Top Products Industrial Sensors

Inductive proximity sensors, capacitive proximity sensors, magnetic proximity sensors, magnetic cylinder sensors, photoelectric sensors



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Technical details and ordering information

- Adjustment: potentiometer
- Operating mode: light/dark with rotary switch

• Enclosure rating: IP 67

• Switching frequency: Up to 2 kHz

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Sensor Intelligence is our promise

SICK sensor solutions for industrial automation are the result of exceptional dedication and experience. From development all the way to service: The people at SICK are committed to investing all their expertise in providing with the very best sensors and system solutions possible.

A company with a culture of success

Approximately 5,000 people are on staff, with products and services available to help SICK sensor technology users increase their productivity and reduce their costs. Founded in 1946 and headquartered in Waldkirch, Germany, SICK is a global sensor specialist with more than 50 subsidiaries and representations worldwide. Our exemplary corporate culture fosters an optimum work-life balance, thus attracting the best employees from all over the world. SICK is one of the best employers – we have been among the winners of the prestigious German "Great Place to Work" award for many years in succession.



Innovation for the leading edge

SICK sensor systems simplify and optimize processes and allow for sustainable production. SICK operates thirteen research and development centers all over the world. Co-designed with customers and universities, our innovative sensor products and solutions are made to give a decisive edge. With an impressive track record of innovation, we take the key parameters of modern production to new levels: reliable process control, safety of people and environmental protection.

A corporate culture for sustainable excellence

SICK is backed by a holistic, homogeneous corporate culture. We are an independent company. And our sensor technology is open to all system environments. The power of innovation has made SICK one of the technology and market leader – sensor technology that is successful in the long term.



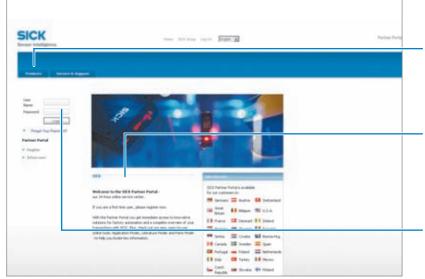
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An online portal is essential when efficient and fast processing of every detail is required!

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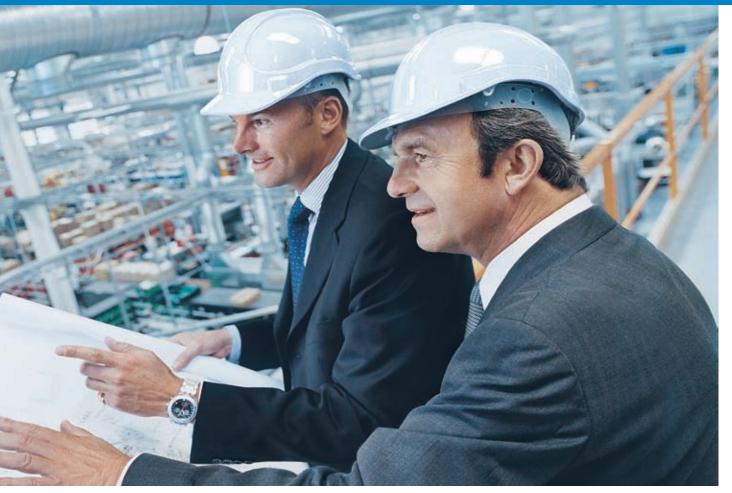
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Despite the extensive range of sensor products that SICK offers, the requirements and application conditions of the automation industry are so varied that adapted, customer-specific solutions are required; products specially tailored to your needs and wishes – customized products.

The industrial sensors approach for realizing customized solutions is divided into six phases. During each phase of the project, you can rely on our support – anywhere in the world:



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Consulting & Design

For the fusion of product, application and industry expertise to create the perfect solution.



Product & System Support

For a rapid response and reliable assistance on any questions relating to the integration and functioning of SICK systems and sensors. Experienced specialists take professional action to supply practical solutions.



Verification & Optimization

For the best possible utilization and trouble-free operation of the SICK systems and sensors. Use SICK's experience for maximum system efficiency.



Upgrade & Retrofits

For the subsequent integration of more powerful and innovative SICK systems and sensors to maintain or enhance economic efficiency.



Training & Education

For trained personnel for the best possible utilization of the SICK systems and sensors. SICK seminars and user training courses improve the ability of design engineers, managers, and supervisors to confidently make the right decisions.



7

The demands placed on systems and their components by the food and beverage industry are especially extreme, especially in terms of wash down conditions and harsh chemicals. With IP 69K, Johnson Diversey and ECOLAB certifications, SICK sensors are ideal for precisely this area.

RELIABLE FUNCTIONING – UNAFFECTED BY STEAM CLEANERS

High pressure cleaners – with hot steam or cold water jets – are standard in industries where clean surfaces are crucial. SICK sensors remain functionally reliable, even in exposed areas. They stay sealed – temperature fluctuations and high steam temperatures have no effect on their functioning.



RESISTANT - UNAFFECTED BY CLEANING AND DISINFECTANT AGENTS

Aggressive cleaning and disinfectant agents which work very effectively – such as alkaline products or products containing chlorine – are particularly demanding on sensors. Resistant materials are an essential minimum requirement for SICK sensors, which are developed and manufactured to exceptionally high quality standards. Aggressive cleaning and disinfectant agents do not affect their functioning, even in the long term.

ECOLAB

ECOLAB

Test of material's resistance to aggressive cleaning and disinfectant agents:

- 28 days' exposure time
- 20 °C temperature
- No swelling
- No brittleness

JOHNSON DIVERSEY



Test of material's resistance to aggressive cleaning and disinfectant agents:

- 7 cleaning agents
- 25 days' exposure time
- Various temperatures
- No swelling
- No brittleness

IP 69K TO DIN 400 50



Resistance of the sensors and accessories during cleaning processes:

- 100 bar high-pressure jet cleaning
- 16 liters per minute
- 80 °C water temperature
- 100 mm distance to unit under test
- Test with spray angle of 0°, 30°, 60°, 90° with the unit under test rotating (5 rpm)





Food & beverage Enclosure ratings and certifications

HACCP "Hazard Analysis and Critical Control Points"

HACCP is a preventive approach to identifying hazards in the manufacturing, processing, and sale of food and beverages. With the HACCP approach, procedures are to be established for detecting, documenting, eliminating, and following up health hazards.

Every machine builder or manufacturer must create their own HACCP system. Many industry-specific recommendations and proven procedures have been emerging over the past few years.

The authorities or customers will establish their own hygiene standards, as the circumstances dictate. With some of these standards, compliance is not mandatory.

Some specialized standards, such as the recommendations for hygienic equipment design set out by the EHEDG (European Hygiene Equipment Design Group), are very useful. The aim of the organizations formulating such standards is to achieve better safety, cleaning, and maintenance of the equipment. These standards are used as the basis for producing equipment for high levels of hygiene, and manufacturers complying with these standards are contributing to preventing problems in the future.

SICK has made it an objective to fulfill these requirements. The guidelines are adhered to wherever possible.





THE SEVEN STEPS OF HACCP

1. Conduct a hazard analysis

- 2. Identify critical control points
- 3. Establish critical limits
- 4. Introduce monitoring procedures
- 5. Establish corrective actions
- 6. Establish validation procedures
- 7. Document the procedures

The reduction of the hazards in step 1 reduces the costs for preventive measures in steps 2 to 7

SICK helps you meet

your requirements



Identify the food safety hazards and establish preventive measures that you can apply in your plant to contain these hazards. Possible hazards in the context of food and beverages could be biological (such as microorganisms), chemical, or physical. The GMP and EHEDG recommendations ensure that the correct materials are used: e.g. smooth surfaces so that dirt cannot collect. SICK assists you in keeping your costs and work time to a minimum in steps 2 to 7.

Work out a strategy for steps 2 to 7 as a response to the identified hazards.

Easy to select: Selection guide for food & beverage sensors

| | Product fa |
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| Proc | luct family | Dimensions | Sensing technology | Sensing range | Enclosure rating & certification | | | | | |
|----------|-------------|---------------------|--------------------------------|---------------|----------------------------------|-------|--------|---------------------|--------|-------|
| | | (W x H x D) [mm] | | | IP 67 | IP 68 | IP 69K | Johnson Diversey | ECOLAB | НАССР |
| | | | Photoelectric proximity | 3 500 mm | | | | | | |
| | W4S-3 Inox | 15.3 x 44.7 x 22.3 | Photoelectric retro-reflective | 0 5 m | | - | | - | | |
| - | | | Through-beam photoelectric | 0 5 m | | | | | | |
| ٠ | | | Photoelectric proximity | 0 950 mm | | | | | - | |
| | W8 Inox | 11 x 33.3 x 21 | Photoelectric retro-reflective | 0 6,5 m | | | | - | | - |
| | | | Through-beam photoelectric | 0 45 m | | | | | | |
| 6 | | | Photoelectric proximity | 3 350 mm | | | | | | |
| | MH15V | M18 x 1 | Photoelectric retro-reflective | 0.04 3.5 m | | - | | - | | |
| | | | Through-beam photoelectric | 0 5 m | | | | | | |
| 3 | | M18 x 1 | Photoelectric proximity | 0 800 mm | | | | | | |
| Ca | V18V | | Photoelectric retro-reflective | 0.04 4.5 m | | | | | | |
| |) | | Through-beam photoelectric | 0 18 m | | | | | | |
| e | | M12 x 1 | Inductive proximity | 6 10 mm | | | | | | |
| 1022 | IM Inox | M18 x 1 | Inductive proximity | 10 20 mm | - | | | | | |
| 100 | | M30 x 1 | Inductive proximity | 20 40 mm | | | | | | |
| | IMF | M12 x 1 | Inductive proximity | 2 8 mm | | | _ | | | |
| 102 | | M18 x 1 | Inductive proximity | 5 12 mm | - | | | | | |
| N | MZT8 | 5 x 5.5 x 24 | Magnetic cylinder | - | | | | - | - | - |

Environmental zones:



AGGRESSIVE ZONE

Food and beverage zone. Constant contact with food or beverage.

CLEANING. RISKS PER HACCP

Aggressive high-pressure cleaning with water and chemicals, and hot cleaning. There is a high bacterial risk in this zone.

HOW SICK CAN ASSIST YOU.

Our specially constructed s in stainless steel and food-quality plastics can help to reduce these risks.

The sturdy housing ensures that our devices are waterproof and highly resistant. IP 69K

Wet Zone

WET ZONE

Food and beverage zone. Constant contact with food or beverage.

CLEANING. RISKS PER HACCP

Low-pressure cleaning with water and chemicals, and hot cleaning. There is a high bacterial risk in this zone.

HOW SICK CAN ASSIST YOU.

Our specially constructed s in stainless steel and food-quality plastics can help to reduce these risks.

The sturdy housing ensures that our devices are waterproof and highly resistant. IP 69K

| Light s | ource | Housing | material | Operating temperature | Environmental zones | | Page | | |
|-----------------|-------|--------------------|----------|---------------------------------------|---------------------|-----|--------|-----|-----|
| Red PinPoint | Red | Stainless steel | Plastic | | Aggres- sive | Wet | Splash | Dry | |
| • | • | • | - | -30 °C +70 °C | • | • | - | • | 74 |
| - | • | • | - | -30 °C +60 °C | • | • | - | • | 78 |
| • | • | • | - | -25 °C +55 °C | • | • | - | • | 124 |
| - | • | • | - | -25 °C +80 °C (short term: 100 °C) | • | • | • | • | 128 |
| - | - | • | - | -25 °C +85 °C | • | • | - | • | 22 |
| - | - | • | - | -40 °C +80 °C (short term: 100 °C) | • | • | • | • | 24 |
| - | - | - | • | -30 °C +80 °C | - | • | - | • | 46 |

Splash Zone

SPLASH ZONE

Splash zone. The personnel touch the surfaces of the equipment and then the food or beverage. The food or beverage could splash in this zone.

CLEANING. RISKS PER HACCP

No aggressive cleaning. The risks in this zone are bacteria and cross-contamination.

HOW SICK CAN ASSIST YOU.

Our housing for wet zones, specially designed to GMP requirements, helps to minimize risks. Special non-poisonous plastics and splash-protected housing. IP 67->IP 69K

Dry Zone



DRY ZONE

Non-contact zone. Underside of machine.

CLEANING. RISKS PER HACCP

No aggressive cleaning. Risks include the danger of glass entering the food or beverage.

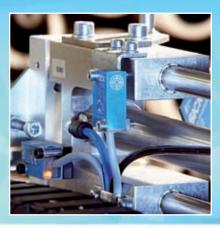
HOW SICK CAN ASSIST YOU.

A special front cover made from plastic prevents any glass from entering the product.





IMF Use in the food and beverage industry



IQ10 Object detection in the machine construction industry

plant

Position determination in a packaging

IME

Equipped for all automation requirements

Inductive sensors are used in virtually all industries. They detect metal objects without contact, and feature long service life and extreme ruggedness.

With the latest ASIC technology, SICK's sensors offer the ultimate in precision and reliability.

SICK can always provide the right solution to meet your requirements – from cylindrical or rectangular standard sensors with single, double, or triple sensing range, to special sensors for explosive zones and harsh environments. It is the intelligent, reliable route to implementing industry-specific and customized solutions to any task involving automation.



Inductive proximity sensors

| | Selection guide for inductive sensors |
|------|---|
| N | IH / IM Miniature |
| | IM Standard 18 The classic series for industrial use |
| NOS: | Triple Sensing Range 20 Sensors with triple sensing range |
| No. | Inox 22 All-metal sensors for the strictest requirements |
| 61 | IMF |
| | IQ Flat |
| | IQ Standard |

Easy to select: Selection guide for inductive sensors

| Design | Dimensions | Max | nominal sensing ran | ge [mm] | Housing material |
|-----------------|------------------|---------|---------------------|-----------|------------------------------|
| | | Flush | Quasi-flush | Non-flush | |
| | M4 | 0.6 | - | - | Stainless steel, plastic |
| | M5 | 0.8 | - | - | Stainless steel, plastic |
| | M8 | 1.5 / 2 | - | 2.5 / 4 | Nickel-plated brass, plastic |
| | IVIð | - | 3 | 6 | Nickel-plated brass, plastic |
| | | 2/4 | - | 4/8 | Nickel-plated brass, plastic |
| | M40 | - | 6 | 10 | Nickel-plated brass, plastic |
| | M12 | 2/4 | - | 4/8 | Stainless steel (V4A) |
| Threaded barrel | | 6 | - | 10 | Stainless steel (V4A) |
| | M18 | 5/8 | - | 8/12 | Nickel-plated brass, plastic |
| | | - | 12 | 20 | Nickel-plated brass, plastic |
| | | 5/8 | - | 8/12 | Stainless steel (V4A) |
| | | 10 | - | 20 | Stainless steel (V4A) |
| | | 10/15 | - | 15/20 | Nickel-plated brass, plastic |
| | M30 | - | 22 | 40 | Nickel-plated brass, plastic |
| | | 20 | - | 40 | Stainless steel (V4A) |
| | Ø 3 mm | 0.6 | - | - | Stainless steel, plastic |
| Smooth barrel | Ø4mm | 0.8 | - | - | Stainless steel, plastic |
| | Ø 6.5 mm | 2 | - | 4 | Stainless steel, plastic |
| | 8 x 16 x 4 mm | 1,5 | - | - | Plastic |
| | 10 x 30 x 6 mm | 3 | - | - | Plastic |
| | 10 x 16 x 37 mm | 3 | - | 6 | Plastic |
| Rectangular | 20 x 32 x 8 mm | 7 | - | - | Metal (GD Zn), plastic |
| | 25 x 50 x 10 mm | 5 | - | - | Metal (Gd Al Si 12), plastic |
| | 40 x 40 x 66 mm | 20 | - | 40 | Plastic |
| | 40 x 40 x 118 mm | 15 | - | 20 | Plastic |



Rugged and durable

High quality manufacturing and tough metal or plastic housings ensure long service life and high accuracy. Inductive sensors are highly reliable even under harsh operating conditions, such as when subjected to vibration and impact, cooling lubricant, high temperature fluctuations, humidity, or electromagnetic interference.



Versatile and easy to install

The SICK range offers you a wide variety of sensors for different installation situations: choose from normally open or normally closed functionality, with NPN or PNP switching output, cable or connector sensor connection, standard or short-body housings, plus multiple and flexible mounting options. In other words: inductive sensors from SICK make using and connecting sensors particularly easy and efficient.

| Connection | | | | Special | features | | Product family | Page | |
|------------|----------|-----------|------------------------|---------------|----------|-------|----------------|----------------------|----|
| Connector | Cable | Terminals | Pigtail | All- metal | IP 67 | IP 68 | IP 69K | | |
| - | PUR, 2 m | - | - | - | | - | - | IM Miniature | 16 |
| M8, 3-pin | PVC, 2 m | - | - | - | | - | - | IM Miniature | 16 |
| M8, 3-pin | - | - | - | - | | - | - | IM Standard | 18 |
| M8, 3-pin | - | - | - | - | | - | - | Triple Sensing Range | 20 |
| M12, 4-pin | - | - | - | - | | - | - | IM Standard | 18 |
| M12, 4-pin | - | - | - | - | | - | - | Triple Sensing Range | 20 |
| M12, 4-pin | - | - | - | | - | | | IMF | 24 |
| M12, 4-pin | - | - | - | | - | | | Inox | 22 |
| M12, 4-pin | - | - | - | - | | - | - | IM Standard | 18 |
| M12, 4-pin | - | - | - | - | | - | - | Triple Sensing Range | 20 |
| M12, 4-pin | - | - | - | | - | | | IMF | 24 |
| M12, 4-pin | - | - | - | | - | | | Inox | 22 |
| M12, 4-pin | - | - | - | - | | - | - | IM Standard | 18 |
| M12, 4-pin | - | - | - | - | | - | - | Triple Sensing Range | 20 |
| M12, 4-pin | - | - | - | | - | | | Inox | 22 |
| - | PUR, 2 m | - | - | - | | - | - | IH Miniature | 16 |
| M8, 3-pin | PVC, 2 m | - | - | - | | - | - | IH Miniature | 16 |
| M8, 3-pin | PVC, 2 m | - | - | - | | - | - | IH Miniature | 16 |
| - | PVC, 2m | - | - | - | | - | - | IQ Flat | 26 |
| - | PUR, 2m | - | - | - | | - | - | IQ Flat | 26 |
| M8, 3-pin | PVC, 2 m | - | - | - | | - | - | IQ 10 | 28 |
| - | - | - | M8, 3-pin / M12, 4-pin | - | | - | - | IQ Flat | 26 |
| - | PUR, 2m | - | - | - | | - | - | IQ Flat | 26 |
| M12, 4-pin | - | - | - | - | | - | - | IQ 40 | 30 |
| - | - | M20 x 1.5 | - | - | - | | - | IQ 40 | 30 |



IM Standard

The classic series. Cylindrical inductive sensors for industrial use:

- Sizes M8 to M30
- Sensing range from 1.5 mm to 20 mm
- DC, AC, and AC/DC versions available
- Customer-specific customizations
 possible
- Variable connection with cable or connector



IMF

IMF inductive sensors for the food and beverage industry:

- Stainless steel housing (316L/1.4404)
- Extremely watertight (IP 68/IP 69K)
- Extended temperature range from -40 to +80 °C (short term: +100 °C)
- Resistant to all common cleaning agents, ECOLAB and JohnsonDiversey certified



IQ Standard

Rectangular inductive sensors from SICK:

- Sensing range up to 60 mm
- DC, AC, and AC/DC versions available
- Customer-specific versions possible
- Connection by cable, connector, or junction box



Product description

Cylindrical, miniature inductive sensors for maximum performance when space restrictions are greatest. The tough and reliable IH and IM Miniature sensor families require a minimum of space. They are ideal for highly dynamic applications in robotics, handling, and assembly. Miniaturization without compromises – without jeopardizing performance, with sensing ranges up to 4 mm, and built-in electronics.

At a glance

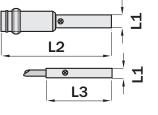
- Small housing sizes and light weight
- Integrated LED indicator

Your benefits

- Trouble-free placement in spacecritical applications; high degree of design flexibility
- Reliable detection of rapid handling and assembly processes
- Simple monitoring of operational state with high visibility
- High positioning accuracy

• Sensing ranges up to 4 mm

Dimensions



| | | Thread type / Ø L1 | Connector type L2 [mm] | Cable type L3 [mm] |
|------|----|-----------------------|---------------------------|-----------------------|
| IM04 | | M4 | - | 22 |
| IM05 | | M5 | 38 | 25 |
| IH03 | | Ø3mm | - | 22 |
| IH04 | | Ø4mm | 38 | 25 |
| IH06 | 1) | Ø 6,5 mm | - | 35,5 |
| | | Ø 6,5 mm | 50 | 45 |

¹⁾Short-body housing

www.mysick.com/en/IM_Miniature

www.mysick.com/en/IH_Miniature

Technical details and ordering information

- Electrical wiring: DC 3-wire
- Supply voltage: 10 ... 30 V DC
- Output function: normally open
- Output type: PNP

IH Miniature

- Operating temperature: -25 °C ... +70 °C
- Enclosure rating: IP 67
- Other models available on request or at www.sick.com

| Housing Ø [mm] | Installation type | Nominal sensing distance [mm] | Connection | Model name | Part no. |
|-------------------|-------------------|-------------------------------------|-----------------|------------------------------|----------|
| 3 | Flush | 0.6 | Cable, PUR, 2 m | IH03-0B6PS-VU1 | 6020141 |
| 4 | Fluch | 0.0 | M8, 3-pin | IH04-0B8PS-VT1 | 6020114 |
| 4 | Flush | 0.8 | Cable, PVC, 2 m | IH04-0B8PS-VW1 | 6020113 |
| | | | Cable, PVC, 2 m | IH06-02BPS-VWK ¹⁾ | 6025874 |
| 6.5 | Flush | 2 | M8, 3-pin | IH06-02BPS-VT1 | 7900179 |
| 0.0 | | | Cable, PVC, 2 m | IH06-02BPS-VW1 | 7900177 |
| | Non-flush | 4 | M8, 3-pin | IH06-04NPS-VT1 | 7900183 |

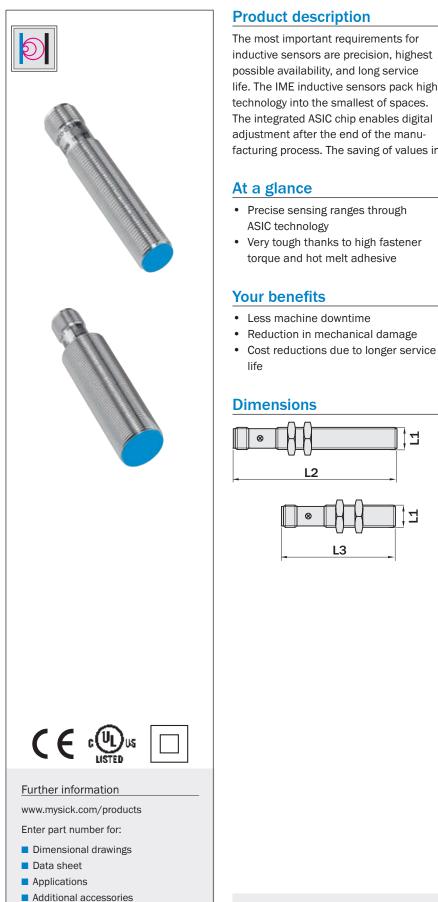
 $^{\mbox{\tiny 1)}} \mbox{Short-body housing}$

IM Miniature

| Housing | Installation type | Nominal sensing distance [mm] | Connection | Model name | Part no. |
|---------|-------------------|-------------------------------------|-----------------|----------------|----------|
| M4 | Flush | 0.6 | Cable, PUR, 2 m | IM04-0B6PS-ZU1 | 6020145 |
| NAE | Fluch | 0.0 | M8, 3-pin | IM05-0B8PS-ZT1 | 6020110 |
| M5 | Flush | 0.8 | Cable, PVC, 2 m | IM05-0B8PS-ZW1 | 6011591 |

Recommended accessories

| Name | Design | Model name | Part no. |
|-----------------------------------|-------------------------------------|------------|----------|
| Mounting clamp | Plastic | BEF-S-H06 | 7901771 |
| Cables and connectors → p. 142 Ac | ditional mounting brackets → p. 146 | | |



Inductive proximity sensors IM Standard

Product description

The most important requirements for inductive sensors are precision, highest possible availability, and long service life. The IME inductive sensors pack high technology into the smallest of spaces. The integrated ASIC chip enables digital adjustment after the end of the manufacturing process. The saving of values in the ASIC ensures highly precise switching points and very high repeatability of values – for any number of production runs. The use of hot melt adhesive inside the housing makes for very high resistance to shock and vibration. For the user, that means high positioning accuracy in the machine and reliable sensor operation.

At a glance

- Precise sensing ranges through ASIC technology
- Very tough thanks to high fastener torque and hot melt adhesive

Your benefits

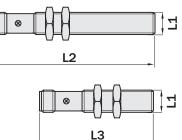
- · Less machine downtime
- · High resistance to shock and vibration

• Enclosure rating IP 67

-25 ... +75 °C

Operating temperature from

Dimensions



| | Thread type L1 | Standard L2 [mm] | Short L3 [mm] |
|-------|-------------------|---------------------|------------------|
| IME08 | M8 | 50 | 41 |
| IME12 | M12 | 65 | 46 |
| IME18 | M18 | 69 | 50 |
| IME30 | M30 | 71 | 52 |

www.mysick.com/en/IM_Standard

Part no.

Technical details and ordering information

- Electrical wiring: DC 3-wire
- Supply voltage: 10 ... 30 V DC
- Output function: normally open
- Output type: PNP

Housing

Housing material: nickel-plated brass, plastic (PA6)

Installation type

- Operating temperature: -25 °C ... +75 °C
- Enclosure rating: IP 67

Connection

Other models available on request or at www.sick.com

Model name

| | | [mm] | | | | | | |
|-----------------------|-----------|-----------|------------------------|--|---|--|--|--|
| | | 1.5 | MQ 2 pip | IME08-1B5PSZT0S | 1040838 | | | |
| | Fluch | 1.5 | M8, 3-pin | IME08-1B5PSZTOK ¹⁾ | 1) 1040837 1) 1040870 1) 1040869 1) 1040853 1) 1040853 1) 1040853 1) 1040886 1) 1040885 1) 1040732 1) 1040731 1) 1040731 1) 1040763 1) 1040763 1) 1040747 1) 1040748 1) 1040743 1) 1040743 1) 1040743 1) 1040743 1) 1040933 1) 1040934 1) 1040933 1) 1040965 1) 1040965 1) 1040982 1) 1040981 1040997 1040997 1041030 1041029 1041029 1041024 | | | |
| | Flush | 2 | MQ 2 pip | IME08-02BPSZT0S | 1040870 | | | |
| M8 | | 2 | M8, 3-pin | IME08-02BPSZTOK ¹⁾ | 1040869 | | | |
| IVIO | | 2.5 | MQ 2 pip | IME08-2N5PSZT0S | 1040854 | | | |
| | Non-flush | 2.5 | M8, 3-pin | IME08-2N5PSZTOK ¹⁾ | 1040853 | | | |
| | NON-HUSH | 4 | M8, 3-pin | IME08-04NPSZT0S | 1040886 | | | |
| | | 4 | мо, 5-рш | IME08-04NPSZTOK ¹⁾ | 1040885 | | | |
| | | 2 | M12, 4-pin | IME12-02BPSZCOS | 1040732 | | | |
| | Flush | 2 | WI12, 4-pill | IME12-02BPSZCOK ¹⁾ | 1040731 | | | |
| | Tush | 4 | M12 Anin | IME12-04BPSZC0S | 1040764 | | | |
| M12 | | 7 | Wi±2, 4 pin | 2, 4-pin IME12-04BPSZCOK ¹⁾ IME12-04NPSZCOS | | | | |
| WITT | | 4 | M12, 4-pin | IME12-04NPSZCOS | 1040748 | | | |
| | Non-flush | т | IME12-04NPS | IME12-04NPSZCOK ¹⁾ | 1040747 | | | |
| | Non nuon | 8 | M12, 4-pin | IME12-08NPSZC0S | 1040780 | | | |
| | | 0 | WI12, 4 pm | IME12-08NPSZCOK ¹⁾ | 1040779 | | | |
| | | 5 | M12, 4-pin | IME18-05BPSZC0S | 1040934 | | | |
| | Flush | | | IME18-05BPSZCOK ¹⁾ | 1040933 | | | |
| | ridon | 8 | M12, 4-pin | IME18-08BPSZC0S | 1040966 | | | |
| M18 | | | | IME18-08BPSZCOK 1) | 1040965 | | | |
| WILD | | 8 Jush | M12, 4-pin | IME18-08NPSZCOS | 1040950 | | | |
| | Non-flush | | | IME18-08NPSZCOK 1) | 1040949 | | | |
| | Non nuon | 12 | M12, 4-pin | IME18-12NPSZCOS | 1040982 | | | |
| | | 12 | | IME18-12NPSZCOK 1) | 1040981 | | | |
| | | 10 | M12, 4-pin | IME30-10BPSZC0S | 1040998 | | | |
| | Flush | 10 | 10112, 4 pm | IME30-10BPSZCOK 1) | 1040997 | | | |
| | 1 don | 15 | M12, 4-pin | IME30-15BPSZC0S | 1041030 | | | |
| M30 | | 10 | 10112, 4 pm | IME30-15BPSZCOK ¹⁾ | 1041029 | | | |
| 10130 | | 15 | M12, 4-pin | IME30-15NPSZC0S | 1041014 | | | |
| | Non-flush | 10 | м±2, т рш | IME30-15NPSZCOK $^{\mbox{\tiny 1)}}$ | 1041013 | | | |
| | Non Indon | 20 | M12, 4-pin | IME30-20NPSZC0S | 1041046 | | | |
| | | 20 | мтz, +-рш | IME30-20NPSZCOK ¹⁾ | 1041045 | | | |
| Short-body housing | | | | | | | | |
| والمرجام ومستعمر والم | | | | | | | | |

Nominal

sensing range

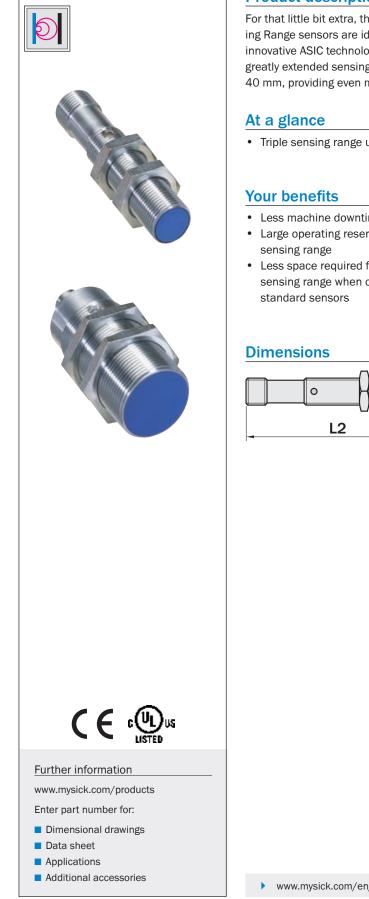
Recommended accessories

| Name | Design | Size | Model name | Part no. |
|----------------------------------|---|------|------------|----------|
| Mounting brookst | 90° bracket, zinc plated steel | M12 | BEF-WN-M12 | 5308447 |
| Mounting bracket | | M18 | BEF-WN-M18 | 5308446 |
| Maunting plate | | M12 | BEF-WG-M12 | 5321869 |
| Mounting plate Zinc plated steel | | M18 | BEF-WG-M18 | 5321870 |
| | والمحالية | | | |

Cables and connectors \rightarrow p. 142

8013958/2011-08-29 Subject to change without notice

1) S



Product description

For that little bit extra, the Triple Sensing Range sensors are ideal. Thanks to innovative ASIC technology, they offer greatly extended sensing ranges up to 40 mm, providing even more capacity in reserve. They can be used like conventional proximity sensors over a operating temperature of -25 °C ... +70 °C, for performance without restrictions.

• Lower risk of mechanical damage due

• High detection sensitivity, therefore

very suitable for detecting difficult

parts such as wires, thin sheets,

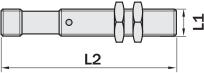
to greater distance away from moving

- Triple sensing range up to 40 mm
- · Operating temperature from -25 °C ... +70 °C

parts

small screws

- Less machine downtime
- Large operating reserve due to triple
- · Less space required for the same sensing range when compared with



| Thread type L1 | Housing length L2 [mm] |
|-------------------|---------------------------|
| M8 | 60 |
| M12 | 60 |
| M18 | 63,5 |
| M30 | 73,5 |

www.mysick.com/en/IM_Triplex

Technical details and ordering information

- Electrical wiring: DC 3-wire
- Supply voltage: 10 ... 30 V DC
- Output function: normally open
- Output type: PNP

- Operating temperature: -25 °C ... +70 °C
- Enclosure rating: IP 67
- Other models available on request or at www.sick.com

| Housing | Installation type | Nominal sensing range [mm] | Connection | Model name | Part no. |
|---------|-------------------|----------------------------------|------------|----------------|----------|
| M8 | Quasi-flush | 3 | M8, 3-pin | IM08-03BPS-ZT1 | 6025574 |
| IVIO | Non-flush | 6 | M8, 3-pin | IM08-06NPS-ZT1 | 6027508 |
| M12 | Quasi-flush | 6 | M12, 4-pin | IM12-06BPS-ZC1 | 6027511 |
| IVIIZ | Non-flush | 10 | M12, 4-pin | IM12-10NPS-ZC1 | 6027514 |
| M18 | Quasi-flush | 12 | M12, 4-pin | IM18-12BPS-ZC1 | 6027517 |
| INITO | Non-flush | 20 | M12, 4-pin | IM18-20NPS-ZC1 | 6027519 |
| M30 | Quasi-flush | 22 | M12, 4-pin | IM30-22BPS-ZC1 | 6027521 |
| INISU | Non-flush | 40 | M12, 4-pin | IM30-40NPS-ZC1 | 6027522 |

Recommended accessories

| Name | Material | Size | Model name | Part no. |
|-----------------------|------------------------------|------|-------------|----------|
| | | M8 | BEF-WN-M08 | 5321721 |
| Mounting brooket | Zina platad ataal | M12 | BEF-WN-M12 | 5308447 |
| Mounting bracket | Zinc plated steel | M18 | BEF-WN-M18 | 5308446 |
| | | M30 | BEF-WN-M30 | 5308445 |
| | | M8 | BEF-WG-M08 | 5321722 |
| Mounting plata large | Zinc plated steel | M12 | BEF-WG-M12 | 5321869 |
| Mounting plate, large | Zinc plated steel | M18 | BEF-WG-M18 | 5321870 |
| | | M30 | BEF-WG-M30 | 5321871 |
| | | M8 | BEF-KHF-M08 | 2051478 |
| Clamping block | PA12, glass fiber reinforced | M12 | BEF-KHF-M12 | 2051479 |
| | | M18 | BEF-KHF-M18 | 2051481 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146



Further information

www.mysick.com/products

Enter part number for:

Dimensional drawings

- Data sheet
- Applications

Additional accessories

Product description

High pressure cleaners with aggressive cleaning agents, acids, and alkalis are a challenge for sensor systems. The solution: Inox inductive sensors in fully encapsulated sensor housings made from stainless steel (316L/1.4404). They can withstand extreme stresses, offer a triple sensing range, and have a very high reduction factor.

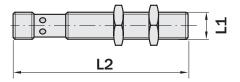
At a glance

- One piece stainless steel housing (316L/1.4404)
- Extremely watertight (IP 68/IP 69K)
- Triple sensing range up to 40 mm
- High resistance to mechanical stress
- Especially suitable for use in hygienic and wet zones
 Not affected by approaching algorithm
- Not affected by aggressive cleaning agents
- Visible signal strength indicator

Your benefits

- Less machine downtime due to tough, sturdy sensors
- Long service life even under the most extreme ambient conditions
- Quick and easy installation thanks to adjustment indicator

Dimensions



| ٠ | Large operating reserve due to triple |
|---|---------------------------------------|
| | sensing range |

- High resistance to shock and impacts due to all-metal sensing face
- No restrictions on cleaning agents or processes

| Thread type L1 | Housing length L2 [mm] |
|-------------------|---------------------------|
| M12 | 60 |
| M18 | 63,5 |
| M30 | 63,5 |

www.mysick.com/en/IM_Inox

Technical details and ordering information

- Electrical wiring: DC 3-wire
- Supply voltage: 10 ... 30 V DC
- Output type: PNP
- Operating temperature: -25 °C ... +85 °C

- Enclosure rating: IP 68 / IP 69K
- Other models available on request or at www.sick.com

| Housing | Installation type | Output function | Nominal sensing range [mm] | Connection | Model name | Part no. |
|---------|-------------------|-----------------|----------------------------------|------------|----------------|----------|
| | Flush | Normally closed | 6 | M12, 4-pin | IM12-06BPO-NC1 | 6027574 |
| M12 | Flush | Normally open | 6 | M12, 4-pin | IM12-06BPS-NC1 | 6027572 |
| | Non-flush | Normally open | 10 | M12, 4-pin | IM12-10NPS-NC1 | 6027575 |
| | Flush | Normally closed | 10 | M12, 4-pin | IM18-10BPO-NC1 | 6027579 |
| M18 | Flush | Normally open | 10 | M12, 4-pin | IM18-10BPS-NC1 | 6027577 |
| | Non-flush | Normally open | 20 | M12, 4-pin | IM18-20NPS-NC1 | 6027580 |
| MOO | Flush | Normally open | 20 | M12, 4-pin | IM30-20BPS-NC1 | 6027582 |
| M30 | Non-flush | Normally open | 40 | M12, 4-pin | IM30-40NPS-NC1 | 6027584 |

Recommended accessories

| Name | Design | Size | Model name | Part no. |
|--------------------------|------------------------------|------|-------------|----------|
| Mounting by oldet | 90° bracket, stainless steel | M12 | BEF-WN-M12N | 5320949 |
| Mounting bracket | | M18 | BEF-WN-M18N | 5320947 |
| Meunting plate | Stainless steel | M12 | BEF-WG-M12N | 5320950 |
| Mounting plate Stainless | Stainless steel | M18 | BEF-WG-M18N | 5320948 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146



Product description

IMF inductive sensors perform tasks reliably and precisely in all branches of food and beverage production, whether breweries, dairies, or producers of frozen foods. Their housings are made from an extremely tough mix of stainless steel and FDA-certified plastic, which defies even the harshest stresses of everyday operation.

At a glance

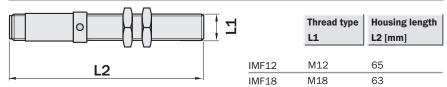
- Extremely watertight (IP 68/IP 69K)
- Stainless steel housing (316L/1.4404)
- Extended operating temperature (-40 ...+80 °C)

Your benefits

- Less machine downtime due to reliable sensors
- Hygienic processes due to suitable sensor housing material and design

- Tolerates short-term spikes up to 100 °C
- Resistant to industrial cleaning agents, ECOLAB and JohnsonDiversey certified
- No sensor failure from aggressive cleaning cycles
- No restrictions on cleaning agents or processes

Dimensions



www.mysick.com/en/IMF

Technical details and ordering information

- Electrical wiring: DC 3/4-wire
- Supply voltage: 10 ... 30 V DC
- Output type: PNP
- Operating temperature: -40 °C ... +80 °C

- Enclosure rating: IP 68 / IP 69K
- Connection: connector M12, 4-pin with gold-plated contacts
- Other models available on request or at www.sick.com

| Housing | Installation type | Output function | Nominal sensing range [mm] | Model name | Part no. |
|---------|-------------------|-----------------|----------------------------------|-----------------|---|
| | | Normally closed | 2 | IMF12-02BPOVCOS | 6035454 |
| | | | 4 | IMF12-04BPOVCOS | 6035462 |
| | Florels | Normally open | 2 | IMF12-02BPSVC0S | 6035452 |
| | Flush | | 4 | IMF12-04BPSVC0S | 6035460 |
| | | | 2 | IMF12-02BPPVC0S | 6035215 |
| M12 | | Complementary | 4 | IMF12-04BPPVC0S | 6035219 |
| IVI12 | | Nemelly deced | 4 | IMF12-04NPOVCOS | 6035458 |
| | | Normally closed | 8 | IMF12-08NPOVCOS | 6035466 |
| | Nor fluch | Nerreelly erer | 4 | IMF12-04NPSVC0S | 6035456 |
| | Non-flush | Normally open | 8 | IMF12-08NPSVC0S | 6035464 |
| | | Complementary | 4 | IMF12-04NPPVC0S | 6035217 |
| | | | 8 | IMF12-08NPPVC0S | 6035221 |
| | | Normally closed | 5 | IMF18-05BPOVCOS | 6035470 |
| | | | 8 | IMF18-08BPOVCOS | 6035462 6035452 6035460 6035215 6035219 6035458 6035456 6035456 6035464 6035217 6035221 |
| | Flush | Nerreelly erer | 5 | IMF18-05BPSVC0S | 6035468 |
| | | Normally open | 8 | IMF18-08BPSVC0S | 6035476 |
| | | Complementary | 5 | IMF18-05BPPVC0S | 6035223 |
| M18 | | | 8 | IMF18-08BPPVC0S | 6035227 |
| MITO | | Newselly closed | 8 | IMF18-08NPOVCOS | 6035474 |
| | | Normally closed | 12 | IMF18-12NPOVCOS | 6035482 |
| | Non-flush | Normally open | 8 | IMF18-08NPSVC0S | 6035472 |
| | Non-Tiusn | | 12 | IMF18-12NPSVC0S | 6035480 |
| | | Ormaliantes | 8 | IMF18-08NPPVC0S | 6035225 |
| | | Complementary | 12 | IMF18-12NPPVC0S | 6035229 |

Recommended accessories

| Name | Design | Size | Model name | Part no. |
|-------------------|------------------------------|------|-------------|----------|
| Mounting by alcot | 90° bracket, stainless steel | M12 | BEF-WN-M12N | 5320949 |
| Mounting bracket | | M18 | BEF-WN-M18N | 5320947 |
| Maunting plate | Otalia la caractera l | M12 | BEF-WG-M12N | 5320950 |
| Mounting plate | Stainless steel | M18 | BEF-WG-M18N | 5320948 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146



Product description

Solve applications where space is at a premium with IQ Flat rectangular inductive sensors. Thanks to their low profile, only 4.7 mm, this family of inductive sensors is designed to fit into tight spaces. IQ Flat sensors are easily installed using one or two screws, depending on the model, which saves installation time and costs. Greater operating distances of up to 7 mm simplify even the trickiest of detection tasks. Versions are available with a metal housing, which reduces maintenance costs. These inductive sensors are space- and cost-saving solutions for universal applications.

At a glance

- Flat, compact design
- Long sensing distance up to 7mm
- One or two screw installation

Your benefits

- Reduced mechanical damage due to space-saving flat housing, which does not protrude from sensor
- Time-saving simple installation with one or two screws

• Available in a plastic (IQ04 and IQ06)

and metal housing (IQ20 and IQ25)

· Easily visible indication LEDs

• No restrictions on machine design

6 (0.24)

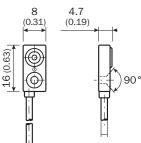
10

(0.39)

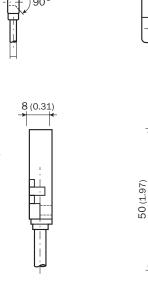
Dimensions

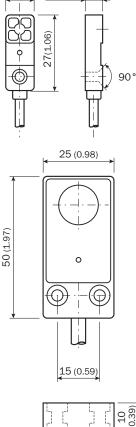
32 (1.3)

13 (0.51



20 (0.79)





www.mysick.com/en/IQ_Flat

26

Technical details and ordering information

- Installation type: flush
- Supply voltage: 10 ... 30 V DC
- Operating temperature: -25 °C ... + 70 °C

IQ Flat

| Housing [W x H x D] in mm | Nominal sensing range [mm] | Output type | Output function | Connection | Model name | Part no. | | | | |
|---------------------------------|----------------------------------|-------------|--------------------|---|----------------|----------|-----|-------------------------|----------------|---------|
| | | DND | NOC | Cable, 3-wire, PVC, 2 m | IQ04-1B5PSKW2S | 6042017 | | | | |
| 8 x 16 x 4.7 | 1.5 | PNP | NCC | Cable, 3-wire, PVC, 2 m | IQ04-1B5P0KW2S | 6042018 | | | | |
| 0 X 10 X 4.7 | 1.5 | NPN | NOC | Cable, 3-wire, PVC, 2 m | IQ04-1B5NSKW2S | 6042019 | | | | |
| | | INPIN | NCC | Cable, 3-wire, PVC, 2 m | IQ04-1B5N0KW2S | 6042020 | | | | |
| | | PNP | NOC | Cable, 3-wire, PUR, 2 m | IQ06-03BPSKU2S | 6042022 | | | | |
| 10 x 27 x 6 | 3 | PNP | NCC | Cable, 3-wire, PUR, 2 m | IQ06-03BP0KU2S | 6042023 | | | | |
| 10 X 27 X 6 | 3 | 5 | 5 | 3 | 3 | NPN | NOC | Cable, 3-wire, PUR, 2 m | IQ06-03BNSKU2S | 6042024 |
| | | INPIN | NCC | Cable, 3-wire, PUR, 2 m | IQ06-03BN0KU2S | 6042025 | | | | |
| | | PNP | NOC | Cable with plug, M8, 3-pin, PUR, 0,3 m | IQ20-07BPSDP0S | 6042043 | | | | |
| 20 x 32 x 8 | 7 | FINE | Complemen- tary | Cable with plug, M12, 4-pin, PUR, 0,3 m | IQ20-07BPPDQ0S | 6042045 | | | | |
| | | NPN | NOC | Cable with plug, M8, 3-pin, PUR, 0,3 m | IQ20-07BNSDP0S | 6042044 | | | | |
| | | | NOC | Cable, 3-wire, PUR, 2 m | IQ25-05BPSDU2S | 6042046 | | | | |
| 25 x 50 x 10 | x 50 x 10 5 | PNP | Complemen- tary | Cable, 4-wire, PUR, 2 m | IQ25-05BPPDU2S | 6042047 | | | | |

Cables and connectors \rightarrow p. 142

- Enclosure rating: IP 67
- Other models available on request or at www.sick.com

B





Product description

A small package with a lot of power. The IQ10 rectangular sensor family impresses with sensing ranges up to 6 mm, outperforming many larger sensors. Thanks to its compact design, it is perfectly at home even in applications where space is at a premium, and is also easy to install. With a stable plastic housing with IP 67 rating, it has nothing to fear from tough conditions either.

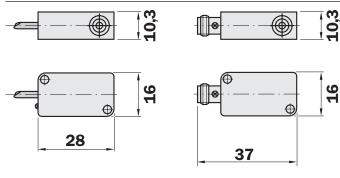
At a glance

- Increased sensing range up to 6 mm
- Small size

Your benefits

- Trouble-free placement in spacecritical applications
- Reliable detection of rapid handling and assembly processes
- Quick and easy installation
- High degree of design freedom
 thanks to compact form

Dimensions



Eurther information

www.mysick.com/products

Enter part number for:

Dimensional drawings

- Data sheet
- Applications

Additional accessories

www.mysick.com/en/IQ_Standard

Technical details and ordering information

- Supply voltage: 10 ... 30 V DC / 10 ... 60 V DC (terminal connection)
- Output type: PNP

- Operating temperature: -25 °C ... +70 °C
- Enclosure rating: IP 67
- Other models available on request or at www.sick.com

| Installation type | Nominal sensing range [mm] | Connection | Model name | Part no. |
|-------------------|-------------------------------|-----------------|----------------|----------|
| Flush | 3 | M8, 3-pin | IQ10-03BPS-KT1 | 7900205 |
| Flush | | Cable, PVC, 2 m | IQ10-03BPS-KW1 | 7900203 |
| Non-flush | 6 | M8, 3-pin | IQ10-06NPS-KT1 | 7900209 |
| Non-Ilusti | | Cable, PVC, 2 m | IQ10-06NPS-KW1 | 7900207 |

Cables and connectors → p. 142





Product description

The reliable IQ40 rectangular design has proven its worth for many years, not only in handling and warehousing systems, but also in many other industrial sectors. Versatile installation options, highly reliable design, and long sensing ranges are just a few of the features behind the success of the IQ40 family. Corner LEDs, easily visible from a number of angles, display the output state and operational state clearly, even under unfavorable installation conditions. Thanks to the adjustable sensor head, which can be turned in five different directions, the IQ40 family adapts quickly to varying application requirements.

At a glance

- Increased sensing range up to 40 mm
- Corner LEDs
- Sensing face can be rotated in five directions

Your benefits

- Versatile mounting options
- Simple monitoring of the output state and operational state
- Cost reduction through higher tolerances in machine design, thanks to increased sensing range
- Shorter installation times due to integrated mounting fixture

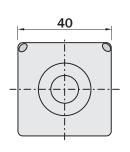
· Sturdy and compact design

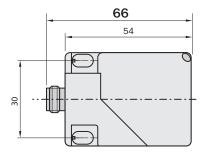
Integrated mounting clamp

Durable and tough

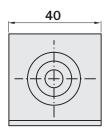
Dimensions

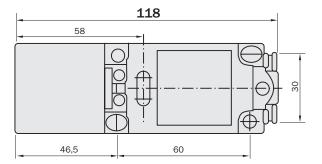
M12 connection:

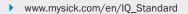




Terminal connection:









Further information www.mysick.com/products Enter part number for: Dimensional drawings

Additional accessories

Data sheetApplications

Technical details and ordering information

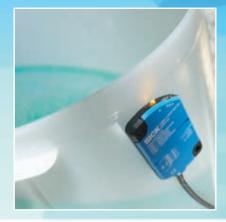
- Output type: PNP
- Operating temperature: -25 °C ... +70 °C

- Enclosure rating: IP 67 (IP 68 for terminal connection)
- Other models available on request or at www.sick.com

| Installation type | Output function | Nominal sensing range [mm] | Connection | Model name | Part no. |
|-------------------|-----------------|----------------------------------|------------|----------------|----------|
| | Complementary | 20 | M12, 4-pin | IQ40-20BPPKC0K | 6037072 |
| Flush | Normally open | 20 | M12, 4-pin | IQ40-20BPSKC0K | 6037070 |
| | Complementary | 15 | Terminals | IQ40-15BPP-KK1 | 6025814 |
| | Complementary | 40 | M12, 4-pin | IQ40-40NPPKC0K | 6037073 |
| Non-flush | Normally open | 40 | M12, 4-pin | IQ40-40NPSKC0K | 6037071 |
| | Complementary | 20 | Terminals | IQ40-20NPP-KK1 | 6025815 |

Cables and connectors \rightarrow p. 142

Close to the action – reliable operation in demanding applications



CQ28 Limit monitoring of liquids



CM30 Level monitoring and final inspection when filling packages



CM30 Use in filling plants

Detection through walls? There's nothing simpler.

Sometimes you just want to know what is hidden behind a surface. Behind a wall, for example, or in a storage container, in a shipping container, or behind a cover. Capacitive proximity sensors are ideal for level and feed monitoring. From solid material, such as paper or wood, to granules or liquids, they reliably detect the status of the product during the production process and final inspection. Is there something behind that cover? Is the filled package really full? How much paint is still left in the tank? These are easy questions for capacitive sensors to answer.

SICK's capacitive sensors are always close to the action. Sensing ranges between 1 and 25 mm allow them to fit nearly any installation situation, and they are extremely adaptable for a wide range of applications. These sensors are also suitable for extremely adverse industrial environments. Impurities, contamination, dust, and airborne particles have little effect on them. They also offer maximum immunity to electromagnetic interference. No wonder they are installed in diverse markets, such as the food industry, automotive industry, or in handling and warehousing systems.



Capacitive proximity sensors





Product description

Just being there is enough: metallic or non-metallic, solid or liquid, compact or free flowing – capacitive sensors can detect them all. Other than gaseous materials, capacitive sensors can detect any materials that come within the sensor's electromagnetic field. And liquid substances are particularly easy to detect by capacitive sensors.

At a glance

- Detects liquids and solids
- Extremely high electromagnetic immunity
- Sensitivity adjustment with potentiometer (CM18/30, CQ35)
- Teach-in via pushbutton or remote input (CQ28)

Your benefits

- Non-contact level measurement possible even through walls
- Tough and reliable in harsh industrial applications
- housing (CM18)

• Enclosure rating IP 67 (CM18/30,

Diverse mounting options (CQ28)

(CQ28) or complementary design

• Programmable output function

Also available with PTFE (Teflon)

CQ35) or IP 68 (CQ28)

(CM18/30, CQ35)

•

- Quick and easy adjustment of the switching point
- Can be used for a very wide range of media

Dimensions

flush

flush

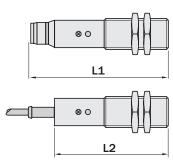
non-flush

non-flush

CM18

CM30





Thread type

L1 [mm]

83.5

915

79

91

Cable type

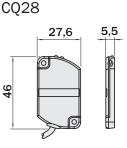
L2 [mm]

71,5

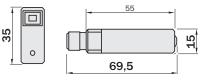
795

63,6

75,6



CQ35



Additional accessories

- www.mysick.com/en/CM
- www.mysick.com/en/CQ

Technical details and ordering information

- Electrical wiring: DC 4-wire
- Supply voltage: 10 ... 40 V DC
- Short-circuit protection (pulsed)
- High electromagnetic immunity

CM – cylindrical housings

| Housing | Installation type | Output function | Nominal sensing range [mm] | Output type | Connection | Model name | Part no. | |
|---------------|----------------------|--------------------------|-------------------------------------|----------------|-----------------|-------------------|----------------|---------|
| | Flush | Comple- | 8 | PNP | M12, 4-pin | CM18-08BPP-KC1 | 6020388 | |
| | Flush | mentary | ð | PNP | Cable, PVC, 2 m | CM18-08BPP-KW1 | 6020136 | |
| | | | | DND | Cable, PVC, 2 m | CM18-12NPP-KW1 | 6020389 | |
| M18 Non-flush | Non-flush | flush Comple- | Comple- mentary | 12 | PNP | M12, 4-pin | CM18-12NPP-KC1 | 6020410 |
| | | mentary | | NPN | M12, 4-pin | CM18-12NNP-KC1 | 6021458 | |
| | Fluck | Flush Comple- mentary | 8 | PNP | Cable, PVC, 2 m | CM18-08BPP-TW0 1) | 6026195 | |
| | Flush | | | NPN | Cable, PVC, 2 m | CM18-08BNP-TWO 1) | 6026194 | |
| | | | | PNP | M12, 4-pin | CM30-16BPP-KC1 | 6020475 | |
| | Flush | Comple- mentary | 16 | NPN | M12, 4-pin | CM30-16BNP-KC1 | 6021460 | |
| M20 | | mentary | | PNP | Cable, PVC, 2 m | CM30-16BPP-KW1 | 6020473 | |
| M30 | | | | | Cable, PVC, 2 m | CM30-25NPP-KW1 | 6020476 | |
| | Non-flush | Comple- mentary | 25 | PNP 25 | M12, 4-pin | CM30-25NPP-KC1 | 6020477 | |
| | | montary | | NPN | M12, 4-pin | CM30-25NNP-KC1 | 6021462 | |

• Housing material: plastic or Teflon

• Other models available on request or at www.sick.com

¹⁾ Teflon housing

CQ - rectangular housings

| Housing [mm] | Installation type | Output function | Nominal sensing range [mm] | Output type | Connection | Model name | Part no. | |
|------------------------|-----------------------------------|------------------------|-------------------------------------|----------------|-----------------|-----------------|----------------|---------|
| 28 x 46 x 5 5 | 28 x 46 x 5.5 Non-flush Programma | Non-flush Programmable | | 10 | PNP | Cable, PVC, 2 m | CQ28-10NPP-KW1 | 6030132 |
| 20 % 40 % 5.5 | | | 10 | NPN | Cable, PVC, 2 m | CQ28-10NNP-KW1 | 6030133 | |
| | | | | PNP | Cable, PVC, 2 m | CQ35-25NPP-KW1 | 6020478 | |
| | Non fluch | Complementer | | 05 | PNP | M12, 4-pin | CQ35-25NPP-KC1 | 6020479 |
| 35 x 15 x 55 Non-flush | NON-IIUSN | on-flush Complementary | 25 | NPN | Cable, PVC, 2 m | CQ35-25NNP-KW1 | 6021463 | |
| | | | | INPIN | M12, 4-pin | CQ35-25NNP-KC1 | 6021464 | |

Recommended accessories

| Name | Design | Material | Size | Model name | Part no. |
|---|-------------|------------------------------|------|-------------|----------|
| | | Zinc plated steel | M18 | BEF-WN-M18 | 5308446 |
| Mounting bracket | 90° bracket | Stainless steel | M18 | BEF-WN-M18N | 5320947 |
| | | Zinc plated steel | M30 | BEF-WN-M30 | 5308445 |
| Clamping block | - | PA12, glass fiber reinforced | M12 | BEF-KHF-M12 | 2051479 |
| Clamping block | - | PA12, glass fiber reinforced | M18 | BEF-KHF-M18 | 2051481 |
| Installation adapter for silo and tank applications | - | Plastic (POM) | M30 | BEF-EA-CM30 | 2043770 |

Cables and connectors \rightarrow p. 142 Additional mounting brackets \rightarrow p. 146

Small size – long sensing range



Built to withstand the harshest environments

SICK offers a thorough portfolio of magnetic proximity sensors in metric (MM) and rectangular (MQ) configurations. The MM sensors are available with standard sensing ranges and, in the Advanced series, with extended sensing ranges. This, together with the use of smaller magnets, opens up a whole new range of application possibilities. The NAMUR version of the MM sensors completes this comprehensive series. The MQ sensors offer all the advantages of a magnetic proximity sensor in a compact plastic housing. Magnetic proximity sensors are designed for use in harsh environments and are unaffected by dust, heat, or vibrations. The SICK magnetic proximity sensors withstand environments where other sensors fail.



Magnetic proximity sensors









Product description

Permanent magnets can be detected with precision at long ranges with magnetic proximity sensors. Magnetic proximity sensors are designed for use in harsh environments and are unaffected by dust, heat, or vibrations. The SICK magnetic proximity sensors withstand environments where other sensors fail.

At a glance

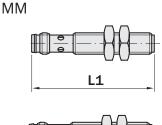
- Detection of permanent magnets through non-ferromagnetic substances, such as stainless steel, aluminum, plastic, or wood
- Precise switching point and exact hysteresis

Your benefits

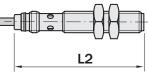
- Unaffected by mechanical influences (shock, impacts, vibration)
- Space saving installation due to small size

- Suitable for detection of objects in high temperature zones
- Very long sensing ranges together with small housing sizes
- Reliable switching, even with high target position tolerances

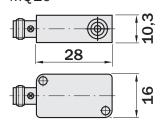
Dimensions



| | Connector type L1 [mm] | Cable type L2 [mm] |
|------|---------------------------|-----------------------|
| MM8 | 46 | 48 |
| MM12 | 46 | 44 |
| MM18 | 50 | 48 |



| M | \cap | 1 | Ω | |
|---|--------|---|---|--|



CE

Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications

Additional accessories

- www.mysick.com/en/MM
- www.mysick.com/en/MQ
- 38 TOP PRODUCTS INDUSTRIAL SENSORS | SICK

• Other models available on request or at www.sick.com

Technical details and ordering information

- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67
- Short-circuit protection, pulsed

MM - cylindrical housings

| Housing | Output function | Nominal sensing range [mm] | Output type | Connection | Model name | Part no. |
|---------|--------------------|----------------------------------|-------------|-----------------|----------------|----------|
| | | | NPN | M8, 3-pin | MM08-60ANS-ZTK | 1040068 |
| M8 | Normally apop | 60 | INPIN | Cable, PUR, 2 m | MM08-60ANS-ZUK | 1040066 |
| IVIO | Normally open | 60 | PNP | M8, 3-pin | MM08-60APS-ZTK | 1040067 |
| | | | PINP | Cable, PUR, 2 m | MM08-60APS-ZUK | 1040027 |
| | | 60 | NPN | M12, 4-pin | MM12-60ANS-ZCK | 1040071 |
| | Normally apop | | | Cable, PUR, 2 m | MM12-60ANS-ZUK | 1040026 |
| M12 | Normally open | | PNP | M12, 4-pin | MM12-60APS-ZCK | 1040070 |
| | | | | Cable, PUR, 2 m | MM12-60APS-ZUK | 1040069 |
| | Normally closed | 60 | PNP | Cable, PUR, 2 m | MM12-60APO-ZUK | 1040065 |
| | | | NPN | M12, 4-pin | MM18-70ANS-ZCK | 1040073 |
| | Normally apop | 70 | INPIN | Cable, PUR, 2 m | MM18-70ANS-ZUK | 1040085 |
| M18 | Normally open | nally open 70 | PNP | M12, 4-pin | MM18-70APS-ZCK | 1040072 |
| | | | | Cable, PUR, 2 m | MM18-70APS-ZUK | 1040029 |
| | Normally closed | 70 | PNP | M12, 4-pin | MM18-70APO-ZCK | 1047255 |

MQ - rectangular housings

| Housing (WxHxL) [mm] | Output function | Nominal sensing range [mm] | Output type | Connection | Model name | Part no. |
|----------------------------|--------------------|----------------------------------|-------------|-----------------|----------------|----------|
| | | ormally open 60 | PNP | M8, 3-pin | MQ10-60APS-KT0 | 7900280 |
| 10.2 × 16 × 08 | Newselly | | | Cable, PVC, 2 m | MQ10-60APS-KUO | 7900278 |
| 10.3 x 16 x 28 | Normany open | | | Cable, PVC, 2 m | MQ10-60ANS-KUO | 7900279 |
| | | NPN | M8, 3-pin | MQ10-60ANS-KTO | 7900281 | |

Recommended accessories

| Name | Material | Dimensions | Model name | Part no. |
|------------------|------------------------------|---------------------------|-------------|----------|
| | Samarium-cobalt | Ø: 10 mm, height: 3 mm | MAG-1003-S | 7901782 |
| | AINiCo | Ø: 6 mm, height: 25 mm | MAG-0625-A | 7901783 |
| Magnet | | Ø: 20 mm, height: 6.5 mm | MAG-2006-B | 7901784 |
| Magnet | Barium ferrite | Ø: 30 mm, height: 10 mm | MAG-3010-B | 7901785 |
| | Banumiente | Ø: 31 mm, height: 15 mm | MAG-3015-B | 7901786 |
| | | Ø: 36 mm, height: 19.5 mm | MAG-3515-B | 7902086 |
| | | M8 | BEF-WN-M08 | 5321721 |
| Mounting bracket | Stainless steel | M12 | BEF-WN-M12 | 5308447 |
| | | M18 | BEF-WN-M18 | 5308446 |
| Clomping block | DA10 globa fiber reinforced | M12 | BEF-KHF-M12 | 2051479 |
| Clamping block | PA12, glass fiber reinforced | M18 | BEF-KHF-M18 | 2051481 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets \rightarrow p. 146

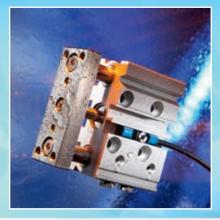
With millimeter precision: cylinder sensors from SICK





MZ2Q

One sensor, two adjustable switching points: saves space, time, and costs



MZT8

MZT8 offers optimum switching characteristics, maximum ease of handling, and is as tough as they come

Cylinder solutions from SICK: precise and reliable detection to enhance productivity

Detecting, measuring, positioning, quality control – all crucial tasks in industrial automation.

MPS in use on an assembly line for

a pneumatic cylinder

analog measurement of piston travel in

Magnetic cylinder sensors from SICK developed for faster and more accurate detection of piston positions in compact pneumatic cylinders offer unprecedented performance levels. This results in wider fields of application for pneumatic cylinders, with new potential for machinery and production plants.

And with our huge range of magnetic cylinder sensors to choose from, we have everything you could need. With features like ease of handling, the option of an analog output, optimum switching characteristics, suitability for use in the food and beverage industry, support for the latest IO-Link technology, and universal mounting options with our comprehensive range of adapters, magnetic cylinder sensors from SICK are equipped for all installation locations and conditions.

MPS



Magnetic cylinder sensors

| Selection table for magnetic cylinder sensors | 42 |
|---|----|
| MPS | 44 |
| MZT8 | 46 |
| MZT6 | 48 |
| MZ2Q | 50 |
| MZN1 | 52 |

Easy to select: Selection guide for magnetic cylinder sensors

| Product | | Cylinder type | | Outpu | ıt type | 0 | utput functio | on |
|---------|--------------------|--|--|-------|---------|--------------------|------------------|--------|
| | Without adapter | With adapter to fit | W x H x D [mm] | PNP | NPN | Normally closed | Normally open | Analog |
| MPS | | | 13.6 x 14.2 x 45/77/109/141/ 173/205/237/269 | | | | | • |
| MZT8 | T-slot | Integrated profile cylinders Tie-rod cylinders | 5 x 5.5 x 24 | • | • | • | • | |
| MZT6 | | Round body cylinders Dovetail groove cylinders SMC rail cylinders ECDQ, CDQ2 | 6.1 x 4.5 x 31.5 | • | • | • | • | |
| MZ2Q | C-slot, T-slot | (,(2 | 6.2 x 4.3 x 19 | • | | | • | |
| MZN1 | C-slot | • SMC rail cylinders ECDQ, CDQ2 | 3.6 x 2.8 x 25 | ÷ | • | • | • | |

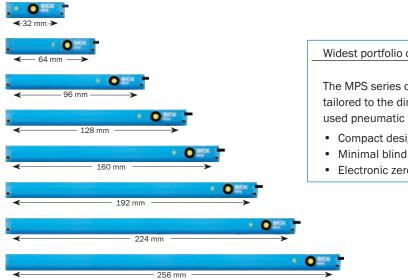
Full "active coverage" of pneumatic cylinders for improved application potential an idea implemented by the MPS position sensors. With sizes from 32 to 256 mm and corresponding ranges of measuring and switching functions:

- 1 ms sampling rate and 0.3 mm linearity set new precision benchmarks in this sensor class, and the MPS features a top-notch operating concept
- · Can be oriented as desired when mounting
- · LED in-range indicator

Example applications

- Magnetic position sensors enable the use of low-cost pneumatic cylinders instead of costly linear drives and offer benefits for all fields of application
- More speed for metering systems
- · More accurate press-in work on automatic assembly machines
- Efficient quality controls
- · Fast product changeovers e.g. for clamping operations



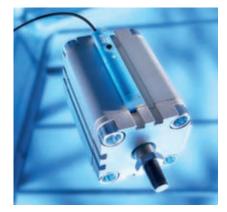


Widest portfolio of measurement!

The MPS series offers a practical variety of sizes, tailored to the dimensions of the most commonly used pneumatic cylinders.

- Compact design
- · Minimal blind zones, wide measuring ranges
- Electronic zero point and end point setting

| Enclosure rating | Conn | ection | Certification | Special features | Page |
|------------------|-------|----------------------|---------------------------------|--|------|
| | Cable | Cable with connector | | | |
| IP 67 | • | • | CE | Analog | 44 |
| IP 68, IP 69K | • | • | | - | 46 |
| IP 68, IP 69K | • | • | C C C LISTED US JohnsonDiversey | Ex ATEX 3D/3G | 48 |
| IP 67 | • | • | CE | 1 sensor – 2 switching points, IO-Link | 50 |
| IP 67 | • | • | | - | 52 |



MPS, magnetic position sensors

Now offering more operating space for low-cost, high-performance pneumatic cylinders – through magnetic position sensors in new sizes.

- Measuring ranges between 32 and 256 mm
- High sampling rate of 1 ms
- Repeatability 0.1 mm
- Resolution 0.05 mm
- Individually teachable measuring ranges
- Time saving installation and evaluation



MZT8, space saving design

Small and rugged, with sensing face on the tip: The MZT8 sensor is the ideal solution for short-stroke pneumatic cylinders, and provides a wealth of technical advantages:

- The shortest sensor on the market, at 24 mm
- ASIC technology from SICK ensures
 optimum switching performance
- IP 68 / IP 69 K
- One-handed assembly using hex key or screwdriver



MZ2Q C and T, magnetic cylinder sensors

An ingenious principle in two sizes for C- and T-slots: MZ2Q series sensors have 2 adjustable switching points.

- Simple 2-point teach-in procedure
- Cabling reduced by half
- Can be mounted from above
- · Can be fully flush mounted into the slot
- IO-Link enabled
- Detection zone up to 50 mm



Product description

The MPS analog position sensors expand the available functionality for pneumatic and hydraulic cylinders. The wide spectrum of measuring ranges makes it possible to cover a great variety of cylinders along their entire stroke. With appropriate functionality in terms of output function, switching and measuring performance, and teaching, many new applications become possible that were previously not possible at all or only with costly systems.

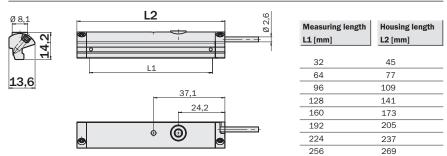
At a glance

- Magnetic position sensor for pneumatic and hydraulic cylinders with T-slot
- Output signal: analog,
- 4 ... 20 mA current and
- 0 ...10 V voltage (in one sensor)
- Maximum precision:
 0.05 mm resolution, 0.1 mm repeatability, 0.3 mm linearity
- Electric setting of zero point and end point via teach-in button

Your benefits

- Maximum flexibility with measuring ranges 32 mm, 64 mm, 96 mm, 128 mm, 160 mm, 192 mm, 224 mm, 256 mm
- Measuring range can be customized using the teach-in function
- Drop-in slot mounting from above makes handling and assembly easy
- Sensor can be oriented as desired when mounting, allowing you to optimize cabling
- Minimal blind zones and therefore no loss of stroke, for optimized application solutions

Dimensions



(6

Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

www.mysick.com/en/MPS

Technical details and ordering information

- Electrical wiring: DC 4-wire
- Supply voltage: 15 ... 30 V DC
- Analog output current: 4 ... 20 mA; voltage: 0 ...10 V
- Operating temperature: -20 ... +70 °C
- Enclosure rating IP 67

- Repeatability: 0.1 mm
- Linearity: +/- 0.3 mm
- Resolution: 0.05 mm
- Measurement output rate: 1 ms
- Impact/oscillation load 30 g, 11 ms/10 ... 55 Hz, 1 mm

| Slot | Output type | Measuring ranges [mm] | Connection type | Model name | Part no. | | | |
|--------|---------------------|--------------------------|--|--------------|----------|--|--------------|---------|
| | | 32 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-032TSTP0 | 1045666 | | | |
| | | | Cable, PUR, 2 m | MPS-032TSTU0 | 1045667 | | | |
| | | 64 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-064TSTP0 | 1045668 | | | |
| | | | Cable, PUR, 2 m | MPS-064TSTU0 | 1045669 | | | |
| | | 96 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-096TSTP0 | 1045670 | | | |
| | | | Cable, PUR, 2 m | MPS-096TSTU0 | 1045671 | | | |
| | Analog | | | | 128 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-128TSTP0 | 1045672 |
| T-slot | | | Cable, PUR, 2 m | MPS-128TSTU0 | 1045673 | | | |
| 1-5101 | 0 10 VDC 4 20 mA | 160 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-160TSTPO | 1050685 | | | |
| | | | Cable, PUR, 2 m | MPS-160TSTU0 | 1050740 | | | |
| | | | Cable with connector, M8 x 1, PUR, 300 mm | MPS-192TSTPO | 1047728 | | | |
| | | | Cable, PUR, 2 m | MPS-192TSTU0 | 1050738 | | | |
| | | 224 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-224TSTPO | 1050686 | | | |
| | | 221 | Cable, PUR, 2 m | MPS-224TSTU0 | 1050741 | | | |
| | | 256 | Cable with connector, M8 x 1, PUR, 300 mm | MPS-256TSTPO | 1050551 | | | |
| | | 200 | Cable, PUR, 2 m | MPS-256TSTU0 | 1050739 | | | |

All M12 models have rotating coupling nuts

Brackets for pneumatic cylinders

| Cylinder type | Material | Model name | Part no. |
|--|---------------|-------------|----------|
| Dovetail groove | Aluminum | BEF-KHZ-ST1 | 2022703 |
| Tie-rod/integrated profile cylinder | Die-cast zinc | BEF-KHZ-PT1 | 2022702 |
| SMC rail cylinder, model ECDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT1 | 2046439 |
| SMC rail cylinder, model CDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT2 | 2046440 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146



Product description

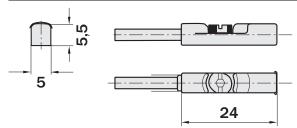
The MZT8 magnetic cylinder sensor is used for detecting the position of pistons in pneumatic cylinders. The MZT8 can be mounted by dropping it directly into the T-slot from above. The MZT8's extreme resilience to shock and vibration, its resistance to media, and its resistance to leaking make it especially well suited to applications where those features are essential.

At a glance

- Magnetic cylinder sensor for pneumatic and hydraulic cylinders with T-slot
- Housing length 24 mm
- Sensor element at the tip of the housing
- SICK-GMR-ASIC technology
- Enclosure rating: IP 68 / IP 69K
- Captive screw
- cULus

- Your benefits
- Shortest sensor on the market allows applications with short-stroke cylinders
- Sensor element at the tip of the sensor – piston detection possible without stroke loss
- Captive fixing screw –
 enables secure and optimized commissioning
- Easy installation: one-handed assembly using hex key
- Compact and flush fitting

Dimensions





www.mysick.com/en/MZT8

Technical details and ordering information

- Supply voltage: 10 ... 30 V DC
- Continuous current output: <= 200 mA •
- Operating temperature: -30 ... +80 °C •

- Enclosure rating: IP 68 / IP 69K
- Impact/oscillation load: 30 g, 11 ms / 10 ... 55 Hz, 1 mm
- Slot Output Output Overrun Connection Model name Part no. type function distance. typical Cable with connector, M8, 3-pin, MZT8-03VPS-KP0 1044458 PUR, 0.3 m Cable with connector, M8, 3-pin, with rotating coupling nut, PUR, MZT8-03VPS-KR0 1044459 4 mm 0.5 m Cable, PUR, 2 m MZT8-03VPS-KU0 1044469 Cable with connector, M12, 3-pin, 1044460 MZT8-03VPS-KQ0 PUR, 0.3 m Normally open Cable with connector, M8, 3-pin, 1048048 MZT8-28VPS-KP0 PUR, 0.3 m PNP Cable, PUR, 2 m MZT8-28VPS-KU0 1048049 Cable with connector, M8, 3-pin, 9 mm T-slot with rotating coupling nut, PUR, MZT8-28VPS-KR0 1048050 0.5 m Cable with connector, M12, 3-pin, MZT8-28VPS-KQ0 1048051 PUR, 0.3 m Cable with connector, M8, 3-pin, MZT8-03VPO-KPO 1044930 PUR, 0.3 m Normally closed 4 mm 1044931 Cable, PUR, 2 m MZT8-03VPO-KU0 Cable with connector, M8, 3-pin, MZT8-03VNS-KP0 1044932 PUR, 0.3 m Cable with connector, M8, 3-pin, NPN Normally open 4 mm with rotating coupling nut, PUR, MZT8-03VNS-KR0 1044935 0.5 m 1044934 Cable, PUR, 2 m MZT8-03VNS-KU0

All M12 models have rotating coupling nut

Brackets for pneumatic cylinders

| Cylinder type | Material | Model name | Part no. |
|---|-------------------------|-----------------|----------|
| Dovetail groove | Aluminum | BEF-KHZ-ST1 | 2022703 |
| Round body cylinder with piston diameter up to 25 mm | Plastic / nickel silver | BEF-KHZ-RT1-25 | 5311171 |
| Round body cylinder with piston diameter up to 63 mm | Plastic / nickel silver | BEF-KHZ-RT1- 63 | 5311172 |
| Round body cylinder with piston diameter up to 130 mm | Plastic / nickel silver | BEF-KHZ-RT1-130 | 5311506 |
| Tie-rod/integrated profile cylinder | Die-cast zinc | BEF-KHZ-PT1 | 2022702 |
| SMC rail cylinder, model ECDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT1 | 2046439 |
| SMC rail cylinder, model CDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT2 | 2046440 |

Cables and connectors → p. 142

Additional mounting brackets → p. 146

Ξ.



Product description

The MZT6 magnetic cylinder sensor is used for detecting the positions of pistons in pneumatic cylinders. The MZT6 can be mounted by dropping it directly into the T-slot from above. With its SICK-GMR-ASIC technology, the switching response of the MZT6 is unsurpassed. The MZT6's high resistance to shock and vibration, its resistance to media, and its resistance to leaking mean it is also suitable for harsh environments.

Enclosure rating: IP 68 / IP 69K

• Fixed in place with combined slot/hex

• Simple "drop-in mounting" is possible

• Combined fixing system: hex socket/

· Compact housing design

• cULus

socket screw

slot screw

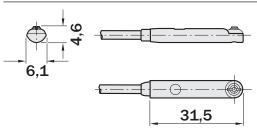
At a glance

- Optimum switching characteristics through SICK-GMR-ASIC technology
- ATEX 3D/3G
- Fits all commonly used cylinders with T-slots, e.g. FESTO or SMC

Your benefits

- Top switching performance allows precision applications
- High resilience to shock and vibration and resistance to media, highly leakproof

Dimensions



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- Data sheet
- Applications
- Additional accessories

www.mysick.com/en/MZT6

Technical details and ordering information

- Supply voltage: 10 ... 30 V DC
- Continuous current output: <= 200 mA
- Operating temperature: -30 ... +80 °C

- Enclosure rating: IP 68 / IP 69K
- Impact/oscillation load 30 g, 11 ms/10 ... 55 Hz, 1mm
- ATEX 3D/3G

MZT6

| Slot | Output type | Output function | Connection | Model name | Part no. |
|--------|-------------|----------------------------------|---|----------------|----------|
| | PNP | Normally open Normally closed | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZT6-03VPS-KP0 | 1023971 |
| | | | Cable with connector, M8, 3-pin, with rotating coupling nut, PUR, 0.5 m | MZT6-03VPS-KR0 | 1023972 |
| | | | Cable, PUR, 2 m | MZT6-03VPS-KU0 | 1043369 |
| T-slot | | | Cable, PVC, 5 m | MZT6-03VPS-KWB | 1025809 |
| | | | Cable with connector, M12, 3-pin, PUR, 0.3 m | MZT6-03VPS-KQ0 | 1025550 |
| | | | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZT6-03VPO-KP0 | 1028741 |
| | NPN | Normally anon | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZT6-03VNS-KP0 | 1029402 |
| | | Normally open | Cable, PVC, 2 m | MZT6-03VNS-KW0 | 1029401 |

MZT6 ATEX

| Slot | Output type | Output function | ATEX | Connection | Model name | Part no. |
|--------|----------------|--------------------|------------------------------|--|----------------|----------|
| | | | | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZT6-03VPS-KPX | 1028629 |
| T-slot | I-slot PNP | Normally | Normally 3D/3G open 3D/3G | Cable with connector, M12, 3-pin, PUR, 0.3 m | MZT6-03VPS-KQX | 1029161 |
| | | open | | Cable, PVC, 2 m | MZT6-03VPS-KWX | 1025827 |

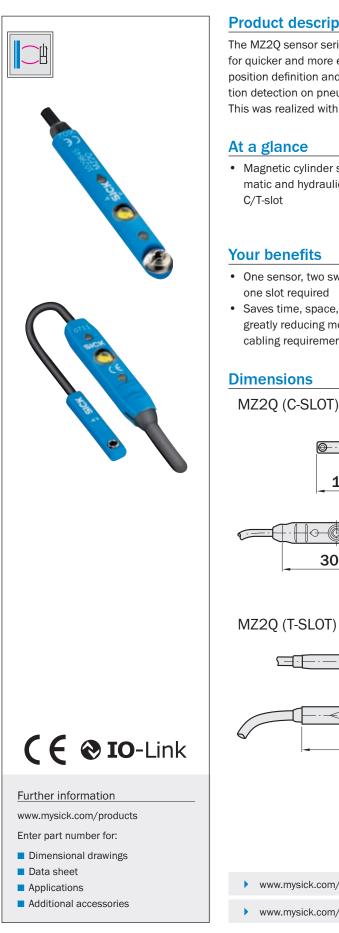
Brackets for pneumatic cylinders

| Cylinder type | Material | Model name | Part no. |
|---|-------------------------|-----------------|----------|
| Dovetail groove | Aluminum | BEF-KHZ-ST1 | 2022703 |
| Round body cylinder with piston diameter up to 25 mm | Plastic / nickel silver | BEF-KHZ-RT1-25 | 5311171 |
| Round body cylinder with piston diameter up to 63 mm | Plastic / nickel silver | BEF-KHZ-RT1- 63 | 5311172 |
| Round body cylinder with piston diameter up to 130 mm | Plastic / nickel silver | BEF-KHZ-RT1-130 | 5311506 |
| Tie-rod/integrated profile cylinder | Die-cast zinc | BEF-KHZ-PT1 | 2022702 |
| SMC rail cylinder, model ECDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT1 | 2046439 |
| SMC rail cylinder, model CDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT2 | 2046440 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146

MZT6



Product description

The MZ2Q sensor series was developed for quicker and more economical end position definition and intermediate position detection on pneumatic cylinders. This was realized with two individually

adjustable switching points in one sensor housing. As a result, only one slot is occupied, greatly reducing mounting and cabling requirements and providing an efficient solution for the application.

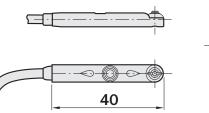
- · Magnetic cylinder sensor for pneumatic and hydraulic cylinders with
- · One sensor with two adjustable switching points
- Detection zone up to 50 mm stroke
- IO-Link communication

Your benefits

- One sensor, two switching points: only one slot required
- · Saves time, space, and costs greatly reducing mounting and cabling requirements
- · Maximum flexibility: detection zone up to 50 mm stroke
- · Allows precision pneumatic applications due to simple and precise definition of two switching points

2,95 19.5 0.5 A 30 4.4

MZ2Q (T-SLOT)





- www.mysick.com/en/MZ2Q-T
- www.mysick.com/en/MZ2Q-C

Technical details and ordering information

- Supply voltage: 12 ... 30 V DC
- Continuous current output: <= 100 mA
- Operating temperature: -20 ... +75 °C

- Enclosure rating: IP 67
- Impact/oscillation load 30 g, 11 ms/10 ... 55 Hz, 1 mm
- Detection zone: up to 50 mm

| Slot | Output type | Output function | Connection | Model name | Part no. |
|--------------|----------------|--------------------|--|----------------|----------|
| | | | Cable, PUR, 2 m | MZ2Q-FTZPS-KU0 | 1029845 |
| T-slot | PNP | Normally open | Cable with connector, M12, 4-pin, PUR, 0.3 m | MZ2Q-FTZPS-KQ0 | 1041323 |
| | | | Cable with connector, M8, 4-pin, with rotating cou- pling nut, PUR, 0.5 m | MZ2Q-FTZPS-KR0 | 1041322 |
| | | | Cable with connector, M8, 4-pin, PUR, 0.3 m | MZ2Q-CFSPSKP0 | 1042242 |
| | PNP | | Cable with connector, M12, 4-pin, PUR, 0.3 m | MZ2Q-CFSPSKQ0 | 1042244 |
| Festo C-slot | | Normally open | Cable with connector, M8, 4-pin, with rotating cou- pling nut, PUR, 0.5 m | MZ2Q-CFSPSKR0 | 1042243 |
| | | | Cable, PUR, 2 m | MZ2Q-CFSPSKU0 | 1042241 |
| | | | Cable with connector, M12, 4-pin, PUR, 0.3 m | MZ2Q-CFLPSKQ0 | 1043697 |
| | | | Cable with connector, M8, 4-pin, PUR, 0.3 m | MZ2Q-CSSPSKP0 | 1042238 |
| | | | Cable with connector, M12, 4-pin, PUR, 0.3 m | MZ2Q-CSSPSKQ0 | 1042240 |
| SMC C-slot | PNP | Normally open | Cable with connector, M8, 4-pin, with rotating cou- pling nut, PUR, 0.5 m | MZ2Q-CSSPSKR0 | 1042239 |
| | | | Cable, PUR, 2 m | MZ2Q-CSSPSKU0 | 1042237 |
| | | | Cable with connector, M12, 4-pin, PUR, 0.3 m | MZ2Q-CSLPSKQ0 | 1043696 |

Brackets for pneumatic cylinders

| Cylinder type | Material | Model name | Part no. |
|---|-------------------------|-----------------|----------|
| Dovetail groove | Aluminum | BEF-KHZ-ST1 | 2022703 |
| Round body cylinder with piston diameter up to 25 mm | Plastic / nickel silver | BEF-KHZ-RT1-25 | 5311171 |
| Round body cylinder with piston diameter up to 63 mm | Plastic / nickel silver | BEF-KHZ-RT1-63 | 5311172 |
| Round body cylinder with piston diameter up to 130 mm | Plastic / nickel silver | BEF-KHZ-RT1-130 | 5311506 |
| Tie-rod/integrated profile cylinder | Die-cast zinc | BEF-KHZ-PT1 | 2022702 |
| SMC rail cylinder, model ECDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT1 | 2046439 |
| SMC rail cylinder, model CDQ 2 (T-slot) | Aluminum | BEF-KHZ-TT2 | 2046440 |
| SMC rail cylinder, model ECDQ 2 (C-slot) | Aluminum | BEF-KHZ-TC1 | 2046441 |
| SMC rail cylinder, model CDQ 2 (C-slot) | Aluminum | BEF-KHZ-TC2 | 2046442 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146

Ε



Product description

The magnetic cylinder sensor is used for detecting the positions of pistons in pneumatic cylinders. The MZN1 can be mounted by dropping it directly into the C-slot from above. With its SICK-GMR-ASIC technology, the switching

At a glance

- Fits all commonly used cylinders with C-slots, e.g. FESTO or SMC
- Optimum switching characteristics
 through SICK-GMR-ASIC technology

Your benefits

- Best in class switching performance
 allows precision applications
- High resilience to shock and vibration and resistance to media, highly leakproof

Dimensions

response of the MZN1 is unsurpassed. The MZN1's high resilience to shock and vibration, its resistance to media, and its resistance to leaking mean it is also suitable for harsh environments.

- Enclosure rating IP 67
- cULus

00

- Simple "drop-in mounting" is possible
- Compact housing design

______3,6 ______25

Further information

www.mysick.com/products

Enter part number for:

Dimensional drawings

- Data sheet
- Applications

Additional accessories

www.mysick.com/en/MZN1

Technical details and ordering information

- Supply voltage: 10 ... 30 V DC
- Continuous current output: <= 100 mA
- Operating temperature: -25 ... +75 °C

- Enclosure rating: IP 67
- Impact/oscillation load 30 g, 11 ms/10 ... 55 Hz, 1 mm

| Slot | Output type | Output function | Connection | Model name | Part no. |
|--------|----------------|-------------------------------------|--|----------------|----------|
| | | | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZN1-06VPS-KP0 | 1022054 |
| | PNP | Normally open Normally closed | Cable with connector, M8, 3-pin, with rotating cou- pling nut, PUR, 0.5 m | MZN1-06VPS-KRD | 1023985 |
| | | | Cable, PUR, 2 m | MZN1-06VPS-KU0 | 1022053 |
| C-slot | | | Cable with connector, M12, 3-pin, PUR, 0.3 m | MZN1-06VPS-KQ0 | 1042443 |
| | | | Cable with connector, M8, 3-pin, with rotating cou- pling nut, PUR, 0.5 m | MZN1-06VPO-KR0 | 1048217 |
| | NDN | Normally open | Cable with connector, M8, 3-pin, PUR, 0.3 m | MZN1-06VNS-KP0 | 1029903 |
| | NPN | | Cable, PUR, 2 m | MZN1-06VNS-KU0 | 1029904 |

Brackets for pneumatic cylinders

| Name | | Material | Model name | Part no. |
|------------------------------------|-------------------------|-----------------|-------------|----------|
| Mounting bracket for mounting on S | SMC rail ECDQ2 (C-slot) | Aluminum | BEF-KHZ-TC1 | 2046441 |
| Mounting bracket for mounting on | SMC rail CDQ2 (C-slot) | Aluminum | BEF-KHZ-TC2 | 2046442 |
| Cables and connectors -> n 142 | Additional mounting br | rooketa 🗈 n 146 | | |

Cables and connectors \rightarrow p. 142

Additional mounting brackets \rightarrow p. 146

Detection. Identification. Positioning. Counting. Photoelectric sensors from SICK.

| | Photoelectric proximity sensors, energetic Sender and receiver in a single housing No reflector required Responds to the reflection from the detected object |
|---------------|---|
| \rightarrow | Photoelectric proximity sensors with background suppression, BGS Detects objects within a defined scanning distance. Objects behind are suppressed. |
| | Photoelectric proximity sensors with foreground suppression, FGS Detects dark and very shiny objects within a defined zone. A defined background is used as a reference, and is covered by an object to produce reliable switching |
| | Photoelectric retro-reflective sensors Sender and receiver in a single housing Different reflector sizes for various scanning ranges and object sizes Polarizing filters allow reflective objects to be detected as well Automatic sensitivity adjustment on sensors for clear material detection |
| • | Through-beam photoelectric sensors Separate sender and receiver, two devices Very long ranges and signal reserves even under harsh conditions Reliable detection of reflective objects |
| | Fiber-optic photoelectric sensors Sender and receiver in a single housing Two fiber-optic cables, choice of proximity switch or through-beam functionality The right fiber-optic cable for every task Especially suitable for tight spaces and harsh environments |



Photoelectric sensors

| | Selection guide for photoelectric sensors Selection guide for sensors for clear material detection Selection guide for sensors for clear material detection Selection | |
|----------|---|-----|
| ļ | Miniature photoelectric sensors | 68 |
| (| Small photoelectric sensors | 84 |
| | Compact photoelectric sensors | 98 |
| | Fiber-optic photoelectric sensors | 108 |
| | Cylindrical photoelectric sensors | 120 |
| | Sensors for roller conveyors and zone control | 136 |

Easy to select: Overview of product families

| Pro | duct family | Dimensions W x H x D [mm] | Photoelectric proximity sensor | Sensing range Photoelectric retro-reflective sensor | Photoelectric through-beam sensor |
|-----------|-----------------------------|--|--------------------------------|---|-----------------------------------|
| | Slim W2 Flat | 7.6 x 20.6 x 12.5 14 x 19.5 x 3.5 | 0.115 m | 0.8 m | 1.2 m |
| ţ, | W4 Slim Standard Inox | 12.2 x 41.8 x 17.3 16 x 39.5 x 12 15.3 x 44.7 x 22.3 | 0.5 m | 5 m | 5 m |
| 1 | W8 / W8 Inox | 11 x 31 x 20 | 0.5 m | 6.5 m | 45 m |
| Į. | W100 | 11 x 32 x 20 | 1 m | 12 m | 35 m |
| I | G6 | 12 x 31.5 x 21 | 0.25 m | 7.2 m | 15 m |
| | W9 | 12 x 40 x 22 12.2 x 52.2 x 23.6 | 0.8 m | 12 m | 50 m |
| | W11 | 15.6 x 48.5 x 42 | 1.1 m | 10 m | 20 m |
| | W12 | 15.6 x 48.5 x 42 | 0.6 m | 18 m | 80 m |
| | W14 | 17.6 x 75.5 x 33.5 | 1.5 m | 17 m | 15 m |
| | W18 | 17.6 x 75.5 x 33.5 | 1m | <mark>7 m</mark> | 20 m |
| | W23 | 24.6 x 80.6 x 54 | 2.3 m | 15 m | - |
| | W27 | 24.6 x 80.6 x 54 | 2.5 m | 19 m | 35 m |
| | W280 | 23.5 x 74.5 x 63 | 1.7 m | 15 m | 45 m |
| | W34 | 27 x 92 x 70 | 2.5 m | 22 m | 60 m |
| | MH15(V) | Ø M18 x 1 | 0.35 m | 3.5 m | 5 m |
| 100 | V180-2 | Ø M18 x 1 | 1.1 m | 7 m | 28 m |
| STO. | V18V | Ø M18 x 1 | 0.8 m | <mark>5 m</mark> | 20 m |
| • | W15 | 16.2 x 48.5 x 31.9 | 0.35 m | 5 m | 5 m |
| P | ELF | 23.8 x 24.3 x 33.6 | 0.1 m | 4.8 m | - |
| `@ | Z-Sensor | 13.6 x 34.8 x 23 13.6 x 45.2 x 31.7 | 0.115 m | 4.8 m | - |

Easy to select: Overview of product families

| | Light | source | | Enclosure rating | Но | using m | naterial | Technology | Page |
|----|-------|-------------------|--------------|--------------------------------|---------|---------|--------------------|----------------------------|------|
| IR | Red | Red Pin- Point | Red Laser | | Plastic | | Stainless steel | | |
| - | | Point | Laser | IP 67 | | - | - | PinPoint | 70 |
| - | | | - | IP 66, IP 67, IP 69K | | - | | PinPoint Sick & IO-Link | 72 |
| - | | - | | IP 66, IP 67, IP 68, IP 69K | | - | | | 76 |
| - | | - | | IP 65, IP 67 | | - | - | | 80 |
| - | | | - | IP 67 | | - | - | PinPoint | 82 |
| | | | | IP 66, IP 67, IP 69K | • | - | - | | 86 |
| - | | - | - | IP 66, IP 67, IP 69K | | - | - | PinPoint | 90 |
| | | | | IP 66, IP 67, IP 69K | - | | - | Pingaint & IO-Link | 92 |
| | | | - | IP 67 | | - | - | PinPoint | 94 |
| - | | - | - | IP 67 | • | - | - | 🚷 IO-Link | 96 |
| | | • | | IP 65 | • | - | - | PinPoint Sick | 100 |
| | | | - | IP 65, IP 69K | • | - | - | PinPoint & IO-Link | 102 |
| - | | - | - | IP 66 | • | - | - | - | 104 |
| - | | - | - | IP 67 | • | - | - | - | 106 |
| • | | | - | IP 67, IP 69K | | - | | PinPoint | 122 |
| - | | - | - | IP 67 | • | | - | - | 126 |
| - | | - | - | IP 69K | - | - | | - | 128 |
| • | | • | - | IP 65 | | - | - | | 130 |
| • | | - | - | IP 67 | | - | - | - | 132 |
| | | - | - | IP 67 | | - | - | - | 134 |

Other devices and configurations on request or at www.sick.com

Easy to select: Photoelectric proximity sensors

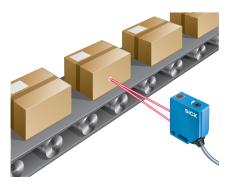
| Produ | ict family | FGS | Sensing range by proxi | nity sensing technology | Energetic | Page |
|-----------|------------|-----------|------------------------|-------------------------|-------------|------|
| 1 | W2 | - | 1 30 mm | - | 1 115 mm | 70 |
| I | W4 | - | 4 180 mm | - | - | 72 |
| Į. | W4 Inox | 20 200 mm | 3 500 mm | - | - | 74 |
| Ņ | W8 | - | 5 300 mm | - | - | 76 |
| 1 | W8 Inox | - | 5 500 mm | - | 0 950 mm | 78 |
| Ŵ | W100 | - | - | - | 0 1000 mm | 80 |
| I | G6 | - | 0 250 mm | - | - | 82 |
| V | W9 | - | 20 800 mm | - | - | 86 |
| 1 | W11 | 30 350 mm | 30 1100 mm | - | 40 1000 mm | 90 |
| | W12 | 35 350 mm | 20 600 mm | - | - | 92 |
| | W14 | - | 100 1300 mm | - | 300 1500 mm | 94 |
| | W18 | - | 50 1000 mm | - | - | 96 |
| | W23 | - | 50 1100 mm | - | 50 2300 mm | 100 |
| | W27 | - | 30 2500 mm | - | - | 102 |
| | W280 | - | - | - | 10 1700 mm | 104 |
| | W34 | - | 100 2500 mm | - | - | 106 |
| | MH15 | - | 3 300 mm | - | 5 350 mm | 122 |
| | MH15V | - | 2 300 mm | - | 10 350 mm | 124 |
| No. | V180-2 | - | 10 300 mm | 1 450 mm | 1 1100 mm | 126 |
| STER. | V18V | - | 0 140 mm | - | 5 800 mm | 128 |
| • | W15 | - | 4 200 mm | - | 10 350 mm | 130 |
| P | ELF | - | - | 1 50 mm | 1 100 mm | 132 |
| `@ | Z-Sensor | - | 0 500 mm | - | 5 115 mm | 134 |

The detection principles in detail:

Photoelectric proximity sensors, energetic

The most affordable solution is the energetic photoelectric proximity sensor with adjustable sensitivity. A light-colored surface reflects more light than a dark one and can therefore be detected from a greater distance away. To achieve similar results with a dark surface, the sensitivity of the sensor must

be increased. Detecting a dark object against a light background will be problematic for energetic sensors. The object is obscured by the brighter background due to its higher reflectivity. Light-colored objects against dark backgrounds are easier to detect.





Photoelectric proximity sensors with foreground suppression, FGS

Photoelectric proximity sensors with foreground suppression (FGS) are able to detect objects at a defined scanning distance. All objects between the scanning distance (set to the background) and the sensor are detected. The foreground is suppressed as a result of the special geometric configuration of the sending and receiving elements. For reliable functioning of these sensors, the

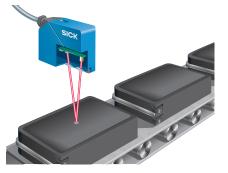
background (for example, a conveyor belt) needs to be relatively bright and should not vary in height.

Photoelectric proximity sensors with background suppression, BGS



Photoelectric proximity sensors with background suppression (BGS) operate on the basis of the geometric relation between the sending and receiving elements. The sensor is set to the object lying on the scanning plane. Signals from objects lying behind the set scanning plane are suppressed. Photoelectric proximity sensors with background suppression can be disrupted by highly reflective

objects in the background, such as panes of glass, polished sheet metal, etc. These effects can increase if there is a non-defined background within the set sensor scanning distance. Shielding or tilting the devices can solve this problem.





Photoelectric proximity sensors with background blanking, BGB



Background blanking can be achieved for photoelectric proximity sensors either optically by changing the geometric relation between the sender and receiver element, or electronically. With the optical solution, the angle between the sent and received beam of light is changed when setting the scanning distance onto the object. Objects at the point of intersection between the two beams are detected. Anything lying behind that is suppressed, as too little or no light from it reaches the receiver element. With the electronic solution, PSD elements (Position Sensitive Device) are used. The sent beam of light is reflected back from the object and strikes the PSD receiver element. Signals from the background are identified as such according to the location of the returning light beam, and are suppressed electronically.

Easy to select: Photoelectric retro-reflective sensors

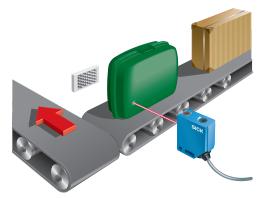
| Product family | | Sensing range by retro-reflective sensing technology Autocollimation Standard Clear material detection | | | | | | | |
|----------------|----------|---|-------------|---|-----|--|--|--|--|
| 10 | W2 | - | 0.045 0.8 m | | 70 | | | | |
| Ĭ | W4 | 0 4 m | - | 0 5 m | 72 | | | | |
| ţ. | W4 Inox | 0 5 m | - | 0 5 m | 74 | | | | |
| Į. | W8 | 0 4 m | - | 0 3 m | 76 | | | | |
| 1 | W8 Inox | - | 0.01 6.5 m | - | 78 | | | | |
| Ņ | W100 | - | 0.08 12 m | - | 80 | | | | |
| I | G6 | - | 0.3 7.2 m | - | 82 | | | | |
| I | W9 | 0 5 m | 0.1 12 m | 0 5 m | 86 | | | | |
| 1 | W11 | - | 0.05 10 m | 0 4 m | 90 | | | | |
| 1 | W12 | 0 18 m | - | 0 4 m | 92 | | | | |
| | W14 | - | 0.15 17 m | - | 94 | | | | |
| | W18 | 0 7 m | - | 0 2 m | 96 | | | | |
| | W23 | - | 0.1 15 m | - | 100 | | | | |
| | W27 | - | 0.1 19 m | 0.5 4.5 m | 102 | | | | |
| | W280 | - | 0.01 15 m | - | 104 | | | | |
| | W34 | - | 0.03 22 m | - | 106 | | | | |
| | MH15 | - | 3.5 m | 0.035 1.5 m | 122 | | | | |
| | MH15V | - | 3.5 m | - | 124 | | | | |
| N | V180-2 | - | 0.05 7 m | - | 126 | | | | |
| YES | V18V | - | 0.1 5 m | 0.1 4.5 m | 128 | | | | |
| • | W15 | - | 0.035 5 m | - | 130 | | | | |
| P | ELF | - | 0 4.8 m | - | 132 | | | | |
| 1 | Z-Sensor | - | 0 4.8 m | - ices and configurations on request or at w | 134 | | | | |

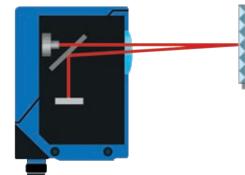
The detection principles in detail:

Photoelectric retro-reflective sensors

With a photoelectric retro-reflective sensor, the emitted light is returned by a reflector and is received and evaluated by the device. Polarizing filters prevent errors when detecting reflective objects. Transparent plastic wrapping and stretch film can affect the functioning of

photoelectric retro-reflective sensors with polarizing filters. In such cases it helps to use devices with reduced sensitivity. The use of laser diodes allows greater scanning ranges while simultaneously maintaining a high resolution. Focus ranges can be set with high precision.



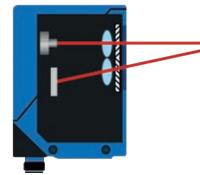


Sensor with autocollimation

Photoelectric retro-reflective sensors with autocollimation

With the autocollimation principle, which unlike the dual lens principle uses only one optical lens, both the beam of light emitted by the sensor and the beam reflected by the reflector lie on a single optical axis. The emitted light passes through a semitransparent mirror before exiting the optical unit. After being returned by the reflector, the beam of light is diverted to the receiver with the aid of the same mirror (see illustration).

This technical principle allows minimization of the so-called blind spot, meaning the area directly in front of the sensor, where an object cannot be detected. That permits reliable detection of the smallest objects even at extremely close range.



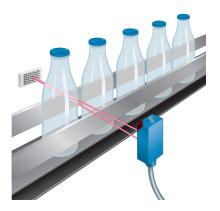
Sensor with dual lens

Photoelectric retro-reflective sensors with standard dual lens

With the dual lens system, the sent and received beams are geometrically separated and are positioned at a small angle to one another. The sent and received beams overlap only in a certain range segment. At close range there is a "blind spot" where an object cannot be detected. When using sensors with dual lens optics, it is therefore important to note the specified minimum range, which should never be undercut.

Photoelectric retro-reflective sensors for detecting clear materials

These photoelectric retro-reflective sensors are characterized by an especially low switching hysteresis. Even minimal light attenuation between the sensor and reflector, such as would be caused by glass bottles or even PET bottles, is detected reliably. An innovative system monitoring feature, continuous threshold adaptation, continuously regulates and adapts the switching threshold in the event of gradual contamination that would otherwise lead to failure.



Easy to select: Through-beam photoelectric sensors

| Produ | ct family | Sensing range for through-beam photoelectric sensors | Page |
|-----------------|-----------|--|------|
| | W2 | 0 1,2 m | 70 |
| 1 | W4 | 0 5 m | 72 |
| ţ, | W4 Inox | 0 5 m | 74 |
| ţ, | W8 | 0 10 m | 76 |
| 1 | W8 Inox | 0 45 m | 78 |
| Ŵ | W100 | 0 35 m | 80 |
| ļ | G6 | 0 15 m | 82 |
| V | W9 | 0 50 m | 86 |
| | W11 | 0 20 m | 90 |
| | W12 | 0 80 m | 92 |
| | W14 | 0 15 m | 94 |
| | W18 | 0 20 m | 96 |
| | W27 | 0 35 m | 102 |
| | W280 | 0 45 m | 104 |
| J | W34 | 0 60 m | 106 |
| | MH15 | 0 5 m | 122 |
| | MH15V | 0 5 m | 124 |
| No. Contraction | V180-2 | 0 20 m | 126 |
| No. | V18V | 0 20 m | 128 |
| • | W15 | 0 5 m | 130 |

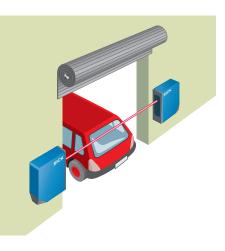
Other devices and configurations on request or at www.sick.com

The through-beam photoelectric sensor in detail:

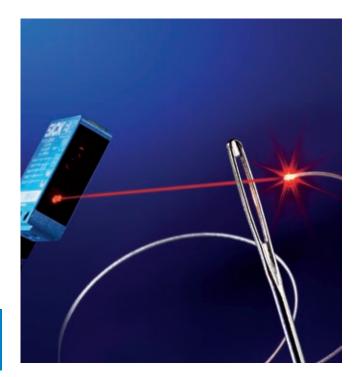


Through-beam photoelectric sensors are composed of two devices, a sender and a receiver. They are physically separate from one another and each are contained in its own housing. The sender contains a light emitting diode (LED) or laser diode, and the receiver detects the incident light with a photodiode.

The separation of sender and receiver allows extremely long scanning ranges, especially with the use of laser diodes. They can therefore reliably detect opaque and reflective objects. However, they are not well suited for clear material detection.



SICK technology: Laser and PinPoint





Light spot: extremely small along its entire length

Sensors equipped with a laser diode allow for the precise detection of objects, no matter how small, thanks to the extremely small laser beam. They are also ideal for applications where the laser beam needs to be guided through small openings or holes.

Features

- Extremely small light spot for highly precise detection tasks
- Light spot diameter of 0.1-2 mm
- Extremely long sensing ranges for photoelectric retro-reflective sensors and through-beam sensors
- Simple installation due to highly visible light spot
- Safety through laser classes 1 and 2

Series with laser and PinPoint technology:



W100 Laser, technology in mini housing

- One of the smallest laser sensors on the market
- Simple alignment thanks to red light laser
- Switching frequency of 2000 Hz
- Polarizing filter for reliable detection
 of shiny objects
- Laser protection class 1



W9 Laser, advanced technology in a compact housing

- Advanced laser technology for performance in a compact housing
- Temperature-compensated laser protection electronics for constant laser performance and compliance with the laser protection class
- Small design with outstanding performance
- Adjustable background suppression
- UL, CE, CDRH approvals for worldwide use



W12-2 Laser, proven in use thousands of times

- Best laser photoelectric sensor performance in metal housing
- The original tried and tested thousands of times in applications
- Precise autocollimation optics
- Adjustable focus for the photoelectric retro-reflective sensor
- High switching frequency of 2.5 kHz
- Laser protection class 1 and 2

Other devices and configurations on request or at www.sick.com



Light spot: extremely small and highly visible

PinPoint is an innovative red light LED in SICK's photoelectric sensor products. The PinPoint LED concentrates the energy into a small area, increasing the light intensity and visibility of the light spot. This makes it much easier for the user to align a photoelectric sensor, creating opportunities for increasing the sensing ranges of the photoelectric retro-reflective and proximity sensors.

Features

- Simple commissioning due to highly visible homogenous light spot
- Light spot diameter of 1–12 mm (depending on sensor type and scanning range)
- · Increased sensing distances in the red emitted light range
- No laser safety measures required
- Wide temperature range from -40 to +60 °C
- Long service life of the PinPoint LED





W4-3, W4-3 Inox, W4S-3, miniature sensors

- Best-in-class performance
- Best background suppression in its class
- Best suppression of extraneous light
- IO-Link
- Brightest light spot in its class
- Autocollimation photoelectric retroreflective sensor for transparent objects, with continuous threshold adaptation



W12-3, best performance in a metal housing

- Tough metal housing with dovetail mounting
- Setting by potentiometer, teach-in, or double teach-in
- High reliability in industrial environments, such as with ambient light, optical reflections, and devices mounted opposite one another
- Optional Teflon coating
- Rotatable M12 connector
- IO-Link



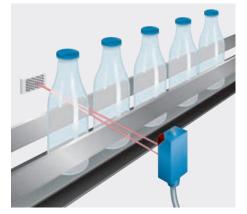
MH15, MH15V, cylindrical photoelectric sensors

- · Best-in-class performance
- Shortest housing in its class provides access to applications with tight installation conditions
- Small, highly visible light spot
- Model with stainless steel housing available for use in the food & beverage industry

Other devices and configurations on request or at www.sick.com

Easy to select: Sensors for clear material detection

| Ρ | roduct | Dimensions W x H x D [mm] | Sensing range max. | Dete 0 % | ctable attenu 10 % | uation rar _ 18 % | 100% | Continuous threshold adaptation | Auto- collimation |
|----------|---------------|---------------------------------|-----------------------|-------------|-----------------------|----------------------|------|---------------------------------------|----------------------|
| Ì | WLG4S | 12.2 x 41.8 x 17.3 | 0 5 m | | | | | | |
| I | WLG4S Inox | 15.3 x 44.7 x 22.3 | 0 5 m | | | | | | |
| Ņ | WL8G | 11 x 31 x 20 | 0 3 m | | | | | - | - |
| | WL9G | 12.2 x 23.6 x 52.5 | 0 5 m | | | | | | |
| | WL11G | 15.6 x 48.5 x 42 | 0 4 m | | | | | - | |
| ١ | WL12G | 15 x 49 x 41.5 | 0 4 m | | | | | | - |
| | WL18 | 17.6 x 75.5 x 33.5 | 0 2 m | | | | | - | |
| | WL27 | 24.6 x 80 x 54.2 | 0.5 4.5 m | | | | | | - |
| | MH15 | Ø M18 x 1 | 0.035 1.5 m | | | | | - | - |
| West . | V18V | Ø M18 x 1 | 4.5 m | | | | | - | - |

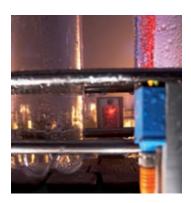


Signal attenuation due to an object in the light path

Transparent objects such as plastic wrap, film, glass and PET bottles lower the intensity of light reflected back to the sensor. This signal weakening or attenuation varies depending on the transparency of the object.

Advanced SICK technologies such as continuous threshold adaptation and autocollimation principle provide reliable detection of highly transparent objects such as plastic wrapping or PET bottles which cause only very minimal signal attenuation in the light path.

| Examples of the signal attenuation of various materials | | | | | | | |
|---|--|--|--|--|--|--|--|
| About 10% signal attenuation | Clean PET bottles, clear glass, thin and clear films (e.g. cellophane), household plastic film, plastic wrapping | | | | | | |
| About 18% signal attenuation | Clean clear glass bottles, thick films, film and wrap- ping folded multiple times | | | | | | |
| About 40% signal attenuation | Green and brown glass, colored glass bottles | | | | | | |

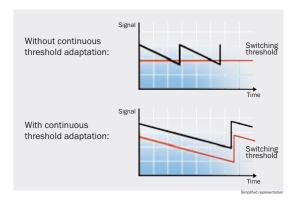


| Light source Connection | | Enclosure rating | Adjustment | | | | Light spot size | Page | | | |
|-------------------------|----|---------------------|------------|---------|-------------------------|---------------------|----------------------|---------|--------------------|--|-----|
| Red | IR | Con- nector | Cable | Pigtail | | Teach-in [cable] | Teach-in [button] | IO-Link | Potentio- meter | | |
| | - | | - | - | IP 66, IP 67 | - | | - | - | 45 mm at 1.5 m | 72 |
| | - | | | - | IP 66, IP 67, IP 69K | | - | - | - | 45 mm at 1.5 m | 74 |
| | - | | - | - | IP 67 | - | - | - | | 70 mm at 2 m | 76 |
| | - | | - | - | IP 66, IP 67, IP 69K | - | | - | - | 45 mm at 1.5 m | 86 |
| | - | | - | - | IP 67 | - | - | - | | 25 mm at 1.5 m | 90 |
| • | • | • | - | - | IP 67, IP 69K | • | • | • | - | 25 mm at 1.5 m / 8 x 13 mm at 200 mm | 92 |
| | - | - | - | | IP 65, IP 67 | - | | - | - | 70 mm at 2 m | 96 |
| | - | - | - | | IP 67 | - | | - | - | 50 mm line | 102 |
| | - | | - | - | IP 67 | - | - | - | | 25 mm at 1 m | 122 |
| | - | | - | - | IP 67, IP 69K | - | | - | - | 60 mm at 1 m | 128 |

Continuous threshold adaptation

Photoelectric sensors designed for the detection of transparent objects feature continuous threshold adaptation, which enables adaptation to optical conditions.

For example, if these are impaired due to contamination, such as dust on the sensor lenses, the sensor adjusts itself to the new conditions with the aid of continuous threshold adaptation, guided by microprocessor analysis.



Other devices and configurations on request or at www.sick.com

Maintenance of the devices is therefore not necessary until contamination is so heavy as to reach the system limits of the glass sensor. In other words, significantly later than with conventional sensors. The signal and the threshold return to the original level automatically after cleaning.

This guarantees enhanced performance, even under harsh and contaminant-heavy application conditions.



Photoelectric sensors Miniature photoelectric sensors

Best in class – minimum size for the toughest requirements





W4 Space-saving design



W8 W8 sensors provide reliable detection even in harsh industrial conditions

Performance that won't be overlooked: SICK's mini sensors

High performance combined with minimum space requirements: the challenge for sensor technology. Tiny machines, intricate and convoluted systems, the toughest ambient conditions,

Sensors scan highly transparent films

under extreme space restrictions

and objects of any kind – the answer to this combination comes from SICK. Equipped with the latest PinPoint LED, intelligent ASIC, microcontroller and IO-Link technologies, packed into rugged, ultracompact housings, combined with a wide assortment of accessories, these sensors offer the reliable solution for the widest possible range of applications and installation conditions.



Miniature photoelectric sensors

| 1 | W2 70 Subminiature photoelectric sensor family | |
|----------|---|--|
| Ì | W4 72 Photoelectric sensor family with best-in-class features | |
| ļ | W4 Inox 74 The stainless steel version for harsh environments | |
| Ì | W8 76 Small, fast, and reliable at close range | |
| | W8 Inox 78 Minimum effort with maximum resistance and variety | |
| Ì | W100 80 Miniature photoelectric sensors for standard applications | |
| İ | G6 82 Global sensor – the economic way to business class | |





Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

Product description

The subminiature photoelectric sensor family is available in two housing shapes, Flat and Slim. The use of optical one-chip systems in highly integrated IC technology provide subminiature sensors with extraordinary performance characteristics. The W2 in Flat housing, with a height of just 3.5 mm, can be installed practically anywhere. The

At a glance

- Sturdy overmolded housing with metal sleeves for M3 fixing bolts
- Photoelectric proximity sensors with precise BGS and fixed focusing. Two sensing distances with 15 mm and 30 mm are available.

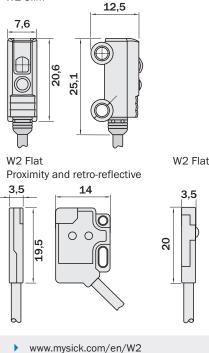
Your benefits

- High performance solutions for very tight spaces
- The laser-like light spot means fast response time with high repeatability and precise switching points, allowing higher process speeds
- The high enclosure rating and the sturdy housing allow for use in harsh ambient conditions

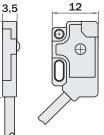
- W2 in Slim housing offers an outstanding BGS sensor with a laser-like light spot, despite its miniature size, allowing precise, repeatable detection tasks to be carried out in the tightest of spaces. Photoelectric retro-reflective sensors and through-beam photoelectric sensors in Slim housing enable detection at long sensing ranges.
- Enclosure rating IP 67
- All models with M8 cable connector
- PinPoint LED in all W2 Slim models
- Compact and space saving machine designs resulting from high scanning ranges onto small reflectors
- Stable detection of transparent films under varying process conditions, without the use of reflectors

Dimensions

W2 Slim



W2 Flat Through-beam



W2

- Light source: Red PinPoint
- Enclosure rating: IP 67

- Metal-reinforced fixing holes
- Cable and cable connector in M8 size available

W2 Slim

| Sensor type | Sensing technology | Sensing range | Output type | Operating mode | Connection | Model name | Part no. |
|------------------|-----------------------|------------------|----------------|----------------------|-----------------------|--------------|----------|
| BGS Proximity | | 1 30 mm | PNP | Light | M8, 3-pin, pigtail | WT2S-P231 | 1022659 |
| | 1 30 mm | NPN | Light | Cable 2 m, 3-wire | WT2S-N131 | 1022663 | |
| | Bas | 1 15 mm | PNP | Light | M8, 3-pin, pigtail | WT2S-P211 | 1022658 |
| | | | NPN | Light | Cable 2 m, 3-wire | WT2S-N111 | 1022662 |
| | Energetic | 1 55 mm | PNP | Light | M8, 3-pin, pigtail | WT2S-P261 | 1023640 |
| Retro-reflective | Standard | 0.045 0.8 m | PNP | Dark | M8, 3-pin, pigtail | WL2S-F211 | 1023868 |
| Through-beam | Standard | 0 1.2 m | PNP | Dark | M8, 3-pin, pigtail | WS/WE2S-F213 | 1023650 |

W2 Flat

| Sensor type | Sensing technology | Sensing range | Output type | Operating mode | Connection | Model name | Part no. |
|-------------------------------------|-----------------------|------------------|----------------|-----------------------|-----------------------|--------------|----------|
| Energetic, V optics Proximity | 2 18 mm | PNP | Light | Cable, 2 m | WT2F-P140 | 6030584 | |
| | | 1 9 mm | PNP | Light | M8, 3-pin, pigtail | WT2F-P270 | 6030589 |
| Proximity | | 2 34 mm | PNP | Light | Cable, 2 m | WT2F-P150 | 6030580 |
| Energetic | 4 115 mm | PNP | Light | M8, 3-pin, pigtail | WT2F-P280 | 6030574 | |
| Through-beam | Standard | 0 0.5 m | PNP | Dark | M8, 3-pin, pigtail | WS/WE2F-F210 | 6030570 |

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. | |
|--|-----------------|------------------------|---|---------------|----------|--|
| Ball-and-socket bracket | | Plastic | - | BEF-GH-Mini01 | 2023160 | |
| Mounting bracket | Floor mounting | Zinc plated steel | - | BEF-W2S-A | 4034748 | |
| | Wall mounting | Zinc plated steel | - | BEF-W2S-B | 4034749 | |
| | | Zinc plated steel | - | BEF-W2S-C | 2033270 | |
| Reflector | O halo mounting | Diantia | 20 x 32.5 | PL10F | 5311210 | |
| Reflector | 2-hole mounting | Plastic | 20 x 60 | PL20A | 1012719 | |
| Reflector, round | Self adhesive | Plastic | Ø 25.5 | PL22-2 | 1003621 | |
| Cables and connectors \rightarrow p. 142 | Addition | al reflectors → p. 148 | Additional mounting brackets \rightarrow p. 146 | | | |



The W4 miniature photoelectric sensors cater to every need with availability in the Flat, Slim and Teflon housing. The W4 family features excellent detection characteristics, high immunity to ambient light and other sources of interference, and mounting stability. Whether transparent, reflective, or textured, all objects are detected reliably. With the advancement of miniaturization in most industries, these miniature sensors are keeping pace.

At a glance

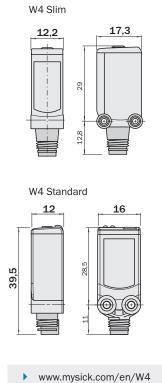
- Different housing shapes provide quick and compact integration into the machine
- PinPoint technology in all models
- Integrated threaded inserts for mounting
- Precise background suppression (best in class)

Your benefits

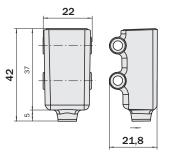
- Secure and precise setting with 5-turn potentiometer or teach-in button
- High process reliability, even with jet black objects, such as solar wafers and black textiles, will be detected reliably
- Easy and accurate alignment of the sensors, with PinPoint technology, makes the light spot clearly visible

- Teach-in via IO-Link, externally via cable, potentiometer, or teach-in button
- Photoelectric retro-reflective sensor for transparent objects, with automatic adaptation of switching threshold
- A range of light spot geometries, specially tailored to applications
- Photoelectric proximity sensors with a line-shaped light spot allow reliable detection of textured objects such as electronic circuit boards
- Detection of reflective and clear materials
- Great variety of customer-specific designs

Dimensions



W4 Standard Teflon



G

- Light source: Red PinPoint LED
- Enclosure rating: IP 67

- Supply voltage: 10 ... 30 V DC
- ng: IP 67

W4 Slim

- Proximity sensors and photoelectric retro-reflective sensors with IO-Link available
- Response time (proximity sensors and photoelectric retroreflective sensors): 0.5 ms

| Sensor type | Sensing technology | Sensing range | Output type | Operating mode | Additional function | Connection | Model name | Part no. |
|----------------------|-----------------------|------------------|-------------|--------------------|----------------------|-----------------------|--------------|----------|
| Proximity BGS | | 4 400 | PNP | Light | External teach-in | M8, 4-pin | WTB4S-3P2264 | 1042034 |
| | 4 180 mm | NPN | Light | Potentio- meter | Cable 2 m, 3-wire | WTB4S-3N1361 | 1042046 | |
| | 4 120 mm | PNP | Light | Potentio- meter | M8, 4-pin | WTB4S-3P2231 | 1042057 | |
| | | 4 120 mm | NPN | Light | External teach-in | Cable 2 m, 4-wire | WTB4S-3N1134 | 1042052 |
| | Autocollima- tion | 0 4 m (PL80A) | PNP | Complemen- tary | Fixed setting | M8, 4-pin | WL4S-3P2230 | 1042066 |
| Retro- reflective | Autocollima- | 0 5 m (PL80A) | PNP | Comple- mentary | - | M8, 4-pin | WLG4S-3P2232 | 1044186 |
| | tion 1) | | | Dark | Alarm output | M8, 4-pin | WLG4S-3V2232 | 1042087 |
| Through- beam | Standard | 0 5 m | PNP | Dark | - | M8, 3-pin, pigtail | WSE4S-3F3130 | 1042089 |

¹⁾ Transparent object detection

W4 Standard

Output type: PNP (NPN devices at www.sick.com)

| Sensor type | Sensing tech- nology | Sensing range [mm] | Operating mode | Additional function | Connection | Model name | Part no. |
|-------------|-------------------------|-----------------------|---|---------------------------|-----------------------|--------------|----------|
| | | 4150 | Light | - | M8, 3-pin | WTB4-3P2161 | 1028099 |
| | Proximity BGS | | Complementary | IO-Link | M12, 4-pin | WTB4C-3P3464 | 1040119 |
| Proximity | | 3 50 | Complementary | Line shaped light spot | M8, 3-pin, pigtail | WTV4-3P2271 | 1046644 |
| | 4 120 | Light | Teflon hous- ing, external teach-in | Cable 5 m, 4-wire | WTB4T-3P1264 | 1028091 | |

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|--|-----------------|------------------------------|--------------------|------------------------------|----------|
| Universal clamp system | - | Zinc plated steel | - | BEF-KHS-N08 | 2051607 |
| Ball-and-socket bracket | - | Plastic | - | BEF-GH-Mini01 | 2023160 |
| Mounting bracket | Wall mounting | Stainless steel | - | BEF-W4-A | 2051628 |
| Protective bracket | Floor mounting | Stainless steel | - | BEF-SW-W4S | 2051497 |
| Reflector | 2 hole mounting | Plastic | 20 x 32.5 | PL10F | 5311210 |
| Reflector | 2-hole mounting | Plastic | 20 x 60 | PL20A | 1012719 |
| Reflector, round | Self adhesive | Plastic | Ø 25.5 | PL22-2 | 1003621 |
| Cables and connectors \rightarrow p. 142 | 2 Ad | ditional reflectors → p. 148 | Additi | ional mounting brackets → p. | 146 |



The W4S-3 Inox photoelectric sensor series combines a tough stainless steel housing with best-in-class performance. Operation is robust and 100% sealed with the use of a stainless steel membrane, via cable, or by IO-Link. The glass photoelectric sensor reliably detects all known

objects, thanks to continuous adaptation of the switching threshold. The diffuse sensor with background suppression is the best in its class. The W4S-3 lnox thus performs its tasks more reliably and for longer in hygienically critical and harsh environments.

At a glance

- · Can be used in conditions above and bevond IP 69K
- Stainless steel housing (316L/1.4404)
- Available in Washdown and Hygiene housing designs
- · Can be cleaned with steam cleaners up to 80 °C

Your benefits

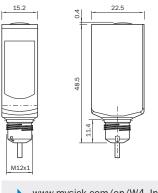
Dimensions

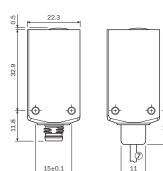
- · High machine availability due to longlife sensor, which resists the harshest conditions
- · No restrictions in choice of cleaning procedures
- Reliable detection of all objects

- · Resistant to all well-known cleaning agents
- All transparent objects are detected by the glass photoelectric sensor
- All models with PinPoint technology
- · Extremely quick and easy set-up with teach-in membrane or external teach-in
- Can be set with new stainless steel membrane teach-in switch or via cable
- · Simple and fast alignment due to highly visible PinPoint light spot
- Monitoring via IO-Link

W4S-3 Inox 32.9 11.8 2 3 М8 15.3

W4S-3 Inox Hygiene







www.mysick.com/en/W4_Inox

C

- Light source: Red PinPoint LED
- Enclosure rating: IP 66, IP 67, IP 69K
- Output type: PNP (IO-Link), NPN

- Inputs: ET (teach-in via cable), IO-Link
- Housing design: Washdown version
- Adjustment via metal teach-in membrane

W4S-3 Inox

| Sensor type | Sensing technology | Sensing range | Output type | Operating mode | Connection | Additional function | Model name | Part no. |
|------------------|-------------------------|------------------|--------------------|--------------------|--------------------------------|---------------------|----------------|----------|
| | | | PNP | Comple- | M12, 4-pin | - | WTB4S-3P2462V | 1054675 |
| | | 3 500 mm | FINF | mentary | M8, 4-pin | IO-Link | WTB4SC-3P2262V | 1045092 |
| Proximity | BGS | | NPN | Comple- mentary | Cable 2 m, 4-wire | - | WTB4S-3N1162V | 1046391 |
| | 3 120 mm | PNP | Comple- mentary | M8, 4-pin | - | WTB4S-3P2232V | 1046396 | |
| | FGS | 20 200 mm | PNP | Comple- mentary | M8, 4-pin | - | WTF4S-3P2262V | 1046410 |
| | | 04 m | PNP | Comple- mentary | M8, 4-pin | - | WL4S-3P2230V | 1045095 |
| Retro-reflec- | Autocollima- | | NPN | Dark | Cable 2 m, 3-wire | - | WL4S-3E1330V | 1046420 |
| tive | tion | 0 5 m | 2112 | Dark | M8, 4-pin | Alarm output | WL4S-3V2232V | 1046422 |
| | | 0 | PNP | Comple- mentary | M12, 4-pin, pigtail, 150 mm | - | WL4S-3P3432V | 1046426 |
| Retro-reflec- | Continuous threshold | 05 m | PNP | Dark | M8, 4-pin | External teach-in | WLG4S-3F2234V | 1047653 |
| tive 1) the | adaptation | 0 5 M | NPN | Comple- mentary | Cable 2 m, 4-wire | - | WLG4S-3N1132V | 1046450 |
| Through- beam | Standard | 0 5 m | PNP | Dark | M8, 3-pin, pigtail | - | WSE4S-3F2130V | 1045099 |

1) Clear material detection

W4S-3 Inox Hygiene

| Sensor type | Sensing technology | Sensing range | Output type | Operating mode | Connection | Model name | Part no. |
|------------------|---|---------------|-------------|----------------|----------------------------------|---------------|----------|
| Proximity | BGS | 3 500 mm | PNP | Light | M8, 4-pin, pigtail, 150 mm | WTB4S-3P3264H | 1048047 |
| Retro-reflective | Retro-reflective Clear material detection | 0 5 m | PNP | Dark | M8, 4-pin, pigtail, 150 mm | WLG4S-3F3234H | 1048121 |
| | | 0 5m | NPN | Complementary | Cable, 2 m, 4-wire | WLG4S-3N1132H | 1048123 |

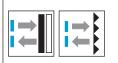
Recommended accessories

| | | • | | |
|------------------------|---|---|---|--|
| Plate and clamp | Stainless steel 1.4571 | - | BEF-KHS-N08N | 2051616 |
| Mounting rod straight | Stainless steel 1.4571 | 300 | BEF-MS12G-NB | 4058915 |
| Rod mounting clamp | Aluminium | 37 x 26,4 x 30 | BEF-RMC-D12 | 5321878 |
| Wall mounting | Stainless steel 1.4571 | - | BEF-W4-A | 2051628 |
| For W4S-3 Inox Hygiene | Stainless steel 1.4571 | Ø 18 x 100 | BEF-MR18G-NA | 4065853 |
| Chemical resistant | Plastic | 47 x 47 | P250CHEM | 5321097 |
| | Mounting rod straight Rod mounting clamp Wall mounting or W4S-3 Inox Hygiene | Mounting rod straightStainless steel 1.4571Rod mounting clampAluminiumWall mountingStainless steel 1.4571For W4S-3 Inox HygieneStainless steel 1.4571 | Mounting rod straightStainless steel 1.4571300Rod mounting clampAluminium37 x 26,4 x 30Wall mountingStainless steel 1.4571-For W4S-3 Inox HygieneStainless steel 1.4571Ø 18 x 100 | Mounting rod straightStainless steel 1.4571300BEF-MS12G-NBRod mounting clampAluminium37 x 26,4 x 30BEF-RMC-D12Wall mountingStainless steel 1.4571-BEF-W4-AFor W4S-3 Inox HygieneStainless steel 1.4571Ø 18 x 100BEF-MR18G-NA |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146



W8



Product description

The W8 is a high-quality, miniature product family specially designed for close-range applications. Autocollimation, background suppression, and high switching frequencies of 2 kHz open up a broad range of possible applications

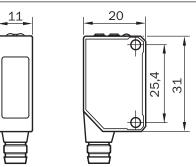
At a glance

- Miniature housing with integrated M3 threaded mounting holes
- Switching frequency up to 2 kHz

Your benefits

- Maximum flexibility in the design and operation of facilities thanks to reliable detection of objects in any situation
- Quick and easy mounting thanks to universally compatible M3 thread
- Even quickly running applications release a 2 kHz switching frequency, so that production processes can be optimized

Dimensions



for these sensors. The series comprises the WTB8 proximity switch and the WL8 photoelectric retro-reflective sensor. The housing design with M3 threaded inserts can be mounted easily and securely.

- BEF-W100-A stainless steel mounting bracket (1.4301/304) included in the delivery
- Everything complete at the installation site – the stainless steel mounting bracket is included in delivery
- Everything from one family a wide variety of principles of operation, brought together, reduces the documentation work

C



Enter part number for:

Dimensional drawings

- Data sheet
- Applications

Additional accessories

- Adjustment: potentiometer
- Operating mode: light/dark with rotary switch
- Enclosure rating: IP 67
- Switching frequency: Up to 2 kHz

W8

| Sensor type | Sensing technology | Output type | Sensing range | Connection | Model name | Part no. |
|------------------|--|-------------|------------------------|------------------------|------------|----------|
| | | PNP | 5100 mm ¹⁾ | Connector M8, 3-pol | WTB8-P2111 | 6033213 |
| Proximity | BGS | | 30300 mm ¹⁾ | Connector M8, 4-pin | WTB8-P2231 | 6033209 |
| | | | | Cable 2m, PVC | WTB8-N1131 | 6033204 |
| | Autokollimation | PNP | 04 m (PL80A) | Connector M8, 4-pin | WL8-P2231 | 6033182 |
| Retro-reflective | Autokollimation, transparent objects | PNP | 03 m (PL80A) | Connector M8, 4-pin | WL8G-P2231 | 6033188 |
| Throug-beam | - | PNP | 010 m | Connector M8, 4-pin | WSE8-P2231 | 6035583 |

1) Objects to be detected having 90% remission (based on DIN 5033 Standard White)

W8 Red laser

Red laser protection class 1

| Sensor type | Sensing technology | Output type | Sensing range | Light spot size | Model name | Part no. |
|---------------|-----------------------|-------------------------|------------------------|-----------------|-------------|----------|
| Proximity BGS | | | 5 100 mm ¹⁾ | 1 mm at 100 mm | WTB8L-P2211 | 6033227 |
| | NPN | 30 300 mm ¹⁾ | 1.5 mm at 300 mm | WTB8L-P2231 | 6033221 | |

¹⁾ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Comment | Model name | Part no. |
|---------------------------------|-----------------------|--|------------------------------|-------------------|--------------------|----------|
| Universal clamp system (UKS) | Plate and clamp | Clamp: Stainless steel (1.4408), Plate: Stainless steel (1.4571 | - | - | BEF-KHS-N08N | 2051616 |
| | Mounting rod straight | Stainless steel (1.4571) | 300 | - | BEF-MS12G-NB | 4058915 |
| | Rod mounting clamp | Aluminum | 37 x 26,4 x 30 | - | BEF-RMC-D12 | 5321878 |
| Manuating by alcat | Wall mounting | Stainless steel | 29,3 x 14 x 32,4 | - | BEF-W100-A 1) | 5311520 |
| Mounting bracket | Floor mounting | Stainless steel | 44,6 x 16 x 21,2 | - | BEF-W100-B 1) | 5311521 |
| Deflector | Standard | PMMA/ABS | 47 x 47 (Reflection area) | - | P250 ¹⁾ | 5304812 |
| Reflector | Fine triple | PMMA/ABS | 47 x 47 (Reflection area) | For laser sensors | P250F 1) | 5308843 |

¹⁾ Included in delivery Cables and connectors → p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146





W8 Inox is a miniature product family especially for applications in harsh am-bient conditions. The high-quality stainless steel housing (1.4404/ SUS316L) in combination with highperformance plastics means these sensors are suitable for a broad range of applications. The mounting system is compatible with the mounting by M3 thread introduced to the market. Beside

At a glance

- Robust stainless steel housing 1.4404/316L with enclosure rating IP 69K
- Front screen made of thermically and chemically resistant high-performance plastic PPSU
- Control element made of mechanically stable high-performance plastic PEEK

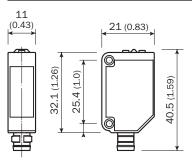
Your benefits

- High system availability, even when aggressive cleaning agents or cooling lubricants are used, is guaranteed by enclosure rating IP 69K and mechanically robust stainless steel housing
- Quick and easy mounting thanks to universally compatible M3 thread

its convincing LED technology, W8 Inox is appealing due to the minimal effort required for mounting and maximum resistance and variety in the product range. The four models – through-beam and photoelectric retro-reflective sensors and energetic photoelectric proximity sensors and those with background suppression (BGS) – provide a convincing solution for customers worldwide.

- Materials with FDA approval
- Sharply defined, highly visible light spot
- M3 threaded mounting hole and stainless steel mounting bracket (1.4301/304)
- Minimum space requirement due to compact housing (same construction as W8 plastic version)
- Easy alignment of the sensor thanks to a sharply defined and highly visible light spot
- Everything complete at the installation site – the stainless steel mounting bracket is included in the delivery

Dimensions



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Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

www.mysick.com/en/W8_Inox

- Housing material: Stainless steel 1.4404 / 316L
- Light source: red light

- Adjustment: potentiometer
- Operating mode: light/dark with rotary switch

• Enclosure rating: IP 69K

W8 Inox

| Sensor type | Sensing technology | Sensing range | Output type | Connection | Model name | Part no. |
|------------------|-----------------------|--------------------------|-------------|---|-------------|----------|
| | | 10 500 mm ¹⁾ | PNP | Connector M8, 3-pin | WTB8-P2131V | 6041466 |
| | Background | 10 500 mm - | NPN | Connector M8, 4-pin | WTB8-N2231V | 6041463 |
| Durativeite | suppression | 5 150 mm 1) | PNP | Cable, 3-wire, PVC, 2 m | WTB8-P1111V | 6041457 |
| Proximity | | | NPN | Cable with plug, M12, 4-pin, PVC, 300 mm | WTB8-N3311V | 6041456 |
| | Energetic | 0 950 mm ¹⁾ | PNP | Cable with plug, M12, 4-pin, PVC, 300 mm | WTE8-P3331V | 6041476 |
| Retro-reflective | Standard | 0.01 6.5 m ²⁾ | PNP | Cable with plug, M12, 4-pin, PVC, 300 mm | WL8-P3331V | 6041484 |
| Through-beam | Standard | 0 45 m | PNP | Cable with plug, M12, 4-pin, PVC, 300 mm | WSE8-P3331V | 6041492 |

 $^{\scriptscriptstyle 1)}$ Object with 90 % reflectance (referred to standard white DIN 5033)

²⁾ with reflector P250

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|-----------------------|--|------------------------------|--------------|----------|
| Universal clamp system (UKS) | Plate and clamp | Clamp: Stainless steel (1.4408), Plate: Stainless steel (1.4571 | - | BEF-KHS-N08N | 2051616 |
| | Mounting rod straight | Stainless steel (1.4571) | 300 | BEF-MS12G-NB | 4058915 |
| | Rod mounting clamp | Aluminum | 37 x 26,4 x 30 | BEF-RMC-D12 | 5321878 |
| Mounting hypolest | Wall mounting | Stainless steel | 29,3 x 14 x 32,4 | BEF-W100-A | 5311520 |
| Mounting bracket | Floor mounting | Stainless steel | 44,6 x 16 x 21,2 | BEF-W100-B | 5311521 |
| Reflector | Standard | PMMA/ABS | 47 x 47 (Reflection area) | P250 | 5304812 |
| | Chemical resistant | Plastic | 47 x 47 (Reflection area) | P250CHEM | 5321097 |

Cables and connectors \rightarrow p. 142

Additional mounting brackets → p. 146





The W100 is a complete family of photoelectric sensors in miniature format, which provide large scanning ranges for standard applications. The well-established housing design with M3 threaded inserts allows simple, standardized, and inexpensive mounting. The W100 is available with a standardized emitter LED, with a bright light LED, or in a laser version. The W100 is therefore an all-purpose, economical option – particularly for handling and warehousing systems.

Connector and cable versions

• Extensive range of accessories

• Light/dark switchover

· Complete product family

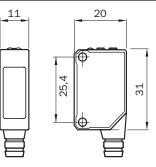
At a glance

- Standardized miniature housing with integrated M3 threaded mounting holes
- Optics with standardized red LED, bright light LED or laser LED

Your benefits

- Simple, standardized mounting
- Highly visible light spot or laser light spot
- Everything from one family a wide variety of principles of operation, brought
- together, reduces the documentation effort

Dimensions





- Applications
- Additional accessories

- Enclosure rating: IP 65 / 67 (depending on type)
- Adjustment: potentiometer

- Operating mode: light/dark with rotary switch
- Switching frequency: 1 kHz

W100

| Sensor type | Sensing technology | Light source | Output type | Sensing range | Connection | Model name | Part no. |
|------------------|-------------------------------------|--------------|-------------|-------------------------|------------------------|---------------------------|----------|
| | | Redlight | PNP | 0 900 mm ¹⁾ | Connector M8, 3-pol | WT100-P3419 | 6026116 |
| Proximity | Energetic | Ū | NPN | 0 900 mm ¹⁾ | Cable, PVC, 2m | WT100-N1419 | 6026113 |
| | | BrightLight | PNP | 0 1000 mm ¹⁾ | Connector M8, 4-pol | WT100-P4409 ²⁾ | 6036506 |
| | Standard | Redlight | PNP | 0,01 6 m | Connector M8, 3-pol | WL100-P3439 | 6026073 |
| Retro-reflective | | BrightLight | NPN | 0,1 7,5 m | Connector M8, 4-pol | WL100-P4409 ²⁾ | 6036512 |
| | Standard, transparent objects | Redlight | PNP | 0,01 3 m | Connector M8, 4-pol | WL100-P4429 | 6028611 |
| Throug-beam | _ | BrightLight | PNP | 0 30 m | Connector M8, 4-pol | WS/WE100-P4409 2) | 6036518 |
| moug-beam | | Redlight | NPN | 0 15 m | Cable, PVC, 2m | WS/WE100-N1439 | 6026040 |

 $^{\rm 1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White) $^{\rm 2)}$ IP 67

W100 Red laser

| Output type: PN | IP | | | | | |
|-------------------------------------|-----------------------|------------------------|-----------------|------------------------|-----------------|----------|
| Sensor type | Sensing technology | Sensing range | Light spot size | Connection | Model name | Part no. |
| Proximity | Energetic | 0 450 mm ¹⁾ | 2 mm at 400 mm | Connector M8, 4-pol | WT100L-F2241 | 6030704 |
| Retro-reflective | Standard | 0.08 12 m | 12 mm at 10 m | Connector M8, 3-pol | WL100L-F2131 | 6030709 |
| Throug-beam | - | 0 35 m | 30 mm at 30 m | Cable, PVC, 2 m | WS/WE100L-F1131 | 6030714 |

 $^{\scriptscriptstyle (1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

Recommended accessories

| | | [mm] | | Model name | Part no. |
|-----------------------|--|--|---|---|--|
| Plate and clamp | Clamp: Stainless steel (1.4408), Plate: Stainless steel (1.4571 | - | - | BEF-KHS-N08N | 2051616 |
| Mounting rod straight | Stainless steel (1.4571) | 300 | - | BEF-MS12G-NB | 4058915 |
| Rod mounting clamp | Aluminium | 37 x 26,4 x 30 | - | BEF-RMC-D12 | 5321878 |
| Wall mounting | Stainless steel | 29,3 x 14 x 32,4 | - | BEF-W100-A1) | 5311520 |
| Floor mounting | Stainless steel | 44,6 x 16 x 21,2 | - | BEF-W100-B1) | 5311521 |
| Standard | PMMA/ABS | 47 x 47 (Reflection area) | - | P2501) | 5304812 |
| Fine triple | PMMA/ABS | 47 x 47 (Reflection area) | For laser sensors | P250F1) | 5308843 |
| | Mounting rod straight Rod mounting clamp Wall mounting Floor mounting Standard | Plate and clampPlate: Stainless steel (1.4571Mounting rod straightStainless steel (1.4571)Rod mounting clampAluminiumWall mountingStainless steelFloor mountingStainless steelStandardPMMA/ABS | Plate and clampPlate: Stainless steel (1.4571Mounting rod straightStainless steel (1.4571)300Rod mounting clampAluminium37 x 26,4 x 30Wall mountingStainless steel29,3 x 14 x 32,4Floor mountingStainless steel44,6 x 16 x 21,2StandardPMMA/ABS47 x 47 (Reflection area)Fine triplePMMA/ABS47 x 47 | Plate and clamp Plate: Stainless steel (1.4571) - - Mounting rod straight Stainless steel (1.4571) 300 - Rod mounting clamp Aluminium 37 x 26,4 x 30 - Wall mounting Stainless steel 29,3 x 14 x 32,4 - Floor mounting Stainless steel 44,6 x 16 x 21,2 - Standard PMMA/ABS 47 x 47 (Reflection area) - Fine triple PMMA/ABS 47 x 47 For laser sensors | Plate and clampPlate: Stainless steel (1.4571BEF-KHS-N08NMounting rod straightStainless steel (1.4571)300-BEF-MS12G-NBRod mounting clampAluminium37 x 26,4 x 30-BEF-RMC-D12Wall mountingStainless steel29,3 x 14 x 32,4-BEF-W100-A1)Floor mountingStainless steel44,6 x 16 x 21,2-BEF-W100-B1)StandardPMMA/ABS47 x 47 (Reflection area)-P2501)Fine triplePMMA/ABS47 x 47 (Reflection area)For laser sensorsP250E1) |

Cables and connectors → p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146

W100

features. With PinPoint LEDs, metal so-

ckets, large-sized, bright indicator LEDs, user-friendly setting screws plus IP 67

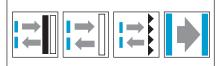
and the very latest SICK-ASIC technology,

the Global Sensor leaves the standard

· Large, user-friendly setting screws • Bright, large-sized indicator LEDs

trailing well behind it.

• Enclosure rating IP 67





Product description

G6 global sensor - photoelectric sensor series in miniature housing with optimal price/performance ratio. Even when mounted using a standard 1-inch hole distance, the global sensor performs outstandingly in all function-relevant

At a glance

- PinPoint LED for an extra bright, precise light spot
- Robust metal inserts with inner thread
- · SICK-ASIC the result of decades of experience in photoelectric sensors

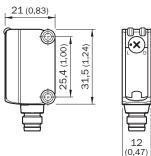
Your benefits

- Easy-to-align and precise detection with highly visible PinPoint light spot
- · Easy-to-mount with maximum robustness due to metal inserts with inner thread
- SICK-ASIC for performance and reliability

• Easy-to-adjust with large, user-friendly setting screws

- · Easy-to-monitor due to extra bright, large-sized indicator LEDs
- Easily installed with SICK accessories

Dimensions





- Applications
- Additional accessories

- Light source: Red PinPoint LED
- Enclosure rating: IP 67

- Operating mode: Light/dark-switching, selectable via light/dark selector
- Switching frequency: 1 kHz

| G6 | Global | Sensor |
|----|--------|--------|
|----|--------|--------|

| Sensor type | Sensing technology | Sensing range | Adjustment | Output type | Connection | Model name | Part no. |
|------------------|-----------------------|-------------------------|---------------|-------------|--|--------------|----------|
| | | | | PNP | Connector M8, 4-pin | GTB6-P4211 | 1052438 |
| Proximity | BGS | 0 250 mm ¹⁾ | | FINF | Cable, 3-wire, PVC, 2 m | GTB6-P1211 | 1052440 |
| Proximity | BUS | 0 250 mm 7 | Potentiometer | NPN | Connector M8, 4-pin | GTB6-N4211 | 1052439 |
| | | | | | Cable, 3-wire, PVC, 2 m | GTB6-N1211 | 1052441 |
| | | 0.3 7.2 m ²⁾ | _ | PNP | Connector M8, 4-pin | GL6-P4111 | 1050706 |
| | | | | | Cable, 3-wire, PVC, 2 m | GL6-P1111 | 1050708 |
| Retro-reflective | | | | | Pigtail, M8, 4-pin, PVC, 200 mm | GL6-P0511S03 | 1052911 |
| Relio-Tellective | Standard | | | | Pigtail, M12, 4-pin, PVC, 300 mm | GL6-P7111 | 1052966 |
| | | | | NPN | Connector M8, 4-pin | GL6-N4111 | 1050707 |
| | | | | INFIN | Cable, 3-wire, PVC, 2 m | GL6-N1111 | 1050709 |
| Through-beam | | 0 15 m | | PNP | Cable, 3-wire, PVC, 2 m | GSE6-P1111 | 1052448 |
| Through-beam | - | 0 15 III | - | NPN | Cable, 3-wire, PVC, 2 m | GSE6-N1111 | 1052449 |

 $^{\scriptscriptstyle 1)}$ Object with 90 % reflectance (referred to standard white DIN 5033)

²⁾ PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|-----------------------|--------------------------|------------------------------|--------------|----------|
| | - | Steel, zinc coated | - | BEF-KHS-L01 | 2051607 |
| Universal clamp system (UKS) | Mounting rod straight | Stainless steel (1.4571) | 300 | BEF-MS12G-NB | 4058915 |
| (0.10) | Rod mounting clamp | Aluminum | 37 x 26,4 x 30 | BEF-RMC-D12 | 5321878 |
| Mounting hypotrat | Wall mounting | Stainless steel | 29,3 x 14 x 32,4 | BEF-W100-A | 5311520 |
| Mounting bracket | Floor mounting | Stainless steel | 44,6 x 16 x 21,2 | BEF-W100-B | 5311521 |
| Reflector | Standard | PMMA/ABS | 47 x 47 (Reflection area) | P250 | 5304812 |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146

Photoelectric sensors Small photoelectric sensors

The packaging wizard – handy helpers for process optimization







W18 Presence checking in the textile industry



W12 The W12 – for reliable clear material detection

Innovation and cost efficient: SICK's small sensors

The wet world of the beverage industry, the design requirements of the packaging industry, and cigarette manufacturing at top speeds – all pose special challenges for sensors.

Equipped with the latest PinPoint LED, intelligent ASIC, μ C and IO-Link technologies, packed into easy-to-

handle advanced housing technology, these small sensors detect each object, even under difficult conditions. High performance electronics combined with sophisticated optics enable reliable detection even of difficult or transparent objects in the world of consumer goods. Communication capabilities with innovative IO-Link technology and intelligent electronics provide long-term reliability for applications and functions by remote control. Flexible mounting and connection systems help with optimum integration.

Photoelectric sensors Small photoelectric sensors



Small photoelectric sensors

| W9-3 | 86 |
|---|----|
| W9 Laser | 88 |
| W11 | 90 |
| W12 | 92 |
| W14 | 94 |
| W18 For demanding industrial applications | 96 |





EC&LAB

PinPpint SICK

Further information www.mysick.com/products Enter part number for: Dimensional drawings

Additional accessories

Data sheetApplications

VISTAL[™]

IP

69K

Product description

The W9-3 is robustness, performance and variance in a compact housing size. With the VISTAL[™] housing comes a outstanding mechanical robustness, optics and ASIC technology by SICK generates the best-in-class performance. All this is available in a unique variance regarding connection, mounting variability and optic spezifications available. – These features makes the W9-3 a perfect solution for the challeging automation application.

Add this advantage to your machine.

At a glance

- Performance in ultra-robust VISTAL[™] housing
- PinPoint LED for highly visible and precise light spot
- Automatic switching threshold adjustment (depending on type)
- Your benefits
- Robustness with the VISTAL[™] housing
- Best-in-class performance
- hole patternWide range of facilities for connecting

• Two emitter LEDs for best-in-class

Variable mounting with M3 or M4

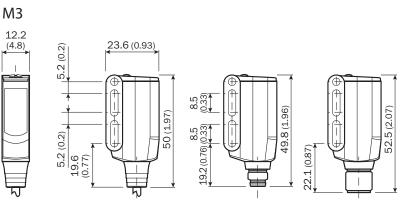
background suppression

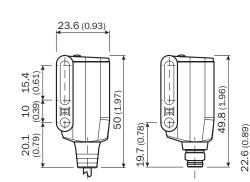
• Wide variance in connection, mouting and optics

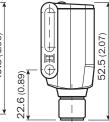
Dimensions

M4

(4.8)







- Light source: Red PinPoint LED
- Enclosure rating: IP 66, IP 67, IP 69K
- Switching output: PNP, complementary

- Operating temperature: -40°C ... +60°C
- Chemical resistance certified by ECOLAB
- For NPN devices, see www.sick.com

W9-3

| Sensor type | Sensor technology | Mounting (Slotted holes) | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|----------------------|----------------------|--------------------------------|-----------------|------------------|-------------------------------------|--|----------------|----------|
| | | noics) | | | | Connector M8, 4-pin | WTB9-3P1161 | 1049043 |
| | | | | | | Connector M12, 4-pin | WTB9-3P2261 | 1049047 |
| | | | PinPoint | 350 mm | Potentiome- ter, 5-turn | Cable, 4-wire, PVC, 2 m | WTB9-3P2461 | 1049049 |
| | | M3 | | | | Cable with plug, M12, 4-pin, PVC, 120 mm | WTB9-3P3461 | 1049051 |
| | | | | | Potentiome- | Connector M8, 4-pin | WTB9-3P2211 | 1049045 |
| Proximity | BGS | | IR | 500 mm | ter, 5-turn Connector M12, 4-pin | | WTB9-3P2411 | 1049048 |
| | | | IIX | | Potentiome- | Connector M8, 4-pin | WTB9-3P2211S14 | 1052171 |
| | | | | 800 mm | ter, 5-turn | Connector M12, 4-pin | WTB9-3P2411S14 | 1052172 |
| | | M4 | PinPoint | 350 mm | Potentiome- | Connector M8, 4-pin | WTB9M4-3P2261 | 1051889 |
| | | | | | ter, 5-turn | Connector M12, 4-pin | WTB9M4-3P2461 | 1051891 |
| | | | | 500 mm | | Connector M8, 4-pin | WTB9M4-3P2211 | 1051888 |
| | | | IR | | Teach | Connector M12, 4-pin | WTB9M4-3P2411 | 1051890 |
| | | | | | - Teach | Cable, 4-wire, PVC, 2 m | WL9-3P1130 | 1049055 |
| | | | | 5 m | | Connector M8, 4-pin | WL9-3P2232 | 1049060 |
| | Autocollima- | M3 | PinPoint | | | Connector M12, 4-pin | WL9-3P2432 | 1049063 |
| Detre | tion | | | | leach | Cable with plug, M12, 4-pin, PVC, 120 mm | WL9-3P3432 | 1049067 |
| Retro- reflective | | | | | | Connector M8, 4-pin | WL9M4-3P2234 | 1051906 |
| Teneotive | | M4 | PinPoint | 5 m | Teach | Connector M12, 4-pin | WL9M4-3P2432 | 1051896 |
| | | | | | | Connector M8, 4-pin | WL9G-3P2232 | 1049082 |
| | Transparent | M3 t | PinPoint | 5 m | Teach | Connector M12, 4-pin | WL9G-3P2432 | 1049083 |
| | objects | cts M4 | | | | Connector M8, 4-pin | WL9M4G-3P2232 | 1051899 |
| | | | PinPoint | 5 m | Teach | Connector M12, 4-pin | WL9M4G-3P2432 | 1051900 |
| Throug- | | | | | Potentiome- | Connector M8, 4-pin | WSE9-3P2230 | 1049076 |
| beam | - | M3 | PinPoint | 10 m | ter, 5-turn | Connector M12, 4-pin | WSE9-3P2430 | 1049077 |

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|-----------------------------------|-------------------|--------------------|-------------|----------|
| Universal clamp system (UKS) | 90° bracket | Zinc-plated steel | - | BEF-KHS-N08 | 2051607 |
| Mounting bracket | 90° bracket | Zinc-plated steel | 17 x 44 x 17 | BEF-WN-W9-2 | 2022855 |
| | | | 20 x 40 | PL20A | 1012719 |
| Deflector | | PMMA/ABS | 40 x 60 | PL40A | 1012720 |
| Reflector | 2-hole mounting | | 47 x 47 | P250 | 5304812 |
| | | | 80 x 80 | PL80A | 1003865 |
| Mask card | Slot width: 0,5/1,0/1,5/2,0 mm | - | - | BL-9-2 | 4033253 |

Cables and connectors \rightarrow p. 142

8013958/2011-08-29 Subject to change without notice Η





The W9 Laser series is as multifaceted as the field of automation itself. Even in tight installation conditions, the compact housing enables powerful and reliable laser sensors to be used. The microlaser spot reliably solves tasks involving applications with the smallest of objects and high precision requirements. The wide range combined with output logic, principles of operation, and types of connection means that a huge variety of sensor types is available to choose from.

 Photoelectric sensor and throughbeam system with teach-in and large

sensing ranges

• UL, CE, CDRH approval

At a glance

- Advanced laser technology for performance and safety
- Temperature-compensated laser protection electronics for constant laser power and compliance with the laser class
- High-precision adjustable photoelectric proximity sensor with background suppression

Your benefits

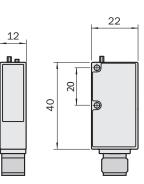
- High availability with maximum eye protection due to laser control
- Precise micro-laser spot detection of the smallest of objects and features
- Approvals for worldwide use
- Easily installed with SICK accessories

Dimensions





- Applications
- Additional accessories



www.mysick.com/en/W9_Laser

- Light source: Red laser class 2
- Enclosure rating: IP 67, IP 69K
- Operating mode: Complementary

W9 Red laser

• Light source: Red laser class 2

| Sensor type | Sensor technology | Mounting (Slotted holes) | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|----------------|-------------------------------|--------------------------------|-------------------------|--------------------|------------|--------------|--------------|----------|
| | | | | | PNP | M12, 4-polig | WT9L-P430 | 1023959 |
| Provimity | Proximity BGS 0,5 mm at 60 mm | 0,5 mm | 30 150 mm ¹⁾ | Potentio- meter | PINP | M8, 4-polig | WT9L-P330 | 1023977 |
| FIOAIIIIIty | | at 60 mm | | | NPN | M12, 4-polig | WT9L-N430 | 1023990 |
| | | | | | | M8, 4-polig | WT9L-N330 | 1023991 |
| Retro- | Standard | 1 mm | 0,1 12 m ²⁾ | Teach-in | PNP | M12, 4-polig | WL9L-P430 | 1023958 |
| reflective | reflective Standard at 500 n | at 500 mm | 0,1 12 111 / | | PNP | M8, 4-polig | WL9L-P330 | 1023976 |
| Through- | | 1 mm | 0 50 | Teach-in | PNP | M12, 4-polig | WS/WE9L-P430 | 1023992 |
| beam | - | at 500 mm | 0 50 m | 0 50 m | | M8, 4-polig | WS/WE9L-P330 | 1023993 |

• Chemcial resistance certified by ECOLAB and

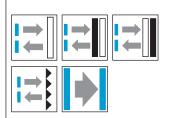
JohnsonDiversey

 $^{\scriptscriptstyle (1)}\mbox{Objects}$ to be detected having 90% remission (based on DIN 5033 Standard white)

²⁾With reflector PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|--|-----------------|------------------------------|--------------------|------------------------------|----------|
| Universal clamp system (UKS) | - | Zinc-plated steel | - | BEF-KHS-N08 | 2051607 |
| Mounting bracket | 90° bracket | Zinc-plated steel | 17 x 44 x 17 | BEF-WN-W9-2 | 2022855 |
| | | | 18 x 18 | PL10F | 5311210 |
| Fine twinle weflector | | PMMA/ABS | 16 x 28 | PL20F | 5308844 |
| Fine triple reflector | 2-hole mounting | | 47 x 47 | P250F | 5308843 |
| | | | 45 x 76 | PL81-1F | 5325060 |
| Reflective tape | Self-adhesive | - | 225 x 225 | REF-AC1000 | 5319429 |
| Cables and connectors \rightarrow p. 142 | 2 Ad | ditional reflectors → p. 148 | Additi | ional mounting brackets → p. | 146 |





W11-2 represents sensor technology designed optimally for individual applications, thus enabling a wide range of applications in automation technology. Whether in the material handling industry or in packaging systems, the

W11-2 offers optimum performance in a rugged small housing, dependable object detection, and high reliability in industrial environments.

The W11-2 caters to every need.

Versatile mounting options with

dovetail

pression

options

housing

through holes, slotted holes and

Complete series from clear material

· Flexibility in installation due to rotat-

Universal application potential due

to wide range of products in rugged

Easily installed with SICK accessories

ing connector and versatile mounting

detection through to background sup-

At a glance

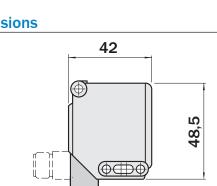
- Outstanding background suppression through OES3 technology
- Highly visible and precise light spot due to PinPoint LED
- Compact and rugged plastic housing
- Connection via cable or sturdy rotating connector

Your benefits

- Reliable detection thanks to superior background suppression and high immunity to ambient light
- Fast installation due to highly visible light spot

Dimensions

15,6



Further information

www.mysick.com/products

Enter part number for:

Dimensional drawings

- Data sheet
- Applications

Additional accessories

- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 69K
 - (devices with push button teach: IP 67)

- Operating mode: Complementary
- Operating temperature: -30°C ... +60°C
- Rugged plastic housing
- Rotatable M12 connector or rotatable cable

| Sensor type | Sensing technology | Sensing range | Output type | Adjustment | Connection | Model name | Part no. |
|-------------|------------------------|--------------------------|----------------|---------------|------------|--------------|----------|
| | BGS | 30 1100 mm ¹⁾ | PNP | Potentiometer | M12, 4-pin | WTB11-2P2461 | 1044442 |
| | DGS | 40 350 mm ¹⁾ | PNP | Potentiometer | M12, 4-pin | WTB11-2P2431 | 1041376 |
| Proximity | FGS | 30 350 mm ¹⁾ | PNP | Potentiometer | M12, 4-pin | WTF11-2P2431 | 1041380 |
| | Energetic | 40 1000 mm ¹⁾ | PNP | Teach-in | M12, 4-pin | WTE11-2P2432 | 1041381 |
| | | 40 1000 mm - | NPN | Teach-in | M12, 4-pin | WTE11-2N2432 | 1041383 |
| | BGS | 40 350 mm ¹⁾ | NPN | Potentiometer | M12, 4-pin | WTB11-2N2431 | 1041378 |
| | | 0.05 m10 m ²⁾ | NPN | - | M12, 4-pin | WL11-2N2430 | 1041387 |
| Retro- | Standard | | PNP | - | M12, 4-pin | WL11-2P2430 | 1041385 |
| reflective | | | PNP | Teach-in | M12, 4-pin | WL11-2P2432 | 1048542 |
| | Transparent objects | 0 4 m ²⁾ | Qp and Qn | Potentiometer | M12, 4-pin | WL11G-2B2531 | 1041390 |
| Through- | Standard | dard 0 20 m | NPN | - | M12, 4-pin | WSE11-2N2430 | 1041396 |
| beam | Standard | | PNP | - | M12, 4-pin | WSE11-2P2430 | 1041394 |

 $^{\scriptscriptstyle (1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

2) With reflector PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|------------------------------|-----------------------------------|-------------------|--------------------|--------------|----------|
| Universal clamp system (UKS) | - | Zinc plated steel | - | BEF-KHS-N02 | 2051608 |
| Mounting bracket, large | 90° bracket | Stainless steel | - | BEF-WG-W12 | 2013942 |
| Mounting bracket, small | 90° bracket | Stainless steel | - | BEF-WK-W12 | 2012938 |
| Protective housing | For universal clamp | Zinc plated steel | - | BEF-SG-W12-3 | 2045175 |
| | 2-hole mounting | | 20 x 60 | PL20A | 1012719 |
| | | PMMA/ABS | 40 x 60 | PL40A | 1012720 |
| Reflector | | | 84 x 84 | PL80A | 1003865 |
| | Suitable up to 100 °C | PMMA/ABS | 52 x 62 | P250H | 5315124 |
| | Center hole mounting | PMMA/ABS | Ø 83 | C110A | 5304549 |
| Mask card for WSE11-2 | Slot width: 0.5/1.0/1.5/2.0 mm | - | - | BL12-SKN | 4031815 |
| | | | | | |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146



For your applications, do you expect optical sensors that can cope with demanding tasks, are suited to high process speeds, and achieve high reliability in industrial environments? Then the new W12-3 series is the right choice. W12-3: the complete range of small photoelectric sensors in metal housings offers

At a glance

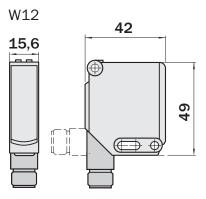
- Best-in-class optical performance due to superior OES technology
- Autocollimation optics
- Background suppression with second emitter LED
- Highly visible and precise light spot due to PinPoint LED; IR emitter and laser classes 1 and 2 available
- Compact and sturdy metal housing, Teflon coating optional

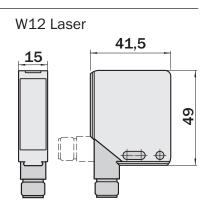
Your benefits

- Maximum electrical, optical, and mechanical performance
- Fast installation due to highly visible light spot
- Flexibility in mounting due to rotating connector and versatile mounting options

- clear advantages over conventional optical sensors in areas of object detection, reliability in industrial environments, and sensor monitoring. Whether in packaging technology, the pharmaceutical industry, food environments, or the bottling industry – the W12-3 is the right choice every time.
- Connection via cable or sturdy rotating connector
- Versatile mounting options with through holes, blind holes, slotted hole and dovetail
- IO-Link communication
- Unprecedented variety of product options including laser
- Versatile sensor for a wealth of applications in industrial environments
- IO-Link enables remote diagnostics and remote maintenance
- Easily installed with SICK accessories

Dimensions





- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 69K (devices with push button teach: IP 67)

- Operating mode: Complementary
- Can be set via potentiometer or push button teach-in
- Sturdy metal housing, optional Teflon coating
- Rotatable M12 connector or rotatable cable

W12

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Connection, M12 connector | Model name | Part no. |
|------------------|--------------------------|---------------|---|--------------|------------------------------|---------------|----------|
| | | Red | 20 350 mm ¹⁾ | PNP | 4-pin | WTB12-3P2431 | 1041411 |
| | BGS | | | NPN | 4-pin | WTB12-3N2431 | 1041416 |
| Proximity | DGS | IR | 20 600 mm ¹⁾ | PNP | 4-pin | WTB12-3P2411 | 1041422 |
| | | IT | 20 000 mm | NPN | 4-pin | WTB12-3N2411 | 1041427 |
| | FGS | Red | | PNP | 4-pin | WTF12-3P2431 | 1041404 |
| | | | 35 350 mm ¹⁾ | NPN | 4-pin | WTF12-3N2431 | 1041408 |
| | | | | PNP, IO-Link | 4-pin | WTF12C-3P2431 | 1042001 |
| | BGS | Red | $20 \ldots 350$ mm $^{\scriptscriptstyle 1)}$ | PNP, IO-Link | 4-pin | WTB12C-3P2431 | 1042002 |
| | Autocollimation | Red | 0 7 m ²⁾ | PNP | 4-pin | WL12-3P2431 | 1041436 |
| | Autocommation | Reu | | NPN | 4-pin | WL12-3N2431 | 1041440 |
| Retro-reflective | Clear material detection | Red | 0 4 m ²⁾ | Qp and Qn | 5-pin | WL12G-3B2531 | 1041456 |
| | Clear material | Red, PinPoint | 0 4 m ²⁾ | PNP | 5-pin | WL12G-3P2572 | 1053535 |
| | detection ³⁾ | IR | 0 4 m ²⁾ | PNP | 5-pin | WL12G-3P2582 | 1053536 |
| Through-beam | Standard | Red | 0 20 m | PNP | 4-pin | WSE12-3P2431 | 1041459 |

 $^{\rm 1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

²⁾ With reflector PL80A

W12 Red laser

- Red laser, laser protection class 1 or laser protection class 2
- Operating range from -10 C ° to +50 °C

³⁾ Adaptable switching threshold

• With WL: adjustable focus and sensitivity

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Connection, M12 connector | Model name | Part no. |
|------------------|-----------------------|----------------------|-------------------------|-------------------------|------------------------------|----------------|----------|
| Proximity | BGS | Red laser class 1 | 30 200 mm ¹⁾ | PNP/NPN 3) | 5-pin | WT12L-2B551 | 1047958 |
| | DGO | Red laser class 2 | 30 200 mm ¹⁾ | PNP/NPN 3) | 5-pin | WT12L-2B530 | 1018250 |
| Retro-reflective | Auto- collimation | Red laser class 1 | 0 18 m ²⁾ | PNP/NPN 3) | 5-pin | WL12L-2B531 | 1047959 |
| | | Red laser class 2 | 0 18 m ²⁾ | PNP/NPN 3) | 5-pin | WL12L-2B530 | 1018252 |
| Through-beam | Standard | Red laser class 1 | 0 80 m | PNP, comple- mentary | 4-pin | WS/WE12L-2P431 | 1047960 |
| | | Red laser class 2 | 0 80 m | PNP, comple- mentary | 4-pin | WS/WE12L-2P430 | 1018254 |

 $^{\rm 1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White) $^{\rm 2)}$ With reflector PL80A

 $^{\scriptscriptstyle 3)}$ Switching type can be selected via control cable

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|-----------------------------------|--------------------|--------------------|--------------|----------|
| Universal clamp system (UKS) | - | Zinc plated steel | - | BEF-KHS-N02 | 2051608 |
| Mounting bracket, large | 90° bracket | Stainless steel | - | BEF-WG-W12 | 2013942 |
| Mounting bracket, small | 90° bracket | Stainless steel | - | BEF-WK-W12 | 2012938 |
| Clamp | For dovetail groove mounting | Aluminum, anodized | 14 x 15.3 | BEF-KH-W12 | 2013285 |
| Protective housing | For universal clamp | Zinc plated steel | - | BEF-SG-W12-3 | 2045175 |
| | | | 20 x 60 | PL20A | 1012719 |
| Reflector | 2-hole mounting | PMMA/ABS | 40 x 60 | PL40A | 1012720 |
| | | | 84 x 85 | PL80A | 1003865 |
| Mask card for WSE12-3 | Slot width: 0.5/1.0/1.5/2.0 mm | - | - | BL12-SKN | 4031815 |

Cables and connectors → p. 142

8013958/2011-08-29 Subject to change without notice Additional reflectors \rightarrow p. 148

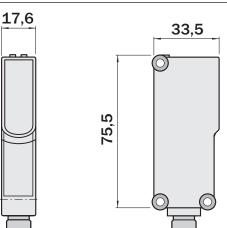


Reliable object detection combined with competitive pricing - these are the principal requirements of a sensor for standard industrial applications. The W14-2 series from SICK combines the two superbly - and does so without restricting product variety or the potential for customization. What's more, individual products in the series offer smart details, such as features that help

At a glance

- Outstanding background suppression through OES3 technology
- · Highly visible and precise light spot due to PinPoint LED
- Your benefits
- · Reliable detection thanks to outstanding background suppression and high immunity to ambient light
- · Fast installation due to highly visible light spot

Dimensions



to simplify mounting and installation or increase user friendliness. The devices with PinPoint technology, for example, have a bright, focused light spot that permits fast and precise alignment of the sensor. An extensive range of accessories completes the W14-2 portfolio, including mounting systems, sensor protection equipment, reflectors, and connection systems from SICK.

- Slim, sturdy plastic housing
- · Complete series featuring all important principles of operation
- Universal application potential due to wide range of products
- · Easily installed with SICK accessories

- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67

- Output type: PNP
- Operating mode: Complementary
- Housing material: ABS

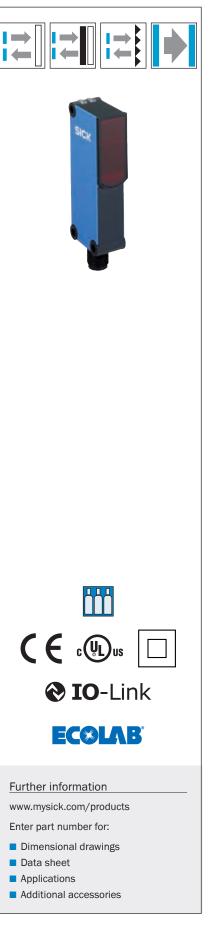
| Sensor type | Sensing technology | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|----------------------|-----------------------|-----------------|---------------------------|---|------------------------|---------------|----------|
| | | IR | 80 500 mm ¹⁾ | Potentiometer | Cable 2 m, 4-wire | WT14-2P122 | 1026051 |
| | | IR | | Potentiometer | M12, 4-pin | WT14-2P422 | 1026052 |
| | BGS | Red | 50 250 mm ¹⁾ | Potentiometer | Cable 2 m, 4-wire | WT14-2P132 | 1026055 |
| Proximity | | | 50 250 mm 7 | Folentiometer | M12, 4-pin | WT14-2P432 | 1026056 |
| | | Red PinPoint | 200 1300 mm ¹⁾ | Potentiometer | M12, 4-pin | WT14-2P432S08 | 1045104 |
| | Energetic | IR | 300 1500 mm ¹⁾ | Teach-in, single teach- in button | Cable 2 m, 4-wire | WT14-2P111 | 1026058 |
| | | | | | M12, 4-pin | WT14-2P411 | 1026059 |
| | | Red | 6 m ²⁾ | | Cable 2 m, 4-wire | WL14-2P130 | 1026050 |
| | | Red | 6 m -/ | - | M12, 4-pin | WL14-2P430 | 1026049 |
| Retro- reflective | Standard | | | - | M12, 4-pin | WL14-2P430S07 | 1045089 |
| Teneotive | | Red PinPoint | 0.15 17 m ²⁾ | Teach-in, single teach- in button | M12, 4-pin | WL14-2P431 | 1050271 |
| | Standard | | | | Cable 2 m, 3/4-wire | WS/WE14-2P130 | 1026430 |
| Through- beam | | Red | 15 m | - | M12, 4-pin | WS/WE14-2P430 | 1026431 |

¹⁾ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

²⁾ With reflector PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. | |
|--|-------------------------------|------------------------|--------------------|---------------------------------------|----------|--|
| Universal clamp system | - | Zinc plated steel | - | BEF-KHS-N03 | 2051609 | |
| Mounting bracket | - | Zinc plated steel | - | BEF-WN-W14 | 2019084 | |
| | With articulated arm | Zinc plated steel | - | BEF-WN-W18 | 2009317 | |
| Protective housing with bracket | For universal clamp system | Zinc plated steel | - | BEF-SG-W27 | 2039601 | |
| | | | 20 x 60 | PL20A | 1012719 | |
| Deflecter | O hala manuting | | 40 x 60 | PL40A | 1012720 | |
| Reflector | 2-hole mounting | PMMA/ABS | 52 x 62 | P250 | 5304812 | |
| | | | 84 x 84 | PL80A | 1003865 | |
| Cables and connectors \rightarrow p. 142 | Addition | al reflectors → p. 148 | Addit | Additional mounting brackets → p. 146 | | |



The optical sensors in SICK's W18-3 series can be found anywhere objects need to be detected reliably under difficult conditions. Whether photoelectric proximity sensors with high-precision background suppression, photoelectric retro-reflective sensors with autocollimation, or through-beam photoelectric sensors with high operating reserves – the W18-3 unites the latest technology for reliable object detection with dependable availability in the field. Neither ambient light shining in, nor reflections from the background, nor light absorbing objects can distract the W18-3. Moreover, in especially critical applications, SICK can work with the customer to tailor the sensors to the specific application conditions on site, in order to achieve an optimum solution. And the W18-3 is naturally equipped for the future: IO-Link, the new sensor communication standard of the future, is already available.

At a glance

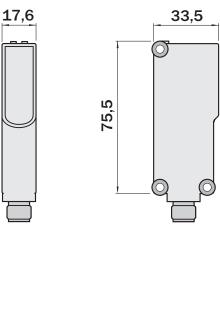
- Best-in-class optical performance due to superior OES technology
- Autocollimation optics
- Background suppression with second emitter LED
- Slim, sturdy plastic housing
- IO-Link communication

Your benefits

- Reliable detection thanks to best-inclass background suppression and high immunity to ambient light
- Universal application potential due to wide range of products

- Operation via double teach-in or potentiometer
- Exceptionally diverse product range in terms of operation, connection, and optical performance
- High reliability in industrial environments
- IO-Link enables remote diagnosis and remote maintenance
- Easily installed with SICK accessories

Dimensions



- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67
- Output type: PNP

- Operating mode: Complementary
- Housing material: ABS
- ECOLAB
- Device models with IO-Link technology available

| Sensor type | Sensing technology | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|-------------|---|-----------------|--------------------------|---|--|---------------|----------|
| | | Red | 50 600 mm ¹⁾ | Potentiometer | M12, 4-pin | WT18-3P430 | 1025896 |
| | | | | Teach-in, double teach- in button | M12, 4-pin | WT18-3P431 | 1026032 |
| Proximity | BGS | | | Potentiometer | Cable 2 m, 4-wire | WT18-3P110 | 1025887 |
| | DGS | | 50 700 mm 1) | Potentiometer | M12, 4-pin | WT18-3P410 | 1025889 |
| | | IR | 50 700 mm ¹⁾ | Teach-in, double teach- in button | M12, 4-pin | WT18-3P411 | 1026031 |
| | | | 50 1000 mm ¹⁾ | Potentiometer | M12, 4-pin | WT18-3P420 | 1025905 |
| | Autocollima- tion | Red | 7 m ²⁾ | Potentiometer | Cable 2 m, 4-wire | WL18-3P130 | 1025909 |
| | | | | Potentiometer | M12, 4-pin | WL18-3P430 | 1025911 |
| Retro- | Autocollima- tion | Red | 7 m ²⁾ | Potentiometer | Cable 2 m, 5-wire | WL18-3P730 3) | 1026029 |
| reflective | Autocollima- tion, clear materials detection | Red | 2 m ²⁾ | Potentiometer | M12 connector, 4-pin, 0.2 m pigtail | WL18-3P030S07 | 1042484 |
| Through- | Standard | Red | 20 m | Potentiometer | M12, 4-pin | WS/WE18-3P430 | 1025923 |
| beam | Standard | IR | 20 m | Potentiometer | M12, 4-pin | WS/WE18-3P410 | 1025927 |

¹⁾ Objects to be detected having 90% remission (based on DIN 5033 Standard White) ³⁾ with test input function

 $^{\scriptscriptstyle 2)}\mbox{With}$ reflector PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|-------------------------------|------------------------|--------------------|-------------|----------|
| Universal clamp system | - | Zinc plated steel | - | BEF-KHS-N03 | 2051609 |
| Mounting bracket | - | Zinc plated steel | - | BEF-WN-W14 | 2019084 |
| | With articulated arm | Zinc plated steel | - | BEF-WN-W18 | 2009317 |
| Protective housing with bracket | For universal clamp system | Zinc plated steel | - | BEF-SG-W27 | 2039601 |
| | | | 20 x 60 | PL20A | 1012719 |
| Deflector | O halo may nation | | 40 x 60 | PL40A | 1012720 |
| Reflector | 2-hole mounting | PMMA/ABS | 52 x 62 | P250 | 5304812 |
| | | | 84 x 84 | PL80A | 1003865 |
| Cables and sennesters -> n 142 | بر بر المالية الم | al reflectore -> = 149 | Addit | | 146 |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146

Photoelectric sensors Compact photoelectric sensors

Multitalented – precise, sturdy, powerful



W27 Reflex Array The one with the light array



W27 Always dependable, even in harsh conditions



W34 Sturdy and precise

Sturdiness is their strength: SICK's compact sensors

The harsh climate of a harbour, the high temperature of a steel mill, or a throughput-optimized logistics center: the challenge is precise and reliable functioning, even under the harshest conditions. Equipped with the latest PinPoint LED, intelligent ASIC, μ C and IO-Link technologies, packed into sturdy housings of plastic, SICK's compact sensors guarantee long term and reliable operation.

Comprehensive specialized accessories expand the application possibilities.

Photoelectric sensors Compact photoelectric sensors



Compact photoelectric sensors

| W23 10 Plug & play, when time is critical | 0 |
|--|---|
| W27 / W27 Reflex Array Sensor | 2 |
| W280 10 Sensor kit with mounting bracket and reflector | 4 |
| W34 | 6 |





Plug & play is central to this series: install the sensor, connect it electrically, quickly align it with the highly visible red light spot, and the sensor is ready to go. In addition to standard products, the series also includes special variants to address specific applications, such as detecting plastic wrap in material handling and distribution.

Photoelectric retro-reflective sensor

· Teach-in for quick sensitivity adjust-

with and without adjustability

ment

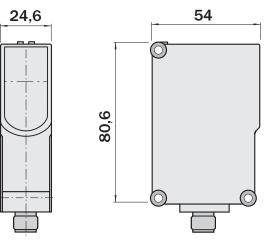
At a glance

- Energetic photoelectric proximity sensors with easy teach-in
- Photoelectric proximity sensors with background suppression
- PinPoint technology: light-intensive red emitter LED with light spot

Your benefits

- Ready for operation with easy teachin
- Faster alignment with highly visible light spot
- Diagnostics with 360° indicator LEDs
- Laser proximity sensor for detecting the extremely small parts

Dimensions



Eurther information www.mysick.com/products Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67
- Output type: PNP

- Output mode: Complementary
- Operating temperature: -25 ... +60 °C
- Housing material: ABS; optics: PMMA
- For NPN devices, see www.sick.com

| Sensor type | Sensing technology | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|------------------|-----------------------|-------------------------|-----------------------------|------------------------------|---------------------------------------|-------------------|----------|
| | Energetic | IR | 50 2300 mm ¹⁾ | Teach-in: teach-in button | M12, 4-pin | WTE23-2P2412 | 1027781 |
| Proximity | BGS | IR | 50 1000 mm ¹⁾ | Potentiometer | M12, 4-pin | WT23-2P2421 | 1027778 |
| | BGS | Red PinPoint | 50 1100 mm ¹⁾ | Potentiometer | M12, 4-pin | WTB23-2P2461 | 1044164 |
| | Standard | Red PinPoint andard Red | 0.1 15 m (PL80A) | Teach-in: teach-in button | M12, 4-pin | WL23-2P2432S02 | 1043566 |
| | | | 0.1 12 m (PL80A) | - | M12, 4-pin | WL23-2P2460 | 1044165 |
| | | | 0.1 10 m (PL80A) | - | Cable, PVC, 2 m | WL23-2P1130 | 1027784 |
| Retro-reflective | | | | | M12, 4-pin, PVC, 270 mm pigtail | WL23-2P3430 | 1027786 |
| | | | | | M12, 4-pin | WL23-2P2430P02 2) | 1028056 |
| | | | 0.1 4 m (PL80A) | - | M12, 4-pin | WL23-2P2430S01 | 1041159 |

 $^{\mbox{\tiny 1)}}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

 $^{\scriptscriptstyle 2)}$ Sensor kit with mounting bracket BEF-WN-W23 and reflector PL40A

W23 Red laser

• Operating temperature: -10 ... + 45 °C

| Sensor type | Sensing technology | Light source | Sensing range | Adjustment | Connection | Model name | Part no. |
|-------------|-----------------------|-------------------------------------|--------------------------------|---------------|------------|------------|----------|
| Proximity | BGS | Red laser, protection class 1 | $50 \dots 800 \text{ mm}^{1)}$ | Potentiometer | M12, 4-pin | WT23L-F430 | 1045643 |

¹⁾ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|--|----------------------------------|---------------------------------------|--------------------|-------------|----------|
| Universal clamp system (UKS) | - | Zinc plated steel | - | BEF-KHS-N04 | 2051610 |
| Mounting by alcot | 00° brookst | Zinc plated steel | - | BEF-WN-W23 | 2019085 |
| Mounting bracket | ounting bracket 90° bracket Zinc | | - | BEF-WN-W27 | 2009122 |
| Protective housing complete with bracket and screws for rod mounting | - | Zinc plated steel | - | BEF-SG-W27 | 2039601 |
| | | | 20 x 60 | PL20A | 1012719 |
| Reflector | 2-hole mounting | PMMA/ABS | 40 x 60 | PL40A | 1012720 |
| | | | 84 x 84 | PL80A | 1003865 |
| Cables and connectors \rightarrow p. 142 | Addition | Additional mounting brackets → p. 146 | | | |





The strengths of the multitalented W27-3 come into play in harsh industrial environments, with its ability to handle heavy vibration, shocks, and extreme temperature variations. The photoelectric proximity sensor is a leader in its class, especially through its detection capacity at long ranges. A diverse range of functions, such as time delays, IO-Link, and front screen heating, simplify system integration and mounting compatibility.

At a glance

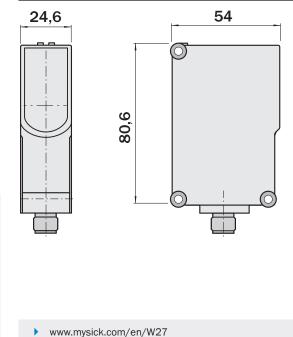
- PinPoint technology: light-intensive red emitter LED
- Long sensing ranges with IR light LED and PinPoint LED
- Precise background suppression without scanning distance drift
- Universal voltage supply (DC, DC/AC)

Your benefits

- Simple installation due to highly visible light spot
- PinPoint technology can replace laser photoelectric proximity sensors in some applications, eliminating the need for laser safety measures, and the service life of the PinPoint LED is double that of laser diodes
- Reliable in operation with ambient light, optical reflections, and when devices are mounted opposite one another

- IP 69K and ECOLAB
- IO-Link
- ATEX: sensors compliant with category 3G/3D
- Reflex array sensor: 24 or 50 mm area detection
- Very high availability thanks to high operating reserve at long sensing ranges
- Extremely vibration resistant and therefore independent of ambient conditions
- Reflex array sensor provides reliable leading edge detection of irregularshaped objects and reduces installation costs by up to 50 % when compared with light grids and other photoelectric sensors options

Dimensions





- Supply voltage:
- 10 ... 30 V DC or 24 ... 240 V DC / 24 ... 240 V AC
- Enclosure rating: IP 69K or IP 65
- Operating temperature: -40 ... +60 °C

- Adjustment: potentiometer or double teach-in button
- Housing material: ABS; optics: PMMA
- For NPN devices, ATEX sensors, Laser proximity switches and IO-Link models, see www.sick.com

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Time delay | Connection | Model name | Part no. | | |
|----------------------|-----------------------|--------------------------|--------------------------|-------------------------|---------------------|-------------------------|----------------------------------|------------|----------------|---------|
| | | Red PinPoint | 30 2000 mm ¹⁾ | PNP, comple- mentary | - | M12, 4-pin | WTB27-3P2461 3) | 1044163 | | |
| | | Red | 30 1100 mm ¹⁾ | PNP, comple- mentary | - | M12, 4-pin | WTB27-3P2443 ^{2) 3) 5)} | 1027745 | | |
| | | | 30 1600 mm ¹⁾ | PNP, comple- | - | M12, 4-pin | WTB27-3P2411 3) | 1025994 | | |
| Proximity | Proximity BGS | IR | 30 1600 mm -/ | mentary | Selectable | M12, 4-pin | WTB27-3F2411 3) | 1027753 | | |
| Proximity | BGS | bus in | 30 2500 mm ¹⁾ | PNP, comple- mentary | - | M12, 4-pin | WTB27-3P2411S18 3) | 1044508 | | |
| | | Red | 30 1100 mm ¹⁾ | Relay | Selectable | Q6, 6-pin, AC/UC | WTB27-3R2641 4) 5) | 1027750 | | |
| | IR | 30 1600 mm ¹⁾ | Relay | Selectable | Q6, 6-pin, AC/UC | WTB27-3R2611 4) 5) | 1027763 | | | |
| | Standard | | | Red PinPoint | 0.1 19 m (PL80A) | PNP, comple- mentary | - | M12, 4-pin | WL27-3P2461 3) | 1044166 |
| Retro- reflective | | Standard Red | 0.1 15 m (PL80A) | PNP, comple- mentary | Selectable | Q6, 6-pin, DC | WL27-3F2631 3) 5) | 1027772 | | |
| | | | | Relay | Selectable | Q6, 6-pin, AC/UC | WL27-3R2631 4) 5) | 1027776 | | |
| Through- | Standard | Ded | 0 25 m | PNP, comple- | - | M12, 4-pin | WSE27-3P2430 3) | 1027790 | | |
| beam | Standard | Standard Red | Red 0 35 m | mentary | Selectable | Q6, 6-pin, DC | WSE27-3F2631 3) 5) | 1027792 | | |

 $^{\scriptscriptstyle (1)}$ Objects to be detected having 90% remission (based on DIN 5033 Standard White)

²⁾ Double teach-in button

 $^{\rm 3)}\,10$... 30 V DC

Retro-reflective array sensor

- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67
- Output type: PNP, complementary

⁵⁾ Enclosure rating: IP 65

 $^{\rm 4)}\,24\,\ldots\,240$ V DC / $24\,\ldots\,240$ V AC

- Continuous threshold adaption
- Minimum distance sensor to reflector: 0.5 m
- Connection: Pigtail, M12, 4-pin, PVC, 270 mm

| Sensor type | Sensing technology | Light source | Sensing range | Detection height [mm] | Min. object size [mm] | Model name | Part no. |
|------------------|-----------------------|--------------|-----------------------|-----------------------------|-----------------------------|----------------|----------|
| | Ctondord | Red PinPoint | 0 1.5 m ¹⁾ | 24 | 5 | WL27-3P3402S17 | 1051529 |
| Retro-reflective | ective Standard R | | 0 4.5 m ¹⁾ | 50 | 12 | WL27-3P3402S13 | 1046538 |

1) PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. | |
|---|-------------------------|-------------------|---------------------------------------|-------------|----------|--|
| Universal clamp system (UKS) | - | Zinc plated steel | - | BEF-KHS-N04 | 2051610 | |
| Mounting brooket | 90° bracket | Zinc plated steel | - | BEF-WN-W23 | 2019085 | |
| Mounting bracket | | | - | BEF-WN-W27 | 2009122 | |
| Protective housing | With bracket and screws | Zinc plated steel | - | BEF-SG-W27 | 2039601 | |
| | 2-hole mounting | PMMA/ABS | 20 x 60 | PL20A | 1012719 | |
| Reflector | | | 40 x 60 | PL40A | 1012720 | |
| | | | 84 x 84 | PL80A | 1003865 | |
| Cables and connectors \rightarrow p. 142 Additional reflectors \rightarrow p. 148 | | | Additional mounting brackets → p. 146 | | | |





In the W280 photoelectric sensor family, three powerful device types – energetic photoelectric proximity sensors, photoelectric retro-reflective sensors, and through-beam photoelectric sensors – cover the main areas of application for doors and gates. The product family is also ideal for price-sensitive projects in material handling and warehousing.

At a glance

- Visible red light
- Light/dark selectable (DC devices only)
- Rotatable connector, cable connection, or terminal connection

EN-61000-6-3 (electromagnetic inter-

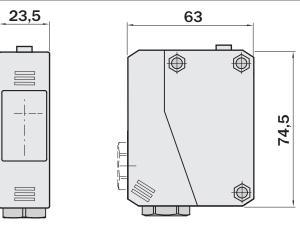
ference for "residential, commercial and light-industrial environments")

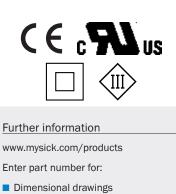
• Universal voltage supply (DC, DC/AC)

• DC/AC devices are compliant with

- **Your benefits**
- The visible red light simplifies alignment of the sensors
- The devices with light/dark selectable options provide flexibility in application and reduce the variety of devices and therefore storage requirements
- Flexible in installation thanks to rotatable connector
- Everything you need is at the installation site, as the mounting bracket (stainless steel 1.4301) and reflector (WL280 only) are included in delivery

Dimensions





- Data sheet
- Applications
- Additional accessories

- · Light source: red
- Enclosure rating: IP 66
- Operating temperature: -25 ... +55 °C
- Adjustment: potentiometer
- Operating mode: Light/Dark selectable

- Housing material: ABS; optics: PMMA
- Mounting bracket (stainless steel 1.4301) included in delivery
- For NPN devices, see www.sick.com

| Sensor type | Sensing technology | Sensing range | Output type | Supply voltage | Connection | Model name | Part no. |
|---------------------|-----------------------|--------------------------|-------------|-------------------|------------|--------------------------|----------|
| | | 10 1700 mm ¹⁾ | PNP | DC 10 20.V | M12, 4-pin | WT280-P430 | 6028280 |
| Proximity Energetic | Energetic | | | DC 10 30 V | Terminal | WT280-P230 | 6028276 |
| | U | | Relay | AC/DC 24 240 V | Terminal | WT280-S230 | 6027480 |
| | Standard | 0.01 15 m (PL80A) | PNP | DC 10 30 V | M12, 4-pin | WL280-P430 ²⁾ | 6028286 |
| | | | | | Terminal | WL280-P230 ²⁾ | 6028282 |
| Retro-reflective | | | Relay | AC/DC 24 240 V | Terminal | WL280-S230 2) | 6027484 |
| | | | | AC/DC 24 240 V | Cable, 2 m | WL280-S132 2) | 6027486 |
| | | | | | Cable, 5 m | WL280-S135 2) | 6028865 |
| | | | | | Terminal | WL280-S230P01 3) | 1041210 |
| | Standard | 0 45 m | PNP | DC 10 30 V | M12, 4-pin | WS/WE280-P430 | 6028293 |
| Through-beam | | | Relay | AC/DC 24 240 V | Terminal | WS/WE280-S230 | 6027488 |
| | | | | | Cable, 2 m | WS/WE280-S132 | 6027490 |

 $^{\scriptscriptstyle 1)}$ Objects to be detected having 90 % remission (based on DIN 5033 Standard White)

 $^{\scriptscriptstyle 3)}$ Reflector C110A also included in delivery

²⁾ Reflector P250 also included in delivery

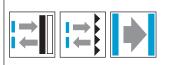
Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|------------------------------|-----------------|-------------------|--------------------|-------------|----------|
| Universal clamp system (UKS) | - | Zinc plated steel | - | BEF-KHS-N04 | 2051610 |
| Mounting bracket | 90° bracket | Stainless steel | - | BEF-W280 | 5313885 |
| | | PMMA/ABS | 20 x 60 | PL20A | 1012719 |
| Reflector | 2-hole mounting | | 40 x 60 | PL40A | 1012720 |
| | | | 84 x 84 | PL80A | 1003865 |
| | | | | | |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets → p. 146





A hallmark of this series is that all controls are protected under the "hood," allowing these sensors to be used outdoors. The housing in diecast zinc is recommended especially for tough and extreme ambient conditions. Front screen heating is also available in cases of rapidly changing ambient temperatures. The basic configuration of the sensors includes a variety of functions, in order to reduce stocking. The photoelectric proximity sensors with BGS are characterized by high precision at long distances, and are highly immune to ambient light.

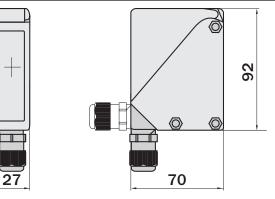
At a glance

- Housing in sturdy plastic or in diecast zinc
- Controls are protected under a cover
- High ambient light immunity
- Universal voltage supply (DC, DC/AC)
- Optional: test input, time delays, and contamination signaling output
 M16 corpus connection or device con
- M16 screw connection, or device connector that can be rotated 90°

Your benefits

- Excellent resistance to chemicals, which increases life
- Controls under the "hood" provide flexibility and optimum protection and reduce the variety of devices needed for stocking
- Reliable in operation with ambient light and when devices are mounted opposite one another (cross talk immunity)
- Maximum availability due to very high operating reserve of photoelectric sensor and through-beam photoelectric sensor

Dimensions



www.mysick.com/en/W34

Further information www.mysick.com/products Enter part number for: Dimensional drawings

Additional accessories

Data sheetApplications

- Housing material: ABS
- Available as W24-2 in die-cast zinc at www.sick.com
- Enclosure rating IP 67
- Operating temperature: -40 ... +60 °C
- Supply voltage:
 - 10 ... 30 V DC or 24 ... 240 V DC / 24 ... 240 V AC
- Output can be changed between PNP/NPN and light/dark switching
- For devices with test input, time delay, and contamination signaling output, see www.sick.com

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Connection | Model name | Part no. | | |
|---------------------------|---|---------------------------|---------------------------|--------------------------------------|-------------------------|----------------------------|----------|-----------|-------------------------|
| | | | 100 0500 11 | PNP/NPN, | M12, 4-pin | WT34-B410 ²⁾ | 1019229 | | |
| | | IR | | light/dark | Terminals | WT34-V210 ²⁾ | 1019280 | | |
| Proximity | BGS | IK | 100 2500 mm ¹⁾ | Delay | Terminals | WT34-R210 ³⁾ | 1019232 | | |
| ŕ | | | | Relay | Terminais | WT34-R220 ³⁾ | 1019233 | | |
| | Red | 100 1200 mm ¹⁾ | PNP/NPN, light/dark | M12, 4-pin | WT34-B440 ²⁾ | 1019237 | | | |
| | Standard | d Red ^O | 0.03 22 m (PL80A) | PNP/NPN, light/dark M12, 4-pin | Torminala | WL34-V230 ²⁾ | 1019243 | | |
| | | | | | Terrinidis | WL34-V240 ²⁾ | 1019244 | | |
| Retro-reflective | | | | | M12, 4-pin | WL34-B430 ²⁾ | 1019245 | | |
| | | | (1 20074) | Delay | Townsinals | WL34-R230 3) | 1019249 | | |
| | Kela | | | | | | Relay | Terminals | WL34-R240 ³⁾ |
| Through-beam | Standard | Red | 0 60 m | PNP/NPN, light/dark | Terminals | WS/WE34-V240 ²⁾ | 1019251 | | |
| | | | | Relay | Terminals | WS/WE34-R230 3) | 1019257 | | |
| 1) Objects to be detected | ¹⁾ Objects to be detected having 90 % remission (based on DIN 5033 Standard White) | | | ³⁾ 24 240 V DC | / 24 240 V AC | | | | |

 $^{1)}$ Objects to be detected having 90 % remission (based on DIN 5033 Standard White) $^{2)}$ 10 ... 30 V DC

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|--------------------------------|--------------------------------|-------------------|--------------------|------------------------------|----------|
| | | Stainless steel | - | BEF-WK-W24 | 4027532 |
| Mounting bracket | Mounting bracket 90° bracket | Zine plated steel | - | BEF-WN-W24 | 2015248 |
| | | Zinc plated steel | - | BEF-WN-W32 | 2005806 |
| Weather hood | For universal clamp | Zinc plated steel | - | OBW-KHS-M01 | 2023240 |
| | | PMMA/ABS | 20 x 60 | PL20A | 1012719 |
| Reflector | 2-hole mounting | | 40 x 60 | PL40A | 1012720 |
| | | | 84 x 84 | PL80A | 1003865 |
| Cables and connectors -> n 142 | Additional reflectors -> n 149 | | Addit | ional mounting brackets -> a | 146 |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Photoelectric sensors Fiber-optic sensors

The flexible option – fibers that bend light





WLL180T The WLL180T in bus configuration



WLL180T Precise level measurement

WLL180T Detection of glass bottles

SICK's fiber-optic cables

SICK's fiber-optic sensors perform amazingly well in areas that are challenging for other sensors - explosive atmospheres, chemical environments and tight spaces.

With innovate, microcontroller-supported electronics, IO-Link technology, intelligent display screens for menu

TOP PRODUCTS INDUSTRIAL SENSORS | SICK

navigation, and standardized mounting, these sensors are equipped for applications in difficult conditions.

The effective use of these technologies is made possible by a wide range of fiber-optic cables made with plastic and glass fibers, with optical heads tailored to the application. This allows the challenges of the electronics industry to be met, just as easily as the intelligent control of an assembly line. Specialized accessories and the option of customization extend the application possibilities to include higher temperatures, longer fiber lengths and all the features needed to satisfy customer requirements.

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Fiber-optic cables and fiber-optic sensors

| General information | .10 |
|--|-----|
| Fiber-optic cables | .12 |
| WLL170 1 Fiber-optic sensors for standard applications | .16 |
| WLL180T 1 The new, powerful fiber-optic sensor | .18 |

Fiber-optic cables provide a "slimline" connection between the sensor and the sensing target. They are an important key to sensing solutions and often the only way to detect inaccessible objects, details, and markings.

OPTICAL FIBER

Optical fibers in plastic or glass. Properties to suit every requirement.

Plastic fiber-optic cable

- Mono fiber or fiber bundle
- Smallest bend radii
- Extremely flexible
- Low weight
- Standard length 2 m
- Can be cut to desired length
- Operating temperatures from -40 °C to +180 °C

Glass fiber-optic cable

- Fiber bundle
- Chemically resistant
- For extreme temperatures from -55 °C to +250 °C

END SLEEVE

Assembly-oriented end sleeves, enabling the fiber-optic cable to be mounted directly in the required sensing position.

End sleeve options

- Very thin end sleeves from ø 1.5 mm
- Long, slim end tips
- Flexible end tubes
- Integrated 90° deflection
- Special end sleeves

PROTECTIVE SHEATHING

Protects the fiber core from mechanical or chemical damage. Sleeve designs are optimized for load resistance.

Plastic sheathing

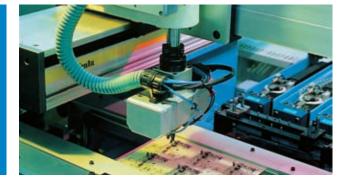
- Lightweight
- Flexible
- Generally resistant
- For standard applications

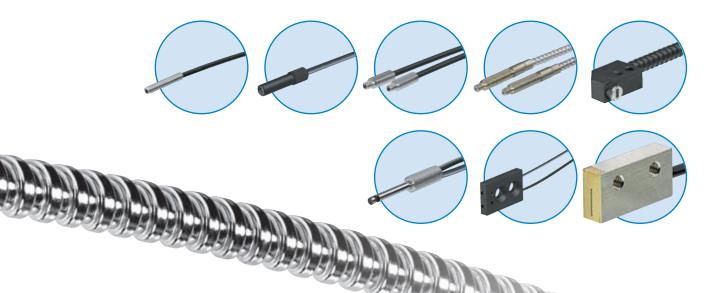
Protective metal sheathing

- For temperatures up to +250 °C
- Protection from mechanical stress

Teflon sheathing

• Protection from extremely aggressive chemicals





PRINCIPLES OF OPERATION

Through-beam fiber-optic cable or proximity fiber-optic cable: both basic options are available.



Through-beam principle

- Sender and receiver fibers are mounted separately
- Very long ranges
- For accurate positioning
- Detection of smallest objects
- Standard applications



Proximity principle

- Sender and receiver fibers are sheathed and mounted together
- Easy mounting
- Standard applications
- Ideal for registration marks

TIP ADAPTORS

Tip adaptor lenses expand the cable's functionality.

They bundle, focus, and deflect.

Tip adaptors for through-beam fiber-optic cables

- Light spot control
- Very long ranges
- · Right angle deflection, plus long ranges

Tip adaptors for proximity fiber-optic cables

- Precise, focused light spot
- Detection of very small parts
- · Detection of registration marks
- Suppression of background interference

Fiber-optic cables Proximity systems

| LL3-DM01 | LL3-DB01 | LL3-DT01 | LL3-DM02 |
|------------------------------------|--|--|------------------------------------|
| | 0.26x16 Receiver 9.1 Sender 9.25 M6x0.75 1) 2) 9.22x2 15 - 15 - 15 - 2000 | 0.25x9 Receiver 0.5 Sender 13x05 13x2 13 | a 0.5 Sender a 0.25:09 Receiver |
| Part no.: 5308071 | Part no.: 5308074 | Part no.: 5308076 | Part no.: 5308077 |
| Standard type | Coaxial cable | Coaxial cable | Coaxial cable |
| Features: | Features: | Features: | Features: |
| Minimum object size: Ø 0.015 mm | Minimum object size: Ø 0.015 mm | Minimum object size: Ø 0.015 mm | Minimum object size: Ø 0.015 mm |
| Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) |
| LL3 length: 2 m | LL3 length: 2 m | LL3 length: 2 m | LL3 length: 2 m |
| Minimum bend radius: R25 mm | Minimum bend radius: R25 mm | Minimum bend radius: R15 mm | Minimum bend radius: R15 mm |
| Mounting sleeve size: M4 | Mounting sleeve size: M6 | Mounting sleeve size: M3 | Mounting sleeve size: M4 |

| WLL170(T)-2 - scanning distance in [mm] | | | | | |
|---|-------------|-------------|-------------|--|--|
| Red light | Red light | Red light | Red light | | |
| 160 | 150 | 70 | 70 | | |
| Green light | Green light | Green light | Green light | | |
| 45 | 45 | 10 | 10 | | |
| High-speed | High-speed | High-speed | High-speed | | |
| 60 | 60 | 20 | 20 | | |

| WLL180 - scanning distance in [mm] | | | | |
|------------------------------------|-----------------------|-----------------------|-----------------------|--|
| Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | |
| 75 | 90 | 40 | 40 | |
| Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | |
| 255 | 280 | 130 | 130 | |
| Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | |
| 420 | 500 | 200 | 200 | |
| Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | |
| 800 | 900 | 350 | 350 | |
| Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | |
| 1300 | 1350 | 600 | 600 | |

Fiber-optic cables Proximity systems

| LL3-DT05 | LL3-DV01 | LL3-DK67 | LL3-DW01 |
|------------------------------------|------------------------------------|------------------------------------|---|
| | | | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Part no.: 5313028 | Part no.: 5308088 | Part no.: 5313025 | Part no.: 5315234 |
| Long end sleeves | Integrated right angle lens | Super flexible | Temperature-resistant to 200°C |
| Features: | Features: | Features: | Features: |
| Minimum object size: Ø 0.015 mm | Minimum object size: Ø 0.025 mm | Minimum object size: Ø 0.015 mm | Minimum object size: Ø 0.02 mm |
| Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) |
| LL3 length: 2 m | LL3 length: 2 m | LL3 length: 2 m | LL3 length: 1 m |
| Minimum bend radius: R15 mm | Minimum bend radius: R25 mm | Minimum bend radius: R2 mm | Minimum bend radius: R25 mm |
| Mounting sleeve size: M4 | Mounting sleeve size: Ø 5 mm | Mounting sleeve size: M6 | Mounting sleeve size: M6 |
| | | | Core: glass Sheath: 1.4305 |

| WLL170 - scanning distance in [mm] | | | | |
|------------------------------------|-------------|-------------|-------------|--|
| Red light | Red light | Red light | Red light | |
| 45 | 90 | 110 | 140 | |
| Green light | Green light | Green light | Green light | |
| 7 | 25 | 25 | 25 | |
| High-speed | High-speed | High-speed | High-speed | |
| 15 | 40 | 45 | 55 | |

| WLL180 - scanning distance in [mm] | | | | |
|------------------------------------|-----------------------|-----------------------|-----------------------|--|
| Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | |
| 10 | 40 | 90 | 85 | |
| Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | |
| 28 | 135 | 300 | 250 | |
| Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | |
| 45 | 180 | 500 | 400 | |
| Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | |
| 95 | 270 | 900 | 700 | |
| Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | |
| 170 | 330 | 1400 | 1000 | |

Fiber-optic cables Through-beam systems

| LL3-TB01 | LL3-TK05 | LL3-TR02 | LL3-TM01 |
|---|----------------------------------|----------------------------------|----------------------------------|
| ♥ 0 1.5 M2.6x0.45 M4 022 ↓ 0 1.5 M2.6x0.45 M4 022 ↓ 0 1.7 3 1 12 0 2000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | e0.25x4 M3x0.5 2.5 | |
| Part no.: 5308050 | Part no.: 5313034 | Part no.: 5308053 | Part no.: 5308068 |
| Standard type | Super flexible | Flexible | Smallest tip |
| Features: | Features: | Features: | Features: |
| Minimum object size: Ø 0.5 mm | Minimum object size: Ø 0.2 mm | Minimum object size: Ø 0.1 mm | Minimum object size: Ø 0.2 mm |
| Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) |
| LL3 length: 2 m | LL3 length: 2 m | LL3 length: 2 m | LL3 length: 2 m |
| Minimum bend radius: R30 mm | Minimum bend radius: R2 mm | Minimum bend radius: R4 mm | Minimum bend radius: R25 mm |
| Mounting sleeve size: M4 | Mounting sleeve size: Ø 3 mm | Mounting sleeve size: M3 | Mounting sleeve size: M3 |

| WLL170(T)-2 - range in [mm] | | | | |
|-----------------------------|-------------|-------------|-------------|--|
| Red light | Red light | Red light | Red light | |
| 700 | 360 | 110 | 450 | |
| Green light | Green light | Green light | Green light | |
| 350 | 110 | 20 | 130 | |
| High-speed | High-speed | High-speed | High-speed | |
| 350 | 120 | 35 | 160 | |

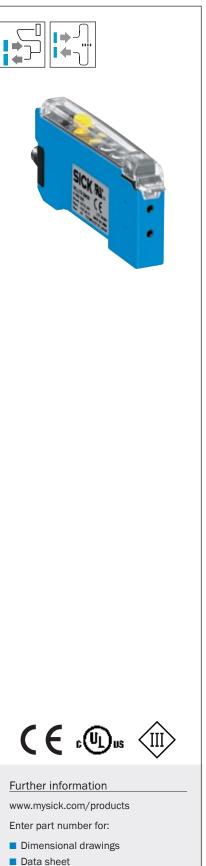
| WLL180 - range in [mm] | | | | | |
|------------------------|-----------------------|-----------------------|-----------------------|--|--|
| Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | | |
| 300 | 220 | 60 | 220 | | |
| Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | | |
| 950 | 650 | 175 | 680 | | |
| Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | | |
| 1700 | 1200 | 330 | 1200 | | |
| Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | | |
| 3500 | 2750 | 750 | 2500 | | |
| Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | | |
| 4000 | 4000 | 1100 | 4000 | | |

Fiber-optic cables Through-beam systems

| LL3-TS08 | LL3-TS14 | LL3-TW01 | LL3-TV07 |
|----------------------------------|---|---|---|
| | | 3 15 10 (12) (59) 39 (13) (59) 39 (147 (59)) (147 (59)) (15) | 3.5 ¥ # 10.5 2000 |
| Part no.: 5308061 | Part no.: 5313039 | Part no.: 5315233 | Part no.: 5322548 |
| Integrated right angle lens | Fiber-optic cable cell | Temperature-resistant to 200°C | Integrated right angle lens |
| Features: | Features: | Features: | Features: |
| Minimum object size: Ø 0.2 mm | Minimum object size: Ø 0.5 mm | Minimum object size: Ø 0.4 mm | Minimum object size: Ø 0.4 mm |
| Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) | Standard object (white 90%) |
| LL3 length: 10 m | LL3 length: 2 m | LL3 length: 1 m | LL3 length: 2 m |
| Minimum bend radius: R25 mm | Minimum bend radius: R25 mm | Minimum bend radius: R25 mm | Minimum bend radius: R2 mm |
| Mounting sleeve size: Ø 3 mm | Mounting sleeve size: 19 x 25 x 5 mm | Mounting sleeve size: M4 | Mounting sleeve size: 8 x 10.5 x 14.4 mm |
| | | Core: glass Sheath: 1.4305 | |

| WLL170 - range in [mm] | | | | | | | |
|------------------------|-------------|-------------|-------------|--|--|--|--|
| Red light | Red light | Red light | Red light | | | | |
| 350 | 330 | 350 | 270 | | | | |
| Green light | Green light | Green light | Green light | | | | |
| 110 | 82 | 130 | 130 | | | | |
| High-speed | High-speed | High-speed | High-speed | | | | |
| 120 | 120 | 150 | 130 | | | | |

| WLL180 - range in [mm] | | | | | | | |
|------------------------|-----------------------|-----------------------|-----------------------|--|--|--|--|
| Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | Response time: 16 µs | | | | |
| 170 | 130 | 60 | 340 | | | | |
| Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | Response time: 70 µs | | | | |
| 500 | 400 | 200 | 1000 | | | | |
| Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | Response time: 250 µs | | | | |
| 1000 | 800 | 350 | 1800 | | | | |
| Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | Response time: 2 ms | | | | |
| 2300 | 2000 | 750 | 4000 | | | | |
| Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | Response time: 8 ms | | | | |
| 3000 | 3500 | 1100 | 4000 | | | | |



- Additional accessories

This fiber-optic photoelectric sensor with its standard operating system is especially suitable for basic applications, but also when rapid response times are crucial. Specialized WLL170(T) versions are available, optimized for a number of key applications, such as detection of very small objects, registration marks, or transparent objects. There are 2 models of the WLL170 family. The WLL170T-2 is a teach-in version, where the switching threshold is set automatically by pressing a button or via a cable (teach-in). The WLL170-2 has a manual switching threshold adjustment via a potentiometer. Both models are available in a highspeed version for up to 10,000 switching operations per second for extremely fast responses. For optimum detection of color contrasts, you can choose between red or green emitter LEDs. The detection tasks are carried out securely and reliably with the fiber-optic cables of the LL3 series.

At a glance

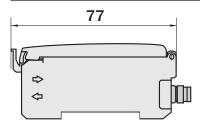
- Rapid response time (50 µs)
- Switching threshold adjustment via potentiometer or teach-in (button or cable)
- · Four different teach-in modes
- Simple installation
- · Red or green emitter LED

Your benefits

- Reliable detection of rapid processes
- Short commissioning time saves on installation costs
- · The optimum setting for every application due to different teach-in modes, making the sensor customized to the specific application

· Ideal emitted light for color or contrast detection

Dimensions





- Applications

www.mysick.com/en/WLL170-2

- Sensing range, through-beam: 0 ... 4000 mm
- Sensing range, proximity: 0 ... 160 mm
- Operating mode: Light/dark selectable
- Supply voltage: 10 ... 30 V DC

- Selectable OFF delay: 40 ms
- Enclosure rating IP 66
- CE, UR

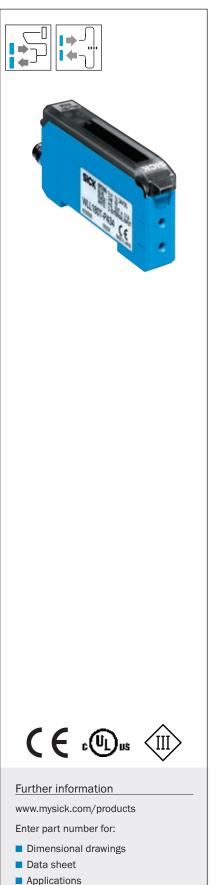
| Light source | Input/output | Response time | Output type | Adjustment | Connection | Model name | Part no. |
|--------------|----------------------|------------------|-------------|---------------|------------|---------------|----------|
| | 0 | < 250 µs | PNP | Potentiometer | M8, 4-pin | WLL170-2P430 | 6029514 |
| Red | Q | < 250 μs | NPN | Potentiometer | Cable, 2 m | WLL170-2N132 | 6029515 |
| Reu | Q, external | < 250 40 | PNP | Teach-in | M8, 4-pin | WLL170T-2P430 | 6033950 |
| | teach-in | < 250 µs | NPN | Teach-in | Cable, 2 m | WLL170T-2N132 | 6033951 |
| Green | 0 | < 250 µs | PNP | Potentiometer | M8, 4-pin | WLL170-2P490 | 6029522 |
| Green | Q | | NPN | Potentiometer | M8, 4-pin | WLL170-2N490 | 6029526 |
| Red | 0 | 50 | PNP | Potentiometer | M8, 4-pin | WLL170-2P460 | 6029530 |
| Red | Q | < 50 µs | NPN | Potentiometer | Cable, 2 m | WLL170-2N162 | 6029531 |
| Green | Q, external teach-in | < 250 µs | PNP | Teach-in | M8, 4-pin | WLL170T-2P490 | 6033956 |
| Q, external | Q, external | $< 50 \mu s$ | PNP | Teach-in | M8, 4-pin | WLL170T-2P460 | 6033965 |
| Red | teach-in | | NPN | Teach-in | Cable, 2 m | WLL170T-2N162 | 6033960 |

Recommended accessories

| Name | Material | Model name | Part no. |
|--|-------------------|---------------|----------|
| Mounting bracket 1) | Zinc plated steel | BEF-WLL170 | 5306574 |
| Endcap for block installation on DIN-rail mounting | Zinc plated steel | BEF-EB01-W190 | 5313011 |
| ¹⁾ Included in delivery | | | |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148



Additional accessories

Product description

The WLL180T are the world's fastest sensor, with a response time of 16 µs. At the same time, these sensors offer good values for sensing range and operating reserve due to its high light intensity and resolution. That considerably increases process reliability when used in dusty or moist environments. Commissioning is simple – either via the external teach-in input or directly on the evaluation unit. The evaluation unit provides a visualization of all programming steps, status displays, and target and actual values on two four-digit displays. The WLL180T can be operated either as an individual sensor or in a sensor group, depending on requirements. For sensor groups, the devices have an internal bus that allows networking of multiple sensors. This configuration also enables the settings on one WLL180T to be copied to all other devices on the bus. Mutual interference by fiber-optic heads installed in close proximity is excluded by their integrated anti-interference logic.

At a glance

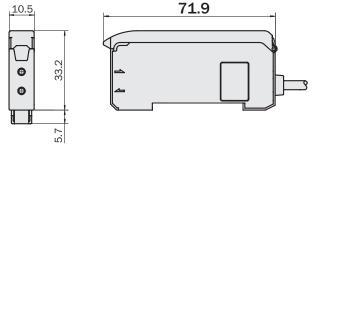
- Selectable response time up to 16 µs
- Sensing range up to 20 m
- Bus-compatible with anti-interference
- 2 x 4-digit display

Your benefits

- Extremely rapid processes are detected reliably
- Workpieces are detected reliably even under the most difficult of ambient conditions such as dust or spray mist
- Fiber-optic heads mounted in close proximity do not affect each other
- Easy monitoring of process parameters

- Adjustable hysteresis
- Rotatable display screen
- High-resolution signal processing
- Programmable time delays
- Hysteresis can be adapted to suit the application, e.g. when detecting tiny or transparent objects
- The display is easy to read, even under difficult installation conditions
- Tiny objects can be detected due to the high-resolution signal processing
- Time delays can be adjusted individually to suit the application

Dimensions



www.mysick.com/en/WLL180T

- Sensing range, through-beam: 0 ... 20 m
- Sensing range, proximity: 0 ... 1400 mm
- + Selectable response time: 16 μs / 70 μs / 250 μs / 2 ms / 8 ms
- Operating mode: Light/dark selectable
- Supply voltage: 12 ... 24 V DC

- Time delay: adjustable 0 ... 9999 ms
- 2 x 4-digit display
- Enclosure rating: IP 50
- External input
- Continuous threshold adaptation

| Bus-compatible | Output type | Connection | Model name | Part no. |
|----------------|-------------------------|------------|--------------|----------|
| | | Cable, 2 m | WLL180T-P432 | 6039093 |
| Nia | PNP NPN PNP | M8, 4-pin | WLL180T-P434 | 6039095 |
| No | NDN | Cable, 2 m | WLL180T-N432 | 6039094 |
| | INPIN | M8, 4-pin | WLL180T-N434 | 6039096 |
| | PNP | Cable, 2 m | WLL180T-M432 | 6039097 |
| | | Cable, 2 m | WLL180T-F232 | 6039098 |
| | | M8, 4-pin | WLL180T-M434 | 6039101 |
| No | | M8, 4-pin | WLL180T-F434 | 6039102 |
| Yes | | Cable, 2 m | WLL180T-L432 | 6039099 |
| | NDN | Cable, 2 m | WLL180T-E232 | 6039100 |
| | INPIN | | WLL180T-L434 | 6039103 |
| | | M8, 4-pin | WLL180T-E434 | 6039104 |

Recommended accessories

| Name | Material | Model name | Part no. |
|--|-------------------|---------------|----------|
| Mounting bracket ¹⁾ | Zinc plated steel | BEF-WLL170 | 5306574 |
| Endcap for block installation on DIN-rail mounting | Zinc plated steel | BEF-EB01-W190 | 5313011 |
| ¹⁾ Included in delivery | | | |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Photoelectric sensors Cylindrical photoelectric sensors

A well-rounded package



V180-2



W15 Reliable detection of all objects



MH15 Part detection in material handling and warehousing systems

Versatile and easy to install: SICK's cylindrical sensors

No tools required: the cylindrical sensor is easy to install by hand and ready for operation in no time.

Mounting options for any application -

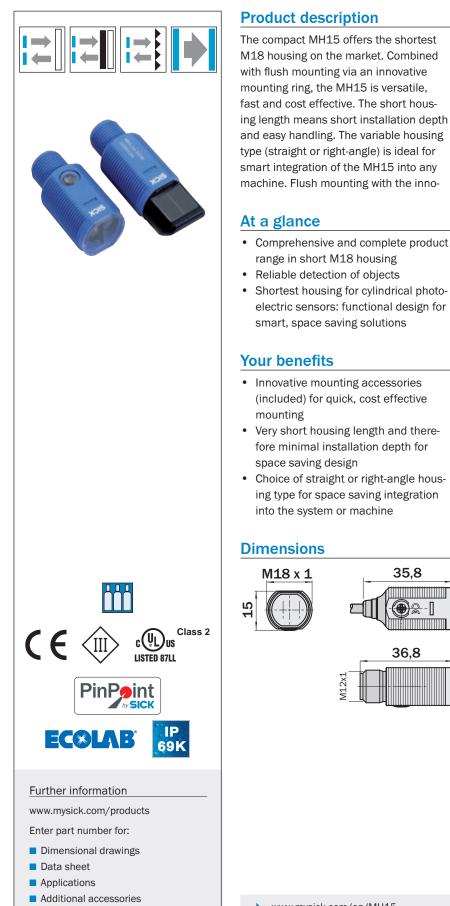
even on roller conveyors

With the broadest portfolio on the market, this sensor family offers total versatility: Equipped with an innovative mounting system, short-body or or plastic and with versions suitable for food and beverage. The comprehensive range covers the entire application spectrum of modern photoelectric sensor technology. SICK's cylindrical sensors are simply designed for every area of application.



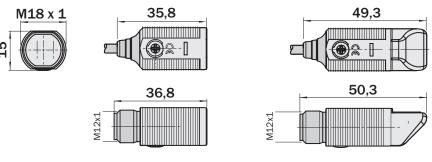
Cylindrical photoelectric sensors

| | MH15 |
|--------|---|
| | MH15V |
| | V180-2 |
| With a | V18V |
| • | W15 130 Small photoelectric sensor in standard North American housing |
| • | ELF |
| ۱) | Z-Sensor |



vative mounting accessories (included) allows the MH15 photoelectric sensors to be installed anywhere. An added bonus: photoelectric proximity sensors with an outstanding sensing range of 300 mm and background suppression (with PinPoint LED) for detecting critical objects even in front of difficult backgrounds.

- Flush mounting with innovative mounting accessories: cost effective and fast
- Photoelectric proximity sensors with an outstanding sensing range of 300 mm and background suppression (with PinPoint LED) for detecting critical objects even in front of difficult backgrounds



www.mysick.com/en/MH15

- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67, IP 69K
- Operating mode: light/dark

- Operating temperature: -25 ... +55 °C
- Adjustable sensitivity/sensing distance (proximity)
- Housing material: ABS; optics: PMMA

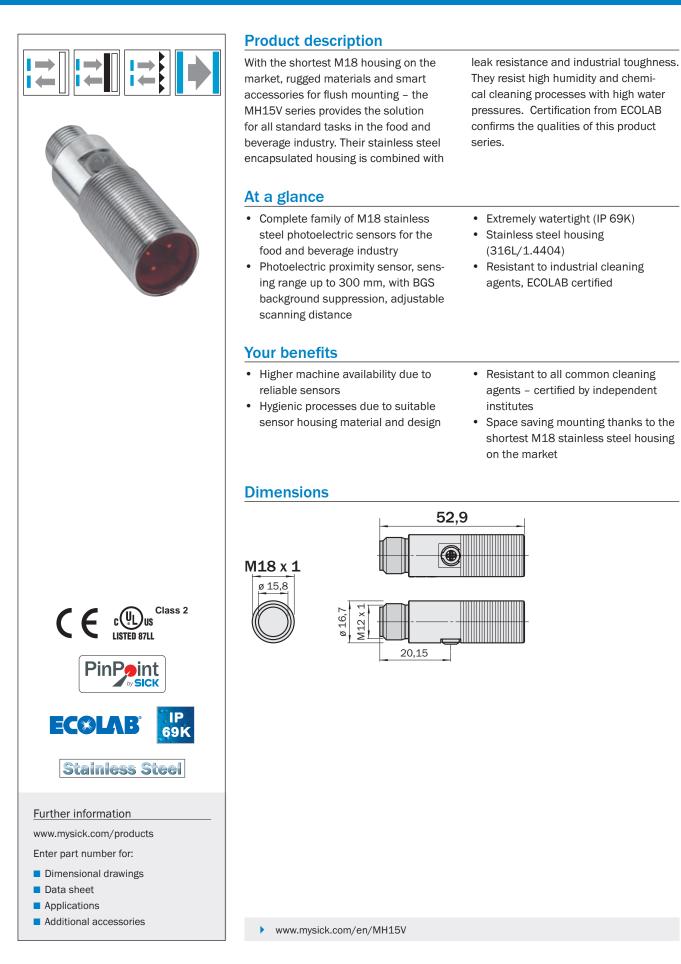
| Sensor type | Sensing technology | Sensing range | Output type | Housing type | Connection | Model name | Part no. |
|------------------|--------------------------|------------------------|-------------|--------------|-------------|----------------|----------|
| | BGS | 3 300 mm | | Ctueidht | M12, 3-pin | MHTB15-P3367 | 1046535 |
| | BGS | 3 300 mm | PNP, Light | Straight | Cable 2 m | MHTB15-P2367 | 1046534 |
| | | 10 100 mm | | Ctueidht | M12, 3-pin | MHT15-P3317 | 1026097 |
| Ducyingity | | 10 100 mm | PNP, Light | Straight | Cable 2 m | MHT15-P2317 | 1026096 |
| Proximity | Francetia | 5 90 mm | PNP, Light | Right-angle | M12, 3-pin | MHT15-P3319 | 1026105 |
| | Energetic | 10 350 mm | PNP, Light | Straight | Cable 2 m | MHT15-P3347 | 1026113 |
| | | 15 250 mm | PNP, Light | Right-angle | Cable 2 m | MHT15-P3349 | 1026121 |
| | | 10 350 mm | NPN, Light | Straight | M12, 3-pin | MHT15-N2347 | 1026108 |
| | | | PNP, Dark | Straight | M12, 3-pin | MHL15-P3236 | 1026127 |
| | Standard | 3.5 m (PL80A) | PNP, Light | P, Light | witz, 5-pin | MHL15-P3336 | 1026129 |
| Retro-reflective | | | PNP, Dark | Right-angle | M12, 3-pin | MHL15-P3238 | 1026135 |
| | Clear material detection | 0.035 1.5 m (PL80A) | PNP, Light | Right-angle | M12, 3-pin | MHL15-P3329S06 | 1042806 |
| Through-beam | Standard | 0 5 m | PNP, Dark | Straight | M12, 3-pin | MHSE15-P3236 | 1026143 |

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Comment | Model name | Part no. |
|---------------------------------|-----------------|-------------------|--------------------|-------------------------|-----------------|----------|
| Universal clamp system (UKS) | - | Zinc plated steel | - | - | BEF-KHS-N06 | 2051612 |
| Mounting bracket | 90° bracket | Zinc plated steel | - | - | BEF-WN-M18 | 5308446 |
| Mounting plate | Straight | Zinc plated steel | - | - | BEF-WG-M18 | 5321870 |
| Mounting ring for MH15 | - | Plastic | - | Included in delivery | BEF-WN-MH15-1 | 4039533 |
| Ball-joint bracket M18 | - | Plastic | - | - | BEF-WN-M18-ST02 | 5312973 |
| | | Plastic | 42 x 62 | - | P250 | 5304812 |
| Reflector 2-hole mountin | 2-hole mounting | Diastia | 84 x 84 | - | PL80A | 1003865 |
| | | Plastic | 40 x 60 | - | PL40A | 1012720 |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148



- Light source: Red PinPoint LED
- Supply voltage: 10 ... 30 V DC
- Enclosure rating: IP 67, IP 68, IP 69KOutput type: PNP, light or dark

- Housing material: stainless steel (316L/1.4404)
- Connection: connector M12, 4-pin
- Housing type: Straight

| Sensor type | Sensing technology | Sensing range | Operating mode | Adjustment | Model name | Part no. |
|------------------|-----------------------|---------------|-----------------------|-----------------------|---------------|----------|
| | BGS | 2 300 mm | Light | Potentiometer 270° | MHTB15-P3367V | 1046537 |
| Proximity | Chargetia | 10 100 mm | Light | Potentiometer 270° | MHT15-P3317V | 1043806 |
| Energetic | 10 350 mm | Light | Potentiometer 270° | MHT15-P3347V | 1043811 | |
| Retro-reflective | Standard | 3.5 m (PL80A) | Dark | - | MHL15-P3236V | 1043814 |
| Through-beam | Standard | 0 5 m | Dark | - | MHSE15-P3236V | 1043818 |

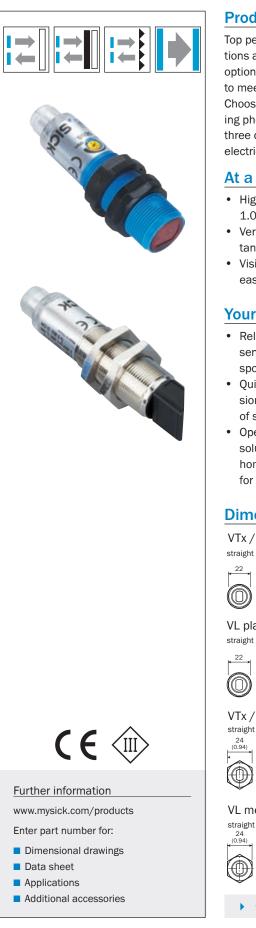
Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|------------------------------|------------------------|----------------------------|--------------------|---------------|----------|
| Universal clamp system (UKS) | - | Stainless steel | - | BEF-KHS-N06N | 2051622 |
| Mounting bracket | 90° bracket | Stainless steel | - | BEF-WN-M18N | 5320947 |
| Mounting plate | Straight | Stainless steel | - | BEF-WG-M18N | 5320948 |
| Mounting ring | Flush installation M18 | Stainless steel | - | BEF-WN-MH15-2 | 4053358 |
| | | Chemical resistant plastic | 52 x 62 | P250CHEM | 5321097 |
| Deflector | | | 20 x 60 | PL20CHEM | 5321089 |
| Reflector | 2-hole mounting | Diantia | 52 x 62 | P250H | 5315124 |
| | | Plastic | 84 x 84 | PL80A | 1003865 |

Cables and connectors \rightarrow p. 142

Additional reflectors → p. 148

Additional mounting brackets \rightarrow p. 146



Top performance for universal applications and quick selection of the right option: The V180-2 series is designed to meet the requirements of the market. Choose from the entire family, comprising photoelectric proximity sensors in three different sensing ranges, photoelectric retro-reflective sensors, and

At a glance

- High switching frequencies of 1.000 Hz
- Very long sensing ranges and distances
- Visible red light enables quick and easy commissioning and adjustment

Your benefits

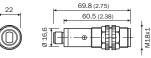
- Reliable switching thanks to long sensing ranges and very short response time
- Quick and easy planning and commissioning thanks to a complete family of sensors
- Operating reserve and access to new solutions due to strong ranges and homogeneous system specifications for all variants

through-beam photoelectric sensors. Quick alignment and commissioning, reliable detection, and dependable switching are achieved with the aid of long sensing ranges, extremely short response time, the red-light emitter LED, and sensitivity adjustment.

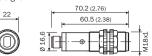
- 2 indicator LEDs with 360° display combined with sensitivity control permit convenient and quick commissioning
- Compact housing with M12 cable / device connector provide spacesaving installation
- · The answer to economic challenges thanks to simple assembly, standardized connection technology, and universal use
- Convenient, fast, compatible thanks to optimally visible emitter LED, 2 status indicator LEDs with 360° visibility, very short housing.
- Compatible and economical due to standardized M18 housing and interfaces

Dimensions

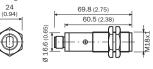
VTx / VSE plastic straight



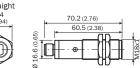
VL plastic



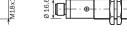
VTx / VSE metal







www.mysick.com/en/V180-2



angled

^{3,16,}

angled

³16,⁸

angled

83.8 (3.30)

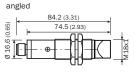
84.2 (3.31)

83.8 (3.30)

74.5 (2.93

74.5 (2.93)

74.5 (2.93)



- Light source: Red light
- Enclosure rating: IP 67
- Supply voltage: 10 ... 30 V DC
- Output type: PNP

- Operating mode: Light/dark switching, selectable by control line
- Connection: connector M12, 4-pin
- Other models available on request or at www.sick.com

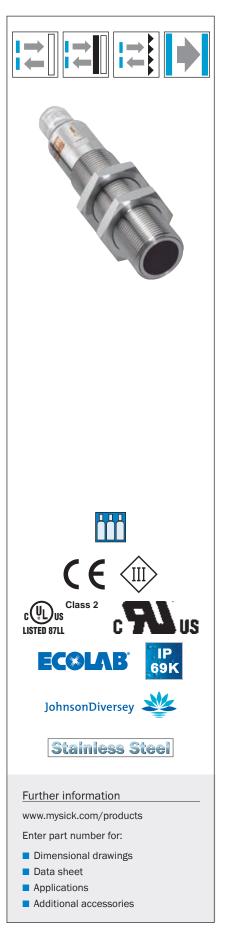
| Sensor type | Sensing technology | Housing type | Housing material | Sensing range | Adjusment | Model name | Part no. | | | |
|------------------|-----------------------|--------------|---------------------|-------------------------------|-----------------------|----------------|--|--|--|--|
| | BGS | Straight | Metal | 10 300 mm | Potentiometer 270° | VTB180-2P42412 | 6043870 | | | |
| | DGS | Straight | Plastic | 10 300 mm | Potentiometer 270° | VTB180-2P42417 | 6043874 | | | |
| | | | Metal | 1 100 mm | Potentiometer 270° | VTF180-2P42412 | 6041803 | | | |
| | | Straight | Weta | 1 450 mm | Potentiometer 270° | VTE180-2P42442 | 6041807 | | | |
| BGB Proximity | | Straight | Plastic | 1 100 mm Potentiometer VT | VTF180-2P42417 | 6037480 | | | | |
| | BGB | | Flastic | 1 450 mm | Potentiometer 270° | VTE180-2P42447 | 6037484 | | | |
| | | Metal | 1 100 mm | Potentiometer 270° | VTF180-2P42414 | 6043806 | | | | |
| | | Angled, 90° | Weta | 1 450 mm | Potentiometer 270° | VTE180-2P42444 | 6043815 | | | |
| | | Aligieu, 90 | Plastic | 1 100 mm | Potentiometer 270° | VTF180-2P42419 | 6043811 | | | |
| | | | Flastic | 1 450 mm | Potentiometer 270° | VTE180-2P42449 | 6043819 | | | |
| | | Straight | Metal | 1 1.100 mm | Potentiometer 270° | VTE180-2P42482 | 6041811 | | | |
| | Energetic | | Plastic | 1 1.100 mm | Potentiometer 270° | VTE180-2P42487 | 6037488 | | | |
| | Energetic | Angled, 90° | Metal | 1 1.100 mm | Potentiometer 270° | VTE180-2P42484 | 6043823 | | | |
| | | Anglea, 90 | Plastic | 1 1.100 mm | Potentiometer 270° | VTE180-2P42489 | 6043827 | | | |
| | | Straight | Metal | $0.05 \dots 7 \text{ m}^{1)}$ | - | VL180-2P42431 | 6041819 | | | |
| Detre reflective | Ctondord | Straight | Plastic | 0.05 7 m ¹⁾ | - | VL180-2P42436 | 6037480 6037484 6043806 6043815 6043811 6043819 6041811 6037488 6043823 6043823 | | | |
| Retro-reflective | Standard | Angled, 90° | Metal | 0.05 7 m ¹⁾ | - | VL180-2P42433 | 6043834 | | | |
| | | Angled, 90 | Plastic | 0.05 7 m ¹⁾ | - | VL180-2P42438 | 6043838 | | | |
| | | Stroight | Metal | 0 28 m | Potentiometer 270° | VSE180-2P42432 | 6041823 | | | |
| Through-beam | | Straight | Plastic | 0 28 m | Potentiometer 270° | VSE180-2P42437 | 6037500 | | | |
| iniougii-bealli | | Angled, 90° | Metal | 0 28 m | Potentiometer 270° | VSE180-2P42434 | 6043850 | | | |
| | | Anglea, 90 | Plastic | 0 28 m | Potentiometer 270° | VSE180-2P42439 | 6043854 | | | |

1) PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---------------------------------|------------------|------------------------|--------------------|-----------------|----------|
| Universal clamp system (UKS) | - | Zinc-plated steel | - | BEF-KHS-N06 | 2051612 |
| Mounting bracket | 90° bracket | Zinc-plated steel | - | BEF-WN-M18 | 5308446 |
| Mounting plate | Straight | Zinc-plated steel | - | BEF-WG-M18 | 5321870 |
| Ball-joint bracket M18 | - | Plastic | - | BEF-WN-M18-ST02 | 5312973 |
| | | Plastic | 52 x 62 | P250 | 5304812 |
| Reflector | 2-hole mounting | Diantia | 40 x 60 | PL40A | 1012720 |
| | | Plastic 84 x 84 F | | PL80A | 1003865 |
| Cables and connectors and n 142 | مر م المالية الم | al reflectore -> = 149 | A ddit | | 146 |

Cables and connectors → p. 142



Patented touch-teach technology, optimized materials: the V18V series offers long sensing ranges and resists stresses from chemical cleaning processes, high ambient temperatures, humidity, and highly pressurized water. With its patented touch-teach sensitivity control, the V18V offers sensitivity adjustment directly on the sensor as usual, but without mechanical controls.

At a glance

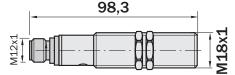
- Complete M18 stainless steel family for the food and beverage industry
- Extremely watertight (IP 68/IP 69K)
- Stainless steel housing (316L/1.4404)
- Patented Touch-Teach-in: adjustment directly on the sensor without mechanical controls

Your benefits

- Higher machine availability due to reliable sensors
- Suitable for hygienic processes due to suitable sensor housing material and design
- Resistant to all common cleaning agents and certified by independent institutes

- Extended temperature range from -40 °C ... +80 °C; short term tolerance (15 min) up to 100 °C
- Resistant to industrial cleaning agents, ECOLAB and JohnsonDiversey certified
- FDA-certified plastics
- Largest M18 Inox photoelectric sensor family, offers wide range of options for simple and reliable sensor solutions
- Encapsulated casting and expanded operating temperature range provides maximum resistance to harsh environments experienced in food and beverage applications

Dimensions



www.mysick.com/en/V18V

- Light source: Red light
- Enclosure rating: IP 68, IP 69K
- Supply voltage: 10 ... 30 V DC
- Output type: PNP
- Operating mode: Light/dark switching, selectable by control line

- Housing material: stainless steel (316L, 1.4404)
- Housing type: straight
- Connection: connector M12, 4-pin
- Other models available on request or at www.sick.com

| Sensor type | Sensing technology | Sensing range | Adjustment | Model name | Part no. |
|------------------|--------------------------|-------------------|------------|------------------|----------|
| | BGS | 0 140 mm | Teach-In | VTB18-4P1240V | 6035493 |
| | BGS focused | 0 100 mm | Teach-in | VTB18-4P1240VS01 | 6037754 |
| Proximity | Energetic | 5 100 mm | Teach-in | VTF18-4P1240V | 6035487 |
| | | 5 400 mm | Teach-in | VTE18-4P4240V | 6035489 |
| | | 5 800 mm | Teach-in | VTE18-4P8240V | 6035491 |
| Retro-reflective | Standard | 0.1 5 m (PL80A) | - | VL18-4P3140V | 6035495 |
| Retro-reflective | Clear material detection | 0.1 4.5 m (PL80A) | Teach-in | VL18-4P2240V | 6035497 |
| Through-beam | Standard | 20 m | - | VS/VE18-4P3140V | 6035499 |

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. | | |
|--|------------------------|------------------------|--------------------|---------------------------------------|----------|--|--|
| Universal clamp system (UKS) | - | Stainless steel | - | BEF-KHS-N06N | 2051622 | | |
| Mounting bracket | 90° bracket | Stainless steel | - | BEF-WN-M18N | 5320947 | | |
| Mounting plate | Straight | Stainless steel | - | BEF-WG-M18N | 5320948 | | |
| Mounting ring | Flush installation M18 | Stainless steel | - | BEF-WN-MH15-2 | 4053358 | | |
| | | Chemical resistant | 52 x 62 | P250CHEM | 5321097 | | |
| Deflector | O halo magnitud | plastic | 20 x 60 | | 5321089 | | |
| Reflector | 2-hole mounting | Diantia | 52 x 62 | P250H | 5315124 | | |
| | | Plastic | 84 x 84 | PL80A | 1003865 | | |
| Cables and connectors \rightarrow p. 142 | Additiona | al reflectors → p. 148 | Additi | Additional mounting brackets → p. 146 | | | |



The W15 photoelectric sensor with its hybrid housing is flexible and versatile. It brings together modern industrial design with SICK technology for the optimum application solution. The WTB15 proximity sensor offers our proven "best in class" background suppression based on OES3 ASIC technology. The WTE15 energetic sensor with IR optics, the WL15 photoelectric sensor with dual lens optics, and the WSE15 through-beam sensor complete the product family. One appealing feature of the series is its flexibility in mounting. With the M18 front mount, the sensor can be flush-mounted with a snap ring. This is especially useful for applications in conveying systems. There is also the option of side mounting.

At a glance

- Best-in-class background suppression through OES3-ASIC and a second emitter LED
- M18 thread mounting from the front and side-mount through holes
- Innovative snap ring for flush mounting
- Highly visible and precise light spot due to PinPoint LED in the WTB15

Your benefits

- Reliable detection thanks to best-inclass background suppression and high immunity to ambient light
- Versatile mounting options
- Flush-mounting allows sensor to be installed close to the process without interfering

of the housing

• Flexible output configuration: bipolar

• Very highly visible LED indicators at

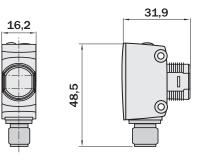
dark selectable)

(PNP/NPN) or complementary (light/

top and behind the transparent back

- Fast installation due to highly visible light spot
- Easily installed with SICK accessories

Dimensions



www.mysick.com/en/W15

- Light source: Red PinPoint LED
- Enclosure rating: IP 67

• Connection: connector M12, 4-pin

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Operating mode | Model name | Part no. |
|----------------------|-----------------------|------------------------|-------------------------|------------------------|------------------------|-------------|----------|
| | Energetic | IR | 10 350 mm ¹⁾ | PNP | Light/dark, selectable | WTE15-P2411 | 1043314 |
| | Energetto | IR | 10 350 mm -/ | PNP/NPN | Light | WTE15-B2411 | 1043317 |
| Proximity | | | | PNP | Light/dark, selectable | WTB15-P2431 | 1044305 |
| BGS | Red PinPoint | 4 200 mm ¹⁾ | NPN | Light/dark, selectable | WTB15-N2431 | 1044306 | |
| | Neu FillFollit | 4 200 mm | PNP/NPN | Dark | WTB15-A2431 | 1043325 | |
| | | | | FINE/INFIN | Light | WTB15-B2431 | 1043326 |
| | | | | PNP | Light/dark, selectable | WL15-P2430 | 1043321 |
| Retro- reflective | Standard | Red | 0.035 5 m (PL80A) | PNP/NPN | Dark | WL15-A2430 | 1043323 |
| | Teneotive | | (1 20077) | PNP | Light/dark, selectable | WL15-F2433 | 1043319 |
| Through- | Through- | Red | 0 5 m | | Dark | WSE15-A2430 | 1043327 |
| beam | Standard | Reu | 05111 | PNP/NPN | Light | WSE15-B2430 | 1043328 |

¹⁾Objects to be detected having 90% remission (based on DIN 5033 Standard White)

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. |
|---|----------------------|-------------------|-------------------------------|--------------|----------|
| Universal clamp system (UKS) | - | Stainless steel | - | BEF-KHS-N06N | 2051622 |
| Mounting bracket M18 | 90° bracket | Zinc plated steel | - | BEF-WN-M18 | 5308446 |
| Mounting bracket | With rotating insert | ABS | - | MB-BS18MM-M4 | 2049694 |
| Reflector | 2-hole mounting | PMMA/ABS | 40 x 60 | PL40A | 1012720 |
| Reflective tape for photoelectric sensors | - | Acrylic | Roll: 25 x 22.8 ¹⁾ | REF-PLUS-R25 | 5319929 |

 $^{\scriptscriptstyle 1)} \mbox{Rolls}$ can also be supplied cut to customized size

Cables and connectors \rightarrow p. 142 Additional reflectors \rightarrow p. 148



The ELF sensor is a miniature photoelectric sensor with basic functions packed into a housing, which is optimized for customer demands. Standard applications reside in the short range. Examples of applications are conveyor systems, vending machines, packaging lines, or other standard on/off applications. The ELF sensor does not have specific adjustment possibilities or additional functions.

At a glance

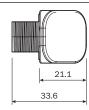
- Integrated M18 threads for front and base mounting
- Integrated ASIC-technology by SICK guarantees the best optical performance
- Photoelectric proximity and retroreflective sensors with different sensing ranges
- typesClear back cover for highly visible power and output indication

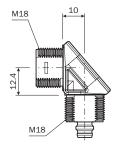
Available as cable, M8 and M12 plug

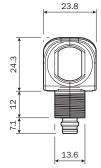
Your benefits

- Fast and cost-effective mounting solutions
- Only little view space required behind the sensor
- Convenient handling, perfect display LED visibility, adjustment possibilities
- Economical hybrid sensor type for cost-sensible applications
- More flexibility caused by multiple sensing ranges

Dimensions



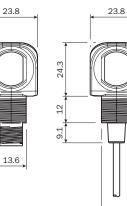




24.3

12

10.4



Dimensional drawings

- Data sheet
- Applications
- Additional accessories

((🗐

Further information

www.mysick.com/products Enter part number for:

www.mysick.com/en/ELF

13.6

- Light source: Red light
- Enclosure rating: IP 67

- Output type: PNP
- Housing material: plastic

• Supply voltage: 10 ... 30 V DC

| Sensor type | Sensing technology | Sensing range | Light source | Output type | Connection | Model name | Part no. |
|------------------|-----------------------|----------------------|--------------|-------------|--------------------|-------------|----------|
| | | | Infrared | PNP, light | Cable, 2m | ET3-P3215 | 1045187 |
| | BGB | 1 50 mm | | | Plug M12, 4-pin | ET3-P3228 | 1045211 |
| Provimity | Proximity | | | | Plug M8, 4-pin | ET3-P3238 | 1045219 |
| FTOXITILITY | | | | | Cable, 2m | m ET3-P4215 | 1045191 |
| | | 1 100 mm | Infrared | PNP, light | Plug M12, 4-pin | ET3-P4228 | 1045215 |
| | | | | | Plug M8, 4-pin | ET3-P4238 | 1045281 |
| | | | | | Cable, 2m | EL3-F2415 | 1043961 |
| Retro-reflective | Standard | 04,8 m ¹⁾ | Red | PNP, dark | Plug M12, 4-pin | EL3-F2428 | 1044705 |
| | | | | | Plug M8, 4-pin | EL3-F2438 | 1044717 |

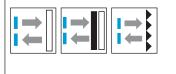
1) PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Model name | Part no. | | |
|---------------------------------|-----------------|------------------------|--------------------|--------------------------------------|----------|--|--|
| Mounting brookst | 90° bracket | Zinc-plated steel | - | BEF-WN-M18 | 5308446 | | |
| Mounting bracket 90° | 90 bracket | Stainless steel | - | MB-W1000 | 7023800 | | |
| | | | 52 x 62 | P250 | 5304812 | | |
| Deflector | O halo mounting | Diastia | 20 x 60 | PL20A | 1012719 | | |
| Reflector | 2-hole mounting | Plastic | 40 x 60 | PL40A | 1012720 | | |
| | | | 84 x 84 | PL80A | 1003865 | | |
| Cables and connectors and n 142 | Addition | al reflectors -> p 149 | ۸ddit | Additional mounting brackets and 146 | | | |

Cables and connectors \rightarrow p. 142

Additional reflectors \rightarrow p. 148





The Z photoelectric sensor family incorporates SICK technology into a clear housing design that provides 360° status indication for presence detection applications. These sensors have an IP 67 enclosure rating for harsh environ-

At a glance

- Optical and electronical elements can be integrated into specific housings
- The Z1 and Z2 models come with integrated M18 threads. The Z3 model, or the "Eyeball", can be aligned in any direction, just like the human eye 18 mm front and flange mounting possibility

ments and offer a high level of functionality at a low cost. In addition, customers can choose the cable length, connectors, brackets and more to suit their specific needs.

- The eyeball-shaped housing allows for infinite adjustability and the indicator LED to be seen from 360° around the device.
- Compact, transparent housing
- Proximity sensors with 3 different sensing ranges and retro-reflective sensors are available

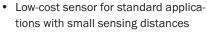
Your benefits

- Customer-specific housing modifications
- Simple and unique mounting options lower installation costs
- Compatibility with competitor products for easy integration into existing systems

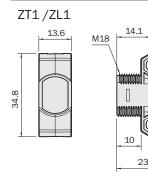
Ø 3.5

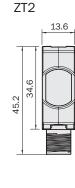
25.

Dimensions

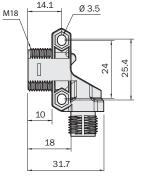


- Small size fits applications with limited space
- High performance at a low cost





ZL3



ZL2

34.6

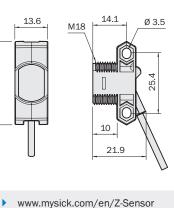


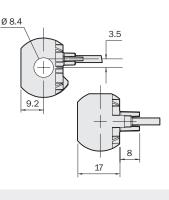
Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories





- Light source: Red light
- Enclosure rating: IP 67

- Supply voltage: 10 ... 30 V DC
- Housing material: Plastic

| Sensor type | Sensing technology | Light source | Sensing range | Output type | Connection | Model name | Part no. |
|------------------|------------------------|--------------|-----------------------|--------------------|-------------------------------|------------|----------|
| Drovimity | BGS | Infrared | 0 50 mm | NPN, light | Cable, PVC, 2 m | ZT1-N3215 | 1045562 |
| Proximity | Energetic, V-optics | Infrared | 5 155 mm | PNP, light | Plug M12, 4-pin | ZT2-P5228 | 1045469 |
| | | | PNP, light | Cable, PVC, 2 m | ZL1-P2415 | 1045497 | |
| | | | | NPN, dark | Cable, PVC, 2 m | ZL2-E2415 | 1045390 |
| Retro-reflective | Standard Red ligh | Red light | 0 4,8 m ¹⁾ | | Pigtail M12, 4-pin, 150 mm | ZL1-F2421 | 1045502 |
| | | | | PNP, dark | Plug M12, 4-pin | ZL2-F2428 | 1045371 |
| | | | | | Pigtail M12, 4-pin, 150 mm | ZL3-F2421 | 1045535 |

1) PL80A

Recommended accessories

| Name | Design | Material | Dimensions [mm] | Comment | Model name | Part no. | |
|---------------------------|--------------------|--------------------|--------------------|----------------|--|----------|--|
| Mounting bracket 90° brac | With rotony incort | | | For Z1, Z2, Z3 | MB-BS18MM-M4 | 2049694 | |
| | with rotary insert | - | - | For Z3 | | | |
| | 90° bracket | Zinc-plated steel | - | For Z1, Z2 | BEF-WN-M18 | 5308446 | |
| | | Stainless steel | - | For Z1, Z2 | MB-W1000 | 7023800 | |
| | | | 52 x 62 | - | P250 | 5304812 | |
| Doflactor | 2 halo mounting | Plastic | 20 x 60 | - | PL20A | 1012719 | |
| Reflector | 2-hole mounting | Plastic | 40 x 60 | - | PL40A | 1012720 | |
| | | | 84 x 84 | - | PL80A | 1003865 | |
| Cables and connectors | p. 142 | Additional reflect | ors → p. 148 | Additi | ional mounting brackets \rightarrow p. | 146 | |

Photoelectric sensors Sensors for roller conveyors & zone control

In another jam? We can help.



ZLM The ZLM in industrial use



WTR Detection of car tires



WTR The WTR with attached solenoid valve

Sensors designed for accumulation on roller conveyors

The sensors are designed to support the accumulation and zone control process on roller conveyors in material handling and logistics operations. They help regulate the flow and accumulation materials and products at distribution stations. All with no complicated programming and less cabling, thus increasing the availability of the conveyor systems. WTR and WLR: "3 in 1" – photoelectric proximity sensors and specialized photoelectric sensors combined with valves and logic to form a compact unit for buffering of conveyed products without pressure. The special slimline housing in the top section of the WTR and WLR allows easy mounting under or between the rollers of a conveyor system. At the same time, this mounting method offers protection against damage and reduces the amount of cabling required by integrating the components. The ZLM1 contains the logic and valve for control of the accumulation conveyor and is the ideal solution for installation in the side tray rollers. Suitable photoelectric or inductive SICK sensors can be connected to the ZLM1. Furthermore, the ZLM1 can be easily combined to operate with the WTR or WLR.

Photoelectric sensors Sensors for roller conveyors & zone control



Sensors for roller conveyors & zone control



 WTR
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 Photoelectric proximity sensors for accumulation on roller conveyors



WTR sensors control the material flow on accumulation conveyors. They ensure very high availability of the conveyor systems by controlling the material flow, thus reducing the costs. The integrated or separate logic modules eliminate any need for programming, with less cabling required as well. The photoelectric proximity sensor, valves, and logic form a functional unit. However, they are also available separately as modules (WTR

At a glance

- · Sensor, logic, and valve in one housing
- Housing design adapted to suit roller conveyor modules
- Precise background suppression with photoelectric proximity sensors with long, adjustable sensing range

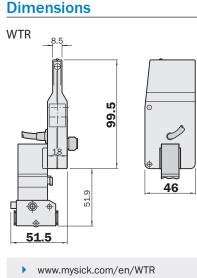
sensor, ZLM logic module, valve), offering many solution options for the designer. A core element is the sensor with its long, adjustable sensing range and background suppression for reliable detection of the conveyed products. The special slimline housing in the top section of the WTR fits between all common roller spacings. At the same time, this mounting method offers protection against damage and simplifies installation.

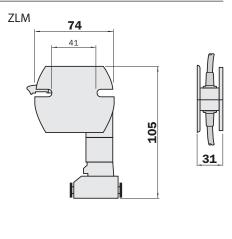
- Integrated logic ensures controlled flow of goods from conveyor systems e.g. single feed & block feed or single/block release
- · Electrical output for motor actuation or integrated solenoid valve
- · Modular structure (with/without solenoid valve or motor actuation, with/ without logic)

- Your benefits
- All-in-one solution: sensor + logic + valve in one housing
- Space-saving and protected mounting, integration below conveying level
- Reliable detection of the transported products and containers without the addition of reflectors
- The ideal standalone solution, saving cabling, simplifying control, and permitting the modular expansion of conveyor systems
- · Controlled flow of goods with starting/stopping within a conveyor belt easy and reliable
- Very high availability of the conveyor systems thanks to controlled flow of material - and therefore reduced costs
- · Flexible process engineering through modularity



- Dimensional drawings
- Data sheet
- Applications
- Additional accessories





- Sensing range: 60 ... 900 mm (500 mm), adjustable
- Adjustment range: 300 ... 900 mm (500 mm)
- Separate ZLM logic module: see www.sick.com

WTR

| Actuator control | Logic | Operating mode | Output type | Sensing range | Connection | Model name | Part no. |
|---------------------|------------------|-------------------|-------------|---------------|----------------------|--------------|----------|
| | | Light | PNP | 900 mm | M12, 4-pin | WTR2-P511 | 1015158 |
| | | Dark | PNP | 900 mm | M12, 4-pin | WTR2-P521 | 1015074 |
| Electric No logic | Dark, pin 4 | PNP | 900 mm | M12, 4-pin | WTR2-P521S09 | 1024302 | |
| | Light & Dark | PNP | 900 mm | M12, 4-pin | WTR2-P551S08 | 1022927 | |
| | | NPN | 900 mm | M12, 4-pin | WTR2-N551 | 1018877 | |
| Pneumatic | Pneumatic Single | Air-to-Drive | PNP | 900 mm | M12, 4-pin, 1.2 m | WTR1-P421S02 | 1015388 |
| | U | | | | M12, 4-pin | WTR1-P421 | 1013260 |
| Penumatic | Cindle | Air-to-Brake | PNP | 500 mm | M12, 4-pin, 1.2 m | WTR1-P721S11 | 1018923 |
| Penumatic | Single | Air-to-Brake | PNP | 900 mm | M12, 4-pin, 1.2 m | WTR1-P721 | 1015301 |
| Electric | Single, | Dorl | | | M12, 4-pin to motor | WTR2-P621S27 | 1042271 |
| Electric | sleep function | Dark PNP | | 900 mm | Cable 1.2 m to motor | WTR2-P621S22 | 1040597 |

ZLM

• Connection to following ZLM: M12, 4-pin

| Mode of operation | Connection type to the sensor | Model name | Part no. |
|-------------------|-----------------------------------|---------------|----------|
| Airte broke | Cable with receptacle, M12, 4-pin | ZLM1-B1612E42 | 7028842 |
| Air-to-brake | Cable with receptacle, M8, 4-pin | ZLM1-B1622E42 | 7028844 |
| Airto drivo | Cable with receptacle, M12, 4-pin | ZLM1-B1612E43 | 7028843 |
| Air-to-drive | Cable with receptacle, M8, 4-pin | ZLM1-B1622E43 | 7028845 |

Recommended accessories

| Name | Material | Model name | Part no. |
|-------------------------|-------------------|------------|----------|
| Mounting bracket, large | Zinc plated steel | BEF-WN-WTR | 2017417 |
| Mounting bracket, small | Zinc plated steel | BEF-WK-WTR | 2051786 |

Cables and connectors \rightarrow p. 142

Accessories from SICK. To suit any application.



A winning combination: sensors and accessories from SICK

For optimal integration of sensors in to your systems, the use of perfectly matched accessories is indispensable.

Reliable signal transmission is critical to productivity – high-quality connectivity components with long service life can lower your costs. That is why SICK offers the right connection systems for any application in any industry, whether material handling, packaging, automotive, or the food and beverage industry. The extensive range of plug connectors and junction boxes makes it possible to achieve the right cabling for every application, even under the harshest and most difficult conditions.

The requirements of mounting systems for sensors are just as diverse as their areas of application. Whether for fine adjustment on precision machines or protection from extreme ambient conditions, SICK offers the right solutions with clever mounting concepts for the installation, alignment, and protection of SICK industrial sensors. Efficient and functional. Whether round or rectangular, made from plastic or from glass, self adhesive or screwed in place, as a reflector or reflective tape: it's the reflectors specially developed for optical sensors that make it possible for SICK photoelectric retro-reflective sensors to reach their full potential – even with a critical light environment, extreme temperatures, or aggressive ambient conditions.



Accessories

| Connection systems | 42 |
|---|----|
| Mounting systems | 46 |
| Reflectors 1 SICK reflectors – optimum performance for your photoelectric retro-reflective sensor | 48 |



- Data sheet
- Applications
- Additional accessories

A wide range of terminal screwed male and female connectors allows the user to implement their own customized wiring solutions. Different lengths and qualities of cable can be put together to suit the application, quickly and smoothly. Connecting cables, having a molded round connector on one end and the other end open, offer a maximum of flexibility for the wiring of sensors. Permanently mold-

At a glance

- Terminal screwed connectors with screw connection or push-in connection (M8 angled)
- Connecting and extension cables with PUR cable for flexible and demanding areas of application. Very high resistance to oils, lubricants, and coolants.
- Connecting and extension cables with PVC cable for use with medium mechanical stresses in dry zones, such as assembly lines, packaging, and material handling. The outer sheath features good resistance to chemicals, but PVC has only limited resistance to lubricants and coolants.

Your benefits

- Operational reliability because the connection systems are designed for the sensors
- High quality components with long service life helps reduce costs

ed cables with molded round connectors on both ends are used as extension cables for connecting to sensor/actuator junction boxes or fieldbus modules. The molding on both ends is especially good at protecting against humidity and contamination. Both connecting cables and extension cables are available in PVC, PUR, and IP 69K models.

• Connecting and extension cables from the IP 69K series are especially suitable for use in the food and beverage industry due to their high resistance to chemicals, acids, alkalis, and cleaning agents

 Reliable signal transmission is critical to high productivity

Technical details and ordering information

Connecting cables

| Connec- tion | Contacts | Design | Cable | Length [m] | Model name | Part no. |
|-----------------|----------|-----------------------------|----------------------|---------------|----------------|----------|
| | | | EV.C | 2 | DOL-0803-G02M | 6010785 |
| | | | PVC, orange | 5 | DOL-0803-G05M | 6022009 |
| | | Female connector, | | 2 | DOL-0803-G02MC | 6025888 |
| | | straight | PUR, black | 5 | DOL-0803-G05MC | 6025889 |
| | | | | 2 | DOL-0803-G02MN | 6033664 |
| | | | PVC, orange, IP 69k | 5 | DOL-0803-G05MN | 6033665 |
| | 3 | | | 2 | DOL-0803-W02M | 6008489 |
| | | | PVC, orange | 5 | DOL-0803-W05M | 6022010 |
| | | Female connector, | | 2 | DOL-0803-W02MC | 6025891 |
| | | angled | PUR, black | 5 | DOL-0803-W05MC | 6025892 |
| | | | PVC, orange, IP 69k | 2 | DOL-0803-W02MN | 6033667 |
| 140 | | | | 5 | DOL-0803-W05MN | 6033668 |
| M8 | | | | 2 | DOL-0804-G02M | 6009870 |
| | | | PVC, orange | 5 | DOL-0804-G05M | 6009872 |
| | | Female connector, | PUR, black | 2 | DOL-0804-G02MC | 6025894 |
| | | straight | | 5 | DOL-0804-G05MC | 6025895 |
| | | | PVC, orange, IP 69k | 2 | DOL-0804-G02MN | 6033670 |
| | 4 | | | 5 | DOL-0804-G05MN | 6033671 |
| | 4 | Female connector, angled | PVC, orange | 2 | DOL-0804-W02M | 6009871 |
| | | | rve, orange | 5 | DOL-0804-W05M | 6009873 |
| | | | PUR, black | 2 | DOL-0804-W02MC | 6025897 |
| | | | angled | 5 | DOL-0804-W05MC | 6025898 |
| | | | PVC, orange, IP 69k | 2 | DOL-0804-W02MN | 6033673 |
| | | | r vo, orange, ir ook | 5 | DOL-0804-W05MN | 6033674 |
| | | | PVC, orange | 2 | DOL-1204-G02M | 6009382 |
| | | | rve, orange | 5 | DOL-1204-G05M | 6009866 |
| | | Female connector, | PUR, black | 2 | DOL-1204-G02MC | 6025900 |
| | | straight | FOR, black | 5 | DOL-1204-G05MC | 6025901 |
| | | | PVC, orange, IP 69k | 2 | DOL-1204-G02MN | 6028128 |
| | | | rve, orange, ir oak | 5 | DOL-1204-G05MN | 6028130 |
| M12 | 4 | | PVC, orange | 2 | DOL-1204-W02M | 6009383 |
| IVIIZ | 4 | | rve, orange | 5 | DOL-1204-W05M | 6009867 |
| | | Female connector, | PUR, black | 2 | DOL-1204-W02MC | 6025903 |
| | | angled | FOR, black | 5 | DOL-1204-W05MC | 6025904 |
| | | | PVC orange ID 60k | 2 | DOL-1204-W02MN | 6028129 |
| | | | PVC, orange, IP 69k | 5 | DOL-1204-W05MN | 6028131 |
| | | Female connector, | PVC, orange, IP 69k | 2 | DOL-1204-L02MN | 6028136 |
| | | angled, 3xLED | rvo, orange, ir oak | 5 | DOL-1204-L05MN | 6028137 |

continued on page 144

| Connec- tion | Contacts | Design | Cable | Length [m] | Model name | Part no. |
|-----------------|-------------------|-------------------|---------------------------------------|----------------|----------------|----------|
| | | | | 2 | DOL-1205-G02M | 6008899 |
| | | | PVC, orange | 5 | DOL-1205-G05M | 6009868 |
| | Female connector, | | 2 | DOL-1205-G02MC | 6025906 | |
| | | straight | PUR, black | 5 | DOL-1205-G05MC | 6025907 |
| M12 | 5 | | PVC, orange, "hygienic and wet zones" | 2 | DOL-1205-G02MN | 6028140 |
| IVIIZ | 5 | | | 5 | DOL-1205-G05MN | 6028141 |
| | | | | 2 | DOL-1205-W02M | 6008900 |
| | | Female connector, | PVC, orange | 5 | DOL-1205-W05M | 6009869 |
| | angled | PUR, black | 2 | DOL-1205-W02MC | 6025906 | |
| | | | 5 | DOL-1205-W05MC | 6025907 | |

Extension cables

| Female connec- tion | Female contacts | Male connec- tion | Male contacts | Design | Cable | Length [m] | Model name | Part no. |
|---------------------------|--------------------|-------------------------|--|---|-------------|----------------|----------------|----------|
| | | M8 | 2 | Female connector, | | 0.6 | DSL-0803-G0M6C | 6029404 |
| | | M8 3 | straight / male con- nector, straight | PUR, black | 2 | DSL-0803-G02MC | 6029406 | |
| | | | | | | 0.6 | DSL-8203-G0M6 | 6022570 |
| | 3 M: | | | Female connector, straight / male con- | PVC, orange | 2 | DSL-8203-G02M | 6022572 |
| | | 1440 | 2 | nector, straight | PUR, black | 0.6 | DSL-8203-G0M6C | 6025914 |
| | | M12 | 3 | | PUR, DIACK | 2 | DSL-8203-G02MC | 6025915 |
| | | | | Female connector, angled / male con- nector, straight | | 0.6 | DSL-8203-B0M6C | 6025916 |
| | | | | | PUR, black | 2 | DSL-8203-B02MC | 6025917 |
| MQ | M8 | | M8 4 | Female connector, straight / male con- | PVC, orange | 0.6 | DSL-0804-G0M6 | 6034664 |
| WIG | | MAQ | | | | 2 | DSL-0804-G02M | 6034665 |
| | | IVIO 4 | nector, straight | PUR, black | 0.6 | DSL-0804-G0M6C | 6039089 | |
| | | | | | 2 | DSL-0804-G02MC | 6036335 | |
| | 4 | | | Female connector, straight / male con- | PVC, orange | 0.6 | DSL-8204-G0M6 | 6022571 |
| | 4 | | | | | 2 | DSL-8204-G02M | 6022573 |
| | | M12 | 4 | nector, straight | PUR, black | 0.6 | DSL-8204-G0M6C | 6025918 |
| | | IVIIZ | 4 | | FUR, black | 2 | DSL-8204-G02MC | 6025919 |
| | | | | Female connector, | DUD block | 0.6 | DSL-8204-B0M6C | 6025920 |
| | | | | angled / male con- nector, straight | PUR, black | 2 | DSL-8204-B02MC | 6025921 |
| | | | | Female connector, | D) (O | 0.6 | DSL-1203-G0M6 | 6022564 |
| 1410 | | M8 3 | 3 | straight / male con- nector, straight | PVC, orange | 2 | DSL-1203-G02M | 6022566 |
| M12 | 3 | | | Female connector, | | 0.6 | DSL-1203-G0M6C | 6025922 |
| | | M12 3 | straight / male con- nector, straight | PUR, black | 2 | DSL-1203-G02MC | 6025923 | |

Μ

| Female connec- tion | Female contacts | Male connec- tion | Male contacts | Design | Cable | Length [m] | Model name | Part no. |
|---------------------------|--------------------|-------------------------|--|---|-----------------------|----------------|----------------|----------|
| | | | 3 | Female connector, | | 0.6 | DSL-2803-G0M6C | 6039183 |
| | | M8 | 5 | straight / male con- nector, straight | PUR, black | 2 | DSL-2803-G02MC | 6039184 |
| | IVIð | 4 | Female connector, | PUR, black | 0.6 | DSL-2804-G0M6C | 6037595 | |
| | | 4 | straight / male con- nector, straight | | 2 | DSL-2804-G02MC | 6039180 | |
| | | | | PVC, orange | 2 | DSL-1204-G02M | 6022567 | |
| | | | | r vo, orange | 5 | DSL-1204-G05M | 6022569 | |
| | 4 | M12 | | Female connector, straight / male con- nector, straight | PUR, black | 0.6 | DSL-1204-G0M6C | 6025926 |
| M12 | | | | | FUR, DIACK | 2 | DSL-1204-G02MC | 6025927 |
| 11112 | | | 4 | | PVC, orange, "hygien- | 0.6 | DSL-1204-G0M6N | 6028194 |
| | | IVIIZ | 4 | | ic and wet zones" | 2 | DSL-1204-G02MN | 6028195 |
| | | | | | PUR, black | 0.6 | DSL-1204-B0M6C | 6025928 |
| | | | | Female connector, angled / male con- | FUR, DIACK | 2 | DSL-1204-B02MC | 6025929 |
| | | | | nector, straight | PVC, orange | 0.6 | DSL-1204-B0M6N | 6028197 |
| | | | | | rvo, orange | 2 | DSL-1204-B02MN | 6028198 |
| | _ | 144.0 | Female connector, | , | | 0.6 | DSL-1205-G0M6C | 6025930 |
| | 5 M12 | 5 | straight / male con- nector, straight | PUR, black | 2 | DSL-1205-G02MC | 6025931 | |

Terminal screwed round connectors

| Connection | Contacts | Design | Cable diameter [mm] | Locking nut material | Model name | Part no. |
|------------|----------|-------------------------------|------------------------|-------------------------|-------------|----------|
| | | Female connector, straight | 3.5 5 | CuZn | DOS-0803-G | 7902077 |
| | 3 | Female connector, angled | 4 5 | CuZn | DOS-0803-W | 7902078 |
| M8 | | Male connector, straight | 3.5 5 | CuZn | STE-0803-G | 6037322 |
| IVIO | | Female connector, straight | 3.5 5 | CuZn | DOS-0804-G | 6009974 |
| | 4 | Female connector, angled | 4 5 | CuZn | DOS-0804-W | 6009975 |
| | | Male connector, straight | 3.5 5 | CuZn | STE-0804-G | 6037323 |
| | | Female connector, straight | 3 6.5 | CuZn | D0S-1204-G | 6007302 |
| | | | 5 0.5 | Stainless steel | DOS-1204-GN | 6028357 |
| | 4 | Female connector, | 3 6.5 | CuZn | D0S-1204-W | 6007303 |
| | | angled | 5 0.5 | Stainless steel | DOS-1204-WN | 6028358 |
| M12 | | Male connector, straight | 3 6.5 | CuZn | STE-1204-G | 6009932 |
| | | Female connector, straight | 3 6.5 | CuZn | DOS-1205-G | 6009719 |
| | 5 | Female connector, angled | 3 6.5 | CuZn | DOS-1205-W | 6009720 |
| | | Male connector, straight | 3 6.5 | CuZn | STE-1205-G | 6022083 |



- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

Product description

To integrate SICK sensors perfectly into a machine or system, mounting equipment tailored precisely to the sensors is required. Whether for fine adjustment on precision machines or protection from extreme ambient conditions, such as in the timber industry, SICK offers the right systems and products for the mounting, alignment, and protection of SICK sensors. For special applications, we also offer the option of working closely with you to develop customized mounting elements for your systems and requirements, which we then deliver together with the sensor.

At a glance

- Mounting systems, designed for SICK's sensor series
- A wide range of mounting brackets and plates to choose from for easy sensor mounting
- Flexible sensor alignment which is right for the application with SICK's universal clamp system

Your benefits

- Fast commissioning and maintenance of systems and machines due to simple, practical sensor mounting
- Optimum alignment of the sensor to the object using the universal clamp system

- Protective devices shield sensors from mechanical stresses or protect from weather, which could impair the functioning of the sensors
- Application-specific solutions possible for sensor mounting, alignment, or protection
- Prevention of sensor damage and securing of sensor functionality with the aid of SICK sensor protection solutions

IV

Technical details and ordering information

Universal clamp system

• For rod diameter 12 mm

• Material: stainless steel (1.4408) (also available in zinc plated steel)

| Description | Included in delivery | For series | Model name | Part no. |
|-----------------------------|--|---|--------------|----------|
| Plate 8 for universal clamp | Universal clamp and mounting hardware | W160, W4S-3 Inox, W11-2, W12-3, W250 | BEF-KHS-N02N | 2051618 |
| Plate 3 for universal clamp | Universal clamp and mounting hardware | W11-2, W12-3, W14-2, W18-3, W24-2, PL20A, PL30A, PL40A, PL50A, PL80A, P250 | BEF-KHS-N03N | 2051619 |
| Plate 4 for universal clamp | Universal clamp and mounting hardware | W11-2, W12-3, W14-2, W18-3, W23-2, W24-2, W27-3, W260, W280, W30, W32, W34, W36, PL20A, PL40A, PL50A, PL80A, P250 | BEF-KHS-N04N | 2051620 |
| Plate 5 for universal clamp | Universal clamp and mounting hardware | V12-2 | BEF-KHS-N05N | 2051621 |
| Plate 6 for universal clamp | Universal clamp and mounting hardware | MH15, V18, W4-3, W15 | BEF-KHS-N06N | 2051622 |
| Plate 7 for universal clamp | Universal clamp and mounting hardware | PL20A, PL40A, PL50A, P250, C110 | BEF-KHS-N07N | 2051623 |
| Plate 8 for universal clamp | Universal clamp and mounting hardware | W4-3, W4S-3, W8, W100, W140, W150, W170, W9-3, W9 Laser | BEF-KHS-N08N | 2051616 |
| Universal clamp | - | - | BEF-KHS-KH3N | 5322627 |
| Mounting rod, straight | - | - | BEF-MS12G-NA | 4058914 |
| Mounting rod, L-shaped | - | - | BEF-MS12L-NA | 4058912 |
| Mounting rod, Z-shaped | - | - | BEF-MS12Z-NA | 4058916 |

Mounting brackets and clamps

| Description | Material | Included in delivery | For series | Model name | Part no. |
|--|--------------------------|-------------------------------|---------------------------------------|-------------|----------|
| | Stainless steel (1.4571) | Mounting hardware included | W4-3, W4S-3, W4S-3 Inox, W8, W100 | BEF-W4-A | 2051628 |
| Mounting bracket for wall mounting | Stainless steel (1.4305) | Mounting hardware included | W8, W100 | BEF-W100-A | 5311520 |
| | Zinc plated steel | Mounting hardware included | W9-3, W9 Laser | BEF-WN-W9-2 | 2022855 |
| Mounting bracket for floor mounting | Stainless steel (1.4301) | Mounting hardware included | W11-2, W12-3 | BEF-WG-W12 | 2013942 |
| Mounting bracket with | | Mounting hardware | W14-2, W18-3 | BEF-WN-W18 | 2009317 |
| articulated arm, floor mounting | Zinc plated steel | included | W23-2, W27-3 | BEF-WN-W27 | 2009122 |
| | | - | IM08, IME08, MM08 | BEF-WN-M08 | 5321721 |
| Mounting bracket for floor mounting | Zinc plated steel | | V12, IM12, IME12, MM12 | BEF-WN-M12 | 5308447 |
| noor mounting | | | MH15, V18, IM18, IME18, MM18, CM18 | BEF-WN-M18 | 5308446 |
| | | Mounting hardware included | IM08, IME08, MM08 | BEF-KHF-M08 | 2051478 |
| Clamping block with fixed stop for cylindrical sensors | forced | Mounting hardware included | V12, IM12, IME12, MM12 | BEF-KHF-M12 | 2051480 |
| 3013013 | | Mounting hardware included | MH15, V18, IM18, IME18, MM18, CM18 | BEF-KHF-M18 | 2051482 |

Protective devices

| Description | Material | Included in delivery | For series | Model name | Part no. |
|--|--------------------------|---------------------------------------|--------------------------------|--------------|----------|
| Protective bracket for floor mounting | Stainless steel (1.4571) | Mounting hardware included | W4S-3, W4S-3 Inox, W8, W100 | BEF-SW-W4S | 2051497 |
| Protective housing for | | Universal elema | W11-2, W12-3 | BEF-SG-W12-3 | 2045175 |
| universal clamp | Zinc plated steel | Universal clamp, mounting hardware | W14-2, W18-3, W23-2, W27-3 | BEF-SG-W27 | 2039601 |
| Dust protection tube, air-purged | Aluminum, anodized | Mounting hardware included | W24-2 | OBS-W24 | 2015069 |

8013958/2011-08-29 Subject to change without notice



Product description

The quality of the reflector is a crucial factor for the use of a photoelectric retro-reflective sensor. Only in combination with the original SICK reflectors can the full performance of SICK's sensors be realized. This is why SICK offers an especially large range of reflectors. The basic range contains a wealth of standard reflectors in various sizes, round or rectangular, for screw, adhe-

At a glance

- Large range of reflectors of various sizes, shapes, and mounting methods
- Chemically resistant reflectors are unaffected by aggressive cleaning agents

Your benefits

- SICK has the right reflector for every application
- The CHEM reflectors suffer no damage from aggressive cleaning agents

sion or plug-in mounting. Then there are also reflectors available for critical areas of application, such as in the food and beverage industry or in the extreme high or low temperature range, which can be relied on to function correctly even under these difficult conditions. The portfolio is completed by SICK reflective tape, which is used wherever the installation of conventional reflectors is not possible.

- Reflectors with special antifog coating prevent water condensation
- Reflectors for use in high or low temperatures
- Can be used in damp or humid environments, or with rapid temperature fluctuations, without reflector fogging
- Customized reflector solutions are
 possible for specialized requirements

CE

Further information

www.mysick.com/products

Enter part number for:

- Dimensional drawings
- Data sheet
- Applications
- Additional accessories

Technical details and ordering information

Reflectors

Suitable for sensors with polarizing filter

• Material: plastic

| Design | Description | Dimensions reflection area [mm] | Model name | Part no. |
|-------------|-----------------|------------------------------------|------------|----------|
| | Self adhesive | Ø 22 | PL22-2 | 1003621 |
| Round | M4 setscrew | Ø 21 | P25 | 5315172 |
| | 1-hole mounting | Ø 80 | C110A | 5304549 |
| | | 15 x 38 | PL20A | 1012719 |
| | O halo mounting | 28 x 56 | PL30A | 1002314 |
| | 2-hole mounting | 37 x 56 | PL40A | 1012720 |
| | | 47 x 47 | P250 | 5304812 |
| Rectangular | M6 setscrew | 45 x 75 | PL72-2 | 5322723 |
| | | 80 x 80 | PL80A | 1003865 |
| | 2 halo mounting | 18 x 18 | PL10F 1) | 5311210 |
| | 2-hole mounting | 16 x 38 | PL20F 1) | 5308844 |
| | | 47 x 47 | PL250F 1) | 5308843 |

¹⁾ Suitable for laser sensors

Special reflectors

• Suitable for sensors with polarizing filter

| Design | Description | Dimensions [mm] | Enclosure rating / certification | Model name | Part no. |
|-------------|---|-----------------------|----------------------------------|--------------------------|----------|
| Round | High-temperature reflector, up to 300 °C | Ø 60 | - | OP61 | 1002627 |
| | High-temperature reflector, up to 110 °C | 47 x 47 | - | P250H | 5315124 |
| | Antifog reflector | 37 x 56 | - | PL40A Antifog | 5322011 |
| | Reflector with integrated regulated heating | width across flats 48 | - | PL50HS | 1009871 |
| | | 15 x 38 | IP 69K, ECOLAB, TÜV Rheinland | PL20CHEM | 5321089 |
| Rectangular | | 47 x 47 | IP 69K, ECOLAB, TÜV Rheinland | P250CHEM | 5321097 |
| | Chemically resistant reflector up to 140 °C | 18 x 18 | IP 69K, ECOLAB, TÜV Rheinland | PL10F-CHEM 1) | 5321636 |
| | | 15 x 38 | IP 69K, ECOLAB, TÜV Rheinland | PL20F-CHEM ¹⁾ | 5326089 |
| | | 37 x 56 | IP 69K, ECOLAB, TÜV Rheinland | PL40B-CHEM | 5326088 |

 ${}^{\scriptscriptstyle (1)}$ Suitable for laser sensors

Reflective tape

• Suitable for sensors with polarizing filter

| Description | Ambient temperature for operation [°C] | Dimensions [mm] | Model name | Part no. |
|--|--|------------------------------------|-----------------------------|----------|
| Reflective tape, self adhesive, for laser sensors | -20 60 | 56.3 mm x 56.3 mm | REF-AC1000-56 ²⁾ | 4063030 |
| | | Roll 22.8 mm x 25 m ¹⁾ | REF-PLUS-R25 | 5319929 |
| Reflective tape, selfadhesive, roll | -20 60 | Roll 22.8 mm x 50 m ¹⁾ | REF-PLUS-R50 | 5319981 |
| | | Roll 22.8 mm x 100 m ¹⁾ | REF-PLUS-R100 | 5319915 |

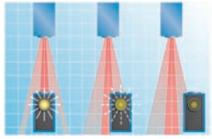
 $^{\scriptscriptstyle 1)}$ Rolls can also be supplied cut to customized size

²⁾ Suitable for laser sensors

Technical terms in the field of automation

Alignment aid

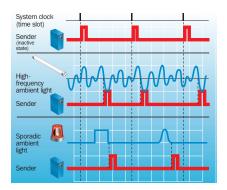
Optical and electronic alignment aids are used for quickly and easily aligning sensors to receiver elements, reflectors, or objects to be detected. This is especially important when the emitted light beam is difficult or impossible to see and when long distances need to be crossed, sometimes up to several hundred meters. An alignment sight is the simplest form of optical alignment aid. It is mainly used for rough alignment. Fine adjustment of a sensor is generally done with the assistance of optical indicators on the device. Alignment accuracy is indicated by these indicators lighting up, flashing, and going out; sometimes also by a red/green LED changing color. The visible red light of many sensors provides further aid. It can be seen clearly when aligning the sensors as a light spot on a reflector or an object to be detected.



↑ Optical alignment aid

Ambient light immunity

To detect objects, photoelectric retroreflective and proximity sensors evaluate their own emitted light or its reflection from a reflector or the surface of a scanned object. At the same time, other light sources emit light too - from the sun to sources of high-frequency radiation. This light is known as ambient light. This light should not be allowed to affect the sensors, otherwise incorrect switching could occur. Therefore one of the central requirements of users is maximum immunity to ambient light, especially to high-frequency lights or strobe warning lamps, without reducing the performance of the sensors.



The sender only issues a pulse during a defined timeframe, and the receiver unit is only active during that timeframe, and observes the surroundings. If the receiver does not detect any interfering pulses, the emitted pulse is set at the end of the timeframe and detection is then carried out. If periodic interference occurs, the intelligent electronics determine the most favorable time for detection and adjusts itself accordingly. The optical sensor is then able to process only its own emitted light in that interference-free zone.

Background suppression, BGS

Photoelectric proximity sensors use the reflective characteristics of the scanned objects for their detection. In the case of energetic sensors, that means: light colored surface = sensing range; dark objects = shorter sensing range. These devices reach their limits especially in cases where dark objects need to be detected against a light background, as the volume of light from the plane behind the object to be detected creates glare, which "dazzles" the energetic sensor. In such cases, photoelectric proximity sen-



Principle of operation of background suppression

sors with background suppression are the appropriate solution. These devices operate on the "glare-free" triangulation principle, with two separate receiver elements for detecting the reflection from a scanned object. BGS works as follows: The BGS photoelectric proximity sensor is set with its light spot positioned on the object to be detected in such a way that the reflection is detected solely by receiver E2. Anything lying behind that focal plane is suppressed. The possible distance between the object surface and the background plane varies depending on the reflectance of the object to be detected (see illustration). When the object leaves the sensor's range of detection, the angle of reflection changes. The reflected beam is detected by receiver element E1 instead and is suppressed electronically. Incorrect switching does not occur.

Cable

PUR cable:

- · Oil-resistant cable
- Not resistant to hydrolysis

PVC cable

- Not for long-term use in surroundings containing oil
- Not ozone- or UV-resistant PUR-PVC cable
- A PVC cable sheathed with PUR

Due to the risk of breakage, the cables must not be moved after the temperature falls below -5 °C.

Capacitive proximity sensors

Capacitive proximity sensors detect metallic and non-metallic objects. The sensing range increases with the dielectric constant of the object to be detected. They are used in applications such as the following:

- · Level monitoring when filling containers
- Level monitoring of bulk materials
- Final inspection in packaging processes

Conformity

Consumer and capital goods sold in the European internal market must comply with specific guidelines and directives. Opto-electronic sensors are governed primarily by two laws:

- The EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/ EEC.
- By affixing the CE marking to the • product, SICK, as the manufacturer, declares the requirements set out in these Directives to be fulfilled.

The operation of electrical devices in the USA is subject to federal regulations and is governed by the OSHA (Occupational Safety and Health Act) and the NEC (National Electrical Code). Testing and inspection is carried out by Underwriters Laboratories, which also issues the necessary marking. "R" here stands for "recognized" and means that the sensor has component approval.

The conditions of approval must Έl be observed and complied with when the component is used. Devices with individual approval and an approval number from Underwriters Laboratories bear the letter "L" for "Listed" in the logo. This marking permits the authority to carry out unannounced inspection of

production facilities.

In Canada, the operating regula-(SP tions for electrical systems and components are subject to the Canadian Electrical Code (CEC). It prescribes CSA conformity for all devices. The corresponding marking is issued by the Canadian Standards Association following successful individual inspection.



Alternatively, UL offers a combined certification for the USA and Canada.

Depending on the likelihood of potentially explosive atmospheres, electrical equipment for use in such areas may need to be designed, marked, and certified by an independent testing and inspection authority, such as the Physikalisch Technischer Bundesanstalt in Braunschweig, Germany.

Contamination control

Photoelectric retro-reflective sensors and proximity sensors sensor when the received light signal is clearly over a programmed switching threshold. Mist, dust, dirt, water spray, and cleaning work in the system are just a few of the things that can result in deposits forming on the device optics or reflectors over time. This causes the level of received light to fall, approaching the set switching threshold. If the level drops below the threshold, the device is no longer able to detect objects. To give the user early warning of an impending device failure due to contamination, most SICK devices are equipped with contamination control. If the intensity of the received light is less than 50% over the switching threshold, the receive indicator starts flashing. Some devices also offer a signaling output separate from the switching outputs for the purpose of monitoring the contamination level.

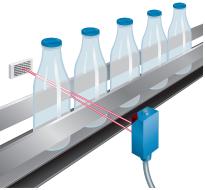
Continuous threshold adaptation

Sensors designed for the detection of transparent objects feature continuous threshold adaptation, which ensures adaptation to optical conditions. For example, if these are impaired due to contamination, such as dust deposited on the sensor lenses, the sensor signals this and adjusts itself to the new conditions with the aid of continuous threshold adaptation. This guarantees enhanced availability even under harsh

and contaminant-heavy application conditions.

Detection of transparent objects

Transparent objects such as clear plastic wrapping, transparent cellulose paper, transparent labeling film, glass bottles, and filled PET mineral water bottles, have long been considered some of the hardest objects to detect in the packaging and filling industries. Moreover, the gradual contamination of the sensors by escaping product, dust, vapors, or water spray impairs reliable detection considerably, because the "dirty" reflector signal gradually approaches the switching threshold, often leading to incorrect switching after even short periods of time. In contrast, the "glass detection method" applied offers a high degree of detection and switching reliability. This method centers on retaining the level interval of the reflector and the switching signal. The switching threshold is set to the



↑ Detection of transparent objects

unimpeded light path between the sensor and the reflector. Different operating modes can be selected depending on the signal attenuation expected: microprocessor evaluation is applied to adapt the switching threshold continually to any contamination occurring, with the interval between the reflector signal and the switching threshold being kept constant electronically. As a result, the dirt-attenuated reflector signal does not approach the set switching threshold in such a way as to impede detection. Maintenance of the devices is therefore not necessary until contamination is

so heavy as to reach the system limits of the glass sensor – in other words, significantly later than with conventional sensors. The signal and the threshold return to the original level automatically after cleaning.

Emitted light configurations

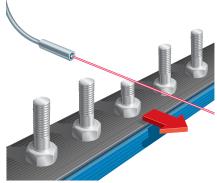
Emitted light can be divergent, convergent, or parallel, depending on the task for which a photoelectric sensor and its light source are designed. Divergent emitted light is used in through-beam systems, for example. The sender and receiver have similar sending and receiving characteristics in terms of the scattering of their beam path. The advantages of this are simple alignment, and insensitivity to oscillations, vibration, and minor misalignment. One particular advantage is the capacity for exact positioning of objects. Precision and the detection of small parts can be improved even more by the use of slotted diaphragms. Photoelectric retroreflective sensors aligned to reflectors usually operate on the same principle. In some cases, the lack of resolution of the divergent emitted light can prove to be critical. One advantage is the lower amount of cabling required. If small objects need to be detected in rapid succession with a high degree of accuracy, specially designed photoelectric proximity sensors are used. The path of their emitted light beam is convergent, i.e. merging, with a point of intersection at a defined distance - which is termed the focal plane. This is the exact point at which the generated light spot is smallest, which means precise object detection at higher resolution. In order to make use of these advantages, various requirements must be fulfilled including mounting that is virtually free of vibration, and a constant scanning distance. With laser diodes, largely parallel light can be generated. This has the advantage of long sensing ranges due to its minimal diffusion. A further plus for laser technology is the small light spot dimensions that can be generated on the objects, permitting detection of even the smallest of objects.

Enclosure ratings

Enclosure ratings indicate the extent of protection of a machine or sensor to touch and to the ingress of impurities and water. The enclosure ratings begin with the letters IP, followed by the first digit, which indicates the degree of protection provided against touch and impurities. The second digit shows the enclosure's protection against the ingress of water. The higher the number, the greater the protection indicated by that digit. Enclosure ratings of IP 65 and higher have established themselves as the standard for industrial applications.

Fiber-optic photoelectric sensors

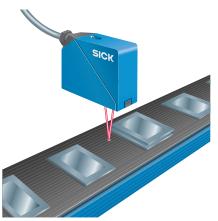
With fiber-optic photoelectric sensors, the sender and receiver are contained in a single housing. For use as a through-beam system, separate fiber-optic cables are used for the sender and the receiver. For a proximity system, the sender and receiver fiber-optic cables are joined in one fiber-optic cable.



† Fiber-optic photoelectric sensors

Foreground suppression FGS

The technique of foreground suppression makes it possible to use photoelectric triangulation scanning to detect objects reliably regardless of their height or surface qualities. Foreground suppression is especially useful when surfaces exhibit great variation in reflectivity, or when flat objects on conveyor belts are to be detected, or when the object is highly textured or glossy. FGS works as follows: The FGS photoelectric



↑ Principle of operation of foreground suppression

proximity sensor is set with its visible light spot positioned on the background, such as on a conveyor belt, in such a way that the reflection from that focal plane is detected solely by receiver E1. If that is the case, the electronics close the circuit and a signal is active at the switching output. If an object passes through the area between the focal plane and the sensor, the angle of reflection changes. The reflected beam is detected by receiver element E2 instead. The receive indicator that had been lit up before goes out and the switching signal drops out, meaning the object is detected.

Function indicator

The switched state of the output (low resistance) is indicated by an LED. On some sensors, operational readiness is also signaled by a second LED.

Housing materials

- Nickel-plated brass
- Stainless steel
- Aluminum
- Plastic (PA12, PBT, PPE)

If frequently or constantly exposed to chemicals, operational testing should be performed and/or more information can be requested from SICK.

| Description of the | Class 1 | Class 2 | Class 3A | Class 3B *) | Class 4 | |
|----------------------|--|--|---|--|--|--|
| hazard class | Integral safety through design features. | Low power; eyes are normally protected by the blink retro- reflective. | As for Class 2. Looking directly into the beam through optical instruments can be hazardous. | Looking directly into the beam through optical instruments can be hazardous. | High power; even diffuse reflection can be hazard- ous. | |
| Remote interlocks | | Not required | | | into room or door circuits | |
| Key-operated switch | | Not required | | | vhen not in opera- on | |
| Beam attenuator | | Not required | | Permanently attached devices are to be fitted to attenuate or block the beam | | |
| Beam indicator | | Not required | | | en the laser is in ation | |
| Warning symbol | | Not required | | Warning symbol be fol | nstructions must lowed | |
| Beam path limitation | Not required | Use fixtures to terr | ninate the beam onc | e it reaches the end | of its useful path. | |
| Specular reflection | No pre | ventive measures re | quired | Unintended reflect by fix | | |
| Protective eyewear | Required if design and organizational measure No requirements not possible and the maximum safe radiation lev exceeded | | | | | |
| Protective clothing | | Not required | | May be necessary in some cases | According to the special require- ments | |
| Training | No requi | rements | Required for | operating and servi | ce personnel | |

^{*)} Class 3B lasers that do not exceed five times the limits of Class 2 in the wavelength range from 400 mm to 700 mm are treated like 3A lasers in respect of interlocking, keyswitches, beam warnings, and attenuators.

Hysteresis

The term hysteresis is used to refer to the differential travel between the switch-on point and the switch-off point as attenuating material approaches or retreats. It is necessary for stable switching free of chatter. It is stated as a percentage of the real sensing range, or in mm.

Inductive proximity sensors

Inductive proximity sensors have found a place as reliable indicators in virtually all areas and sectors of industry. They detect metallic objects and are suitable for diverse applications due to their variety of housing shapes and sizes; applications such as the following:

- Position sensing
- Transport monitoring
- Pulse generation
- Rpm monitoring
- Detection of direction of rotation
- Feed and reject control

 Monitoring of idle running or congestion

IO-Link

O-Link is a neutral, backwards compatible, point-to-point communication system for sensors and actuators below the fieldbus level. This communication technology and its features allow machines and systems to be operated much more effectively.

1 Summary of the laser protection classes

- Reduction of machine downtimes, setup and changeover times
- Easy setting and management of parameters
- Improved process quality through continuous monitoring of process parameters
- Reduced maintenance costs through problem-oriented diagnostics
- Investment security through open standard transfer of parameters (e.g. scanning distance, hysteresis, etc.) from PLC or IPC direct to the sensor. Thus format or product

changes can be handled within a few milliseconds even with inaccessible sensors

 Reduced downtimes through detailed diagnostics ("see what the sensor sees")

Laser protection classes

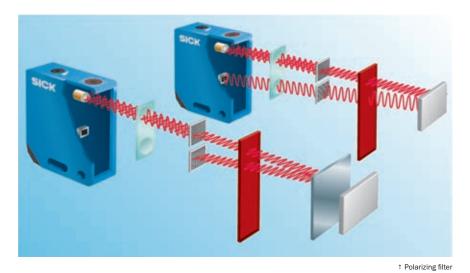
The following table shows a summary of the EN 60825 and VDE 0837 laser classes. For the complete provisions, see the text of the standard.

Magnetic cylinder sensors

For many tasks in automation it is necessary to detect the motions of pneumatic cylinders and to determine their settings exactly. SICK offers specially designed magnetic cylinder sensors for this purpose, which are used to determine the position of the pistons in pneumatic cylinders. They are mounted directly on the cylinder body. They reliably detect a magnet in the piston through the housing wall of aluminum, brass, or stainless steel, and trigger a switching signal. The magnetic cylinder sensors from SICK feature high sensitivity and operating precision, plus practical mounting fittings for all commonly used pneumatic cylinders.

Magnetic proximity sensors

The outstanding feature of magnetic proximity sensors is long sensing ranges, even with small housing sizes. They detect magnetic objects, usually permanent magnets, which are used to trigger switching. As magnetic fields can penetrate many non-magnetizable materials, switching can be triggered even through other materials. By the use of magnetic conductors (such as iron) the magnetic field can also be transported relatively long distances, for example in order to take the signal out of an area of high temperature. The range of possible applications is correspondingly diverse, including:



- Object detection through plastic containers/tubes
- Object detection in aggressive media
 through a protective Teflon wall
- Object detection in high temperature zones
- Detection of coding using magnets

No false triggering on power-up

With electronic devices, the start of power supply - in other words, when the device is switched on - is not the same as the normal start of sensor function. First the device electronics check certain operational states. To prevent a false pulse from causing incorrect switching and thus premature starting of systems controlled by the sensor, SICK's photoelectric sensors have an electronic "no false triggering on power-up" feature. It ensures that the switching outputs are not enabled until the device has checked itself completely and successfully for proper functioning - a procedure that can take up to 150 ms depending on the sensor.

Polarizing filter

Photoelectric retro-reflective sensors, aligned to a reflector, detect the presence of objects when the light path is interrupted (i.e. the reflection fails to arrive), triggering a switching signal. Since the objects to be detected may have high-gloss or reflective surfaces - such as stainless steel, aluminum, or tin, for example - the possibility of incorrect detection and switching as a result must be reliably ruled out. This is achieved effectively by the use of polarizing filters. One of these linear filters aligns the randomly oscillating emitted light to a plane of polarization, e.g. horizontal. If the light path is unobstructed, it strikes an optically active reflector, which rotates the plane of polarization by 90°, returning the light vertically polarized. This rotated beam passes back into the device through a second, correspondingly rotated polarizing filter before reaching the photoelectric retroreflective sensor's receiver element. As a shiny object does not rotate the plane of polarization, however, the light reflected from it remains horizontal and is not detected by the vertically polarized receiver - just as it should be. The object is thus detected as an interruption in the light path, triggering the switching output. Photoelectric retro-reflective sensors with polarizing filters will not be disrupted by surface reflections. However optically transparent materials do pose a problem, such as acrylic glass covers, lamination, or unprinted sections of film. Here it is not the surface shine that is disruptive, but rather the back of the transparent material. Due to their molecular structure, acrylic glass and some optically clear films display a property that rotates the plane of polarization: The polarized light from the light source is rotated when passing through the film medium, for

example by 45° from its original direction of oscillation. After reflecting off the back of the material, it passes through the material and rotates 45° again. The total rotation is therefore 90° – or a multiple of that. In such cases the photoelectric retro-reflective

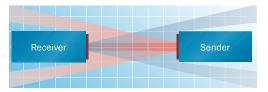
sensor can respond in an unintended way. The influence of this disruption is relatively minor, however; reducing the system sensitivity slightly (by turning the sensitivity controller to the left) eliminates the effect. Further improvement can be achieved by altering the scanning angle from the photoelectric sensor to the object surface.

Photoelectric proximity sensor, energetic

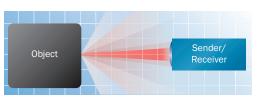
The most affordable solution is the energetic photoelectric proximity sensor with adjustable sensitivity. A light colored surface reflects more light than a dark one and can therefore be detected from a greater distance away. To achieve similar results with a dark surface, the sensitivity of the sensor must be increased. Detecting a dark object against a light background is not without its problems for energetic sensors. The object is obscured by glare from the background due to the higher reflectivity of the latter. Light colored objects against dark backgrounds are easier to detect.



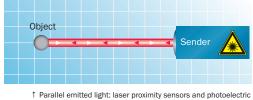
↑ Accumulating roller conveyor



↑ Divergent emitted light: photoelectric through-beam and retro-reflective sensors



↑ Convergent, focused emitted light: photoelectric proximity sensors



retro-reflective sensors

Photoelectric proximity sensor for accumulating roller conveyors, BGS

Specially designed for materials handling, these photoelectric proximity sensors between the rollers detect the conveyed product without contact. The detection signal is evaluated in the logic unit and actuated via the valve of the electro-pneumatic cylinder. This technique allows the principle of accumulating conveying to be realized without the use of additional control elements.

Photoelectric proximity sensor with background suppression, BGS

Photoelectric proximity sensors with background suppression (BGS) operate on the basis of the geometric relation between the sending and receiving elements. The sensor is set to the object lying on the sensing plane. Signals from objects lying behind the set scanning plane are suppressed. Photoelectric proximity sensors with background suppression can be disrupted by highly reflective objects in the background, such as panes of glass, polished sheet metal, etc. These effects can increase if there is a non-defined background within the set sensor scanning distance. Shielding or tilting the devices can solve this problem.

Photoelectric proximity sensor with background blanking, BGB

Background blanking can be achieved for photoelectric proximity sensors either optically by changing the geometric relation between the sender and receiver element, or electronically. With the optical solution, the angle between the sent and received beam of light is changed when setting the scanning distance onto the object. Objects at the point of intersection between the two beams are detected. Anything lying behind that is suppressed, as too little or no light from it reaches the receiver ele-

ment. With the electronic solution, PSD elements (Position Sensitive Device) are used. The sent beam of light is reflected back from the object and strikes the PSD receiver element. Signals from the background are identified as such according to the location of the impinging light beam, and are suppressed electronically.

Photoelectric proximity sensor with foreground suppression, FGS

Photoelectric proximity sensors with foreground suppression (FGS) are able to detect objects at a defined scanning distance. All objects between the scanning distance (set to the background) and the sensor are detected. The foreground is suppressed as a result of the special geometric configuration of the sending and receiving elements. For reliable functioning of these sensors, the background (for example, a conveyor belt) needs to be relatively bright and should not vary in height.

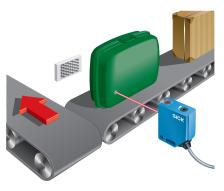
Photoelectric retro-reflective sensors

With a photoelectric retro-reflective sensor, the emitted light is returned by

a reflector and is received and evaluated by the device. Polarizing filters prevent errors when detecting reflective objects. Transparent plastic wrapping and stretch film can affect the functioning of photoelectric retro-reflective sensors with polarizing filters. In such cases it helps to use devices with reduced sensitivity. The use of laser diodes allows greater scanning ranges while simultaneously maintaining a high resolution. Focus ranges can be set with high precision.

Photoelectric retro-reflective sensors for detecting transparent objects

These photoelectric retro-reflective sensors are characterized by an especially low switching hysteresis. Even minimal light attenuation between the sensor and reflector, such as would be caused by glass bottles or even PET bottles, is detected reliably. An innovative system monitoring feature continuously regulates and adapts the switching threshold in the event of gradual contamination that would otherwise lead to failure.



↑ Photoelectric retro-reflective sensor

Requirements for explosion-protected electrical equipment

Potentially explosive atmospheres can arise wherever dust, flammable gases or flammable liquids are manufactured, transported, processed, or stored. An explosion can occur if three factors come together at the same time:

- Flammable substance: e.g. gas, vapor, mist, dust
- Sufficient oxygen: e.g. from ambient air
- Source of ignition: e.g. sparks or hot surfaces

Sensors for potentially explosive atmospheres: devices are offered that have been developed especially for potentially explosive atmospheres. These are designed in accordance with the relevant standards, based on the European Directive 94/9/EC (ATEX). Depending on their specific design, devices can be used in zones 1 and 2 (gas) and in zone 22 (non-conductive dust).

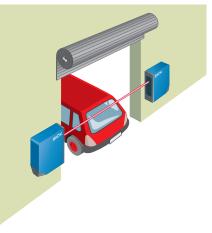
Teach-in

Teach-in means teaching an electronic evaluation module one or more of the features of an object to be tested or detected. Many photoelectric retro-reflective sensors, photoelectric proximity sensors, contrast scanners, color sensors, luminescence scanners, and light section sensors offer this possibility. When "teaching", an object is placed in the light path of the sensor. The reflection is evaluated in the device's receiver.

The detected switching threshold is then saved by pressing a button on the device or via an external control cable. The advantage of teach-in is that the switching threshold is set electronically instead of by using a potentiometer, which simplifies and speeds up the commissioning of the sensor or its adaptation to new applications.

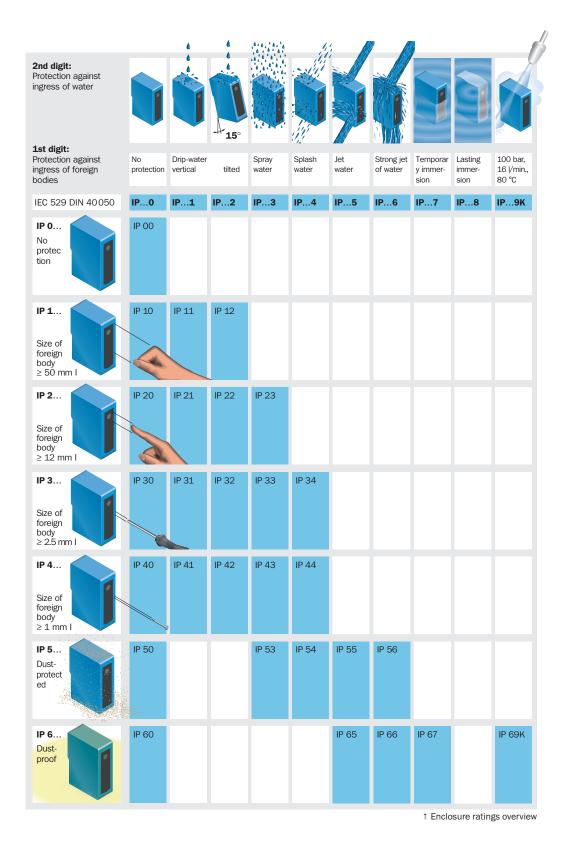
Through-beam photoelectric sensors

The through-beam photoelectric sensor comprises two devices, a sender and the receiver. The separate layout makes long sensing ranges possible. The use of laser diodes allows greater sensing ranges while simultaneously maintaining a high resolution. Focus ranges can be set with high precision.



| Responsibility of the sensor manu- facturer | Respon | sibility of the r | nachine manuf | acturer | | |
|---|---------------------------------|--------------------------------------|---|---------------------------------------|---|---------------------|
| Category | Can be used in zone (gas) | Can also be used in zone (gas) | Can be used in zone (dust) | Can also be used in zone (dust) | Definition (94/9/EC) Explosive atmospheres are present: | Certification by |
| 1G/1D | 0 (0) | 1 and 2 | 20 (10) | 21 and 22 | Always, for long periods, or often | Known authority |
| 2G/2D | 1(1) | 2 | 21 (11) Zone 22: conductive dust | 22 | Occasionally | Known authority |
| 3G/3D | 2 (2) | - | Zone 22: non-conduc- tive dust | 22 | Occasionally | Known authority |

G = gas, D = dust; () = older code in parentheses



1002314 ... 1042237

| Part no. | Model name | Page | Part no. | Model name | Page | Part no. | Model name | Page |
|----------|----------------|------|----------|----------------|------|----------|-----------------|------|
| 1002314 | PL30A | 149 | 1025909 | WL18-3P130 | 97 | 1040069 | MM12-60APS-ZUK | 39 |
| 1002627 | 0P61 | 149 | 1025911 | WL18-3P430 | 97 | 1040070 | MM12-60APS-ZCK | 39 |
| 1003621 | PL22-2 | 149 | 1025923 | WS/WE18-3P430 | 97 | 1040071 | MM12-60ANS-ZCK | 39 |
| 1003865 | PL80A | 149 | 1025927 | WS/WE18-3P410 | 97 | 1040072 | MM18-70APS-ZCK | 39 |
| 1003865 | PL80A | 95 | 1025994 | WTB27-3P2411 | 103 | 1040073 | MM18-70ANS-ZCK | 39 |
| 1009871 | PL50HS | 149 | 1026029 | WL18-3P730 | 97 | 1040085 | MM18-70ANS-ZUK | 39 |
| 1012719 | PL20A | 149 | 1026031 | WT18-3P411 | 97 | 1040119 | WTB4C-3P3464 | 73 |
| 1012719 | PL20A | 95 | 1026032 | WT18-3P431 | 97 | 1040597 | WTR2-P621S22 | 139 |
| 1012720 | PL40A | 149 | 1026049 | WL14-2P430 | 95 | 1040732 | IME12-02BPSZCOS | 19 |
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| 1015301 | WTR1-P721 | 139 | 1026056 | WT14-2P432 | 95 | 1040854 | IME08-2N5PSZT0S | 19 |
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| 1018254 | WS/WE12L-2P430 | 93 | 1026097 | MHT15-P3317 | 123 | 1040950 | IME18-08NPSZCOS | 19 |
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| 1019257 | WS/WE34-R230 | 107 | 1026431 | WS/WE14-2P430 | 95 | 1041323 | MZ2Q-FTZPS-KQ0 | 51 |
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| 1022659 | WT2S-P231 | 71 | 1027772 | WL27-3F2631 | 103 | 1041383 | WTE11-2N2432 | 91 |
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| 1023976 | WL9L-P330 | 89 | 1028629 | MZT6-03VPS-KPX | 49 | 1041427 | WTB12-3N2411 | 93 |
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| 1023991 | WT9L-N330 | 89 | 1029402 | MZT6-03VNS-KP0 | 49 | 1041459 | WSE12-3P2431 | 93 |
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| 1023993 | WS/WE9L-P330 | 89 | 1029903 | MZN1-06VNS-KP0 | 53 | 1042002 | WTB12C-3P2431 | 93 |
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| 1025809 | MZT6-03VPS-KWB | 49 | 1040027 | MM08-60APS-ZUK | 39 | 1042052 | WTB4S-3N1134 | 73 |
| 1025827 | MZT6-03VPS-KWX | 49 | 1040029 | MM18-70APS-ZUK | 39 | 1042057 | WTB4S-3P2231 | 73 |
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| 1025889 | WT18-3P410 | 97 | 1040066 | MM08-60ANS-ZUK | 39 | 1042087 | WLG4S-3V2232 | 73 |
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| 1025905 | WT18-3P420 | 97 | 1040068 | MM08-60ANS-ZTK | 39 | 1042237 | MZ2Q-CSSPSKU0 | 51 |

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| 1042240 | MZ2Q-CSSPSKQ0 | 51 | 1045390 | ZL2-E2415 | 135 | 1050685 | MPS-160TSTP0 | 45 |
| 1042241 | MZ2Q-CFSPSKU0 | 51 | 1045469 | ZT2-P5228 | 135 | 1050686 | MPS-224TSTPO | 45 |
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| 1043814 | MHL15-P3236V | 125 | 1046535 | MHTB15-P3367 | 123 | 1052440 | GTB6-P1211 | 83 |
| 1043818 | MHSE15-P3236V | 125 | 1046537 | MHTB15-P3367V | 125 | 1052441 | GTB6-N1211 | 83 |
| 1043961 | EL3-F2415 | 133 | 1046538 | WL27-3P3402S13 | 103 | 1052448 | GSE6-P1111 | 83 |
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| 1044165 | WL23-2P2460 | 101 | 1047653 | WLG4S-3F2234V | 75 | 1052966 | GL6-P7111 | 83 |
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| 1044186 | WLG4S-3P2232 | 73 | 1047958 | WT12L-2B551 | 93 | 1053536 | WL12G-3P2582 | 93 |
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| 1044459 | MZT8-03VPS-KR0 | 47 | 1048049 | MZT8-28VPS-KU0 | 47 | 2013942 | BEF-WG-W12 | 147 |
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| 1044469 | MZT8-03VPS-KU0 | 47 | 1048051 | MZT8-28VPS-KQ0 | 47 | 2019084 | BEF-WN-W14 | 95 |
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| 1044717 | EL3-F2438 | 133 | 1048217 | MZN1-06VPO-KR0 | 53 | 2039601 | BEF-SG-W27 | 147 |
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| 1044931 | MZT8-03VPO-KU0 | 47 | 1049043 | WTB9-3P1161 | 87 | 2051478 | BEF-KHF-M08 | 147 |
| 1044932 | MZT8-03VNS-KP0 | 47 | 1049045 | WTB9-3P2211 | 87 | 2051480 | BEF-KHF-M12 | 147 |
| 1044934 | MZT8-03VNS-KU0 | 47 | 1049047 | WTB9-3P2261 | 87 | 2051482 | BEF-KHF-M18 | 147 |
| 1044935 | MZT8-03VNS-KR0 | 47 | 1049048 | WTB9-3P2411 | 87 | 2051497 | BEF-SW-W4S | 147 |
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| 1045095 | WL4S-3P2230V | 75 | 1049055 | WL9-3P1130 | 87 | 2051618 | BEF-KHS-N02N | 147 |
| 1045099 | WSE4S-3F2130V | 75 | 1049060 | WL9-3P2232 | 87 | 2051619 | BEF-KHS-N03N | 147 |
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| 1045191 | ET3-P4215 | 133 | 1049076 | WSE9-3P2230 | 87 | 2051622 | BEF-KHS-N06N | 147 |
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| 1045215 | ET3-P4228 | 133 | 1049082 | WL9G-3P2232 | 87 | 2051628 | BEF-W4-A | 147 |
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| 5319929 | REF-PLUS-R25 | 149 | 602256 | 7 DSL-1204-G02M | 144 | 6027521 | IM30-22BPS-ZC1 | 21 |
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| 6020410 | CM18-12NPP-KC1 | 35 | 602593 | | | 6030570 | WS/WE2F-F210 | 71 |
| 6020473 | CM30-16BPP-KW1 | 35 | 602604 | 0 WS/WE100-N143 | 9 81 | 6030574 | WT2F-P280 | 71 |

| B03080 WT2FP140 71 B03086 WT2FP140 B043815 WTEB-024044 127 B030869 WT2FP140 71 B0307071 U0400P4409 81 B043813 VTEB-024244 127 B030869 WT2FP140 77 B037071 U0400P84004 81 B043823 VTEB-0242443 127 B033182 WTEB-1211 77 B037071 U0400P84004 81 B043854 WTEB-0242483 127 B033213 WTEB-1211 77 B037072 U0400P84004 81 B043856 WTEB-024243 127 B033212 WTB-1211 77 B03722 STE-80946 145 G043850 VEEB0-24211 127 B03386 D0L-803-300MN 143 B037488 VTEB0-24213 127 702884 21ME-8161242 139 B033861 D0L-803-300MN 143 B03764 V1280-242431 127 702884 21ME-8161242 139 B033861 D0L-803-300MN 143 B03764 V1280-24243131 | Part no. | Model name | Page | Part no. | Model name | Page | Part no. | Model name | Page |
|--|----------|-----------------|------|----------|------------------|------|----------|----------------|------|
| 6030899 WTE-P270 71 6038182 WTE-P270 71 6037070 (1040-0005K00K 81 6043823 VTE30-024044 127 6033180 WTE-P2211 77 6037071 (1040-0005K00K 81 6043838 VTE30-024043 127 6033204 WTB8-P2211 77 6037073 (1040-0005K00K 81 6043838 VTE30-024243 127 6033212 WTB8-P2211 77 603703 (1040-0004500CM147 6043836 VSE30-024243 127 6033227 WTB8-P2211 77 603748 VTE180-242417 127 702884 ZUM-81612243 139 6033665 D0-003-002M1 43 6037480 VTE180-242437 127 702884 ZUM-81612243 139 6033665 D0-00403-002M1 43 6037560 VTE180-242437 127 702884 ZUM-81612243 139 6033670 VD-00404-002M1 43 6037560 VTE180-42431 127 702845 ZUM-81612243 139 6033670< | 6030580 | WT2F-P150 | | 6036506 | WT100-P4409 | 81 | 6043815 | VTE180-2P42444 | 127 |
| 6033182 WLB P2231 77 6037071 1040 20BFK00K 31 604327 VTLB 0242489 127 6033204 WTB P4231 77 6037071 1040 20BFK00K 31 6043334 VLIS 0242439 127 6033213 WTB P231 77 603703 1040 400FK00K 31 6043834 VLIS 0242434 127 6033213 WTB P231 77 6037322 STE 0804.6 145 6043854 VTEIS0-242417 127 6033667 D0-0003-000KM 143 6037460 VTEIS0-242447 127 7028842 ZLM+BIS12242 139 6033667 D0-0003-00KM 143 6037560 VEIS0-242437 127 7028843 ZLM+BIS12242 139 6033670 D0-00460-00KM 143 603756 DSL2804 60M6 144 790017 H06 02PEY VLI 17 6033671 D0-00460-00KM 143 603905 WLIS07H432 119 7900205 1010 0BFK+K 139 6033670 D0-00460-00KM 143 | 6030584 | WT2F-P140 | 71 | 6036512 | WL100-P4409 | 81 | 6043819 | VTE180-2P42449 | 127 |
| 6033188 WLSA-0231 77 603707 (q0-40NFSKOCK 61 6043834 WLS0-242433 127 6033209 WTB8-H131 77 603707 (q0-40NFNCOK 51 6043854 VLS0-242434 127 6033213 WTB8-P231 77 603722 STE 08036 145 6043854 VS1B0-242439 127 6033227 WTB8.P2211 77 603748 VTE180-242417 127 702843 ZLM BISD-242421 127 6033665 D0.00030.60NM 143 6037464 VTE180-242437 127 702843 ZLM BISD-24243 139 6033665 D0.00030.60NM 143 603769 VSE180-242437 127 702844 ZLM BISD-24243 139 6033671 D0.0004.400NM 143 603769 VSE180-242437 127 702844 ZLM BISD-24243 139 6033650 D0.0004.400NM 143 603764 VTB.80244247 127 702844 ZLM BISD-242421 139 6033650 D0.00004.000NM 143 | 6030589 | WT2F-P270 | 71 | 6036518 | WS/WE100-P4409 | 81 | 6043823 | VTE180-2P42484 | 127 |
| 6033204 WTB8-H1131 77 6037073 (Q40.4004PPKOCK 61 6043328 VL5180.2424.44 127 6033213 WTB8-P2111 77 603732 STE-0603.6 145 6043854 VSE180.2424.41 127 6033221 WTB8.P2211 77 6037323 STE-0604.6 145 6043870 VTB180.2424.17 127 6033667 D0L0803.602MN 143 6037484 VTE180.2424.17 127 7028842 ZLM181612242 139 6033667 D0L0803.402MN 143 6037468 VTE180.2424.47 127 7028842 ZLM181612242 139 6033667 D0L0804.402MN 143 603769 VSL80.2424.37 170 7028845 ZLM181622424 139 6033670 D0L0804.402MN 143 603769 DSL80.402MC 144 7000284 ZLM181622424 137 6033670 D0L0804.402MN 143 6037059 NSL18074423 170 70002845 ZLM181622424 137 6033670 D0L0804.402MN | 6033182 | WL8-P2231 | 77 | 6037070 | IQ40-20BPSKC0K | 31 | 6043827 | VTE180-2P42489 | 127 |
| 6033209 WTB8-P2311 77 603722 STE.0893.6 145 6043850 VSTB8.0242.43 127 603321 WTB8.12231 77 603722 STE.0893.6 145 6043850 VSTB.0242.43 127 6033227 WTB8.12231 77 6037480 VTE180.242417 127 702843 ZUM-B1612422 139 6033665 D0.0003005MN 143 603748 VTE180.242437 127 702843 ZUM-B1612422 139 6033667 D0.0003005MN 143 6037468 VTE180.242437 127 702843 ZUM-B1612422 139 6033670 D0.0003005MN 143 603750 VSE180.244247 127 702845 ZUM-B1622423 139 6033671 D0.00804.605MN 143 603750 VSE180.244243 137 7002845 ZUM-B1622474 127 6033670 UL170712430 143 6033903 WL18071432 149 7900276 1406.0285/V11 17 6033671 D0.00804605MN 143 | 6033188 | WL8G-P2231 | 77 | 6037071 | IQ40-40NPSKC0K | 31 | 6043834 | VL180-2P42433 | 127 |
| 603213 WTB8-P2111 77 603722 STE-0803.6 445 6043854 WTB18.0242.439 127 6033227 WTB8.1P2211 77 6037480 VTE180.242447 127 6043874 VTB18.0242.417 127 6033664 D00.603.602NN 143 6037484 VTE180.242447 127 7028842 ZUM18151242 139 6033667 D00.603.002NN 143 603769 VSTEN0.242436 127 7028842 ZUM181512424 139 6033670 D00.603.002NN 143 603750 VSTEN0.242436 127 7028845 ZUM181522424 139 6033670 D00.603.002NN 143 603756 VSTEN0.24424 12 700017 H06.02857VH 117 6033671 D00.603.002NN 143 6039063 WL1807H432 119 7900276 100.038541 29 6033650 WL17072H62 117 6039063 WL1807H432 119 7900276 100.0485441 29 6033651 WL17072H62 117 | 6033204 | WTB8-N1131 | 77 | 6037072 | IQ40-20BPPKC0K | 31 | 6043838 | VL180-2P42438 | 127 |
| 6033221 WTBR-P221 77 6037232 STE.0804.6 145 6043870 VTBR0-224212 127 6033664 DOL0803.602MN 143 6037480 VTE180.244247 127 7028842 ZLM1.B1612E42 139 6033665 DOL0803.4005MN 143 6037484 VTE180.244247 127 7028842 ZLM1.B1612E42 139 6033665 DOL0803.4005MN 143 6037550 VSE180.2442437 127 7028844 ZLM1.B1622E43 139 6033671 DOL0804.4005MN 143 6037550 VSE180.2442472 117 790177 H060.2868-WIL1 17 6033874 DOL0804.4005MN 143 6033909 WL1307.72430 117 6033904 WL1807.H432 119 7900207 1010-0878-WL 29 6033955 WL1707.27460 117 603906 WL1807.H432 119 7900207 1010-0878-WL 29 6033865 DSL0804.0000K 144 603906 WL1807.H432 119 79002278 MQ16.60ANS.KU 39< | 6033209 | WTB8-P2231 | 77 | 6037073 | IQ40-40NPPKC0K | 31 | 6043850 | VSE180-2P42434 | 127 |
| 603227 WTBLP2211 77 6037464 VTF180.2424417 127 7028842 ZUL11B161243 139 6037464 VTE180.242447 127 7028843 ZUL11B161243 139 6033667 D0L0803.002MN 143 6037484 VTE180.242447 127 7028843 ZUL11B1612243 139 6033670 D0L0804.002MN 143 6037500 S5180.242437 127 7028845 ZUL11B162243 139 6033671 D0L0804.002MN 143 6037500 S5180.242437 119 790179 H060.028FS.VII 17 6033673 D0L0804.400MN 143 6039093 WL180TH432 119 7900281 H060.04FS.VII 127 6033960 WL17072.N132 117 6039069 WL180TH432 119 7900278 M010-60NH400 39 6033960 WL17072.N152 117 6039069 WL180TH432 119 7900278 M010-60NH400 39 6033960 WL17072.N162 117 6039069 WL180TH432 < | 6033213 | WTB8-P2111 | 77 | 6037322 | STE-0803-G | 145 | 6043854 | VSE180-2P42439 | 127 |
| 6033664 D0L6903-G02MN 143 6037484 VTE302242437 127 7028842 ZLM181612E42 139 6033665 D0L60803-W02MN 143 6037486 VTE302242437 127 7028843 ZLM181612E42 139 6033665 D0L60803-W02MN 143 6037595 D52804-00MC 144 700177 H06028F-W1 17 6033671 D0L60804-00MN 143 6037595 D52804-00MC 144 7900177 H06028F-W1 17 6033674 D0L60804-W02MN 143 6039093 WL1807H432 119 7900173 H0604NPS-W1 17 6033950 WL17072H400 117 6039094 WL1807H432 119 7900207 101006NF-KW1 29 6033956 WL17072H400 117 6039096 WL1807H432 119 7900207 101006NF-KW1 29 6033965 WL17072H400 117 6039096 WL1807H432 119 7900279 M010-60NF-KU1 29 6033805 WL17077H260 117 | 6033221 | WTB8L-P2231 | 77 | 6037323 | STE-0804-G | 145 | 6043870 | VTB180-2P42412 | 127 |
| 6033665 D0L0603.405MN 143 6037496 VL180.2P42436 127 7028843 ZLM151622E43 139 6033667 D0L0603.W02MN 143 6037500 VSE180.2P42437 127 7028845 ZLM151622E43 139 6033670 D0L0604.002MN 143 6037550 DSL2804.60ME 144 790179 H060.22P5.VII 17 6033673 D0L0604.W02MN 143 603909 DSL0804.60MC 144 790179 H060.22P5.VII 17 6033950 WLL170T-2P430 117 6039094 WLL180T-H342 119 7900205 IQ10.03P5.KVI 29 6033960 WLL170T-2P430 117 6039067 WLL180T-H341 119 7900205 IQ10.06NF.SKII 29 6033961 WLL170T-2P430 117 6039067 WLL180T-H341 119 7900207 IQ10.06NF.SKII 29 6033962 WLL170T-2P450 117 6039067 WLL180T-H341 119 7900278 MQ16.60AF.SKIO 39 6034664 DSL0804-60M6 144 6039039 WLL180T-H341 119 7900278 | 6033227 | WTB8L-P2211 | 77 | 6037480 | VTF180-2P42417 | 127 | 6043874 | VTB180-2P42417 | 127 |
| 6033667 D0L0034W02MN 143 6037496 V130.2P42437 127 702844 ZLM1-B1622E42 139 6033668 D0L0804 (02MN) 143 6037500 VSEL80.2P42437 127 702845 ZLM1-B1622E42 139 6033671 D0L0804 (02MN) 143 6037754 VTB18-H1240VS01 129 7900177 H06-02BFs-W11 17 6033674 D0L0804 (02MN) 143 6039093 WLL180T-H32 119 7900203 IQ10-03BFs-KT1 29 6033950 WLL17072P430 117 6039096 WLL180T-H334 119 7900205 IQ10-08BFs-KT1 29 6033965 WLL17072P490 117 6039096 WLL180T-H324 119 7900207 IQ10-08HS-KW1 29 6033865 WLL17072P460 114 6039099 WLL180T-H324 119 7900278 MQ10-60AK-KU0 39 60338215 IMF12-04RPFV025 25 6039100 WLL180T-H324 119 7900277 DOS-0803 W 145 6033521 IMF12-04B | 6033664 | DOL-0803-G02MN | 143 | 6037484 | VTE180-2P42447 | 127 | 7028842 | ZLM1-B1612E42 | 139 |
| 6033668 D0L0804-W05MN 143 6037500 VSE180-2P42437 127 702845 ZLML-E1622E43 139 6033670 D0L0804-G02MN 143 6037595 DSL2804-G0M6C 144 7900177 HH06-02BPS-W1 17 6033671 D0L0804-W02MN 143 6039090 DSL2804-G0M6C 144 7900177 HH06-02BPS-W1 17 6033860 WLL170T-2P430 117 6039096 WLL180T-N432 119 7900205 IQ10-03BPS-KT1 29 6033960 WLL170T-2P4162 117 6039096 WLL180T-M432 119 7900205 IQ10-03BPS-KT1 29 6033960 WLL170T-2P4162 117 6039090 WLL180T-M432 119 7900205 IQ10-08PS-KT1 29 6033626 DSL-0804-000E 144 6039099 WLL180T-M432 119 7900236 MQ10-60APS-KU0 39 6034261 DSL-0804-002M 144 6039100 WLL180T-H434 119 7900280 MQ10-60APS-KU0 39 6035221 IMF1 | 6033665 | DOL-0803-G05MN | 143 | 6037488 | VTE180-2P42487 | 127 | 7028843 | ZLM1-B1612E43 | 139 |
| 6033670 D0L0804-G02NN 143 6037595 D5L2804-G0MC 144 7900179 IH06-02BF3-VH1 17 6033671 D0L0804-W05NN 143 6037754 VTB14-P1240vS01 129 7900179 IH06-02BF3-VH1 17 6033674 D0L0804-W05NN 143 6039093 WL130TP432 119 7900203 IQ10-03BF3-KH1 29 6033956 WL170T2H32 117 6039096 WL130TH432 119 7900207 IQ10-08BF3-KH1 29 6033965 WL170T2H40 117 6039098 WL130TH432 119 7900207 IQ10-08BF3-KH1 29 6033965 WL170T2H40 117 6039098 WL130TH32 119 7900278 MQ10-6ANS-KN0 39 603466 D5L0804-602M 144 6039100 WL180TH434 119 7900278 MQ10-6ANS-KN0 39 6035217 IMF12-04RPFV050 25 6039110 WL180TH434 119 7900278 MQ10-6ANS-KN0 39 6035221 IMF12-04RPFV050 | 6033667 | DOL-0803-W02MN | 143 | 6037496 | VL180-2P42436 | 127 | 7028844 | ZLM1-B1622E42 | 139 |
| 6033671 D0L08044005MN 143 6037754 VTB13-4P1240VS01 129 7900179 IH06-02BPS-VT1 17 6033673 D0L0804-W02MN 143 6039069 DSL0804-60M6C 144 6033950 WLL170T2P430 117 6039069 WLL180T-M432 119 7900205 IQ10-03BPS-KT1 29 6033956 WLL170T2P490 117 6039096 WLL180T-M434 119 7900207 IQ10-06NPS-KT1 29 6033960 WLL170T2P460 117 6039099 WLL180T-M432 119 7900207 IQ10-06NPS-KT1 29 6033960 WLL170T2P460 117 6039099 WLL180T-H32 119 7900278 MQ10-60APS-KU0 39 6034664 DSL0804-600M 144 603910 WLL180T-H32 119 7900278 MQ10-60APS-KU0 39 6035215 IMF12-02BPVC0S 25 603910 WLL180T-H32 119 7900207 D0S-0803.6 145 6035221 IMF12-04NPVC0S 25 6039103 DSL2804-602MC< | 6033668 | DOL-0803-W05MN | 143 | 6037500 | VSE180-2P42437 | 127 | 7028845 | ZLM1-B1622E43 | 139 |
| 6033673 D0L0804-W02MN 143 6039089 DSL0804-606MC 144 7900183 IH06-04NFS-VT1 17 6033867 D0L0804-W05MN 143 6039093 WL1807-H432 119 7900205 [010-038PS-KW1 29 6033956 WL11707-2N430 117 6039096 WL1807-H432 119 7900207 [010-08PS-KW1 29 6033965 WL11707-2N460 117 6039096 WL1807-H32 119 7900278 MQ10-60ANS-KU0 39 6033965 WL11707-2P460 117 6039096 WL1807-H32 119 7900278 MQ10-60ANS-KU0 39 60338205 MUL1707-2P460 117 603900 WL1807-H32 119 7900278 MQ10-60ANS-KU0 39 60335215 IMF12-048PVC0S 25 6039103 WL1807-H341 119 7902077 D05-0803-M 145 6035221 IMF12-048PVC0S 25 6039103 WL1807-H341 119 7902077 D05-0803-W 145 6035221 IMF12-048PVC0S 25 6041464 WTB8-P3311V | 6033670 | DOL-0804-G02MN | 143 | 6037595 | DSL-2804-G0M6C | 144 | 7900177 | IH06-02BPS-VW1 | 17 |
| 6033674 D0L-0804-W05MN 143 6039093 WLL180T-H432 119 7900203 IQL0-03BPS-KW1 29 6033980 WLL170T-2P430 117 6039094 WLL180T-H432 119 7900205 IQL0-03BPS-KW1 29 6033956 WLL170T-2P490 117 6039096 WLL180T-H434 119 7900207 IQL0-06NPS-KW1 29 6033966 WLL170T-2P460 117 6039098 WLL180T-H432 119 7900278 MQL0-60APS-KW0 39 6034664 DSL0804-60M6 144 6039099 WLL180T-H432 119 7900278 MQL0-60APS-KW0 39 6035215 MF12-02BPPVC0S 25 6039101 WLL180T-H434 119 7900278 MQL0-60APS-KT0 39 6035217 MF12-04PPVC0S 25 6039103 WLL180T-H434 119 7902078 D02-080.34 145 6035221 MF12-04PPVC0S 25 6031810 DSL2804.602MC 144 6035225 MF18-08PVC0S 25 6041464 WBP2-3331V 79< | 6033671 | DOL-0804-G05MN | 143 | 6037754 | VTB18-4P1240VS01 | 129 | 7900179 | IH06-02BPS-VT1 | 17 |
| 6033950 WLL170T2P430 117 603994 WLL180TN432 119 7900205 IQ10.03BFS.KT1 29 6033951 WLL170T2N132 117 6039095 WLL180TN434 119 7900207 IQ10.06NFS.WUI 29 6033965 WLL170T2P490 117 6039097 WLL180TN432 119 7900278 MQ10-60AFS.KU0 39 6033665 WLL170T2P460 117 6039098 WLL180TN432 119 7900278 MQ10-60AFS.KU0 39 6034664 DSL0804-GO2M 144 6039100 WLL180TF432 119 7900278 MQ10-60AFS.KU0 39 6035217 IMF12-04NPPVC0S 25 6039103 WLL180TF434 119 7902078 DOS-0803.6 145 6035221 IMF12-04NPPVC0S 25 6039183 DSL2804-6020K 144 6035227 IMF12-04NPVC0S 25 6041456 WTBR.N311V 79 6035422 IMF12-04NPVC0S 25 6041465 WTBR.N311V 79 6035462 IMF12-04NPVC0S 25 | 6033673 | DOL-0804-W02MN | 143 | 6039089 | DSL-0804-G0M6C | 144 | 7900183 | IH06-04NPS-VT1 | 17 |
| 6033951 WLL170T-2N132 117 603905 WLL180T-N434 119 7900207 IQ10-06NP5-KW1 29 6033966 WLL170T-2P460 117 603906 WLL180T-M432 119 7900279 IQ10-06NP5-KW1 29 6033965 WLL170T-2P460 117 6039098 WLL180T-M432 119 7900278 MQ16-60APS-KU0 39 6034664 DSL0804-602M 144 6039100 WLL180T-M32 119 7900280 MQ10-60APS-KU0 39 6035215 IMF12-02NPPVCOS 25 6039100 WLL180T-H344 119 7900278 D00-0803-4 145 6035217 IMF12-04NPPVCOS 25 6039103 WLL180T-H344 119 790277 D05-0803-W 145 6035221 IMF18-08BPPVCOS 25 603183 DSL2804-602MC 144 6035227 IMF18-08BPPVCOS 25 6041456 WTB8-2131V 79 6035454 IMF12-02BPVCOS 25 6041456 WTB8-2131V 79 6035456 IMF12-04PPVCOS 25 604147 | 6033674 | DOL-0804-W05MN | 143 | 6039093 | WLL180T-P432 | 119 | 7900203 | IQ10-03BPS-KW1 | 29 |
| 6033956 WLL170T-2P490 117 603906 WLL180T-N434 119 7900209 IQ10-60RPS-KT1 29 6033960 WLL170T-ZN162 117 6039097 WLL180T-M432 119 7900278 MQ10-60APS-KU0 39 6034664 DSL0804-GOM6 144 6039099 WLL180T-K322 119 7900279 MQ10-60APS-KU0 39 6034664 DSL0804-GOM6 144 6039100 WLL180T-K322 119 7900280 MQ10-60APS-KU0 39 60342517 IMF12-04NPVC0S 25 6039102 WLL180T-K434 119 7900278 DS-0803-4 145 6035221 IMF12-04NPVC0S 25 6039183 DSL280-602MC 144 6035223 IMF18-05NPVC0S 25 6041456 WTB8-N311V 79 6035223 IMF18-03NPVC0S 25 6041466 WTB8-N331V 79 6035452 IMF12-04NPVC0S 25 6041466 WTB8-P331V 79 6035456 IMF12-04NPVC0S 25 6041461 WTB8-P3331V 79 6035462 <td>6033950</td> <td>WLL170T-2P430</td> <td>117</td> <td>6039094</td> <td>WLL180T-N432</td> <td>119</td> <td>7900205</td> <td>IQ10-03BPS-KT1</td> <td>29</td> | 6033950 | WLL170T-2P430 | 117 | 6039094 | WLL180T-N432 | 119 | 7900205 | IQ10-03BPS-KT1 | 29 |
| 6033960 WLL170T-2N162 117 6039097 WLL180T-M432 119 7900278 MQ10-60APS-KU0 39 6033665 WLL170T-2P460 117 6039098 WLL180T-E32 119 7900279 MQ10-60APS-KU0 39 6034665 DSL0804-602M 144 6039100 WLL180T-E32 119 7900278 MQ10-60APS-KU0 39 6035215 IMF12-02BPPVC0S 25 6039101 WLL180T-H344 119 7900278 MQ10-60APS-KU0 39 6035219 IMF12-04BPPVC0S 25 6039102 WLL180T-H344 119 7902078 DOS-0803-0 145 6035221 IMF12-04BPPVC0S 25 6039180 DSL280-602MC 144 6035227 IMF18-08BPPVC0S 25 6041456 WTB*N311V 79 6035452 IMF12-02BPVC0S 25 6041463 WTB*P3331V 79 6035466 IMF12-04BPVC0S 25 6041476 WTB*P3331V 79 6035466 IMF12-04BPVC0S 25 6041470 WTE*P3331V 79 6035466 IMF | 6033951 | WLL170T-2N132 | 117 | 6039095 | WLL180T-P434 | 119 | 7900207 | IQ10-06NPS-KW1 | 29 |
| 6033965 WIL170T2P460 117 6039098 WIL180T-F232 119 7900279 MQ10-60ANS-KU0 39 6034665 DSL-0804-602M 144 6039099 WIL180T-F432 119 7900280 MQ10-60ANS-KU0 39 6035215 IMF12-02BPVC0S 25 6039101 WIL180T-F434 119 7900277 DS-0803-G 145 6035217 IMF12-04NPPVC0S 25 6039103 WIL180T-F434 119 7902078 DOS-0803-W 145 6035221 IMF12-08NPPVC0S 25 6039180 DSL-2804-602MC 144 6035227 IMF18-08PPVC0S 25 6039184 DSL-2803-600MC 144 6035229 IMF18-08PPVC0S 25 604145 WTBR-N3311V 79 6035452 IMF12-04PSVC0S 25 6041463 WTBR-P2331V 79 6035462 IMF12-04PSVC0S 25 6041476 WTBR-P3331V 79 6035462 IMF12-04PSVC0S 25 6041803 VTE180-2P42412 127 6035464 IMF12-04PSVC0S 25 6041813 VTE180-2P42432 | 6033956 | WLL170T-2P490 | 117 | 6039096 | WLL180T-N434 | 119 | 7900209 | IQ10-06NPS-KT1 | 29 |
| 6034664 DSL-0804-60M6 144 6039099 WLL180T-L432 119 7900280 MQ10-60APS-KT0 39 6034665 DSL-0804-602M 144 6039100 WLL180T-E322 119 7900281 MQ10-60APS-KT0 39 6035215 IMF12-02BPPVC0S 25 6039101 WLL180T-H344 119 7902077 D0S-0803-G 145 6035217 IMF12-08NPPVC0S 25 6039180 DSL-2804-602MC 144 6035223 IMF18-08NPPVC0S 25 6039180 DSL-2803-602MC 144 6035227 IMF18-08NPPVC0S 25 6041456 WTBN-N311V 79 6035452 IMF12-02PPVC0S 25 6041463 WTBN-N211V 79 6035454 IMF12-02BPVC0S 25 6041463 WTBN-P2331V 79 6035460 IMF12-04BPVC0S 25 6041481 WLB-P3331V 79 6035461 IMF12-04BPVC0S 25 6041481 WLB-P3331V 79 6035462 IMF12-04BPVC0S 25 6041 | 6033960 | WLL170T-2N162 | 117 | 6039097 | WLL180T-M432 | 119 | 7900278 | MQ10-60APS-KUO | 39 |
| 6034665 DSL-0804-G02M 144 6039100 WLL180T-E322 119 7900281 MQ10-60ANS-KTO 39 6035215 IMF12-02BPPVC0S 25 6039101 WLL180T-H434 119 7902077 DOS-0803-G 145 6035211 IMF12-04BPPVC0S 25 6039103 WLL180T-H434 119 7902077 DOS-0803-G 145 6035221 IMF12-08NPPVC0S 25 6039180 DSL-2804-602MC 144 6035225 IMF18-05BPPVC0S 25 6039183 DSL-2803-602MC 144 6035227 IMF18-05BPPVC0S 25 6041457 WTB8-N311V 79 6035454 IMF12-02BPSVC0S 25 6041466 WTB8-P1311V 79 6035456 IMF12-04NPSVC0S 25 6041461 WTB8-P331V 79 6035460 IMF12-04NPSVC0S 25 6041481 WLB-P331V 79 6035461 IMF12-04NPSVC0S 25 6041807 VTE180-2P42412 127 6035461 IMF12-04NPOVC0S 25 < | 6033965 | WLL170T-2P460 | 117 | 6039098 | WLL180T-F232 | 119 | 7900279 | MQ10-60ANS-KUO | 39 |
| 6035215 IMF12-02BPPVC0S 25 6039101 WLL180T-M434 119 6035217 IMF12-04NPPVC0S 25 6039102 WLL180T-K434 119 6035219 IMF12-04NPPVC0S 25 6039103 WLL180T-K434 119 6035221 IMF12-05NPPVC0S 25 6039180 DSL2804-002MC 144 6035223 IMF18-05NPPVC0S 25 6039183 DSL2803-G02MC 144 6035225 IMF18-05NPVC0S 25 6041456 WTB8-N311V 79 6035452 IMF18-02PPVC0S 25 6041466 WTB8-N231V 79 6035454 IMF12-04NPSVC0S 25 6041463 WTB8-N231V 79 6035456 IMF12-04NPSVC0S 25 6041476 WTE8-P3331V 79 6035460 IMF12-04NPSVC0S 25 6041481 WLB8-P331V 79 6035462 IMF12-04NPSVC0S 25 6041803 VTE180-2P42412 127 6035464 IMF12-08NPSVC0S 25 6042017 1004-185P5KW2S < | 6034664 | DSL-0804-G0M6 | 144 | 6039099 | WLL180T-L432 | 119 | 7900280 | MQ10-60APS-KT0 | 39 |
| 6035217 IMF12-04PPVC0S 25 6039102 WL180T-F434 119 6035219 IMF12-04BPPVC0S 25 6039103 WL180T-L434 119 6035221 IMF12-08PPVC0S 25 6039183 DSL-2804-602MC 144 6035225 IMF18-08PPVC0S 25 6039184 DSL-2803-600MC 144 6035227 IMF18-08PPVC0S 25 6041456 WTB8-N3311V 79 6035452 IMF12-02PSVC0S 25 6041456 WTB8-N231V 79 6035454 IMF12-02PSVC0S 25 6041466 WTB8-N231V 79 6035456 IMF12-04PSVC0S 25 6041466 WTB8-N231V 79 6035456 IMF12-04PSVC0S 25 6041467 WTE8-P3331V 79 6035460 IMF12-04PSVC0S 25 6041803 VTF180-2P42412 127 6035464 IMF12-04PSVC0S 25 6041803 VTF180-2P42422 127 6035462 IMF12-04PSVC0S 25 6041803 VTE180-2P42422 127 6035464 IMF12-04PSVC0S 25 6042014 120 </td <td>6034665</td> <td>DSL-0804-G02M</td> <td>144</td> <td>6039100</td> <td>WLL180T-E232</td> <td>119</td> <td>7900281</td> <td>MQ10-60ANS-KTO</td> <td>39</td> | 6034665 | DSL-0804-G02M | 144 | 6039100 | WLL180T-E232 | 119 | 7900281 | MQ10-60ANS-KTO | 39 |
| 6035219 IMF12-04BPPVC0S 25 6039130 WLL180T-L434 119 6035221 IMF18-08BPPVC0S 25 6039180 DSL-2804-002MC 144 6035223 IMF18-05BPPVC0S 25 6039183 DSL-2803-602MC 144 6035225 IMF18-05BPPVC0S 25 6041456 WTB8-N3311V 79 6035421 IMF12-02BPVC0S 25 6041466 WTB8-N231V 79 6035452 IMF12-02BPVC0S 25 6041466 WTB8-N231V 79 6035454 IMF12-04NPSVC0S 25 6041476 WTE8-N2331V 79 6035464 IMF12-04NPSVC0S 25 6041482 WSE8-P3331V 79 6035462 IMF12-04NPSVC0S 25 6041483 VTF180-2P42412 127 6035464 IMF12-08NPSVC0S 25 6041803 VTF180-2P42442 127 6035472 IMF18-05BPSVC0S 25 6041811 VTE180-2P42432 127 6035474 IMF18-05BPSVC0S 25 6042018 IQO4-1B5PKW2S | 6035215 | IMF12-02BPPVC0S | 25 | 6039101 | WLL180T-M434 | 119 | 7902077 | D0S-0803-G | 145 |
| 6035221 IMF12-08NPPVC0S 25 6039180 DSL-2804-602MC 144 6035223 IMF18-08PPVC0S 25 6039183 DSL-2803-60MC 144 6035227 IMF18-08PPVC0S 25 6031484 DSL-2803-60MC 144 6035229 IMF18-12NPVC0S 25 6041456 WTB8-N311V 79 6035452 IMF12-02BPSVC0S 25 6041463 WTB8-N2211V 79 6035454 IMF12-04NPSVC0S 25 6041464 WTB8-P331V 79 6035456 IMF12-04NPSVC0S 25 6041476 WTE8-P3331V 79 6035460 IMF12-04NPSVC0S 25 6041807 VTE180-2P42422 127 6035461 IMF12-04BPSVC0S 25 6041801 VTE180-2P42432 127 6035468 IMF12-08NPSVC0S 25 6041811 VTE180-2P42432 127 6035478 IMF18-08NPSVC0S 25 6042017 1004-1B5SNKW2S 27 6035478 IMF18-08NPSVC0S 25 6042017 1004-1B5SNKW2S | 6035217 | IMF12-04NPPVC0S | 25 | 6039102 | WLL180T-F434 | 119 | 7902078 | DOS-0803-W | 145 |
| 6035223 IMF18-05BPPVC0S 25 6039183 DSL-2803-GO2MC 144 6035225 IMF18-08NPPVC0S 25 6039184 DSL-2803-GO2MC 144 6035227 IMF18-08BPPVC0S 25 6041456 WTB8-N3311V 79 6035429 IMF18-120PPVC0S 25 6041463 WTB8-N231V 79 6035454 IMF12-02BPVC0S 25 6041466 WTB8-P2131V 79 6035456 IMF12-04NPVC0S 25 6041476 WTE8-P3331V 79 6035462 IMF12-04NPVC0S 25 6041492 WSE8-P3331V 79 6035462 IMF12-04NPVC0S 25 6041807 VTE180-2P42412 127 6035462 IMF12-08NPVC0S 25 6041801 VTE180-2P42482 127 6035464 IMF12-08NPVC0S 25 6041811 VTE180-2P42482 127 6035470 IMF18-08NPVC0S 25 6042017 1004-185NKW2S 27 6035476 IMF18-08NPVC0S 25 6042017 1004-185NKW2S | 6035219 | IMF12-04BPPVC0S | 25 | 6039103 | WLL180T-L434 | 119 | | | |
| 6035225 IMF18-08NPPVC0S 25 6039184 DSL-2803-602MC 144 6035227 IMF18-08BPPVC0S 25 6041456 WTB8-N3311V 79 6035422 IMF12-02BPVC0S 25 6041457 WTB8-P1111V 79 6035454 IMF12-02BPVC0S 25 6041463 WTB8-P2311V 79 6035456 IMF12-04NP5VC0S 25 6041464 WTB8-P331V 79 6035463 IMF12-04NP5VC0S 25 6041484 WISE-P3331V 79 6035464 IMF12-04NP5VC0S 25 6041803 VTF180-2P42412 127 6035464 IMF12-04NP5VC0S 25 6041807 VTE180-2P42412 127 6035466 IMF12-08NP5VC0S 25 6041811 VTE180-2P42412 127 6035466 IMF12-08NP5VC0S 25 6042017 IQ04-1B5PSKW2S 27 6035470 IMF18-08NP5VC0S 25 6042019 IQ04-1B5NKW2S 27 6035474 IMF18-08NP5VC0S 25 6042021 IQ06-03BPSKU2S | 6035221 | IMF12-08NPPVC0S | 25 | 6039180 | DSL-2804-G02MC | 144 | | | |
| 6035227IMF18-08BPPVCOS256041456WTB8-N3311V796035229IMF18-12NPPVCOS256041457WTB8-P1111V796035452IMF12-02BPVCOS256041463WTB8-P2131V796035454IMF12-04PPVCOS256041466WTB8-P3331V796035456IMF12-04PPVCOS256041464WTB8-P3331V796035460IMF12-04PPVCOS256041492WSE8-P331V796035462IMF12-04PPVCOS256041803VTF180-2P424121276035464IMF12-08PPVCOS256041803VTE180-2P424121276035466IMF12-08PPVCOS256041819V1180-2P424121276035466IMF12-08PPVCOS256041819V1180-2P424121276035470IMF18-05BPVCOS256042017IQ04-1B5PKW2S276035472IMF18-08PPVCOS256042018IQ04-1B5PKW2S276035474IMF18-08PPVCOS256042020IQ04-1B5NKW2S276035474IMF18-08PPVCOS256042021IQ06-03BPKU2S276035480IMF18-12NPVCOS256042023IQ06-03BPKU2S276035482IMF18-12NPVCOS256042023IQ06-03BNKU2S276035482IMF18-12NPVCOS256042023IQ06-03BPKU2S276035483VTE18-4P1240V1296042044IQ20-07BNSDPOS276035483VTE18-4P1240V1296042045IQ20-07BNSDPOS2 | 6035223 | IMF18-05BPPVC0S | 25 | 6039183 | DSL-2803-G0M6C | 144 | | | |
| 6035229 IMF18-12NPPVCOS 25 6041457 WTB8-P1111V 79 6035452 IMF12-02BPSVCOS 25 6041463 WTB8-N2231V 79 6035454 IMF12-02BPOVCOS 25 6041466 WTB8-P2131V 79 6035456 IMF12-04NPSVCOS 25 6041476 WTB8-P3331V 79 6035456 IMF12-04NPSVCOS 25 6041484 WL8-P3331V 79 6035462 IMF12-04NPOVCOS 25 6041803 VTF180-2P42412 127 6035464 IMF12-08NPOVCOS 25 6041807 VTE180-2P42442 127 6035466 IMF12-08NPOVCOS 25 604181 VTE180-2P42442 127 6035470 IMF18-05BPVCOS 25 6042017 IQ04-1B5PKW2S 27 6035474 IMF18-08BPSVCOS 25 6042018 IQ04-1B5PKW2S 27 6035482 IMF18-08BPVCOS 25 6042021 IQ06-03BPKU2S 27 6035474 IMF18-08BPVCOS 25 6042021 IQ06-03BPKU2S 27 6035482 IMF18-12NPSVCOS 25 6042022 < | 6035225 | IMF18-08NPPVC0S | 25 | 6039184 | DSL-2803-G02MC | 144 | | | |
| 6035452IMF12-02BPSVC0S256041463WTB8-N2231V796035454IMF12-04BPSVC0S256041466WTB8-P2131V796035456IMF12-04NPSVC0S256041476WTE8-P3331V796035460IMF12-04BPSVC0S256041484WL8-P3331V796035461IMF12-04BPSVC0S256041492WSE8-P3331V796035462IMF12-04BPSVC0S256041803VTF180-2P424121276035464IMF12-08NPSVC0S256041811VTE180-2P424221276035466IMF12-08NPOVC0S256041813VSE180-2P424321276035466IMF18-05BPSVC0S256041823VSE180-2P424321276035470IMF18-05BPSVC0S256042017IQ04-1B5PSKW2S276035471IMF18-08NPOVC0S256042018IQ04-1B5PSKW2S276035472IMF18-08BPSVC0S256042020IQ04-1B5NSKW2S276035473IMF18-08PSVC0S256042021IQ06-03BPSKU2S276035482IMF18-12NPSVC0S256042022IQ06-03BPSKU2S276035483VTE18-4P1240V1296042025IQ06-03BPSKU2S276035491VTE18-4P1240V1296042043IQ20-07BPSDP0S276035491VTE18-4P1240V1296042044IQ20-07BPSDP0S276035493VTB18-4P1240V1296042045IQ20-07BPSDP0S276035493VTB18-4P1340V1296042046I | 6035227 | IMF18-08BPPVC0S | 25 | 6041456 | WTB8-N3311V | 79 | | | |
| 6035454IMF12-02BP0VC0S256041466WTB8-P2131V796035456IMF12-04NPSVC0S256041476WTE8-P3331V796035460IMF12-04PSVC0S256041484WL8-P3331V796035462IMF12-04BP0VC0S256041492WSE8-P331V796035464IMF12-08NPSVC0S256041803VTF180-2P424121276035466IMF12-08NPSVC0S256041807VTE180-2P424821276035466IMF12-08NPSVC0S256041819V.180-2P424311276035470IMF18-05BPSVC0S256041823VSE180-2P424321276035472IMF18-05BPSVC0S256042017IQ04-1B5PKW2S276035474IMF18-08BPSVC0S256042019IQ04-1B5NKW2S276035476IMF18-08BPSVC0S256042022IQ06-03BPKU2S276035480IMF18-12NPOVC0S256042023IQ06-03BPKU2S276035481VTE18-4P1240V1296042024IQ06-03BNKU2S276035491VTE18-4P4240V1296042043IQ20-07BPSDP0S276035493VTB18-4P1240V1296042044IQ20-07BPSDP0S276035493VTB18-4P1240V1296042044IQ20-07BPSDP0S276035491VTE18-4P2240V1296042045IQ20-07BPSDP0S276035493VTB18-4P1240V1296042046IQ25-05BPSDU2S276035495VL18-4P2240V1296042046IQ25-05B | 6035229 | IMF18-12NPPVC0S | 25 | 6041457 | WTB8-P1111V | 79 | | | |
| 6035456IMF12-04NPSVC0S256041476WTE8-P3331V796035458IMF12-04PSVC0S256041484WL8-P3331V796035462IMF12-04PSVC0S256041492WSE8-P3331V796035462IMF12-08NPSVC0S256041803VTF180-2P424121276035464IMF12-08NPSVC0S256041807VTE180-2P424821276035466IMF12-08NPSVC0S256041819VL180-2P424321276035468IMF18-05BPSVC0S256041813VSE180-2P424321276035470IMF18-05BPSVC0S256042017IQ04-1B5PSKW2S276035472IMF18-08NPSVC0S256042018IQ04-1B5NSKW2S276035476IMF18-08NPSVC0S256042022IQ06-03BPSKW2S276035476IMF18-08NPSVC0S256042022IQ06-03BPSKW2S276035478IMF18-08NPSVC0S256042022IQ06-03BPSKU2S276035480IMF18-12NPOVC0S256042023IQ06-03BNSKU2S276035481VTE18-4P1240V1296042043IQ20-07BPSDP0S276035493VTB18-4P1240V1296042044IQ20-07BPSDP0S276035493VTB18-4P1240V1296042046IQ25-05BPSDU2S276035495VL18-4P2240V1296042046IQ25-05BPSD0S276035495VL18-4P2240V1296042046IQ25-05BPSDU2S276035495VL18-4P2240V1296042046IQ | 6035452 | IMF12-02BPSVC0S | 25 | 6041463 | WTB8-N2231V | 79 | | | |
| 6035458IMF12-04NP0VC0S256041484WL8-P3331V796035460IMF12-04BPSVC0S256041492WSE8-P3331V796035462IMF12-04BPOVC0S256041803VTF180-2P424121276035464IMF12-08NPSVC0S256041807VTE180-2P424821276035466IMF12-08NPSVC0S256041811VTE180-2P424311276035476IMF18-05BPSVC0S256041823VSE180-2P424311276035472IMF18-05BPOVC0S256041823VSE180-2P424321276035473IMF18-08NPSVC0S256042017IQ04-1B5PKW2S276035474IMF18-08BPSVC0S256042018IQ04-1B5PKW2S276035474IMF18-08BPSVC0S25604202IQ04-1B5NKW2S276035474IMF18-08BPSVC0S25604202IQ06-03BPSKU2S276035475IMF18-12NPSVC0S25604202IQ06-03BNSKU2S276035482IMF18-12NPSVC0S256042023IQ06-03BNSKU2S276035483VTE18-4P4240V1296042043IQ20-07BSDPOS276035493VTE18-4P4240V1296042044IQ20-07BNSDPOS276035495VL18-4P3140V1296042044IQ20-07BSDPOS276035495VL18-4P3140V1296042045IQ20-07BPPDQOS276035495VL18-4P3140V1296042045IQ20-07BSDPOS276035495VL18-4P3140V1296042045IQ20 | 6035454 | IMF12-02BPOVCOS | 25 | 6041466 | WTB8-P2131V | 79 | | | |
| 6035460IMF12-04BPSVC0S256041492WSE8-P3331V796035462IMF12-04BPOVC0S256041803VTF180-2P424121276035464IMF12-08NPSVC0S256041807VTE180-2P424421276035466IMF12-08NPOVC0S256041811VTE180-2P424821276035476IMF18-05BPSVC0S256041819VL180-2P424311276035477IMF18-05BPOVC0S256041823VSE180-2P424321276035476IMF18-08NPSVC0S256042017IQ04-1B5PSKW2S276035476IMF18-08NPSVC0S256042018IQ04-1B5PoKW2S276035476IMF18-08BPSVC0S256042020IQ04-1B5NSKW2S276035476IMF18-08BPSVC0S256042020IQ04-1B5NSKW2S276035478IMF18-08BPSVC0S256042020IQ04-1B5NSKW2S276035480IMF18-12NPSVC0S256042021IQ06-03BPSKU2S276035481VTE18-4P1240V1296042024IQ06-03BNSKU2S276035487VTE18-4P240V1296042043IQ20-07BPSDP0S276035491VTE18-4P240V1296042044IQ20-07BPSDP0S276035495VL18-4P240V1296042044IQ20-07BPSDP0S276035495VL18-4P3140V1296042046IQ25-05BPD12S276035499VS/VE18-4P3140V1296042046IQ25-05BPPD12S276035583WSE8-P2231776043806< | 6035456 | IMF12-04NPSVC0S | 25 | 6041476 | WTE8-P3331V | 79 | | | |
| 6035462IMF12-04BPOVCOS256041803VTF180-2P424121276035464IMF12-08NPSVCOS256041807VTE180-2P424221276035466IMF12-08NPOVCOS256041811VTE180-2P424321276035468IMF18-05BPSVCOS256041819VL180-2P424321276035470IMF18-05BPOVCOS256041823VSE180-2P424321276035472IMF18-08NPSVCOS256042017IQ04-1B5PSKW2S276035474IMF18-08NPOVCOS256042019IQ04-1B5NSKW2S276035476IMF18-08NPOVCOS256042019IQ04-1B5NSKW2S276035478IMF18-08BPSVCOS256042020IQ04-03BPSKU2S276035480IMF18-12NPSVCOS256042022IQ06-03BPSKU2S276035482IMF18-12NPOVCOS256042023IQ06-03BPSKU2S276035481VTE18-4P1240V1296042024IQ06-03BNSKU2S276035491VTE18-4P1240V1296042043IQ20-07BPSDPOS276035493VTB18-4P1240V1296042044IQ20-07BNSDPOS276035495VL18-4P3140V1296042045IQ20-07BPSDQOS276035497VL18-4P240V1296042045IQ20-07BPSDQOS276035499VS/VE18-4P3140V1296042047IQ25-05BPSDU2S276035499VS/VE18-4P3140V1296042047IQ25-05BPSDU2S276035583WSE8-P223177604380 | 6035458 | IMF12-04NPOVCOS | 25 | 6041484 | WL8-P3331V | 79 | | | |
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| 6035466IMF12-08NP0VC0S256041811VTE180-2P424821276035468IMF18-05BPSVC0S256041819VL180-2P424311276035470IMF18-05BP0VC0S256041823VSE180-2P424321276035472IMF18-08NPSVC0S256042017IQ04-1B5PSKW2S276035474IMF18-08BPSVC0S256042019IQ04-1B5P0KW2S276035476IMF18-08BPSVC0S256042019IQ04-1B5NSKW2S276035478IMF18-08BPOVC0S256042020IQ04-1B5NOKW2S276035480IMF18-12NPSVC0S256042020IQ04-1B5NOKW2S276035482IMF18-12NPOVC0S256042021IQ06-03BPSKU2S276035487VTF18-4P1240V1296042024IQ06-03BNSKU2S276035493VTE18-4P8240V1296042043IQ20-07BPSDPOS276035495VL18-4P3140V1296042044IQ20-07BNSDPOS276035497VL18-4P2240V1296042045IQ20-07BPPDQOS276035499VS/VE18-4P3140V1296042046IQ25-05BPSDU2S276035499VS/VE18-4P3140V1296042047IQ25-05BPPDU2S276035583WSE8-P2231776043806VTF180-2P42414127 | 6035462 | IMF12-04BPOVCOS | 25 | 6041803 | VTF180-2P42412 | 127 | | | |
| 6035468IMF18-05BPSVC0S256041819VL180-2P424311276035470IMF18-05BP0VC0S256041823VSE180-2P424321276035472IMF18-08NPSVC0S256042017IQ04-1B5PSKW2S276035474IMF18-08NPOVC0S256042018IQ04-1B5P0KW2S276035476IMF18-08BPSVC0S256042019IQ04-1B5NSKW2S276035478IMF18-08BPOVC0S256042020IQ04-1B5N0KW2S276035480IMF18-12NPSVC0S256042022IQ06-03BPSKU2S276035482IMF18-12NPOVC0S256042023IQ06-03BPOKU2S276035487VTF18-4P1240V1296042025IQ06-03BNSKU2S276035491VTE18-4P8240V1296042043IQ20-07BNSDPOS276035493VTB18-4P1240V1296042045IQ20-07BNSDPOS276035497VL18-4P3140V1296042045IQ20-07BNSDPOS276035499VS/VE18-4P3140V1296042046IQ25-05BPSDU2S276035499VS/VE18-4P3140V1296042047IQ25-05BPSDU2S276035499VS/VE18-4P3140V1296042047IQ25-05BPSDU2S276035433WSE8-P2231776043806VTF180-2P42414127 | 6035464 | IMF12-08NPSVC0S | 25 | 6041807 | VTE180-2P42442 | 127 | | | |
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| 6035474IMF18-08NPOVCOS256042018IQ04-1B5P0KW2S276035476IMF18-08BPSVCOS256042019IQ04-1B5NSKW2S276035478IMF18-08BPOVCOS256042020IQ04-1B5NOKW2S276035480IMF18-12NPSVCOS256042022IQ06-03BPSKU2S276035482IMF18-12NPOVCOS256042023IQ06-03BPSKU2S276035487VTF18-4P1240V1296042024IQ06-03BNSKU2S276035491VTE18-4P4240V1296042043IQ20-07BPSDPOS276035493VTB18-4P1240V1296042044IQ20-07BNSDPOS276035495VL18-4P3140V1296042045IQ20-07BPPDQOS276035499VS/VE18-4P3140V1296042047IQ25-05BPSDU2S276035583WSE8-P2231776043806VTF180-2P42414127 | 6035470 | IMF18-05BPOVCOS | 25 | 6041823 | VSE180-2P42432 | 127 | | | |
| 6035476IMF18-08BPSVC0S256042019IQ04-1B5NSKW2S276035478IMF18-08BP0VC0S256042020IQ04-1B5NOKW2S276035480IMF18-12NPSVC0S256042022IQ06-03BPSKU2S276035482IMF18-12NPOVC0S256042023IQ06-03BPOKU2S276035487VTF18-4P1240V1296042025IQ06-03BNSKU2S276035491VTE18-4P4240V1296042025IQ06-03BNOKU2S276035493VTB18-4P1240V1296042043IQ20-07BPSDPOS276035495VL18-4P3140V1296042045IQ20-07BNSDPOS276035499VS/VE18-4P3140V1296042046IQ25-05BPSDU2S276035583WSE8-P2231776043806VTF180-2P42414127 | 6035472 | IMF18-08NPSVC0S | 25 | 6042017 | IQ04-1B5PSKW2S | 27 | | | |
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| 6035583 WSE8-P2231 77 6043806 VTF180-2P42414 127 | 6035497 | VL18-4P2240V | 129 | 6042046 | IQ25-05BPSDU2S | | | | |
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| BEF-KHF-M08 | 2051478 | 147 | DOL-0803-W02MN | 6033667 | 143 | DSL-1203-G02M | 6022566 | 144 |
| BEF-KHF-M12 | 2051480 | 147 | DOL-0803-W05M | 6022010 | 143 | DSL-1203-G02MC | 6025923 | 144 |
| BEF-KHF-M18 | 2051482 | 147 | DOL-0803-W05MC | 6025892 | 143 | DSL-1203-G0M6 | 6022564 | 144 |
| BEF-KHS-KH3N | 5322627 | 147 | DOL-0803-W05MN | 6033668 | 143 | DSL-1203-G0M6C | 6025922 | 144 |
| BEF-KHS-N02N | 2051618 | 147 | DOL-0803-G02M | 6010785 | 143 | DSL-1204-B02MC | 6025929 | 144 |
| BEF-KHS-N03 | 2051609 | 95 | DOL-0803-W02M | 6008489 | 143 | DSL-1204-B02MN | 6028198 | 144 |
| BEF-KHS-N03N | 2051619 | 147 | DOL-0804-G02MC | 6025894 | 143 | DSL-1204-B0M6C | 6025928 | 144 |
| BEF-KHS-N04N | 2051620 | 147 | DOL-0804-G02MN | 6033670 | 143 | DSL-1204-B0M6N | 6028197 | 144 |
| BEF-KHS-N05N | 2051621 | 147 | DOL-0804-G05M | 6009872 | 143 | DSL-1204-G02M | 6022567 | 144 |
| BEF-KHS-N06N | 2051622 | 147 | DOL-0804-G05MC | 6025895 | 143 | DSL-1204-G02MC | 6025927 | 144 |
| BEF-KHS-N07N | 2051623 | 147 | DOL-0804-G05MN | 6033671 | 143 | DSL-1204-G02MN | 6028195 | 144 |
| BEF-KHS-N08N | 2051616 | 147 | DOL-0804-W02MC | 6025897 | 143 | DSL-1204-G05M | 6022569 | 144 |
| BEF-MS12G-NA | 4058914 | 147 | DOL-0804-W02MN | 6033673 | 143 | DSL-1204-G0M6C | 6025926 | 144 |
| BEF-MS12L-NA | 4058912 | 147 | DOL-0804-W05M | 6009873 | 143 | DSL-1204-GOM6N | 6028194 | 144 |
| BEF-MS12Z-NA | 4058916 | 147 | DOL-0804-W05MC | 6025898 | 143 | DSL-1205-G02MC | 6025931 | 144 |
| BEF-SG-W12-3 | 2045175 | 147 | DOL-0804-W05MN | 6033674 | 143 | DSL-1205-G0M6C | 6025930 | 144 |
| BEF-SG-W27 | 2039601 | 147 | DOL-0804-G02M | 6009870 | 143 | DSL-2803-G02MC | 6039184 | 144 |
| BEF-SG-W27 | 2039601 | 95 | DOL-0804-W02M | 6009871 | 143 | DSL-2803-G0M6C | 6039183 | 144 |
| BEF-SW-W4S | 2051497 | 147 | DOL-1204-G02MC | 6025900 | 143 | DSL-2804-G02MC | 6039180 | 144 |
| BEF-W100-A | 5311520 | 147 | DOL-1204-G02MN | 6028128 | 143 | DSL-2804-G0M6C | 6037595 | 144 |
| BEF-W4-A | 2051628 | 147 | DOL-1204-G05M | 6009866 | 143 | DSL-8203-B02MC | 6025917 | 144 |
| BEF-WG-W12 | 2013942 | 147 | DOL-1204-G05MC | 6025901 | 143 | DSL-8203-B0M6C | 6025916 | 144 |
| BEF-WN-M08 | 5321721 | 147 | DOL-1204-G05MN | 6028130 | 143 | DSL-8203-G02M | 6022572 | 144 |
| BEF-WN-M12 | 5308447 | 147 | DOL-1204-L02MN | 6028136 | 143 | DSL-8203-G02MC | 6025915 | 144 |
| BEF-WN-M18 | 5308446 | 147 | DOL-1204-L05MN | 6028137 | 143 | DSL-8203-G0M6 | 6022570 | 144 |
| BEF-WN-W14 | 2019084 | 95 | DOL-1204-W02MC | 6025903 | 143 | DSL-8203-G0M6C | 6025914 | 144 |
| BEF-WN-W18 | 2009317 | 147 | DOL-1204-W02MN | 6028129 | 143 | DSL-8204-B02MC | 6025921 | 144 |
| BEF-WN-W18 | 2009317 | 95 | DOL-1204-W05M | 6009867 | 143 | DSL-8204-B0M6C | 6025920 | 144 |
| BEF-WN-W27 | 2009122 | 147 | DOL-1204-W05MC | 6025904 | 143 | DSL-8204-G02M | 6022573 | 144 |
| BEF-WN-W9-2 | 2022855 | 147 | DOL-1204-W05MN | 6028131 | 143 | DSL-8204-G02MC | 6025919 | 144 |
| С | | | DOL-1204-G02M | 6009382 | 143 | DSL-8204-G0M6 | 6022571 | 144 |
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| CM18-08BPP-TW0 | 6026195 | 35 | DOL-1205-G05MC | 6025907 | 143 | EL3-F2438 | 1044717 | 133 |
| CM18-12NNP-KC1 | 6021458 | 35 | DOL-1205-G05MN | 6028141 | 143 | ET3-P3215 | 1045187 | 133 |
| CM18-12NPP-KC1 | 6020410 | 35 | DOL-1205-W02MC | 6025906 | 143 | ET3-P3228 | 1045211 | 133 |
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| DOL-0803-G05MN | 6033665 | 143 | DSL-0804-G0M6 | 6034664 | 144 | | | |
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| IH06-02BPS-VT1 | 7900179 | 17 | IMF18-08NPPVC0S | 6035225 | 25 | MM18-70APS-ZCK | 1040072 | 39 |
| IH06-02BPS-VW1 | 7900177 | 17 | IMF18-08NPSVC0S | 6035472 | 25 | MM18-70APS-ZUK | 1040029 | 39 |
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| VTF180-2P424126041803127VTF180-2P424146043806127VTF180-2P424176037480127VTF180-2P424196043811127WWWWL100-P3439602607381WL100-P4409603651281WL100-P4429602861181WL11-2P2430104138791WL11-2P2432104854291WL11-2P2432104854291WL12-3N2431104143693WL12-3P2431104143693WL12G-3P2572105353593WL12L-2B531104795993WL12L-2B531104795993WL14-2P130102605095WL14-2P430102604995WL14-2P4301043323131WL15-F24331043319131WL15-P2430102590997WL18-3P130102590997WL18-3P130102590997WL18-3P130102591197WL18-3P1301027784101WL23-2P24305011041159101WL23-2P24305011043165101WL23-2P24305011044165101WL23-2P24305011044165101WL23-2P24611044166103WL27-3F26311027772103WL27-3P24611044166103WL27-3P3402S131046538103 | VTE180-2P42489 | 6043827 | 127 |
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| VTF180-2P424196043811127WWL100-P3439602607381WL100-P4409603651281WL100-P4429602861181WL11-2N2430104138791WL11-2P2432104854291WL11-2P2432104854291WL11-2P2432104854291WL12-3N2431104144093WL12-3P2431104143693WL12-3P2431104145693WL12G-3P2572105353593WL12G-3P2582105353693WL12L-2B531104795993WL12-2B531102605095WL14-2P130102605095WL14-2P430102604995WL14-2P431105027195WL15-F24331043319131WL15-F24301043223131WL18-3P03007104248497WL18-3P130102590997WL18-3P130102591197WL18-3P130102602997WL3-2P2430011041159101WL23-2P2430021028056101WL23-2P2430011044165101WL23-2P2430011044165101WL23-2P34301027786101WL23-2P34301027772103WL27-3P24611044166103WL27-3P3402S131046538103 | VTF180-2P42414 | 6043806 | 127 |
| W WL100-P3439 6026073 81 WL100-P4409 6036512 81 WL100-P4429 6028611 81 WL11-2N2430 1041387 91 WL11-2P2432 104542 91 WL11-2P2432 104542 91 WL11-2P2432 104436 93 WL12-3P2431 1041440 93 WL12G-3B2531 1041456 93 WL12G-3P2572 1053535 93 WL12G-3P2582 1053536 93 WL12-2B531 1047959 93 WL12-2B531 1026050 95 WL14-2P130 1026050 95 WL14-2P430 1026049 95 WL14-2P430 1043023 131 WL15-F2433 1043319 131 WL15-F2433 1043319 131 WL18-3P030S07 1042484 97 WL18-3P130 1025909 97 WL18-3P130 1025909 97 WL18-3P130 | VTF180-2P42417 | 6037480 | 127 |
| WL100-P3439 6026073 81 WL100-P4409 6036512 81 WL100-P4429 6028611 81 WL11-2N2430 1041387 91 WL11-2P2432 1048542 91 WL11-2P2432 1048542 91 WL11-2P2432 1044385 91 WL11-2P2432 1048542 91 WL11-2P2431 1041430 93 WL12-3N2431 1041440 93 WL12G-3B2531 1041456 93 WL12G-3P2572 1053535 93 WL12G-3P2582 1053536 93 WL12L-2B531 1047959 93 WL14-2P430 1026050 95 WL14-2P430 1026049 95 WL14-2P430 104323 131 WL15-F2433 1043319 131 WL15-F2433 1043323 131 WL18-3P030S07 1042484 97 WL18-3P130 1025909 97 WL18-3P130 1026029 97 <td>VTF180-2P42419</td> <td>6043811</td> <td>127</td> | VTF180-2P42419 | 6043811 | 127 |
| WL100-P4409 6036512 81 WL100-P4429 6028611 81 WL11-2N2430 1041387 91 WL11-2P2430 1041385 91 WL11-2P2432 1048542 91 WL11-2P2432 1048542 91 WL11-2P2431 1041300 91 WL12-3N2431 1041440 93 WL12-3P2431 1041456 93 WL12G-3P2572 1053535 93 WL12G-3P2582 1053536 93 WL12L-2B530 1018252 93 WL12L-2B531 1047959 93 WL14-2P130 1026050 95 WL14-2P430 1026049 95 WL14-2P430 1043023 131 WL15-F2433 1043323 131 WL15-F2433 1043321 131 WL18-3P030S07 1042484 97 WL18-3P130 1025909 97 WL18-3P130 1025029 97 WL18-3P730 1026029 97 | W | | |
| WL100-P4429 6028611 81 WL11-2N2430 1041387 91 WL11-2P2430 1041385 91 WL11-2P2432 1048542 91 WL11-2P2432 1048542 91 WL11-2P2431 1041390 91 WL12-3N2431 1041440 93 WL12-3P2431 1041456 93 WL12G-3P2572 1053535 93 WL12G-3P2582 1053536 93 WL12L-2B530 1018252 93 WL12L-2B531 1047959 93 WL14-2P130 1026050 95 WL14-2P430 1026049 95 WL14-2P430 1026049 95 WL14-2P430 104323 131 WL15-F2433 1043323 131 WL15-P2430 1043321 131 WL18-3P030S07 1042484 97 WL18-3P130 1025909 97 WL18-3P430 1025027 97 WL18-3P730 1026029 97 | WL100-P3439 | 6026073 | 81 |
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| WL11-2P2430 1041385 91 WL11-2P2432 1048542 91 WL11-2P2432 1041390 91 WL11-2N2431 1041400 93 WL12-3N2431 1041440 93 WL12-3P2431 1041456 93 WL12G-3P2531 1041456 93 WL12G-3P2572 1053535 93 WL12C-3P2582 1053536 93 WL12L-2B530 1018252 93 WL14-2P430 1026050 95 WL14-2P430 1026049 95 WL14-2P430 1026049 95 WL14-2P430 1043023 131 WL15-F2433 1043319 131 WL15-F2430 1043321 131 WL18-3P030S07 1042484 97 WL18-3P130 1025909 97 WL18-3P130 1025911 97 WL18-3P130 1026029 97 WL18-3P130 1027784 101 WL23-2P24300P02 1028056 101 | WL100-P4429 | 6028611 | 81 |
| WL11-2P2432 1048542 91 WL11G-2B2531 1041390 91 WL12-3N2431 1041440 93 WL12-3P2431 1041446 93 WL12G-3B2531 1041456 93 WL12G-3P2572 1053535 93 WL12C-3P2582 1053536 93 WL12L-2B530 1018252 93 WL14-2P130 1026050 95 WL14-2P430 1026049 95 WL14-2P430 1043123 131 WL15-F2433 1043319 131 WL15-P2430 1043321 131 WL18-3P030S07 1042484 97 WL18-3P130 1025911 97 WL18-3P130 1025911 97 WL18-3P730 1026029 97 WL23-2P2430S02 1028056 101 <td>WL11-2N2430</td> <td>1041387</td> <td>91</td> | WL11-2N2430 | 1041387 | 91 |
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| WL12-3N2431104144093WL12-3P2431104143693WL12G-3B2531104145693WL12G-3P2572105353593WL12G-3P2582105353693WL12L-2B530101825293WL12L-2B531104795993WL14-2P130102605095WL14-2P430102604995WL14-2P431105027195WL14-2P4331043323131WL15-F24331043319131WL15-P2430102590997WL18-3P130102591197WL18-3P430102591197WL18-3P430102591197WL23-2P11301027784101WL23-2P2430S011041159101WL23-2P24301027786101WL23-2P24601044165101WL27-3F26311027772103WL27-3P24611046538103WL27-3P3402S131046538103 | WL11-2P2432 | 1048542 | 91 |
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| WS,WE14,2430 1026430 95 WT34,6410 1019227 107 WT89M4.3P2411 1001898 87 WS,WE14,2430 1025927 97 WT34,4210 1019232 107 WT89M4.3P2411 1001898 87 WS,WE18,34430 1025923 97 WT34,4210 1019230 107 WTE11,224332 1041383 91 WS,WE280,5122 6027490 105 WT91,4300 1023997 88 WTE15,22431 1041314 131 WS,WE280,5122 6027490 105 WT91,4300 1023979 88 WTE15,22431 1041376 91 WS,WE24,420 010957 107 WTB1,224231 1041376 91 WTE1,22431 1041406 93 WS,WE44,200 1019357 107 WTB1,224231 1041407 93 WTF1,224331 1041406 93 WS,WE4,2430 1043365 91 WTB1,2342411 1041427 93 WTF1,224231 1041306 93 WSL1,274,243 1041396 91 WTB1,23421 | WS/WE12L-2P431 | 1047960 | 93 | WT2S-P261 | 1023640 | 71 | WTB9M4-3P2211 | 1051888 | 87 |
| WS,WEIB-3P410 1025927 97 WT34-210 1019222 107 WTBM-3P430 105191 87 WS,WEIB-3P430 1025923 105 WTBL/N30 1023901 89 WTEL1-2P2432 1041383 91 WS,WE280-5132 6027490 105 WTBL/N30 1023971 89 WTEL5-2P2432 1041381 91 WS,WE280-5132 6027490 105 WT9LA930 1023979 89 WTEL5-2P2432 1041381 131 WS,WE28-720 6030570 71 WTBL/2P2431 1041376 91 WTEL3-2P2431 1041406 93 WS,WE24-200 1019257 107 WTBL/2P2431 10414127 93 WTEL3-2P2431 1041406 93 WS,WE24-2930 1043296 91 WTBL/2P2431 10414127 93 WTFL/2P2431 1041406 93 WSE12-2P2431 1044326 91 WTBL/2P2431 1041422 93 WTFL/2P2431 1041406 93 WSE12-2P2431 1041396 91 WTBL/2P2431 | | 1026430 | 95 | WT34-B410 | 1019229 | 107 | WTB9M4-3P2261 | 1051889 | 87 |
| WS,WEIB-3P410 1025927 97 WT34-210 1019222 107 WTBM-3P430 105191 87 WS,WEIB-3P430 1025923 105 WTBL/N30 1023901 89 WTEL1-2P2432 1041383 91 WS,WE280-5132 6027490 105 WTBL/N30 1023971 89 WTEL5-2P2432 1041381 91 WS,WE280-5132 6027490 105 WT9LA930 1023979 89 WTEL5-2P2432 1041381 131 WS,WE28-720 6030570 71 WTBL/2P2431 1041376 91 WTEL3-2P2431 1041406 93 WS,WE24-200 1019257 107 WTBL/2P2431 10414127 93 WTEL3-2P2431 1041406 93 WS,WE24-2930 1043296 91 WTBL/2P2431 10414127 93 WTFL/2P2431 1041406 93 WSE12-2P2431 1044326 91 WTBL/2P2431 1041422 93 WTFL/2P2431 1041406 93 WSE12-2P2431 1041396 91 WTBL/2P2431 | , | | | WT34-B440 | | | WTB9M4-3P2411 | | 87 |
| WS,WE18,SPA30 1025923 97 WT34/210 1013280 107 WTE112/2432 1041383 91 WS,WE280,P430 6022438 105 WT9LN30 1023990 89 WTE1522411 1043317 131 WS,WE280,F230 6027488 105 WT9LP30 1023997 89 WTE1522411 1043317 131 WS,WE287,E213 1023650 71 WTB112/P2431 1041476 91 WTE1522411 1043364 71 WS,WE287,213 1023992 89 WTB12/32431 1041470 93 WTF12/32431 1041480 93 WS,WE9LP430 1013290 103 WTB12/32431 1044414 93 WTF12/326221 104336 11 WTF12/32621 1031280 193 WSE15/4240 1041349 91 WTB12/32431 1044420 93 WTF12/32621 1031280 193 WSE15/42430 1041349 91 WTB12/32431 1044420 93 WTR1472120 1013388 139 WSE15/42430 | | | | | | | | | |
| WS, WE280 P430 602823 105 WT9LN330 1022991 89 WTEL12P2422 1041381 91 WS, WE280 S132 6027498 105 WT9LN430 1023997 89 WTE13P2411 1043317 131 WS, WE280 S132 6030570 71 WT9LP330 1023997 89 WTE32P2411 1041376 91 WS, WE24 R230 101257 107 WTB112P2431 1041376 91 WTF123P2431 1041408 93 WS, WE44 R230 1012392 89 WTB122N2411 1041416 93 WTF123P2431 1041408 93 WS, WE9LR330 1023992 89 WTB122N2431 1041404 93 WTF123P2431 1041406 93 WSE12N2430 1041394 91 WTB122N2431 1044141 93 WTB142N2431 1043325 131 WSE12N2430 1043327 131 WTB12N2431 1044335 131 WTB142N2431 1043325 131 WTB142N2431 101380 139 WSE12N2440 | , | | | | | | | | |
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| WS/WE25F213 1023650 71 WTB11292431 1041376 91 WS/WE34R230 1019257 107 WTB11292431 1041376 91 WS/WE34R230 102393 89 WTB1229X2411 10414427 93 WS/WE9LR330 102393 89 WTB123P2431 1041404 93 WS/WE9LR330 1041396 91 WTB123P2431 1041404 93 WSL123P2431 1041416 93 WTF423P2431 1041404 93 WSE123P2431 1041496 94 WTB123P2431 1041402 93 WSE123P2431 1041495 93 WTR423P2431 1011200 193 WSE123P2431 1041326 131 WTR4211 1015301 139 WSE123P2430 104327 131 WTB1529231 1044306 131 WTR273P211 101518 194 WSE23P2320 1049077 70 103 WTB273P2413 1044305 131 WTR2P511 1015874 139 WSE43P32100 | , | 6027488 | 105 | | 1023977 | 89 | WTE15-P2411 | 1043314 | 131 |
| WS/WES-F213 1023650 T1 WTB1/2P2431 1041376 91 WS/WE34R230 1019257 107 WTB1/2P2431 1041376 91 WS/WE34R230 102393 89 WTB1/2P2431 1041442 91 WTF1/2/3R2431 1041404 93 WS/WE9LH30 102393 89 WTB1/2/3R2431 1041416 93 WTF1/2/3R2431 1041404 93 WSL12/P2430 1041396 91 WTB1/2/3R2431 1041416 93 WTF4/2/3P2431 1041404 93 WSL12/P2430 1041396 91 WTB1/2/3P2431 1041402 93 WTF4/2/3P2431 101200 193 WSE12/P2431 1041327 131 WTB1/2/3P2431 1041306 131 WTR4/21210 1015031 139 WSE15/8/2430 104327 131 WTB1/2/3P2451 1044306 131 WTR2/3P211 1015874 139 WSE3/27/3F2631 1027790 103 WTB1/2/3P24721 1040305 131 WTR2/3P211 1015874 139 < | , | 6030570 | | | 1023959 | 89 | WTE23-2P2412 | | |
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| WS/WE34/240 101251 107 WTB1292461 1044442 91 WTF1238/2431 1041404 93 WS/WE9LP330 1023992 89 WTB1238/2431 1041416 93 WTF1238/2431 1041404 93 WSE112/2430 1041396 91 WTB1238/2431 1041416 93 WSE12-3P2431 1041419 93 WTB1238/2431 1041411 93 WSE15-82430 1043326 131 WTB1238/2431 1043226 131 WSE15-82430 1043328 131 WTB1248/2431 1044306 131 WSE27-3P2430 1027792 103 WTB1273P2411 1027753 103 WSE28-82330 1042089 73 WTB273P2411 1027753 103 WSE88-8331V 6041492 79 WTB273P2411 1027750 103 WTB273P24261 1044052 73 WTB273P2414 1042052 73 WT100P34149 6026116 81 WTB273P2416 1044658 103 WT122P52150 | , | | | | | | | | |
| WS/WE9LP330 1023993 89 WTB123N2411 1041427 93 WTF123P2431 1041404 93 WSE112N2430 1041396 91 WTB123P2411 1041412 93 WTF123P24210 1041304 91 WSE12N2430 1041394 91 WTB123P2411 1041412 93 WTF123P2421 1041401 93 WSE12N2430 1041337 131 WTB123P2431 1044302 93 WTF1423P226220 1064101 75 WSE12N2430 1043327 131 WTB12AP2431 1044306 131 WTF14721511 1015388 139 WSE27N2531 1027790 103 WTB23P2431 1044306 131 WTR2A551 101877 139 WSE43N3130 1042089 73 WTE23P24211 1027753 103 WTR2A55108 1022927 139 WSE89N2230 1049077 87 WTE273P2443 1027753 103 WTR2A551208 1042297 139 WT100P3419 6026116 81 WTE273P2441 | | 1019251 | 107 | WTB11-2P2461 | 1044442 | 91 | WTF12-3N2431 | 1041408 | 93 |
| WS/WE9LP430 1023992 89 WTB123N2431 1041416 93 WSE112N2430 1041396 91 WTB123P2411 1041422 93 WSE112N2430 1041394 91 WTB123P2411 1041422 93 WSE15A2430 1044394 93 WTB12C3P2431 1044202 93 WSE15A2430 1043328 131 WTB12A3P2411 1043326 131 WSE15A2430 1043328 131 WTB12A3P2431 1044306 131 WSE273P2431 1044005 131 WTR2P511 101588 139 WSE45A3P21300 1042099 73 WTB273P2411 1027753 103 WTR2P51509 1024302 139 WSE43A3P2130 1044097 87 WTB273P2411 1027763 103 WTR2P61509 1024302 139 WSE43A32230 1049077 87 WTB273P2461 1044508 103 WTR2P61509 1024302 139 WT10P2419 6026116 81 WTB273P2461 1027750 < | , | 1023993 | 89 | WTB12-3N2411 | 1041427 | 93 | WTF12-3P2431 | 1041404 | 93 |
| WSE11-2P2430 1041394 91 WTB12-3P2431 1041411 93 WTR1-P2120 1013260 139 WSE15-242431 104327 131 WTB12-2P2431 104325 131 WTR1-P21502 1015301 139 WSE15-24230 1043327 131 WTB15-24231 104325 131 WTR1-P21511 1015301 139 WSE27-3P2431 1027792 103 WTB15-P2431 1044305 131 WTR2+P511 1015158 139 WSE45-3P2300 1045099 75 WTB2-3P2411 1027753 103 WTR2+P51209 1023021 139 WSE8-3P3230 1049076 87 WTB27-3P2413 1024765 103 WTR2+P51508 1022927 139 WSE9-3P230 1049076 87 WTB27-3P2413 1024763 103 WTR2+P51508 1022927 139 WT100-N1419 6026113 81 WTB27-3P2413 1024763 103 WT42+P21527 104257 133 WT100-N1419 602616 81 WTB | , | | 89 | WTB12-3N2431 | | | | | 93 |
| WSE11-2P2430 1041394 91 WTB12-3P2431 1041411 93 WTR1-P2120 1013260 139 WSE15-24240 1043327 131 WTB12-C3P2431 1040325 131 WTR1-P21502 1015301 139 WSE15-2430 1043327 131 WTB15-P2431 1043256 131 WTR1-P21511 1015301 139 WSE27-3F2831 1027790 103 WTB15-P2431 1044305 131 WTR2N551 1018877 139 WSE45-3F2130 1045099 75 WTB27-3F2411 1027753 103 WTR2P551509 1022927 139 WSE8-P3331V 6041492 79 WTB27-3F2411 1027745 103 WTR2P551508 1022927 139 WSE9-3P230 1049076 87 WTB27-3F2413 1024763 103 WTR2P551508 1022927 139 WT100-N1419 6026116 81 WTB27-3F2411 1027763 103 VTR2-651527 1042271 139 WT100-N1419 602616 81 | , | | | WTB12-3P2411 | | | WTF4S-3P2262V | | |
| WSE12-3P2431 1041459 93 WTB12C-3P2431 104202 93 WTR1-P21 1015388 139 WSE15-82430 1043326 131 WTB15A2431 104326 131 WTR1-P721 1015301 139 WSE15-73F2631 1027792 103 WTB15N2431 1044306 131 WTR1-P72111 1015301 139 WSE27-3F2631 1027790 103 WTB15N2431 1044306 131 WTR2-P511 1015158 139 WSE4S-3F3130 1042089 73 WTB27-3F2411 1027753 103 WTR2-P511509 1024302 139 WSE8-3F3130 1044089 73 WTB27-3F2411 1027753 103 WTR2-P51509 1024302 139 WSE9-3P230 1049077 87 WTB27-3P2441 1044508 103 WTR2-P621527 1042271 139 WT100-P3419 6026116 81 WTB27-3P2461 1024763 103 Z Z 142712 1046547 73 Z11-F2421 10465497 135 | | 1041394 | | | | | | | |
| WSE15-A2430 1043327 131 WTB15-A2431 1043325 131 WTR1-P721 1015301 139 WSE15-B2430 1043328 131 WTB15-B2431 1043326 131 WTR1-P721511 1018923 139 WSE27-3P2430 1027792 103 WTB15-P2431 1044305 131 WTR2-P511 101877 139 WSE45-3F21300 1042089 73 WTB27-3P2411 102753 103 WTR2-P5110 1015158 139 WSE8-37310 1042089 73 WTB27-3P24111 102753 103 WTR2-P51509 1024302 139 WSE9-3P2230 1049076 87 WTB27-3P2413 1027763 103 WTR2-P51508 1022927 139 WSE9-3P2230 1049076 87 WTB27-3P2411 1027763 103 WTR2-P51508 1022927 139 WT100-P3419 6026116 81 WTB27-3P2411 1027763 103 ZL-F2412 1046644 73 WT100-P3419 6026116 81 WTB43 | | | | | | | | | |
| WSE15-B2430 1043328 131 WTB15-B2431 1044336 131 WTR1-P721S11 1018923 139 WSE27-3F2631 1027792 103 WTB15-N2431 1044306 131 WTR2-MS151 1018977 139 WSE243-F2130V 1045099 75 WTB23-2P2461 1044306 131 WTR2-F511 1015158 139 WSE45-3F2130V 1045099 75 WTB27-3P2411 1027753 103 WTR2-F51509 1022927 139 WSE8-P3230 1049076 87 WTB27-3P2411 1027751 103 WTR2-F51508 1022927 1042057 139 WSE9-3P230 1049077 87 WTB27-3P2461 1024765 103 WTR2-F621527 1042271 1046644 73 WT100-P3419 6026113 81 WTB27-3R2611 1027750 103 ZL-F2421 1045652 135 WT100-P3419 6026116 81 WTB2-3P2461 102099 73 ZL-F2421 1045497 135 WT142-P1551 | WSE15-A2430 | | | | | - | | | |
| WSE27-3F2631 1027792 103 WTB15-N2431 1044306 131 WTR2-N551 1018877 139 WSE45-3F2130V 1040099 75 WTB15-P2431 1044164 101 WTR2-F511 1015158 139 WSE45-3F2130V 1040099 73 WTB27-3P2411 1027753 103 WTR2-F521509 1024302 139 WSE8-92311 6041492 79 WTB27-3P2411 1027754 103 WTR2-F521508 1022927 139 WSE9-3P2230 1049076 87 WTB27-3P2411 1027763 103 WTR2-F51508 1022927 139 WSE9-3P2230 1049076 87 WTB27-3P2411 1027763 103 WTR2-F51508 1022927 139 WT100-P1419 6026116 81 WTB27-3P2411 1027763 103 WTW4'3P2271 1046644 73 WT100-P1419 6036506 81 WTB4-3P2161 1028099 73 ZL-F2415 1045390 135 WT142-P1551 1018750 93 WT | WSE15-B2430 | | | WTB15-B2431 | | - | | | |
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| WSE4S-3F2130V 1045099 75 WTB23-2P2461 1044164 101 WSE4S-3F3130 1042099 73 WTB27-3P2411 1027753 103 WSE8P2231 6035583 77 WTB27-3P2411 1025994 103 WSE8P32230 1049076 87 WTB27-3P2413 1027745 103 WSE93P2230 1049076 87 WTB27-3P2413 1027745 103 WT10.0H149 6026116 81 WTB27-3P2411 1027750 103 WT10.0P3419 6026116 81 WTB27-3P2411 1027750 103 WT12.2B501 1049076 87 WTB27-3P2461 104163 103 WT14.2B12 1026056 93 WTB47-3P2641 104019 73 212-F2415 1045497 135 WT14.2P121 1026055 95 WTB45-3P1264 1042046 73 212-F2428 1045535 135 WT14.2P411 1026056 95 WTB45-3P1264 1042034 73 214-F2421 1045652 < | | | | | | | | | |
| WSE4S-3F3130 1042089 73 WTB27-3F2411 1027753 103 WTR2+521509 1024302 139 WSE8P2331V 6035583 77 WTB27-3F2411 1025994 103 WTR2+551508 1022927 139 WSE93P2230 1049076 87 WTB27-3F2411 104508 103 WTR2+651522 10402271 139 WSE93P2430 1049076 87 WTB27-3F2411 1027763 103 WTR2+651522 1042271 139 WT100-N1419 6026116 81 WTB27-3R2611 1027763 103 WT43P2271 1046644 73 WT100-P3419 6026166 81 WTB27-3R2641 1027763 103 ZL1-F2415 1045497 135 WT142-28530 1018250 93 WTB4-3R1162 1042051 75 ZL2-F2415 1045497 135 WT14-2P122 1026055 95 WTB4-SN1162 1042067 73 ZL4-F2421 1045555 135 WT14-2P132 1026052 95 WTB4-S3P2264 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> | | | | | | - | | | |
| WSE8-P2231 6035583 77 WTB27.3P2411 1025994 103 WTR2-P551508 1022927 139 WSE8-P3320 1049076 87 WTB27.3P2411S18 1044508 103 WTR2-P621527 1042057 139 WSE9-3P2230 1049077 87 WTB27.3P2443 1027745 103 WTR2-P621527 1042271 139 WT100-N1419 6026116 81 WTB27.3P2461 1027763 103 WTV-3P2271 104644 73 WT100-P3419 6026116 81 WTB27.3P2641 1027763 103 ZL-F2415 1045300 135 WT12228530 1018250 93 WTB4C-3P3464 1040119 73 ZL-F2421 1045330 135 WT1422B530 1018250 93 WTB4S-3N11361 1042052 73 ZL-F2415 1045390 135 WT142P122 1026051 95 WTB4S-3N1361 1042057 73 ZLM-181612E42 7028843 139 WT14-2P422 1026056 95 WTB4S-3P22 | | | | | | | | | |
| WSE8-P3331V 6041492 79 WTB27-3P2411S18 1044508 103 WSE9-3P2230 1049076 87 WTB27-3P2443 1027745 103 WTR2-P621522 1040597 139 WSE9-3P2430 1049076 87 WTB27-3P2461 104163 103 WTW43P2271 104271 139 WT100-N4199 6026116 81 WTB27-3P2461 1027763 103 Z Z11-F2421 10465497 135 WT100-P4409 6036506 81 WTB47-3P2161 1028099 73 Z1.F2415 1045370 135 WT12.28551 1047958 93 WTB45-3N1134 1042052 73 Z1.F2415 1045371 135 WT14-2P111 1026055 95 WTB45-3N1361 1042046 73 ZLM1-B162E42 702844 139 WT14-2P112 1026055 95 WTB45-3P2232V 1046396 75 ZLM1-B162E42 702844 139 WT14-2P422 1026052 95 WTB45-3P2262V 1045092 75 | | | | | | - | | | |
| WSE9-3P2230 1049076 87 WTB27-3P2443 1027745 103 WSE9-3P2430 1049077 87 WTB27-3P2461 1044163 103 WT100-N1419 6026113 81 WTB27-3P2461 1027763 103 Z WT100-P3419 6026116 81 WTB27-3P2461 1027750 103 Z Z U14/9202 135 WT100-P4409 6036506 81 WTB27-3P2461 1027750 103 Z L1-F2421 1045502 135 WT122-28530 1018250 93 WTB45-3P1464 1040119 73 Z12-F2428 1045371 135 WT142-P122 1026055 95 WTB45-3P1161 1042057 73 Z14-P14242 7028442 139 WT14-2P122 1026055 95 WTB45-3P2264 1042057 73 Z1M1-B1622E42 7028443 139 WT14-2P422 1026055 95 WTB45-3P2264 1042034 73 Z1M1-B1622E43 7028845 139 WT14-2P432 <td>WSE8-P3331V</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> | WSE8-P3331V | | | | | - | | | |
| WT100-N1419 6026113 81 WTB27-3R2611 1027763 103 WT100-P3419 6026116 81 WTB27-3R2641 1027750 103 WT100-P4409 6036506 81 WTB27-3R2641 1028099 73 WT12L-2B530 1018250 93 WTB42-3P3464 1040119 73 WT14-2P111 1026058 95 WTB45-3N1134 1042052 73 WT14-2P112 1026051 95 WTB45-3N1161 1042046 73 WT14-2P132 1026055 95 WTB45-3P2231 1042057 73 ZLM-B1612E42 7028842 139 WT14-2P422 1026056 95 WTB45-3P2264 1042034 73 ZLM-B1612E43 7028845 139 WT14-2P432 1026056 95 WTB45-3P2264 1042041 75 ZLM-B1612E42 7028845 139 WT14-2P432 1026056 95 WTB45-3P2264 1042041 75 ZLM-B162E43 7028845 139 WT18-3P410 1025887 | WSE9-3P2230 | 1049076 | 87 | WTB27-3P2443 | 1027745 | 103 | WTR2-P621S27 | 1042271 | 139 |
| WT100-P3419 6026116 81 WTB27-3R2641 1027750 103 ZL1-F2421 1045502 135 WT100-P4409 6036506 81 WTB4-3P2161 1028099 73 ZL1-F2415 1045497 135 WT12L-2B530 1018250 93 WTB4C3P3464 1040119 73 ZL2-F2415 1045390 135 WT14-2P111 1026058 95 WTB45-3N1162V 1046391 75 ZL3-F2421 1045535 135 WT14-2P132 1026055 95 WTB45-3N1361 1042046 73 ZLM1-B1612E42 7028843 139 WT14-2P132 1026055 95 WTB45-3P2264 1042057 73 ZLM1-B1612E42 7028843 139 WT14-2P432 1026052 95 WTB45-3P2264 1042046 73 ZLM1-B1622E42 7028845 139 WT14-2P432 1026056 95 WTB45-3P2262V 1045067 75 ZT1-N3215 104562 135 WT18-2P432 1026058 97 WTB45-3P262V 1026092 75 ZT1-N3215 104562 135 WT1 | WSE9-3P2430 | 1049077 | 87 | WTB27-3P2461 | 1044163 | 103 | WTV4-3P2271 | 1046644 | 73 |
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| WT14-2P122102605195WTB4S-3N1361104204673ZLM1-B1612E427028842139WT14-2P132102605595WTB4S-3P2231104205773ZLM1-B1612E437028843139WT14-2P421102605295WTB4S-3P2232V104639675ZLM1-B1612E437028845139WT14-2P432102605695WTB4S-3P2264104203473ZLM1-B1622E437028845139WT14-2P4320102605695WTB4S-3P2262V105467575ZLM1-B1622E437028845139WT14-2P43208104510495WTB4S-3P2262V105407575ZT1-N32151045562135WT18-3P110102588797WTB4S-3P2262V104509275ZT2-P52281045469135WT18-3P410102588997WTB8-N131603320477ZT2-P52281045469135WT18-3P430102589697WTB8-N231V604146379YT8-P1111V604145779WT18-3P431102603297WTB8-P2111603321377YT280-P306028276105WTB8-P2231603322777WT280-P306028276105WTB8-P2211603322777YT89-S2211104904387WT2F-P140603058471WTB9-3P1161104904387YT49-S2115487WT2F-P150603058071WTB9-3P2211514105217187 | WT12L-2B551 | 1047958 | 93 | WTB4S-3N1134 | 1042052 | 73 | ZL2-F2428 | 1045371 | 135 |
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| WT14-2P411102605995WTB4S-3P2232V104639675WT14-2P422102605295WTB4S-3P2264104203473WT14-2P432102605695WTB4S-3P2262V105467575WT14-2P432S08104510495WTB4S-3P2262V105467575WT18-3P110102588797WTB4S-3P2262V104509275WT18-3P410102588997WTB4S-3P2262V104509275WT18-3P411102603197WTB8-N1131603320477WT18-3P430102589697WTB8-N2231V604146379WT18-3P431102603297WTB8-P111V604145779WT23-P24211027778101WTB8-P2131603320977WT280-P2306028276105WTB8-P2131603322777WT280-P2306028280105WTB8-P2131603322177WT280-P2306028280105WTB8-P2131603322177WT280-P2306028280105WTB8-P2131603322177WT280-P2306028280105WTB8-P2131603322177WT280-P2306028280105WTB8-P2131603322177WT280-P2306028280105WTB9-3P1161104904387WT2F-P140603058471WTB9-3P1211104904587WT2F-P150603058071WTB9-3P22111104904587WT2F-P270603058971WTB9-3P22115141052171 | WT14-2P122 | 1026051 | 95 | WTB4S-3N1361 | 1042046 | 73 | ZLM1-B1612E42 | 7028842 | 139 |
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| WT2F-P270 6030589 71 WTB9-3P2211S14 1052171 87 | WT2F-P140 | 6030584 | 71 | WTB9-3P1161 | 1049043 | 87 | | | |
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| WT2F-P280 6030574 71 WTB9-3P2261 1049047 87 | WT2F-P270 | 6030589 | 71 | WTB9-3P2211S14 | 1052171 | 87 | | | |
| | WT2F-P280 | 6030574 | 71 | WTB9-3P2261 | 1049047 | 87 | | | |

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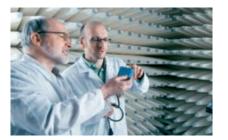
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SICK provides the right technology to respond to the tasks involved in industrial automation: measuring, detecting, monitoring and controlling, protecting, networking and integrating, identifying, positioning. Our development and industry experts continually create groundbreaking innovation to solve these tasks.





SICK at a glance



Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.



Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids



Comprehensive services

- SICK LifeTime Services for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under realworld conditions
- E-Business Partner Portal www.mysick.com – price and availability of products, requests for quotation and online orders

Worldwide presence with subsidiaries in the following countries:

Australia Belgium/Luxembourg Brasil Ceská Republika Canada China Danmark Deutschland España France Great Britain India Israel Italia Japan

México Nederland Norge Österreich Polska România Russia Schweiz Singapore Slovenija South Africa South Korea Suomi Sverige Taiwan Türkiye **United Arab Emirates** USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at www.sick.com

