H | LR12-04HC-YAD-TM-H                       | LR12-08HC-YBD-TM-H |
| DC 3 wire 10-55V NPN NO                              | LR12-02NO-YAC-TM-H                       | LR12-04NO-YBC-TM-H | LR12-04NO-YAC-TM-H        | LR12-08NO-YBC-TM-H | LR12-04NO-YAC-TM-H                       | LR12-08NO-YBC-TM-H |
| DC 3 wire 10-55V NPN NC                              | LR12-02NC-YAC-TM-H                       | LR12-04NC-YBC-TM-H | LR12-04NC-YAC-TM-H        | LR12-08NC-YBC-TM-H | LR12-04NC-YAC-TM-H                       | LR12-08NC-YBC-TM-H |
| DC 3 wire 10-55V PNP NO                              | LR12-02PO-YAC-TM-H                       | LR12-04PO-YBC-TM-H | LR12-04PO-YAC-TM-H        | LR12-08PO-YBC-TM-H | LR12-04PO-YAC-TM-H                       | LR12-08PO-YBC-TM-H |
| DC 3 wire 10-55V PNP NC                              | LR12-02PC-YAC-TM-H                       | LR12-04PC-YBC-TM-H | LR12-04PC-YAC-TM-H        | LR12-08PC-YBC-TM-H | LR12-04PC-YAC-TM-H                       | LR12-08PC-YBC-TM-H |
| DC 3 wire 5-36V NPN NO                               | LR12-02NO-YAB-TM-H                       | LR12-04NO-YBB-TM-H | LR12-04NO-YAB-TM-H        | LR12-08NO-YBB-TM-H | LR12-04NO-YAB-TM-H                       | LR12-08NO-YBB-TM-H |
| DC 3 wire 5-36V NPN NC                               | LR12-02NC-YAB-TM-H                       | LR12-04NC-YBB-TM-H | LR12-04NC-YAB-TM-H        | LR12-08NC-YBB-TM-H | LR12-04NC-YAB-TM-H                       | LR12-08NC-YBB-TM-H |
| DC 3 wire 5-36V PNP NO                               | LR12-02PO-YAB-TM-H                       | LR12-04PO-YBB-TM-H | LR12-04PO-YAB-TM-H        | LR12-08PO-YBB-TM-H | LR12-04PO-YAB-TM-H                       | LR12-08PO-YBB-TM-H |
| DC 3 wire 5-36V PNP NC                               | LR12-02PC-YAB-TM-H                       | LR12-04PC-YBB-TM-H | LR12-04PC-YAB-TM-H        | LR12-08PC-YBB-TM-H | LR12-04PC-YAB-TM-H                       | LR12-08PC-YBB-TM-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-02PS-YAB-TM-H                       | LR12-04PS-YBB-TM-H | LR12-04PS-YAB-TM-H        | LR12-08PS-YBB-TM-H | LR12-04PS-YAB-TM-H                       | LR12-08PS-YBB-TM-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-02NS-YAB-TM-H                       | LR12-04NS-YBB-TM-H | LR12-04NS-YAB-TM-H        | LR12-08NS-YBB-TM-H | LR12-04NS-YAB-TM-H                       | LR12-08NS-YBB-TM-H |

# Product Parameters

## M12 Series



### Size category

### M12

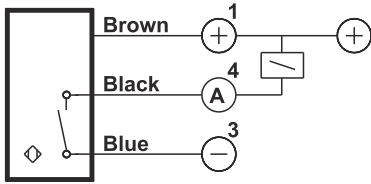
### M12

|  |  |                    |  |                    |
|--|--|--------------------|--|--------------------|
| ● Shielded   ○ Non-shielded   ● Semi-shielded        | ●   ○                                    | ●   ○              |  |                    |
| Sn: mm   | 6 mm                                     | 10mm               | 8 mm                                     | 12 mm              |
| Shell material                                       | Nickel-plated brass                      |                    | Nickel-plated brass                      |                    |
| ● LED display   ○ No LED display                     | ●  |                    | ●  |                    |
| Operating voltage                                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    | 10-30VDC / 5-36VDC / 10-55VDC / 10-60VDC |                    |
| Allowable pulsating voltage                          | <10%                                     |                    | <10%                                     |                    |
| No-load current                                      | <10mA                                    |                    | <10mA                                    |                    |
| Maximum load current                                 | 200mA                                    |                    | 200mA                                    |                    |
| Leakage current                                      | <0.01mA                                  |                    | <0.01mA                                  |                    |
| Voltage drop   | <1.5V                                    |                    | <1.5V                                    |                    |
| Switching frequency                                  | 800HZ                                    | 400HZ              | 800HZ                                    | 400HZ              |
| Response time  | 0.2ms                                    | 0.5ms              | 0.2ms                                    | 0.5ms              |
| Switching hysteresis                                 | <15%(Sr)                                 |                    | <15%(Sr)                                 |                    |
| Repeat accuracy                                      | <1.0%(Sr)                                |                    | <1.0%(Sr)                                |                    |
| Protection level                                     | IP67                                     |                    | IP67                                     |                    |
| Operating temperature                                | -25°C - +70°C                            |                    | -25°C - +70°C                            |                    |
| Temperature drift                                    | <10%(Sr)                                 |                    | <10%(Sr)                                 |                    |
| Short circuit protection/reverse polarity protection | Yes                                      |                    | Yes                                      |                    |
| Overload protection current                          | 220mA                                    |                    | 220mA                                    |                    |
| Sensing surface material                             | PBT                                      |                    | PBT                                      |                    |
| Connection method                                    | M12 Connectors                           |                    | M12 Connectors                           |                    |
| Product Model  |  |                    |  |                    |
| DC 3 wire 10-30V NPN NO                              | LR12-06NO-YAA-TM-H                       | LR12-10NO-YBA-TM-H | LR12-08NO-YAA-TM-H                       | LR12-12NO-YBA-TM-H |
| DC 3 wire 10-30V NPN NC                              | LR12-06NC-YAA-TM-H                       | LR12-10NC-YBA-TM-H | LR12-08NC-YAA-TM-H                       | LR12-12NC-YBA-TM-H |
| DC 3 wire 10-30V PNP NO                              | LR12-06PO-YAA-TM-H                       | LR12-10PO-YBA-TM-H | LR12-08PO-YAA-TM-H                       | LR12-12PO-YBA-TM-H |
| DC 3 wire 10-30V PNP NC                              | LR12-06PC-YAA-TM-H                       | LR12-10PC-YBA-TM-H | LR12-08PC-YAA-TM-H                       | LR12-12PC-YBA-TM-H |
| DC 4 wire 10-30V Convertible PNP (NO&NC)             | LR12-06NS-YAA-TM-H                       | LR12-10NS-YBA-TM-H | LR12-08NS-YAA-TM-H                       | LR12-12NS-YBA-TM-H |
| DC 4 wire 10-30V Convertible NPN (NO&NC)             | LR12-06PS-YAA-TM-H                       | LR12-10PS-YBA-TM-H | LR12-08PS-YAA-TM-H                       | LR12-12PS-YBA-TM-H |
| DC 2 wire 10-60V NO                                  | LR12-06HO-YAD-TM-H                       | LR12-10HO-YBD-TM-H | LR12-08HO-YAD-TM-H                       | LR12-12HO-YBD-TM-H |
| DC 2 wire 10-60V NC                                  | LR12-06HC-YAD-TM-H                       | LR12-10HC-YBD-TM-H | LR12-08HC-YAD-TM-H                       | LR12-12HC-YBD-TM-H |
| DC 3 wire 10-55V NPN NO                              | LR12-06NO-YAC-TM-H                       | LR12-10NO-YBC-TM-H | LR12-08NO-YAC-TM-H                       | LR12-12NO-YBC-TM-H |
| DC 3 wire 10-55V NPN NC                              | LR12-06NC-YAC-TM-H                       | LR12-10NC-YBC-TM-H | LR12-08NC-YAC-TM-H                       | LR12-12NC-YBC-TM-H |
| DC 3 wire 10-55V PNP NO                              | LR12-06PO-YAC-TM-H                       | LR12-10PO-YBC-TM-H | LR12-08PO-YAC-TM-H                       | LR12-12PO-YBC-TM-H |
| DC 3 wire 10-55V PNP NC                              | LR12-06PC-YAC-TM-H                       | LR12-10PC-YBC-TM-H | LR12-08PC-YAC-TM-H                       | LR12-12PC-YBC-TM-H |
| DC 3 wire 5-36V NPN NO                               | LR12-06NO-YAB-TM-H                       | LR12-10NO-YBB-TM-H | LR12-08NO-YAB-TM-H                       | LR12-12NO-YBB-TM-H |
| DC 3 wire 5-36V NPN NC                               | LR12-06NC-YAB-TM-H                       | LR12-10NC-YBB-TM-H | LR12-08NC-YAB-TM-H                       | LR12-12NC-YBB-TM-H |
| DC 3 wire 5-36V PNP NO                               | LR12-06PO-YAB-TM-H                       | LR12-10PO-YBB-TM-H | LR12-08PO-YAB-TM-H                       | LR12-12PO-YBB-TM-H |
| DC 3 wire 5-36V PNP NC                               | LR12-06PC-YAB-TM-H                       | LR12-10PC-YBB-TM-H | LR12-08PC-YAB-TM-H                       | LR12-12PC-YBB-TM-H |
| DC 4 wire 5-36V Convertible PNP (NO&NC)              | LR12-06PS-YAB-TM-H                       | LR12-10PS-YBB-TM-H | LR12-08PS-YAB-TM-H                       | LR12-12PS-YBB-TM-H |
| DC 4 wire 5-36V Convertible NPN (NO&NC)              | LR12-06NS-YAB-TM-H                       | LR12-10NS-YBB-TM-H | LR12-08NS-YAB-TM-H                       | LR12-12NS-YBB-TM-H |

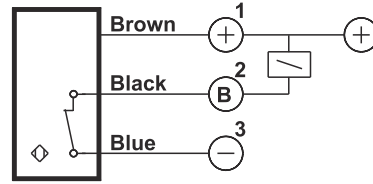


# Wiring Diagram

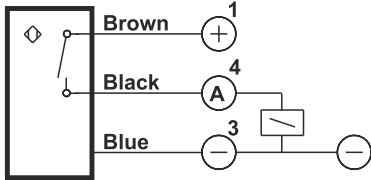
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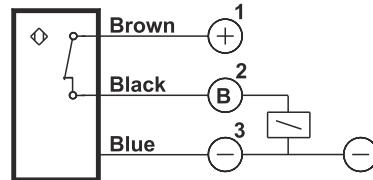
**DC NPN NC**



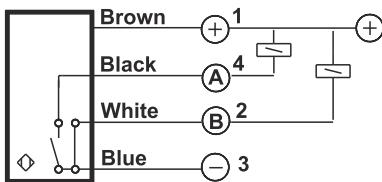
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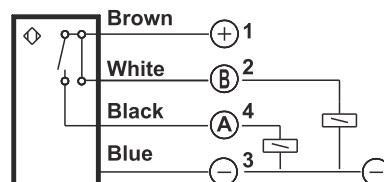
**DC PNP NC**



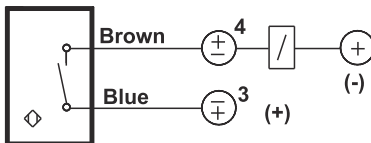
**DC NPN NO&NC**



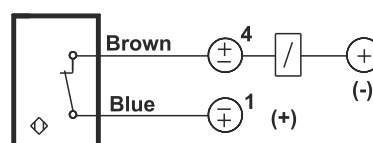
**DC PNP NO&NC**



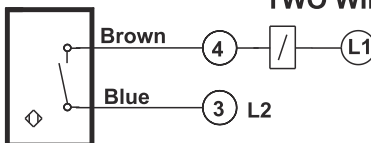
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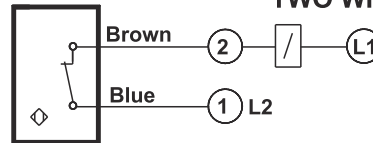
**DC 2 wire NC**



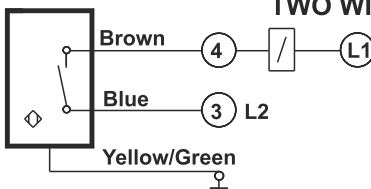
**Plastic housing AC/DC 20-250V or AC 20-250V TWO WIRE-NO**



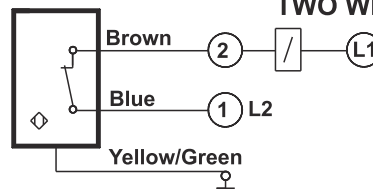
**Plastic housing AC/DC 20-250V or AC 20-250V TWO WIRE-NC**



**Metal housing AC/DC 20-250V or AC 20-250V TWO WIRE-NO**

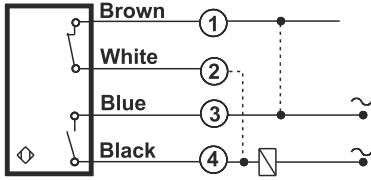


**Metal housing AC/DC 20-250V or AC 20-250V TWO WIRE-NC**

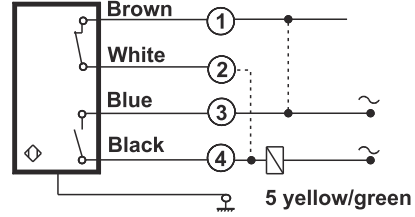


# Wiring Diagram

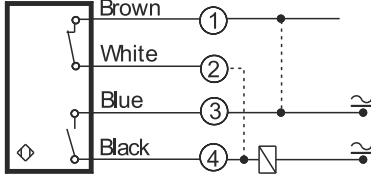
**Plastic housing** AC 20-250V  
NO,NC Changeable



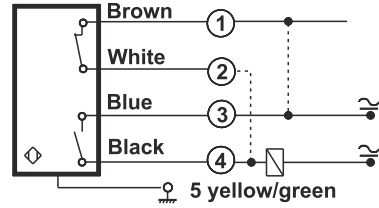
**Metal housing** AC 20-250V  
NO,NC Changeable



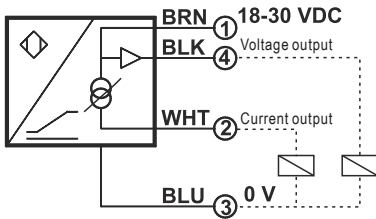
**Plastic housing** AC 20-250V  
NO,NC Changeable



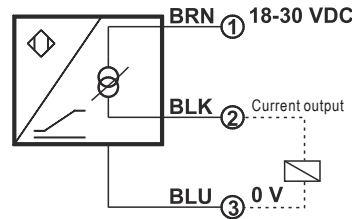
**Metal housing** AC 20-250V  
NO,NC Changeable



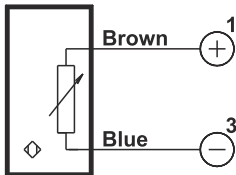
**Analog (current + voltage output type)**



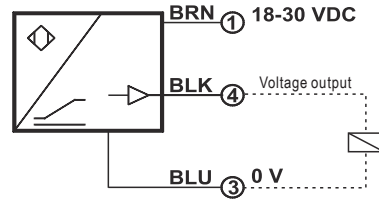
**Analog (current output type)**



**Riot-proof DC 6-12V**

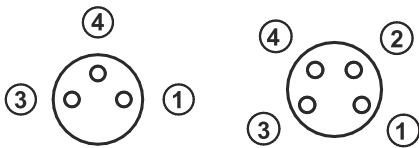


**Analog (voltage output type)**

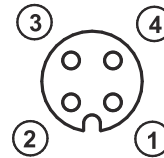


## Connector Diagram

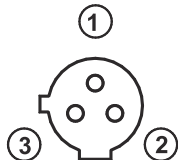
Used for M8 DC  
M8



Used for M12 DC  
M12



Used for M12 AC  
M12



Used for M18 M30 DC or AC

