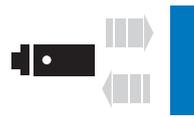


Photoelectric Sensors

- Cylindrical
- Cubic



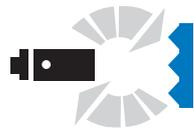
direct diffuse



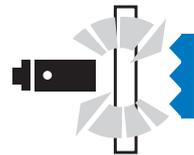
reflector



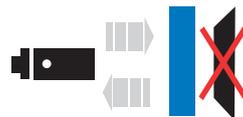
beam



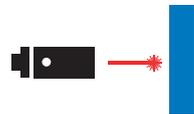
polarized



for transparent objects



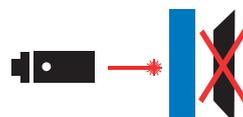
background suppression



LASER direct diffuse



LASER beam



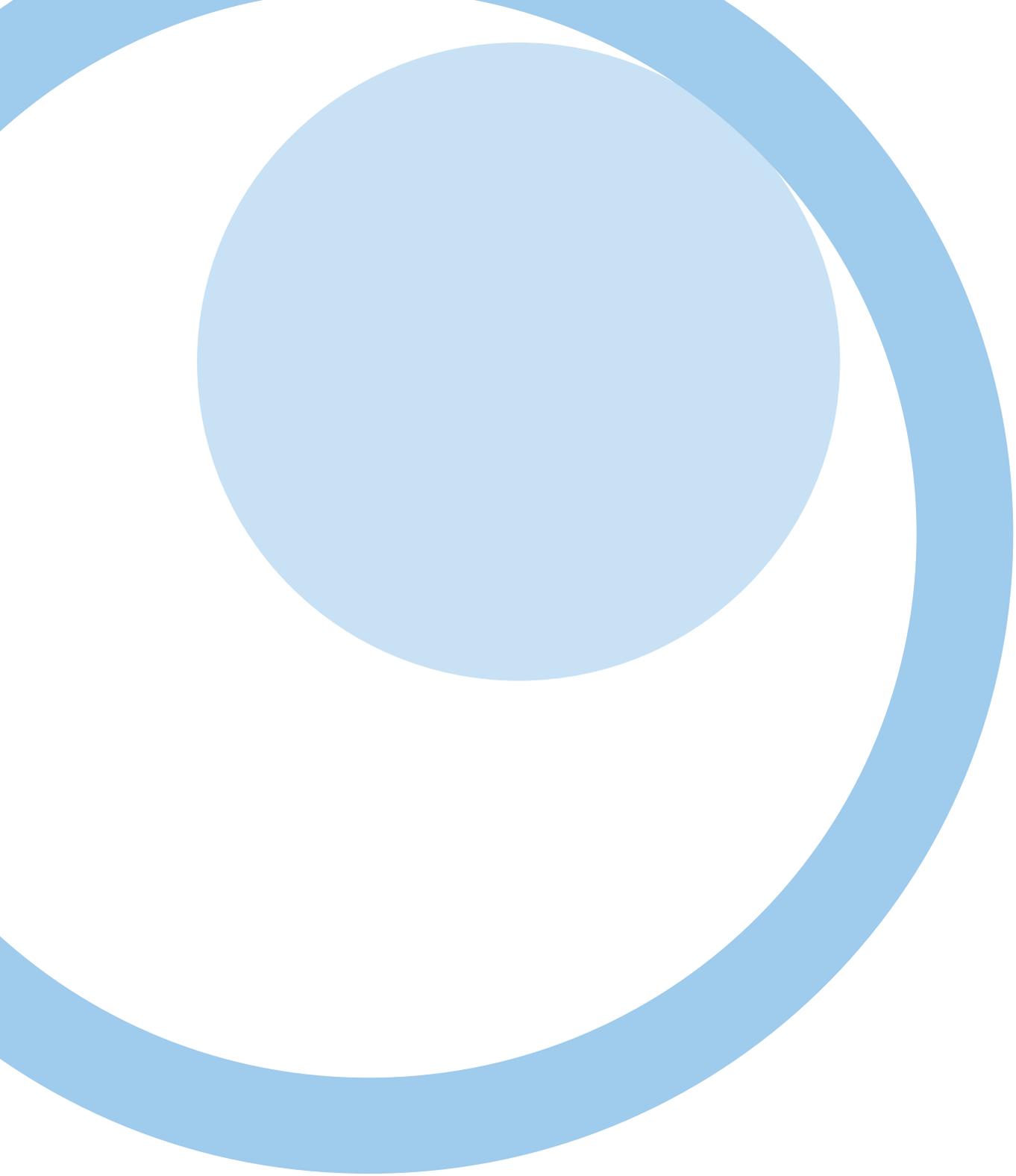
LASER background suppression



LASER polarized



fork





Photoelectric technology

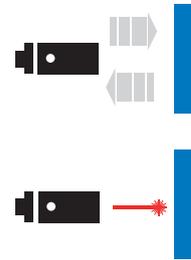
A photoelectric sensor is formed by an element that emits light radiations which, directly or indirectly, reach the receiver. The level of the light signal is converted into an electrical signal amplified and elaborated to drive the output state of the sensor. A variation of the received light radiations indicates the presence or the absence of the target, or its variation in terms of: color, position, reflection. The light radiation can be visible emission or outside the visible band and it is usually modulated (emission and reception under impulsive).

There are different methods of detection:

Direct diffuse

Emitter and receiver form part of the same unit. The optical beams are parallel or slightly convergent. The presence of a target in the optical field produces the diffuse reflection of the light beam on the receiver and the consequent detection of the target. The reflective quality of the target is essential, it is possible to detect any target unless it is perfectly reflective or ideally black. Light objects, with reflectivity at 90%, are detected near the nominal distance S_n , dark objects, with reflectivity at the 18% are generally detected at $\frac{1}{2} S_n$.

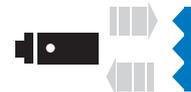
- Easy alignment
- Moderate detection distance
- Reflector is not needed



Retro-reflective

Emitter and receiver form part of the same unit. The optical beams are parallel. The emitter's luminous signal is reflected by a reflector and re-directed towards the sensor. Detection occurs when the path of the beam is interrupted by the presence of an opaque object.

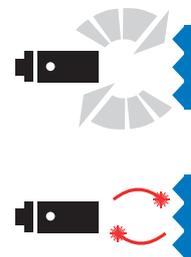
- Moderate detection distances
- Easy alignment



Polarized retro-reflective

This is a variant of the retro-reflective system which eliminates its main defect consisting in the possible non-recognition of standard specular reflective surfaces facing the optical axis as they cannot be distinguished from the reflector. A polarizing filter is placed in the emitter's optical system along an axis that we will call horizontal, whilst a vertical polarizer is placed in the receiver. This results in the elimination of reflections from surfaces which are not optically active. The light reflected from the reflector possesses a component that is strongly polarized in a perpendicular direction to the incident light and therefore becomes the only recognizable reflected-light source.

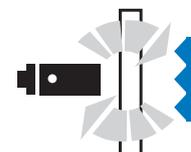
- Moderate detection distances
- Not effected by the target surface reflections
- Red emission beam, Easy alignment



Retro-reflective for transparent objects

This is a variant for the retro-reflective model. This model is used in those applications where the object consists of transparent glass, transparent thin films or surfaces covered with these films as they have moderate properties of distorting the polarization.

- Possibility to detect transparent objects

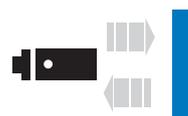




Focalized diffuse reflection

Emitter and receiver are built in the same unit. Their beams converge in one point where there sensitivity is at the top; outside of it the sensitivity decreases. In summary, a background and first level suppression is carried out with limited/fair efficiency.

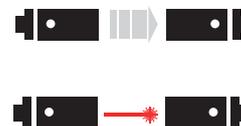
- Small influence of background beyond the target detection distance
- Reduced product complexity with respect to background suppression



Through-Beam

Emitter and Receiver are manufactured as two separate units and are installed one in front of the other. Detection occurs when the path of the beam is interrupted by the presence of an object.

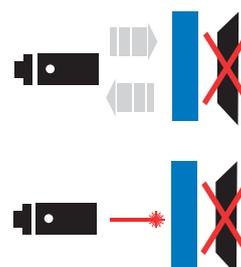
- High signal, possible to use it in "dirty" environments
- Long sensing distances (longer than Reflex and Diffuse Reflection types)
- No influence due to reflections or very reflective objects



Background suppression

Emitter and receiver are built in the same unit. The detection system is based on a triangulation principle and it is sensitive to the reflecting angle, which decreases proportional to the object distance. The emitter has a small emission angle, therefore the luminous area hitting the object is also small. The receiver optics receives the reflected light both from the near objects (target) and from the distant ones (background), then a sophisticated electronics processes the two signals in a way to enable detection both of the target and of the background. The influence of the target color is then considerably reduced. The background suppression allows the sensor to ignore a very reflective background, even if behind a darker object/target.

- No influence of the background beyond the detection distance of target
- No influence of the color of target to be detected at a specific distance



In addition to above mentioned modes, following special functions are also available:

- **Contrast scanner:** emitter and receiver are built in the same unit. The emitter can be of different colors, since they can detect two surfaces on the basis of the contrast created by the different reflection degree. In this way a dark bar taken as a reference (little reflective), can be detected by contrast on a light background (highly reflective), or viceversa. In presence of colored surfaces the contrast is increased by the emission Led.
- **Luminescence scanner:** emitter and receiver are built in the same unit. For luminescence scanners the property of fluorescent material is used that absorbs energy from the ultraviolet light emitted by the sensor; this light is then reflected by the fluorescent surface with a greater wave length, thus entering the visible light spectrum. The emission of ultraviolet light is obtained by means of special emitter leds.
- **Color sensor:** emitter and receiver are built in the same unit. The color of an enlightened target depends on the color components of light hitting it, which are reflected, after deducting the absorbed ones. It can be shown that every single color can be dispersed proportionally to the three base colors: red, green and blue. The sensor uses the RGB principle for sensing, that is it emits three base colors (Red, Green, Blue) and measures the intensity of each component in order to obtain accurate sensing of a wide range of colors. In practice in order to make the sensor recognize a color, it is enough to place the color under the sensing head and take advantage of the self learning/reading functions.

M.D. Micro Detectors Photoelectric Sensors

M.D. Micro Detectors Photoelectric Sensors portfolio includes cylindrical sensors from M8 to M18 diameters as well as cubic sensors both MINI and MAXI size. In addition to above different models depending on the functions described, following products for special applications are also available:

- with AISI316L stainless steel housing and IP69K protection degree suitable for applications in food & beverage and pharmaceutical industry
- with DECOUT (NPN/PNP,NO/NC) output to fit any connection need as well as for series and parallel connections
- with laser emission (classe1), necessary either to detect very small objects or to reach great distances
- with AC supply 24-230 Vac o 24-230 Vdc
- sensors with separate amplifier unit

Industries and Applications

Thanks to the wide range of models and shapes available (Direct Diffuse, Reflex, Polarized Retro Reflective ...), Photoelectric Sensors can be used in all industrial automation fields:

- conveyor lines
- packaging lines
- ceramic and wood industry
- automated warehouses

Customization

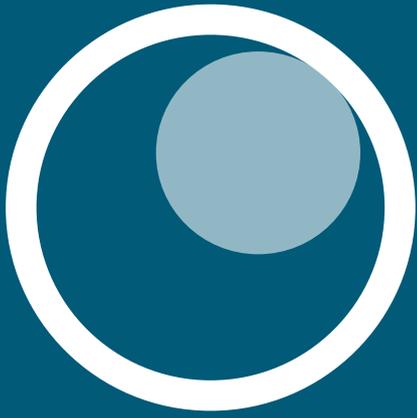
In addition to standard products, MD is available to realize customized products according to specific customers' application requirements:

- cable versions with different cable length than standard ones;
- specific labeling;
- cable versions with specific plugs;
- models with different performances than the catalogue ones (sensing distances, working frequencies, ...)





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Cylindrical Photoelectric Sensor





H8 series

M8 high frequency DC



features

- Very small dimensions: M8 housing
- High switching frequency: 50 kHz
- Completely amplified
- IP67 protection degree
- Strong stainless steel housing
- Approvals: CE



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- Photos
- Catalogue / Manuals



M8 high frequency
DC

code description

H8 E / 1

| | | |
|----------|-----------|------------------------------|
| series | H8 | M8 miniaturized through-beam |
| function | E | Emitter |
| | R | Receiver |
| version | 1 | Standard version |

available models

| model | housing | distance (mm) | exit | note | model |
|----------|-----------------|---------------|-------|---|-------|
| emitter | stainless steel | 80 | cable | 5 Vdc - 25 mA | H8E/1 |
| receiver | | | | I _{max} = 50 mA P _{max} = 250 mW | H8R/1 |



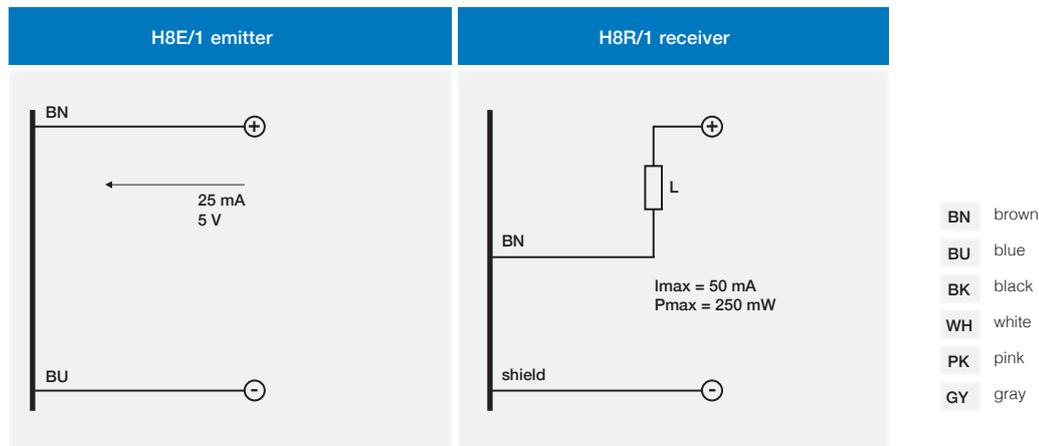
technical specification

through-beam models

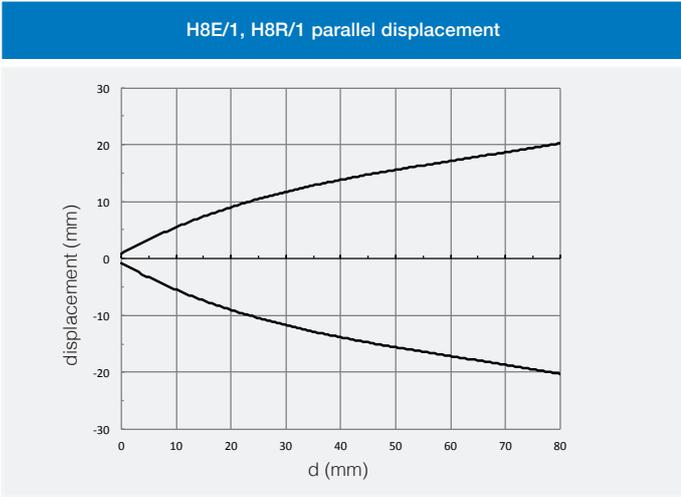
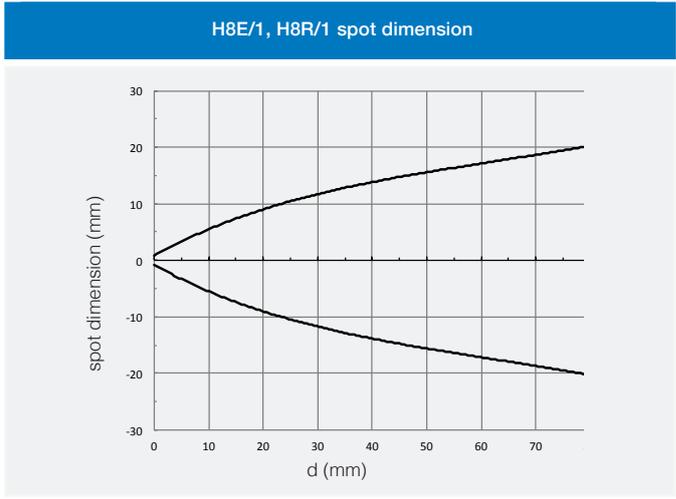
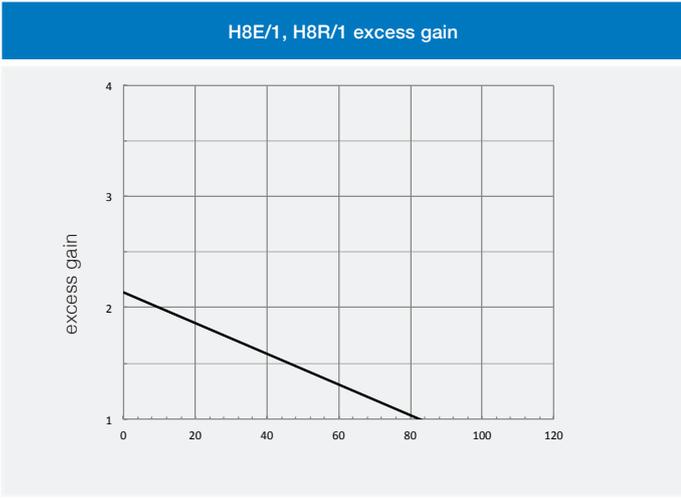
DC
M8 high frequency

| H8 | |
|-----------------------------|--|
| | |
| nominal sensing distance | 80 mm |
| emission | infrared (880 nm) |
| minimum detectable object | - |
| repeatability | - |
| supply voltage | 5 Vdc (E1), 30 Vdc max R1 |
| ripple | ≤ 1 % |
| no-load supply current | 25 mA (E1) |
| load current (nominal) | ≥ 2,5 mA |
| load current (maximum) | ≤ 50 mA, 250 mW |
| leakage current | - |
| voltage drop | ≤ 0.2 V @ 2.5 mA |
| output type | open collector |
| switching frequency | 50 kHz |
| power on delay | - |
| power supply protections | - |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| output protection | - |
| operating temperature range | - 25°C...+ 70°C (without freeze) |
| external light interference | 150 lux (incandescent lamp) |
| protection degree | IP67 (EN60529) |
| LEDs | - |
| housing materials | stainless steel |
| optic materials | plastic |
| weight | 63 g |

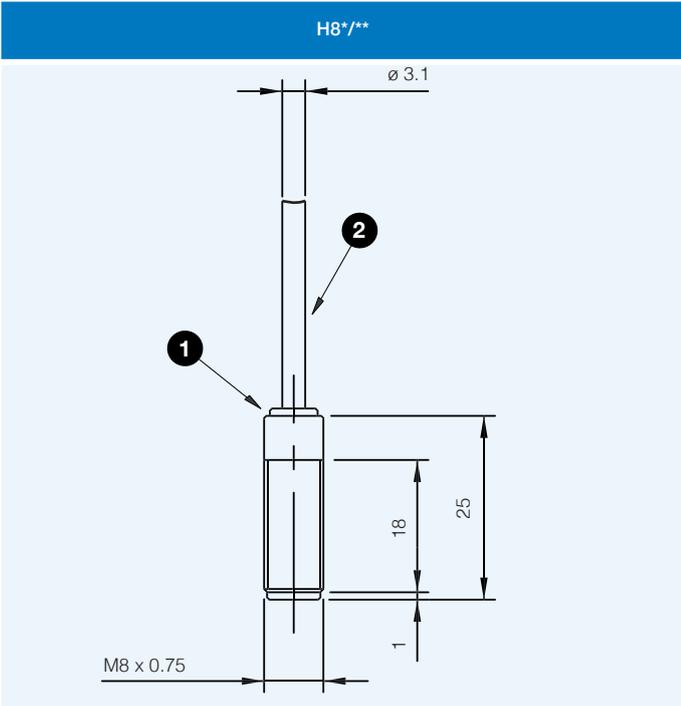
electrical diagrams of the connections



response diagram



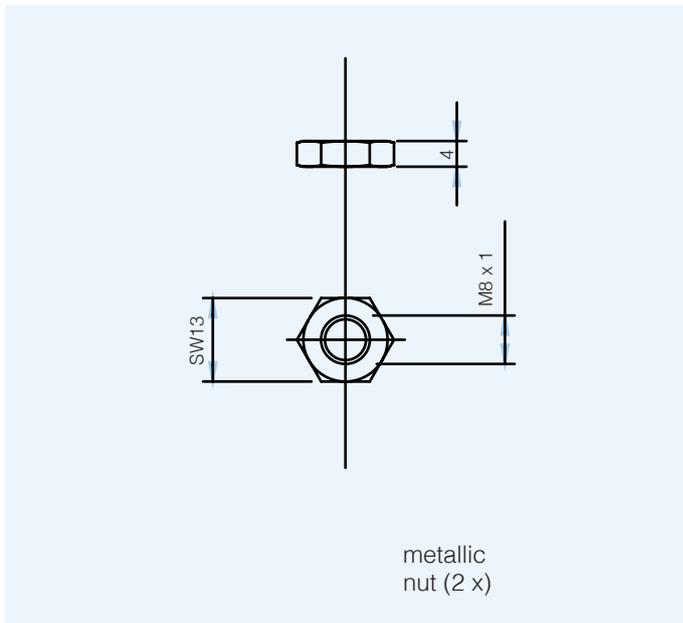
dimensions (mm)



- 1 axial cable exit
- 2 $\varnothing 3.1$ mm, PVC, 2 m

dimensions (mm)

accessories included in all metallic models





Blank lined area for notes, consisting of 20 horizontal light blue lines.



HE series

M8 miniaturized through-beam sensors DC



M8 through-beam sensors DC

features

- M8 through beam models with high switching frequency
- LED status indicator for all models
- Complete protection against electrical damages
- IP67 protection degree
- Stainless steel housing
- Supply voltage 10...30 Vdc
- Approvals: CE



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- Catalogue / Manuals



code description

| | HE | E | / | 0 | 0 | - | 3 | A |
|--------------|----|--|---|---|---|---|---|---|
| series | HE | M8 high switching frequency through beam sensors | | | | | | |
| output | E | Emitter | | | | | | |
| | R | Receiver | | | | | | |
| output state | 0 | Emitter | | | | | | |
| | A | NO output receiver | | | | | | |
| output logic | 0 | Emitter | | | | | | |
| | P | PNP receiver | | | | | | |
| distance | 3 | Models with 10 kHz, 1 m sensing distance | | | | | | |
| | 4 | Models with 1 kHz, 2 m sensing distance | | | | | | |
| connect. | A | Cable exit 2 m | | | | | | |
| | F | M8 plug cable exit | | | | | | |

available models

| model | distance (m) | switching frequency (kHz) | exit | PNP NO | NPN NO | PNP NC | NPN NC |
|----------|--------------|---------------------------|-----------|-----------|-----------|-----------|--------|
| emitter | 1 | 10 | cable | HEE/00-3A | | | |
| | | | M8 | HEE/00-3F | | | |
| cable | | | HER/AP-3A | HER/AN-3A | HER/CP-3A | HER/CN-3A | |
| M8 | | | HER/AP-3F | HER/AN-3F | HER/CP-3F | HER/CN-3F | |
| receiver | 2 | 1 | cable | HEE/00-4A | | | |
| | | | M8 | HEE/00-4F | | | |
| cable | | | HER/AP-4A | HER/AN-4A | HER/CP-4A | HER/CN-4A | |
| M8 | | | HER/AP-4F | HER/AN-4F | HER/CP-4F | HER/CN-4F | |

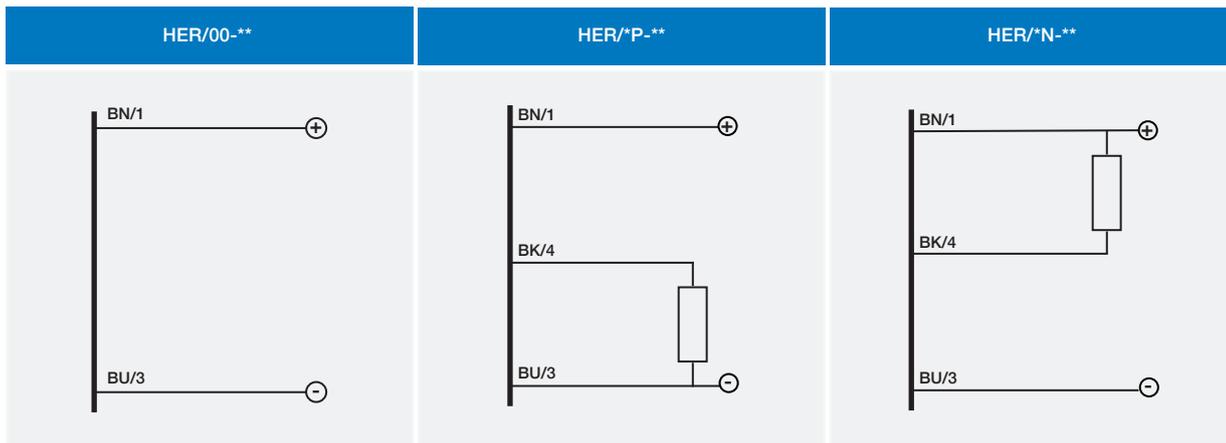
technical specification

through-beam models

| | HEE/**-3* | HER/**-3* | HEE/**-4* | HER/**-4* |
|-----------------------------|--|------------------------|-------------------|------------------------|
| | | | | |
| nominal sensing distance Sn | 1 m (EG = 2) | | 2 m (EG = 2) | |
| emission | infrared (880 nm) | - | infrared (880 nm) | - |
| hysteresis | ≤ 10 % | | | |
| repeatability | 10 % | | | |
| operating voltage | 10...30 Vdc, 30 Vdc max | | | |
| ripple | ≤ 10 % | | | |
| no-load supply current | ≤ 45 mA | | | |
| load current | ≤ 100 mA | | | |
| leakage current | 10 µA | | | |
| output voltage drop | ≤ 2 V | | | |
| output type | - | NPN or PNP NO or NC | - | NPN or PNP NO or NC |
| switching frequency | 10 kHz | | 1 kHz | |
| power on delay | - | ≤ 100 ms | - | ≤ 100 ms |
| power supply protections | polarity reversal, impulsive overvoltages | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| output protection | short circuit (autoreset) | | | |
| temperature range | - 25°C...+ 50°C | | | |
| temperature drift | ≤ 10 % | | | |
| external light interference | 3,000 lux (incandescent lamp), 5,000 lux (sunlight) | | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | | |
| LEDs | yellow (supply) | yellow (output active) | yellow (supply) | yellow (output active) |
| housing material | stainless steel | | | |
| optic material | plastic | | | |
| weight | 15 g connector / 40 g cable | | | |

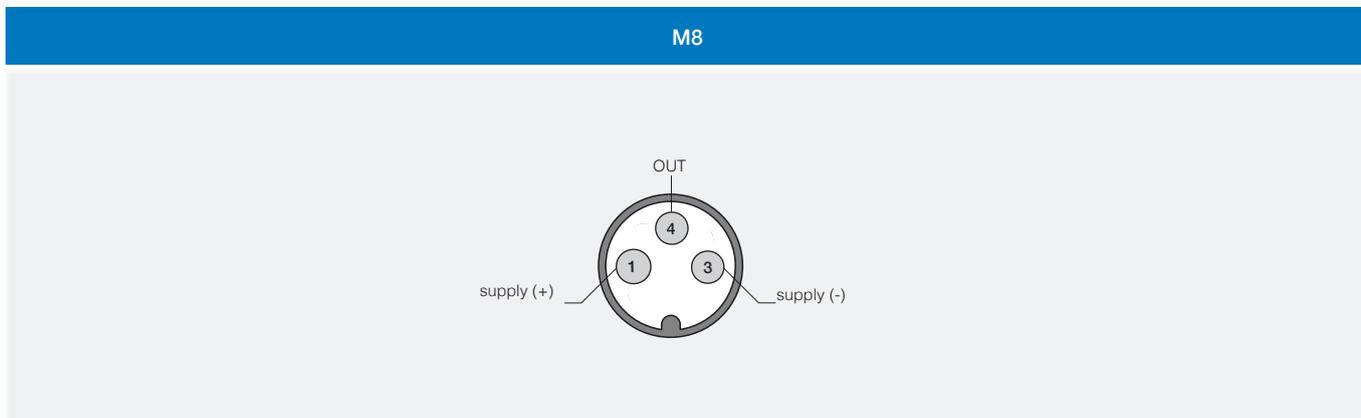
⁽¹⁾ Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

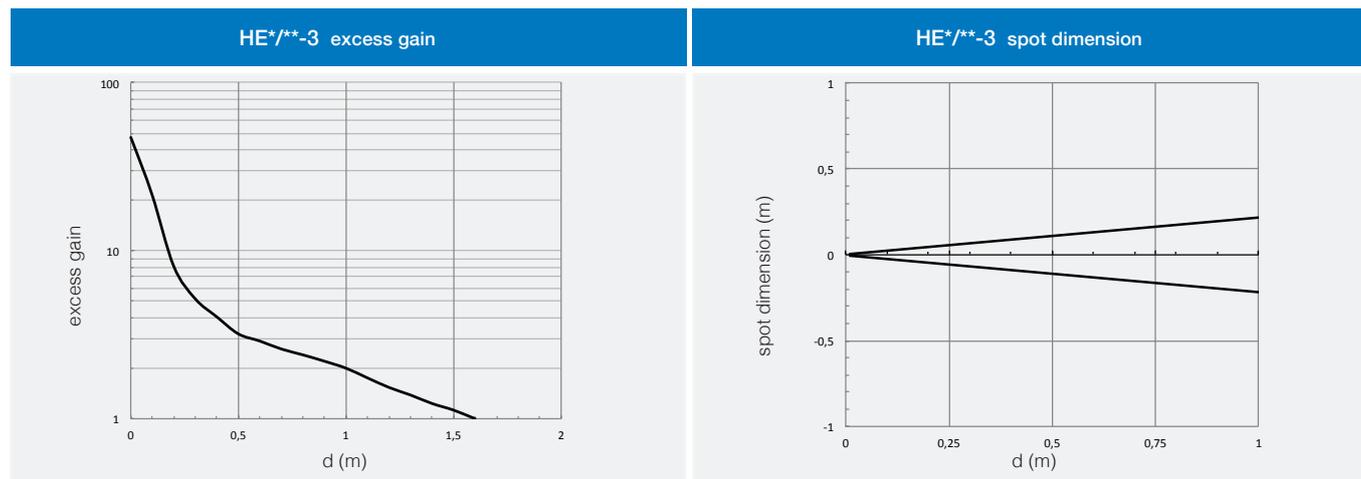


- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

plug



response diagram

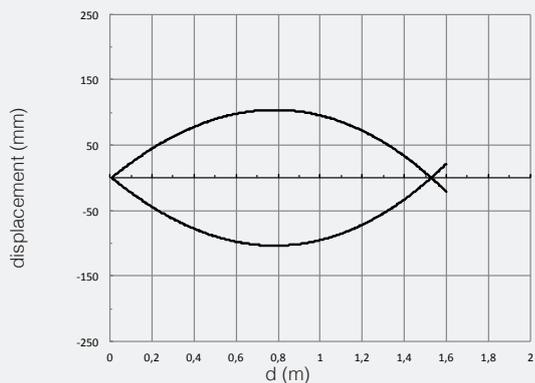




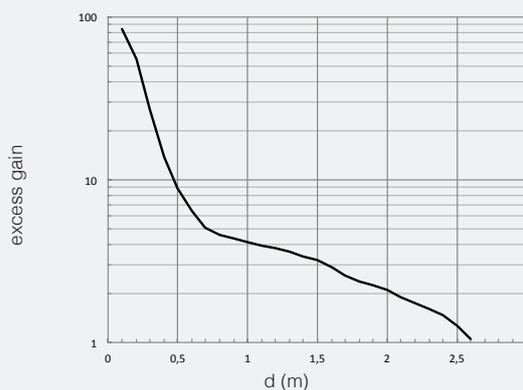
response diagram

M8 through beam DC

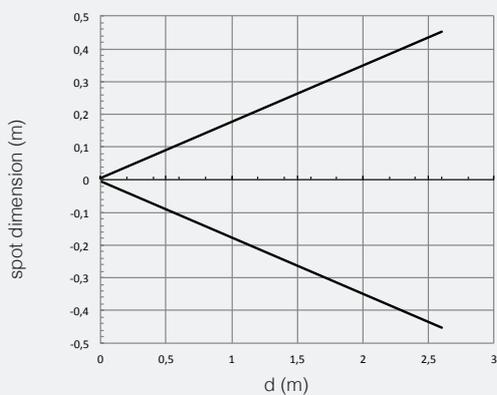
HE*/**-3 parallel displacement



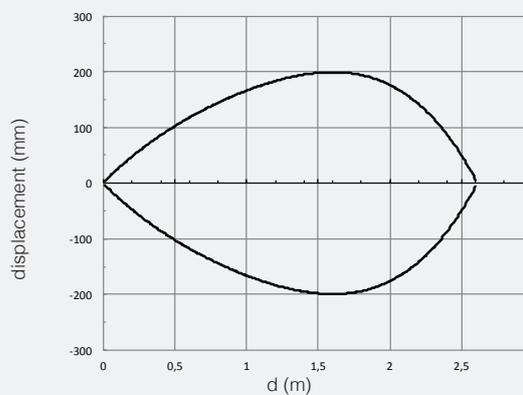
HE*/**-4 excess gain



HE*/**-4 spot dimension

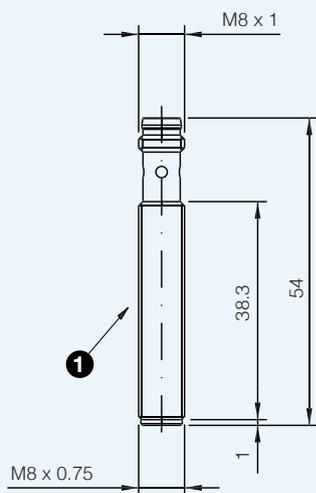


HE*/**-4 parallel displacement

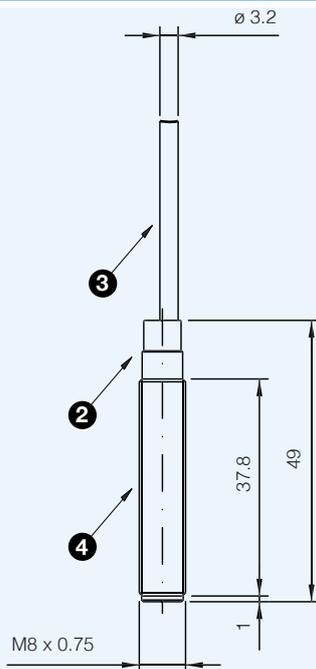


dimensions (mm)

HE*/**-*F

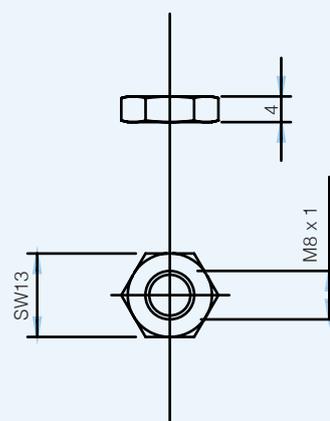


HE*/**-*A



dimensions (mm)

accessories included



metallic nut (2 x)

- 1 cylindrical threaded housing exit F
- 2 plastic cable exit

- 3 cable Ø 3,1
- 4 cylindrical threaded housing exit A

HE



DG series

Ø 10 mm miniaturized through-beam sensors



Cylindrical
Ø 10 mm

features

- Ø 10 mm plastic housing 41 mm length
- Ø 13 mm hole irreversible spring latch fixing
- LED status indicator receiver only
- Complete protection against electrical damages
- IP67 protection degree
- Nominal sensing distance (Sn): 2 m ExG. = 4
- Supply voltage 15...37 Vdc (10...30 Vdc for EA version)
- Approvals: CE



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code description

DG E / L N - 3 A

| | | |
|---------------------------|----|---|
| series | DG | Miniaturized photoelectric sensor DG series |
| emitter / receiver | E | Emitter |
| | R | Receiver |
| emitter / receiver output | 1 | Emitter |
| | L | Receiver Light ON |
| | D | Receiver Dark ON |
| function | 1 | Emitter |
| | N | NPN logic receiver |
| | P | PNP logic receiver |
| housing | 3 | Housing Ø 10 mm with spring latch fixing for Ø 13 mm hole |
| cable | A | 5 m cable length |
| | D | 7 m cable length |
| version | EA | Special version with 10...30 Vdc supply voltage |
| | | Standard version |

available models

| model | distance (m) | supply voltage | cable (m) | PNP NO | NPN NO | PNP NC | NPN NC |
|----------|--------------|----------------|-----------|-------------|-----------|-----------|-----------|
| emitter | - | 15...37 Vdc | 5 | DGE/11-3A | | | |
| | | | 7 | DGE/11-3D | | | |
| | | 10...30 Vdc | 5 | DGE/11-3AEA | | | |
| | | | 7 | DGE/11-3DEA | | | |
| receiver | 2 | 15...37 Vdc | 5 | DGR/DP-3A | DGR/LP-3A | DGR/DN-3A | DGR/LN-3A |
| | | | 7 | DGR/DP-3D | DGR/LP-3D | DGR/DN-3D | DGR/LN-3D |
| | | 10...30 Vdc | 5 | DGR/DP-3AEA | - | - | - |
| | | | 7 | DGR/DP-3DEA | - | - | - |

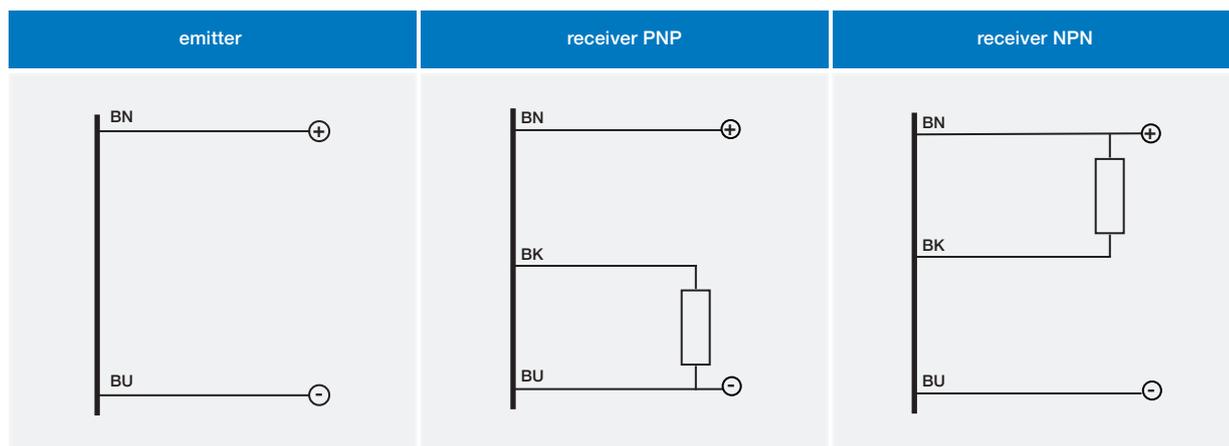
technical specification

through-beam models

| | DGE/11-** | DGR/**-** | DG*/**-**EA |
|-----------------------------|--|------------------------|-------------|
| |  | | |
| nominal sensing distance | 2 m (EG = 4) | | |
| emission | infrared (880 nm) | - | - |
| supply operating voltage | 15...37 Vdc | | 10...30 Vdc |
| ripple | 10 % | | |
| no-load supply current | ≤ 10 mA | | |
| load output current | - | 30 mA | |
| leakage current | - | 10 µA | |
| output voltage drop | - | 2 V with = 30 mA | |
| output type | - | NPN or PNP LO or DO | |
| switching frequency | - | 40 Hz | |
| power on delay | - | 100 ms | |
| power supply protections | polarity reversal, pulse overvoltage | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | |
| output protection | - | short circuit | |
| operating temperature range | - 25°C...+ 70°C | | |
| temperature drift | ≤ 10 % | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | |
| external light interference | - | 20,000 lux | |
| LEDs | supply | output status | |
| housing material | PC | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted

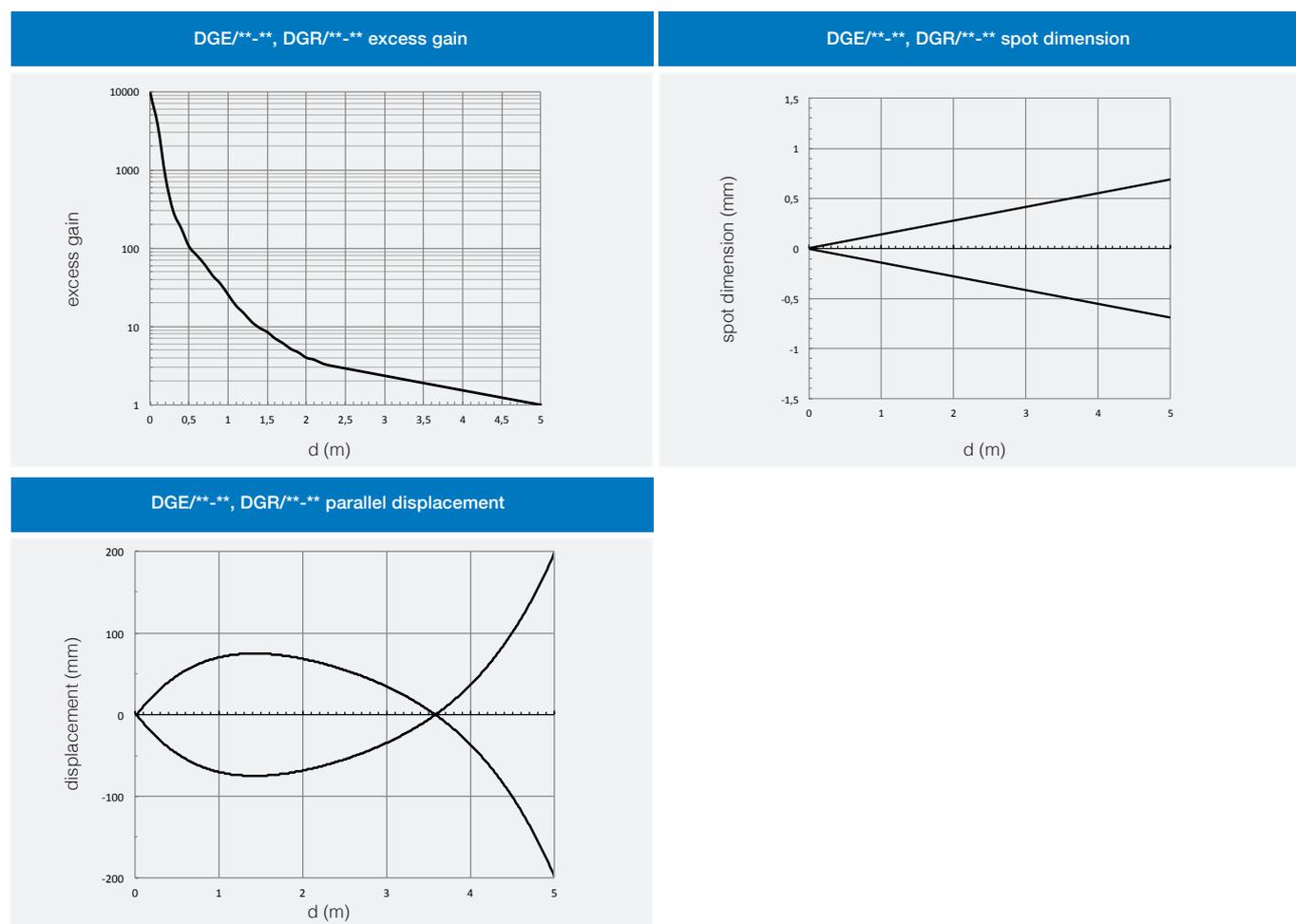
electrical diagrams of the connections



- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

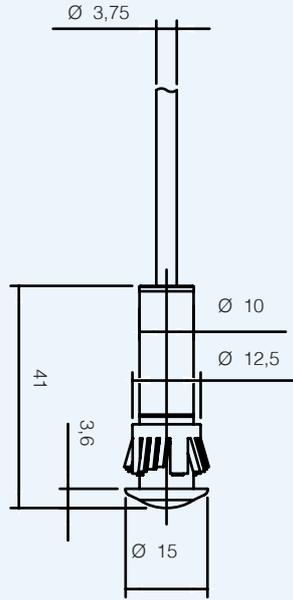
Cylindrical
Ø 10 mm

response diagram





DG*/**-*





DM series

M12 cylindrical photoelectric sensors



features

- Models diffuse reflection, polarized and through-beam
- Local and remote teach-in function
- Light-on / Dark-on selectable outputs
- IP67 protection degree
- Multifunction LED status indicator
- Complete protection against electrical damages
- Approvals: CE and cULus listed



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M12 cylindrical

code description (*)

DM 2 / 0 N - 1 A

| | | |
|--------------------|-----------|--|
| series | DM | M12 cylindrical photoelectric sensor |
| type | 2 | Diffuse reflection 100 mm without sensitivity adjustment |
| | 3 | Diffuse reflection 100 mm with sensitivity adjustment |
| | 7 | Diffuse reflection 300 mm with sensitivity adjustment |
| | P | Polarized 2.5 m with sensitivity adjustment |
| | E | Emitter 4 m with power emission adjustment |
| emitter / receiver | R | Receiver 4 m |
| | 0 | Emitter without check - Receiver LO/DO selectable |
| function | X | Emitter with check |
| | 0 | Emitter |
| | N | NPN output |
| housing | P | PNP output |
| | 1 | Metal housing |
| cable | A | Axial cable exit |
| | H | M12 plug cable exit |
| version | 25 | DMP and DME without sensitivity adjustment |
| | | Standard version |

(*) ATEX models available, contact our Sales Dept. for further information.

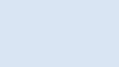


M12 cylindrical

available models

| model | distance | adjustment | 4 wires LO / DO NPN | | 4 wires LO / DO PNP | |
|----------------|----------|------------|---------------------|------------|---------------------|------------|
| | | | cable | plug | cable | plug |
| direct diffuse | 100 mm | - | DM2/0N -1A | DM2/0N -1H | DM2/0P -1A | DM2/0P -1H |
| | 100 mm | ● | DM3/0N -1A | DM3/0N -1H | DM3/0P -1A | DM3/0P -1H |
| | 300 mm | | DM7/0N -1A | DM7/0N -1H | DM7/0P -1A | DM7/0P -1H |
| polarized | 2.5 m | | DMP/0N -1A | DMP/0N -1H | DMP/0P -1A | DMP/0P -1H |
| emitter | 4 m | - | DME/00 -1A | DME/00 -1H | DME/00 -1A | DME/00 -1H |
| receiver | | | DMR/0N -1A | DMR/0N -1H | DMR/0P -1A | DMR/0P -1H |

technical specification

| | diffuse reflection | | | polarized | through-beam | |
|-----------------------------|--|-----------|--|--|--|-----------|
| | DM2/0*-1* | DM3/0*-1* | DM7/0*-1* | DMP/0*-1* | DMR/0*-1* | DME/0*-1* |
| nominal sensing distance |  100 mm ⁽¹⁾ | |  300 mm ⁽²⁾ |  2.5 m ⁽³⁾ |  4 m | |
| emission | infrared (880 nm) | | | red (660 nm) | infrared (880 nm) | |
| tolerance | + 15 % / - 5 % | | | | | |
| hysteresis | ≤ 10 % | | | ≤ 20 % | | |
| repeatability | 5 % | | | | | |
| operating voltage | 10...30 Vdc | | | | | |
| ripple | ≤ 10 % | | | | | |
| no-load current | ≤ 30 mA | | | | | |
| load current | 100 mA | | | | | |
| leakage current | ≤ 10 µA | | | | | |
| output voltage drop | 2 V max. IL = 100 mA | | | | | |
| output type | NPN o PNP - LO / DO selectable | | | | | |
| switching frequency | 400 Hz | | | 250 Hz | | |
| response time | 1.1 ms | | | 2 ms | | |
| power on delay | 150 ms | | | | | |
| power supply protections | polarity reversal, transient | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | |
| output protection | short circuit (autoreset) | | | | | |
| temperature range | - 25°C...+ 70°C | | | | | |
| temperature drift | 10 % Sr | | | | | |
| protection degree | IP67 (EN60529) ⁽⁴⁾ | | | | | |
| check input | - | | | decoupled input supply 10..30 Vdc | | |
| external light interference | 3000 lux (incandescent lamp), 10000 lux (sunlight) | | | | | |
| LEDs | yellow | | | | | |
| sensitivity adjustment | - | ● | | | - | ● |
| housing material | nickel-plated brass | | | | | |
| optic material | plastic | | | | | |
| tightening torque | 10 Nm | | | | | |
| weight (approximate) | 28 g connector / 60 g cable | | | | | |

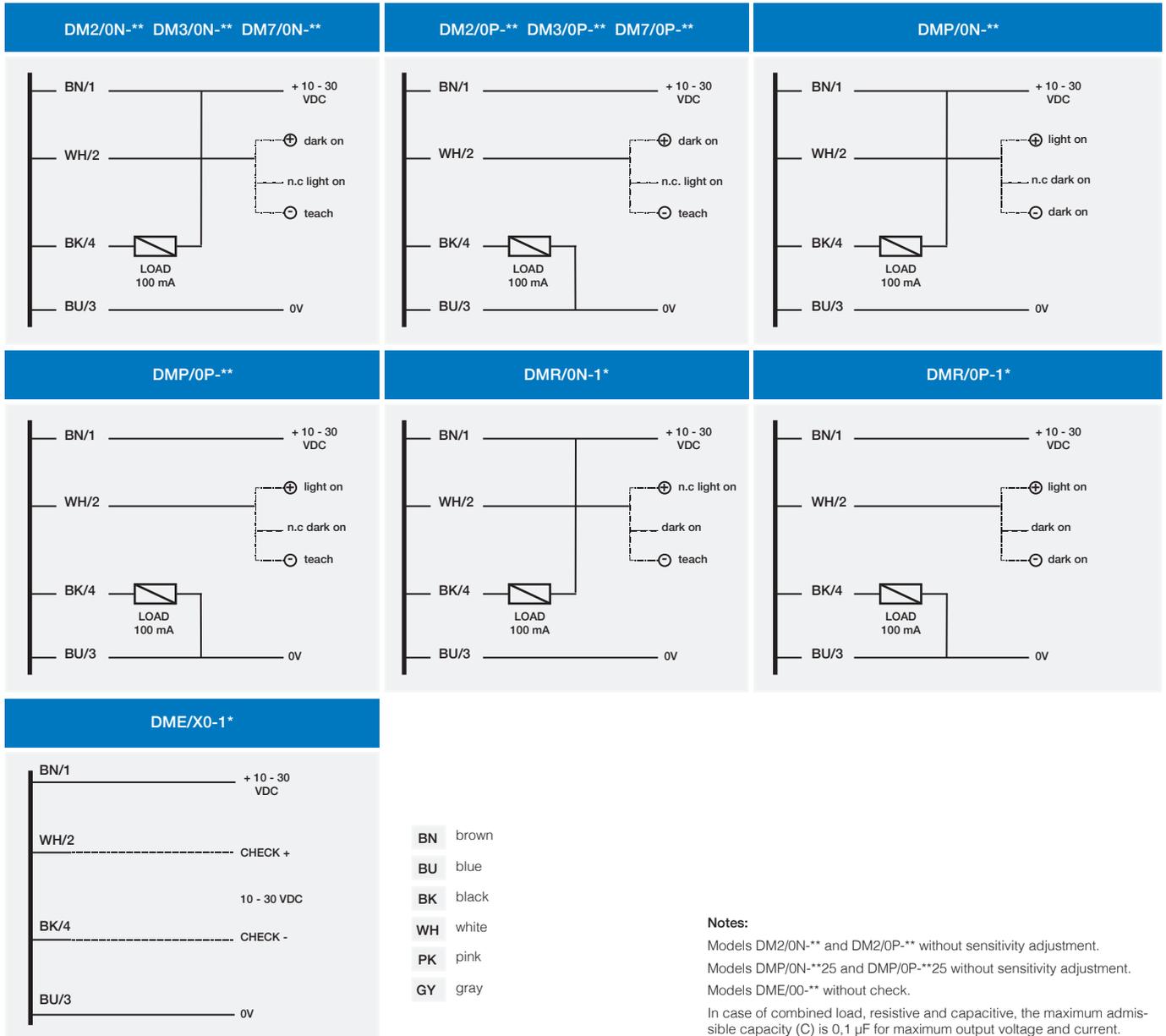
⁽¹⁾ With 100x100 mm white paper ⁽²⁾ With 200x200 mm white paper ⁽³⁾ With RL 110 reflector ⁽⁴⁾ Protection guaranteed only with plug cable well mounted

DM SERIES.

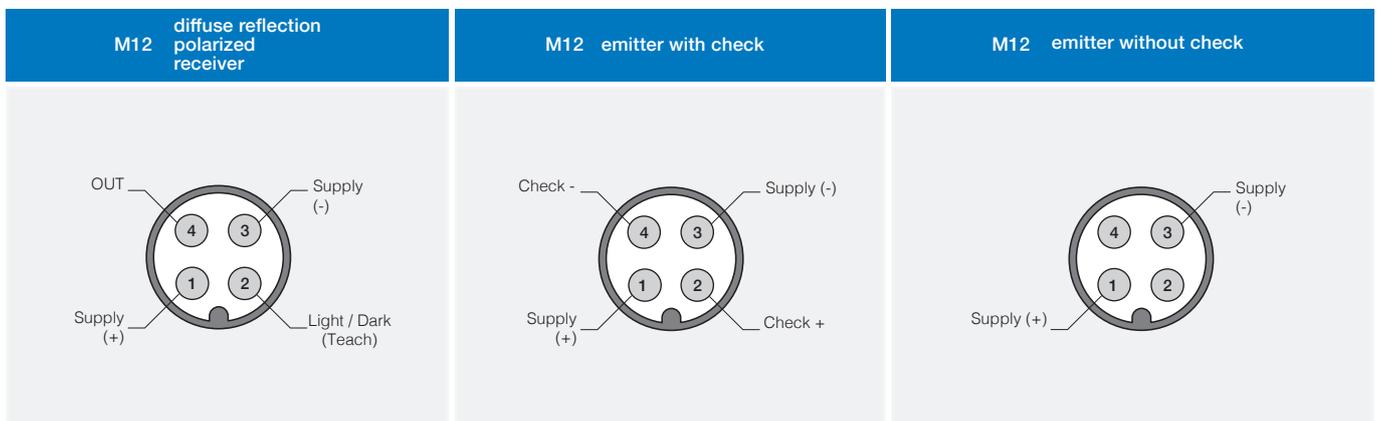
electrical diagrams of the connections



M12 cylindrical



plug



DM

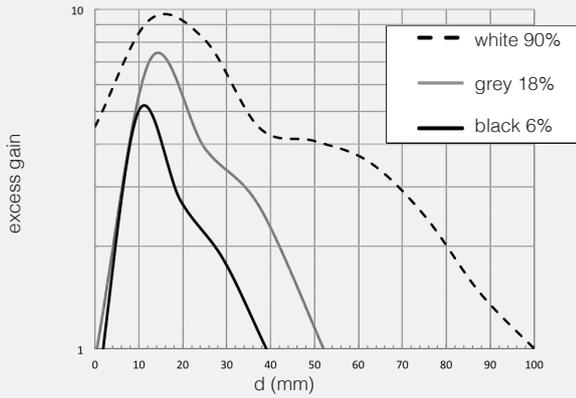


response diagrams

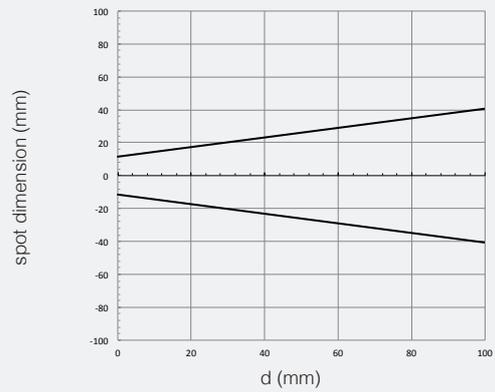
direct reflection models

M12 cylindrical

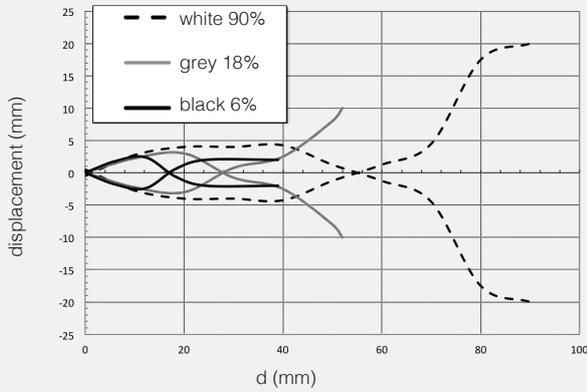
DM2/**-**-** excess gain



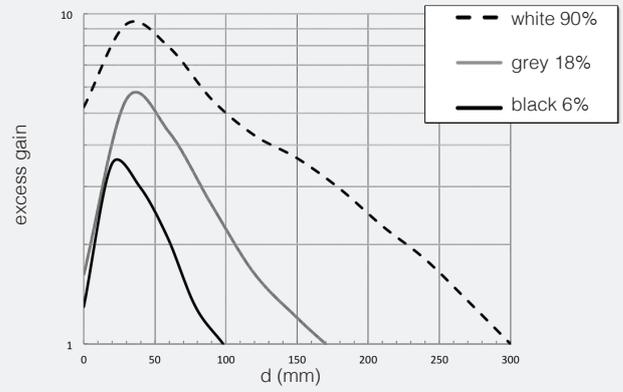
DM2/**-**-** spot dimension



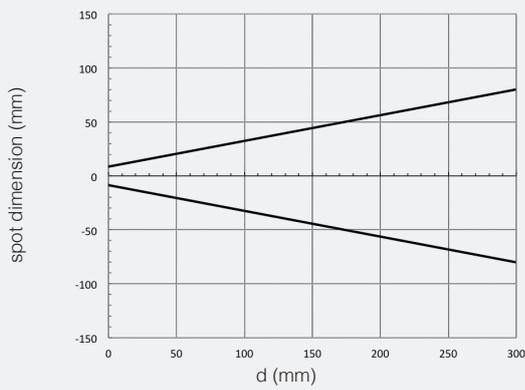
DM2/**-**-** parallel displacement



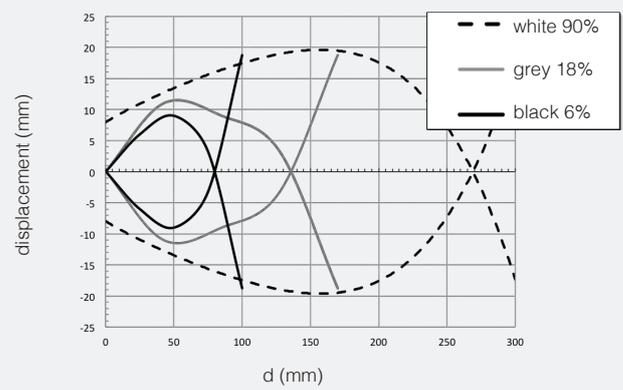
DM7/**-**-** excess gain



DM7/**-**-** spot dimension



DM7/**-**-** parallel displacement



DM

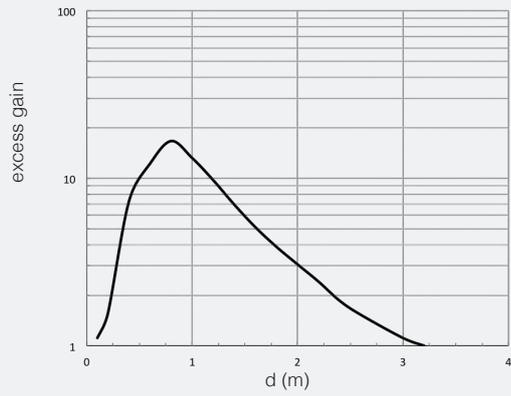
response diagrams

polarized models (diagrams calculated with RL110)

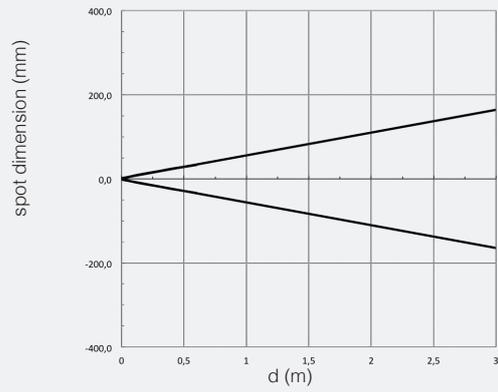


M12 cylindrical

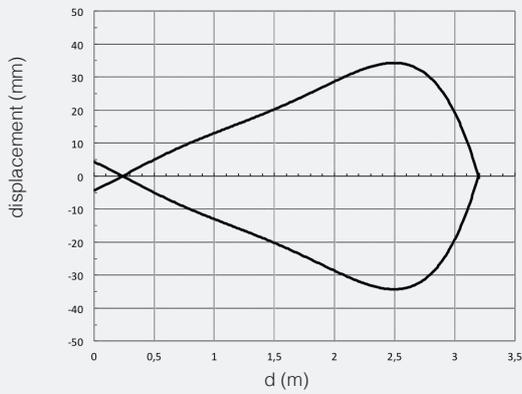
DMP/**_** excess gain



DMP/**_** spot dimension



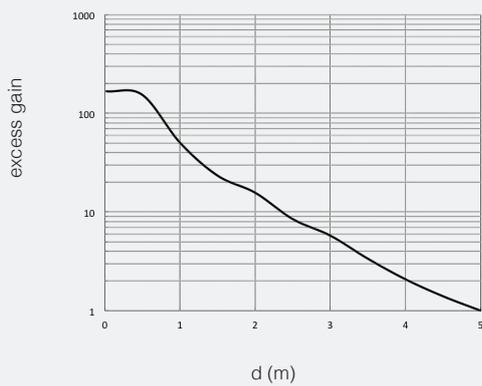
DMP/**_** parallel displacement



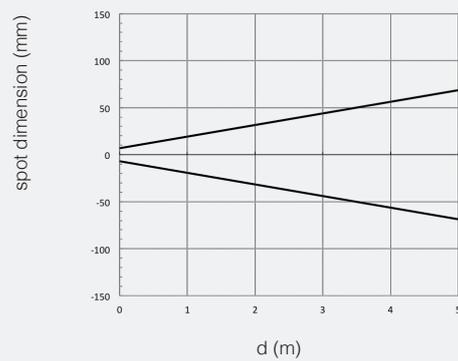
response diagrams

through-beam models

DMP/**_** excess gain



DMP/**_** spot dimension



DM

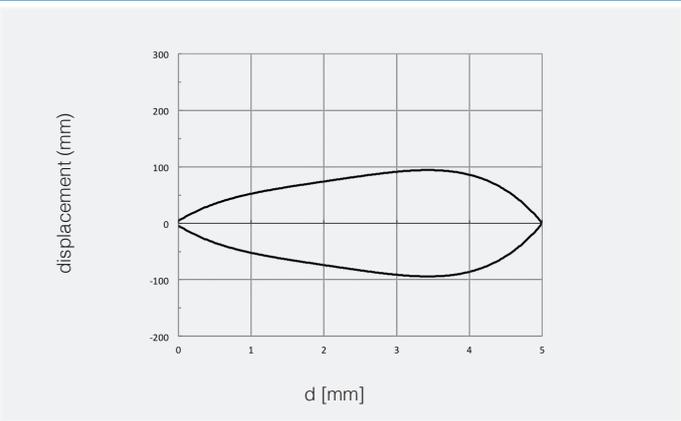


response diagrams

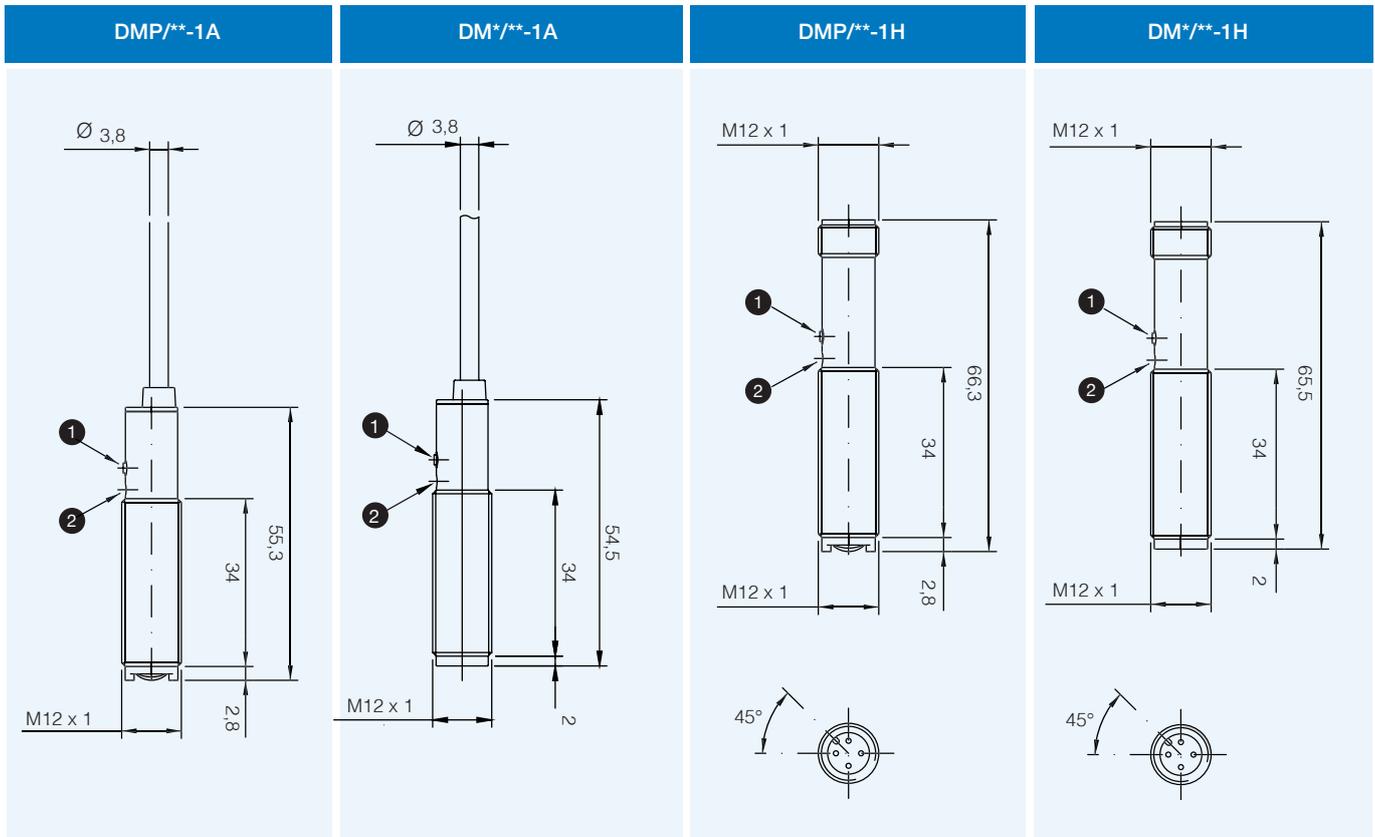
through-beam models

M12 cylindrical

DMP/**-** parallel displacement



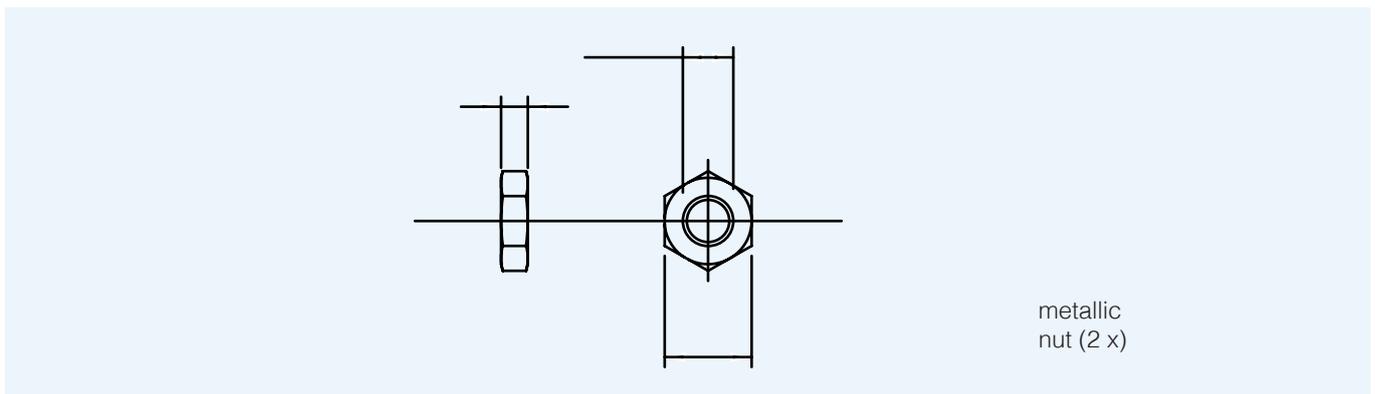
dimensions (mm)



- 1 Teach-In button
- 2 LED

dimensions (mm)

accessories included

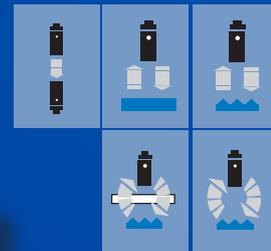


DM



FA series

M18 photoelectric sensors DC



M18 cylindrical DC

features

- Complete range of M18 sensors with 10...30 Vdc power supply
- Axial and radial optic with flat surface
- Retro-reflective models for transparent objects detection, with red emission
- IP67 protection degree
- Metallic or plastic housing
- Sensitivity adjustment available for all models
- Total protection against any type of electric damages
- Approvals: CE and cULus listed

web contents



- Application notes
- Photos
- Catalogue / Manuals



code description (*)

| | FA | I | C | / | B | P | - | 0 | A | |
|---------------------|---|---|---|---|---|---|---|---|---|--|
| series | FA | M18 sensor with 4 DC wires | | | | | | | | |
| emission | I | Infrared invisible led emission | | | | | | | | |
| | R | Red visible led emission | | | | | | | | |
| type | 2 | 100 mm Direct reflection without adjustment | | | | | | | | |
| | 3 | 100 mm Direct reflection with adjustment | | | | | | | | |
| | 4 | 200 mm Direct reflection with adjustment | | | | | | | | |
| | 5 | 200 mm Direct reflection without adjustment | | | | | | | | |
| | 6 | 400 mm Direct reflection without adjustment | | | | | | | | |
| | 7 | 400 mm Direct reflection with adjustment | | | | | | | | |
| | 8 | Direct reflection: 1000 mm axial, 800 mm radial with adjustment | | | | | | | | |
| | C | Reflex without adjustment | | | | | | | | |
| | P | Reflex polarized without adjustment | | | | | | | | |
| | N | Reflex polarized with adjustment | | | | | | | | |
| | M | Reflex with adjustment | | | | | | | | |
| | L | Reflex with adj. for transparent objects detection | | | | | | | | |
| | H | Emitter | | | | | | | | |
| | D | Receiver with sensitivity adjustment | | | | | | | | |
| Z | Receiver without sensitivity adjustment | | | | | | | | | |
| emitter | 0 | Emitter | | | | | | | | |
| | X | Emitter with check | | | | | | | | |
| | B | 4 wires output complementary NO and NC | | | | | | | | |
| output | 0 | Emitter | | | | | | | | |
| | P | PNP output | | | | | | | | |
| | N | NPN output | | | | | | | | |
| housing | 0 | Plastic housing, axial optic | | | | | | | | |
| | 1 | Metal housing, axial optic | | | | | | | | |
| | 2 | Plastic housing, radial optic | | | | | | | | |
| | 3 | Metal housing, radial optic | | | | | | | | |
| plug / cable output | A | Axial cable output | | | | | | | | |
| | E | Axial M12 plastic connector output | | | | | | | | |

201701_MD_Product Catalogue

(*) ATEX models available, contact our Sales Dept. for further information.

FA



available models

cable exit photoelectric sensors

M18 cylindrical DC

| model | distance | housing | adjustment | 4 wires (axial optic) | | 4 wires (right angle optic) | |
|--------------------|--------------|----------|----------------|-----------------------|-------------|-----------------------------|-------------|
| | | | | NPN NO + NC | PNP NO + NC | NPN NO + NC | PNP NO + NC |
| diffuse reflection | 100 mm | plastic | - | FAR2/BN-0A | FAR2/BP-0A | FAR2/BN-2A | FAR2/BP-2A |
| | | | ● | FAR3/BN-0A | FAR3/BP-0A | FAR3/BN-2A | FAR3/BP-2A |
| | | metallic | - | FAR2/BN-1A | FAR2/BP-1A | FAR2/BN-3A | FAR2/BP-3A |
| | | | ● | FAR3/BN-1A | FAR3/BP-1A | FAR3/BN-3A | FAR3/BP-3A |
| | 200 mm | plastic | - | FAI4/BN-0A | FAI4/BP-0A | FAI4/BN-2A | FAI4/BP-2A |
| | | | ● | FAI5/BN-0A | FAI5/BP-0A | FAI5/BN-2A | FAI5/BP-2A |
| | | | - | FAI4/BN-1A | FAI4/BP-1A | FAI4/BN-3A | FAI4/BP-3A |
| | | metallic | ● | FAI5/BN-1A | FAI5/BP-1A | FAI5/BN-3A | FAI5/BP-3A |
| | | | - | FAI6/BN-0A | FAI6/BP-0A | FAI6/BN-2A | FAI6/BP-2A |
| | | | ● | FAI7/BN-0A | FAI7/BP-0A | FAI7/BN-2A | FAI7/BP-2A |
| | 400 mm | plastic | - | FAI6/BN-1A | FAI6/BP-1A | FAI6/BN-3A | FAI6/BP-3A |
| | | | ● | FAI7/BN-1A | FAI7/BP-1A | FAI7/BN-3A | FAI7/BP-3A |
| | | metallic | - | FAI6/BN-0A | FAI6/BP-0A | FAI6/BN-2A | FAI6/BP-2A |
| | | | ● | FAI7/BN-0A | FAI7/BP-0A | FAI7/BN-2A | FAI7/BP-2A |
| 1,000 mm (axial) | plastic | ● | FAI8/BN-0A | FAI8/BP-0A | FAI8/BN-2A | FAI8/BP-2A | |
| 800 mm (90°) | metallic | - | FAI8/BN-1A | FAI8/BP-1A | FAI8/BN-3A | FAI8/BP-3A | |
| retroreflective | 5 m (axial) | plastic | - | FAIC/BN-0A | FAIC/BP-0A | FAIC/BN-2A | FAIC/BP-2A |
| | | | ● | FAIM/BN-0A | FAIM/BP-0A | FAIM/BN-2A | FAIM/BP-2A |
| | 4 m (90°) | metallic | - | FAIC/BN-1A | FAIC/BP-1A | FAIC/BN-3A | FAIC/BP-3A |
| | | | ● | FAIM/BN-1A | FAIM/BP-1A | FAIM/BN-3A | FAIM/BP-3A |
| polarized | 4 m (axial) | plastic | - | FARP/BN-0A | FARP/BP-0A | FARP/BN-2A | FARP/BP-2A |
| | | | ● | FARN/BN-0A | FARN/BP-0A | FARN/BN-2A | FARN/BP-2A |
| | 2.5 m (90°) | metallic | - | FARP/BN-1A | FARP/BP-1A | FARP/BN-3A | FARP/BP-3A |
| | | | ● | FARN/BN-1A | FARN/BP-1A | FARN/BN-3A | FARN/BP-3A |
| trasparents | 0.1...1.5 m | plastic | ● | FARL/BN-0A | FARL/BP-0A | FARL/BN-2A | FARL/BP-2A |
| | | metallic | - | FARL/BN-1A | FARL/BP-1A | FARL/BN-3A | FARL/BP-3A |
| through-beam | 20 m (axial) | plastic | emitter | FAIH/00-0A | | FAIH/00-2A | |
| | | | emitt. + check | FAIH/X0-0A | | FAIH/X0-2A | |
| | | | receiver | FAIZ/BN-0A | FAIZ/BP-0A | FAIZ/BN-2A | FAIZ/BP-2A |
| | | | adj. receiver | FAID/BN-0A | FAID/BP-0A | FAID/BN-2A | FAID/BP-2A |
| | 15 m (90°) | metallic | emitter | FAIH/00-1A | | FAIH/00-3A | |
| | | | emitt. + check | FAIH/X0-1A | | FAIH/X0-3A | |
| | | | receiver | FAIZ/BN-0A | FAIZ/BP-0A | FAIZ/BN-2A | FAIZ/BP-2A |
| | | | adj. receiver | FAID/BN-1A | FAID/BP-1A | FAID/BN-3A | FAID/BP-3A |

available models

plug cable exit photoelectric sensors

| model | distance | housing | adjustment | 4 wires (axial optic) | | 4 wires (right angle optic) | |
|--------------------|------------------|----------|----------------|-----------------------|-------------|-----------------------------|-------------|
| | | | | NPN NO + NC | PNP NO + NC | NPN NO + NC | PNP NO + NC |
| diffuse reflection | 100 mm | plastic | - | FAR2/BN-0E | FAR2/BP-0E | FAR2/BN-2E | FAR2/BP-2E |
| | | | ● | FAR3/BN-0E | FAR3/BP-0E | FAR3/BN-2E | FAR3/BP-2E |
| | | metallic | - | FAR2/BN-1E | FAR2/BP-1E | FAR2/BN-3E | FAR2/BP-3E |
| | | | ● | FAR3/BN-1E | FAR3/BP-1E | FAR3/BN-3E | FAR3/BP-3E |
| | 200 mm | plastic | - | FAI4/BN-0E | FAI4/BP-0E | FAI4/BN-2E | FAI4/BP-2E |
| | | | ● | FAI5/BN-0E | FAI5/BP-0E | FAI5/BN-2E | FAI5/BP-2E |
| | | metallic | - | FAI4/BN-1E | FAI4/BP-1E | FAI4/BN-3E | FAI4/BP-3E |
| | | | ● | FAI5/BN-1E | FAI5/BP-1E | FAI5/BN-3E | FAI5/BP-3E |
| | 400 mm | plastic | - | FAI6/BN-0E | FAI6/BP-0E | FAI6/BN-2E | FAI6/BP-2E |
| | | | ● | FAI7/BN-0E | FAI7/BP-0E | FAI7/BN-2E | FAI7/BP-2E |
| | | metallic | - | FAI6/BN-1E | FAI6/BP-1E | FAI6/BN-3E | FAI6/BP-3E |
| | | | ● | FAI7/BN-1E | FAI7/BP-1E | FAI7/BN-3E | FAI7/BP-3E |
| | 1.000 mm (axial) | plastic | ● | FAI8/BN-0E | FAI8/BP-0E | FAI8/BN-2E | FAI8/BP-2E |
| | 800 mm (90°) | metallic | | FAI8/BN-1E | FAI8/BP-1E | FAI8/BN-3E | FAI8/BP-3E |
| retroreflective | 5 m (axial) | plastic | - | FAIC/BN-0E | FAIC/BP-0E | FAIC/BN-2E | FAIC/BP-2E |
| | | | ● | FAIM/BN-0E | FAIM/BP-0E | FAIM/BN-2E | FAIM/BP-2E |
| | 4 m (90°) | metallic | - | FAIC/BN-1E | FAIC/BP-1E | FAIC/BN-3E | FAIC/BP-3E |
| | | | ● | FAIM/BN-1E | FAIM/BP-1E | FAIM/BN-3E | FAIM/BP-3E |
| polarized | 4 m (axial) | plastic | - | FARP/BN-0E | FARP/BP-0E | FARP/BN-2E | FARP/BP-2E |
| | | | ● | FARN/BN-0E | FARN/BP-0E | FARN/BN-2E | FARN/BP-2E |
| | 2.5 m (90°) | metallic | - | FARP/BN-1E | FARP/BP-1E | FARP/BN-3E | FARP/BP-3E |
| | | | ● | FARN/BN-1E | FARN/BP-1E | FARN/BN-3E | FARN/BP-3E |
| trasparents | 0,1...1.5 m | plastic | ● | FARL/BN-0E | FARL/BP-0E | FARL/BN-2E | FARL/BP-2E |
| | | metallic | | FARL/BN-1E | FARL/BP-1E | FARL/BN-3E | FARL/BP-3E |
| through-beam | 20 m (axial) | plastic | emitter | FAIH/00-0E | | FAIH/00-2E | |
| | | | emitt. + check | FAIH/X0-0E | | FAIH/X0-2E | |
| | | | receiver | FAIZ/BN-0E | FAIZ/BP-0E | FAIZ/BN-2E | FAIZ/BP-2E |
| | | | adj. receiver | FAID/BN-0E | FAID/BP-0E | FAID/BN-2E | FAID/BP-2E |
| | 15 m (90°) | metallic | emitter | FAIH/00-1E | | FAIH/00-3E | |
| | | | emitt. + check | FAIH/X0-1E | | FAIH/X0-3E | |
| | | | receiver | FAIZ/BN-0E | FAIZ/BP-0E | FAIZ/BN-2E | FAIZ/BP-2E |
| | | | adj. receiver | FAID/BN-1E | FAID/BP-1E | FAID/BN-3E | FAID/BP-3E |



| | red LED emission | |
|-----------------------------|---|------------|
| | FAR2/B*~** | FAR3/B*~** |
| |  | |
| nominal sensing distance | 100 mm ⁽¹⁾ | |
| emission | red (660 nm) | |
| hysteresis | ≤ 10 % | |
| repeatability | 5 % | |
| operating voltage | 10...30 Vcc | |
| ripple | ≤ 10 % | |
| no-load supply current | 30 mA | |
| load current | 100 mA | |
| leakage current | 10 µA | |
| output voltage drop | 2 V max. I _L = 100 mA | |
| output type | NPN or PNP NO + NC | |
| switching frequency | 250 Hz | |
| power on delay | 200 ms | |
| power supply protections | polarity reversal, impulsive overvoltage | |
| output protection | Short circuit (autoreset) Overvoltage | |
| sensitivity adjustment | - | ● |
| operating temperature range | - 25°C...+ 70°C (without freeze) | |
| temperature drift | 10 % Sr | |
| protection degree | IP67 (EN60529) ⁽⁴⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| external light interference | 3,000 lux (incandescence lamp), 10,000 lux (sunlight) | |
| LEDs | Yellow (Light status) or (output status in the LO/DO special versions) | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | |
| optic material | PC | |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) | |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable | |

⁽¹⁾ White target kodak 90% reflection 100 x 100 mm

⁽²⁾ Protection guaranteed only with plug cable well mounted



| | | infrared LED emission | | | | |
|-----------------------------|--|---|------------|-----------------------|------------|--|
| | | FAI4/B*-** | FAI5/B*-** | FAI6/B*-** | FAI7/B*-** | FAI8/B*-** |
| nominal sensing distance | | 200 mm ⁽¹⁾ | | 400 mm ⁽²⁾ | | 1,000 mm ⁽³⁾ (axial) 800 mm ⁽³⁾ (90°) |
| emission | | infrared (880 nm) | | | | |
| hysteresis | | ≤ 10 % | | | | |
| repeatability | | 5 % | | | | |
| operating voltage | | 10...30 Vcc | | | | |
| ripple | | ≤ 10 % | | | | |
| no-load supply current | | 30 mA | | | | |
| load current | | 100 mA | | | | |
| leakage current | | 10 μA | | | | |
| output voltage drop | | 2 V max. IL = 100 mA | | | | |
| output type | | NPN or PNP NO + NC | | | | |
| switching frequency | | 250 Hz | | | | |
| power on delay | | 200 ms | | | | |
| power supply protections | | polarity reversal, impulsive overvoltage | | | | |
| output protection | | Short circuit (autoreset) Overvoltage | | | | |
| sensitivity adjustment | | • | - | | • | |
| operating temperature range | | - 25°C...+ 70°C (without freeze) | | | | |
| temperature drift | | 10 % Sr | | | | |
| protection degree | | IP67 (EN60529) ⁽⁴⁾ | | | | |
| EMC | | in conformity with the EMC Directive according to EN 60947-5-2 | | | | |
| external light interference | | 3,000 lux (incandescence lamp), 10,000 lux (sunlight) | | | | |
| LEDs | | Yellow (Light status) or (output status in the LO/DO special versions) | | | | |
| housing material | | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | | | |
| optic material | | PC | | | | |
| tightening torque | | 1 Nm (plastic), 25 Nm (metallic) | | | | |
| weight (approximate) | | plastic version: 30 g plug / 50 g cable metallic version: 100 g plug / 130 g cable | | | | |

⁽¹⁾ White target kodak 90% reflection 100 x 100 mm ⁽²⁾ White target kodak 90% reflection 200 x 200 mm ⁽³⁾ White target kodak 90% reflection 400 x 400 mm

⁽⁴⁾ Protection guaranteed only with plug cable well mounted



technical specification

reflex and polarized models

M18 cylindrical DC

| | retroreflective | | polarized | | transparent objects detection |
|-----------------------------|---|----------------|-----------------------------|----------------|-------------------------------|
| | FAIC/B*~** (1) | FAIM/B*~** (1) | FARP/B*~** (1) | FARN/B*~** (1) | FARL/B*~** (2) |
| | | | | | |
| nominal sensing distance | 5 m (axial), 4 m (radial) | | 4 m (axial), 2.5 m (radial) | | 1.5 m |
| emission | infrared (880 nm) | | red (660 nm) | | |
| hysteresis | ≤ 10 % | | | | |
| repeatability | 5 % | | | | |
| operating voltage | 10...30 Vdc | | | | |
| ripple | ≤ 10 % | | | | |
| no-load supply current | 30 mA | | | | |
| load current | 100 mA | | | | |
| leakage current | ≤ 10 µA | | | | |
| output voltage drop | 2 V max. IL = 100 mA | | | | |
| output type | NPN or PNP NO + NC | | | | |
| switching frequency | 250 Hz | | | | |
| power on delay | 200 ms | | | | |
| power supply protections | polarity reversal, impulsive overvoltage | | | | |
| output protection | Short circuit (autoreset) Overvoltage | | | | |
| sensitivity adjustment | - | ● | - | ● | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | | |
| temperature drift | 10 % Sr | | | | |
| protection degree | IP67 (EN60529) (3) | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | |
| external light interference | 5000 lux (incandescence lamp), 10.000 lux (sunlight) | | | | |
| LEDs | Yellow (Light status) or (output status in the LO/DO special versions) | | | | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | | | |
| optic material | PC | | plastic | | PC |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) | | | | |
| weight (approximate) | plastic version: 30 g plug / 50 g cable metallic version: 100 g plug / 130 g cable | | | | |

(1) With RL 110 reflector (2) With RL 113G or RL 116 reflector (3) Protection guaranteed only with plug cable well mounted



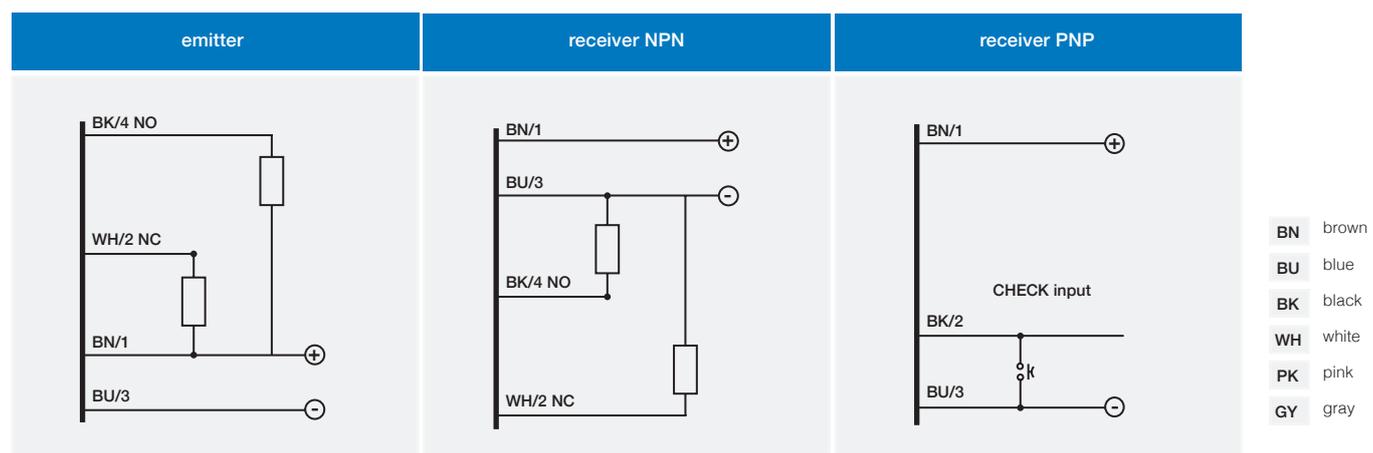
| | emitter | | receiver | |
|-----------------------------|---|-------------|---|-------------|
| | FAIH/X0-**- | FAIH/00-**- | FAIZ/B*-**- | FAID/B*-**- |
| | | | | |
| nominal sensing distance | 20 m axial model / 15 m right angle model | | | |
| emission | infrared (880 nm) | | | |
| hysteresis | ≤ 10 % | | | |
| repeatability | 5 % | | | |
| operating voltage | 10...30 Vdc | | | |
| ripple | ≤ 10 % | | | |
| no-load supply current | 25 mA | | | |
| load current | - | | 100 mA | |
| leakage current | - | | 10 µA | |
| output voltage drop | - | | 2 V max. IL = 100 mA | |
| output type | - | | NPN or PNP NO + NC | |
| switching frequency | - | | 250 Hz | |
| power on delay | - | | 200 ms | |
| power supply protections | impulsive overvoltage polarity reversal | | | |
| output protection | - | | Short circuit (autoreset) - Overvoltage | |
| sensitivity adjustment | - | | - | ● |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | |
| temperature drift | 10 % Sr | | | |
| check input | BK/2 connected to 0 V switches off the emission | | - | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | | |
| external light interference | 5,000 lux (incandescence lamp), 10,000 lux (sunlight) | | | |
| LEDs | green (power ON) | | Yellow (light state or output status in the special LO/DO versions) | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | | |
| optic material | PC | | | |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) | | | |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable | | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted

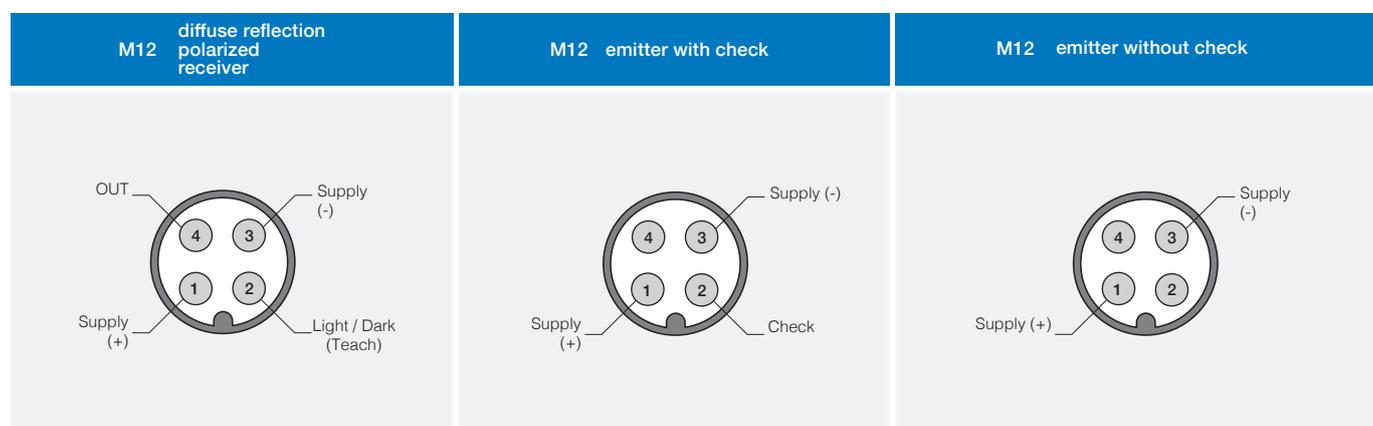


M18 cylindrical DC

electrical diagrams of the connections

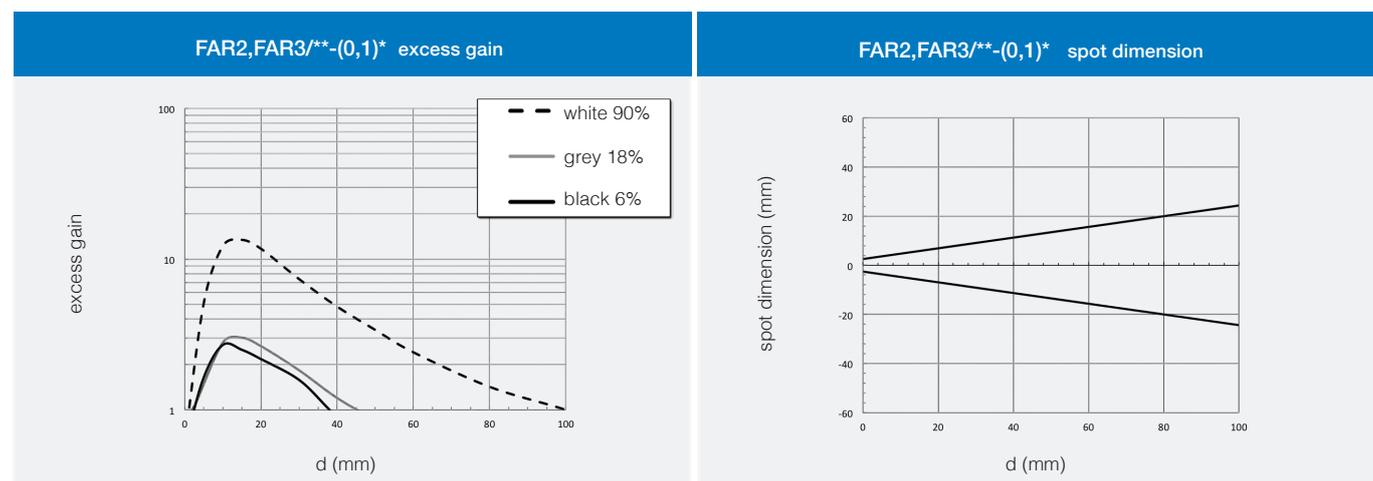


plug



response diagram

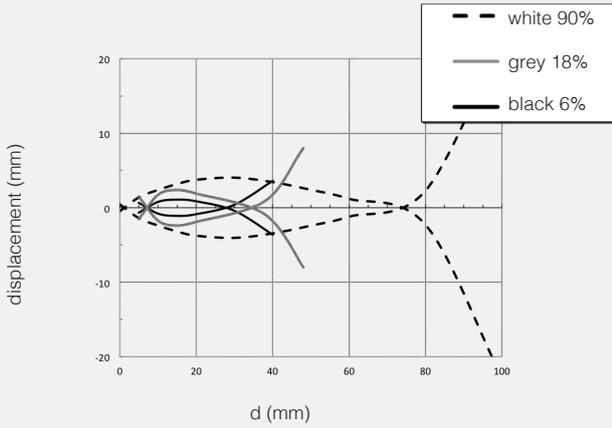
direct diffuse models



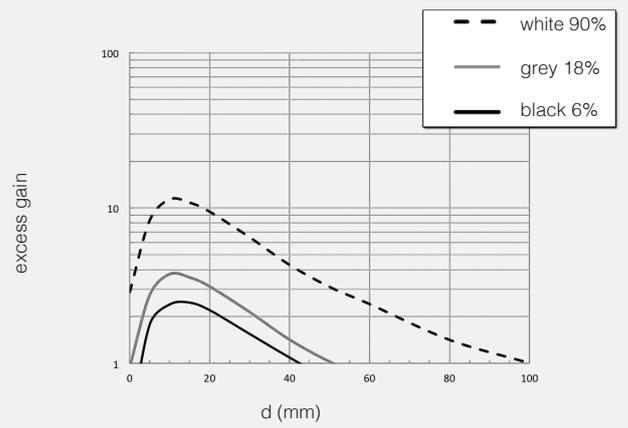
FA



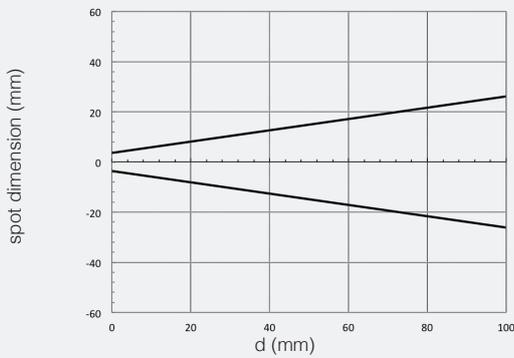
FAR2,FAR3/**-(0,1)* parallel displacement



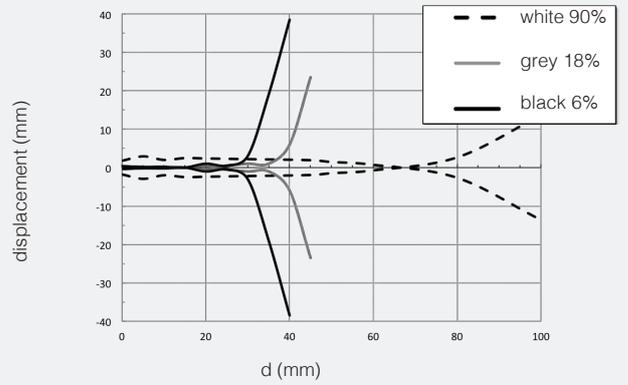
FAR2,FAR3/**-(2,3)* excess gain



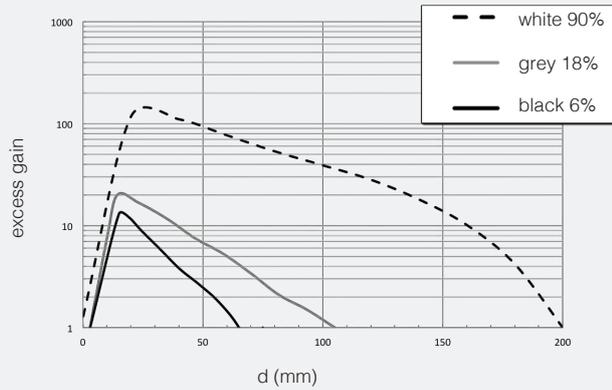
FAR2,FAR3/**-(2,3)* spot dimension



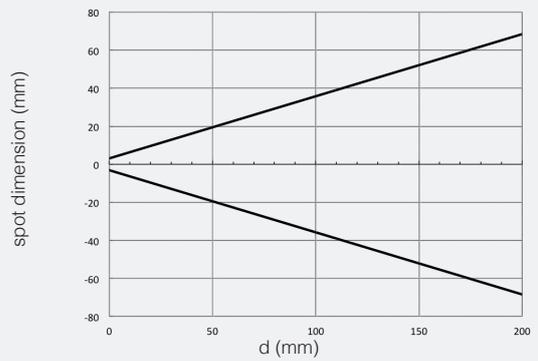
FAR2,FAR3/**-(2,3)* parallel displacement



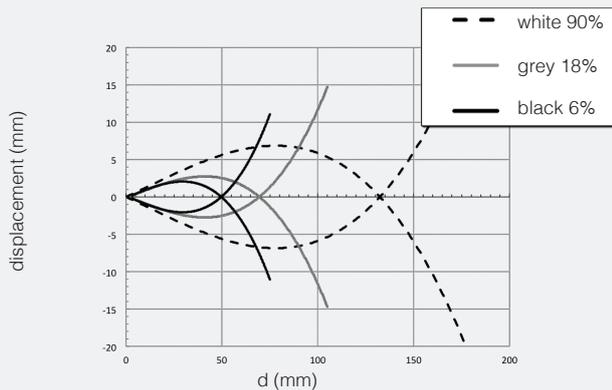
FAI4, FAI5/**-(0,1)* excess gain



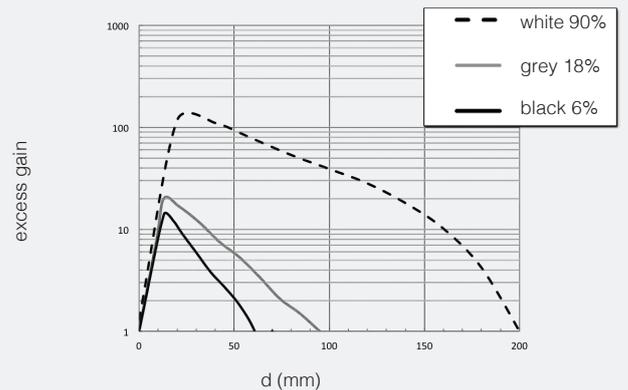
FAI4, FAI5/**-(0,1)* spot dimension



FAI4, FAI5/**-(0,1)* parallel displacement



FAI4, FAI5/**-(2,3)* excess gain

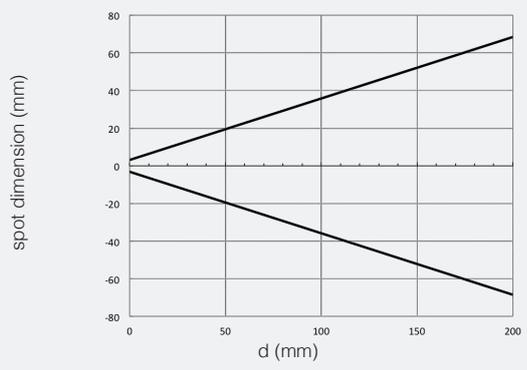




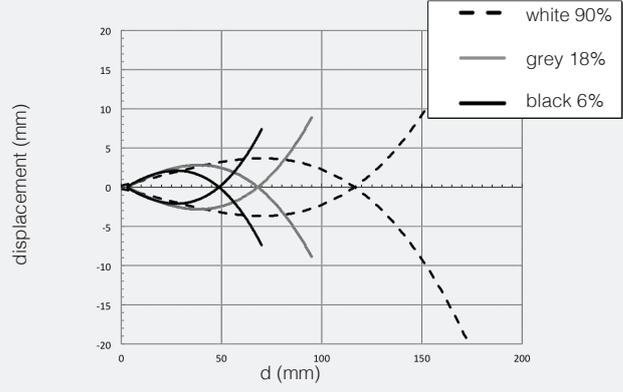
response diagrams

direct diffuse models

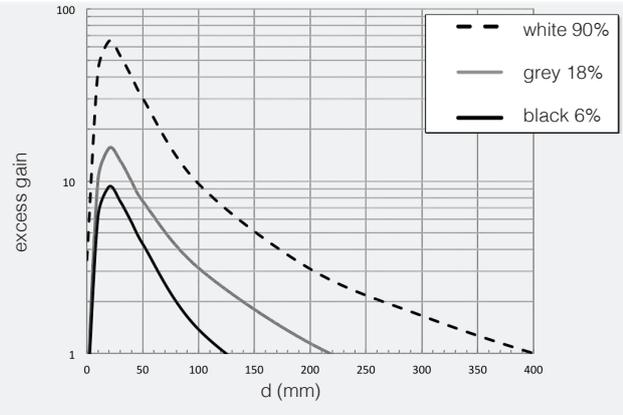
FAI4, FAI5/**-(2,3)* spot dimension



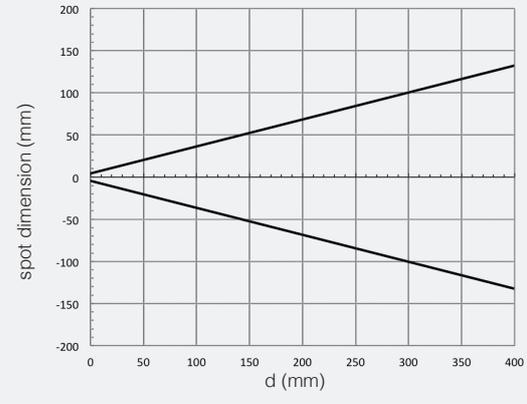
FAI4, FAI5/**-(2,3)* parallel displacement



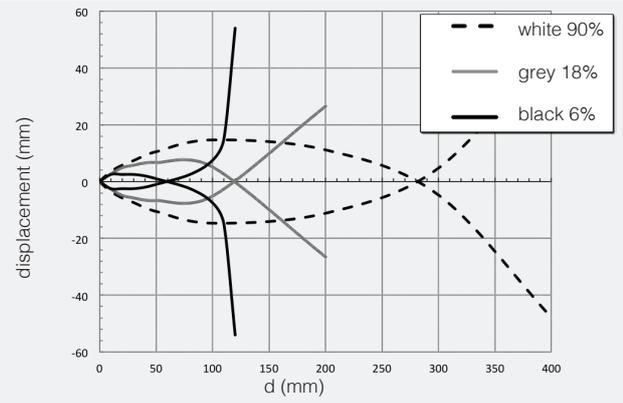
FAI6,FAI7/**-(0,1)* excess gain



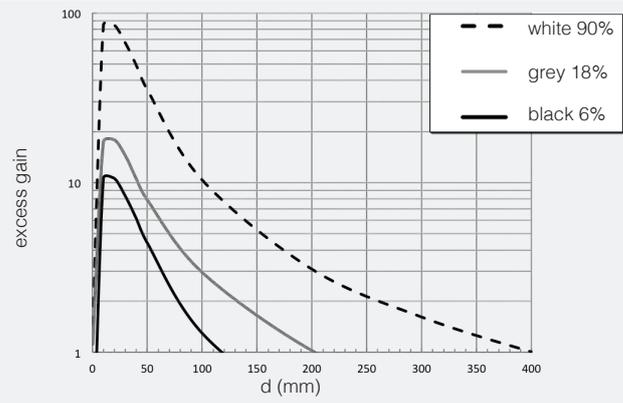
FAI6,FAI7/**-(0,1)* spot dimension



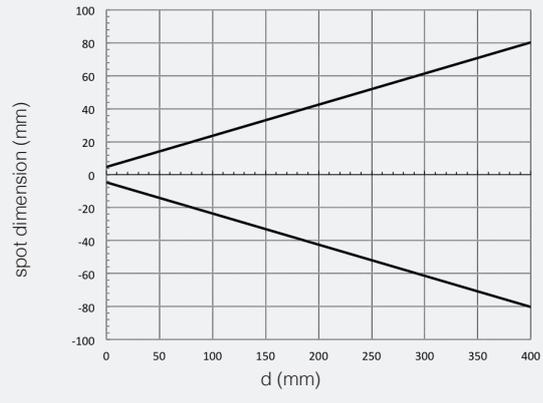
FAI6,FAI7/**-(0,1)*parallel displacement



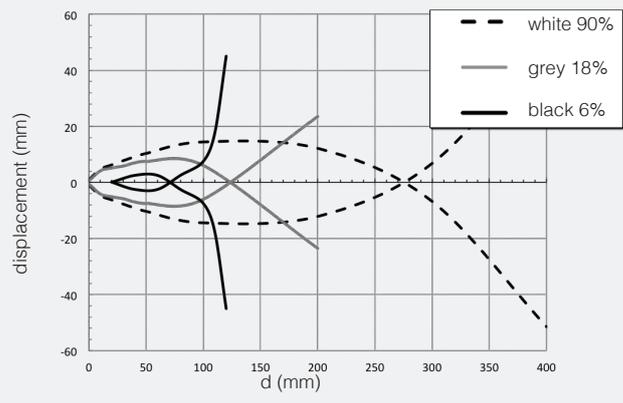
FAI6,FAI7/**-(2,3)* excess gain

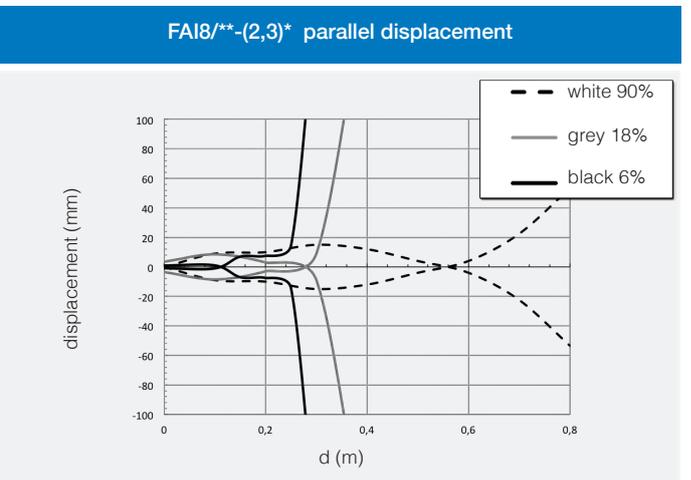
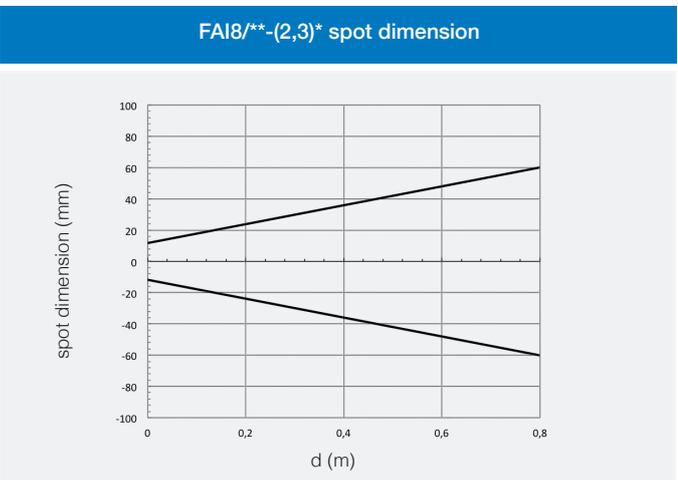
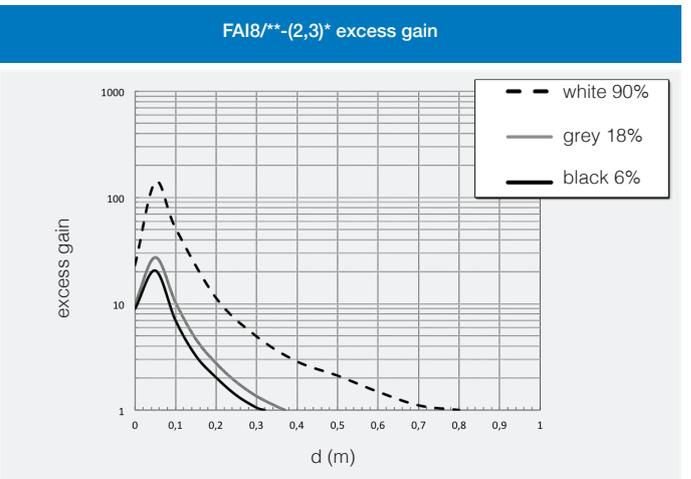
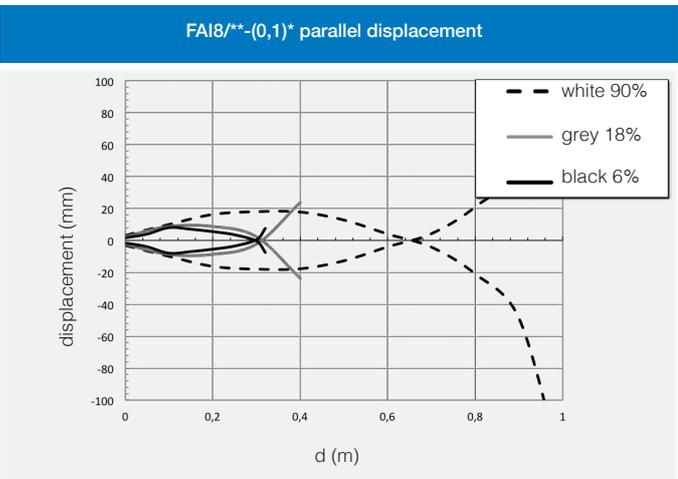
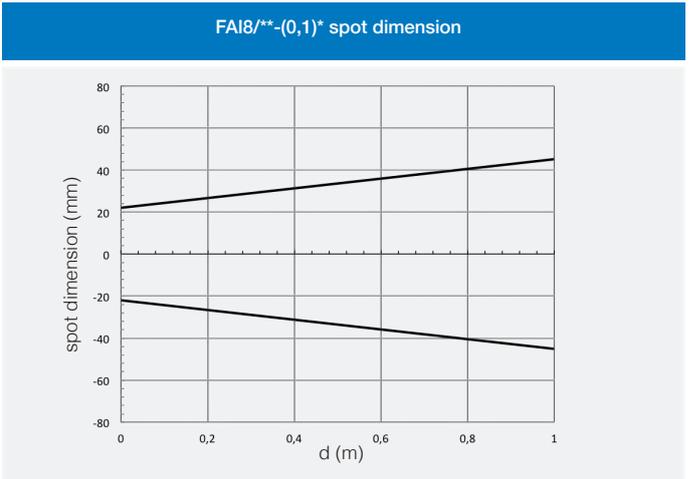
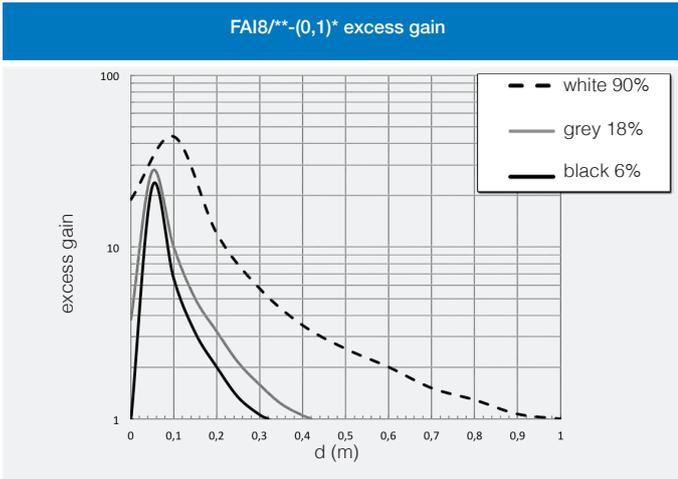


FAI6,FAI7/**-(2,3)* spot dimension



FAI6,FAI7/**-(2,3)* parallel displacement





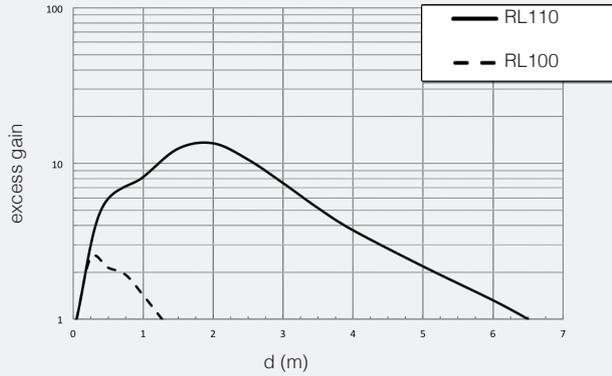


response diagrams

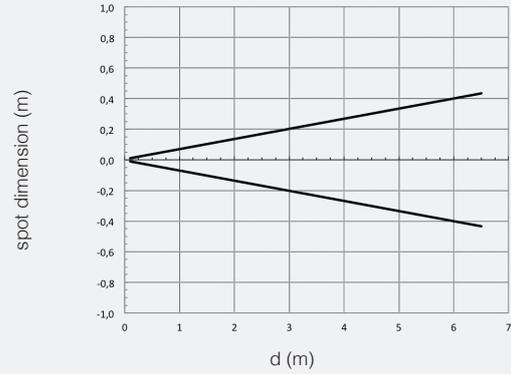
retro-reflective models

M18 cylindrical DC

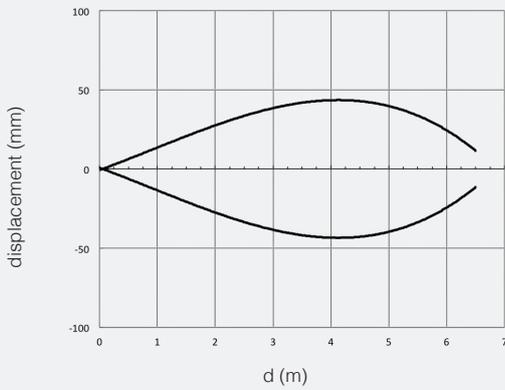
FAIC,FAIM/**-(0,1)* excess gain



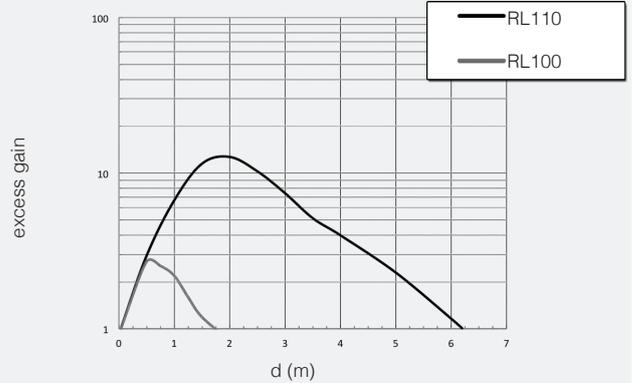
FAIC,FAIM/**-(0,1)* spot dimension



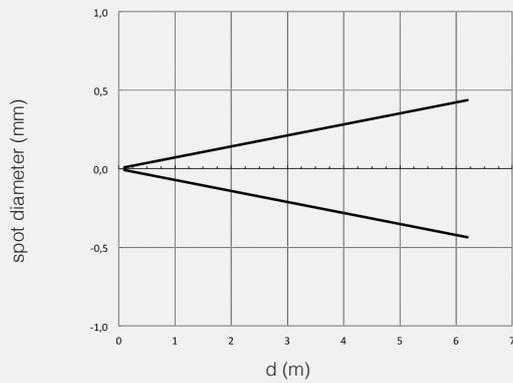
FAIC,FAIM/**-(0,1)* parallel displacement



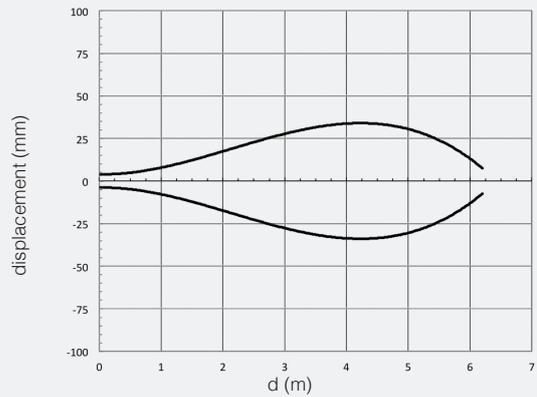
FAIC,FAIM/**-(2,3)* excess gain



FAIC,FAIM/**-(2,3)* spot diameter



FAIC,FAIM/**-(2,3)* parallel displacement

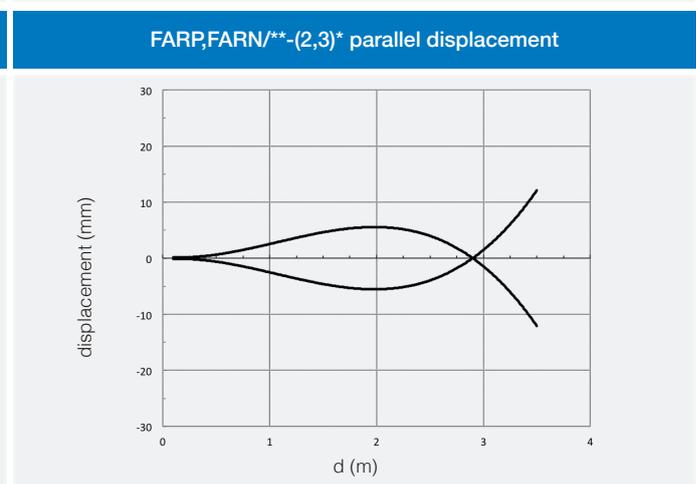
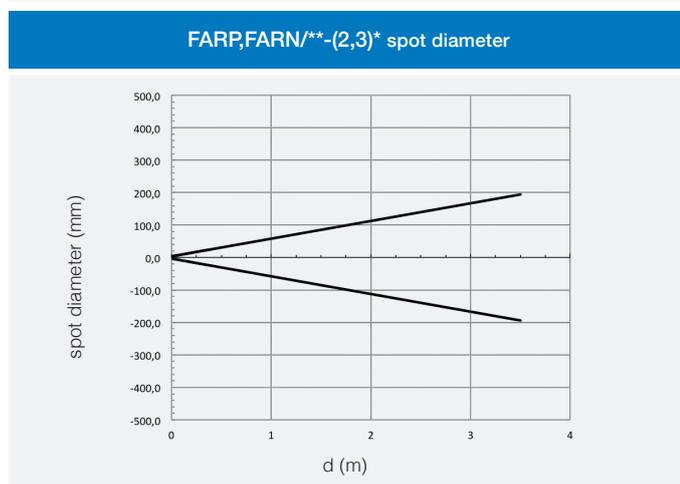
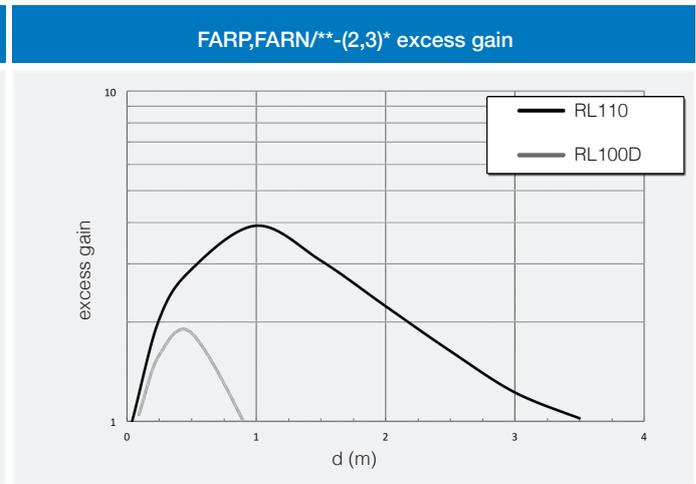
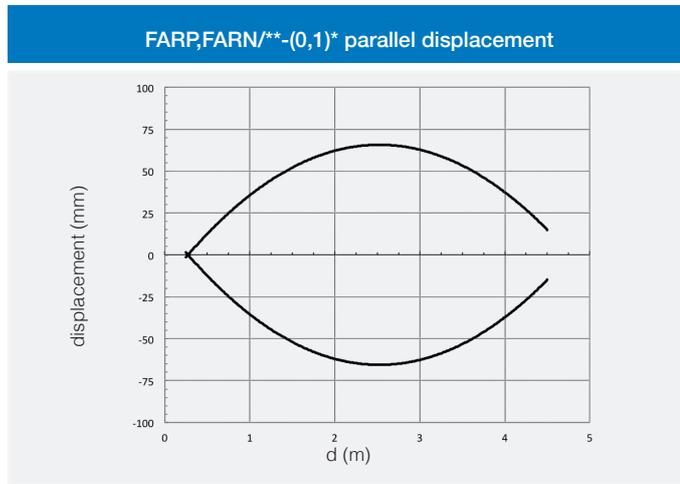
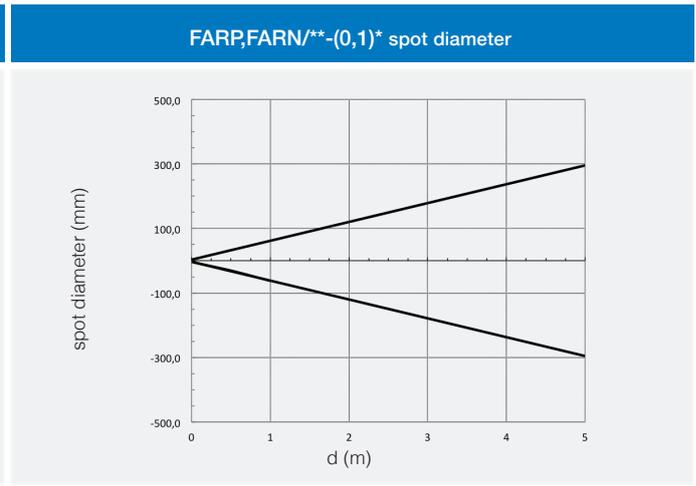
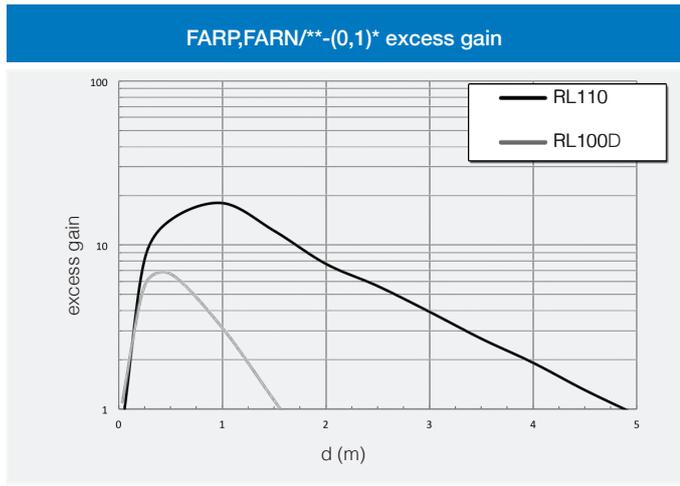


response diagrams

polarized models



M18 cylindrical DC



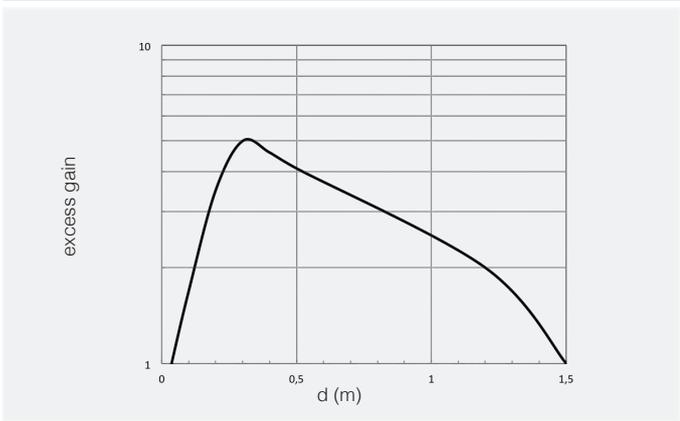


response diagrams

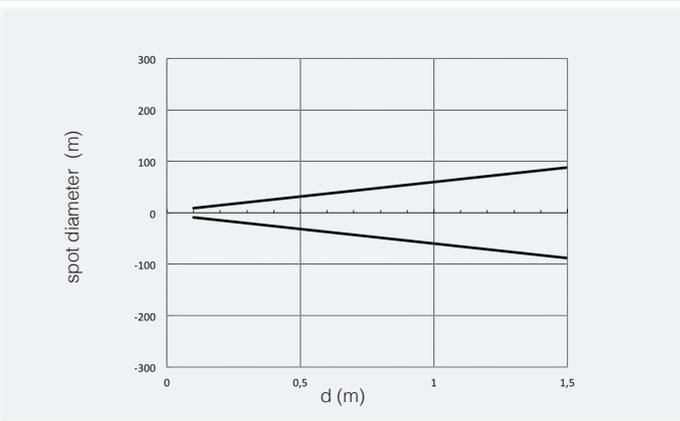
polarized models for transparent objects (diagrams calculated with RL110)

M18 cylindrical DC

FARL/**-* excess gain



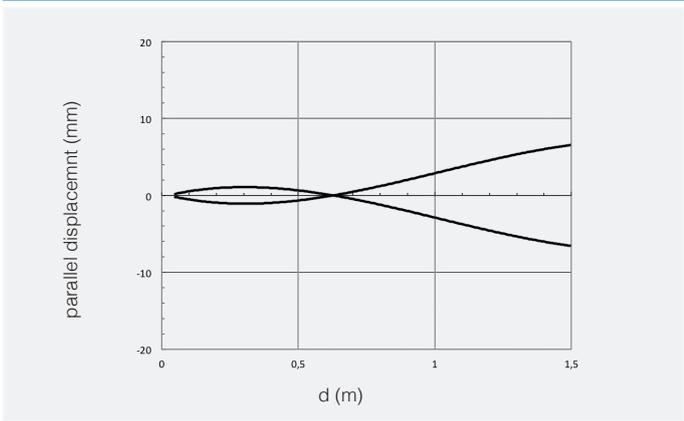
FARL/**-* spot diameter



response diagrams

polarized models for transparent objects

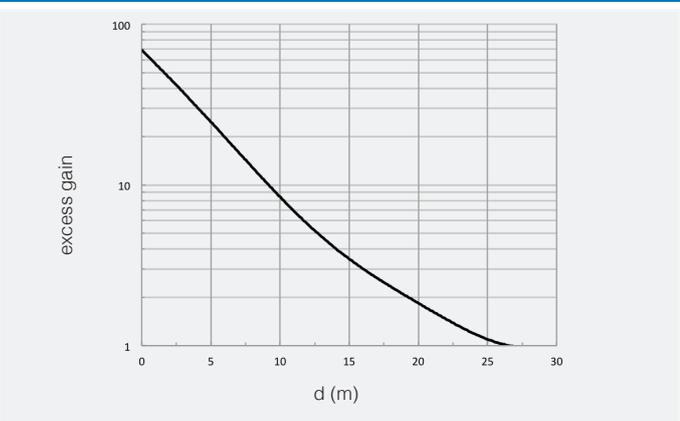
FARL/**-* parallel displacement



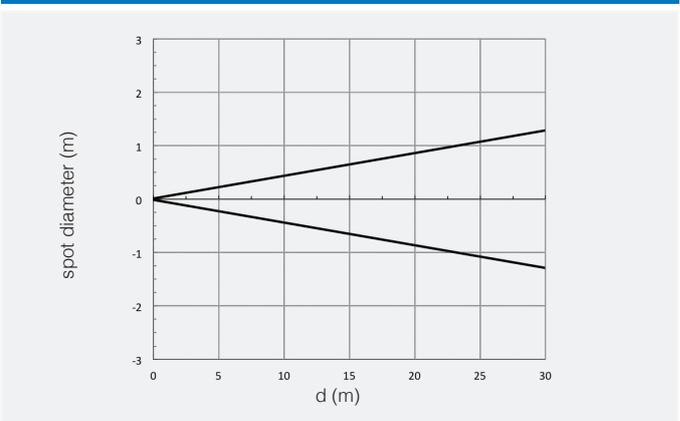
response diagrams

through beam models

FAIH/**-(0,1)* FAID/**-(0,1)*, excess gain



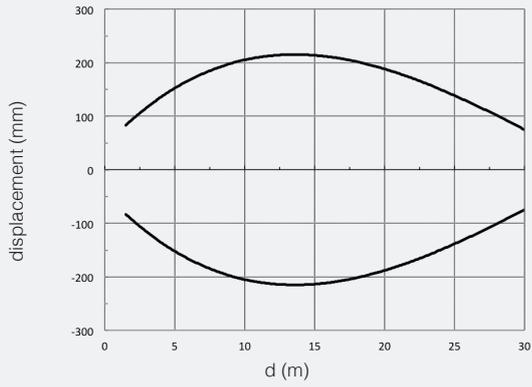
FAIH/**-(0,1)* FAID/**-(0,1)*, spot diameter



FA



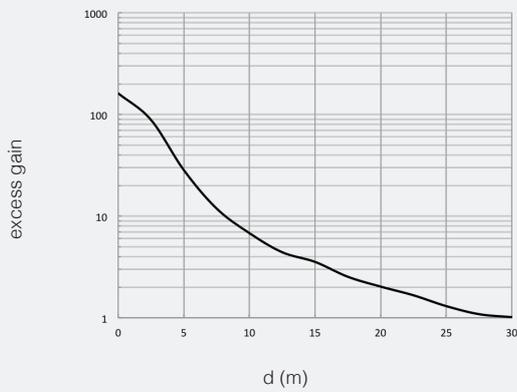
FAIH/**-(0,1)* FAID/**-(0,1)*, parallel displacement



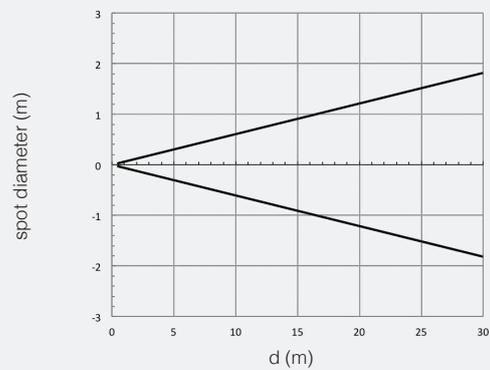
response diagrams

through beam models

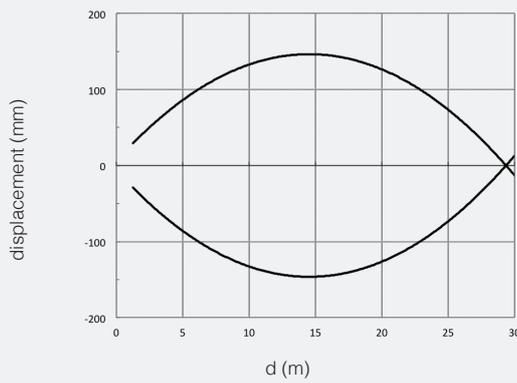
FAIH/**-(2,3)* FAID/**-(2,3)*, excess gain



FAIH/**-(2,3)* FAID/**-(2,3)*, spot diameter



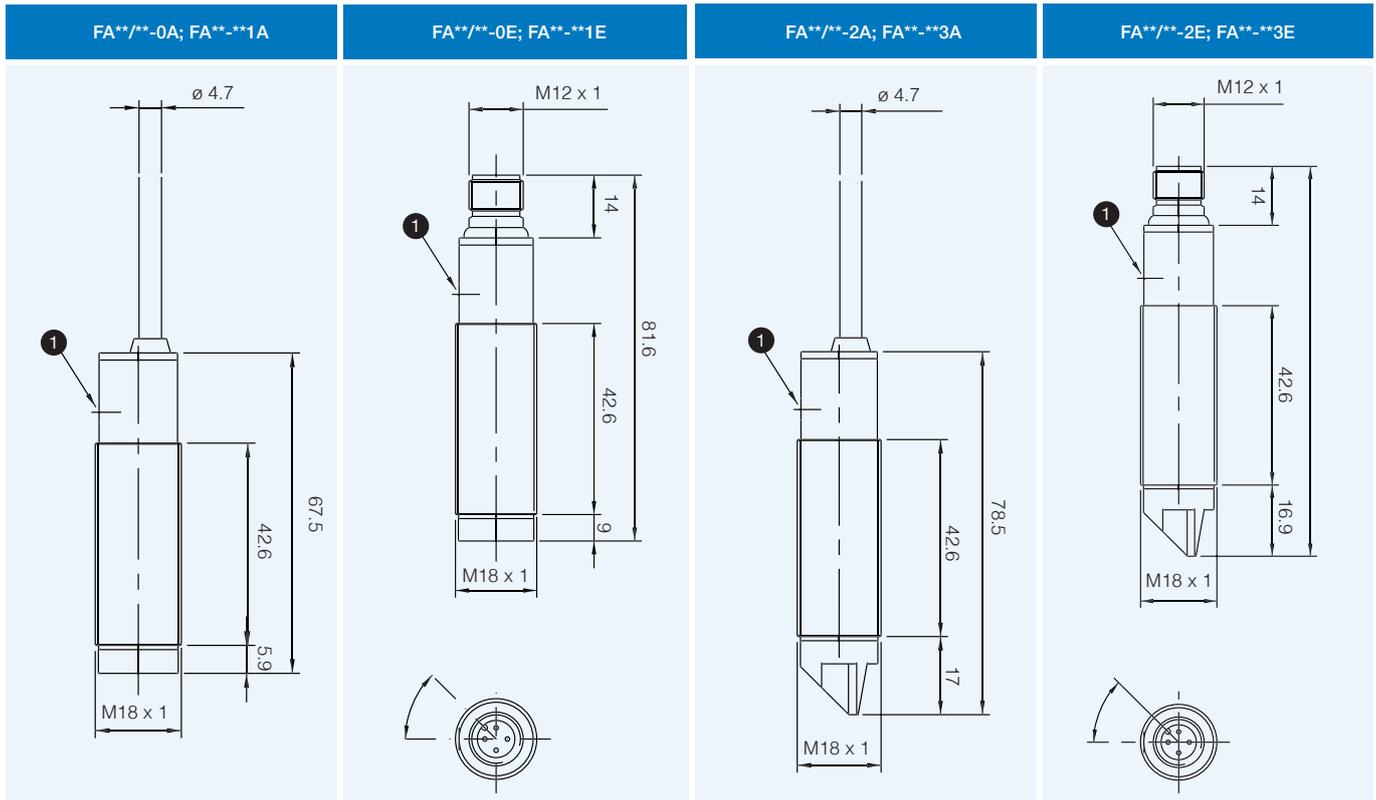
FAIH/**-(2,3)* FAID/**-(2,3)*, parallel displacement





dimensions (mm)

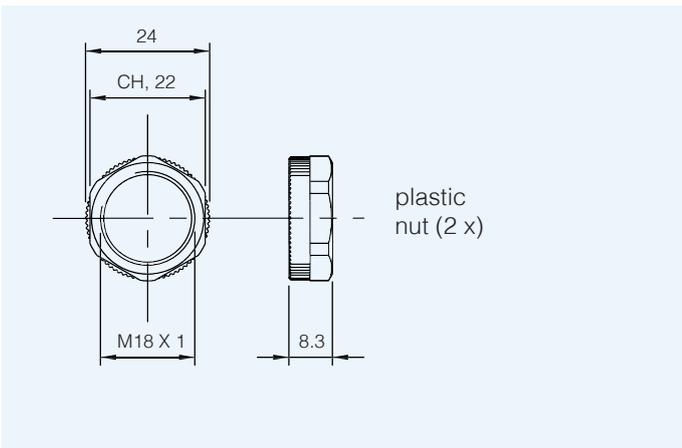
M18 cylindrical DC



1 Trimmer for sensibility regulation

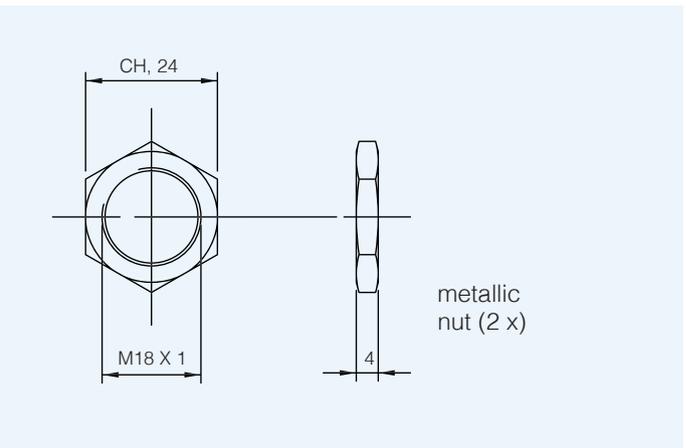
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models



FA



FA BGS series

M18 direct diffuse with adjustable background suppression



features

- up 300 mm adjustable reading distance
- Cable or M12 plastic plug versions
- Supply voltage 10...30 Vdc, output current 100 mA
- LED light status indicator
- IP67 protection degree
- Complete protection against electrical damages
- ATEX models, cat.3, available on request
- Approvals: CE and cULus Listed



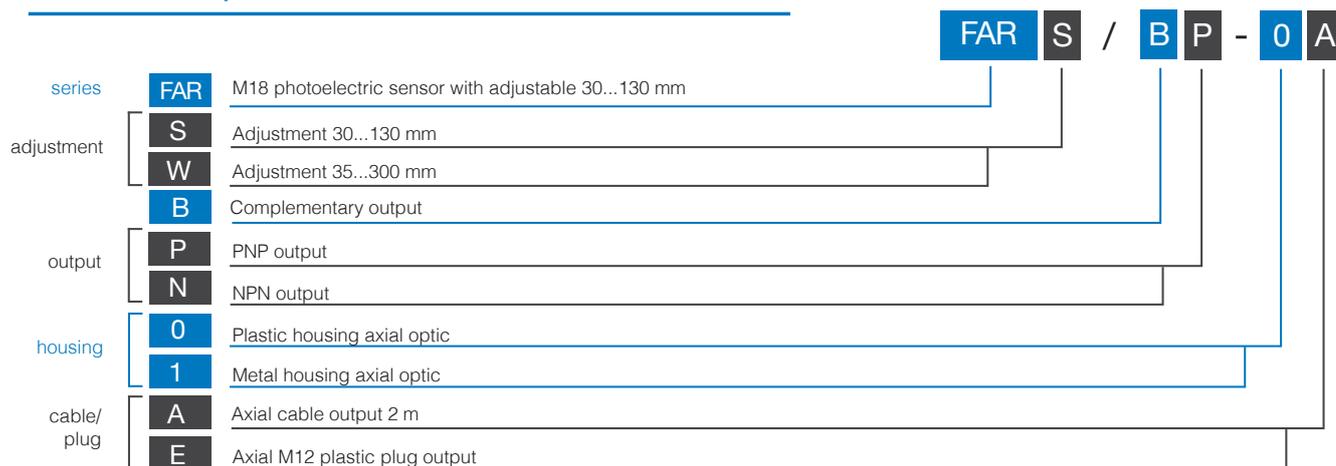
web contents

- Application notes
- Photos
- Catalogue / Manuals



M18 direct diffuse

code description(*)



(*) ATEX models available, contact our Sales Dept. for further information.

available models

| function | distance | housing | 4 wires NO + NC PNP | | 4 wires NO + NC NPN | |
|------------------------|-------------|----------------|---------------------|----------------|---------------------|----------------|
| | | | cable | plug | cable | plug |
| background suppression | 30...130 mm | axial plastic | FARS/BP-0A | FARS/BP-0E | FARS/BN-0A | FARS/BN-0E |
| | | axial metallic | FARS/BP-1A | FARS/BP-1E | FARS/BN-1A | FARS/BN-1E |
| | 60...100 | metallic | - | FARS/BP-1E7712 | - | FARS/BN-1E7712 |
| | 35...300 mm | axial plastic | FARW/BP-0A | FARW/BP-0E | FARW/BN-0A | FARW/BN-0E |
| | | axial metallic | FARW/BP-1A | FARW/BP-1E | FARW/BN-1A | FARW/BN-1E |

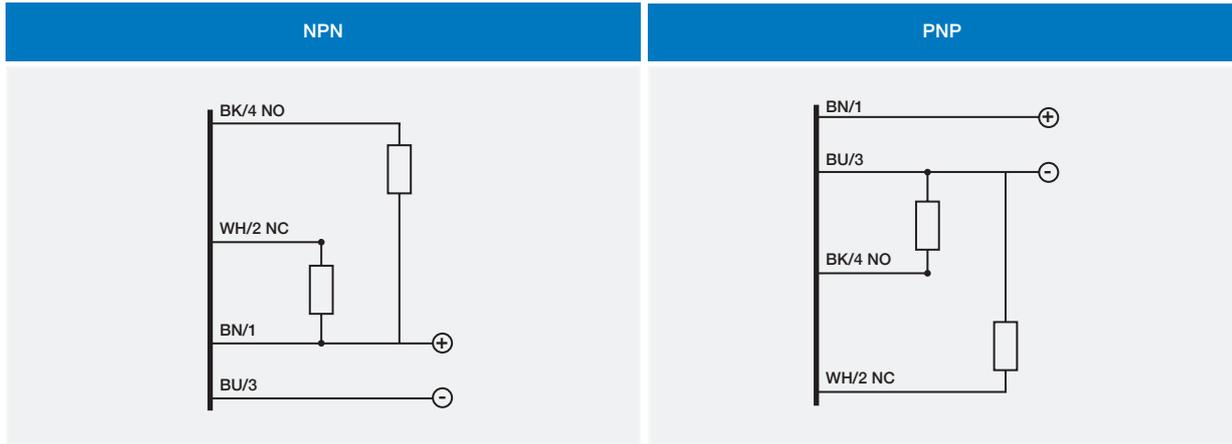
FARS



| | FARS/**-** | FARW/**-** |
|------------------------------|---|------------------------------|
| | | |
| nominal sensing distance | 30...130 mm | 35...300 mm |
| scanning adjustable range Sd | 30...130 mm (white paper) | 35...300 mm (white paper) |
| emission | red light (660 nm) | Pin Point red light (660 nm) |
| hysteresis | ≤ 10 % | |
| repeatability | 10 % | |
| operating voltage | 10...30 Vcc | |
| ripple | ≤ 10 % | |
| no-load supply current | 25 mA | |
| load current | 100 mA | |
| leakage current | ≤ 10 µA (@ 30 Vcc) | |
| output voltage drop | 2 V max. IL = 100 mA | |
| output type | NPN o PNP; NO + NC | |
| switching frequency | 1 kHz | |
| power on delay | 200 ms | |
| power supply protections | short circuit (auto reset) | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | |
| temperature drift | ≤ 10 % Sd (≤ 3 % Sd per Sd 60...110 mm) | |
| distance adjustment | potentiometer | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| external light interference | 5,000 lux (incandescence lamp), 10,000 lux (sunlight) | |
| LEDs | yellow / light status / short circuit / internal error | |
| cable exit | PVC 4x0, 34 mmq; Ø 4,7 mm; 2m | |
| plug exit | M12 4 pins, male | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit and plug) | |
| optic material | plastic | |
| tightening torque | 25 Nm (metallic) | |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable | |
| yellow LED status | sensor status | |
| ON | light status | |
| OFF | dark status | |
| flashing slowly | output short circuit detected | |
| flashing 3 of 10 | internal error | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted

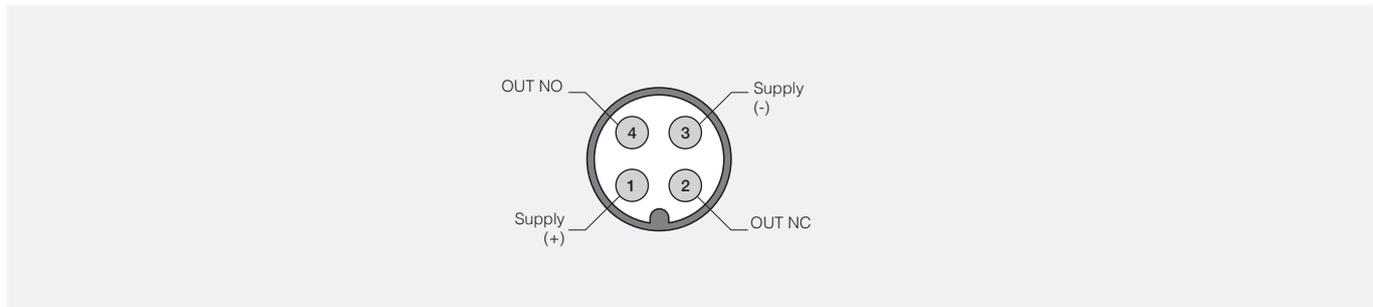
electrical diagrams of the connections



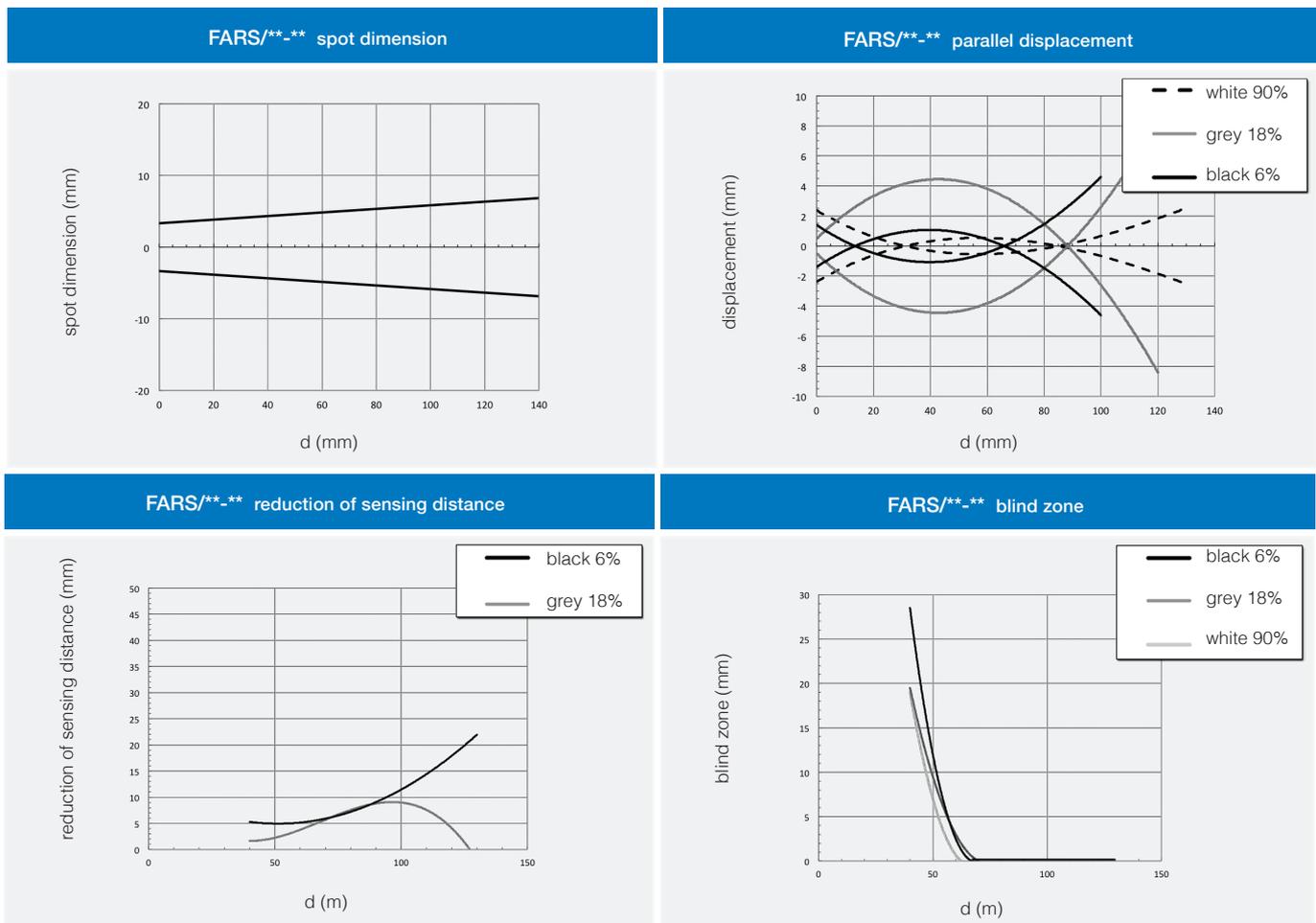
- BN** brown
- BU** blue
- BK** black
- WH** white
- PK** pink
- GY** gray

plug

M12 4 wires output complementary NO and NC

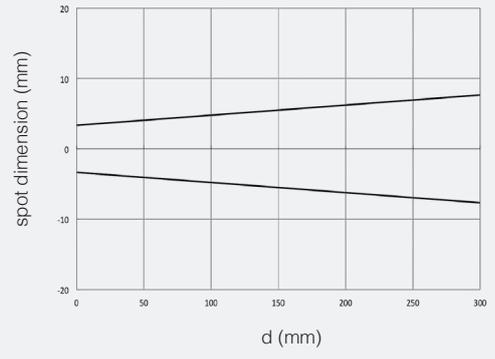


response diagram

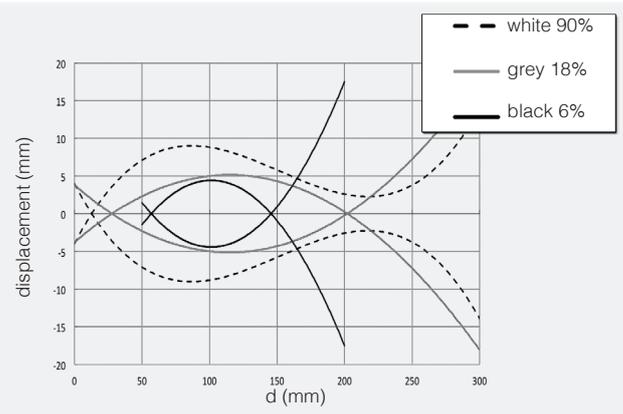




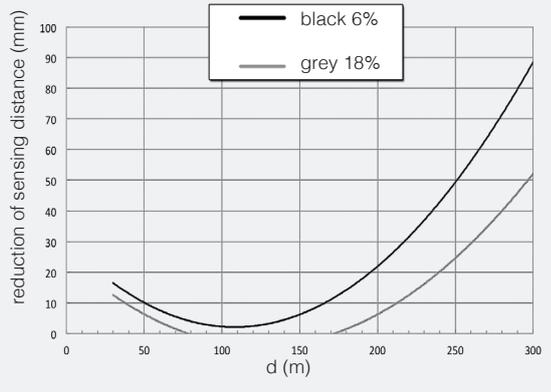
FARW/**-** spot dimension



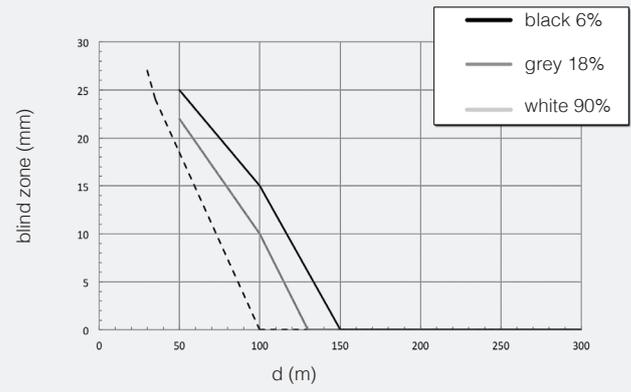
FARW/**-** parallel displacement



FARW/**-** reduction of sensing distance

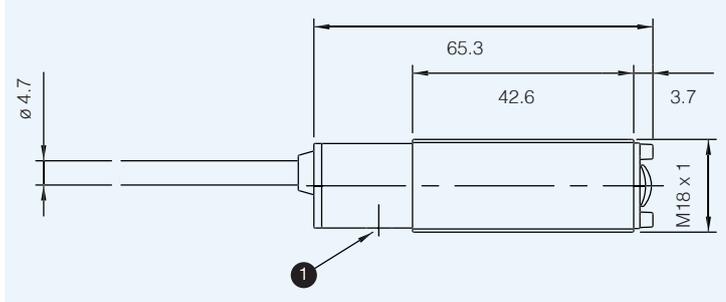


FARW/**-** blind zone

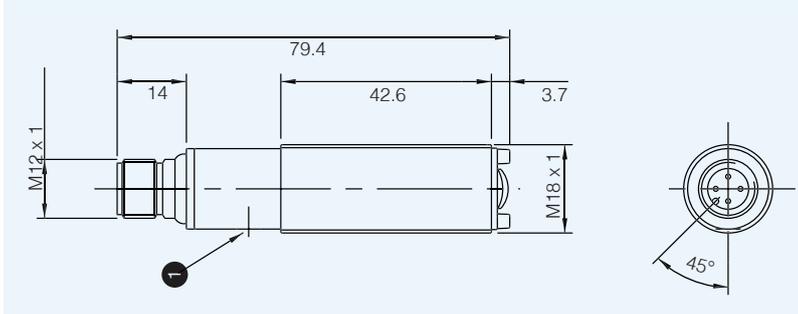


dimensions (mm)

FAR*/**-*A



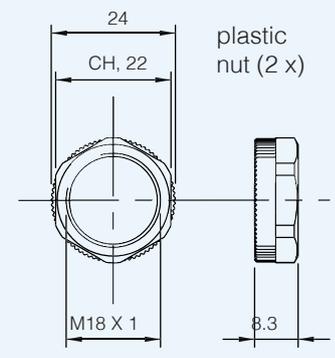
FAR*/**-*E



1 potentiometer for sensitivity adjustment

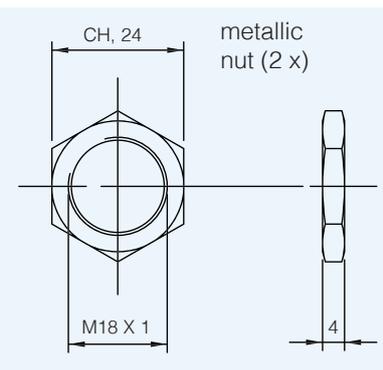
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models





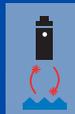
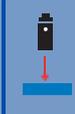
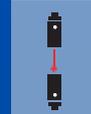
FA LASER series

M18 photoelectric sensors
DC LASER emission



features

- Complete range of M18 sensors with 10...30 Vdc power supply
- Axial and radial optic with flat surface
- Visible red laser emission models
- IP67 protection degree
- Metallic or plastic housing
- Sensitivity adjustment available for all models
- Total protection against any type of electric damages
- Approvals: CE and cULus listed



Cylindrical
M18 DC LASER

web contents



- Application notes
- Photos
- Catalogue / Manuals



code description

FA L N / B P - 0 A

| | | |
|---------------------|-----------|--|
| series | FA | M18 sensor with 3/4 DC wires |
| emission | L | Red laser diode emission |
| type | 4 | 300 mm direct reflection with adjustment |
| | N | Polarized with adjustment |
| emitter | H | Emitter |
| | D | Receiver with sensitivity adjustment |
| | 0 | LO/DO selectable output, 4 wires - Emitter |
| output | X | Emitter with check |
| | B | 4 wires output Complementary NO + NC |
| housing | 0 | Emitter |
| | P | PNP output |
| | N | NPN output |
| cable / plug output | 0 | Plastic housing axial optic |
| | 1 | Metal housing axial optic |
| | 2 | Plastic housing radial optic |
| | 3 | Metal housing radial optic |
| | A | Axial cable output |
| | E | Axial M12 plastic connector output |

(*) ATEX models available, contact our Sales Dept. for further information.



available models

Cylindrical
M18 DC LASER

| model | distance | housing | 4 wires NPN NO + NC | | 4 wires PNP NO + NC | |
|----------------|------------------|---------------|---------------------|------------|---------------------|------------|
| | | | cable | plug | cable | plug |
| direct diffuse | 300 mm | axial plastic | FAL4/BN-0A | FAL4/BN-0E | FAL4/BP-0A | FAL4/BP-0E |
| | | axial metal | FAL4/BN-1A | FAL4/BN-1E | FAL4/BP-1A | FAL4/BP-1E |
| | 200 mm | 90° plastic | FAL4/BN-2A | FAL4/BN-2E | FAL4/BP-2A | FAL4/BP-2E |
| | | 90° metal | FAL4/BN-3A | FAL4/BN-3E | FAL4/BP-3A | FAL4/BP-3E |
| polarized | 20 m (RL 110) | axial plastic | FALN/BN-0A | FALN/BN-0E | FALN/BP-0A | FALN/BP-0E |
| | | axial metal | FALN/BN-1A | FALN/BN-1E | FALN/BP-1A | FALN/BP-1E |
| | 30 m (RL 201) | 90° plastic | FALN/BN-2A | FALN/BN-2E | FALN/BP-2A | FALN/BP-2E |
| | | 90° metal | FALN/BN-3A | FALN/BN-3E | FALN/BP-3A | FALN/BP-3E |
| emitter | 50 m | axial plastic | - | FALH/X0-0E | - | - |
| | | axial metal | - | FALH/X0-1E | FALH/X0-1A | - |
| | | 90° plastic | - | FALH/X0-2E | FALH/X0-2A | - |
| | | 90° metal | - | FALH/X0-3E | FALH/X0-3A | FALH/X0-3E |
| receiver | 50 m | axial plastic | FALD/BN-1A | FALD/BN-0E | FALD/BP-0A | FALD/BP-0E |
| | | axial metal | FALD/BN-2A | FALD/BN-1E | FALD/BP-1A | FALD/BP-1E |
| | | 90° plastic | FALD/BN-3A | FALD/BN-2E | FALD/BP-2A | FALD/BP-2E |
| | | 90° metal | FALD/BN-4A | FALD/BN-3E | FALD/BP-3A | FALD/BP-3E |

| FAL4/**-** | |
|---|---|
|  | |
| nominal sensing distance | 300 mm (axial optic focused 100 mm) ⁽¹⁾ 200 mm (radial optic focused 100 mm) ⁽¹⁾ |
| emission | red laser diode (650 nm) class 1 laser (IEC60825-1) |
| minimum detectable object | 0.1 mm |
| hysteresis | ≤ 10 % |
| repeatability | 5 % |
| operating voltage | 10...30 Vdc |
| ripple | ≤ 10 % |
| no-load supply current | ≤ 30 mA |
| load current | 100 mA |
| leakage current | ≤ 10 µA a V max |
| output voltage drop | 2 V max. IL = 100 mA |
| output type | NPN or PNP; NO + NC or LO/DO selectable |
| switching frequency | 800 Hz |
| power on delay | 200 ms |
| power supply protections | polarity reversal, transient |
| output protection | short circuit (autoreset) Overvoltage |
| sensitivity adjustment | yes / Teach-In function |
| operating temperature range | - 15°C...+ 55°C (without freeze) |
| temperature drift | 10 % Sr |
| protection degree | IP67 (EN60529) ⁽²⁾ |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| external light interference | 3,000 lux (incandescent lamp) 10,000 lux (sunlight) |
| LEDs | green power supply / yellow (ON-Light state EG ≥ 2) / yellow (Flashing-Light state 1 < EG < 2) / yellow (OFF-Dark state) |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) |
| optic material | PC / glass |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable |

⁽¹⁾ White target kodak 90% reflection 100 x 100 mm

⁽²⁾ Protection guaranteed only with plug cable well mounted



technical specification

polarized models

Cylindrical
M18 DC LASER

| FALN/**-** | |
|-----------------------------|--|
| |  |
| nominal sensing distance | 20 m with RL 110 30 m with RL 201; 5 m with RL 100D |
| emission | red laser diode (650 nm) |
| emitter | class 1 Laser (IEC 825-1) |
| minimum detectable object | 0.7 mm - 1 m 24 mm - 25 m |
| spot dimension | see diagram |
| hysteresis | ≤ 10 % |
| repeatability | 5 % |
| operating voltage | 10...30 Vdc |
| ripple | ≤ 10 % |
| no-load supply current | ≤ 30 mA |
| load current | 100 mA |
| leakage current | ≤ 10 µA a V max |
| output voltage drop | 2 V max. IL = 100 mA |
| output type | NPN or PNP; NO + NC or LO/DO selectable |
| switching frequency | 800 Hz |
| power on delay | 200 ms |
| power supply protections | polarity reversal, transient |
| output protection | short circuit (autoreset) overvoltage |
| sensitivity adjustment | Yes / Teach-In function |
| operating temperature range | - 15°C...+ 55°C (without freeze) |
| temperature drift | 10 % Sr |
| protection degree | IP67 (EN60529) ⁽¹⁾ |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| external light interference | 3,000 lux (incandescent lamp) 10,000 lux (sunlight) |
| LEDs | green power supply / yellow (EG ≥ 2) / yellow (Flashing-Light state 1 < EG < 2) / yellow (OFF-Dark state) |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) |
| optic material | PC / glass |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable |

⁽¹⁾ Protection guaranteed only with plug cable well mounted



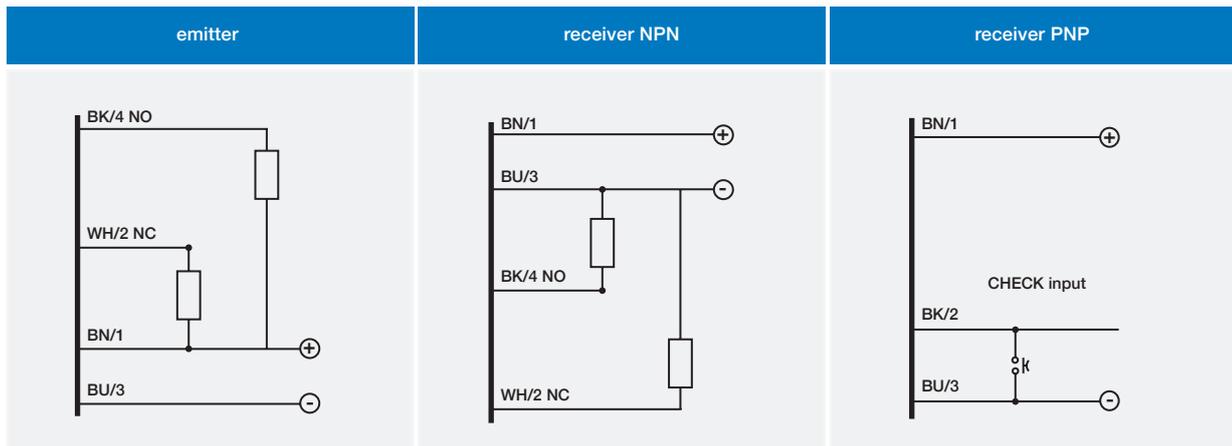
| | emitter | receiver |
|-----------------------------|---|---|
| | FALH/X0-** | FALD/**-** |
| | | |
| nominal sensing distance | 50 m | |
| emission | red laser diode (650 nm) | |
| emitter | class 1 Laser (IEC 60825-1) | |
| minimum detectable object | 10 mm | |
| spot dimension | see diagram | |
| hysteresis | ≤ 10 % | |
| repeatability | 5 % | |
| operating voltage | 10...30 Vdc | |
| ripple | ≤ 10 % | |
| no-load supply current | ≤ 25 mA | |
| load current | | 100 mA |
| leakage current | | ≤ 10 µA @ Vmax |
| output voltage drop | | 2 V max. IL = 100 mA |
| output type | | NPN or PNP |
| switching frequency | | 1 kHz |
| power on delay | | 200 ms |
| power supply protections | polarity reversal, transient | |
| output protection | | short circuit (autoreset) overvoltage |
| sensitivity adjustment | | trimmer |
| operating temperature range | - 15°C...+ 55°C (without freeze) | |
| temperature drift | 10 % Sr | |
| check input | BK/2 connected to 0 switches off the emission | - |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | |
| external light interference | - | |
| LEDs | green (power supply) yellow (on) yellow (off) | green (power supply) yellow (light status or output status in the special LO/DO version) |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | |
| optic material | PC / glass | |
| tightening torque | 1 Nm (plastic), 25 Nm (metallic) | |
| weight (approximate) | plastic version: 30 g connector / 50 g cable metallic version: 100 g connector / 130 g cable | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted



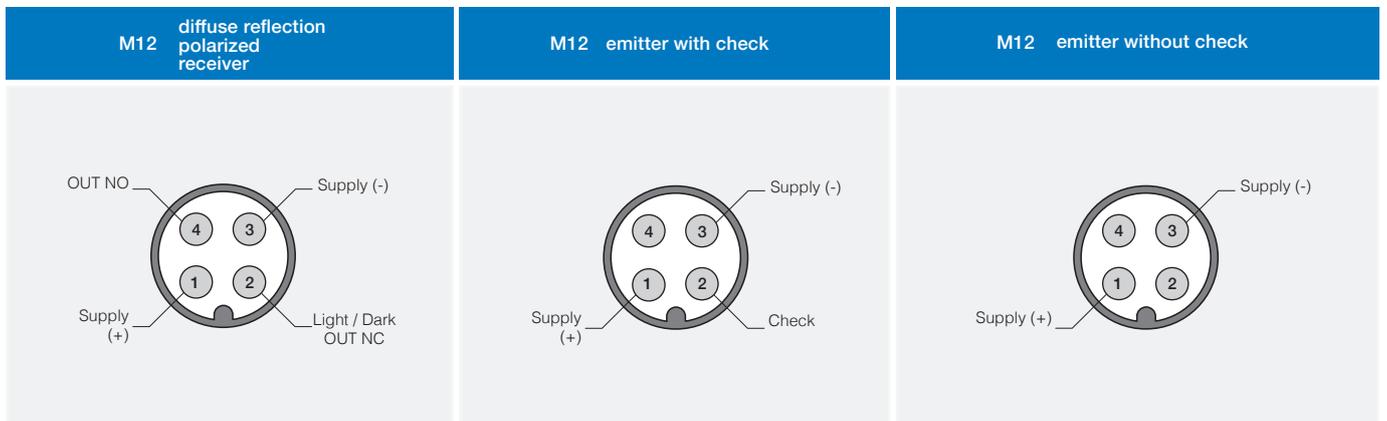
Cylindrical
M18 DC LASER

electrical diagrams of the connections



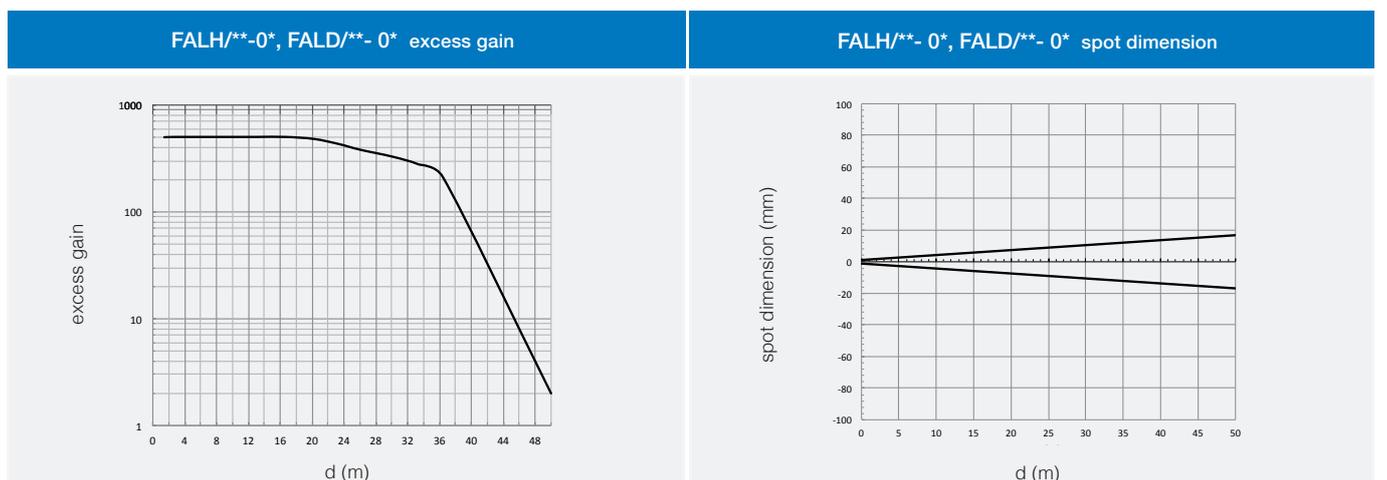
- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

plug



response diagram

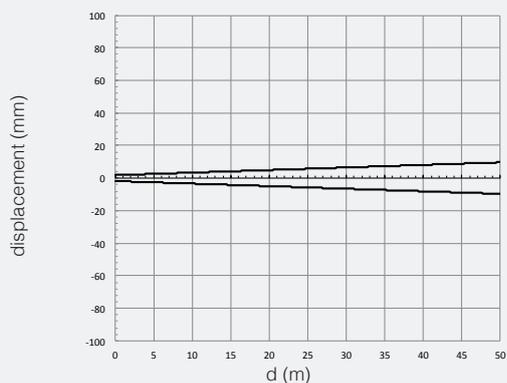
through beam models



FA LASER



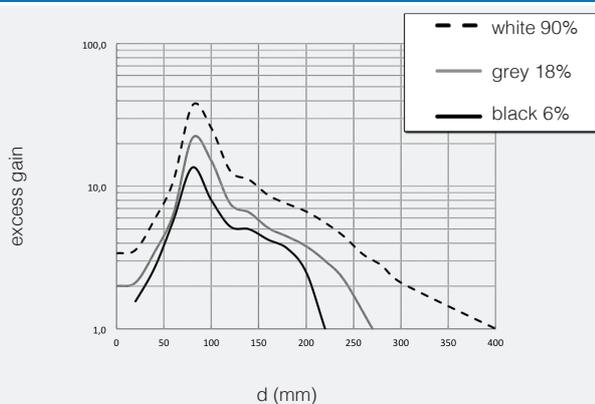
FALH/**- 0*, FALD/**- 0* parallel displacement



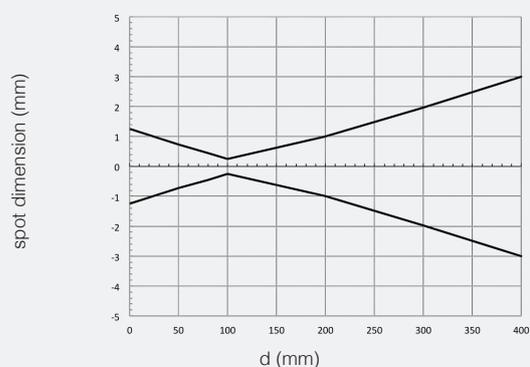
response diagram

direct diffuse models

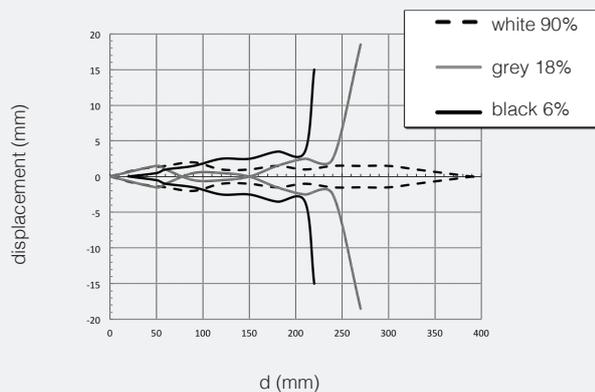
FAL4/B*-0,1* excess gain



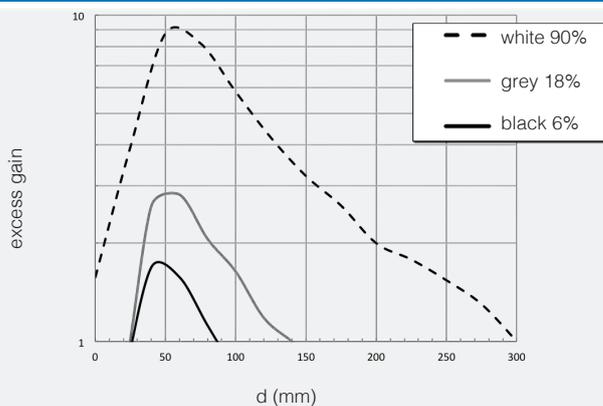
FAL4/B*-0,1* spot dimension



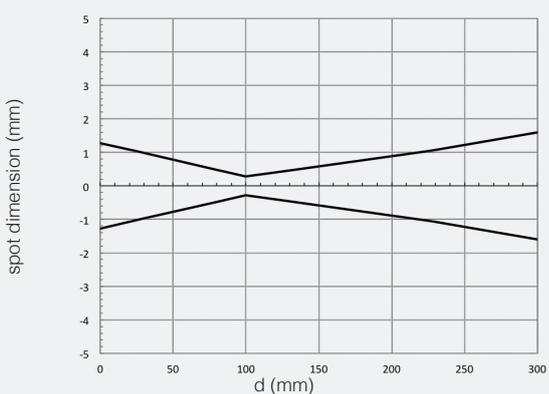
FAL4/B*-0,1* parallel displacement



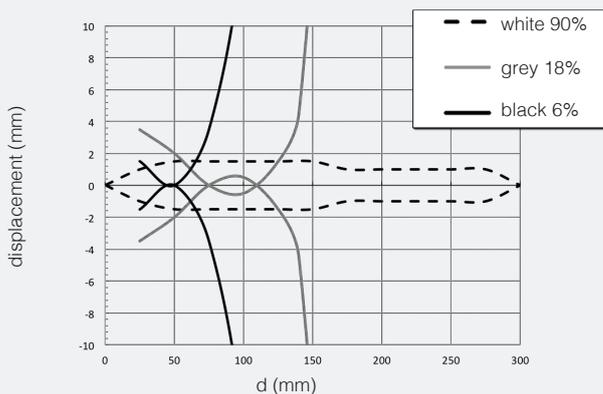
FAL4/B*-2,3* excess gain



FAL4/B*-2,3* spot dimension



FAL4/B*- 2,3* parallel displacement



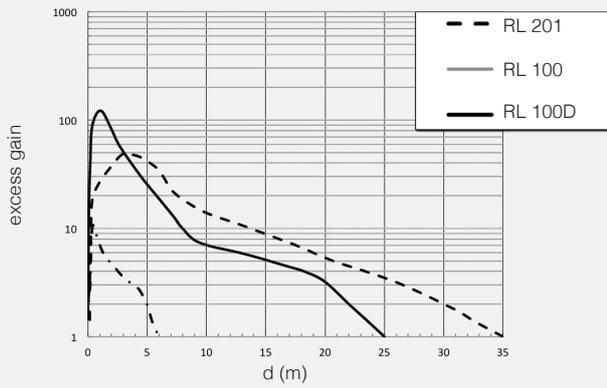


response diagram

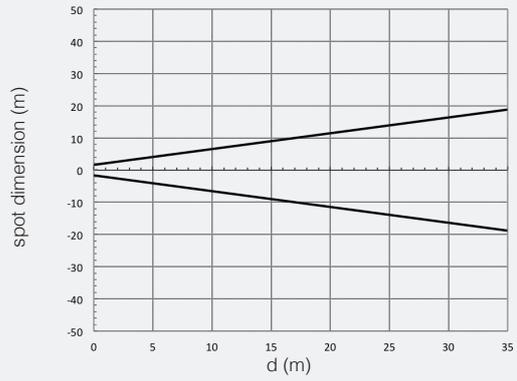
polarized models

Cylindrical
M18 DC LASER

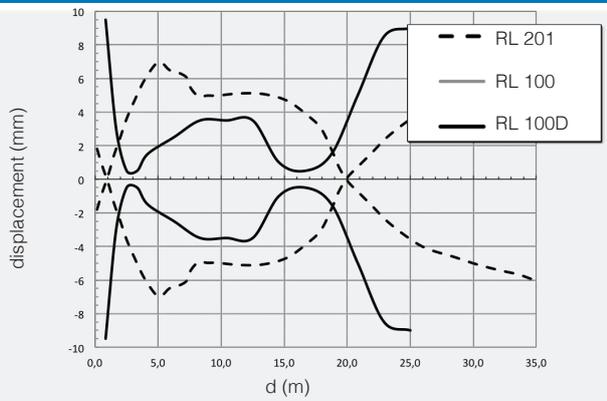
FALN/**-** excess gain



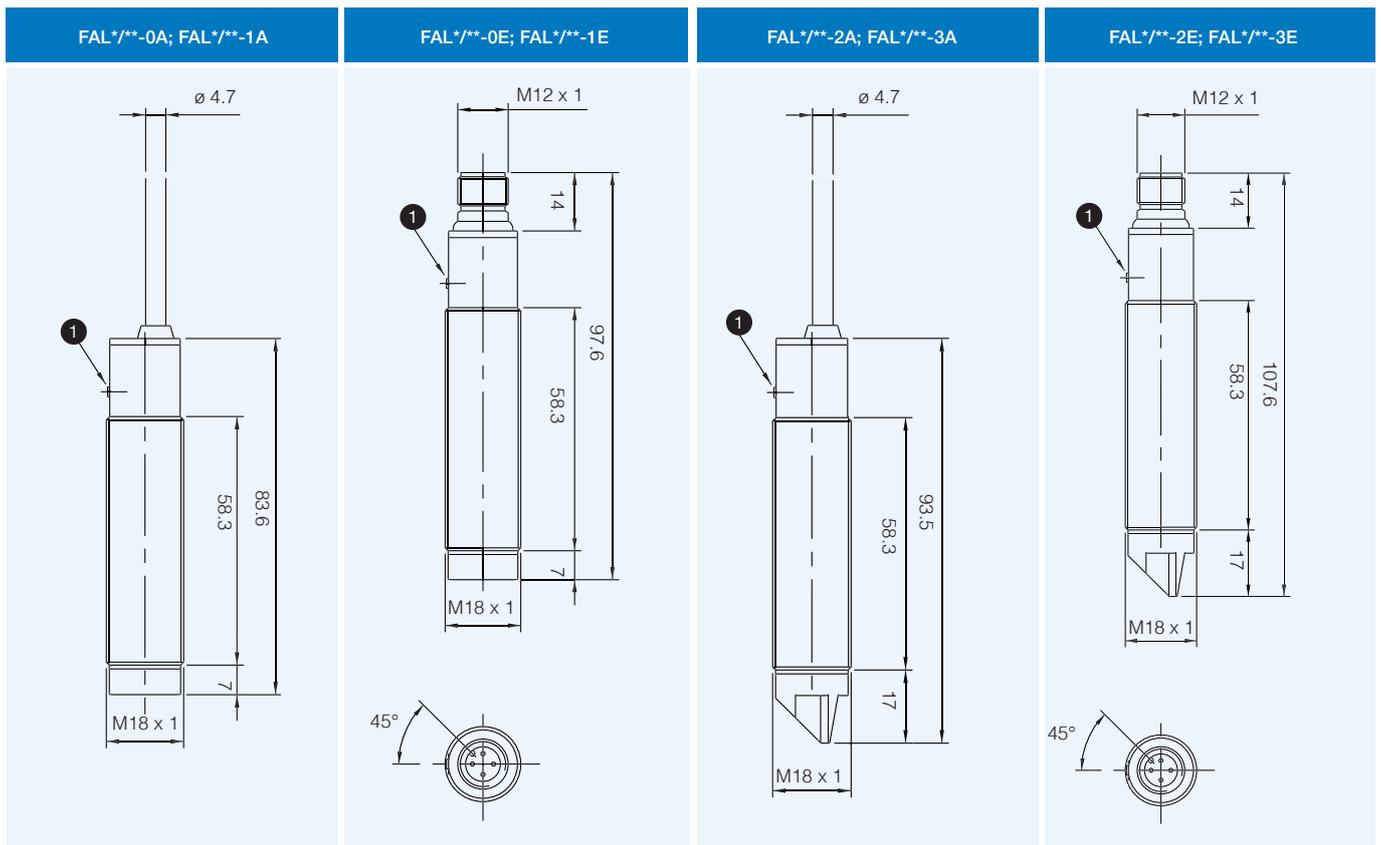
FALN/**-** spot dimension



FALN/**-** parallel displacement



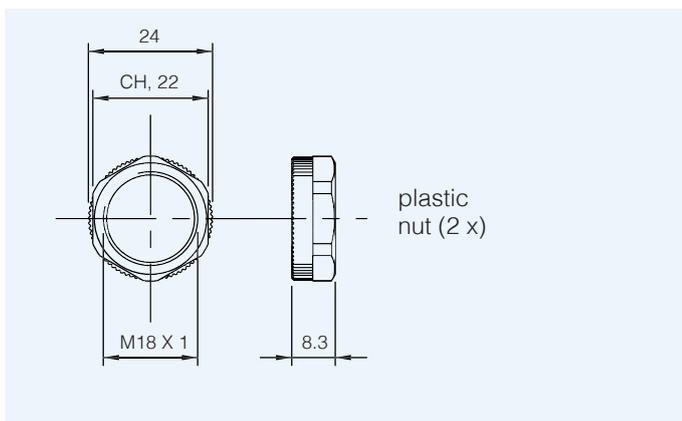
dimensions (mm)



1 Button for sensitivity adjustment

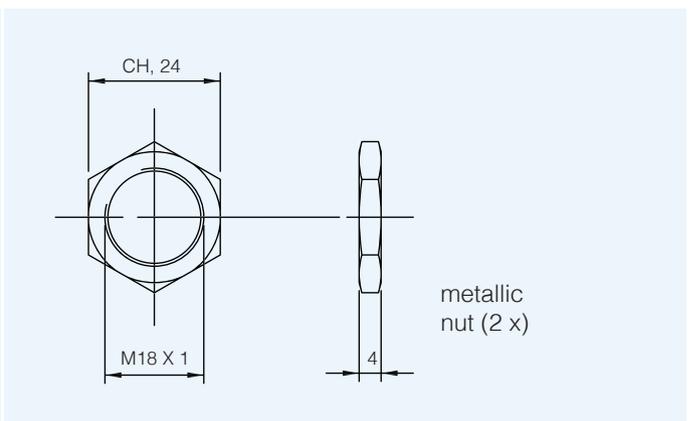
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models



Cylindrical
M18 DC LASER



Blank lined area for notes, consisting of 20 horizontal light blue lines.



FAL BGS series

M18 LASER with adjustable background suppression



features

- M18 Photoelectric sensor Background Suppression with Laser emission
- Models in Class I and Class II Laser emission power
- Axial and Right angle optic materials
- Sensing distance adjustment by trimmer
- Collimated Light spot
- Complete protection against electrical damages
- Nichel brass housing



web contents

- Application notes
- Photos
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Cylindrical M18 LASER

code description

FA L W / B P - 1 E 77

| | | |
|------------------------|----|--|
| series | FA | M18 Cylindrical photoelectric sensor |
| emission | L | Laser emission |
| background suppression | S | Background Suppression (Laser Class 1) |
| | W | Background Suppression (Laser Class 2) |
| output | 0 | Lo/Do selectable output |
| | B | Complementary output (NO+NC) |
| NPN / PNP output | N | NPN output |
| | P | PNP output |
| housing | 1 | Axial version Metallic housing |
| | 3 | Right Angle (90°) version Metallic housing |
| plug | E | Connector M12 4 pins |
| version | 77 | Special version (Anti Reflex) |

available models

| model | distance (mm) | laser class | optical | output selectable (LO/DO) | | complementary output (NO+NC) | |
|------------------------|---------------|-------------|-------------|---------------------------|------------|------------------------------|--------------|
| | | | | NPN | PNP | NPN | PNP |
| background suppression | 30...100 | 1 | axial | FALS/0N-1E | FALS/0P-1E | FALS/BN-1E | FALS/BP-1E |
| | 30...80 | | right angle | FALS/0N-3E | FALS/0P-3E | FALS/BN-3E | FALS/BP-3E |
| | 30...150 | 2 | axial | FALW/0N-1E | FALW/0P-1E | FALW/BN-1E | FALW/BP-1E |
| | 30...130 | | right angle | FALW/0N-3E | FALW/0P-3E | FALW/BN-3E | FALW/BP-3E |
| | 30...120 | | axial | - | - | FALW/BN-1E77 | FALW/BP-1E77 |
| | 30...100 | | right angle | - | - | FALW/BN-3E77 | FALW/BP-3E77 |



technical specification

according to IEC EN 60947-5-2

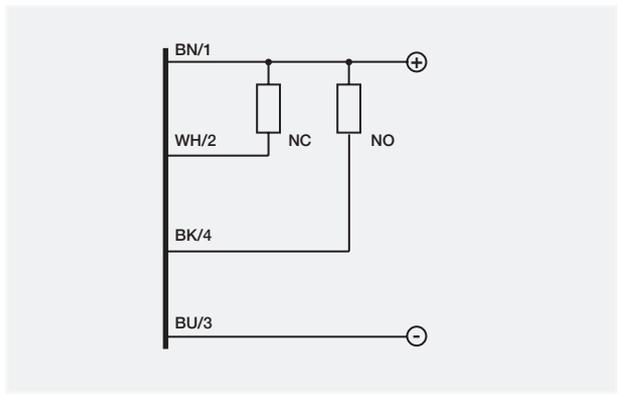
Cylindrical M18
LASER

| | axial | radial | axial | radial |
|----------------------------------|--|------------|-------------|----------------------|
| | FALS/**_** | FALS/**_** | FALW/**_** | FALW/**_** |
| | | | | |
| nominal sensing distance | 25...100 mm | 25...80 mm | 25...150 mm | 25...130 mm |
| sensing range (Sd) | 30...100 mm | 30...80 mm | 30...150 mm | 30...130 mm |
| emission | red laser diode (650 nm) | | | |
| Laser Protection Class EN60852-1 | 1 | | 2 | |
| adjustment | trimmer (270°) | | | |
| hysteresis | 10 % | | | |
| repeatability | 10 % | | | |
| operating voltage | 10...30 Vdc | | | |
| ripple | ≤ 10 % | | | |
| no-load current | ≤ 40 mA | | | |
| output current | 100 mA | | | |
| leakage current | ≤ 10 µA (Vdc max) | | | |
| output voltage drop | 2 V max. IL = 100 mA | | | |
| output type | NPN or PNP; NO + NC or LO/DO selectable | | | |
| switching frequency | 1.5 kHz | | | |
| power on delay | 250 ms | | | |
| power supply protections | polarity reversal, transient | | | |
| output protection | short circuit (auto reset), over voltage pulses | | | |
| temperature range | - 10°C...+ 50°C | | | |
| temperature drift | 10 % Sn | | | |
| max. Capacitive Load | 500 nF | | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | | |
| external light interference | 15,000 lux (incandescent lamp) | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| LED indicator | yellow (output state) | | | |
| housing material | nickel plated brass | | | |
| optic materials | PMMA ABS | | glass ABS | PMMA ABS glass ABS |
| exit plug | grilamid (PA 12) | | | |
| tightening torque | 40 Nm (metallic) | | | |
| weight | 60 g | | | |

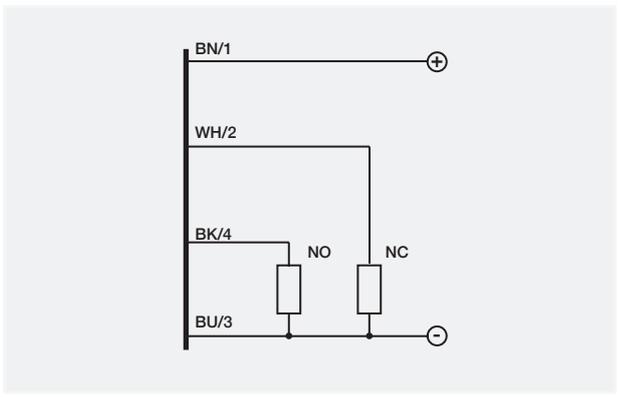
⁽¹⁾ Protection guaranteed only with plug cable well mounted

electric diagrams of the connections

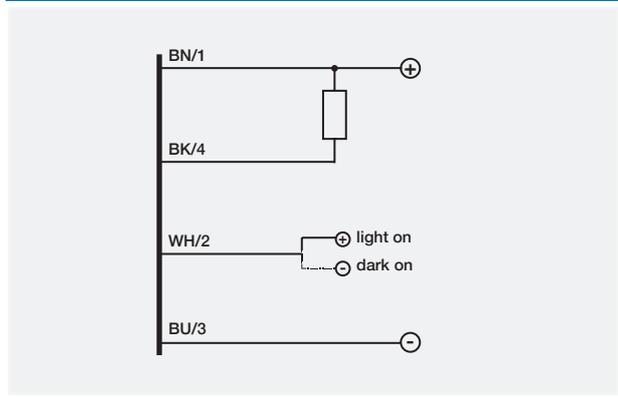
NPN NO + NC



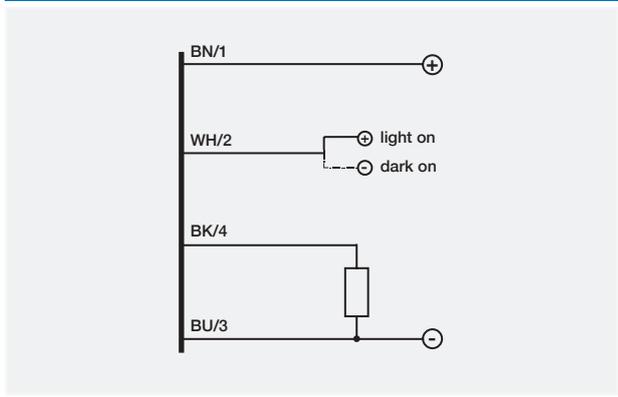
PNP NO + NC



NPN LO/DO



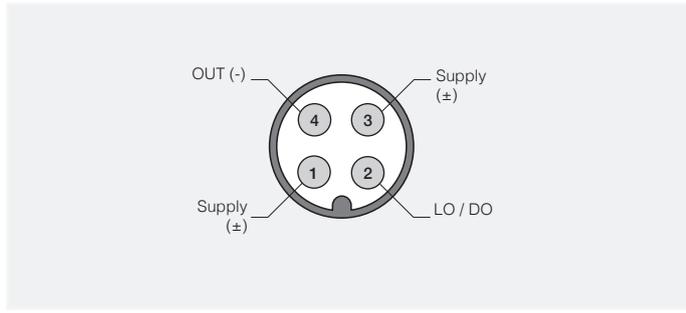
PNP LO/DO



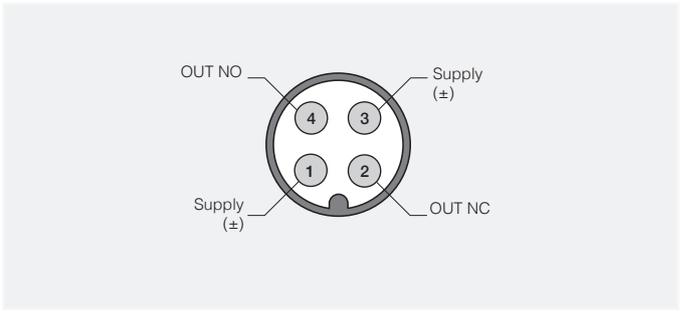
- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

plug

M12 FAL*/0*--**

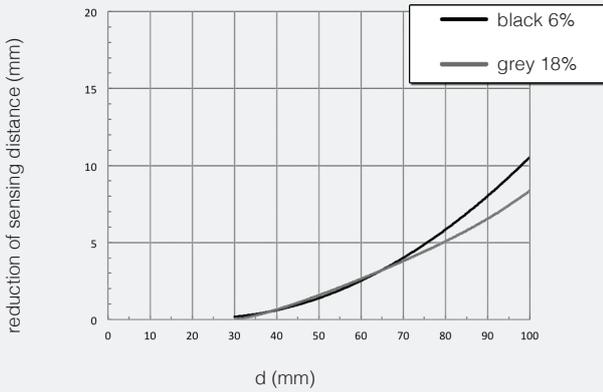


M12 FAL*/B*--**

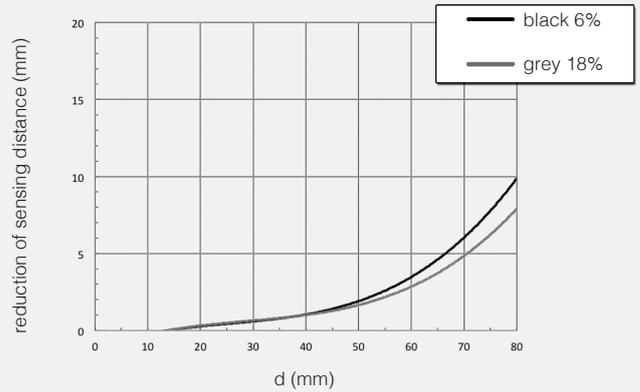




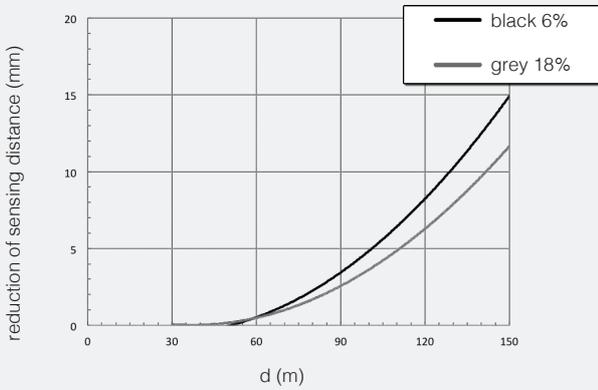
FALS/**-1E reduction of sensing distance



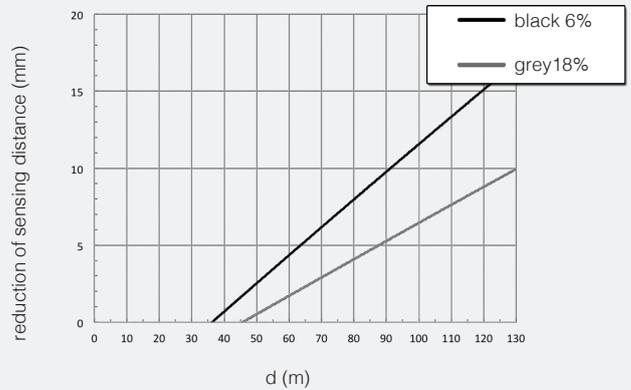
FALS/**-3E reduction of sensing distance



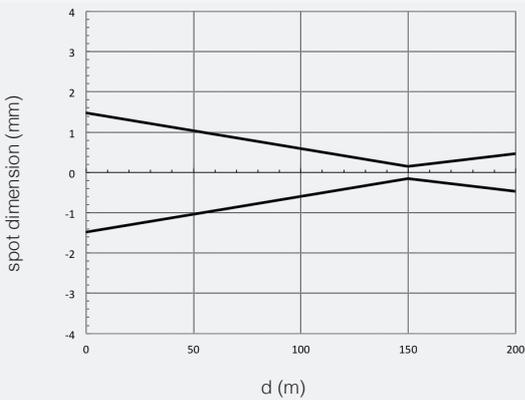
FALW/**-1E reduction of sensing distance



FALW/**-3E reduction of sensing distance

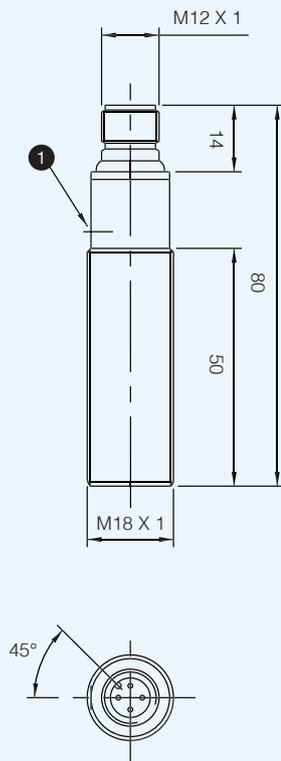


FAL_**/**_** spot dimension

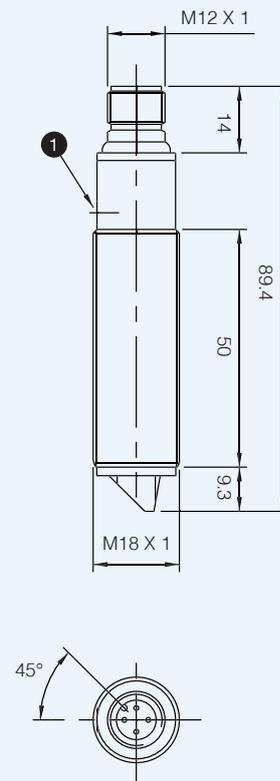


dimensions (mm)

FALS/**-1E; FALW/**-1E



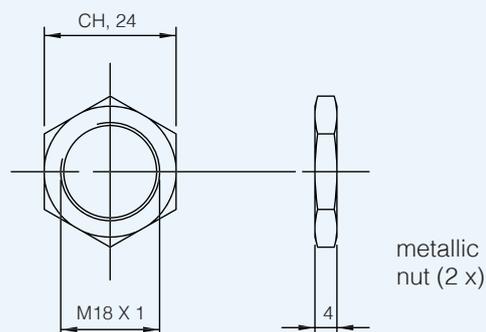
FALS/**-3E; FALW/**-3E



1 Trimmer

dimensions (mm)

accessories included in all models



Cylindrical M18
LASER



Blank lined area for notes, consisting of 20 horizontal light blue lines.



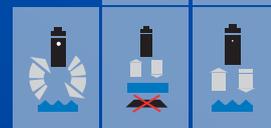
SS - SP series

M18 DC with lateral adjustment



features

- Models with side sens. adjustment on axial and right angle optic
- LO/DO selectable output
- ATEX models, cat. 3, available on request
- LED status indicator for all versions
- Complete protection against electrical damages
- IP67 protection degree for all models
- Approvals: CE and cULus listed



M18 DC with lateral adjustment

web contents

- Application notes
- Photos
- Catalogue / Manuals



code description (*)

background suppression

SS 0 / 0 N - 0 A

| | | |
|-------------------|-----------|---|
| series | SS | M18 photoelectric sensors with axial optic |
| type | 0 | 50 mm background suppr. without sens. adjust. |
| | 1 | 100 mm background suppr. without sens. adjust. |
| | T | Focalizer background suppr. 12 mm (with focalizer STF-12) - 25 mm (with focalizer STF-25) |
| output | 0 | LO/DO selectable output |
| | L | 3 wires – light on |
| | D | 3 wires – dark on |
| NPN / PNP output | N | NPN output |
| | P | PNP output |
| housing material | 0 | Plastic housing |
| | 1 | Metallic housing |
| cable / plug exit | A | Axial cable exit 2 m |
| | E | M12 plug cable exit |

(*) ATEX models available, contact our Sales Dept. for further information.



code description

diffuse reflection and retro-reflective

SS 2 / 0 N - 0 A

| | | |
|---------------------|----|---|
| series | SS | M18 photoelectric sensors with axial optic |
| | SP | M18 photoelectric sensors with right angle optic |
| type | 2 | 100 mm diffuse reflection without sens. adjust. |
| | 3 | 100 mm diffuse reflection with sens. adjust. |
| | 7 | 400 mm diffuse reflection with sens. adjust. |
| | 8 | 800 mm diffuse reflection with sens. adjust. |
| | C | 5 m retro-reflective without sens. adjust. ⁽¹⁾ |
| | P | 4 m polarized retro-reflective without sens. adjust. ⁽¹⁾ |
| output | 0 | LO/DO selectable output |
| | L | 3 wires - light on |
| | D | 3 wires - dark on |
| NPN / PNP output | N | NPN output |
| | P | PNP output |
| housing material | 0 | Plastic housing |
| | 1 | Metallic housing |
| cable / plug output | A | Axial cable exit |
| | E | M12 plug cable exit |
| | | Standard version |
| | 3X | Retro-reflective and polarized with sens. adjust. |

⁽¹⁾ Special version with sens. adjust, 3X variant

M18 DC with lateral adjustment

code description

through beam

SS H / 0 0 - 0 A

| | | |
|-------------------|----|---|
| series | SS | M18 photoelectric sensors with axial optic |
| | SP | M18 photoelectric sensors with right angle optic |
| type | H | 14 m emitter without sens. adjust. |
| | Z | 14 m receiver without sens. adjust. |
| | D | 14 m receiver with sens. adjust. |
| | U | Emitter with reduced visible beam |
| | G | 8 m receiver for small object |
| | V | 3 m receiver for ultra small object |
| | | 0 |
| features | X | Emitter with check |
| | L | 3 wires - light on - S*D and S*Z only |
| | D | 3 wires-dark on - S*D and S*Z only |
| | A | 3 wires - light on - S*G and S*V only |
| | C | 3 wires-dark on - S*G and S*V only |
| NPN / PNP output | 0 | Emitter |
| | N | NPN output |
| | P | PNP output |
| housing material | 0 | Plastic housing |
| | 1 | Metallic housing |
| cable / plug exit | A | Axial cable exit |
| | E | M12 plug cable exit - S*H, S*D and S*Z" versions only |
| | H | M12 plug cable exit - S*U, S*G and S*V versions only |

SS - SP

available models

plug exit photoelectric sensors axial optic



M18 DC with lateral adjustment

| function | distance | housing | adjustment | 3 wires LO NPN | 3 wires LO PNP | 3 wires DO NPN | 3 wires DO PNP | 4 wires NPN LO / DO | 4 wires PNP LO / DO |
|------------------------|-----------|---------------|----------------|----------------|----------------|----------------|----------------|---------------------|---------------------|
| background suppression | 50 mm | plastic | - | - | SS0/LP-0E | - | - | SS0/0N-0E | SS0/0P-0E |
| | | metallic | | - | SS0/LP-1E | - | - | SS0/0N-1E | SS0/0P-1E |
| | 100 mm | plastic | | - | SS1/LP-0E | - | - | SS1/0N-0E | SS1/0P-0E |
| | | metallic | | - | SS1/LP-1E | - | - | SS1/0N-1E | SS1/0P-1E |
| | focalized | plastic | | - | - | - | - | SST/0N-0E | SST/0P-0E |
| | | metallic | | - | - | - | - | SST/0N-1E | SST/0P-1E |
| diffuse reflection | 100 m | plastic | • | SS2/LN-0E | SS2/LP-0E | - | - | SS2/0N-0E | SS2/0P-0E |
| | | metallic | - | - | - | - | - | - | |
| | | plastic | • | SS2/LN-1E | SS2/LP-1E | - | - | SS2/0N-1E | SS2/0P-1E |
| | | metallic | - | - | - | - | - | SS3/0P-1E | |
| | 400 mm | plastic | • | - | SS7/LP-0E | - | - | SS7/0N-0E | SS7/0P-0E |
| | | metallic | - | - | SS7/LP-1E | - | - | SS7/0N-1E | SS7/0P-1E |
| | | 800 mm | plastic | • | - | - | - | - | SS8/0P-0E |
| | | | metallic | - | - | - | - | - | SS8/0P-1E |
| retro-reflective | 4 m | plastic | - | SSC/LN-0E | SSC/LP-0E | SSC/DN-0E | SSC/DP-0E | SSC/0N-0E | SSC/0P-0E |
| | | metallic | • | - | - | - | - | SSC/0N-0E3X | SSC/0P-0E3X |
| | | plastic | • | SSC/LN-1E | SSC/LP-1E | SSC/DN-1E | SSC/DP-1E | SSC/0N-1E | SSC/0P-1E |
| | | metallic | • | - | - | - | - | SSC/0N-1E3X | SSC/0P-1E3X |
| polarized | 3 m | plastic | - | SSP/LN-0E | SSP/LP-0E | SSP/DN-0E | SSP/DP-0E | SSP/0N-1E | SSP/0P-1E |
| | | metallic | • | - | - | - | - | SSP/0N-1E3X | SSP/0P-1E3X |
| | | plastic | • | SSP/LN-1E | SSP/LP-1E | SSP/DN-1E | SSP/DP-1E | SSP/0N-1E | SSP/0P-1E |
| | | metallic | • | - | - | - | - | SSP/0N-1E3X | SSP/0P-1E3X |
| through-beam | 14 m | plastic | emitter | SSH/00-0E | | | | | |
| | | | em. with check | SSH/X0-0E | | | | | |
| | | | receiver | SSZ/LN-0E | SSZ/LP-0E | SSZ/DN-0E | SSZ/DP-0E | SSZ/0N-0E | SSZ/0P-0E |
| | | receiver adj. | SSD/LN-0E | SSD/LP-0E | SSD/DN-0E | SSD/DP-0E | SSD/0N-0E | SSD/0P-0E | |
| | | metallic | emitter | SSH/00-1E | | | | | |
| | | | em. with check | SSH/X0-1E | | | | | |
| | receiver | | SSZ/LN-1E | SSZ/LP-1E | SSZ/DN-1E | SSZ/DP-1E | SSZ/0N-1E | SSZ/0P-1E | |
| | 8 m | plastic | emitter | SSU/00-0E | | | | | |
| | | | receiver | SSG/AN-0E | SSG/AP-0E | SSG/CN-0E | SSG/CP-0E | - | - |
| | | | emitter | SSU/00-1H | | | | | |
| | | receiver | SSG/AN-1H | SSG/AP-1H | SSG/CN-1E | SSG/CP-1H | - | - | |
| | | 3 m | plastic | emitter | SSU/00-0E | | | | |
| receiver | | | | SSV/AN-0E | SSV/AP-0E | SSV/CN-0E | SSV/CP-0E | - | - |
| metallic | emitter | | SSU/00-1H | | | | | | |
| receiver | - | | | | | | | | |



available models

cable exit photoelectric sensors axial optic

M18 DC with lateral adjustment

| function | distance | housing | adjustment | 3 wires LO NPN | 3 wires LO PNP | 3 wires DO NPN | 3 wires DO PNP | 4 wires NPN LO / DO | 4 wires PNP LO / DO |
|---------------------------|-------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|------------------------|------------------------|
| background suppression | 50 mm | plastic | - | - | - | - | - | SS0/0N-0A | SS0/0P-0A |
| | | metallic | | - | - | - | - | SS0/0N-1A | SS0/0P-1A |
| | 100 mm | plastic | | - | - | - | - | SS1/0N-0A | SS1/0P-0A |
| | | metallic | | - | - | - | - | SS1/0N-1A | SS1/0P-1A |
| | focalizzata | plastic | | - | - | - | - | SST/0N-0A | SST/0P-0A |
| | | metallic | | - | - | - | - | SST/0N-1A | SST/0P-1A |
| diffuse reflection | 100 m | plastic | ● | SS2/LN-0A | SS2/LP-0A | - | SS2/DP-0A | SS2/0N-0A | SS2/0P-0A |
| | | metallic | - | - | - | - | SS3/0N-0A | SS3/0P-0A | |
| | | plastic | ● | SS2/LN-1A | SS2/LP-1A | SS2/DN-1A | SS2/DP-1A | SS2/0N-1A | SS2/0P-1A |
| | | metallic | - | - | - | - | SS3/0N-1A | SS3/0P-1A | |
| | 400 mm | plastic | ● | - | - | - | - | SS7/0N-0A | SS7/0P-0A |
| | | metallic | - | - | - | - | - | SS7/0N-1A | SS7/0P-1A |
| | | plastic | ● | - | - | - | - | SS8/0N-0A | SS8/0P-0A |
| | | metallic | - | - | - | - | - | SS8/0N-1A | SS8/0P-1A |
| 800 mm | plastic | ● | - | - | - | - | SS8/0N-0A | SS8/0P-0A | |
| | metallic | - | - | - | - | - | SS8/0N-1A | SS8/0P-1A | |
| | plastic | ● | - | - | - | - | SSC/0N-0A | SSC/0P-0A | |
| | metallic | - | - | - | - | - | SSC/0N-1A | SSC/0P-1A | |
| retro-reflective | 5 m | plastic | ● | - | - | - | - | SSC/0N-0A3X | SSC/0P-0A3X |
| | | metallic | - | - | - | - | - | SSC/0N-1A | SSC/0P-1A |
| | | plastic | ● | - | - | - | - | SSC/0N-1A3X | SSC/0P-1A3X |
| | | metallic | - | - | - | - | - | SSC/0N-1A3X | SSC/0P-1A3X |
| polarized | 4 m | plastic | ● | - | - | - | SSP/DP-0A | SSP/0N-1A | SSP/0P-1A |
| | | metallic | - | - | - | - | SSP/DP-1A | SSP/0N-1A | SSP/0P-1A |
| | | plastic | ● | - | - | - | - | SSP/0N-1A3X | SSP/0P-1A3X |
| | | metallic | - | - | - | - | - | SSP/0N-1A3X | SSP/0P-1A3X |
| through-beam | 14 m | plastic | emitter | SSH/00-0A | | | | | |
| | | | em. with check | SSH/X0-0A | | | | | |
| | | | receiver | SSZ/LN-0A | SSZ/LP-0A | SSZ/DN-0A | SSZ/DP-0A | SSZ/0N-0A | SSZ/0P-0A |
| | | | receiver adj. | - | - | - | - | SSD/0N-0A | SSD/0P-0A |
| | | metallic | emitter | SSH/00-1A | | | | | |
| | | | em. with check | SSH/X0-1A | | | | | |
| | | | receiver | - | - | - | - | SSZ/0N-1E | SSZ/0P-1E |
| | | | receiver adj. | - | - | - | - | SSD/0N-1E | SSD/0P-1E |
| | 8 m | plastic | emitter | SSU/00-0A | | | | | |
| | | | receiver | SST/AN-0A | SST/AP-0A | SST/CN-0A | SST/CP-0A | - | - |
| | | | emitter | SSU/00-1A | | | | | |
| | | | em. with check | SSU/X0-1A | | | | | |
| | | metallic | receiver | SST/AN-1A | SST/AP-1A | SST/CN-1A | SST/CP-1A | - | - |
| | | | emitter | SSU/00-0A | | | | | |
| | | | em. with check | SSU/X0-0A | | | | | |
| | | | receiver | - | SSV/AP-0A | - | - | - | - |
| 3 m | plastic | emitter | SSU/00-0A | | | | | | |
| | | em. with check | SSU/X0-0A | | | | | | |
| | receiver | - | SSV/AP-0A | - | - | - | - | | |
| | metallic | emitter | SSU/00-1A | | | | | | |
| receiver | | - | SSV/AP-1A | - | - | - | - | | |



available models

plug exit photoelectric sensors radial optic

| function | distance | housing | adjustment | 3 wires LO NPN | 3 wires LO PNP | 3 wires DO NPN | 3 wires DO PNP | 4 wires NPN LO/DO | 4 wires PNP LO/DO |
|--------------------|----------|----------|--------------------------------|-------------------|-------------------|-------------------|-------------------|----------------------|----------------------|
| diffuse reflection | 100 mm | plastic | - | SP2/LN-0E | SP2/LP-0E | - | - | SP2/0N-0E | SP2/0P-0E |
| | | metallic | ● | - | - | - | - | - | SP3/0P-0E |
| | 400 mm | plastic | - | SP2/LN-1E | SP2/LP-1E | - | - | SP2/0N-1E | SP2/0P-1E |
| | | metallic | ● | - | - | - | - | - | SP3/0P-1E |
| | | plastic | - | - | - | - | - | SP7/0N-0E | SP7/0P-0E |
| | | metallic | - | - | - | - | - | - | SP8/0P-0E |
| through-beam | 14 m | plastic | emitter receiver with check | SPH/00-0E | | | | | |
| | | metallic | emitter | - | - | - | - | SPZ/0N-0E | SPZ/0P-0E |
| | 8 m | plastic | emitter | SPH/00-1E | | | | | |
| | 3 m | metallic | emitter | SPU/00-0E | | | | | |
| | | | | SPU/00-1E | | | | | |

available models

cable exit photoelectric sensors radial optic

| function | distance | housing | adjustment | 3 wires LO NPN | 3 wires LO PNP | 3 wires DO NPN | 3 wires DO PNP | 3 wires NPN LO/DO | 3 wires PNP LO/DO |
|--------------------|----------|----------|----------------|-------------------|-------------------|-------------------|-------------------|----------------------|----------------------|
| diffuse reflection | 100 mm | metallic | ● | - | - | SP3/DN-1A | - | - | - |
| | 400 mm | plastic | | - | - | - | - | SP7/0N-0A | SP7/0P-0A |
| | | metallic | | - | - | - | - | SP7/0N-1A | SP7/0P-1A |
| through-beam | 14 m | plastic | emitter | SPH/00-0A | | | | | |
| | | | em. with check | SPH/X0-0A | | | | | |
| | | | receiver | - | - | - | - | SPZ/0N-0A | SPZ/0P-0A |
| | 3 m | metallic | emitter | SPH/00-1A | | | | | |
| | | | em. with check | SPH/X0-1A | | | | | |
| | | | receiver | - | - | - | - | SPZ/0N-1A | SPZ/0P-1A |
| | | | emitter | SPU/00-1A | | | | | |



technical specification

background suppression models

M18 DC with lateral adjustment

| | SS0/**-** | SS1/**-** | SST/**-** |
|-----------------------------|---|---|---|
| | |  | |
| nominal sensing distance | 50 mm | 100 mm | 12/25 mm |
| emission | red (660 nm) | | |
| spot diameter | see diagram | | |
| minimum detectable object | 1 mm | 3.5 mm | 0.1 mm with STF-12 0.25 mm with STF-25 |
| dfferential travel | ≤ 10 % | | |
| repeatability | 5 % | | |
| operating voltage | 10...30 Vdc | | |
| ripple | ≤ 10 % | | |
| supply current | ≤ 30 mA | | |
| load current | 100 mA | | |
| leakage current | 10 µA | | |
| output voltage drop | 1.2 V max. IL = 100 mA | | |
| output type | NPN or PNP - LO/DO selectable | | |
| switching frequency | 1 kHz | | |
| power on delay | 200 ms | | |
| power supply protections | polarity reversal, transient | | |
| output protection | short circuit (autoreset) | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | |
| temperature drift | 10 % Sr | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | |
| external light interference | 3,000 lux (incandescence lamp) 10,000 lux (sunlight) | | |
| LEDs | yellow | | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | |
| optic material | plastic | | |
| tightening torque | 25 Nm (metallic housing), 1 Nm (plastic housing) | | |
| weight (approx) | plastic version: 30 g connector / 70 g cable metallic version: 100 g connector / 130 g cable | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted

technical specification

diffuse reflection and retro-reflective models



M18 DC with lateral adjustment

| | diffuse reflection | | | | retro-reflective | polarized |
|-----------------------------|---|---------------------------------------|---------------------------------------|---------------------------|---------------------------|--------------|
| | S*2/**_** | S*3/**_** | S*7/**_** | S*8/**_** | S*C/**_**** | S*P/**_**** |
| | | | | | | |
| nominal sensing distance | with white target 100 x 100 mm | 400 mm with white target 200 x 200 mm | 800 mm with white target 400 x 400 mm | 5 m with reflector RL 110 | 4 m with reflector RL 110 | |
| emission | infrared (880 nm) | | | | | red (660 nm) |
| differential travel | ≤ 10 % | | | | | |
| repeatability | 5 % | | | | | |
| operating voltage | 10...30 Vdc | | | | | |
| ripple | ≤ 10 % | | | | | |
| supply current | 30 mA | | | | | |
| load current | 100 mA | | | | | |
| leakage current | 10 µA | | | | | |
| output voltage drop | 1.2 V max. IL = 100 mA | | | | | |
| output type | NPN or PNP - LO/DO selectable | | | | | |
| switching frequency | 250 Hz | | | | | |
| power on delay | 200 ms | | | | | |
| power supply protections | polarity reversal, transient | | | | | |
| output protection | short circuit (autoreset) | | | | | |
| sensibility adjustment | - | ● | | | - | ● |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | | | |
| temperature drift | 10 % Sr | | | | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | |
| external light interference | 3,000 lux (incandescence lamp), 10,000 lux (sunlight) | | | | | |
| LEDs | yellow | | | | | |
| housing material | PBT (plastic) / nicked plated brass / PC (cable exit) | | | | | |
| optic material | plastic | | | | | |
| tightening torque | 1 Nm (plastic housing), 25 Nm (metal housing) | | | | | |
| weight (approx) | plastic version: 30 g connector / 70 g cable metallic version: 100 g connector / 130 g cable | | | | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted



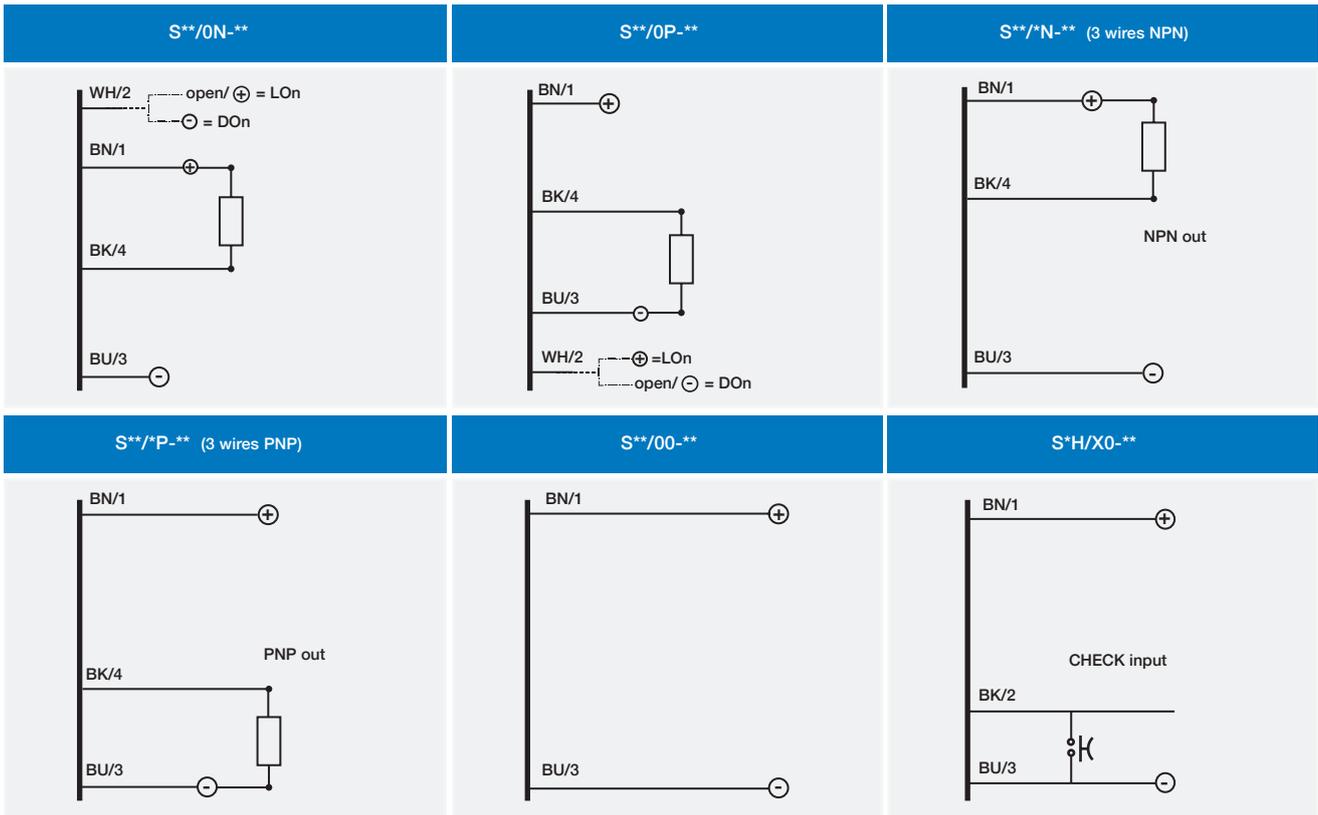
technical specification

through beam models

M18 DC with lateral adjustment

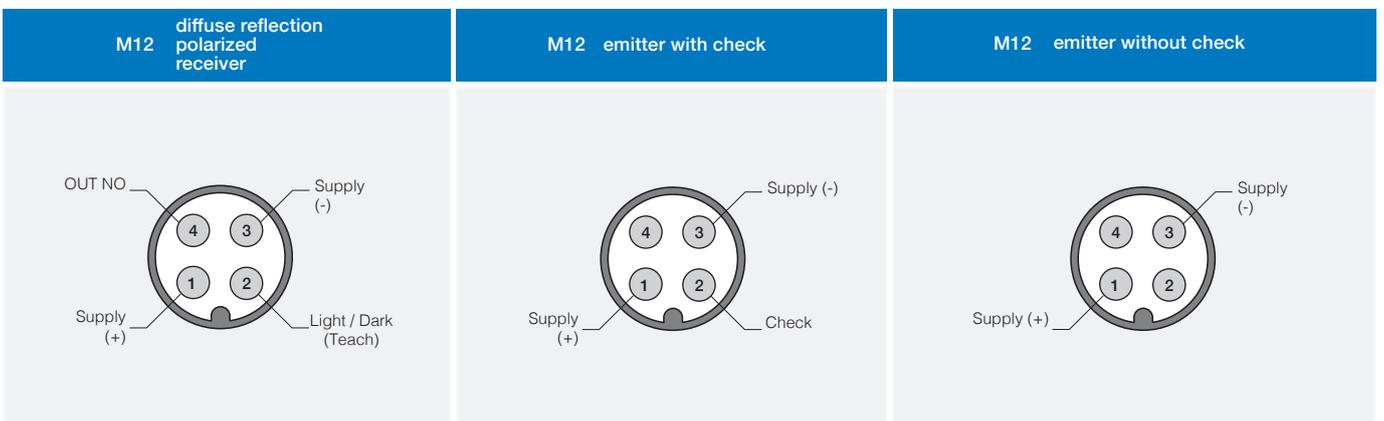
| | standard beam | | | barrier for small and ultra-small objects | | |
|-----------------------------|---|-----------|-----------|---|-----------|-----------|
| | emitter | receiver | receiver | emitter | receiver | receiver |
| | S*H/*0-** | S*Z/**_** | S*D/**_** | S*U/*0-** | S*G/**_** | S*V/**_** |
| | | | | | | |
| nominal sensing distance | 14 m | | | - | 8 m | 3 m |
| minimum detectable object | - | | | | Ø 4 mm | Ø 1 mm |
| emission | red (660) | | | | | |
| tolerance | - | | | 90% - 200% @ Eg = 1,5 | | |
| dfferential travel | ≤ 10 % | | | | | |
| repeatability | 5 % | | | | | |
| operating voltage | 10...30 Vdc | | | | | |
| ripple | ≤ 10 % | | | | | |
| supply current | 40 mA | 30 mA | | 25 mA | 20 mA | |
| load current | 100 mA | | | | | |
| leakage current | 10 µA | | | | | |
| output voltage drop | 2.5 V max. IL = 100 mA | | | | | |
| output type | NPN or PNP - LO/DO selectable | | | NPN or PNP - NO or NC | | |
| switching frequency | 250 Hz | | | | | |
| power on delay | 200 ms | | | | | |
| power supply protections | polarity reversal, transient | | | | | |
| output protection | short circuit (autoreset) | | | | | |
| sensibility adjustment | - | ● | | | | - |
| operating temperature range | - 25°C...+ 75°C (without freeze) | | | | | |
| temperature drift | 10 % Sr | | | ≤ 10 % Sr | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | | |
| LEDs | yellow | | | red (activated output) | | |
| housing material | PBT (plastic) / nicked plated brass / PC (cable exit) | | | | | |
| optic material | plastic | | | | | |
| tightening torque | 1 Nm (plastic housing), 25 Nm (metallic housing) | | | | | |
| weight (approx) | plastic version: 30 g connector / 70 g cable metallic version: 100 g connector / 130 g cable | | | | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted



- BN** brown
- BU** blue
- BK** black
- WH** white
- PK** pink
- GY** grey

plug



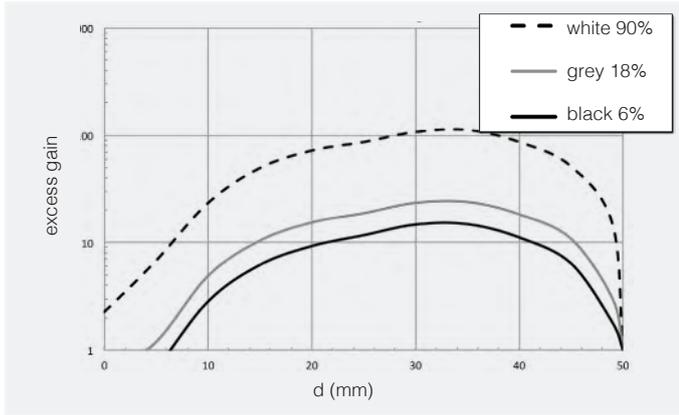


response diagrams

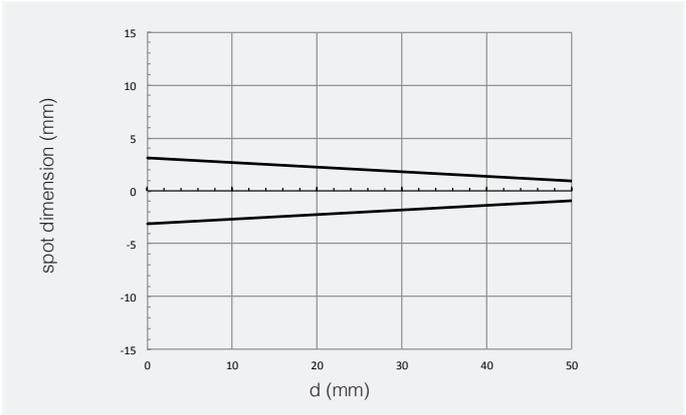
background suppression models

M18 DC with lateral adjustment

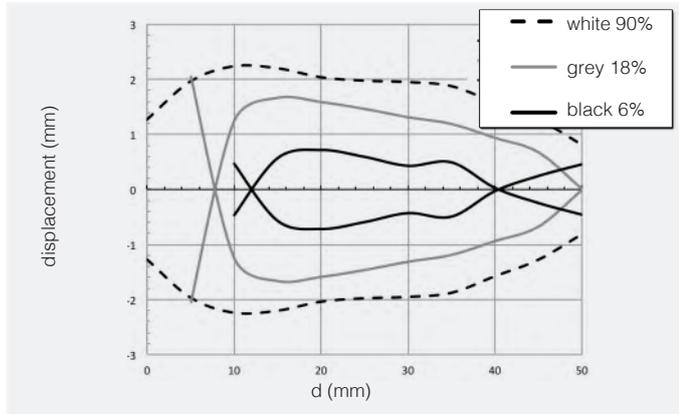
SS0/**-** excess gain



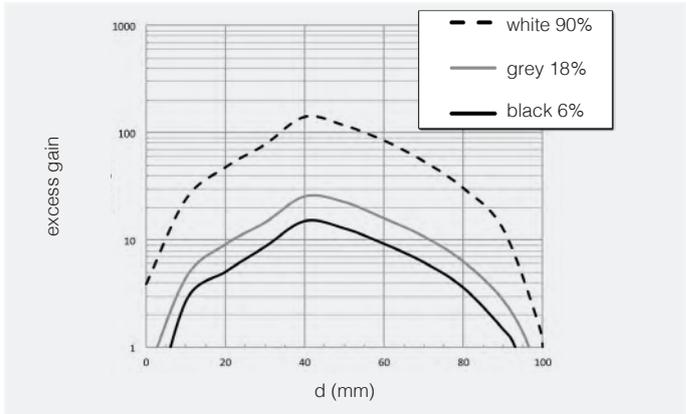
SS0/**-** spot dimension



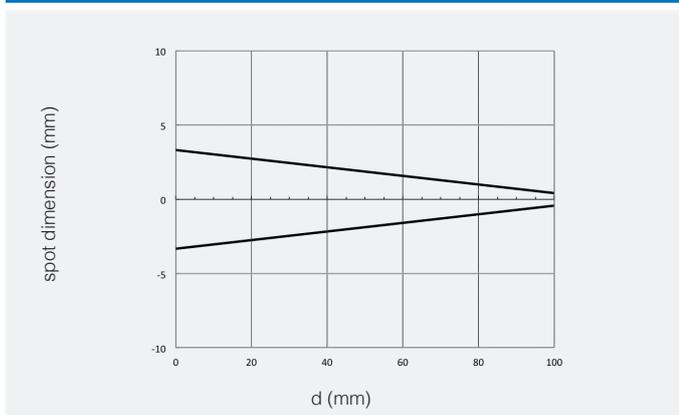
SS0/**-** parallel displacement



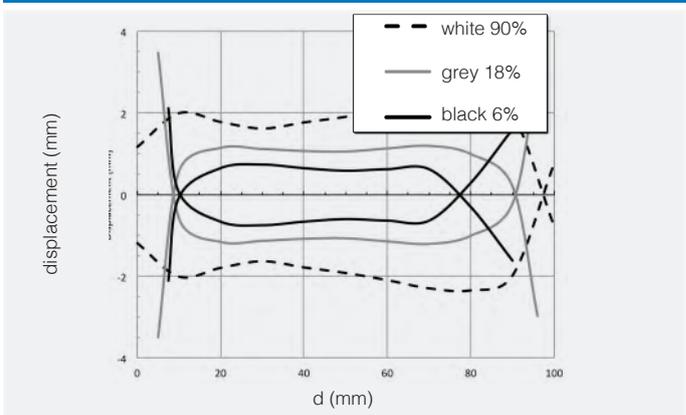
SS1/**-** excess gain



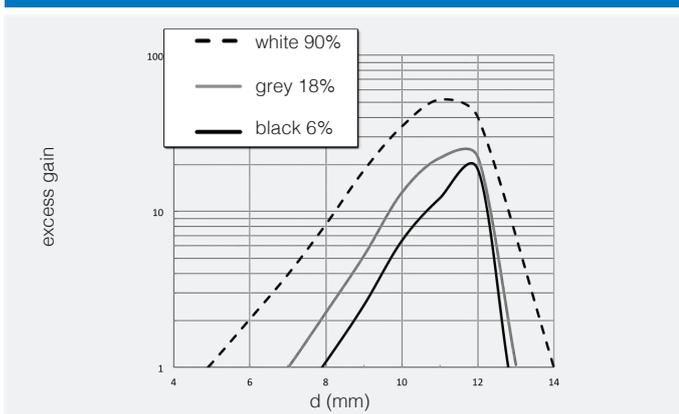
SS1/**-** spot dimension



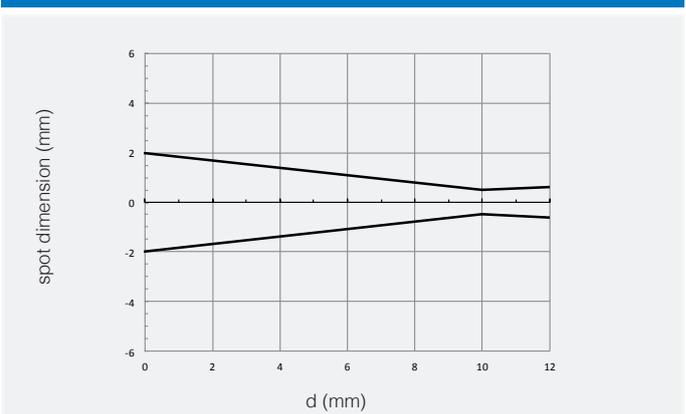
SS1/**-** parallel displacement



S*T/**-** + STF-12 excess gain



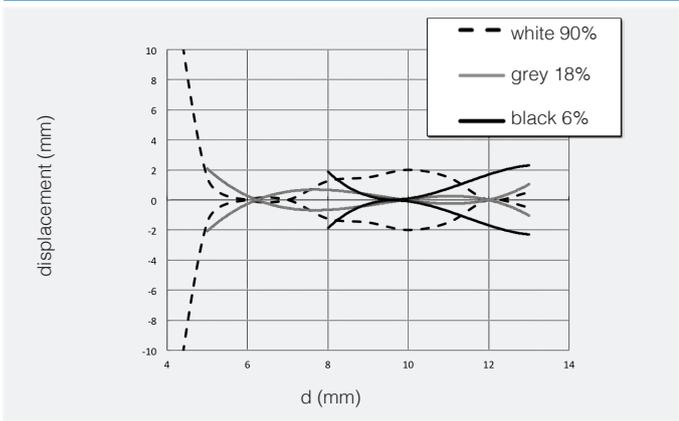
S*T/**-** + STF-12 spot dimension



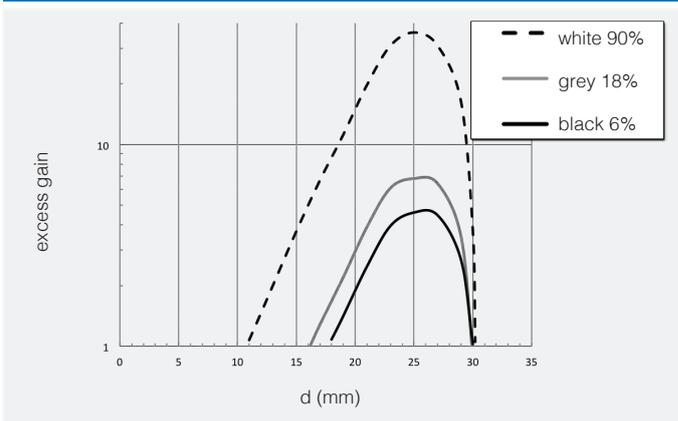
SS - SP



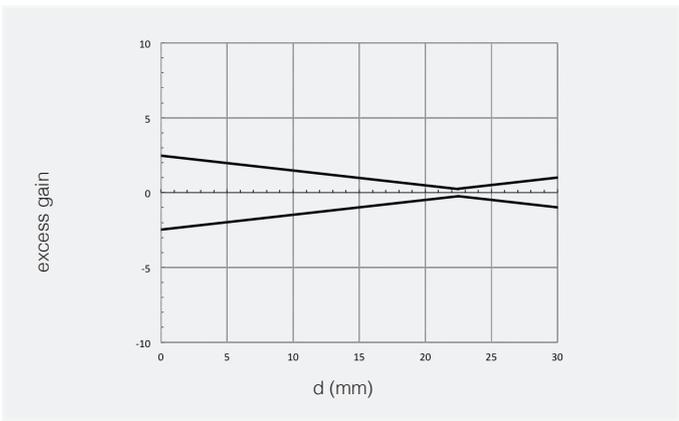
S*T/**-** + STF-12 parallel displacement



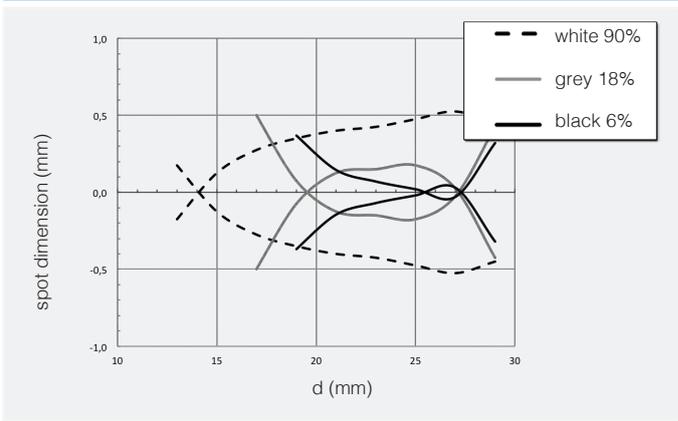
S*T/**-** + STF-25 excess gain



S*T/**-** + STF-25 spot dimension



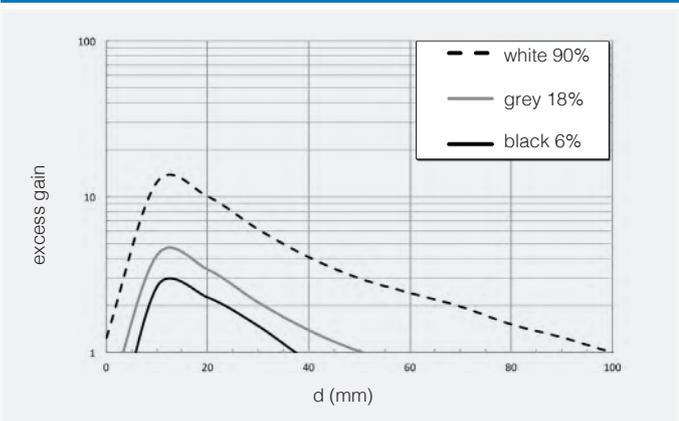
S*T/**-** + STF-25parallel displacementnt



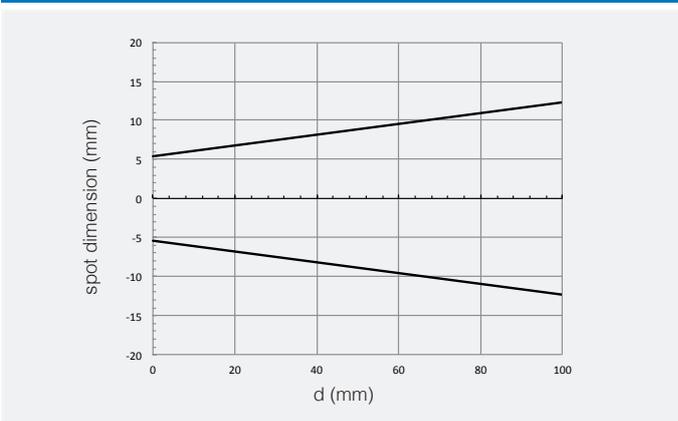
response diagrams

retro-reflective models

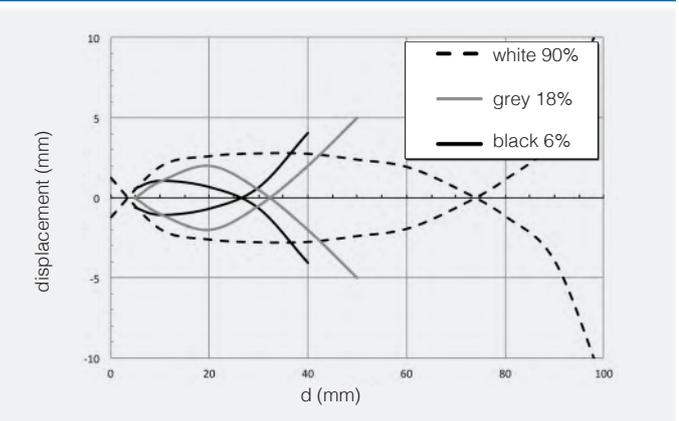
S*2,S*3/**-** excess gain



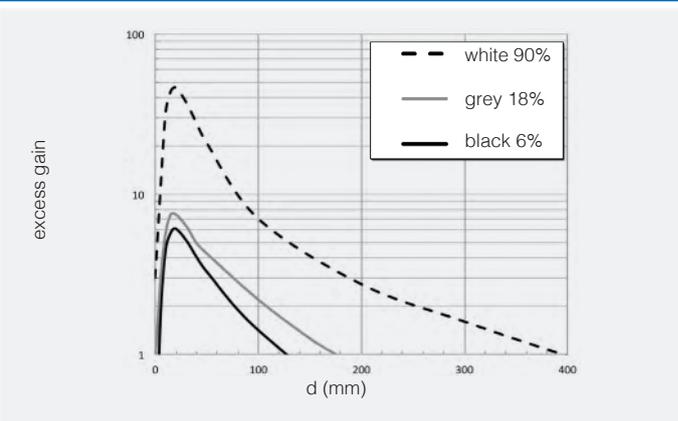
S*2,S*3/**-** spot dimension



S*2,S*3/**-** parallel displacement



S*6,S*7/**-** excess gain



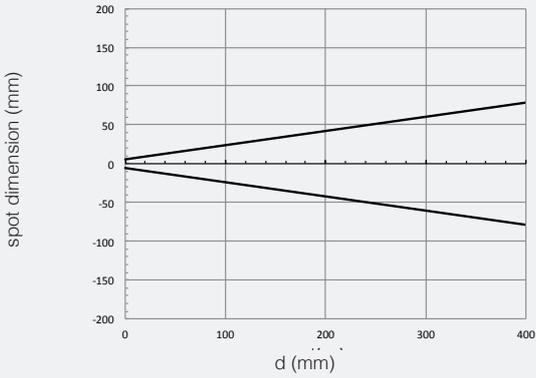


response diagrams

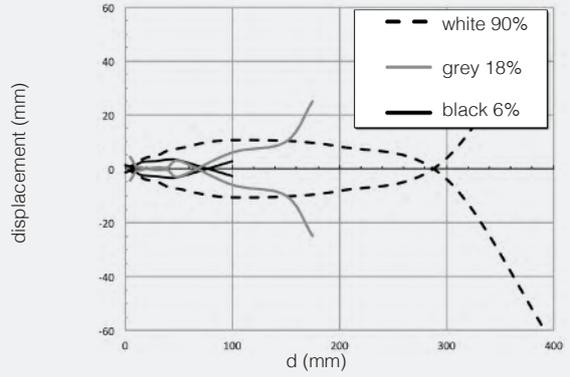
retro-reflective models

M18 DC with lateral adjustment

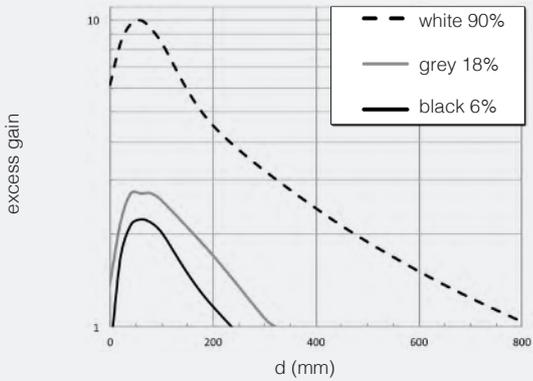
S*6/**-**,S*7/**-** spot dimension



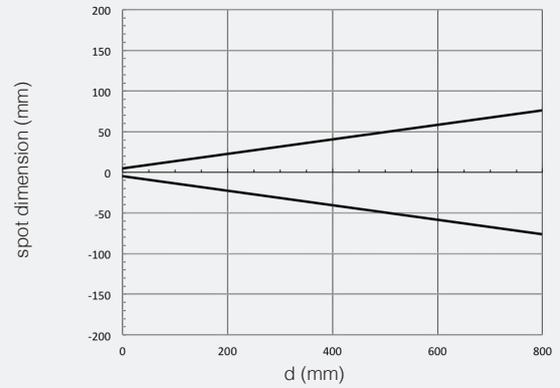
S*6/**-**,S*7/**-** parallel displacement



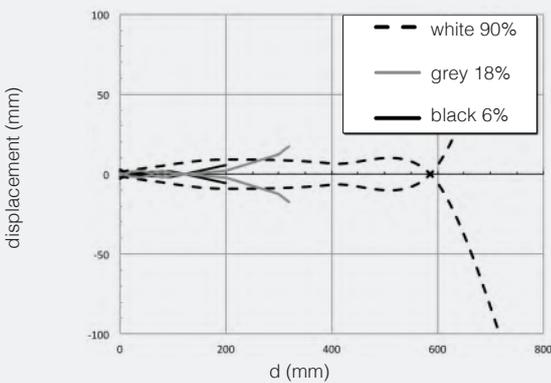
S*8/**-** excess gain



S*8/**-** spot dimension



S*8/**-** parallel displacement

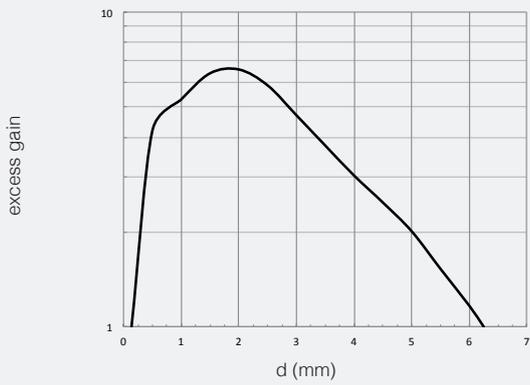


response diagrams

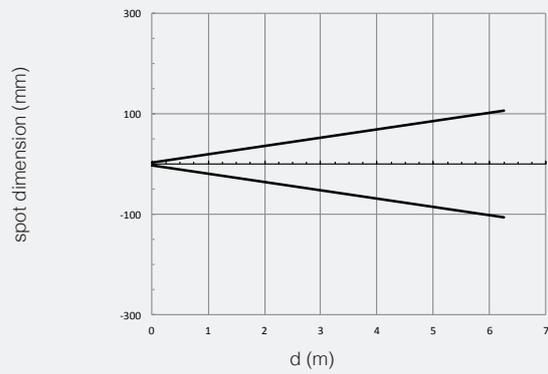
retro-reflective models (diagrams measured using RL100)



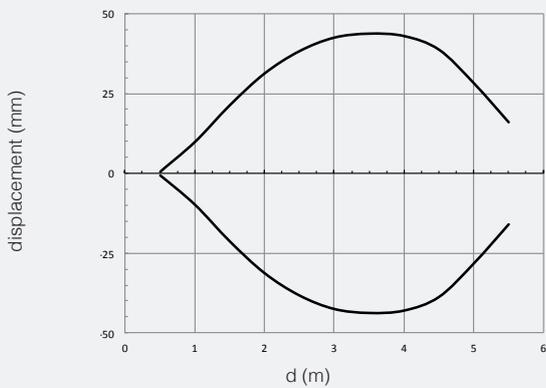
$S^*C/**-**$ excess gain



$S^*C/**-**$ spot dimension



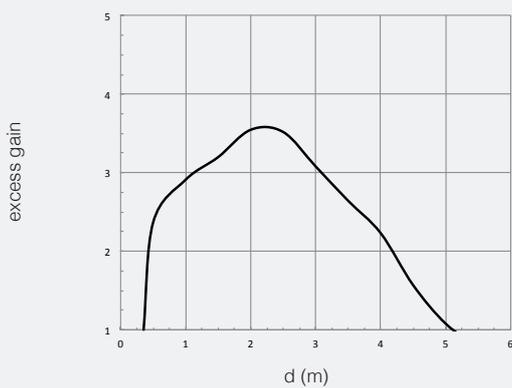
$S^*C/**-**$ parallel displacement



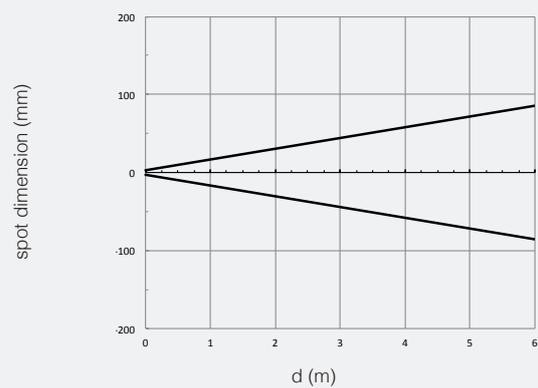
response diagrams

polarized models (diagrams measured using RL100)

$S^*P/**-**$ excess gain



$S^*P/**-**$ spot dimension



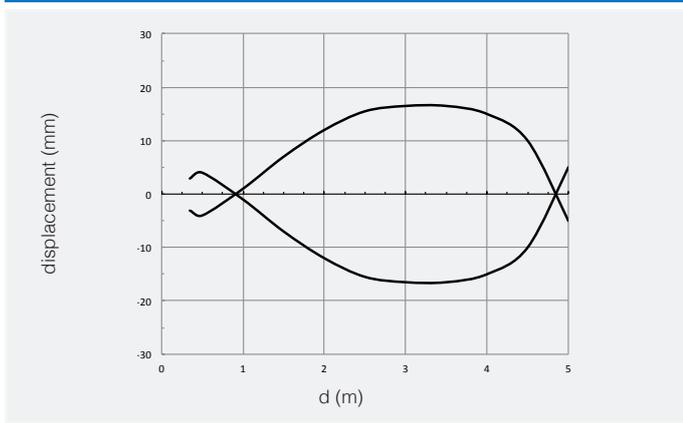


response diagrams

polarized models (diagrams measured using RL100)

M18 DC with lateral adjustment

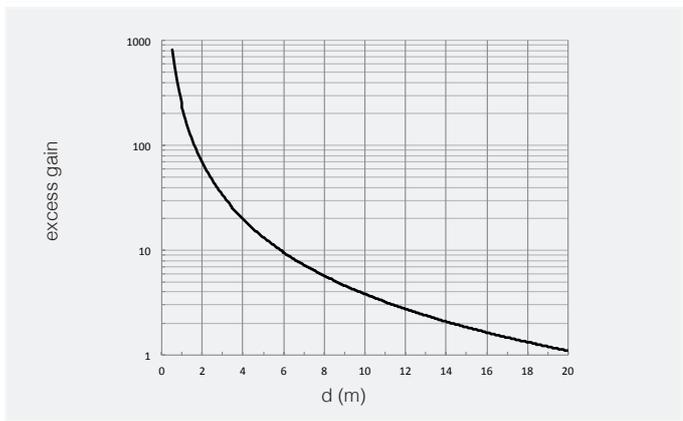
S*P/**-** parallel displacement



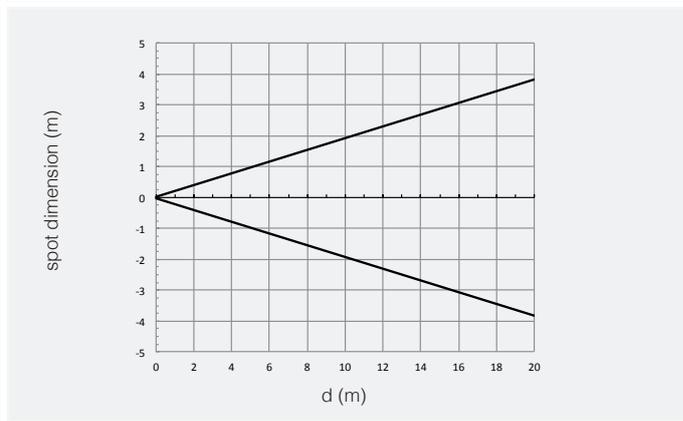
response diagrams

through beam models

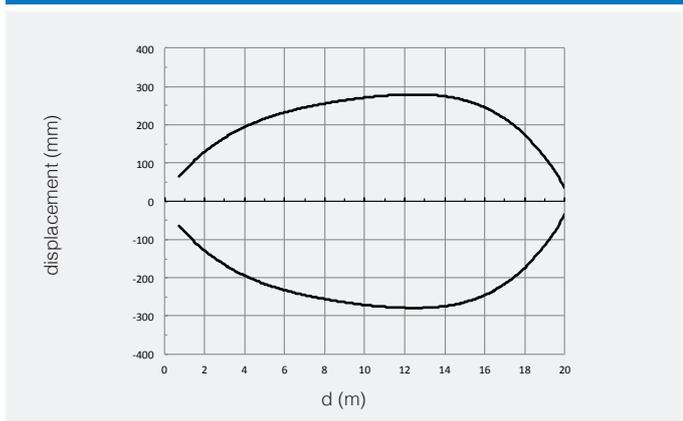
S*H/**-(0,1)*, S*D/**-(0,1)* excess gain



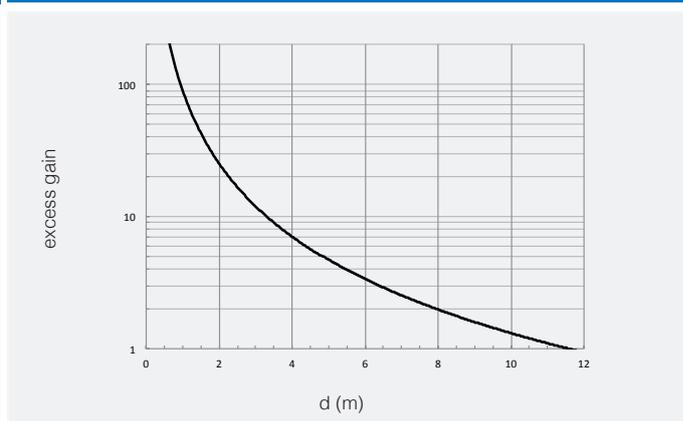
S*H/**-(0,1)*, S*D/**-(0,1)* spot dimension



S*H/**-(0,1)*, S*D/**-(0,1)* parallel displacement



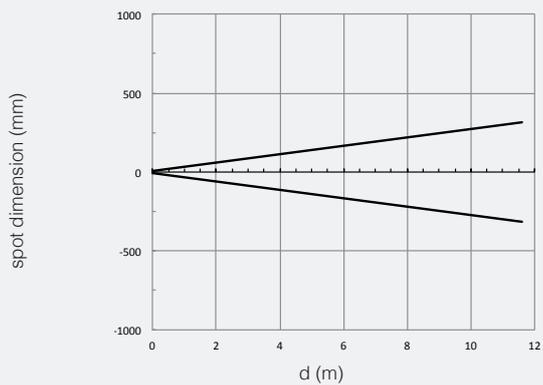
S*U/**-**, S*G/**-** excess gain



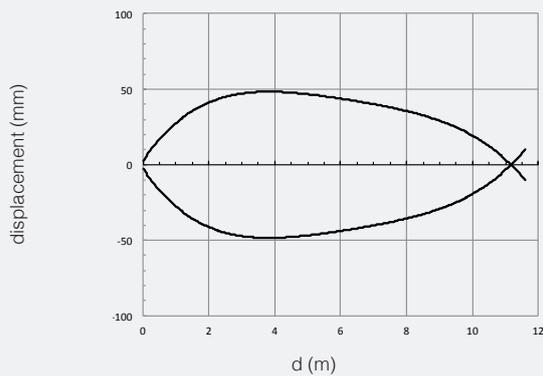
SS - SP



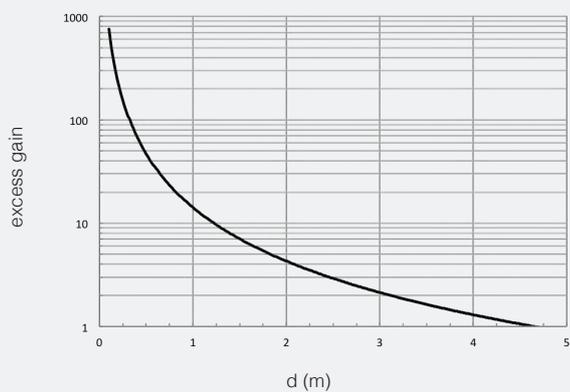
S*U/**-**, S*G/**-** spot dimension



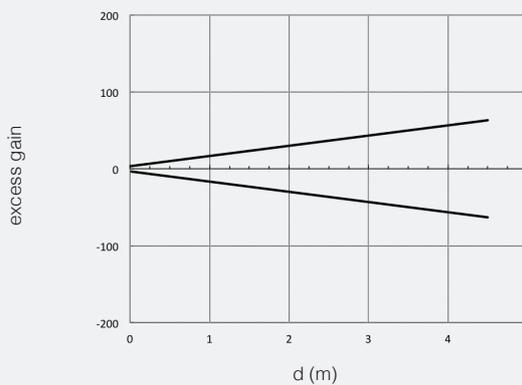
S*U/**-**, S*G/**-** parallel displacement



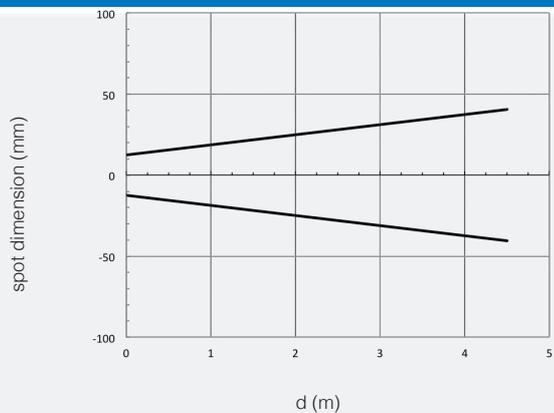
S*U/**-** S*V/**-** excess gain



S*U/**-** S*V/**-** excess gain



S*U/**-** S*V/**-** spot dimension

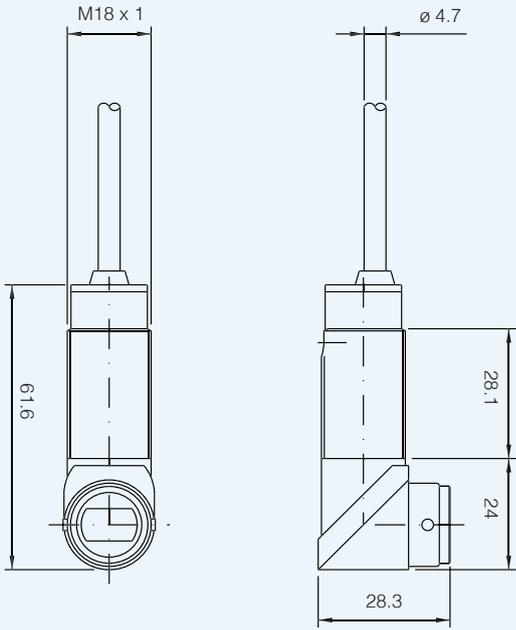




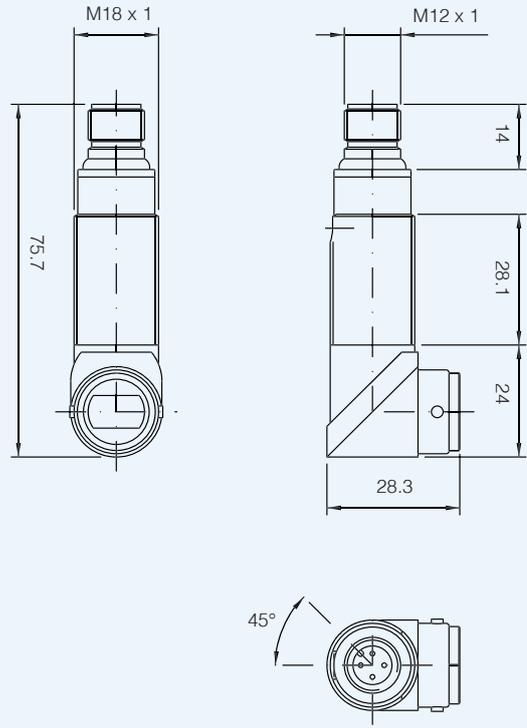
dimensions (mm)

M18 DC with lateral adjustment

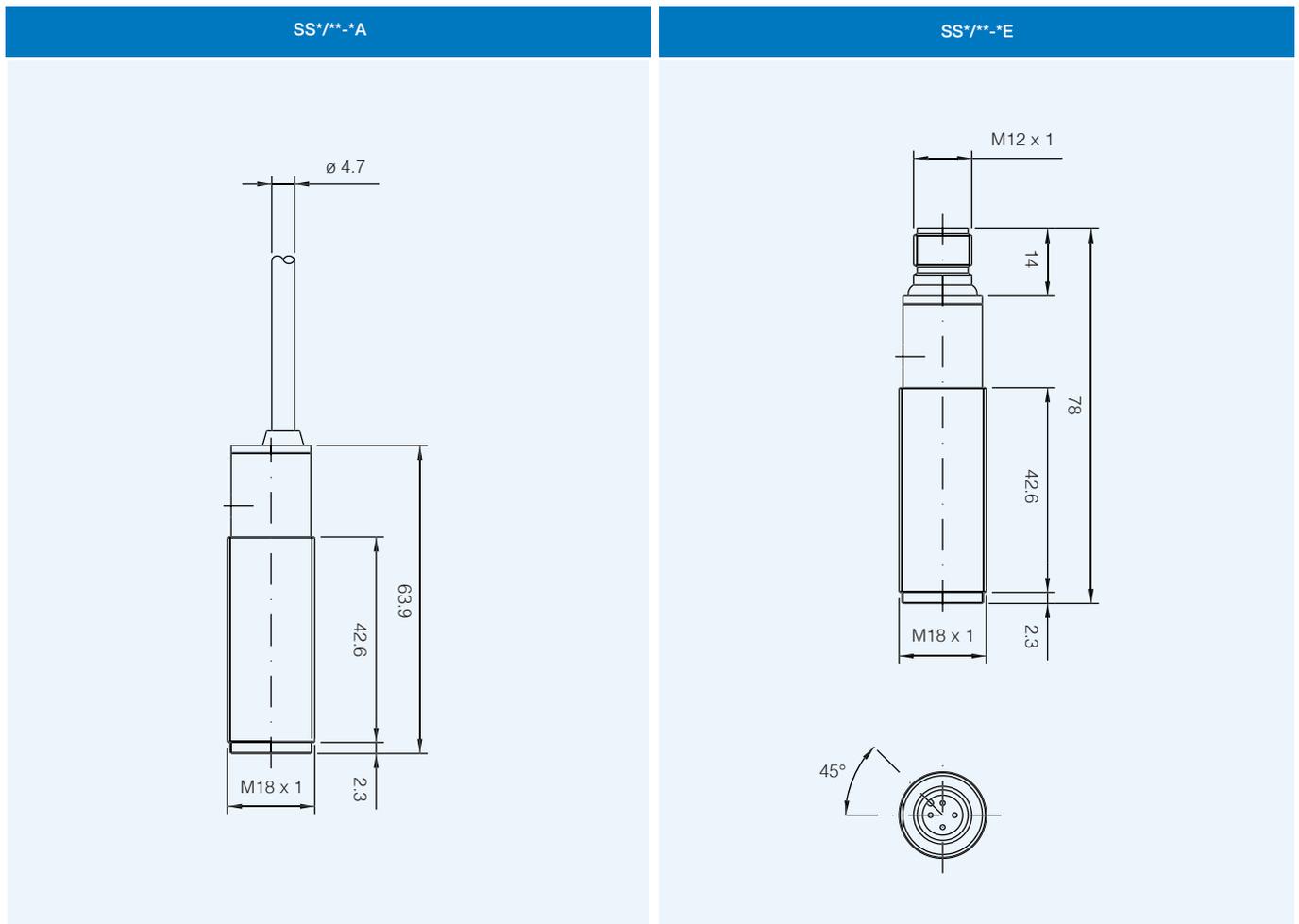
SP*/**-*A



SP*/**-*E

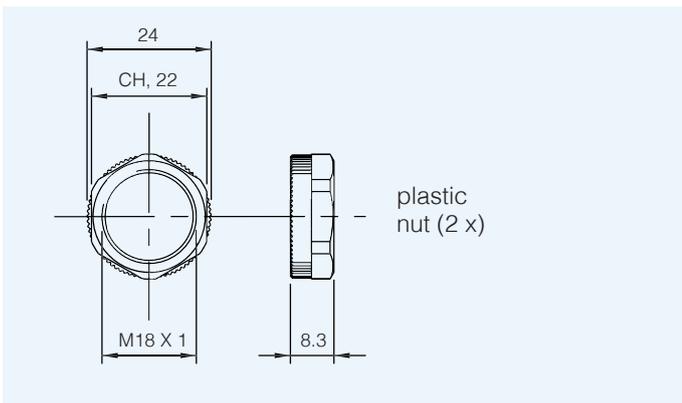


dimensions (mm)



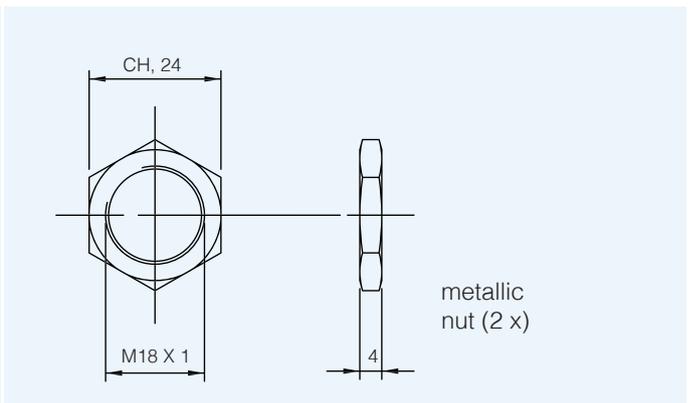
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models



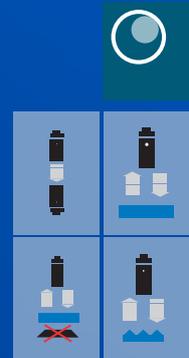


Blank lined area for notes, consisting of 20 horizontal light blue lines.



MS - MP series

M18 DECOUT® DC output



features

- Wide range of models: diffuse, retro-reflective, polarized, through-beam detection and background suppression
- Through-beam models with high sensing range
- Retro-reflective models with red visible polarized light
- Models with right angle optic (MP)
- Background suppression models with fixed distance
- Check function available for all through-beam models
- Complete protection against electrical damage



web contents



- Application notes
- Photos
- Catalogue / Manuals



M18 DECOUT®
DC output

code description

MS 0 / 0 0 - 0 A

| | | |
|---------------------|----|---|
| series | MS | M18 DECOUT® photoelectric sensor |
| | MP | M18 photoelectric sensor with right angle optic and DECOUT® output |
| type | 0 | 50 mm background suppression |
| | 1 | 100 mm background suppression |
| | T | Focalized background suppr. 12 mm (focalizer STF-12), 25 mm (focalizer STF-25) ⁽¹⁾ |
| | 2 | 100 mm diffuse reflection |
| | 3 | 100 mm diffuse reflection with adjustment |
| | 4 | 200 mm diffuse reflection |
| | 6 | 400 mm diffuse reflection |
| | 7 | 400 mm diffuse reflection with adjustment |
| | C | 4.5 m retro-reflective |
| | P | 3.5 m polarized retro-reflective |
| emitter type | N | 3.5 m polarized retro-reflective with adjustment |
| | E | Standard emitter |
| | R | 16 m standard receiver |
| emitter | D | 32 m long distance receiver |
| | 0 | Standard emitter - DECOUT® output |
| housing material | X | Emitter with check |
| | 0 | Standard emitter - DECOUT® output |
| cable / plug output | 0 | Plastic housing |
| | 1 | Metal housing |
| | A | Axial cable output |
| | C | Right angle cable exit ⁽¹⁾ |
| | E | M12 plug cable exit |
| | K | M12 right angle plug cable exit ⁽¹⁾ |

⁽¹⁾ Not available for MP models



available models

photoelectric sensors with axial optic

| function | distance | axial cable exit 4 wires PNP/NPN - NO/NC | | axial plug exit 4 wires PNP/NPN - NO/NC | | radial cable exit 4 wires PNP/NPN - NO/NC | | radial plug exit 4 wires PNP/NPN - NO/NC | |
|------------------------|--------------------|---|---------------|--|---------------|--|---------------|---|---------------|
| | | plastic housing | metal housing | plastic housing | metal housing | plastic housing | metal housing | plastic housing | metal housing |
| background suppression | 50 mm | MS0/00-0A | MS0/00-1A | MS0/00-0E | MS0/00-1E | - | - | MS0/00-0K | - |
| | 100 mm | MS1/00-0A | MS1/00-1A | MS1/00-0E | MS1/00-1E | - | - | - | - |
| | focalized | | | MST/00-0E | MST/00-1E | - | - | - | - |
| direct diffuse | 100 mm | MS2/00-0A | MS2/00-1A | MS2/00-0E | MS2/00-1E | - | - | - | - |
| | | MS3/00-0A | MS3/00-1A | MS3/00-0E | MS3/00-1E | - | - | - | - |
| | 200 mm | MS4/00-0A | MS4/00-1A | MS4/00-0E | MS4/00-1E | - | - | MS4/00-0K | - |
| | 400 mm | MS6/00-0A | MS6/00-0A | MS6/00-0E | MS6/00-0E | - | - | MS6/00-0K | - |
| | | MS7/00-0A | MS7/00-0A | MS7/00-0E | MS7/00-0E | - | - | MS7/00-0K | - |
| retro-reflective | 4 m | MSC/00-0A | MSC/00-0A | MSC/00-0E | MSC/00-0E | MSC/00-0C | MSC/00-1C | MSC/00-0K | - |
| polarized | 3.5 m | MSP/00-0A | MSP/00-1A | MSP/00-0E | MSP/00-1E | - | - | - | - |
| | | MSN/00-0A | MSN/00-1A | MSN/00-0E | MSN/00-1E | - | - | MSE/00-0K | MSE/00-1K |
| through beam | emitter | MSE/00-0A | MSE/00-1A | MSE/00-0E | MSE/00-1E | - | - | - | - |
| | emitter with check | MSE/X0-0A | MSE/X0-1A | MSE/X0-0E | MSE/X0-1E | - | - | - | - |
| | receiver 16 m | MSR/00-0A | MSR/00-1A | MSR/00-0E | MSR/00-0E | - | - | MSR/00-0K | MSR/00-1K |
| | receiver 32 m | MSD/00-0A | MSD/00-1A | MSD/00-0E | MSD/00-1E | - | - | - | - |

available models

photoelectric sensors with radial optic

| function | distance | axial cable exit 4 wires PNP/NPN - NO/NC | | axial plug exit 4 wires PNP/NPN - NO/NC | | radial cable exit 4 wires PNP/NPN - NO/NC | | radial plug exit 4 wires PNP/NPN - NO/NC | |
|------------------------|--------------------|---|---------------|--|---------------|--|---------------|---|---------------|
| | | plastic housing | metal housing | plastic housing | metal housing | plastic housing | metal housing | plastic housing | metal housing |
| background suppression | 50 mm | MP0/00-0A | MP0/00-1A | MP0/00-0E | MP0/00-1E | - | - | - | - |
| | 100 mm | MP1/00-0A | MP1/00-1A | MP1/00-0E | MP1/00-1E | - | - | - | - |
| direct diffuse | 200 mm | MP2/00-0A | - | MP2/00-0E | - | - | - | - | - |
| | | MP4/00-0A | - | MP4/00-0E | - | - | - | - | - |
| | 400 mm | - | - | MP6/00-0E | - | - | - | - | - |
| retro-reflective | 4.5 m | MPC/00-0A | MPC/00-0A | MPC/00-0E | MPC/00-0E | - | - | - | - |
| polarized | 3.5 m | - | - | - | - | - | - | - | - |
| through beam | emitter | MPE/00-0A | MPE/00-1A | MPE/00-0E | MPE/00-1E | - | - | - | - |
| | emitter with check | MPE/X0-0A | MPE/X0-1A | MPE/X0-0E | MPE/X0-1E | - | - | - | - |
| | receiver 16 m | MPR/00-0A | MPR/00-1A | MPR/00-0E | MPR/00-0E | - | - | - | - |



| | M*0/00-* | M*1/00-** | MST/00-** |
|-----------------------------|---|-----------------------|--------------|
| | | | |
| nominal sensing distance | 50 mm ⁽¹⁾ | 100 mm ⁽¹⁾ | 12/25 mm |
| emission | infrared (880 nm) | | red (660 nm) |
| regulation | - | | |
| tolerance | 0...+10 % Sn | | |
| dfferential travel | ≤ 5 % | | ≤ 10 % |
| repeatability | 5 % | | |
| operating voltage | 10...30 Vdc | | |
| ripple | ≤ 10 % | | |
| supply current | ≤ 40 mA | | ≤ 30 mA |
| load current | ≤ 100 mA | | |
| leakage current | 6 A (Ton = 10 ms) | | |
| output voltage drop | 1.2 V max. IL = 100 mA | | |
| output type | DECOUT® (NPN/PNP, NO, NC) | | |
| switching frequency | 1 KHz | | |
| power on delay | 200 ms | | |
| power supply protections | transient | | |
| output protection | short circuit (with hold) | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | |
| temperature drift | 5 % Sr | | 10 % Sr |
| protection degree | IP67 (EN60529) ⁽²⁾ | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | |
| LEDs | yellow (output energized) | | yellow |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | |
| optic material | PMMA | | plastic |
| tightening torque | 1 Nm (plastic housing), 25 Nm (metallic housing) | | |
| weight (approx) | plastic version: 30 g plug / 70 g cable metallic version: 100 g plug / 130 g cable | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ Protection guaranteed only with plug cable well mounted



technical specification

direct diffuse models

M18 DECOUT®
DC output

| | M*2/00-** | M*3/00-** | M*4/00-** | M*6/00-0** | M*7/00-** |
|-----------------------------|---|-----------|-----------------------|-----------------------|----------------|
| | | | | | |
| nominal sensing distance | 100 mm ⁽¹⁾ | | 200 mm ⁽¹⁾ | 400 mm ⁽²⁾ | |
| emission | infrared (880 nm) | | | | |
| regulation | - | ● | - | - | ● |
| tolerance | | | | | +15...-10 % Sn |
| dfferential travel | ≤ 5 % | | | | ≤ 10 % |
| repeatability | 5% | | | | |
| operating voltage | 10...30 Vdc | | | | |
| ripple | ≤ 10 % | | | | |
| supply current | ≤ 40 mA | | | | ≤ 30 mA |
| load current | ≤ 100 mA | | | | |
| leakage current | 6 A (Ton = 10 ms) | | | | |
| output voltage drop | 1,2 V max. IL = 100 mA | | | | |
| output type | DECOUT® (NPN/PNP, NO NC) | | | | |
| switching frequency | 80 Hz | | | | |
| power on delay | 200 ms | | | | |
| power supply protections | transient | | | | |
| output protection | short circuit (with hold) | | | | |
| operating temperature range | -25°C...+70°C (without freeze) | | | | |
| temperature drift | 5 % Sr | | | | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | |
| LEDs | yellow (output energized) | | | | |
| housing material | PBT (plastic) / nicked plated brass (metallic) / PC (cable exit) | | | | |
| optic material | PMMA | | | | |
| tightening torque | 1 Nm (plastic housing), 25 Nm (metallic housing) | | | | |
| weight (approx) | plastic version: 30 g plug / 70 g cable metallic version: 100 g plug / 130 g cable | | | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With 200x200 mm white matt paper ⁽³⁾ Protection guaranteed only with plug cable well mounted

technical specification

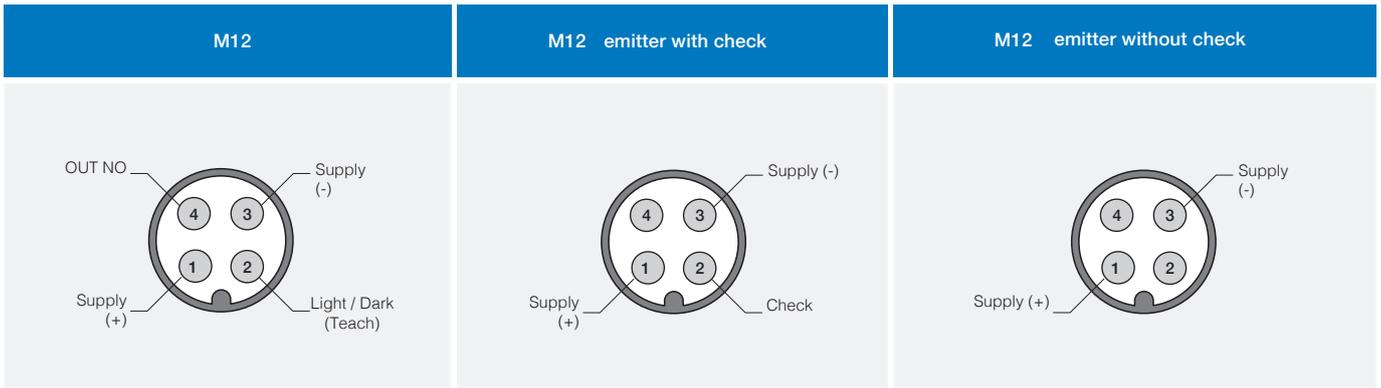
retro-reflective and long distance models



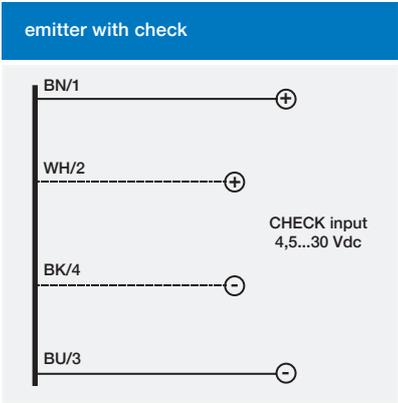
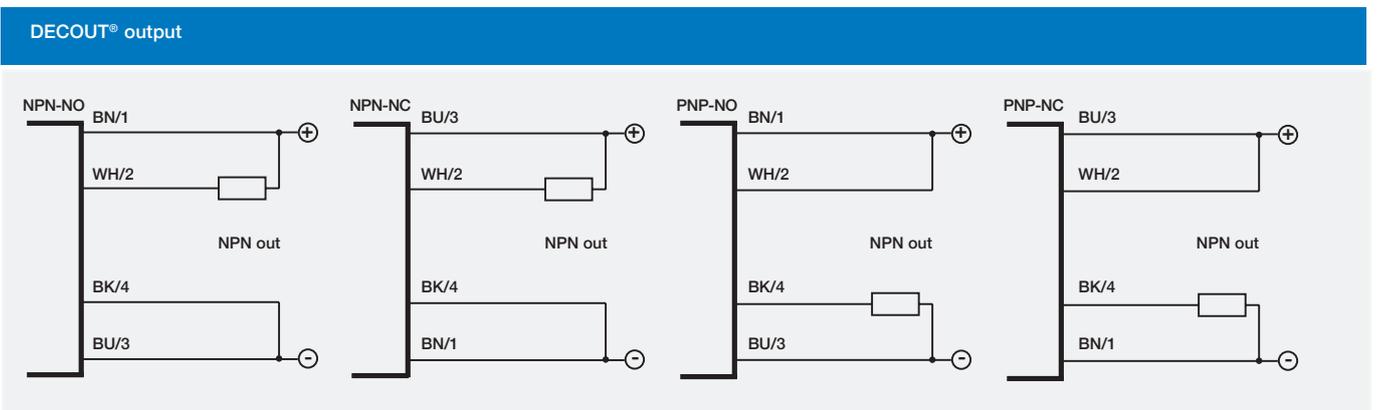
M18 DECOU[®]
DC output

| | retro-reflective | | | through-beam | |
|-----------------------------|---|----------------------|-----------|---|------------------------|
| | standard | polarized | | standard | long distance |
| | M*C/00-* | M*P/00-** | MSN/00-** | M*E/**-** M*R/**-** | M*E/**-** M*D/**-** |
| |  | | |  | |
| nominal sensing distance | 4,5 m ⁽¹⁾ | 3,5 m ⁽¹⁾ | | 16 m | 32 m |
| emission | infrared (880 nm) | red (660 nm) | | infrared (880 nm) | |
| tolerance | +15...-10 % Sn | | | - | |
| dfferential travel | ≤ 10 % | | | | |
| repeatability | 5 % | | | | |
| operating voltage | 10...30 Vdc | | | | |
| ripple | ≤ 10 % | | | | |
| no-load supply current | ≤ 30 mA | | | ≤ 15 mA (emitter) ≤ 35 mA (emitter with check) ≤ 25 mA (receiver) | |
| load current | ≤ 100 mA | | | | |
| leakage current | ≤ 10 µA | | | | |
| output voltage drop | 1,2 V max. IL = 100 mA | | | | |
| output type | DECOU [®] (NPN/PNP, NO/NC) | | | | |
| switching frequency | 80 Hz | | | 30 Hz | |
| power on delay | 200 ms | | | | |
| power supply protections | transient | | | | |
| output protection | short circuit (with hold) | | | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | | |
| temperature drift | ≤ 10 % Sr | | | | |
| protection degree | IP67 (EN60529) ⁽²⁾ | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 60947-5-2 | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | |
| LEDs | yellow (output energized) | | | | |
| housing material | PBT (plastic) / nickel-plated brass (metallic) / polycarbonate (cable exit) | | | | |
| optic material | PMMA | | | | |
| tightening torque | 1 Nm (plastic housing), 25 Nm (metallic housing) | | | | |
| weight (approx) | plastic version: 30 g plug / 70 g cable metallic version: 100 g plug / 130 g cable | | | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ Protection guaranteed only with plug cable well mounted

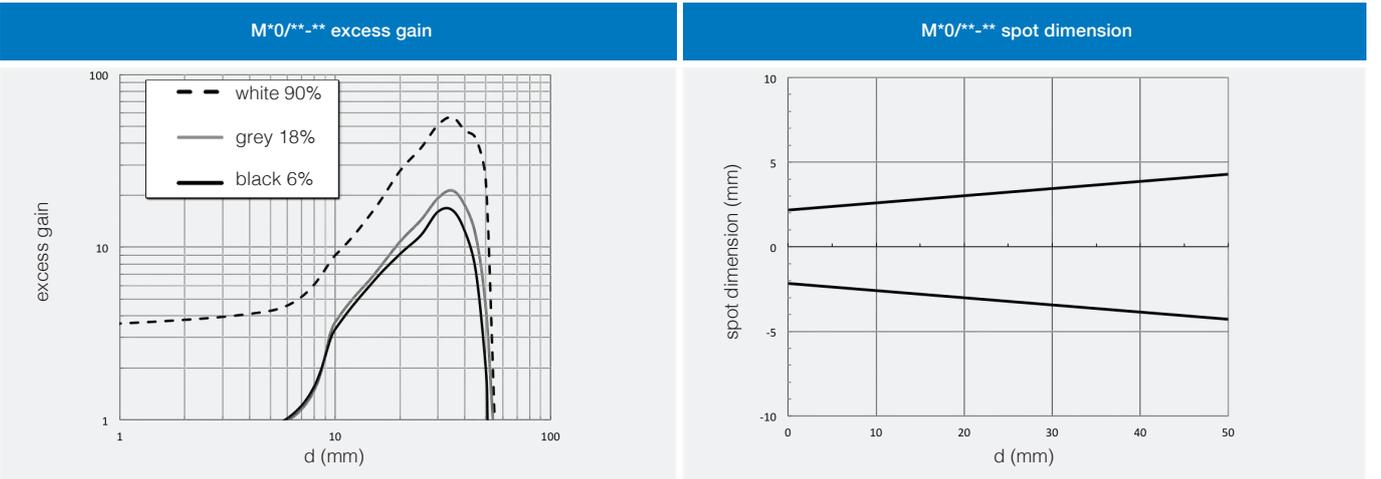


electrical diagrams of the connections



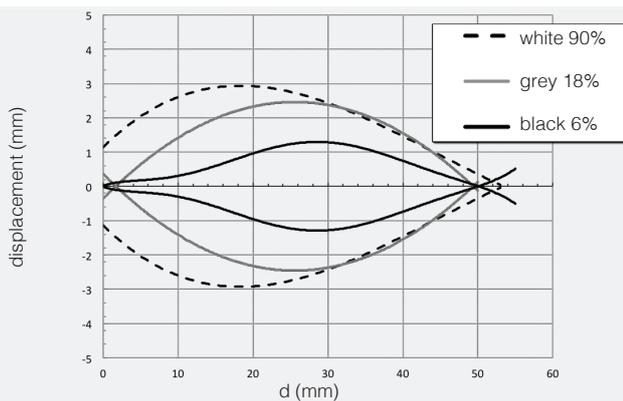
response diagrams

background suppression models

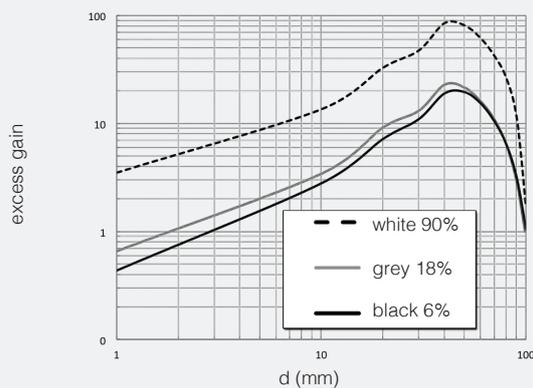




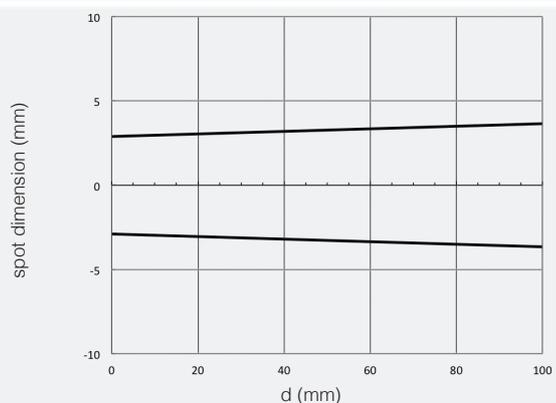
M*0/**-** parallel displacement



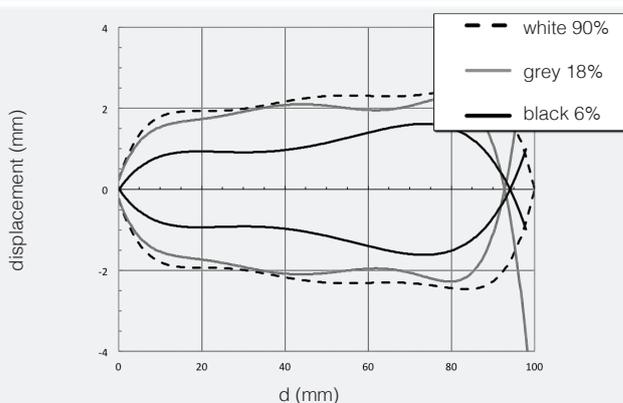
M*1/**-** excess gain



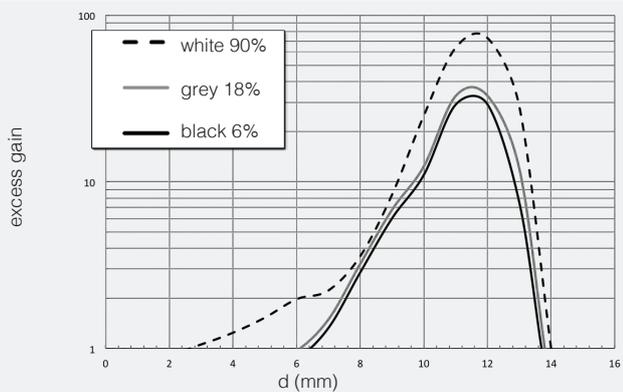
M*1/**-** spot dimension



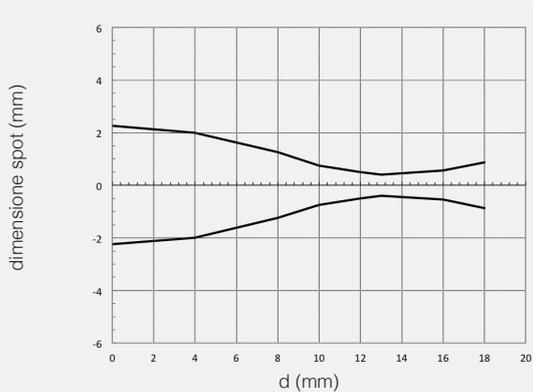
M*1/**-** parallel displacement



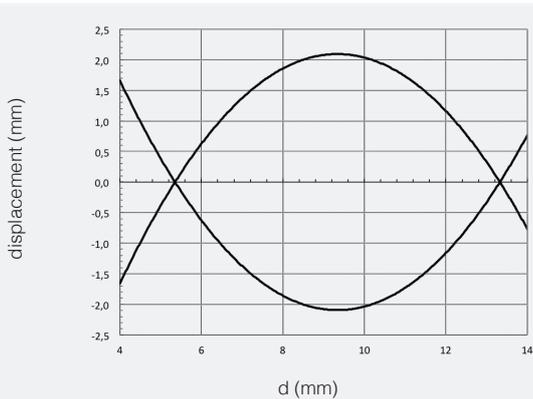
MST/00-** + STF12 excess gain



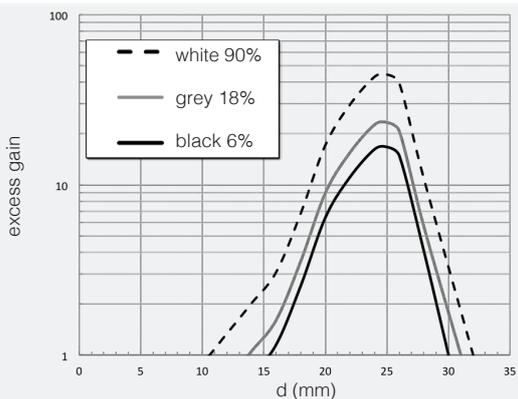
MST/00-** + STF12 spot dimension



MST/00-** + STF12 parallel displacement



MST/00-** + STF25 excess gain



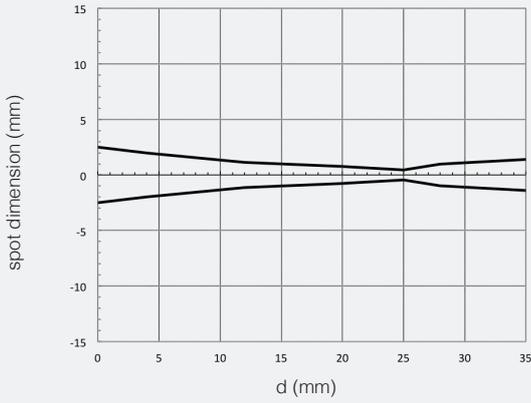


response diagrams

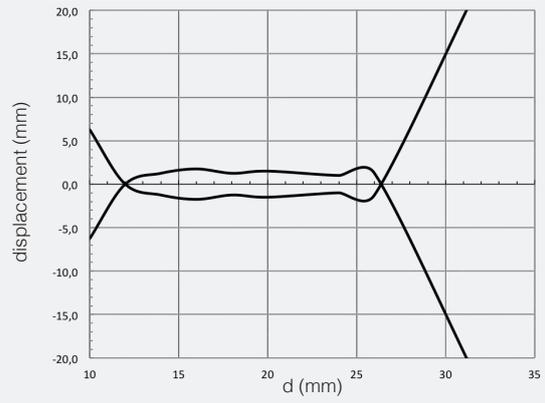
direct diffuse models

M18 DECOULT®
DC output

MST/00-** + STF25 spot dimension



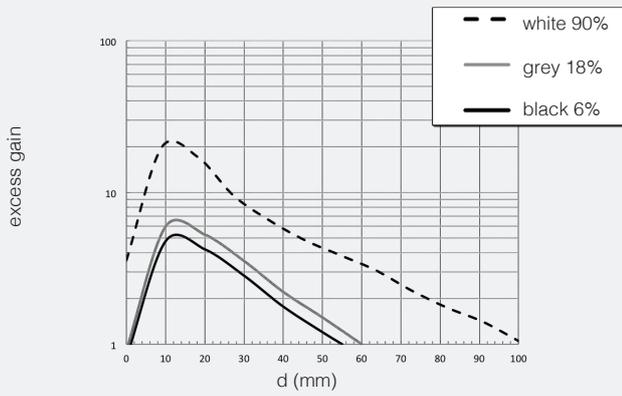
MST/00-** + STF25 parallel displacement



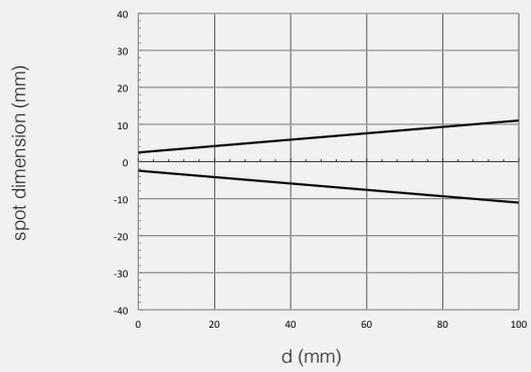
response diagrams

direct diffuse models

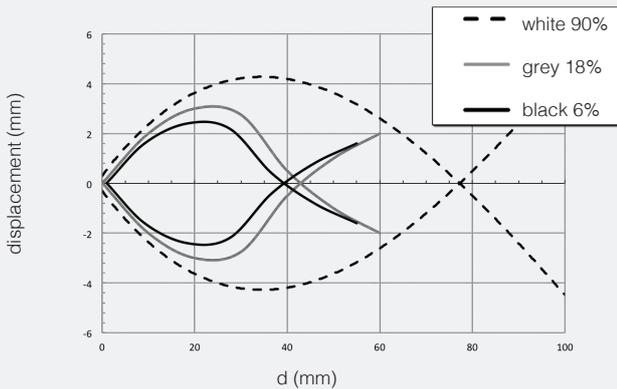
M*2, M*3/00-** excess gain



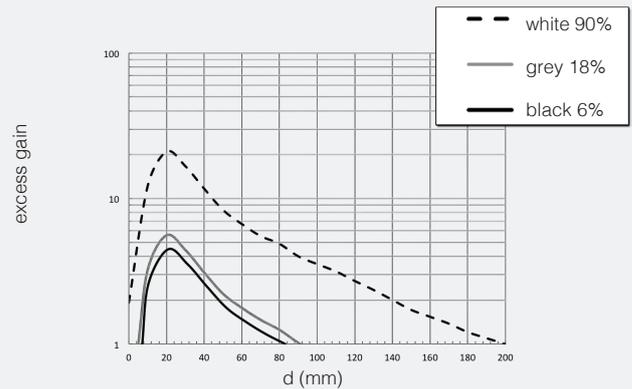
M*2, M*3/00-** spot dimension



M*2, M*3/00-** parallel displacement



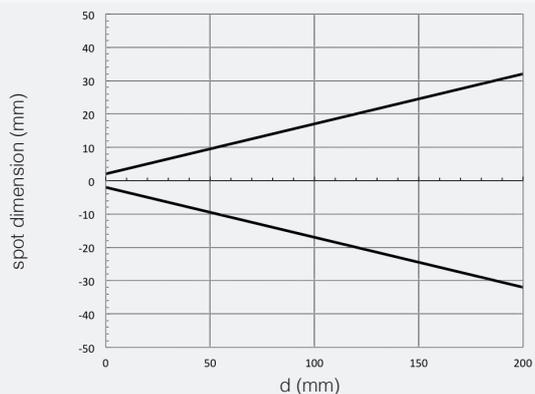
M*4/00-** excess gain



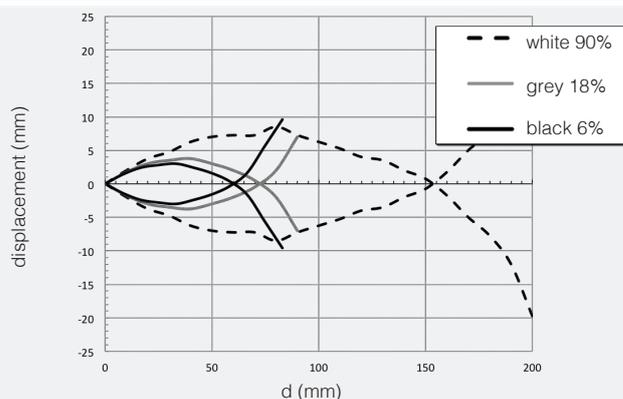
MS - MP



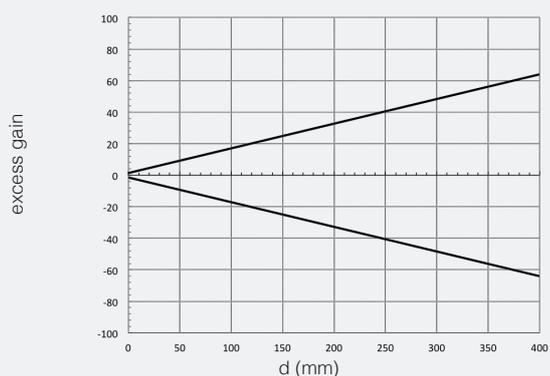
M*4/00-** dimensione spot



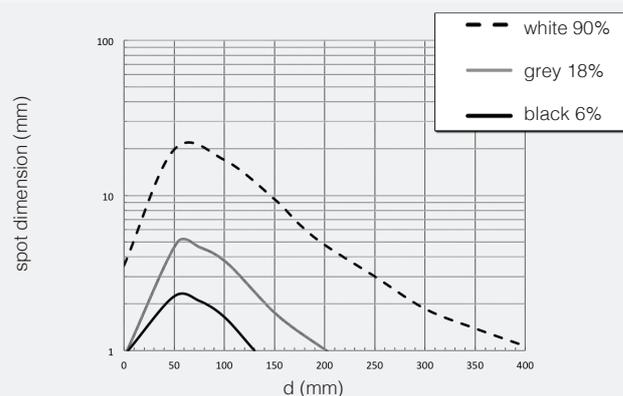
M*4/00-** parallel displacement



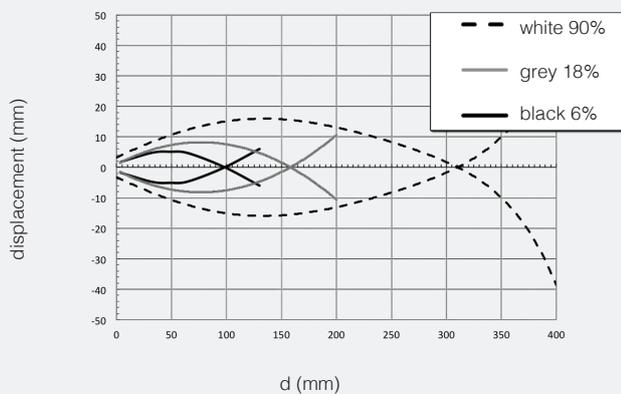
M*6, M*7**/00-** excess gain



M*6, M*7**/00-** spot dimension



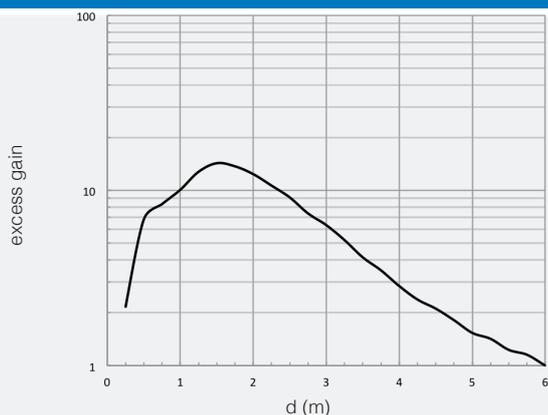
M*6, M*7**/00-** parallel displacement



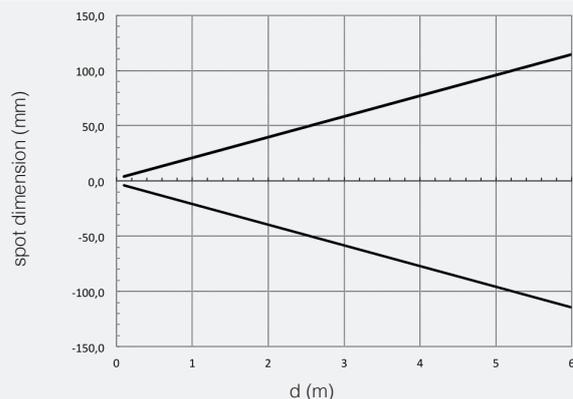
response diagrams

retro-reflective standard and polarized models

MSC/**-** excess gain



MSC/**-** spot dimension



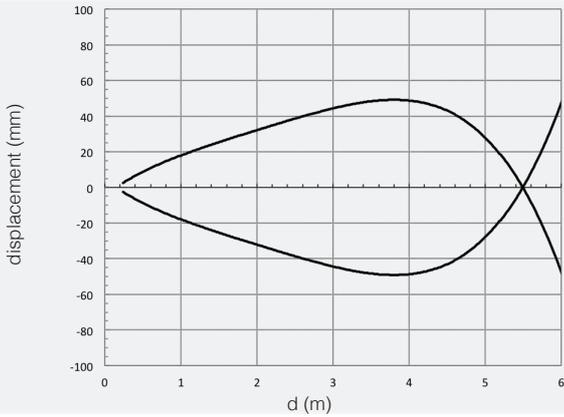


response diagrams

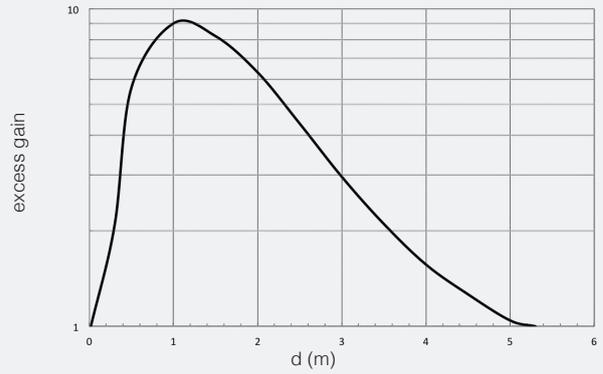
retro-reflective polarized models (diagrams measured using RL100)

M18 DECOULT®
DC output

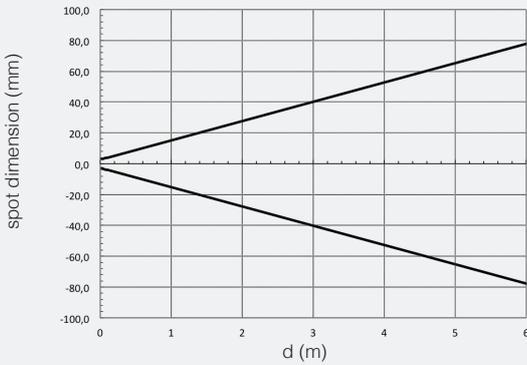
MSC/**-** parallel displacement



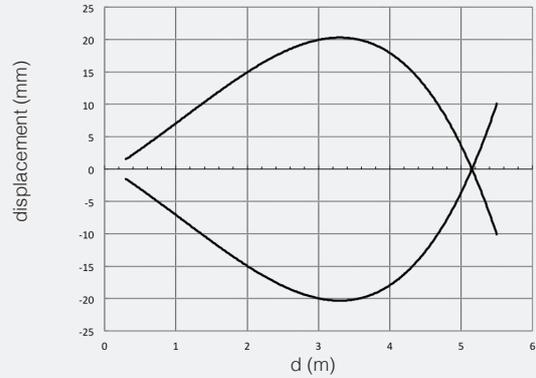
MSP, MSN/**-** excess gain



MSP, MSN/**-** spot dimension



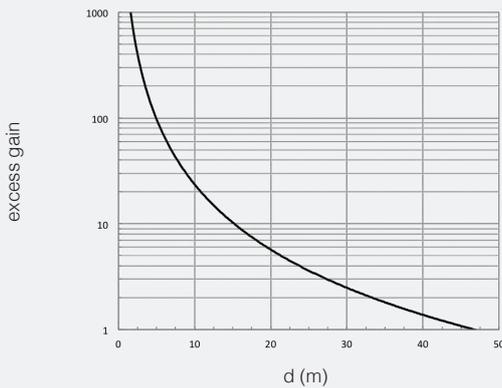
MSP, MSN/**-** parallel displacement



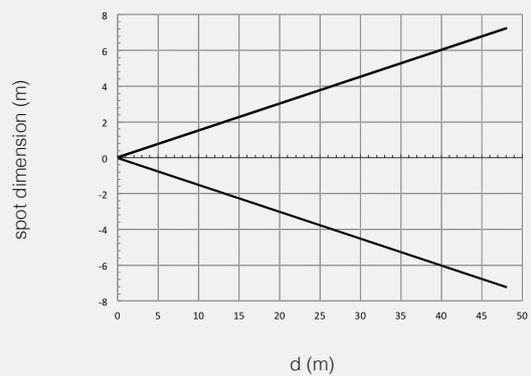
response diagrams

through-beam standard and long distance models

MSE/**-** - MSD/**-** excess gain



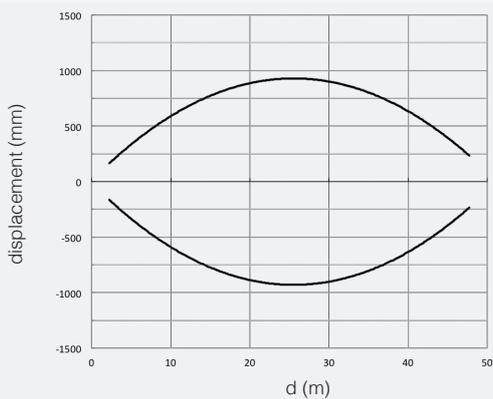
MSE/**-** - MSD/**-** spot dimension



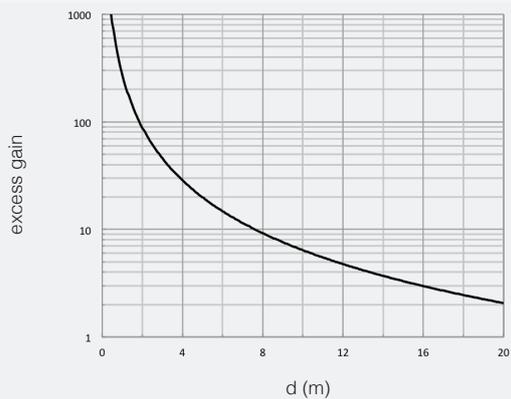
MS - MP



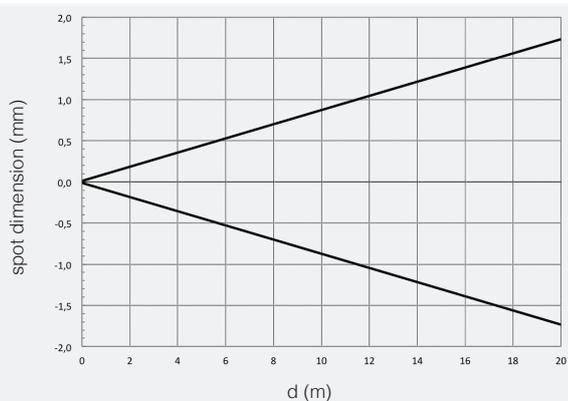
MSE/**_** - MSD/**_** parallel displacement



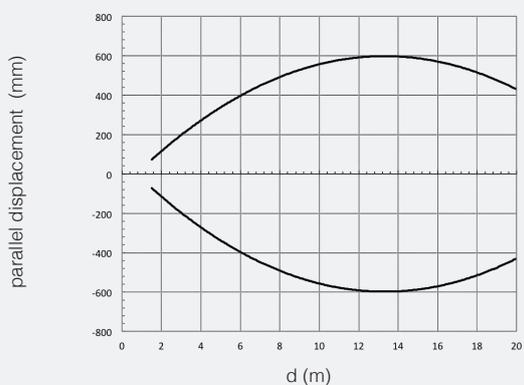
MSE/**_** - MSR/**_** excess gain



MSE/**_** - MSR/**_** spot dimension



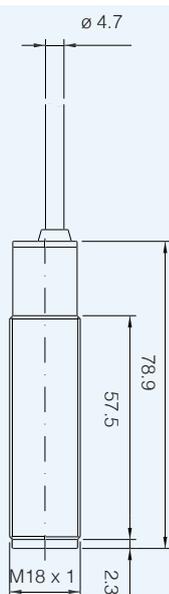
MSE/**_** - MSR/**_** parallel displacement



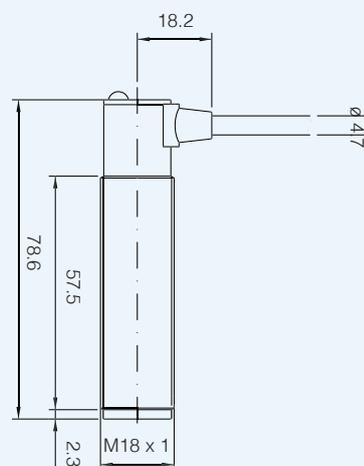
dimensions (mm)

axial models

MS*/00-*A



MS*/00-0C

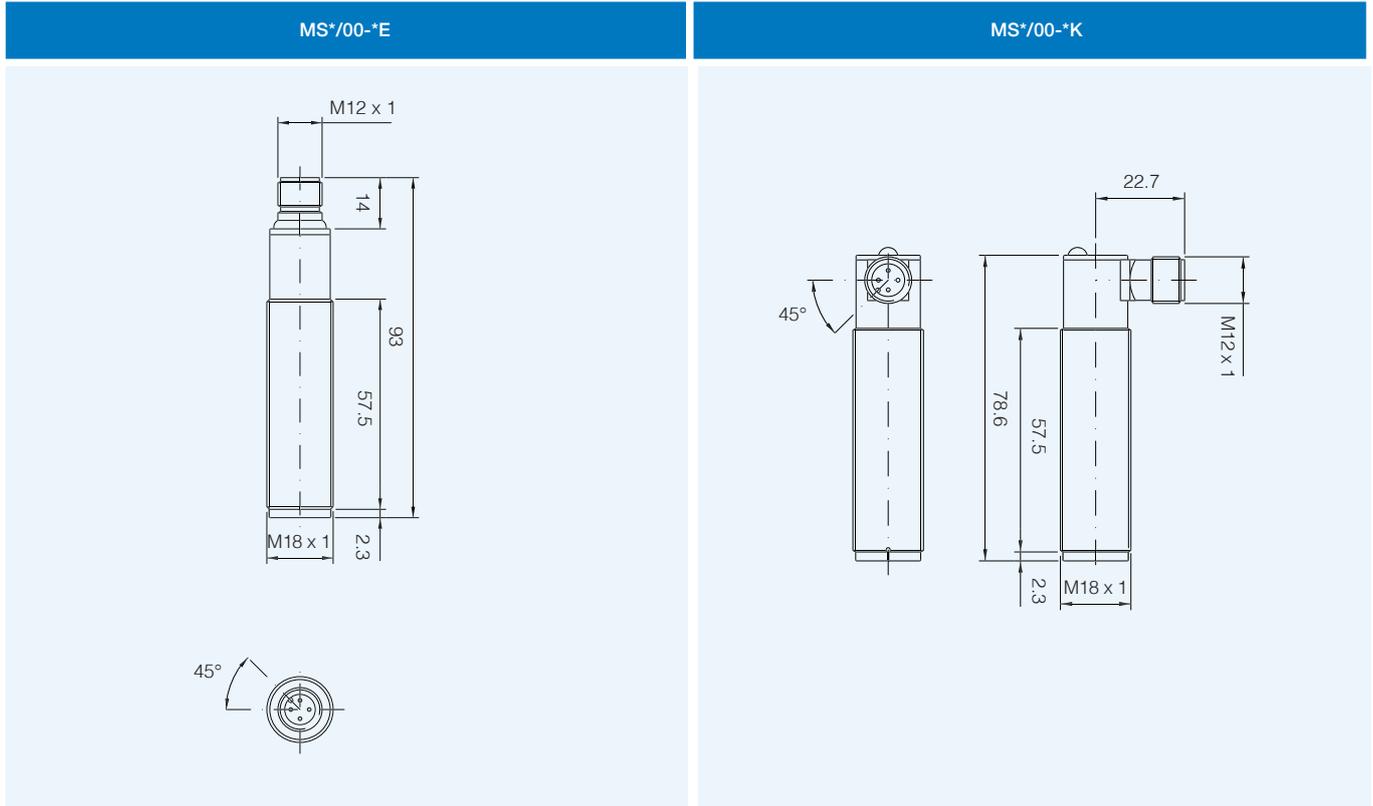




M18 DECOUT®
DC output

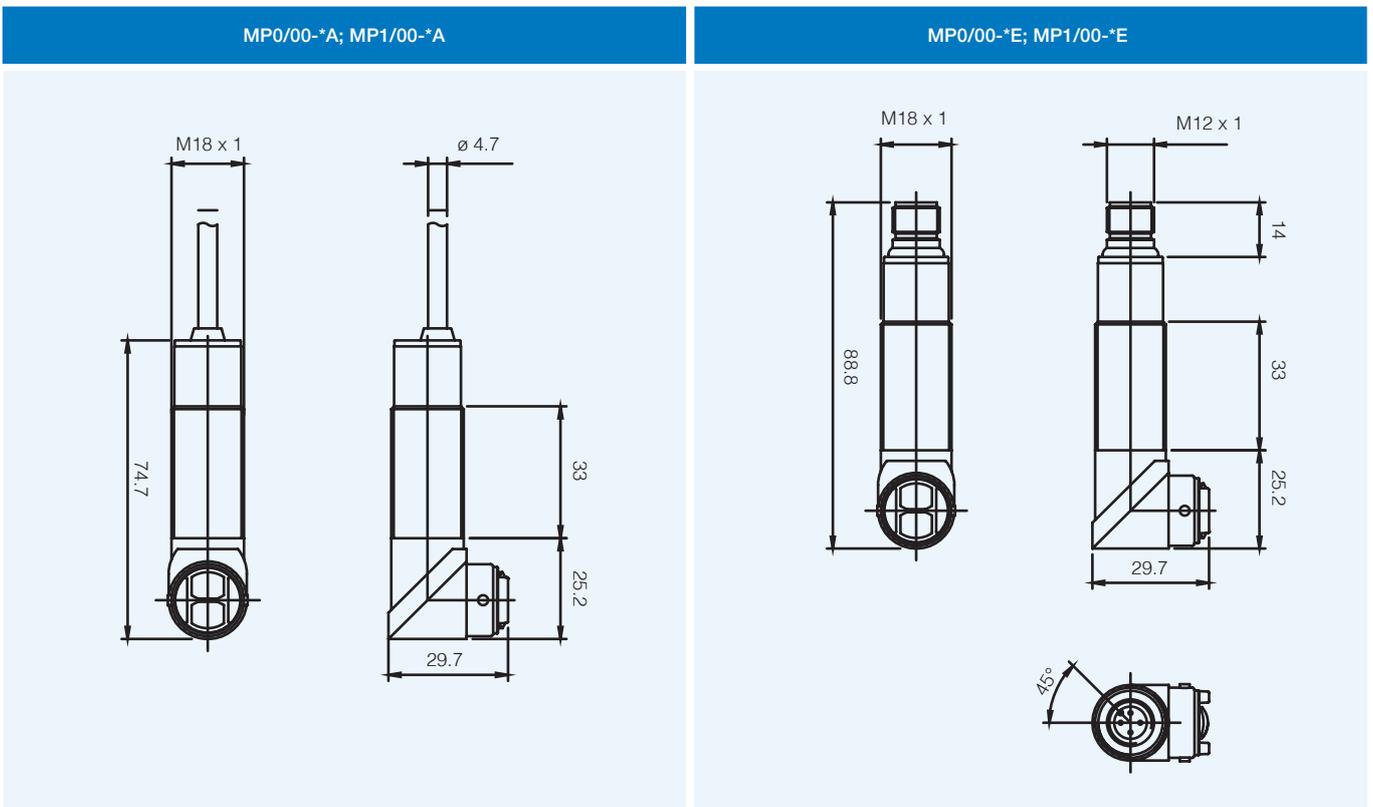
dimensions (mm)

axial models



dimensions (mm)

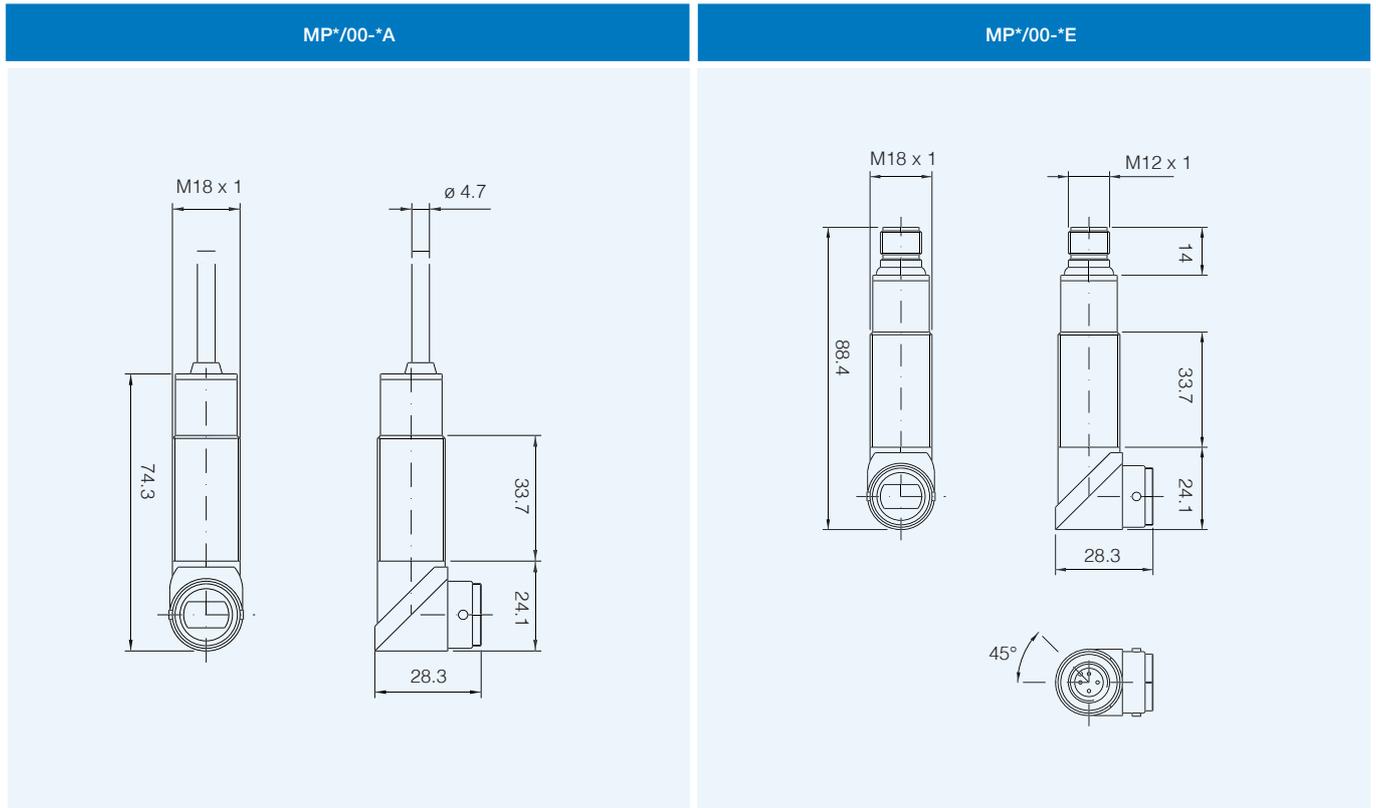
background suppression radial models



MS - MP

dimensions (mm)

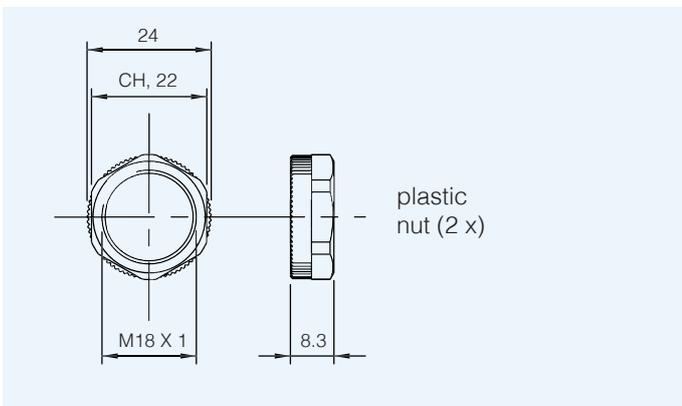
diffuse reflection, retroreflective, polarized, through beam radial models



M18 DECOUT®
DC output

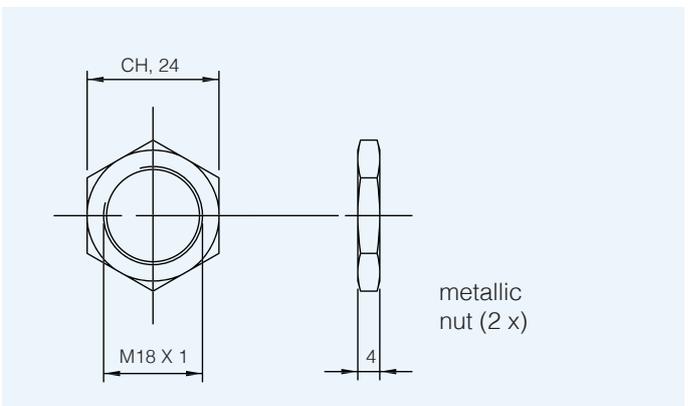
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models



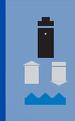
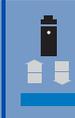


Area containing multiple horizontal light blue lines for taking notes.



SA series

M18 DC high performances
with rear adjustment



M18 with high performances

features

- Wide range of models: diffuse, retro-reflective, polarized and fixed-focus
- All models are available with sensitivity adjustment trimmer
- Double LED indicator (ON/OFF - supply)
- NO/NC selectable output
- IP65 protection degree
- Complete protection against electrical damage
- Wide range of plugs, accessories and reflectors available
- Approvals: CE



web contents



- Application notes
- Photos
- Catalogue / Manuals



code description

SA 2 / 0 N - 0 C

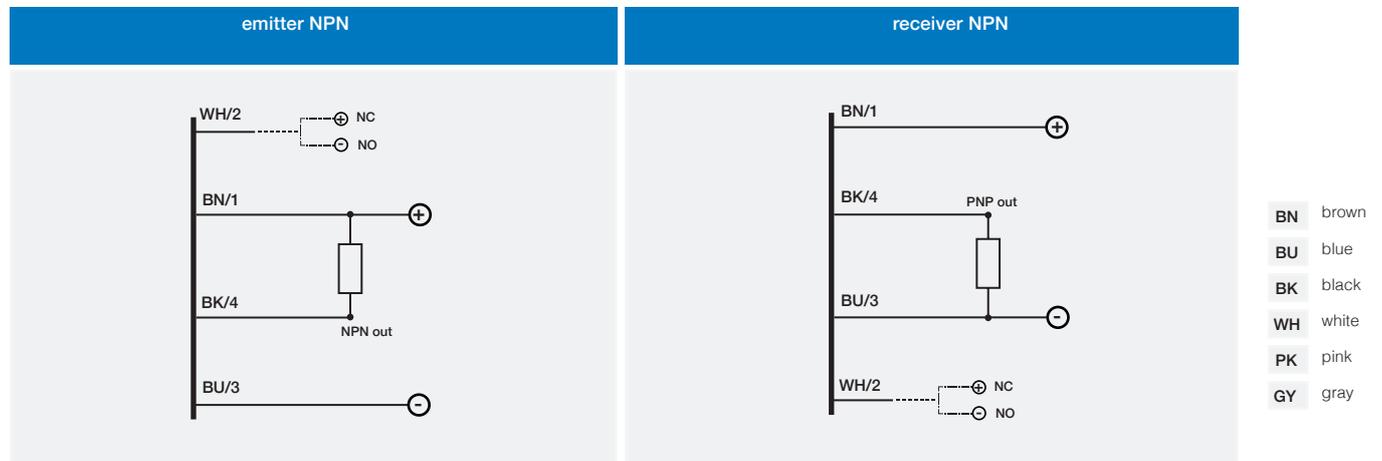
| | | |
|-------------------|----|--|
| series | SA | M18 photoelectric sensor with high performance |
| | 2 | 150 mm diffuse reflection |
| type | 6 | 400 mm diffuse reflection |
| | 8 | 1000 mm diffuse reflection |
| | C | 6 m retro-reflective |
| | P | 3.5 m polarized |
| | T | Diffuse reflection fixed-focus |
| NO / NC | 0 | NO/NC selectable |
| NPN / PNP output | N | NPN output logic |
| | P | PNP output logic |
| housing material | 0 | Plastic housing |
| | 1 | Metal housing |
| cable / plug exit | C | Right angle cable output 2 m |
| | K | M12 right angle plug cable exit |



available models

| output | function | distance | plastic models | | metal models | |
|----------------------|-----------------------|----------|----------------|-----------|--------------|-----------|
| | | | PNP NO/NC | NPN NO/NC | PNP NO/NC | NPN NO/NC |
| right angle cable | diffuse reflection | 150 mm | SA2/0P-0C | SA2/0N-0C | SA2/0P-1C | SA2/0N-1C |
| | | 400 mm | SA6/0P-0C | SA6/0N-0C | SA6/0P-1C | SA6/0N-1C |
| | | 1.000 mm | SA8/0P-0C | SA8/0N-0C | SA8/0P-1C | SA8/0N-1C |
| | retro-reflective | 6 m | SAC/0P-0C | SAC/0N-0C | SAC/0P-1C | SAC/0N-1C |
| | polarized | 3 m | SAP/0P-0C | SAP/0N-0C | SAP/0P-1C | SAP/0N-1C |
| | focalized with STF-12 | 12 mm | SAT/0P-0C | SAT/0N-0C | SAT/0P-1C | SAT/0N-1C |
| | focalized with STF-25 | 25 mm | | | | |
| | focalized with STF-50 | 50 mm | | | | |
| | | | | | | |
| M12 right angle plug | diffuse reflection | 150 mm | SA2/0P-0K | SA2/0N-0K | SA2/0P-1K | SA2/0N-1K |
| | | 400 mm | SA6/0P-0K | SA6/0N-0K | SA6/0P-1K | SA6/0N-1K |
| | | 1.000 mm | SA8/0P-0K | SA8/0N-0K | SA8/0P-1K | SA8/0N-1K |
| | retro-reflective | 6 m | SAC/0P-0K | SAC/0N-0K | SAC/0P-1K | SAC/0N-1K |
| | polarized | 3 m | SAP/0P-0K | SAP/0N-0K | SAP/0P-1K | SAP/0N-1K |
| | focalized with STF-12 | 12 mm | SAT/0P-0K | SAT/0N-0K | SAT/0P-1K | SAT/0N-1K |
| | focalized with STF-25 | 25 mm | | | | |
| | focalized with STF-50 | 50 mm | | | | |
| | | | | | | |

electrical diagrams of the connections



In case of combined load, resistive and capacitive, the maximum admissible capacity C is 0,2µF, for maximum load voltage and current.

Indications NO and NC are referred to the diffuse reflection sensors (on target absence). For retro-reflective models the indication NO to be replaced by NC and NC becomes NO.

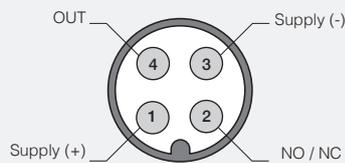


| | iffuse reflection | | | retro-reflective | | fixed-focus | | |
|-----------------------------|---|-----------------------|-------------------------|--------------------|--------------------|----------------|--------|--------|
| | standard | | | standard | polarized | STF-12 | STF-25 | STF-50 |
| | SA2/0*-** | SA6/0*-** | SA8/0*-** | SAC/0*-** | SAP/0*-** | SAT/0*-** | | |
| | | | | | | | | |
| nominal sensing distance | 150 mm ⁽¹⁾ | 400 mm ⁽¹⁾ | 1.000 mm ⁽²⁾ | 6 m ⁽³⁾ | 3 m ⁽³⁾ | 12 mm | 25 mm | 50 mm |
| emission | infrared (880 nm) | | | | | red (660 nm) | | |
| tolerance | +15...-10 % Sn | | | | | | | |
| hysteresis | ≤ 10 % | | | | | | | |
| repeatability | 5 % | | | | | | | |
| operating voltage | 10...30 Vdc | | | | | | | |
| ripple | ≤ 10 % | | | | | | | |
| no-load supply current | ≤ 30 mA | ≤ 35 mA | ≤ 30 mA | ≤ 35 mA | ≤ 30 mA | | | |
| load current | ≤ 100 mA | | | | | | | |
| leakage current | ≤ 10 µA | | | | | | | |
| output voltage drop | 2 V max. IL = 100 mA | | | | | | | |
| output type | NPN or PNP, NO/NC selectable | | | | | | | |
| switching frequency | 1 kHz max. | | | | | | | |
| power on delay | 200 ms | | | | | | | |
| power supply protections | polarity reversal, transient | | | | | | | |
| output protection | short circuit (autoreset) | | | | | | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | | | | | |
| temperature drift | ≤ 10 % Sr | | | | | | | |
| protection degree | IP67 (EN60529) ⁽⁴⁾ | | | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | | | | |
| LEDs | yellow (output energized), green (supply), red (activated output) | | | | | | | |
| housing material | BT (plastic housing), nickel-plated brass (metal housing), nylon (cable exit) | | | | | | | |
| optic material | PMMA | | | | | glass (STF-**) | | |
| tightening torque | 1 Nm (plastic housing) / 25 Nm (metal housing) | | | | | | | |
| weight (approximate) | plastic version: 40 g connector / 75 g cable metallic version: 100 g connector / 140 g cable | | | | | | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With 200x200 mm white matt paper ⁽³⁾ With standard reflector Ø 80 mm (RL110 supplied separately) ⁽⁴⁾ Protection guaranteed only with plug cable well mounted.

plug

M12



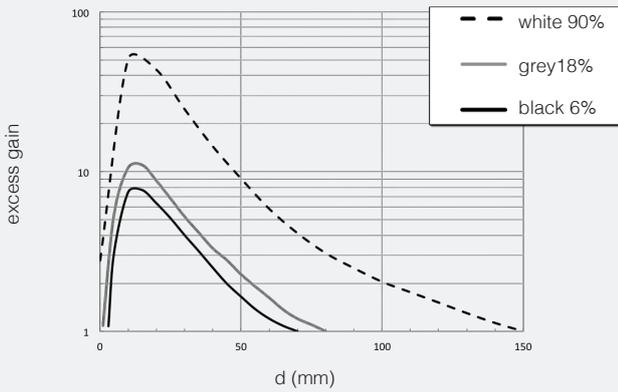


response diagrams

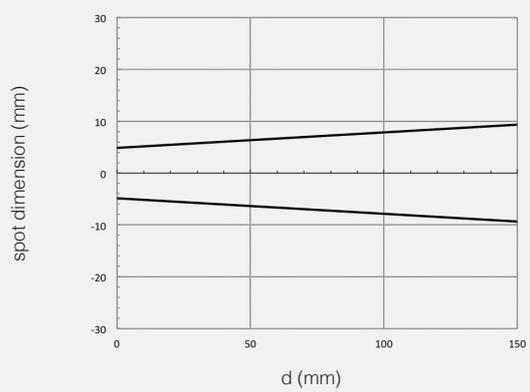
direct diffuse models

M18 with high performances

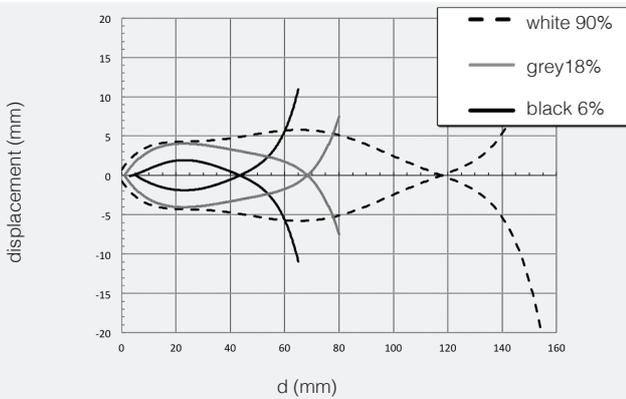
SA2/0*-** excess gain



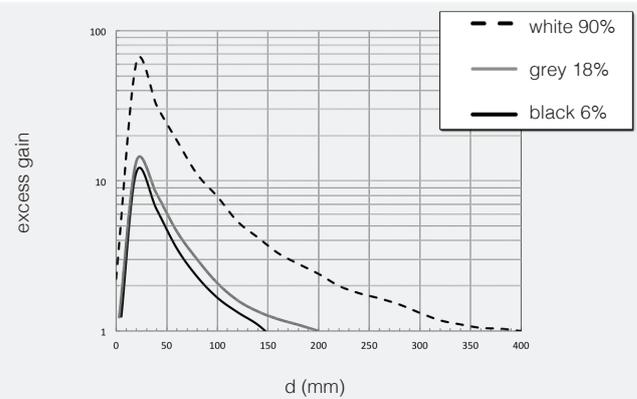
SA2/0*-** spot dimension



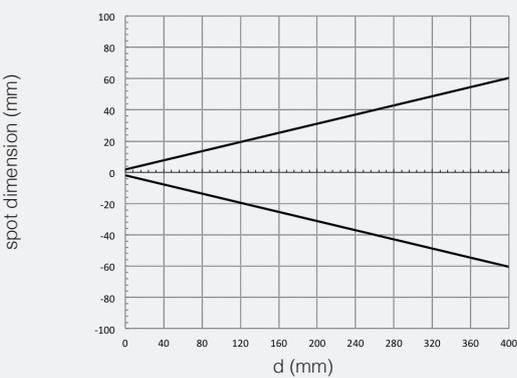
SA2/0*-** parallel displacement



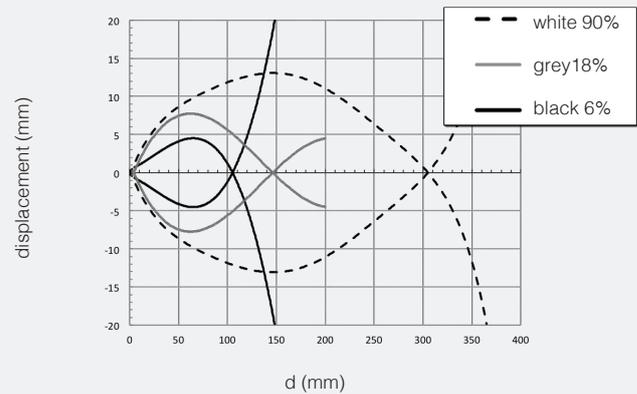
SA6/0*-** excess gain



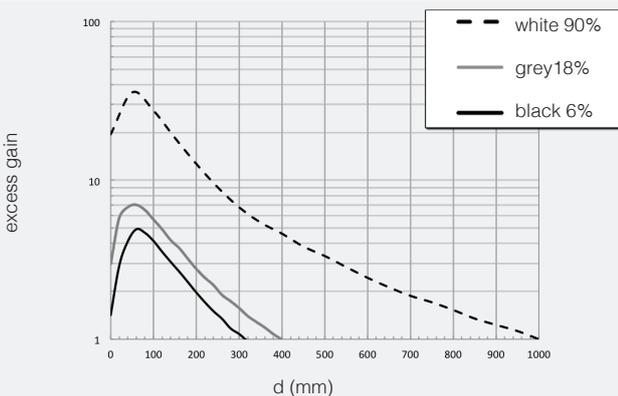
SA6/0*-** spot dimension



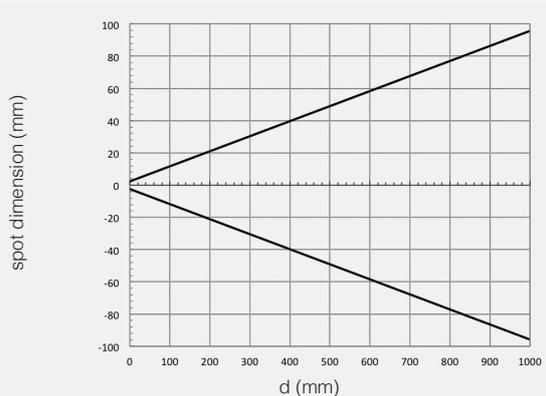
SA6/0*-** parallel displacement



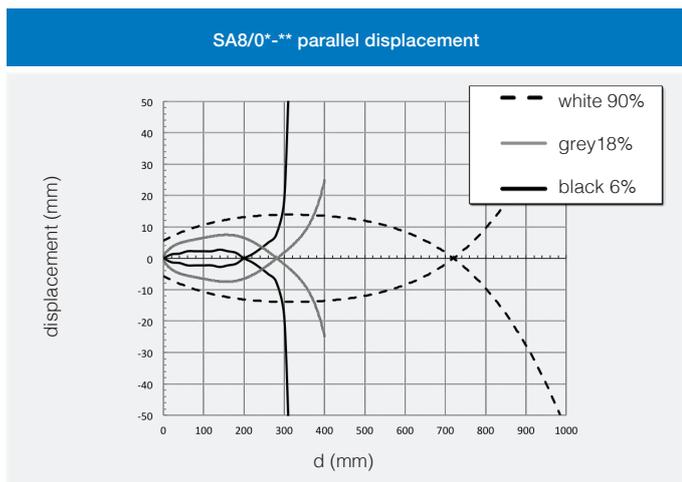
SA8/0*-** excess gain



SA8/0*-** spot dimension

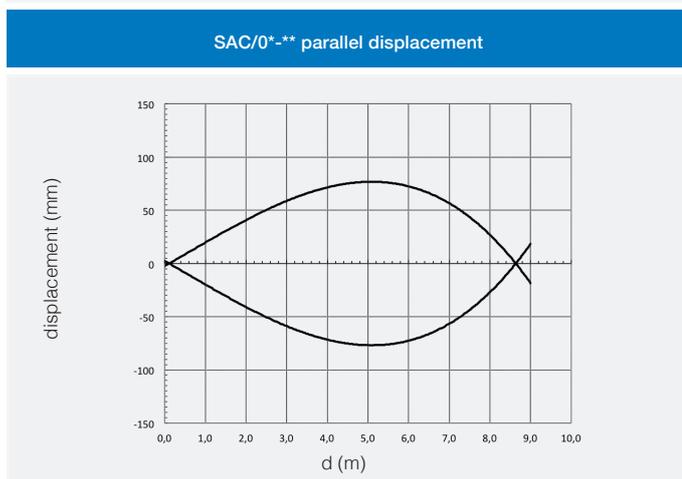
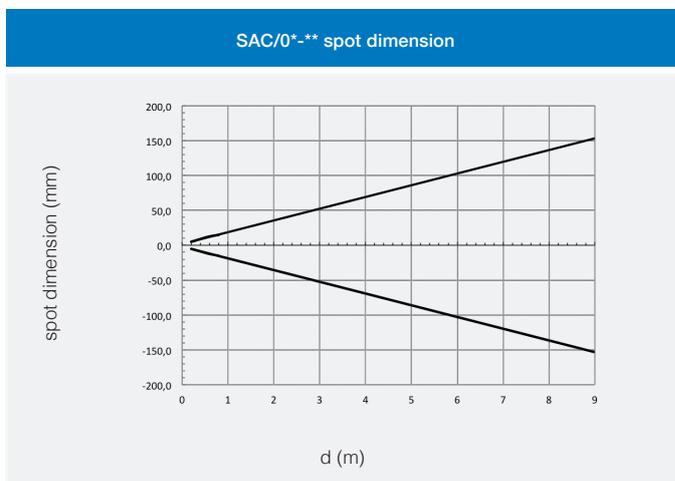
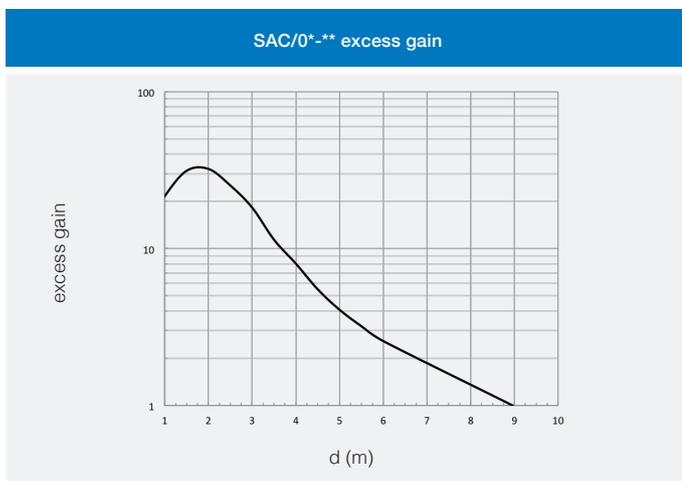


SA



response diagrams

direct diffuse models



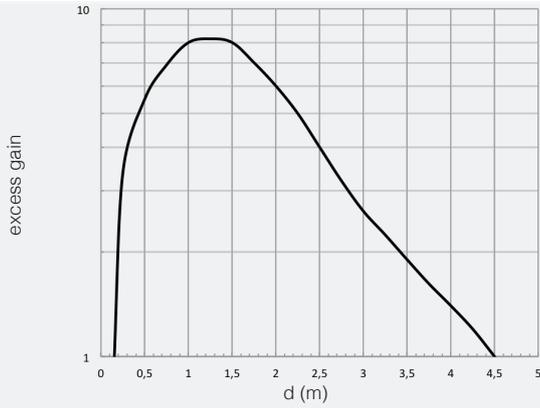


response diagrams

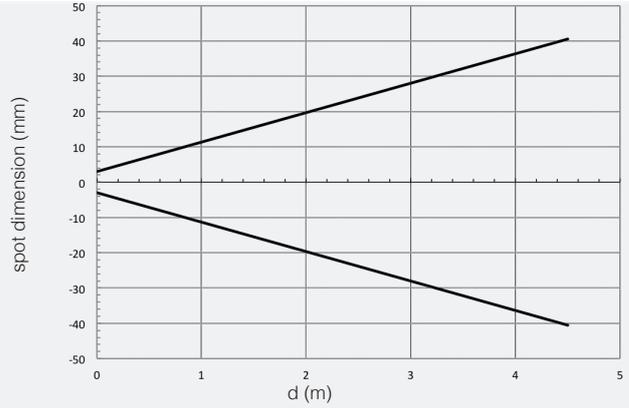
polarized models (diagrams detected with RL110)

M18 with high performances

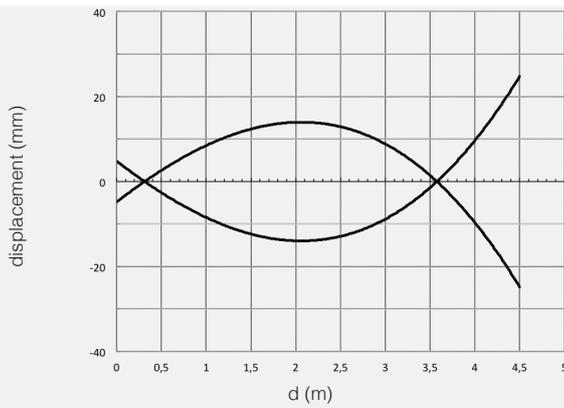
SAP/**-** excess gain



SAP/**-** spot dimension



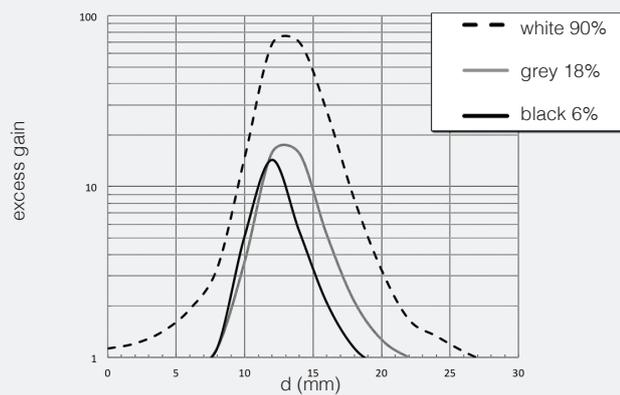
SAP/**-** parallel displacement



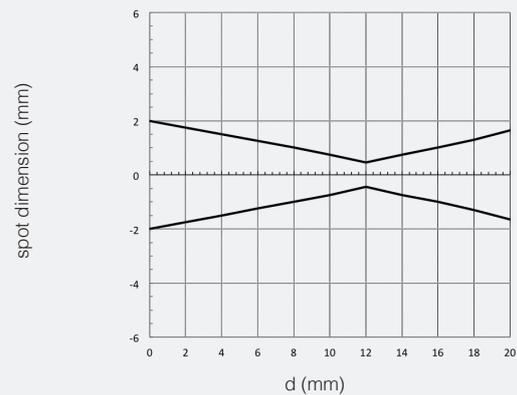
response diagrams

direct diffuse models

S*T/**-** + STF-12 excess gain



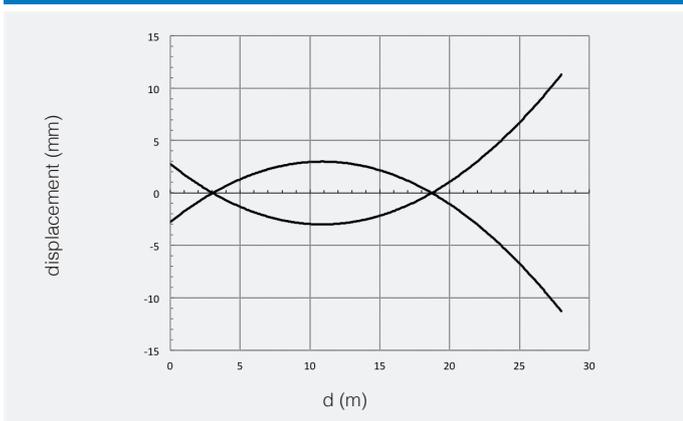
S*T/**-** + STF-12 spot dimension



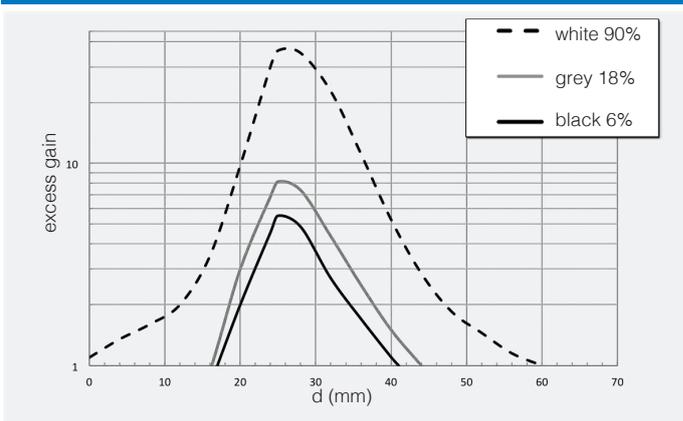
SA



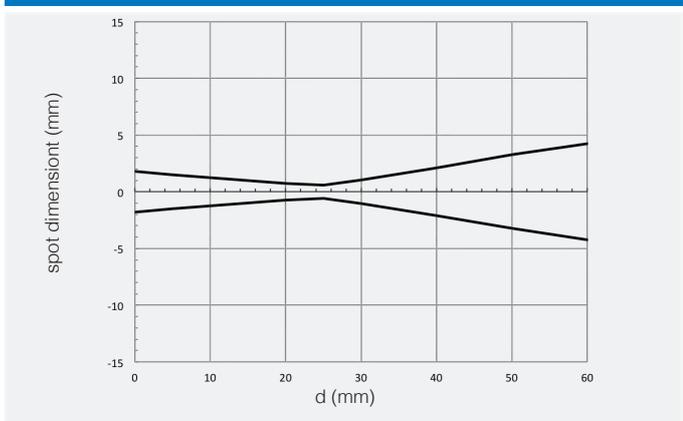
S*T/**-** + STF-12 parallel displacement



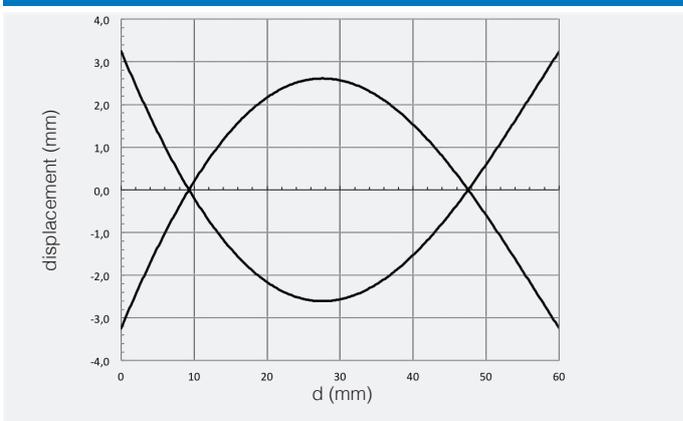
S*T/**-** + STF-12 excess gain



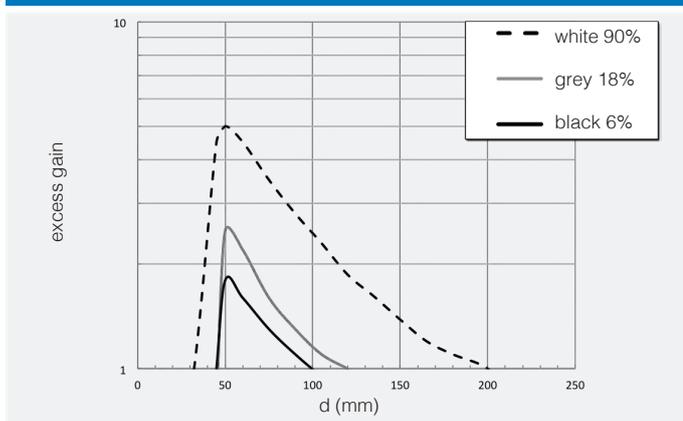
S*T/**-** + STF-12 spot dimension



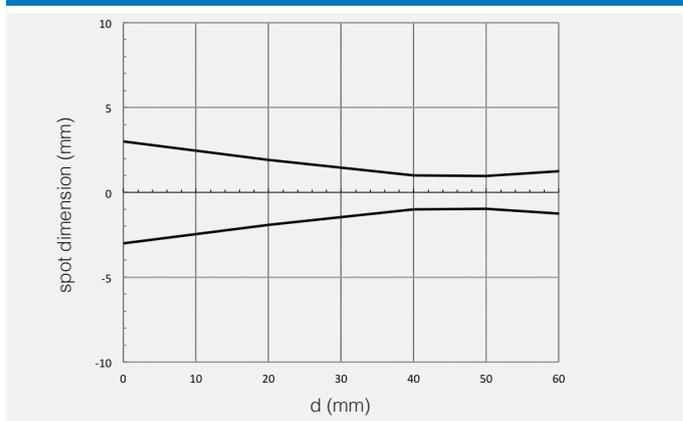
S*T/**-** + STF-12 parallel displacement



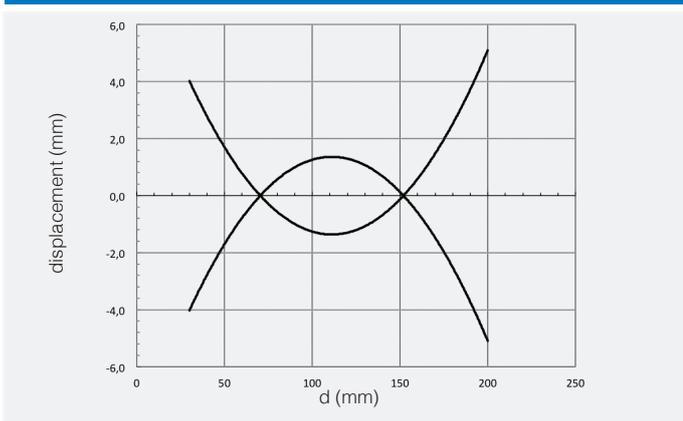
S*T/**-** + STF-50 excess gain



S*T/**-** + STF-50 spot dimension



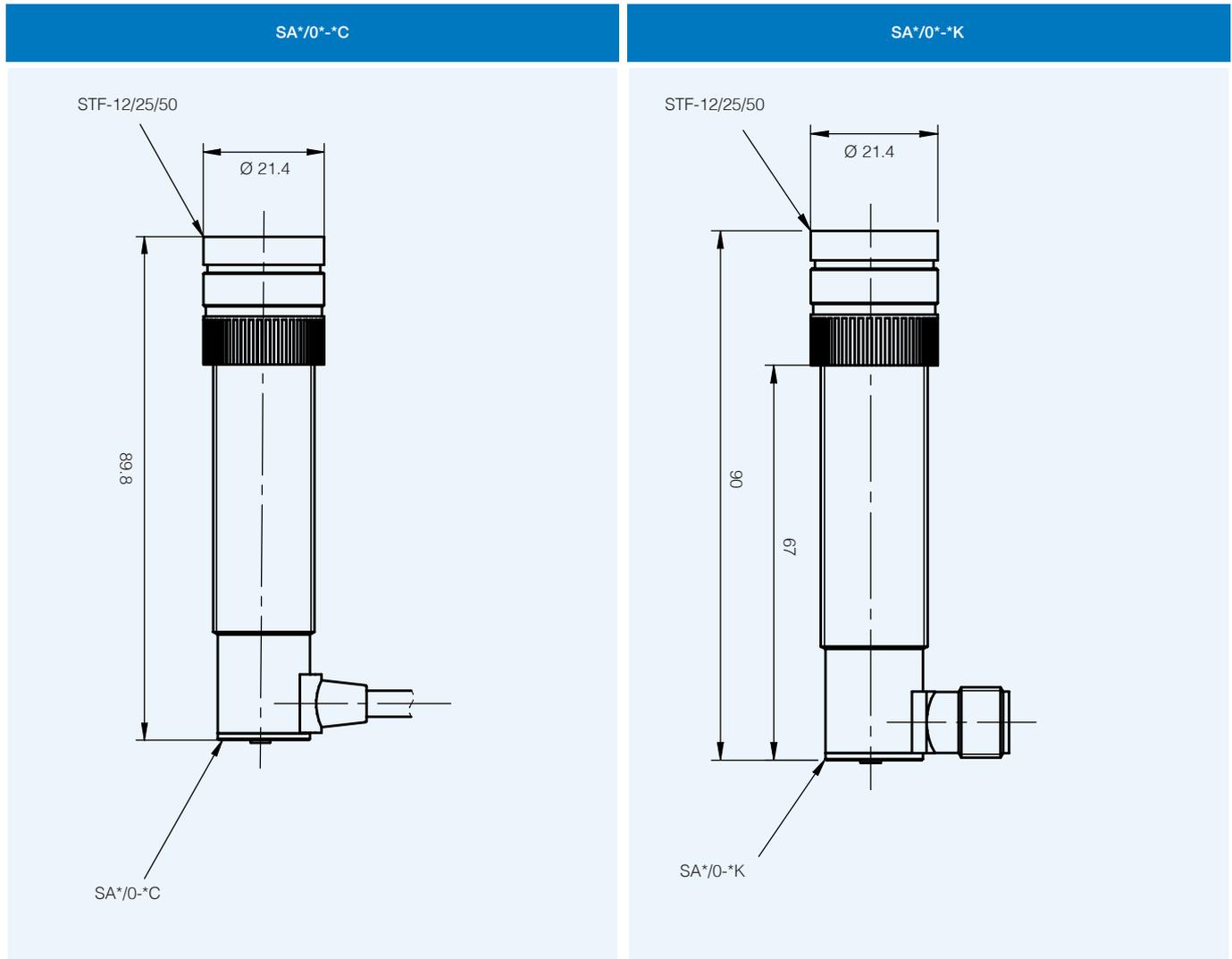
S*T/**-** + STF-50 parallel displacement





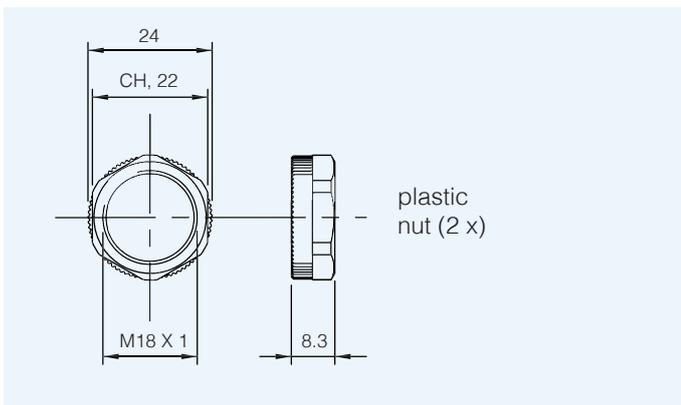
dimensions (mm)

M18 with high performances



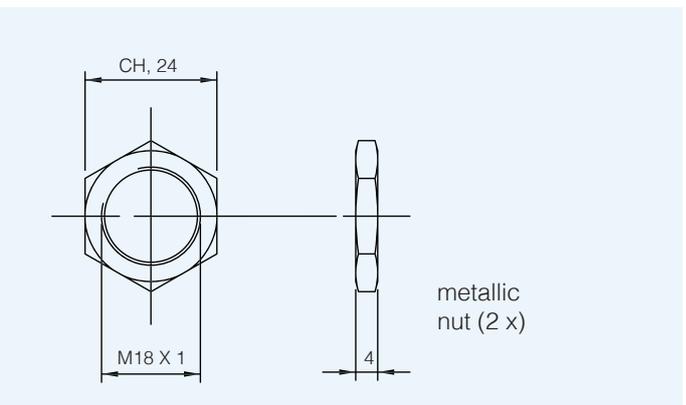
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

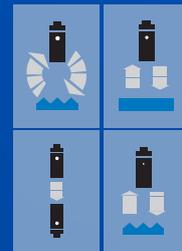
accessories included in all metallic models





MV series

M18 AC multivoltage output photoelectric sensors



M18 AC multivoltage output

features

- Wide range of models: diffuse, retro-reflective, polarized, through-beam
- Through-beam models with high sensing range
- Retro-reflective models with polarized light (with visible beam)
- M12 plug cable exit in axial or right angle shape
- Low leakage current and high output current
- IP67 protection degree
- Complete protection against electrical damage



web contents



- Application notes
- Photos
- Catalogue / Manuals



code description

MV 2 / A 0 - 0 A

| | | |
|---------------------|-----------|---------------------------------------|
| series | MV | M18 multivoltage photoelectric sensor |
| type | 2 | 100 mm diffuse reflection |
| | 4 | 200 mm diffuse reflection |
| | 6 | 400 mm diffuse reflection |
| | C | 4.5 m retro-reflective |
| | P | 3.5 m polarized |
| | E | Emitter |
| | R | 16 m standard receiver |
| output | D | 32 m high distance receiver |
| | A | NO output state |
| | C | Uscita normalmente chiusa NC |
| AC output | 0 | Emettitore |
| NC output | 0 | Uscita AC |
| cable / plug output | 0 | NC output state |
| | A | Axial cable exit |
| | E | M12 plug cable exit |



M18 AC multivoltage output

available models

M18 multitension photoelectric sensor

| function | distance | housing | axial cable exit | | M12 plug exit | |
|--------------------|-----------|---------|------------------|------------|---------------|------------|
| | | | 3 wires N0 | 3 wires NC | 3 wires N0 | 3 wires NC |
| diffuse reflection | 100 mm | plastic | MV2/A0-0A | MV2/C0-0A | MV2/A0-0E | MV2/C0-0E |
| | 200 mm | | MV4/A0-0A | MV4/C0-0A | MV4/A0-0E | MV4/C0-0E |
| | 400 mm | | MV6/A0-0A | MV6/C0-0A | MV6/A0-0E | MV6/C0-0E |
| retro-reflective | 4.5 m | | MVC/A0-0A | MVC/C0-0A | MVC/A0-0E | MVC/C0-0E |
| polarized | 3.5 m | | MVP/A0-0A | MVP/C0-0A | MVP/A0-0E | MVP/C0-0E |
| through-beam | 16 / 32 m | | MVE/00-0A | | MVE/00-0E | |
| | 16 m | | MVR/A0-0A | MVR/C0-0A | MVR/A0-0E | MVR/C0-0E |
| | 32 m | | MVD/A0-0A | MVD/C0-0A | MVD/A0-0E | MVD/C0-0E |

technical specification

| | diffuse reflection | | | retro-reflective | |
|-----------------------------|--|-----------------------|-----------------------|----------------------|----------------------|
| | standard | | | | polarized |
| | MV2/*0-0* | MV4/*0-0* | MV6/*0-0* | MVC/*0-0* | MVP/*0-0* |
| nominal sensing distance | 100 mm ⁽¹⁾ | 200 mm ⁽¹⁾ | 400 mm ⁽²⁾ | 4.5 m ⁽³⁾ | 3.5 m ⁽³⁾ |
| emission | infrared (880 nm) | | | | red (660 nm) |
| tolerance | +15...-5 % Sn | | | | |
| hysteresis | ≤ 10 % | | | | |
| repeatability | 5 % | | | | |
| operating voltage | 20...253 Vac / 50...60 Hz | | | | |
| ripple | ≤ 10 % | | | | |
| no-load supply current | ≤ 30 mA _{RMS} | | | | |
| load current | 5...300 mA _{RMS} (Ta = 50°C) | | | | |
| inrush current | 6 A (Ton = 10 ms) | | | | |
| leakage current | 1.5 mA _{RMS} max. (Volltaggio = 250 Vac) | | | | |
| voltage drop | 3 V max. IL = 300 mA | | | | |
| output type | TRIAC | | | | |
| switching frequency | 25 Hz | | | | |
| power on delay | 200 ms | | | | |
| temperature range | - 25°C...+ 70°C (without freeze) | | | | - 25°C...+ 60°C |
| temperature drift | ≤ 10 % Sr | | | | |
| protection degree | IP67 (EN60529) ⁽⁴⁾ | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | |
| LEDs | red | | | | |
| housing material | PBT (plastic housing) / polycarbonate (cable exit) | | | | |
| lenses material | PMMA | | | | |
| tightening torque | 1 Nm | | | | |
| weight (approximate) | 30 g connector / 100 g cable | | | | |

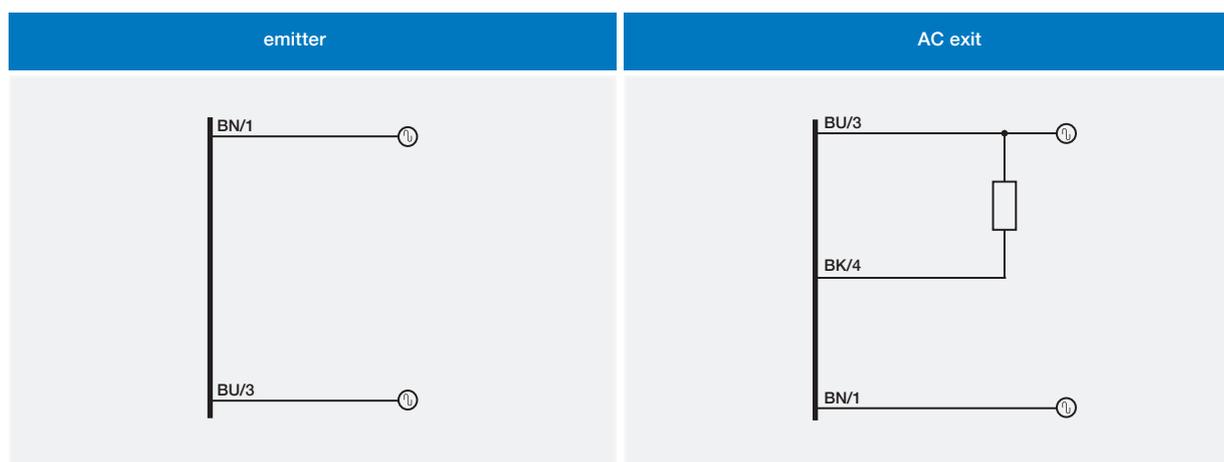
⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With 200x200 mm white matt paper ⁽³⁾ With standard reflector Ø80 mm (RL110 supplied separately) ⁽⁴⁾ Protection guaranteed only with plug cable well mounted



| | through-beam | |
|-----------------------------|--|-----------------------|
| | standard | high distance |
| | M*E/00-0* + M*R/*0-0* | M*E/00-0* + M*D/*0-0* |
| | | |
| nominal sensing distance | 16 m | 32 m |
| emission | infrared (880 nm) | |
| minimum detectable object | Ø 7,5 mm | |
| tollarence | see Sr (glossary) | |
| hysteresis | ≤ 10 % | |
| repeatability | 5 % | |
| operating voltage | 20...253 Vac / 50...60 Hz | |
| no-load supply current | ≤ 30 mA _{RMS} (emitter), 15 mA _{RMS} (receiver) | |
| load current | 5...300 mA _{RMS} (Ta = 50°C) | |
| inrush current | 6 A (Ton = 10 ms) | |
| leakage current | 1,5 mA _{RMS} max. (Votaggio = 250 Vac) | |
| voltage drop | 3 V max. IL = 300 mA | |
| output type | TRIAC | |
| switching frequency | 25 Hz | |
| power on delay | 200 ms | |
| temperature range | - 25°C...+ 70°C (without freeze) | |
| temperature drift | ≤ 10 % Sr | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | |
| LEDs | red (output energized) | |
| housing material | PBT (plastic) / polycarbonate (cable exit) | |
| lenses material | PMMA | |
| tightening torque | 1 Nm | |
| weight (approximate) | 30 g plug / 100 g cable | |

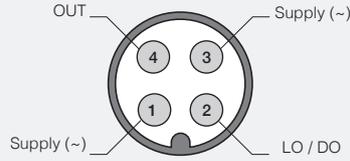
⁽¹⁾ Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections





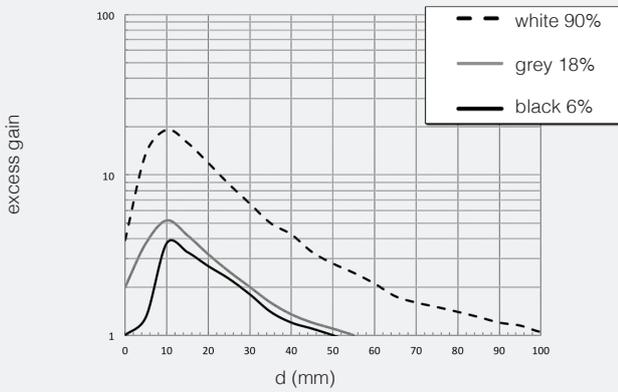
MQ background suppression



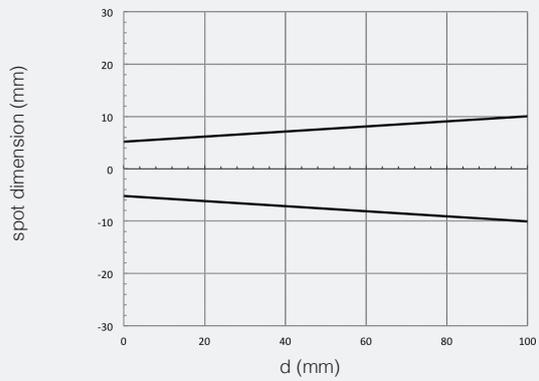
response diagrams

diffuse reflection models

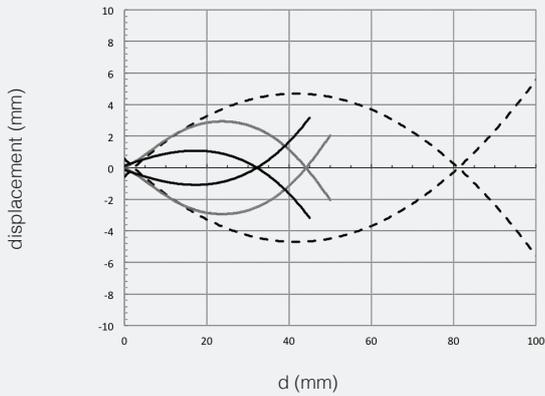
MV2/00-**-** excess gain



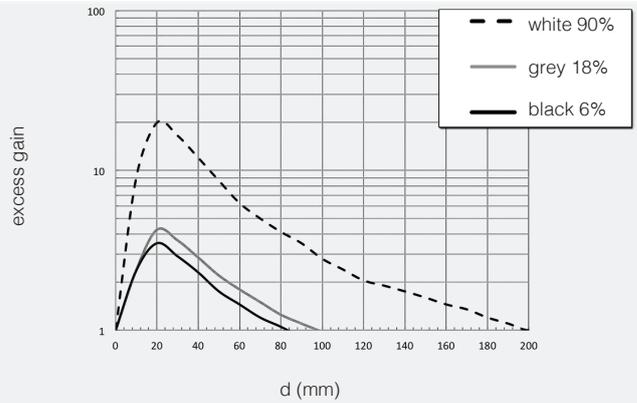
MV2/00-**-** spot dimension



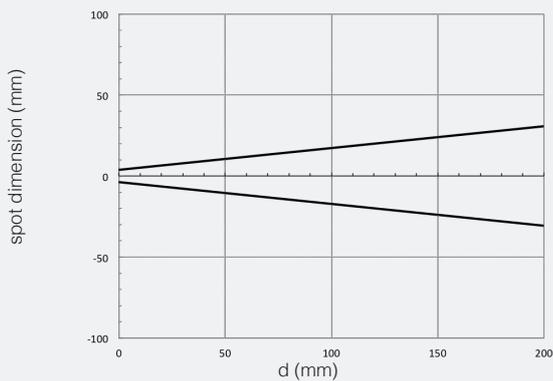
MV2/00-**-** parallel displacement



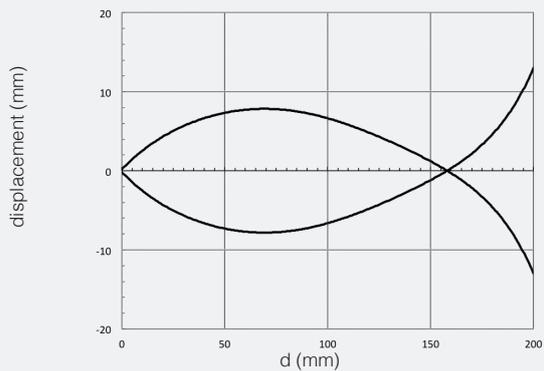
MV4/00-**-** excess gain



MV4/00-**-** spot dimension

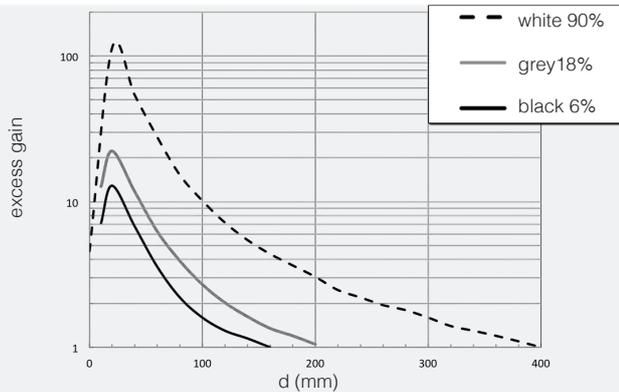


MV4/00-**-** parallel displacement

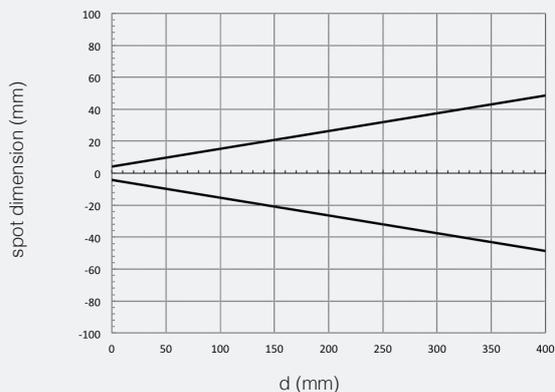




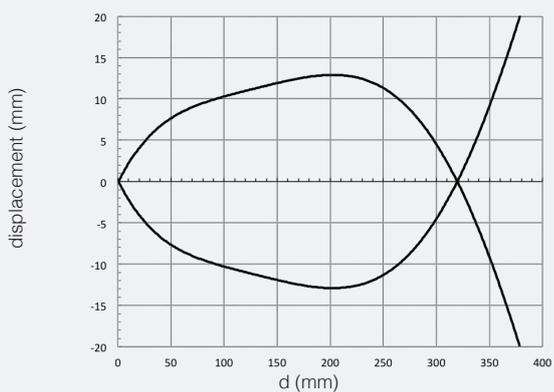
MV6/0*-** excess gain



MV6/0*-** spot dimension



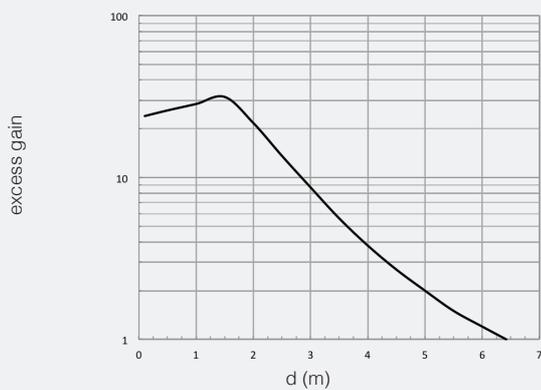
MV6/0*-** parallel displacement



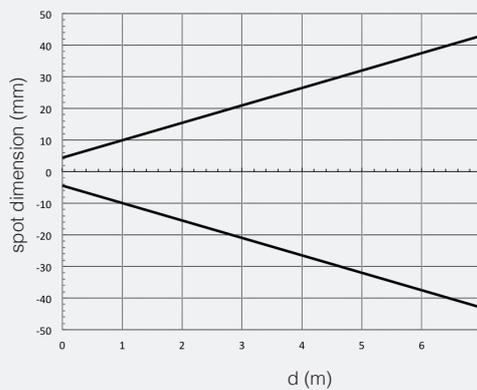
response diagrams

retro-reflective models (diagrams detected using RL110)

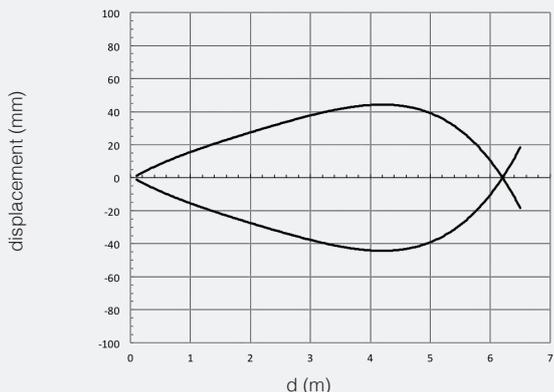
MVC/**-** excess gain



MVC/**-** spot dimension



MVC/**-** parallel displacement



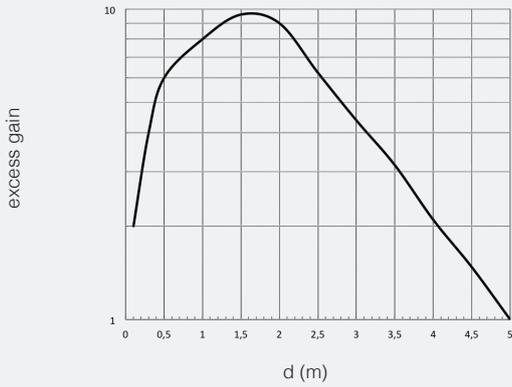


response diagrams

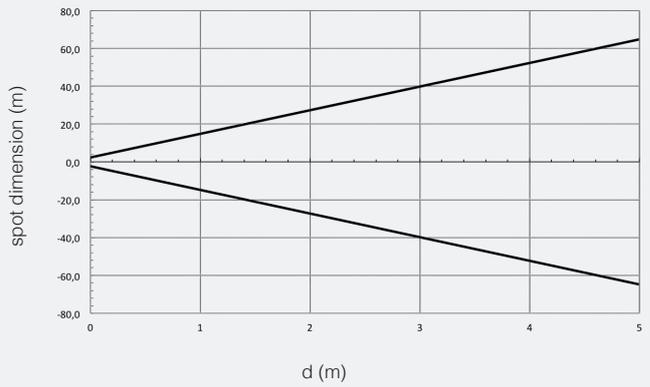
polarized models

M18 AC multivoltage
output

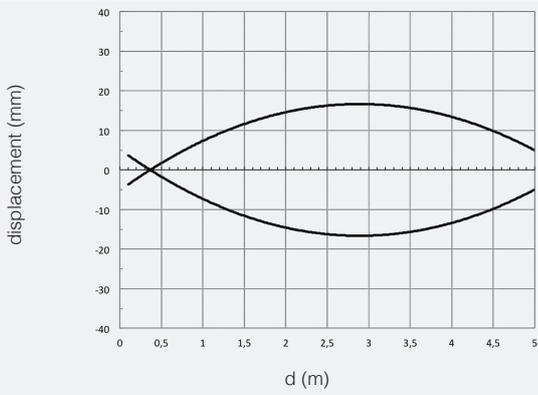
MVP/**-** excess gain



MVP/**-** spot dimension



MVP/**-** parallel displacement



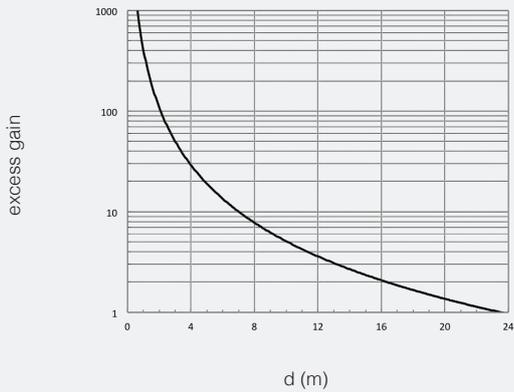
response diagrams

through-beam models

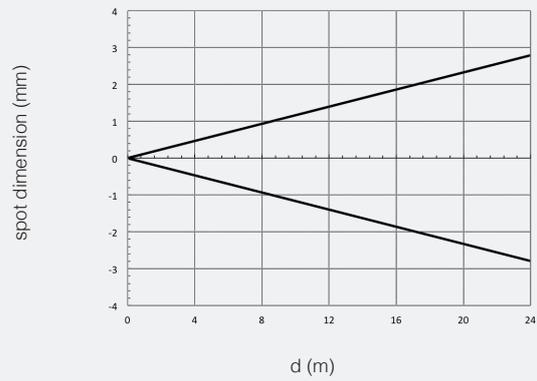


M18 AC multivoltage output

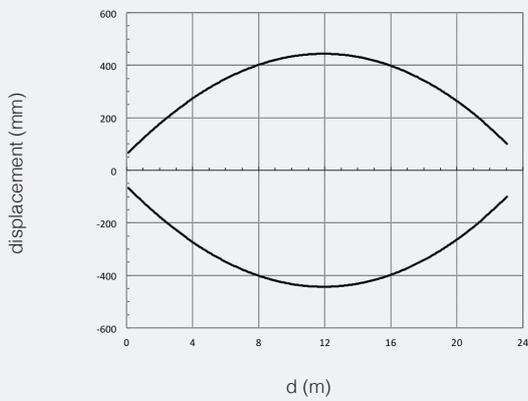
MVE/**_** - MVR/**_** excess gain



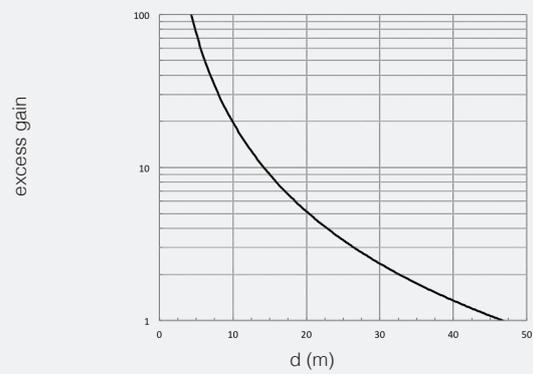
MVE/**_** - MVR/**_** spot dimension



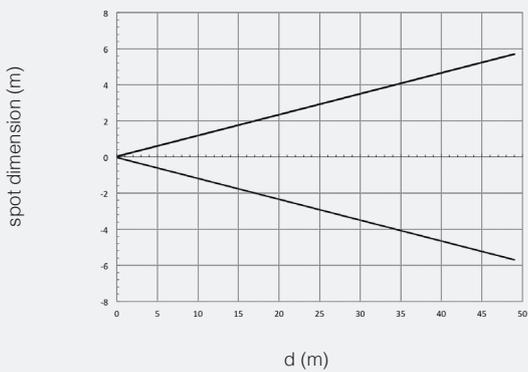
MVE/**_** - MVR/**_** parallel displacement



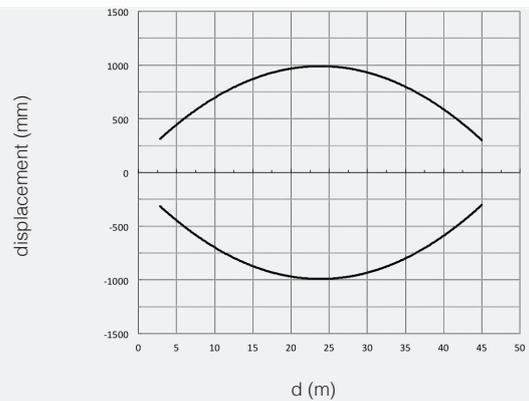
MVE/**_** - MVD/**_** excess gain



MVE/**_** - MVD/**_** spot dimension



MVE/**_** - MVD/**_** parallel displacement

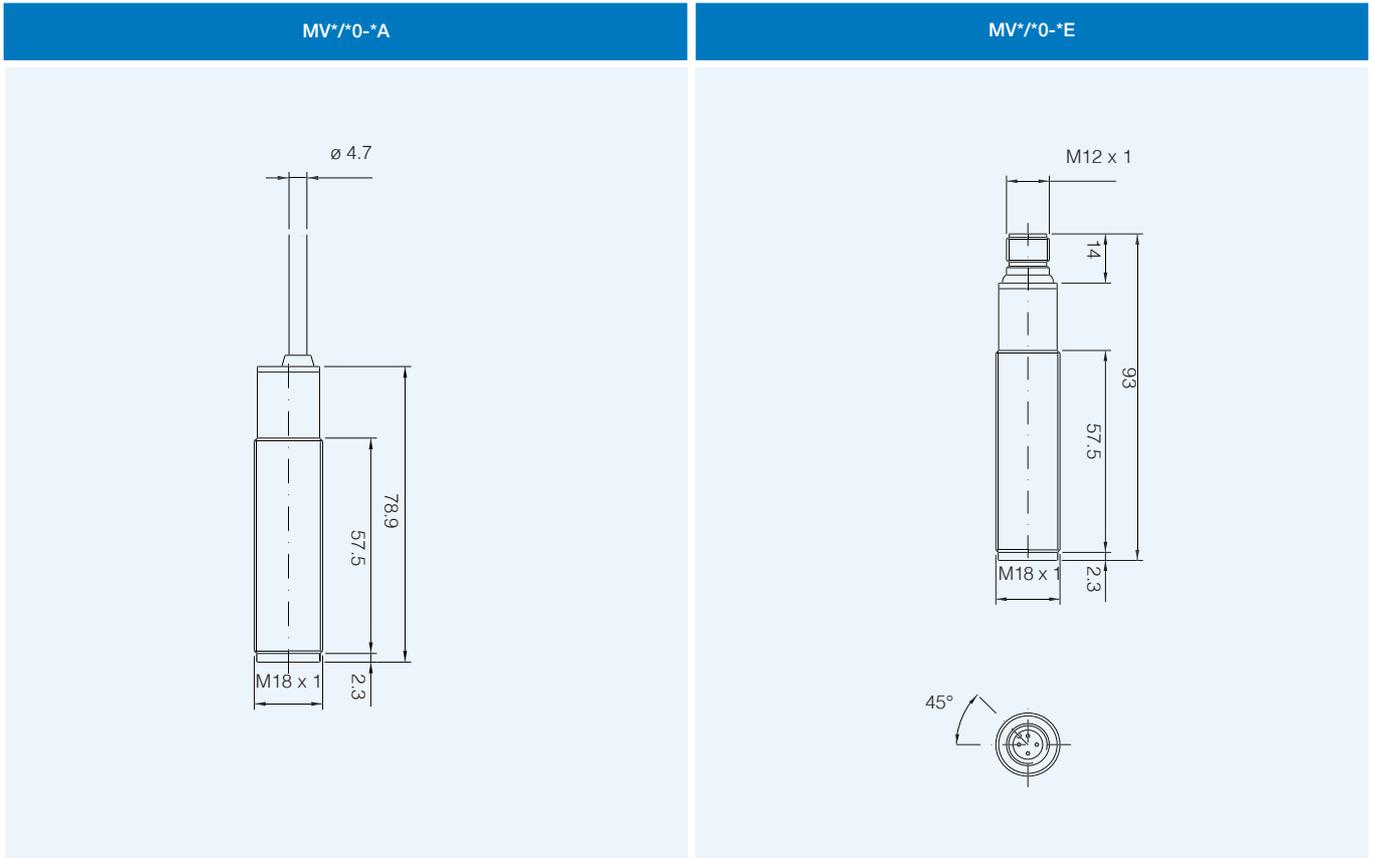




dimensions (mm)

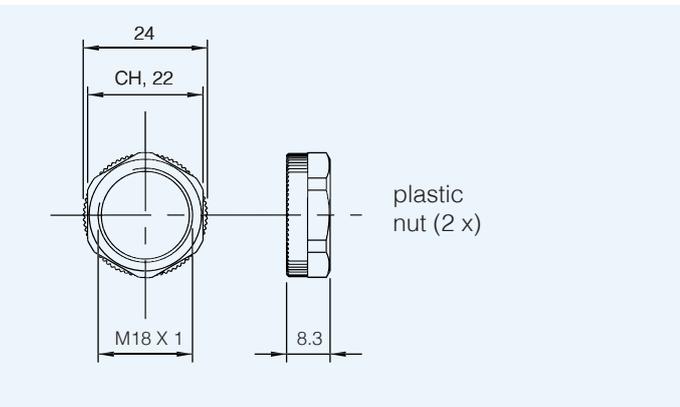
axial models

M18 AC multivoltage output



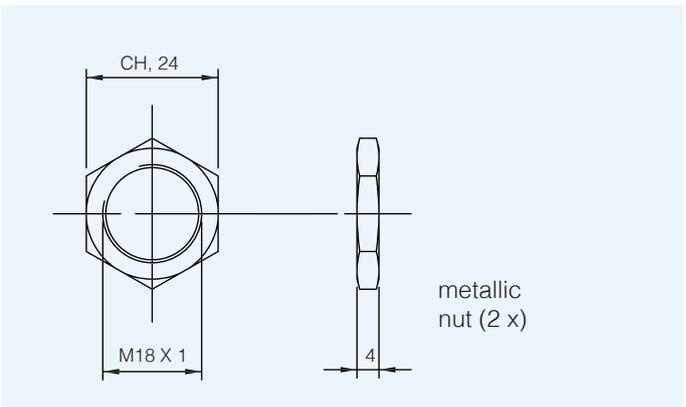
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models

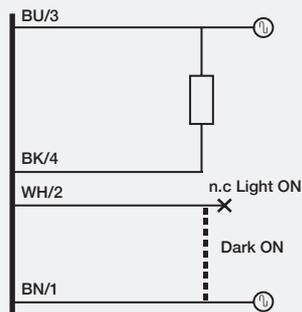




| | MQ0/00-0E | MQ1/00-0E |
|-----------------------------|---|-----------|
| | | |
| nominal sensing distance | 50 mm | 100 mm |
| tolerance | + 15 / 0 % di Sn | |
| emission | infrared (880 nm) | |
| hysteresis | ≤ 1.5 % (white paper) | |
| repeatability | 5 % | |
| supply voltage | 20...253 Vac / 50 - 60 Hz | |
| no-load supply current | 40 mA _{RMS} | |
| load current | 5...300 mA _{RMS} | |
| inrush current | 64 (Ton=10 ms) | |
| leakage current | ≤ 1.5 mA _{RMS} (@ 250 Vca) | |
| output voltage drop | 3 V max @ IL 300 mA | |
| output type | TRIAC | |
| switching frequency | 25 Hz | |
| power on delay | 200 ms | |
| power supply protections | impulsive over voltage | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | |
| storage temperature | - 55°C...+80°C | |
| external light interference | 3,000 lux (incandescence lamp), 10,000 lux (sunlight) | |
| temperature drift | ≤ 10 % Sr | |
| EMC | according to EN50082-2; EN60947-5-2; EN50081-1 | |
| LED indicator | yellow (light output status) | |
| protection degree | IP67 (EN60529) | |
| plug exit | M12 4 poli; Male | |
| housing material | PBT (barrel), PC (plug) | |
| optic material | PMMA | |
| tightening torque | 1 Nm | |
| weight (approximate) | 30 gr | |

electrical diagrams of the connections

MQ background suppression



- BN** brown
- BU** blue
- BK** black
- WH** white
- PK** pink
- GY** gray

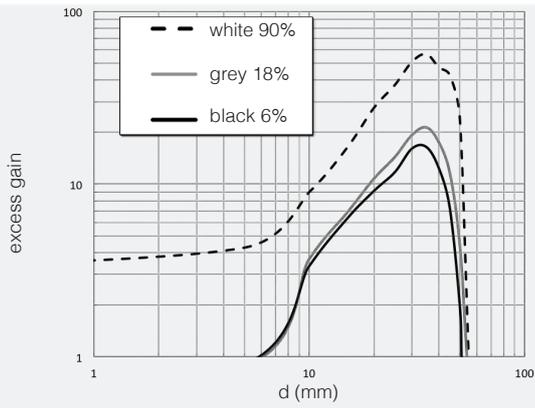
response diagrams

background suppression models

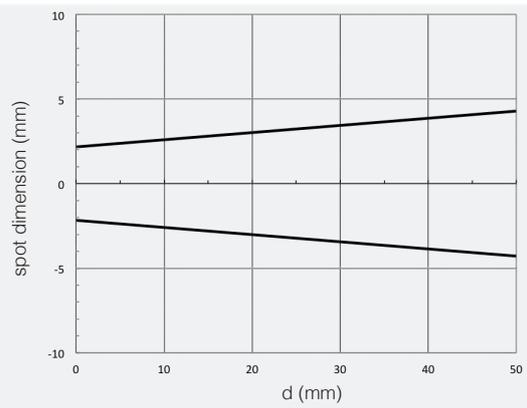


M18 AC with
90° optic

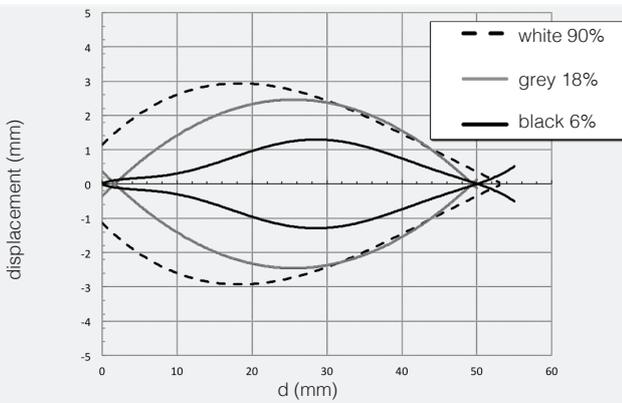
M*0/**-** excess gain



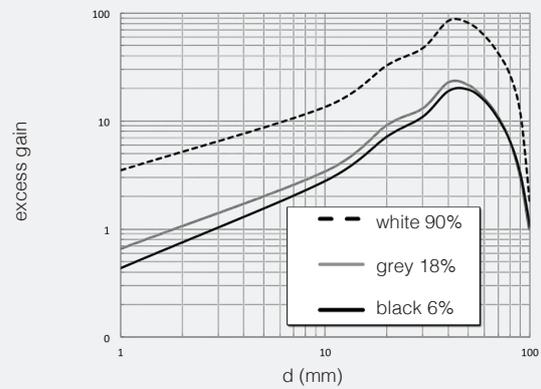
M*0/**-** spot dimension



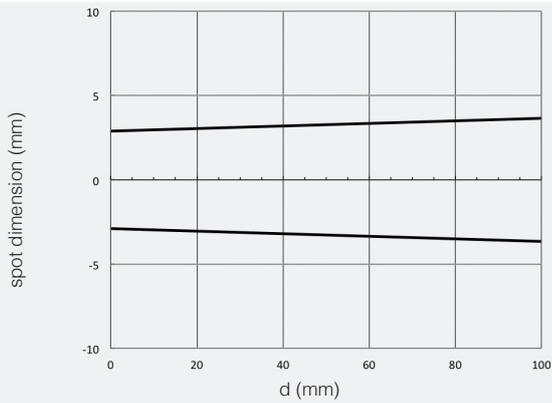
M*0/**-** parallel displacement



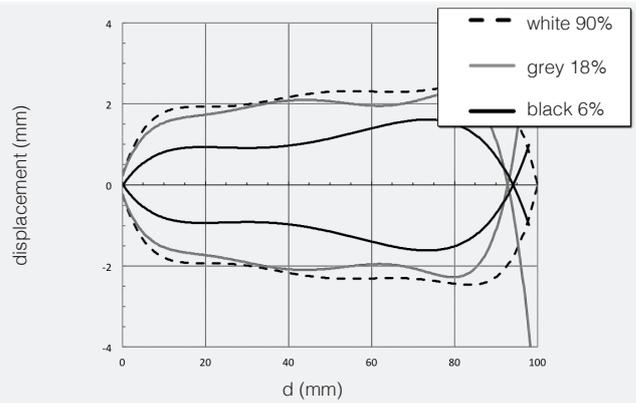
M*1/**-** excess gain



M*1/**-** spot dimension

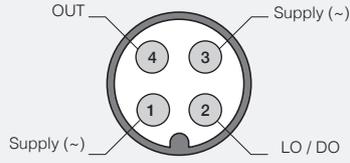


M*1/**-** parallel displacement





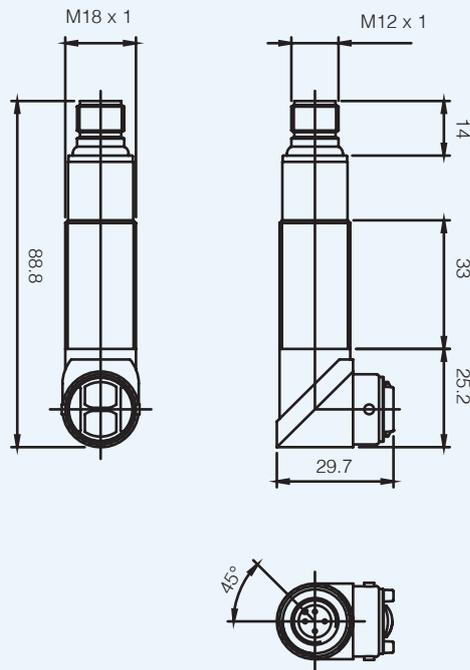
MQ background suppression



LO = Light ON
DO = Dark ON

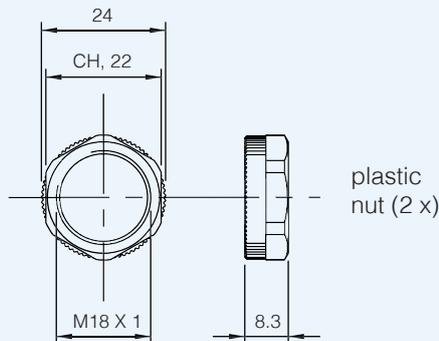
dimensions (mm)

MQ0/00-0E; MQ1/00-0E



dimensions (mm)

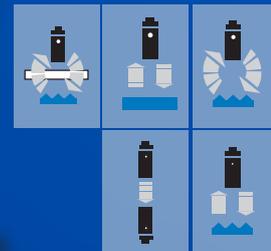
accessories included in all plastic models





FQ series

M18 photoelectric sensors with short body



features

- Wide range of models: direct diffuse, retro-reflective, polarized and fixed-focus
- Direct diffuse models with short and long sensing distance, polarized and through beam
- Nickel brass or plastic housing
- NO+NC complementary output
- P67 protection degree
- Complete protection against electrical damages
- Approvals: CE



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M18 short body

code description

FQ I 7 / B P - 0 E

| | | |
|---------------------|-----------|---|
| series | FQ | M18 photoelectric sensors with short body |
| emission | I | Infrared emission |
| | R | Visible red light emission |
| type | 2 | 100 mm direct diffuse without sens. adj. |
| | 3 | 100 mm direct diffuse with sens. adj. |
| | 7 | 400 mm direct. diffuse with sens. adj. |
| | 8 | Direct reflection: 1200 mm (axial), 1000 mm (90°) with adj. |
| | C | 6 m retro-reflective |
| | N | 4.5 m retro-reflective with adj. |
| | L | Retroreflective for transparent objects 1.5 m |
| housing | H | Emitter without sens. adj. |
| | Z | 20 m Receiver without sens. adj. |
| | 0 | Emitter without check |
| output logic | B | Complementary output NO+NC |
| | 0 | Emitter |
| | P | PNP output |
| housing material | N | NPN output |
| | 0 | Plastic housing, axial optic |
| | 1 | Metal housing, axial optic |
| | 2 | Plastic housing, right angle optic |
| cable / plug output | 3 | Metal housing, right angle optic |
| | E | M12 plastic plug cable exit |
| | A | 2 m axial cable exit |



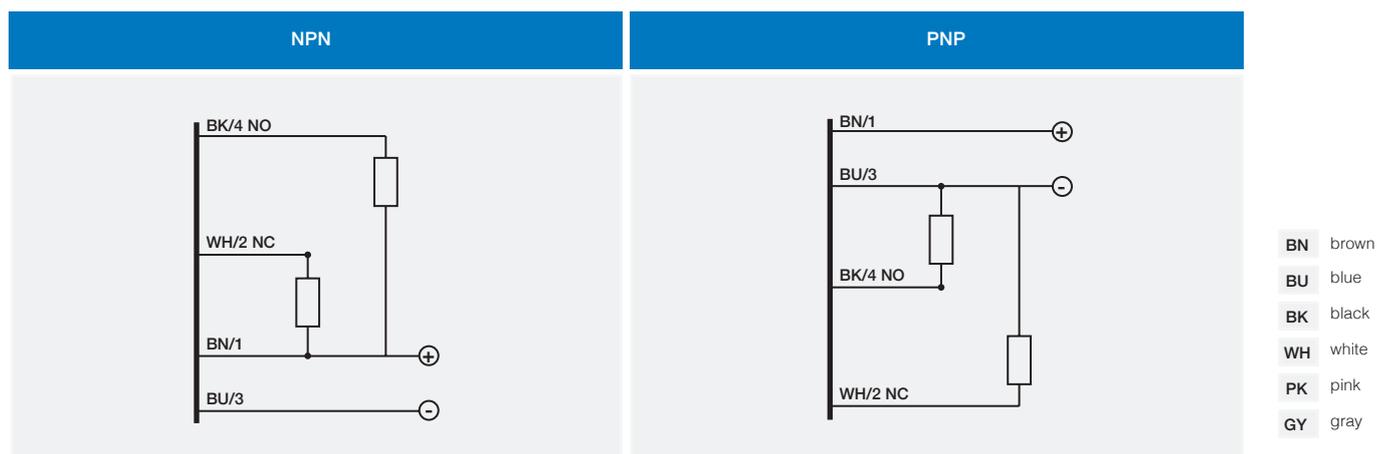
M18 short body

available models

| function | distance | adjustment | output | housing | axial models | | right angle models | |
|-----------------------------------|------------------------------|------------|----------|------------|--------------|-------------|--------------------|-------------|
| | | | | | PNP NO + NC | NPN NO + NC | PNP NO + NC | NPN NO + NC |
| direct diffuse | 100 mm | ● | cable | plastic | FQR2/BP-0A | - | - | - |
| | | | M12 plug | | FQR3/BP-0E | - | - | - |
| | | | cable | | FQI7/BP-0E | - | - | - |
| | 400 mm | | M12 plug | FQI7/BP-1A | - | - | - | |
| | | | cable | FQI7/BP-1E | - | - | - | |
| | | | M12 plug | - | FQI7/BP-1A | - | - | |
| | 1,200 mm (A) 1,000 mm (R) | | cable | - | FQI8/BN-0A | - | - | |
| | | | M12 plug | FQI8/BP-0E | FQI8/BN-0E | FQI8/BP-2E | - | |
| | | | cable | FQI8/BP-1A | - | - | - | |
| retro-reflective | 6 m | cable | plastic | FQIC/BP-0A | FQIC/BN-0A | FQIC/BP-2A | FQIC/BN-2A | |
| | | M12 plug | | FQIC/BP-0E | - | - | - | |
| polarized | 4.5 m | cable | plastic | FQRN/BP-0A | - | FQRN/BP-2A | - | |
| | | M12 plug | | FQRN/BP-0E | - | FQRN/BP-2E | - | |
| | | M12 plug | | FQRN/BP-1E | - | FQRN/BP-3E | - | |
| for transparent objects detection | 1.5 m | cable | plastic | - | - | FQRL/BP-2A | - | |
| | | M12 plug | | FQRL/BP-0E | - | FQRL/BP-2E | - | |
| | | M12 plug | | FQRL/BP-1E | - | - | - | |
| emitter | 20 m | - | cable | plastic | FQIH/00-0A | - | - | - |
| | | | M12 plug | | FQIH/00-0E | - | FQIH/00-2E | - |
| | | | M12 plug | | FQIH/00-1E | - | - | - |
| receiver | 20 m | - | cable | plastic | FQIZ/BP-0A | - | - | - |
| | | | M12 plug | | FQIZ/BP-0E | - | FQIZ/BP-2E | - |
| | | | M12 plug | | FQIZ/BP-1E | - | - | - |

electric diagrams of the connections

NO + NC complementary exit

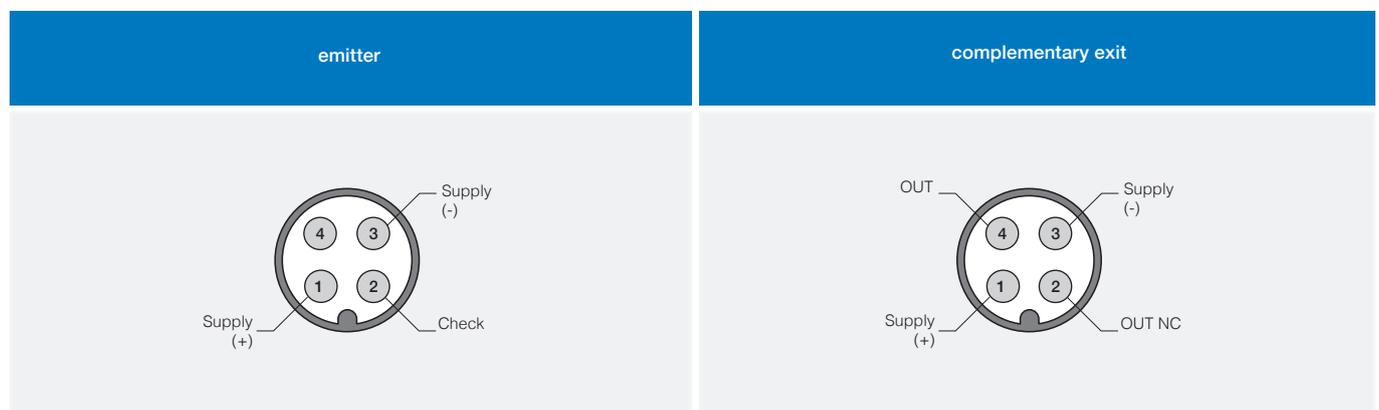




| | direct diffuse | | | | retroreflective | polarized | for transparent objects | through beam | |
|--------------------------------|----------------|--------|--------------------|------------------|--------------------|---|-------------------------|-------------------|------|
| | FQR2 | FQR3 | FQI7 | FQI8 | FQIC | FQRN | FQRL ⁽²⁾ | FQIZ | FQIH |
| nominal sensing distance | 100 mm | 400 mm | 1,2 m 1 m (90°) | 6 m 4 m (90°) | 4,5 m 3 m (90°) | 0.1...1.5 m | 20 m 15 m (90°) | | |
| emission | red (660 nm) | | infrared (880 nm) | | | red (660 nm) | | infrared (880 nm) | |
| differential travel | | | | | | ≤ 10 % | | | |
| repeatability | | | | | | ≤ 5 % | | | |
| operating voltage | | | | | | 10...30 Vcc | | | |
| ripple | | | | | | ≤ 10 % | | | |
| no-load supply current | | | | | | ≤ 30 mA | | | |
| load current | | | | | | ≤ 50 mA | | | |
| leakage current | | | | | | ≤ 10 µA | | | |
| output voltage drop | | | | | | 2 V max. @ IL = 50 mA | | | |
| output type | | | | | | NPN or PNP NO + NC | | | |
| switching frequency | | | | | | 250 Hz | | | |
| power on delay | | | | | | ≤ 200 ms | | | |
| operating temperature range | | | | | | - 25°C...+ 70°C (without freeze) | | | |
| power supply protections | | | | | | polarity reversal, impulsive overvoltage | | | |
| output electrical protection | | | | | | short circuit (autoreset), overvoltage | | | |
| temperature drift | | | | | | ≤ 10 % Sr | | | |
| protection degree | | | | | | IP67 (EN60529) ⁽¹⁾ | | | |
| EMC | | | | | | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| interference by external light | | | | | | 5,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | |
| LEDs | | | | | | yellow (Light status) | | | |
| housing material | | | | | | PBT (plastic model) /nicked plated brass (metallic model) / PC (cable exit) | | | |
| optic material | | | | | | PC/PMMA | | | |
| tightening torque | | | | | | 1 Nm (plastic), 25 Nm (metallic) | | | |
| weight (approx) | | | | | | 20 g plug (40 g metallic version) / 60 g cable | | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted ⁽²⁾ With RL 113G or RL 116

plug



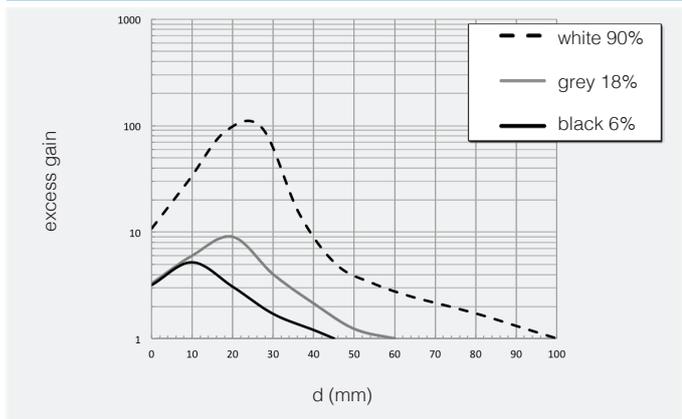


M18 short body

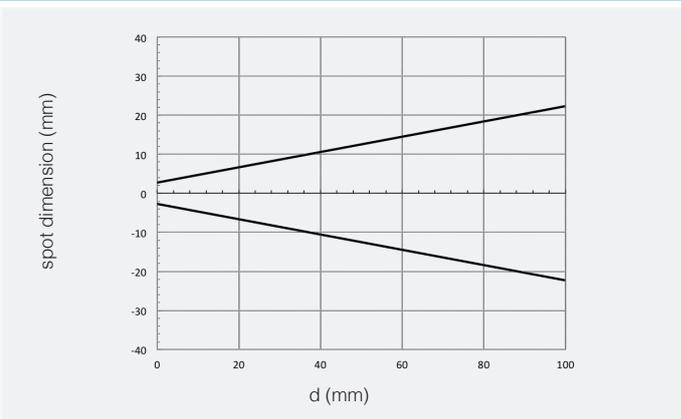
response diagrams

background suppression models

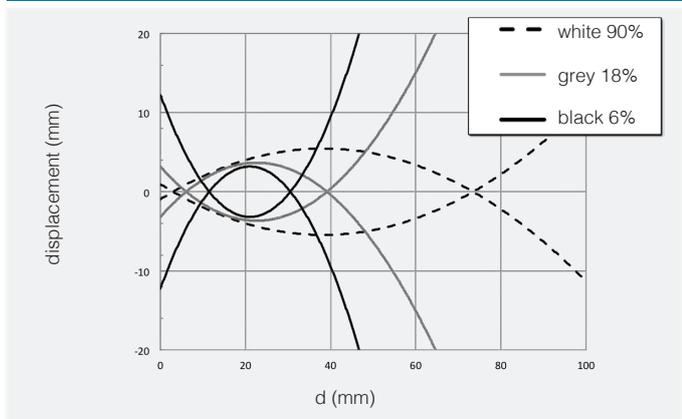
FQR2/FQR3 excess gain



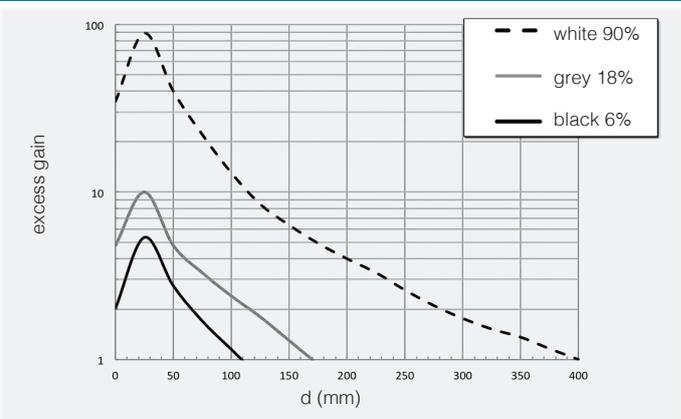
FQR2/FQR3 spot dimension



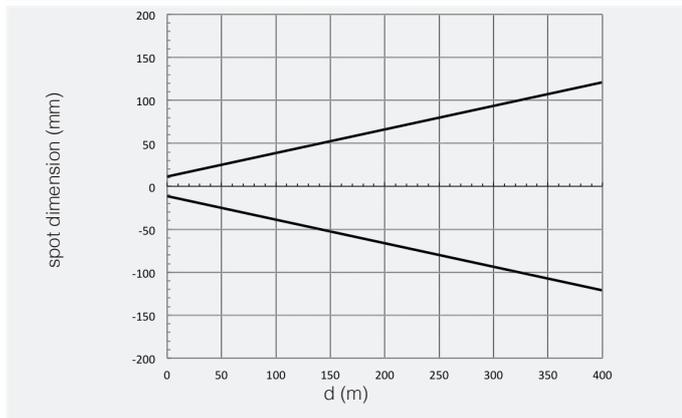
FQR2/FQR3 parallel displacement



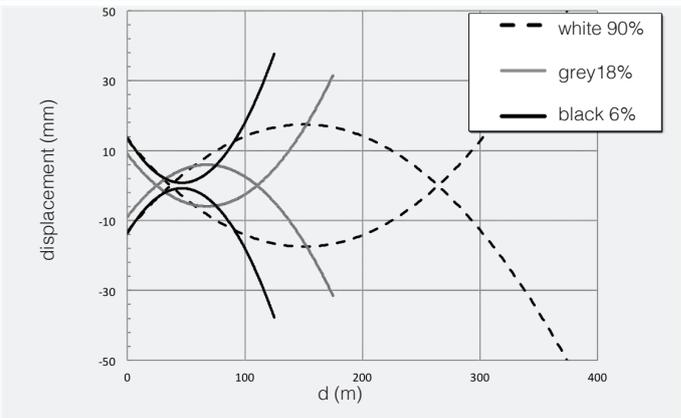
FQI7/B*-** excess gain



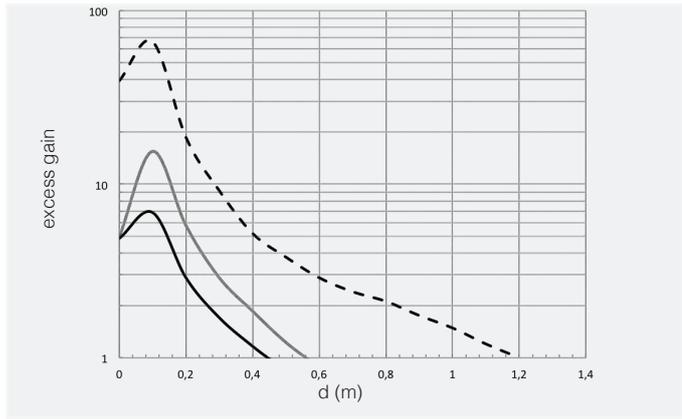
FQI7/B*-** spot dimension



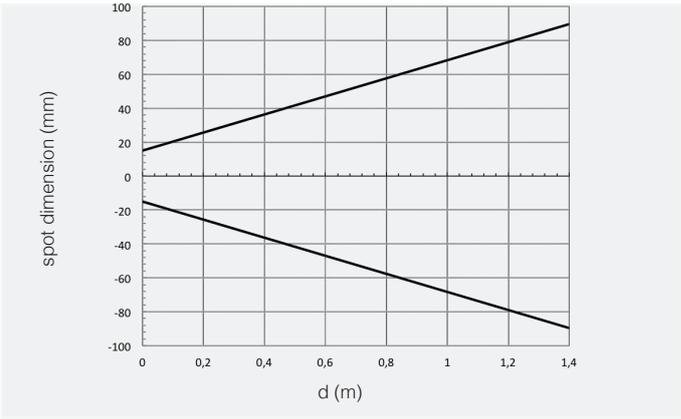
FQI7/B*-** parallel displacement



FQI8/B*-(0,1)* excess gain



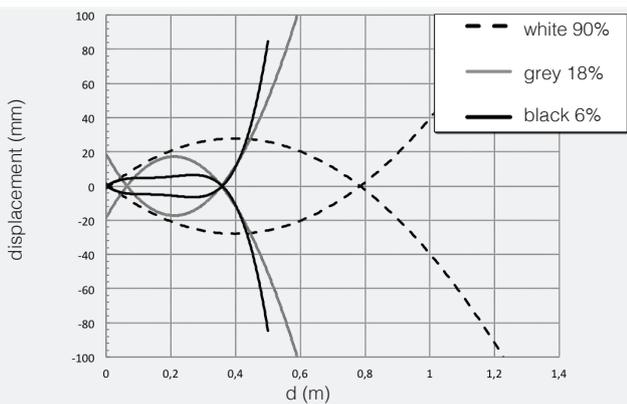
FQI8/B*-(0,1)* spot dimension



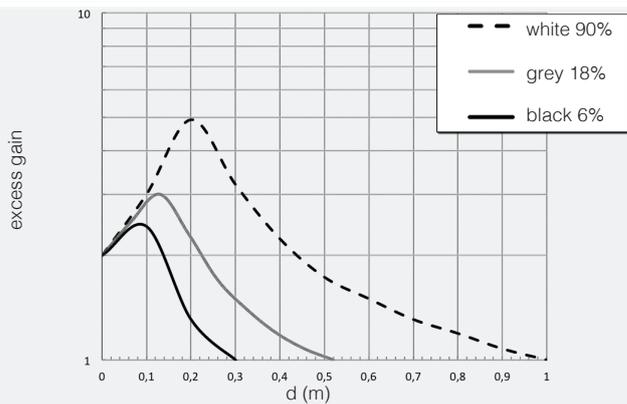
FQ



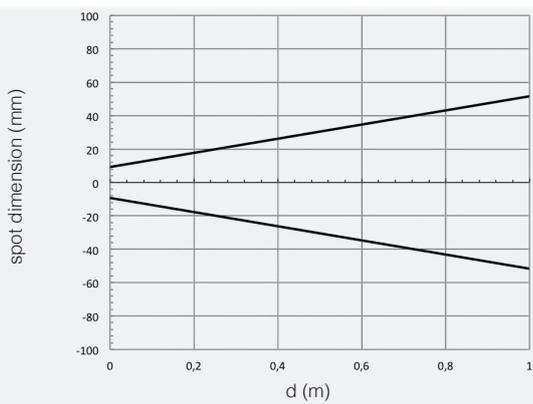
FQI8/B*-(0,1)* parallel displacement



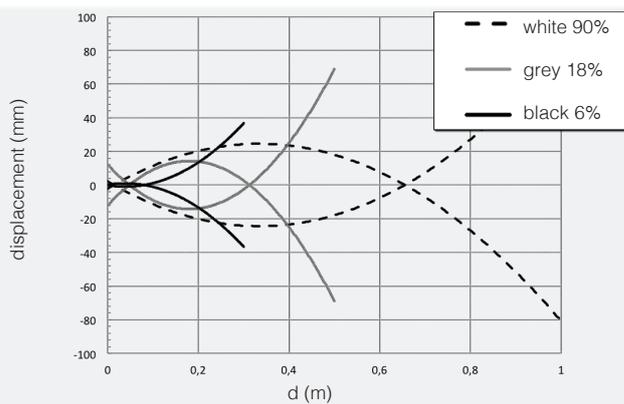
FQI8/B*-(2,3)* excess gain



FQI8/B*-(2,3)* spot dimension



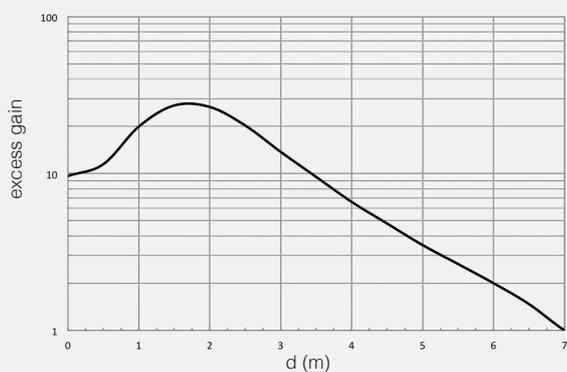
FQI8/B*-(2,3)* parallel displacement



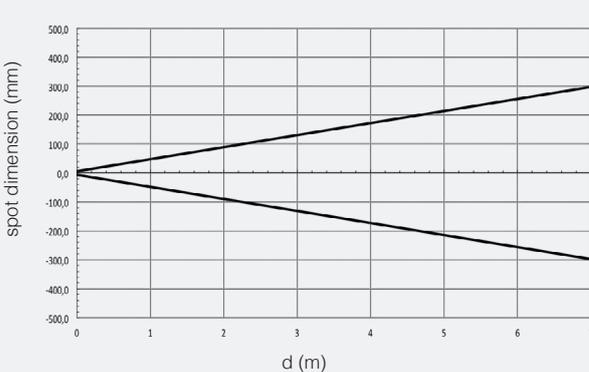
response diagrams

retro-reflective models (diagrams detected using RL110)

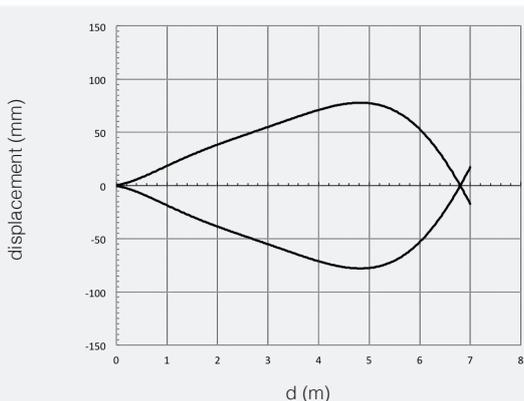
FQIC/B*-(0,1)* excess gain



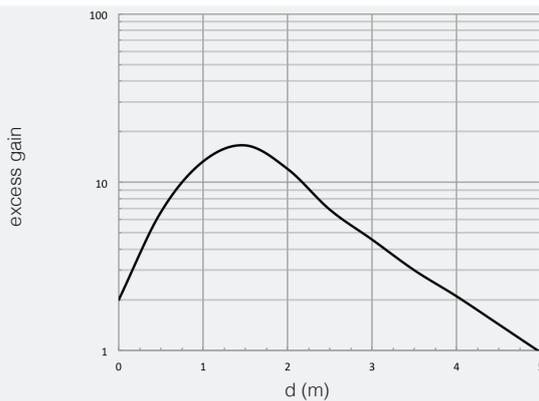
FQIC/B*-(0,1)* spot dimension



FQIC/B*-(0,1)* parallel displacement



FQIC/B*-(2,3)* excess gain

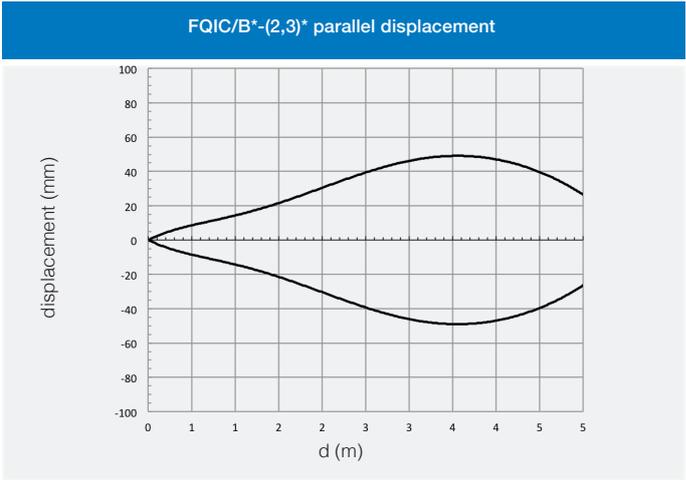
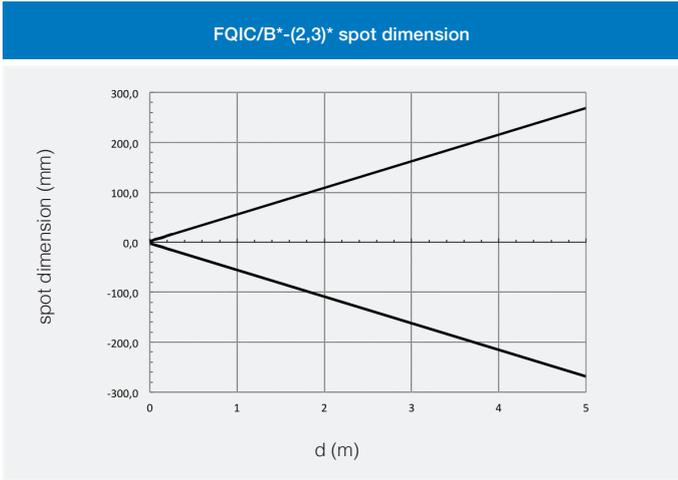




response diagrams

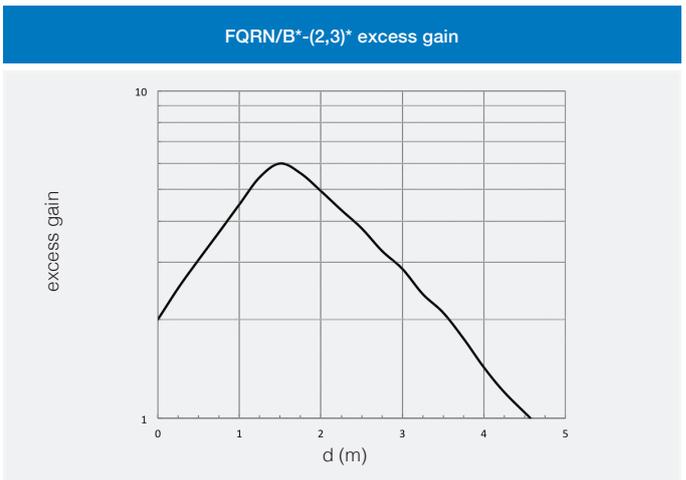
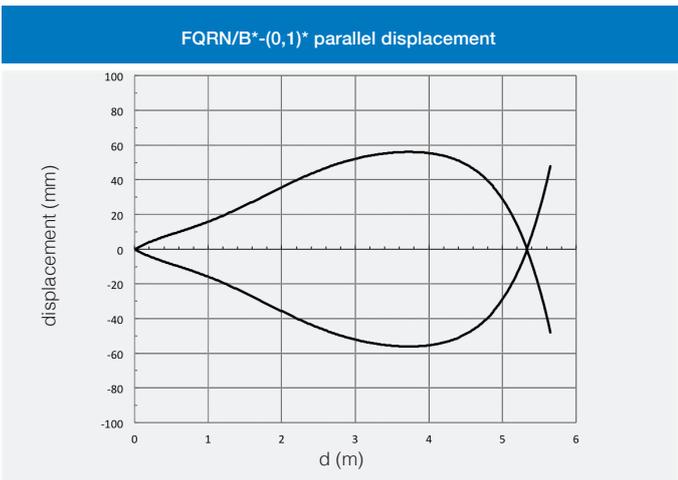
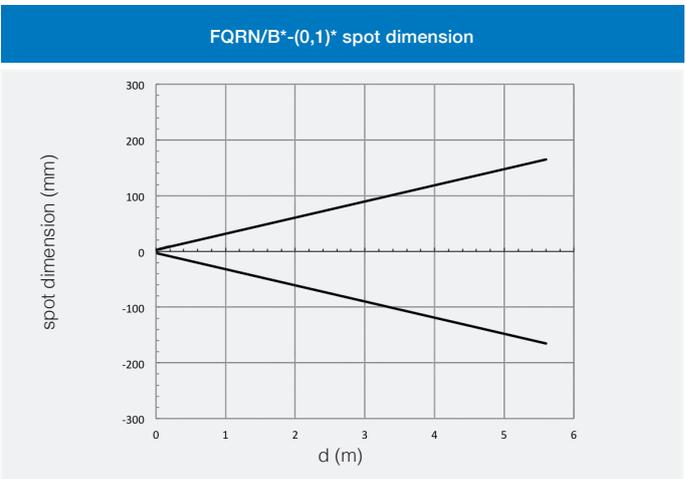
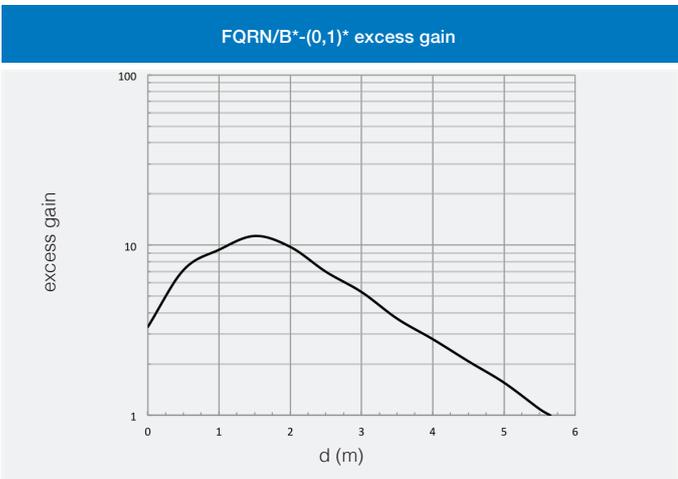
retro-reflective models

M18 short body



response diagrams

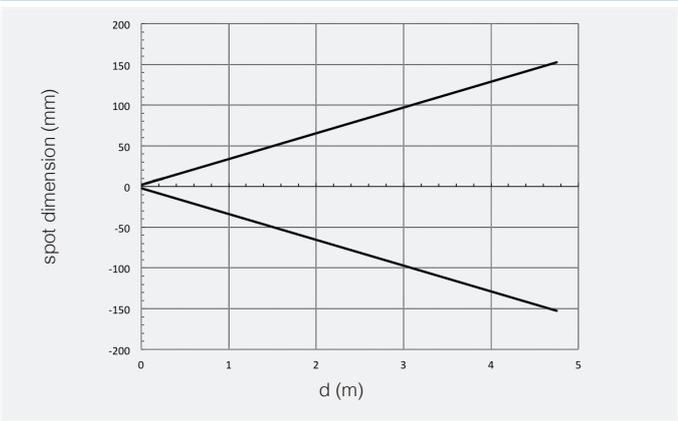
polarized models (diagrams detected using RL110)



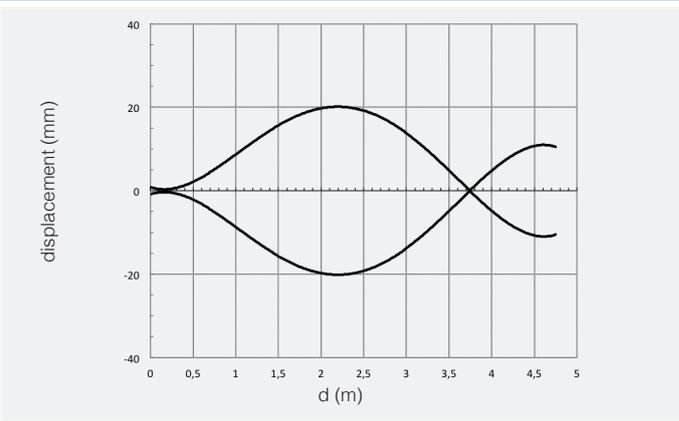
FQ



FQRN/B⁺-(2,3)⁺ spot dimension



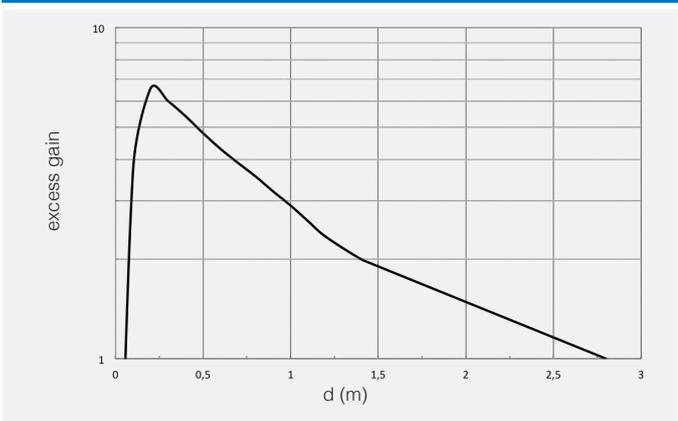
FQRN/B⁺-(2,3)⁺ parallel displacement



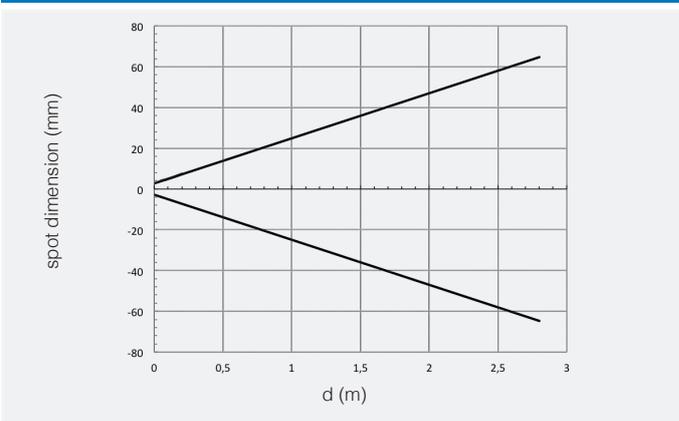
response diagrams

for transparent objects models (diagrams detected using RL110)

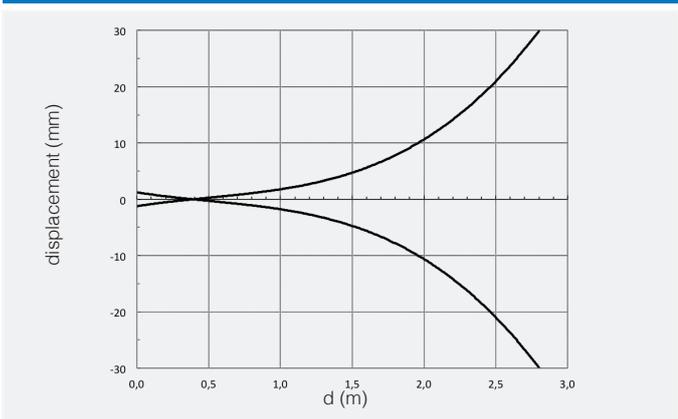
FQRL/B⁺-(0,1)⁺ excess gain



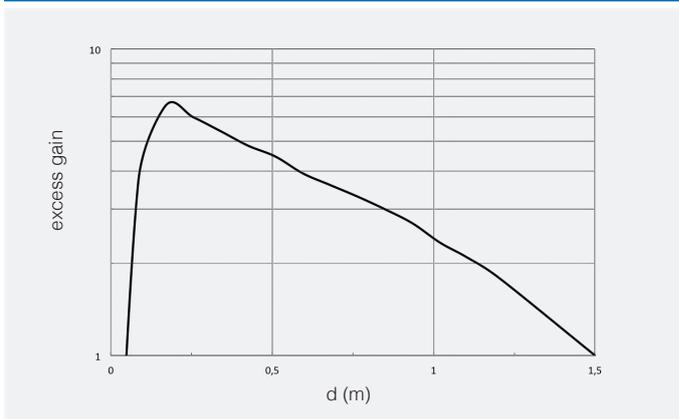
FQRL/B⁺-(0,1)⁺ spot dimension



FQRL/B⁺-(0,1)⁺ parallel displacement



FQRL/B⁺-(2,3)⁺ excess gain



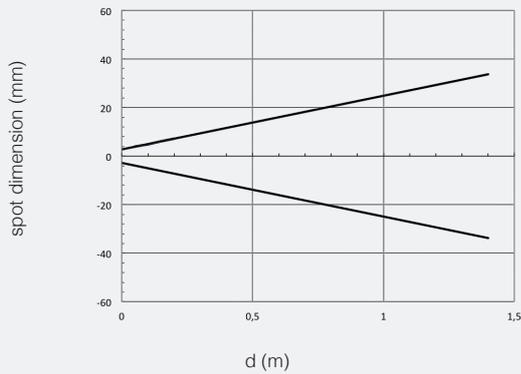


response diagrams

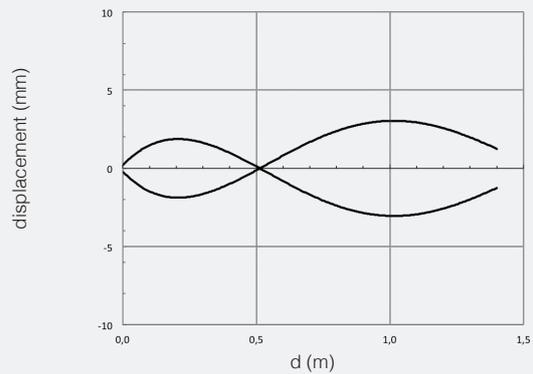
transparent models

M18 short body

FQRL/B*-(2,3)* spot dimension



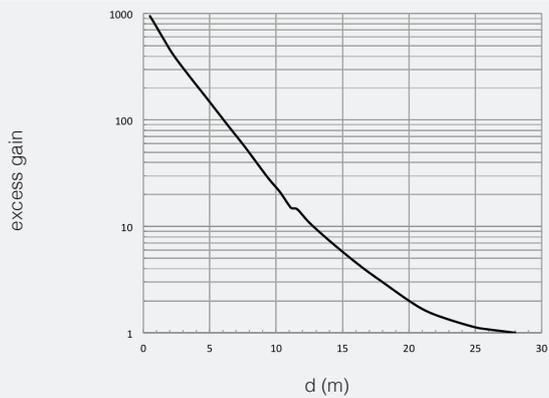
FQRL/B*-(2,3)* parallel displacement



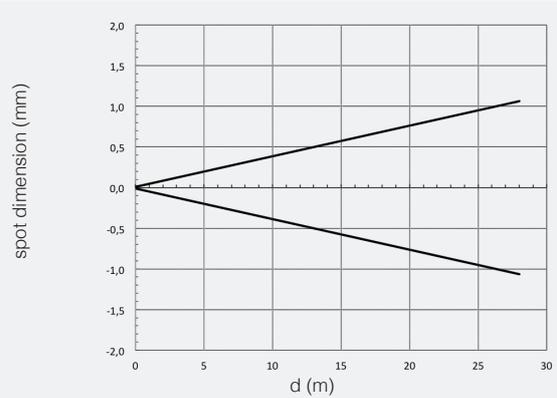
response diagrams

through-beam models

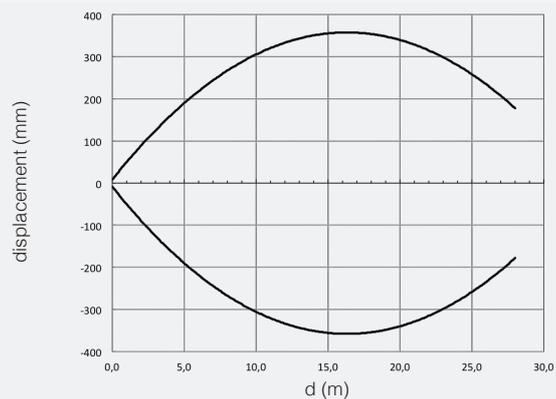
FQIH/00*-(0,1) - FQIZ/B*-(0,1) excess gain



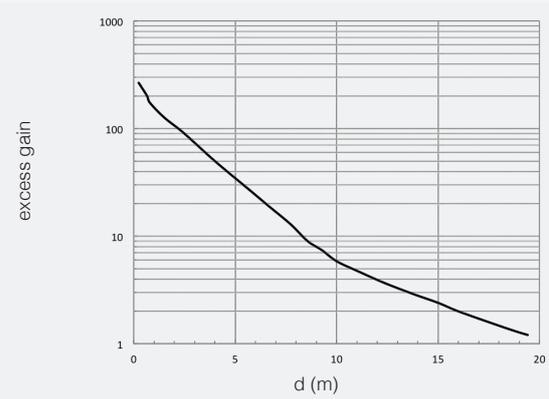
FQIH/00*-(0,1) - FQIZ/B*-(0,1) dimensione spot



FQIH/00*-(0,1) - FQIZ/B*-(0,1) parallel displacement

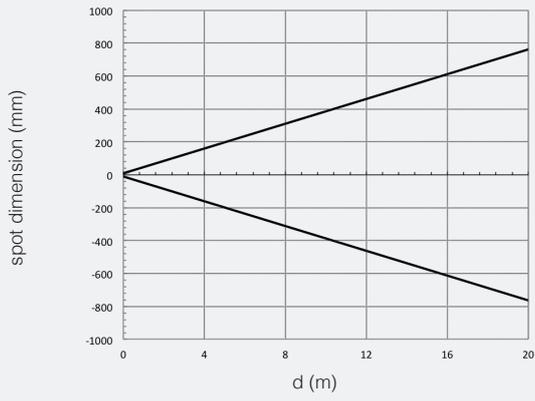


FQIH/00*-(2,3)* - FQIZ/B*-(2,3)* excess gain

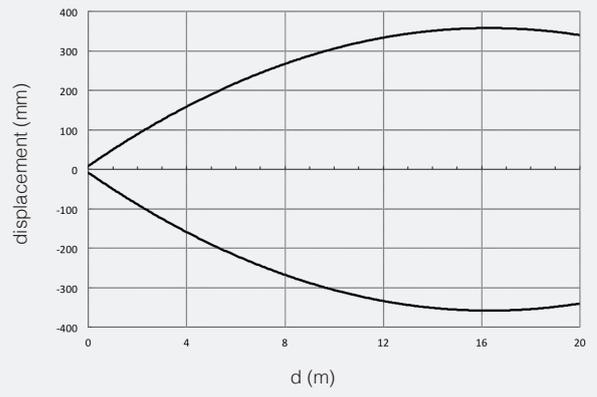


FQ

FQIH/00-*(0,1) - FQIZ/B*-(0,1) spot dimension



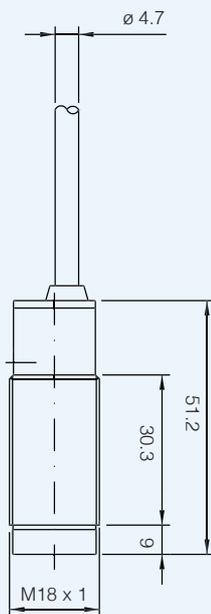
FQIH/00-*(0,1) - FQIZ/B*-(0,1) parallel displacement



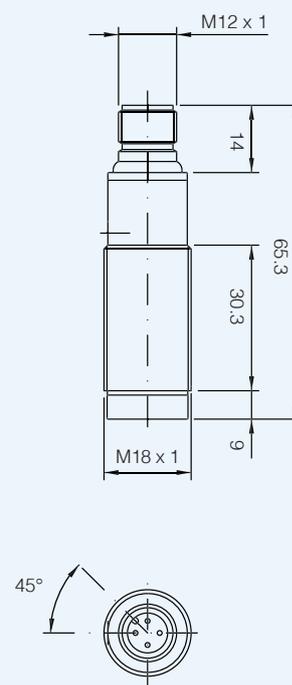
M18 short body

dimensions (mm)

FQ**/**-0A; FQ**/**-1A



FQ**/**-0E; FQ**/**-1E

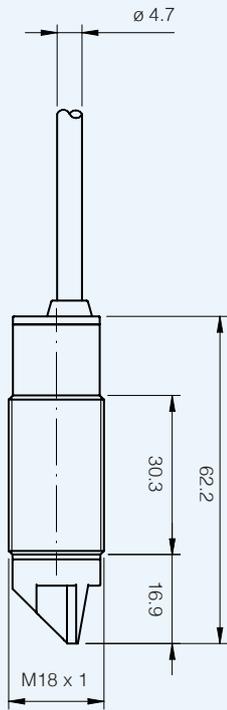




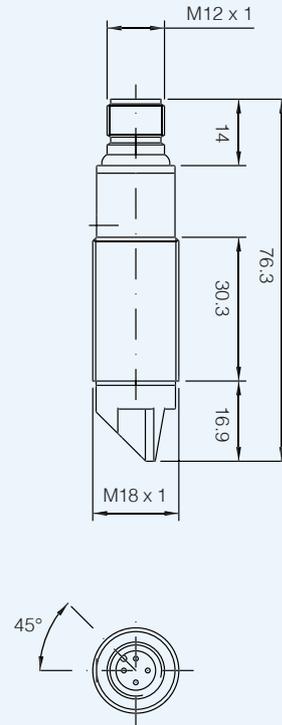
dimensions (mm)

M18 short body

FQ**/**-2A; FQ**/**-3A

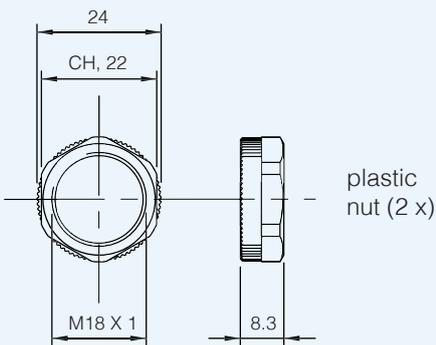


FQ**/**-2E; FQ**/**-3E



dimensions (mm)

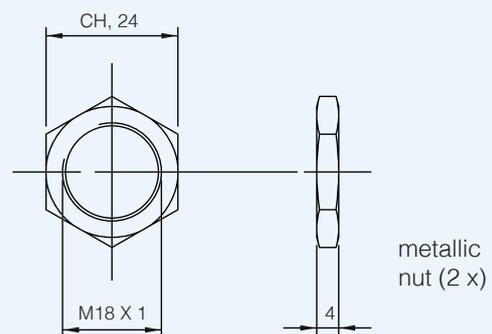
accessories included in all plastic models



plastic nut (2 x)

dimensions (mm)

accessories included in all metallic models



metallic nut (2 x)

FQ



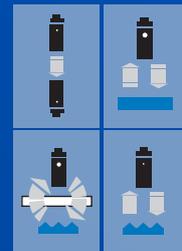
FF series

M18 IP69K photoelectric sensors for harsh environments



features

- AISI 316L (DIN 1.4404) stainless steel housing
- LED status indicators: yellow (output), green (teach-in function)
- IP67 - IP68 - IP69K protection degree
- Complete protection against electrical damages
- ATEX models, cat. 3, available on request
- Direct diffuse, polarized, through beam models
- Innovative teach-in function through sensor's housing
- Approvals: CE and cULus Listed



web contents



- Application notes
- Photos
- Catalogue / Manuals



M18 IP69K
for harsh environments

code description^(*)

FF R 3 / B P - 1 E

| | | |
|-------------|----|---|
| series | FF | M18 photoelectric sensor for food + beverage applications |
| emission | R | Visible red LED emission |
| | I | Infrared LED emission |
| type | 3 | 100 mm direct diffuse with sens. adjust. |
| | 7 | 400 mm direct diffuse with sens. adjust. |
| | 8 | 800 mm direct diffuse with sens. adjust. |
| | N | 4.5 m polarized with sens. adjust. |
| | P | 4.5 m polarized without sens. adjust. |
| | L | 1 m retrorefl. for transp. objects with sens. adjust. |
| | H | Emitter |
| output | Z | 20 m receiver without sens. adjust. |
| | B | NO+NC complementary output, 4 wires |
| | 0 | LO/DO selectable output, 4 wires - Emitter |
| | X | Emitter with Check |
| PNP / NPN | P | PNP output |
| | N | NPN output |
| | 0 | Emitter |
| housing | 1 | Stainless steel housing, axial optic |
| plug output | E | M12 plug exit |
| version | | Standard version |
| | V5 | Smooth housing |

(*) ATEX models available, contact our Sales Dept. for further information.



M18 IP69K
for harsh environments

available models

| model | housing | adjustment | distance | 4 wires | | | | |
|---|---------------------------|---------------------------|----------|-------------|-------------|-------------|-------------|------------|
| | | | | NPN NO + NC | PNP NO + NC | NPN NO + NC | PNP NO + NC | |
| direct diffuse | AISI 316L (DIN 1.4404) | Teach-In | 100 mm | FFR3/0N-1E | FFR3/0P-1E | FFR3/BN-1E | FFR3/BP-1E | |
| | | | 400 mm | FFI7/0N-1E | FFI7/0P-1E | FFI7/BN-1E | FFI7/BP-1E | |
| | | | 800 mm | FFI8/0N-1E | FFI8/0P-1E | FFI8/BN-1E | FFI8/BP-1E | |
| polarized | | - | 4 m | FFRN/0N-1E | FFRN/0P-1E | FFRN/BN-1E | FFRN/BP-1E | |
| | | | | FFRP/0N-1E | FFRP/0P-1E | FFRP/BN-1E | FFRP/BP-1E | |
| retroreflective for transparent objects | | AISI 316L (DIN 1.4404) | Teach-In | 0.1...1.5 m | FFRL/0N-1E | FFRL/0P-1E | FFRL/BN-1E | FFRL/BP-1E |
| receiver | | | - | 20 m | FFIZ/0N-1E | FFIZ/0P-1E | FFIZ/BN-1E | FFIZ/BP-1E |
| emitter with check | | | | | FFIH/X0-1E | | | |
| emitter without check | FFIH/00-1E | | | | | | | |

plug

| M12 emitter without check | M12 emitter with check |
|---|---|
| | |
| M12 diffuse reflection polarized receiver | M12 diffuse reflection polarized receiver |
| | |



| | direct diffuse | | | polarized | | for transpa- rent objects | through beam | |
|-----------------------------|--|-----------------------|-----------------------|----------------------|-------|------------------------------|--|-----------------------|
| | FFR3 | FFI7 | FFI8 | FFRN | FFRP | FFRL | FFIZ | FFIH |
| nominal sensing distance | 100 mm ⁽¹⁾ | 400 mm ⁽²⁾ | 800 mm ⁽³⁾ | 4.5 m ⁽⁴⁾ | | 0.1...1.5 m ⁽⁵⁾ | 20 m | |
| emission | red (660 nm) | infrared (880 nm) | | red (660 nm) | | | - | infrared (880 nm) |
| hysteresis | ≤ 10 % | | | | | | | |
| repeatability | 5 % | | | | | | | |
| tolerance | + 15 / - 5 % Sn | | | | | | | |
| operating voltage | 10...30 Vdc | | | | | | | |
| ripple | ≤ 10 % | | | | | | | |
| no-load supply current | max 35 mA (at Val = 30 V) | | | | | | 25 mA | 40 mA |
| load current | 100 mA | | | | | | | |
| leakage current | ≤ 10 µA @ Vmax | | | | | | | |
| output voltage drop | 2 V max. IL = 100 mA | | | | | | | |
| output type | NPN o PNP selectable output LO / DO or complementary output NO + NC | | | | | | | |
| switching frequency | 500 Hz | | | | | | 250 Hz | - |
| power on delay | 200 ms | | | | | | | |
| temperature range | - 25°C...+ 80°C (without freeze) | | | | | | | |
| power supply protections | polarity reversal, transient | | | | | | | |
| output protection | short circuit (autoreset) | | | | | | | |
| sensitivity adjustment | Teach | | | - | Teach | - | - | |
| temperature drift | 10 % Sr | | | | | | | |
| protection degree | IP67; IP68 (1 m, 7 days); IP69K (according 40050 part 9) ⁽⁶⁾ | | | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | | | |
| external light interference | 5,000 lux (ncandescent lamp), 10,000 lux (sunlight) | | | | | | | |
| LEDs | Green: ON: teach function available OFF: teach function blocked Fast flashing: fine teach active Slow flashing: teach in progress Yellow: output state - excess gain (0 models) light State - excess gain (B models) ⁽⁷⁾ | | | | | | Yellow: output state (0 models) light state (B models) | yellow (supply on) |
| housing material | stainless steel AISI316 | | | | | | | |
| exit plug | PA12 | | | | | | | |
| optic material | PA12 | | | | | | | |
| tightening torque | 50 Nm | | | | | | | |
| approvals | CE, cULus, IP69K, ECOLAB, Diversey | | | | | | | |
| weight (approximate) | 60 gr | | | | | | | |

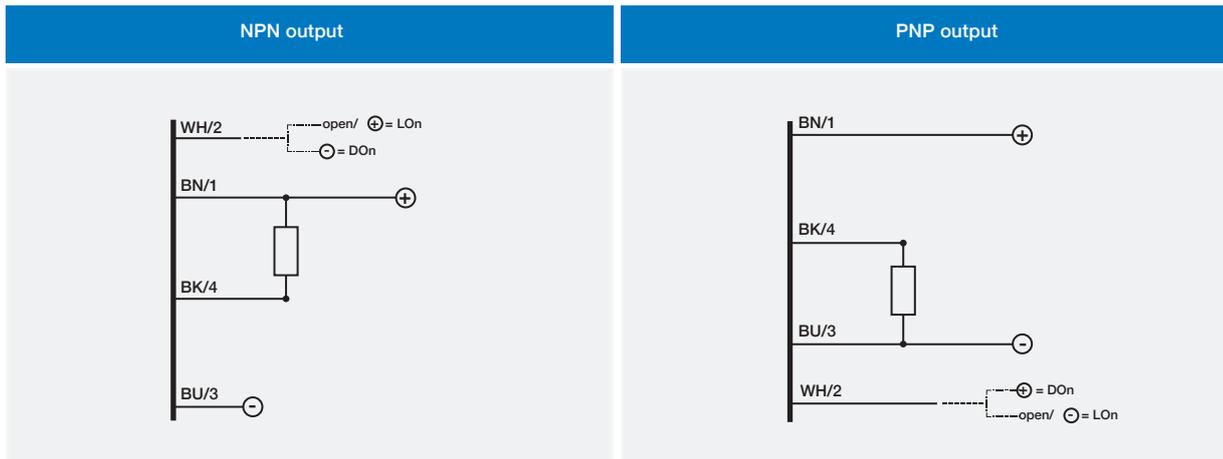
⁽¹⁾ White target Kodak 90% reflection 100x100 mm ⁽²⁾ White target Kodak 90% reflection 200x200 mm ⁽³⁾ White target Kodak 90% reflection 400x400 mm ⁽⁴⁾ With RL110 reflector ⁽⁵⁾ With RL113G or RL116 reflector ⁽⁶⁾ Protection guaranteed only with plug cable well mounted ⁽⁷⁾ Yellow LED Fixed On: Excess Gain ≤ 2, Yellow LED flashing: Excess Gain <2



electrical diagrams of the connections

LO/DO selectable output

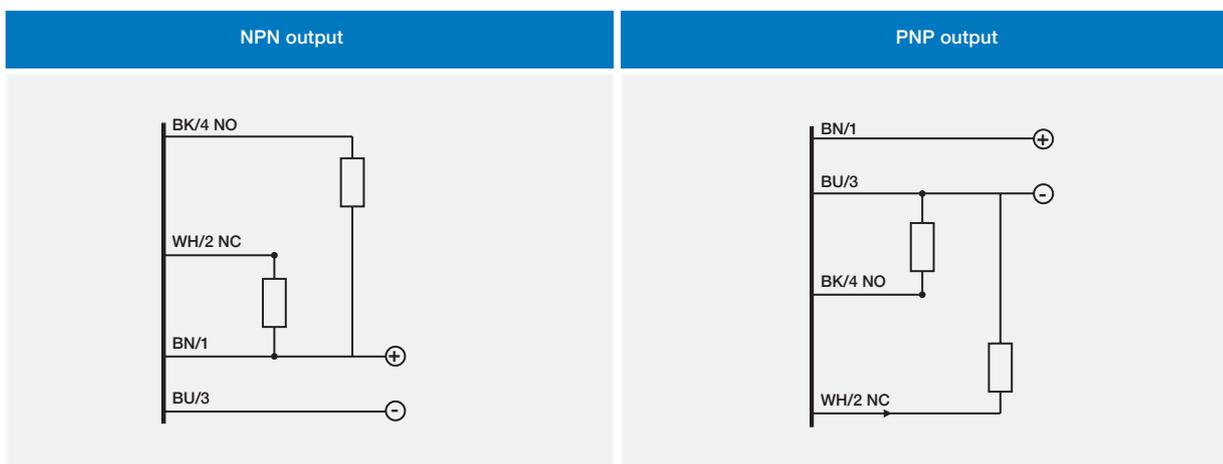
M18 IP69K
for harsh environments



- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

electrical diagrams of the connections

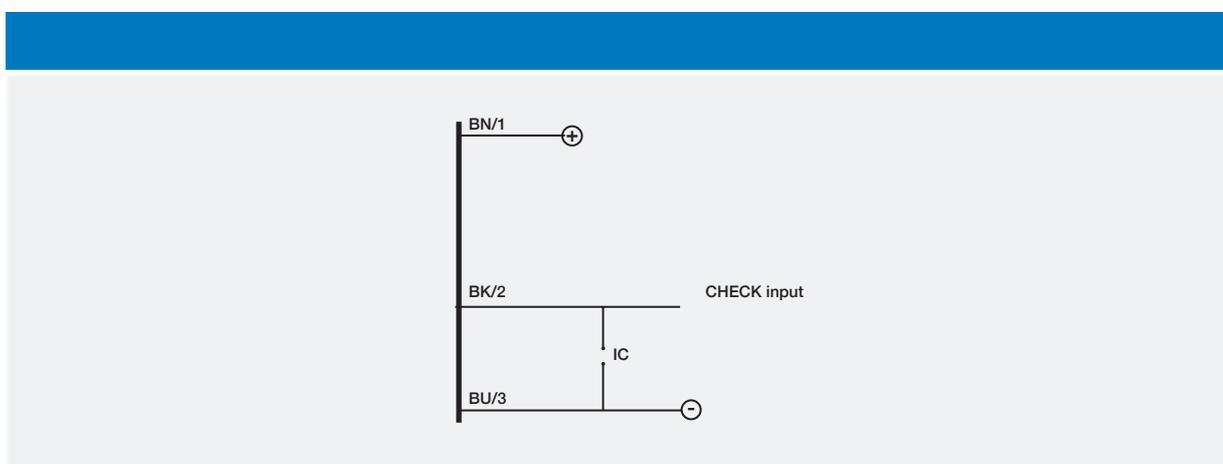
NO+NC complementary output



- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

electrical diagrams of the connections

emitter with check



- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

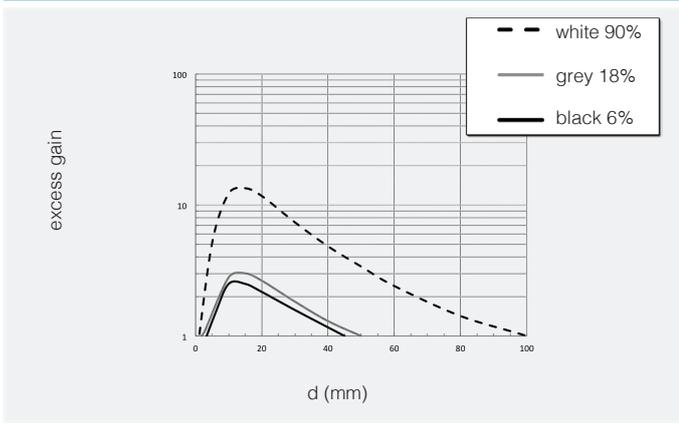
response diagrams

direct diffuse models

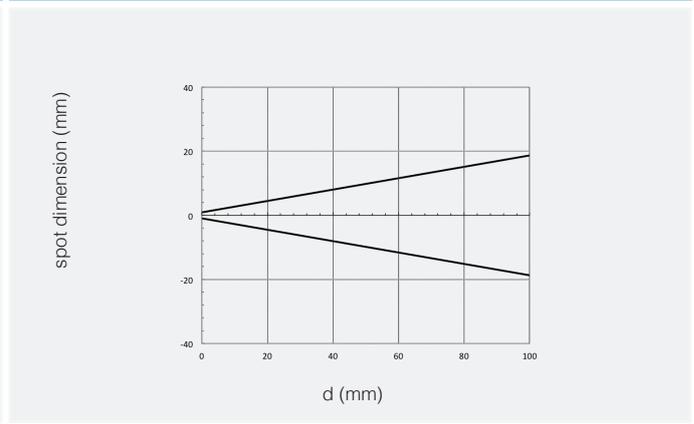


M18 IP69K
for harsh environments

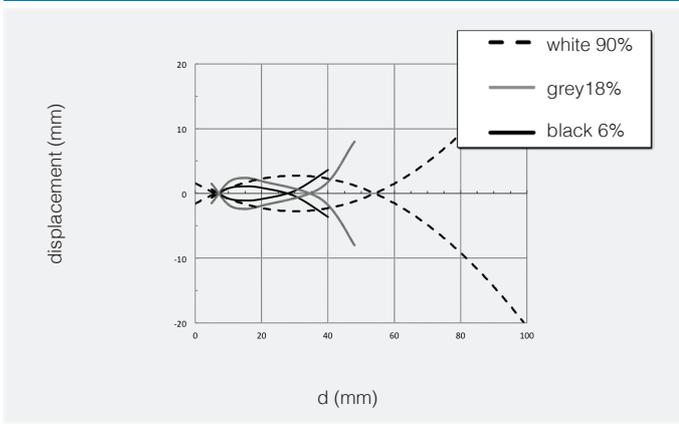
FFR3/**-1E excess gain



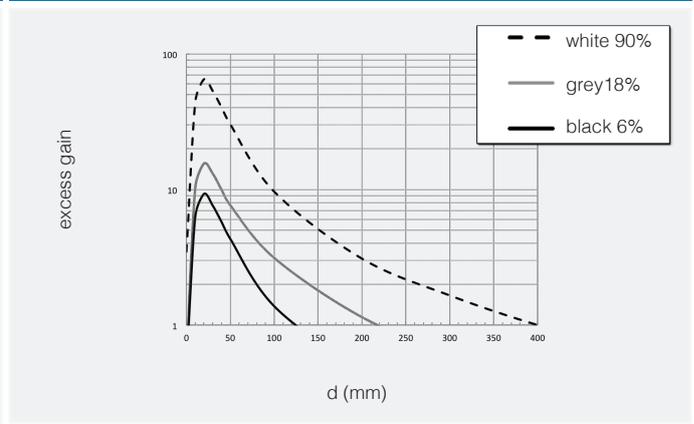
FFR3/**-1E spot dimension



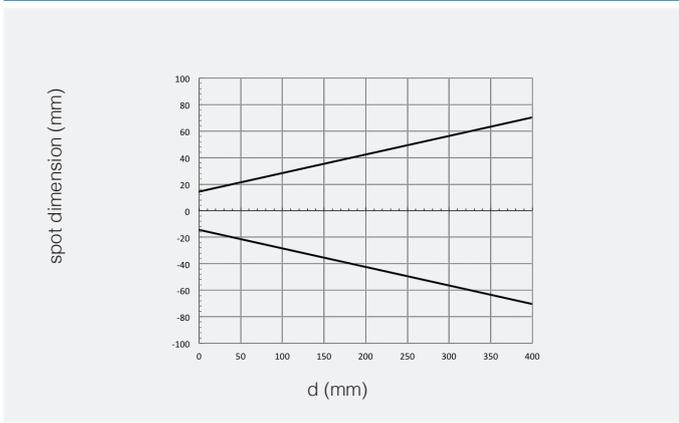
FFR3/**-1E parallel displacement



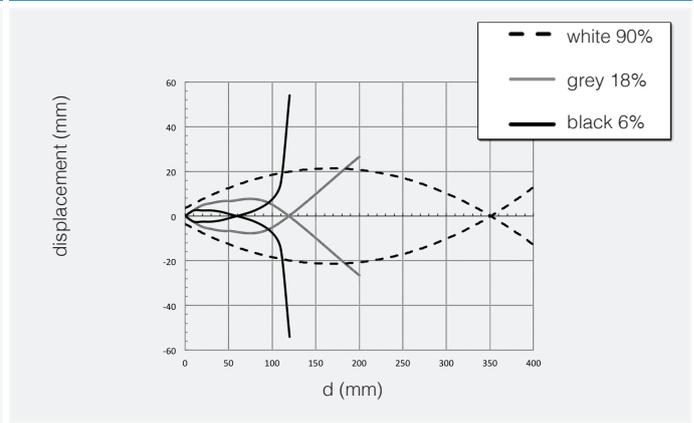
FFI7/**-** excess gain



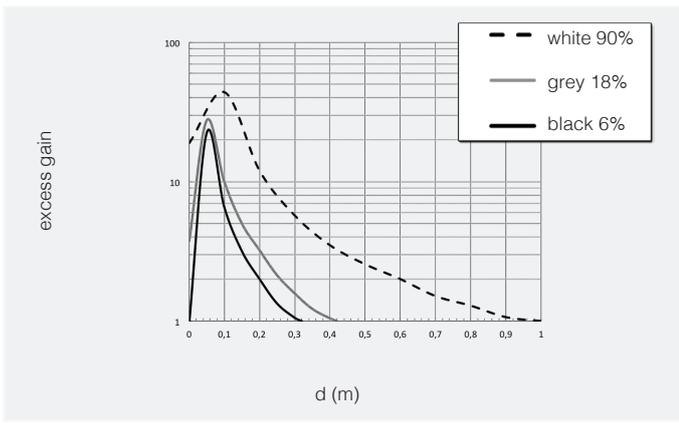
FFI7/**-** spot dimension



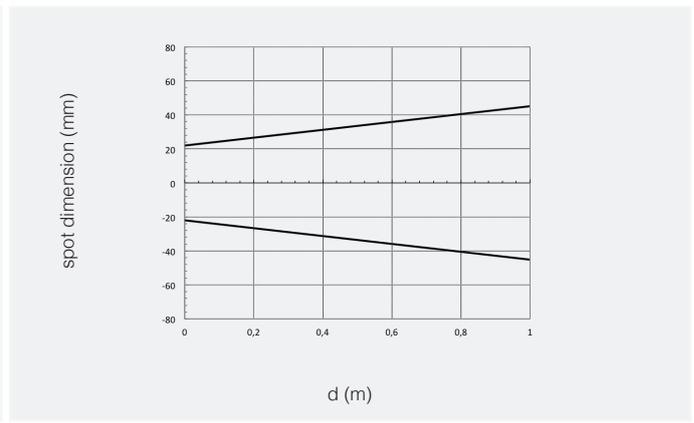
FFI7/**-** parallel displacement



FFI8/**-** excess gain



FFI8/**-** spot dimension



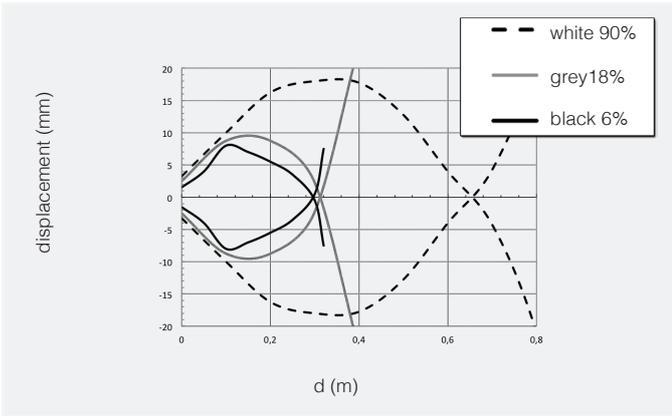


M18 IP69K
for harsh environments

response diagrams

direct diffuse models

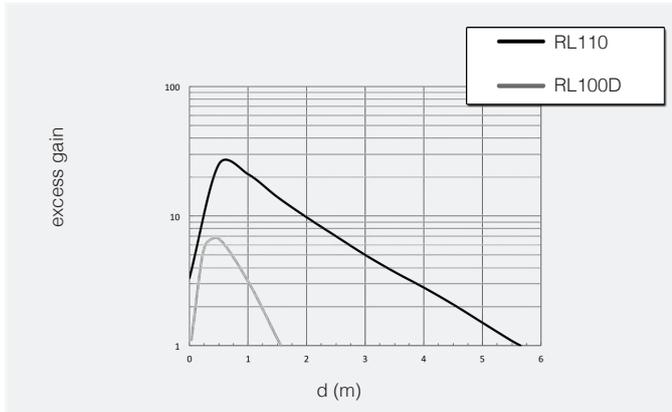
FFI8/**-** parallel displacement



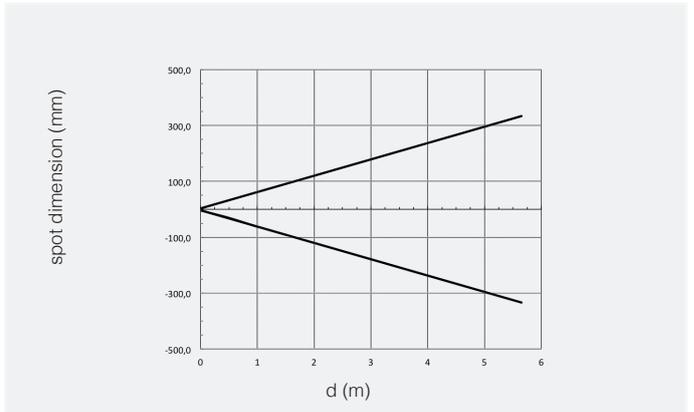
response diagrams

polarized models

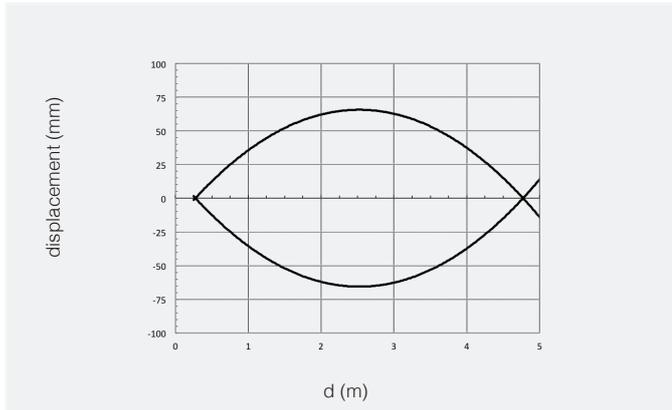
FFRN/**- 1E - FFRP/**- 1E excess gain



FFRN/**- 1E - FFRP/**- 1E spot dimension



FFRN/**- 1E - FFRP/**- 1E* parallel displacement



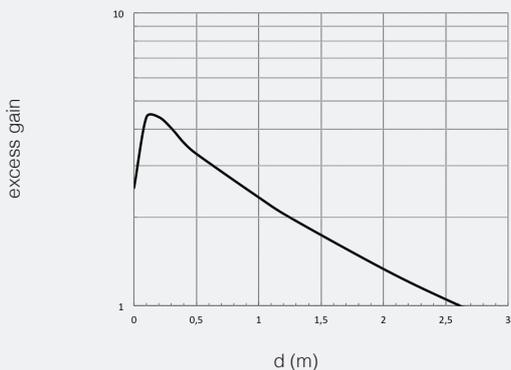
response diagrams

models for transparent objects

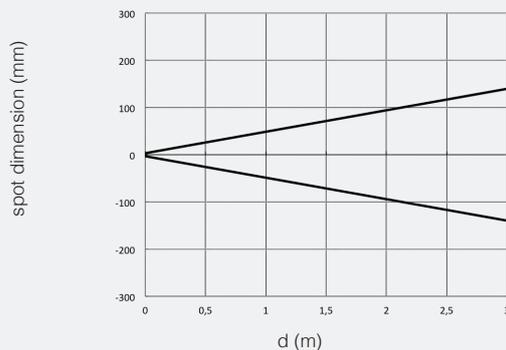


M18 IP69K
for harsh environments

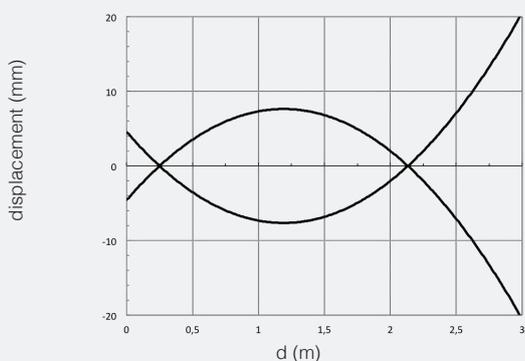
FFRL/**-1E excess gain



FFRL/**-1E spot dimension



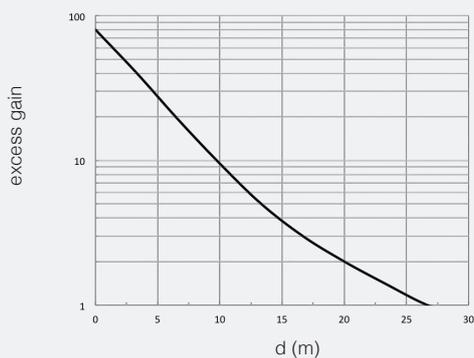
FFRL/**-1E parallel displacement



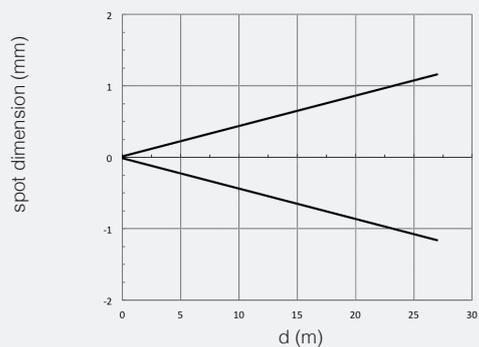
response diagrams

through beam models

FFIH/**-1E + FFIZ/**-1E excess gain



FFIH/**-1E + FFIZ/**-1E spot dimension



FF

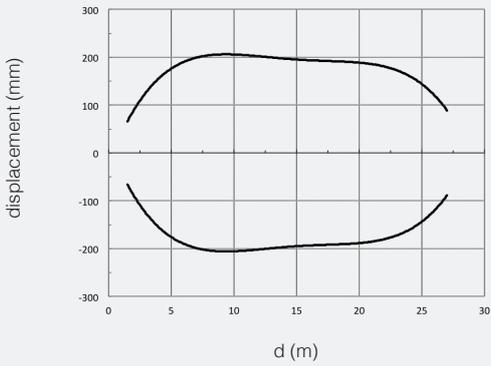


response diagrams

through beam models

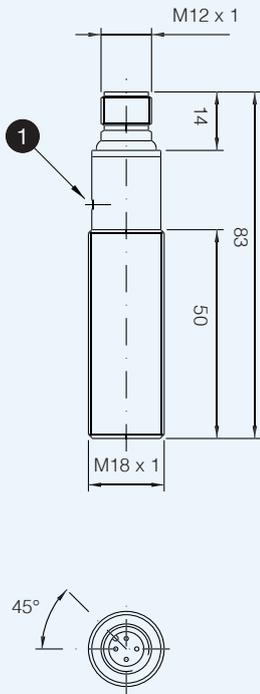
M18 IP69K
for harsh environments

FFIH/**-1E + FFIZ/**-1E parallel displacement



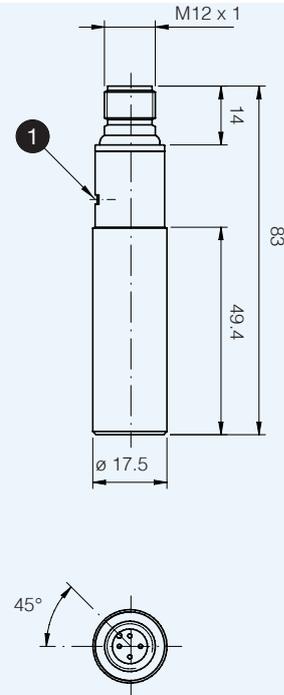
dimensions (mm)

FF**/**-**



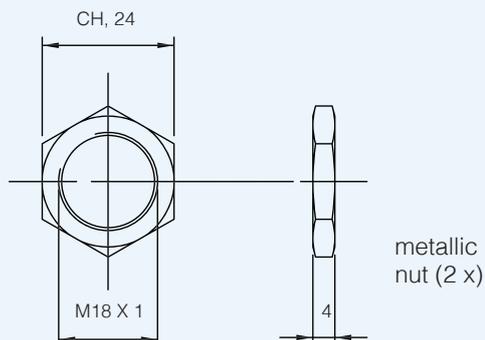
1 Inductive Teach-In

FF**/**-1EV5



dimensions (mm)

accessories included in all metallic models





FFRS series

M18 IP69K photoelectric sensors with background suppression for harsh environments



features

- Stainless steel housing AISI316L (DIN 1.4404)
- protection degree: IP68-IP69K
- Complete protection against electrical damages
- New sensitive adjustment through sensor housing: on object or on background
- Special model with reduced spot dimension and good performance on reflective material
- Approvals: CE and cULus Listed



web contents

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- Photos
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M18 IP69K with background suppression

code description^(*)

FFRS / BP - 1E

| | | |
|------------------|------|---|
| series | FF | M18 photoelectric sensor with IP69K protection degree |
| emission | R | Visible red LED emission |
| function | S | Background suppression 30...130 mm |
| output | 0 | NO/NC selectable output, 4 wires |
| | B | NO+NC selectable output, 4 wires |
| PNP / NPN output | P | PNP output |
| | N | NPN output |
| housing | 1 | Stainless steel housing, axial optic |
| plug | E | M12 plug exit |
| | | Standard version |
| | V5 | Smooth housing |
| | 77 | Special model for shiny object and 60...100 mm sensing distance |
| version | | Special model with smooth housing for shiny object and 60...100 mm sensing distance |
| | V577 | |

(*) ATEX models available, contact our Sales Dept. for further information.

available models

| functions | housing | adjustment | distance (mm) | 4 wires | | | |
|---|---------------------------------------|------------|---------------|--------------|--------------|----------------|----------------|
| | | | | NPN NO + NC | PNP NO + NC | NPN NO + NC | PNP NO + NC |
| background suppression | AISI 316L (DIN 1.4404) thread housing | Teach-In | 30...130 | FFRS/0N-1E | FFRS/0P-1E | FFRS/BN-1E | FFRS/BP-1E |
| | AISI 316L (DIN 1.4404) smooth housing | | | - | - | FFRS/BN-1EV5 | FFRS/BP-1EV5 |
| background suppression for shiny object | AISI 316L (DIN 1.4404) thread housing | | 60...100 | FFRS/0N-1E77 | FFRS/0P-1E77 | FFRS/BN-1E77 | FFRS/BP-1E77 |
| | AISI 316L (DIN 1.4404) smooth housing | | | - | - | FFRS/BN-1EV577 | FFRS/BP-1EV577 |

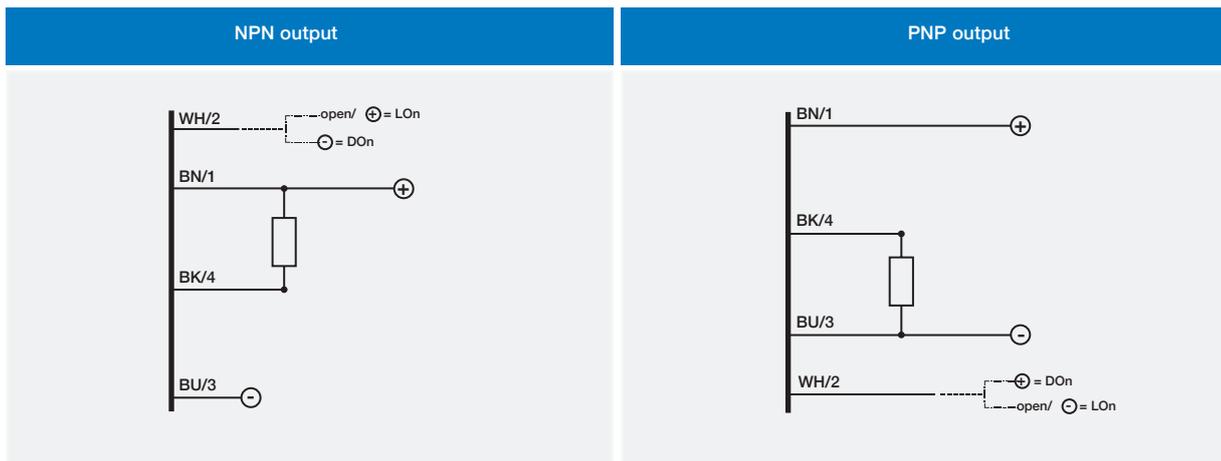


| | FFRS/**_** | FFRS/**_**77 |
|-----------------------------|---|---------------------------|
| | | |
| nominal sensing distance | 30...130 mm | 60...100 mm |
| scanning range (Sd) | 30...130 mm (white paper) | 60...100 mm (white paper) |
| emission | red (660 nm) | |
| hysteresis | ≤ 10 % (white paper) | ≤ 15 % (white paper) |
| repeatability | 10 % | |
| tolerance | + 15 / - 5 % Sn | |
| supply voltage | 10...30 Vdc | |
| ripple | ≤ 10 % | |
| no-load supply current | 50 mA (Val = 30 V) | |
| output current | 100 mA | |
| leakage current | ≤ 10 µA @ Vdc max | |
| output voltage drop | 2 V max. IL = 100 mA | |
| output type | NPN or PNP selectable output LO/DO or complementary output NO + NC | |
| switching frequency | 1kHz | 400 Hz |
| power on delay | 200 ms | |
| temperature range | - 25°C...+ 80°C (without freeze); short exposure with not working sensor 15 min to 100°C | |
| power supply protections | polarity reversal, transient | |
| output protection | short circuit (autoreset) | |
| protection degree | IP67; IP68 (1 m, 7 days); IP69K (according 40050 part 9) ⁽¹⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| external light interference | 5,000 lux (incandescent lamp), 10,000 lux (sunlight) | |
| LEDs | Green: ON: teach function available OFF: teach function blocked Fast flashing: teach in progress Yellow: output state (O models) light State (B models) | |
| housing material | stainless steel | |
| exit plug | PA12 | |
| optic material | PA12 | |
| approvals | CE, cULus, IP68, IP69K, ECOLAB, Diversey | |
| weight (approximate) | 60 gr | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted

response diagram

LO/DO selectable output

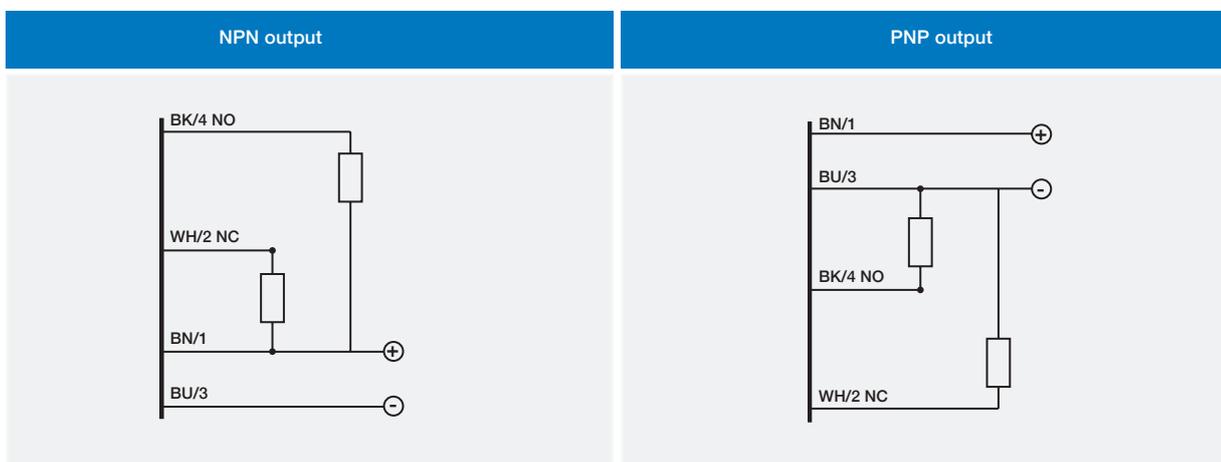


- BN brown
- BU blue
- BK black
- WH white

M18 IP69K for harsh environments

response diagram

NO+NC complementary output



- BN brown
- BU blue
- BK black
- WH white

plug



FFRS

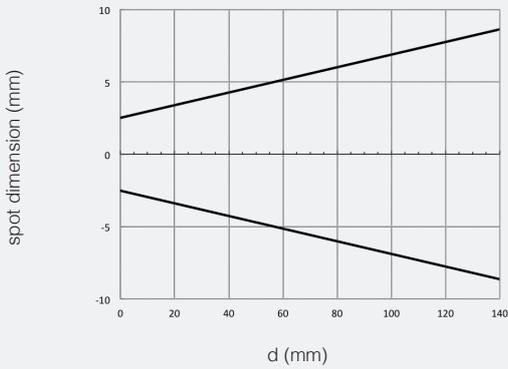


response diagrams

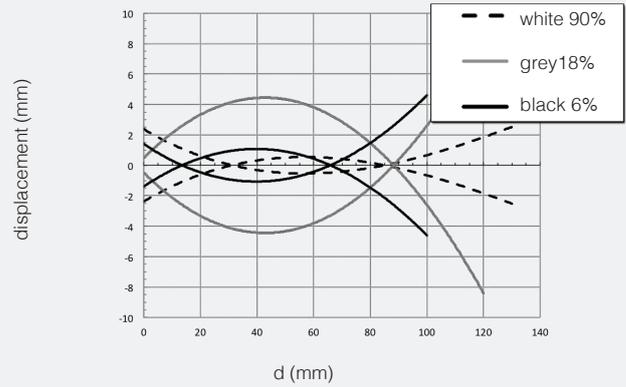
background suppression models

M18 IP69K
for harsh environments

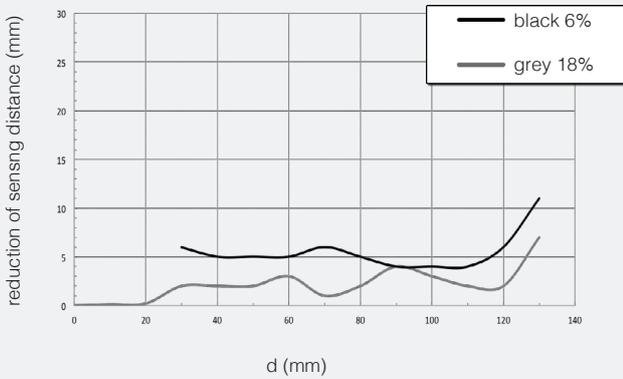
FFRS/**-** spot dimension



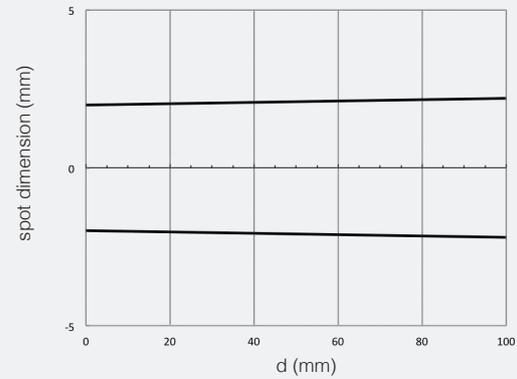
FFRS/**-** parallel displacement



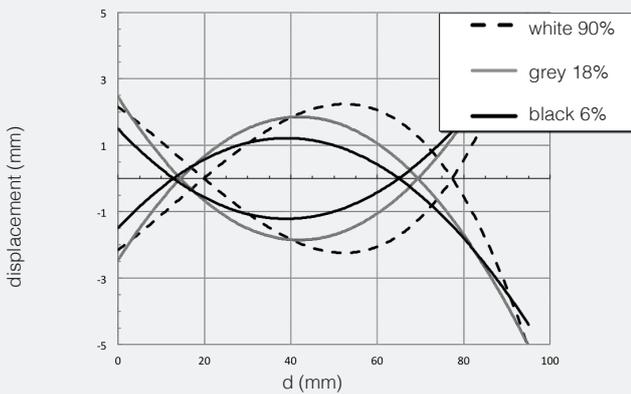
FFRS/**-** reduction of sensing distance



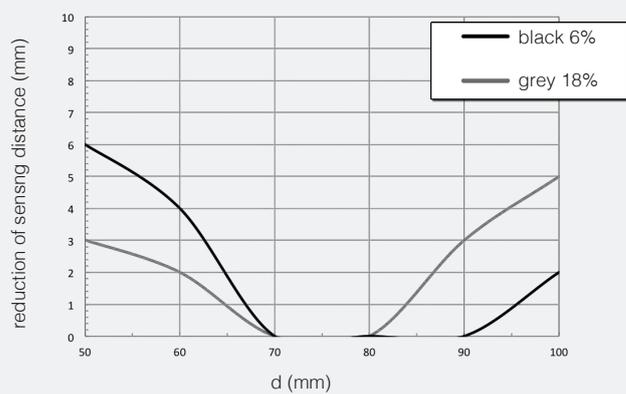
FFRS/**-77 spot dimension



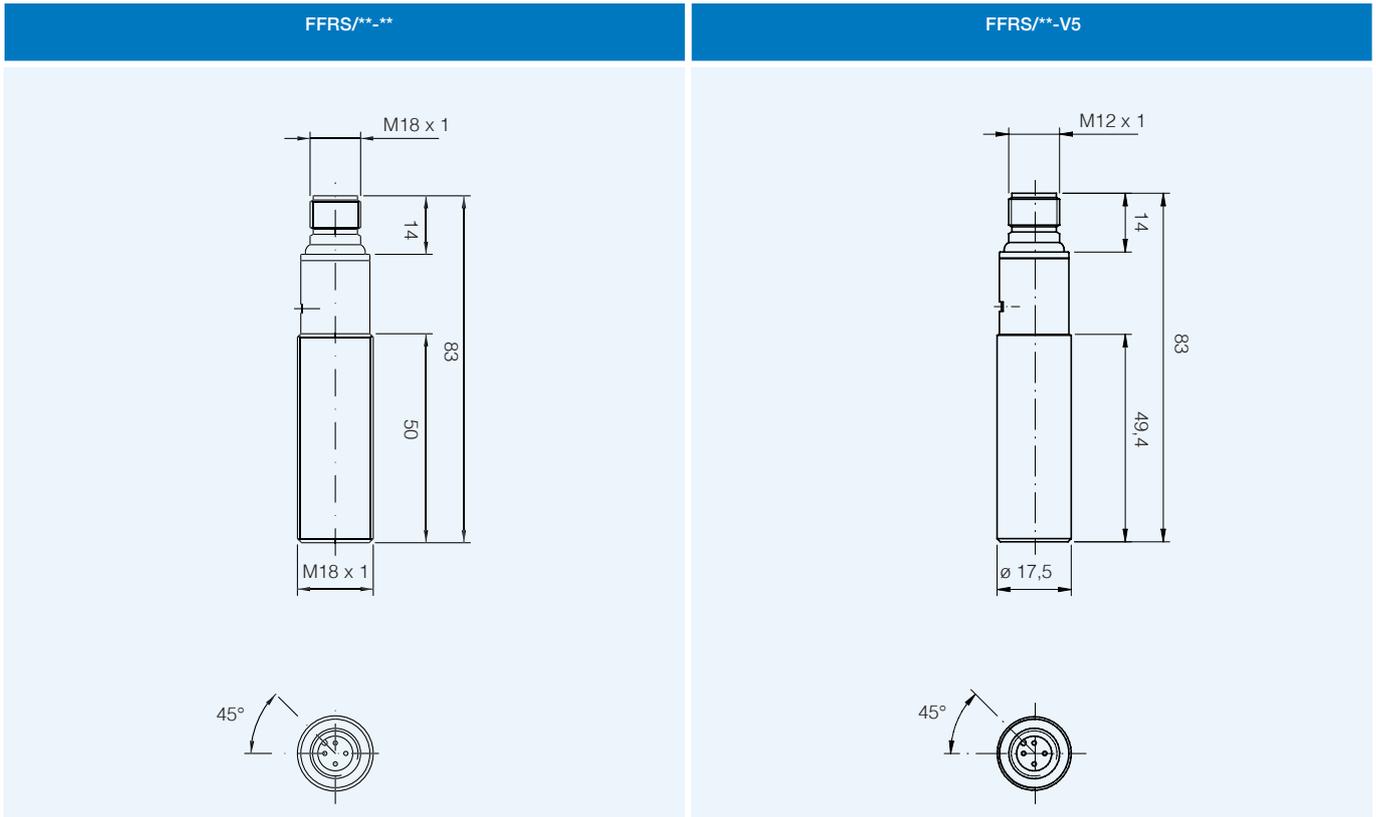
FFRS/**-77 parallel displacement



FFRS/**-77 reduction of sensing distance



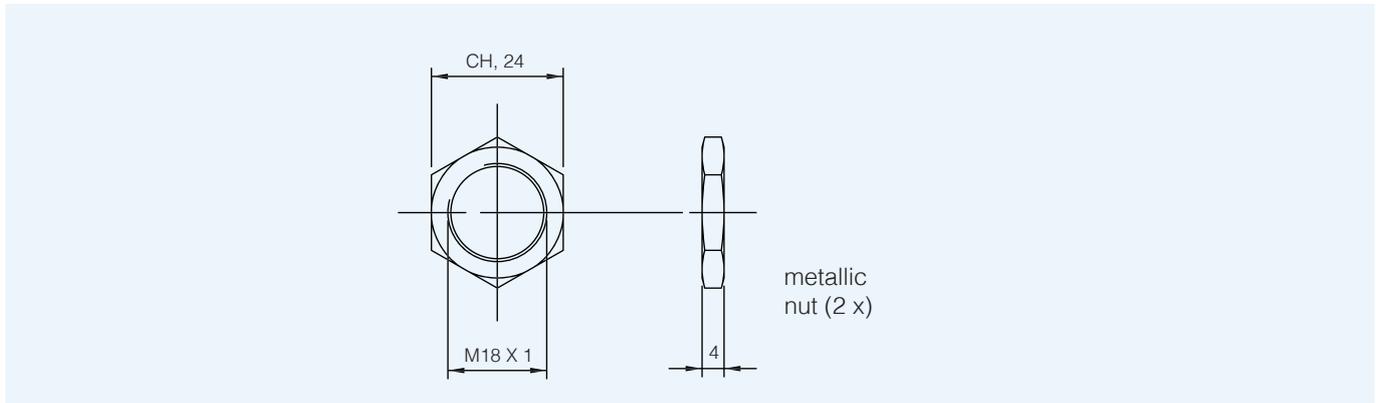
dimensions (mm)



M18 IP69K
for harsh environments

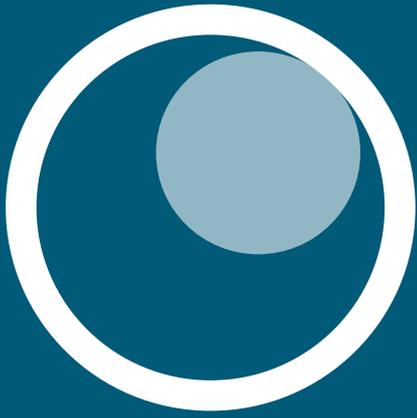
dimensions (mm)

accessories included in all metallic models

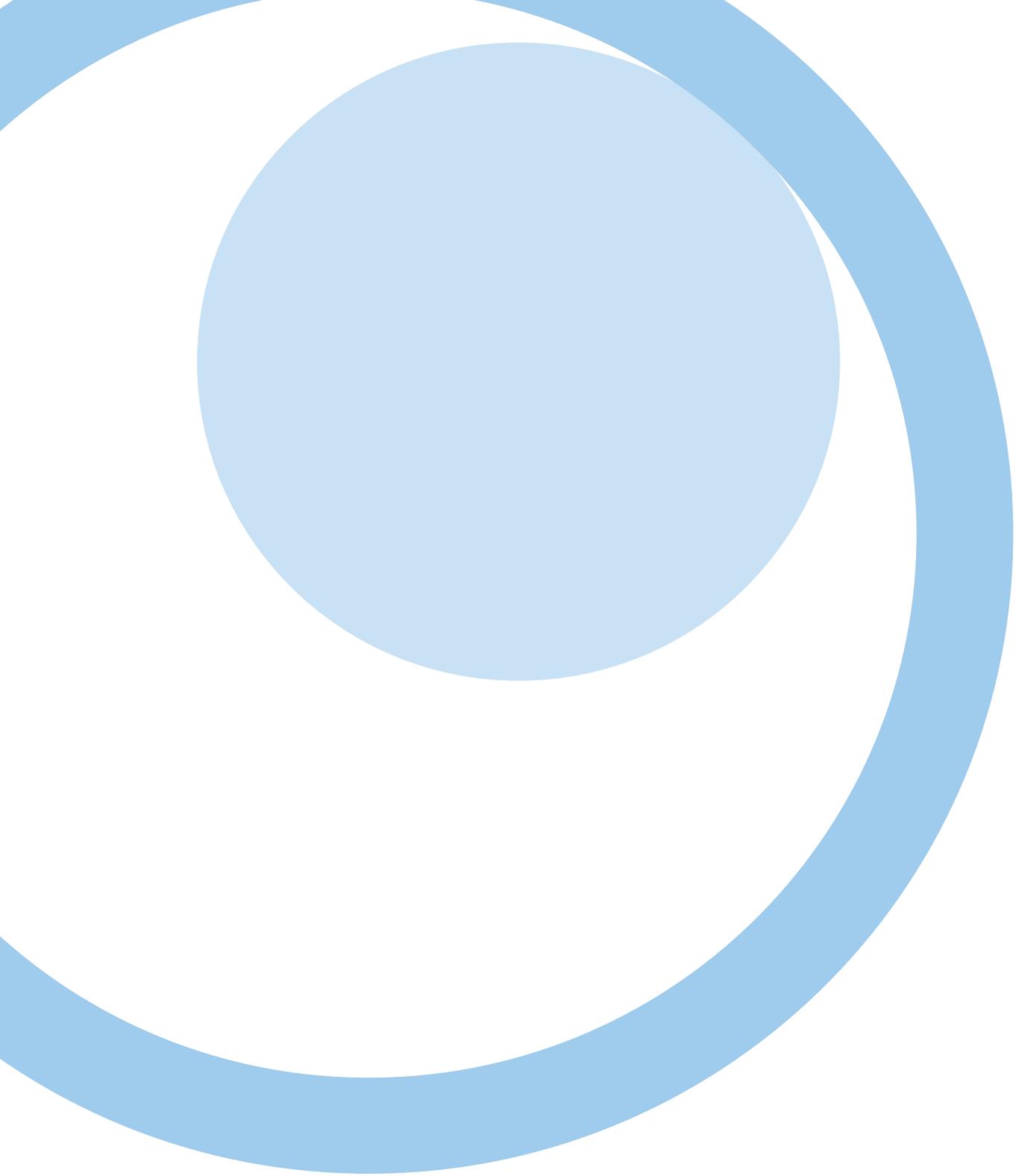




Blank lined area for notes, consisting of 20 horizontal light blue lines.



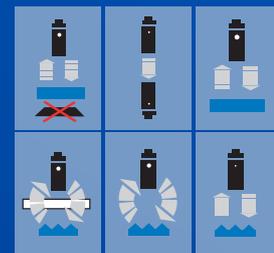
Cubic Photoelectric Sensor





QM series

Miniaturized photoelectric sensors with high performance



High performances
miniaturized

features

- Cubic miniaturized photoelectric high-performance sensors with long sensing distance
- 2 kHz switching frequency, background suppression with mechanical adjustment
- Wide range of models: diffuse reflection with short, medium and long sensing distance, polarized, reflective for transparent objects, through-beam and background suppression
- Available with cable and M8 plug exit or with M8-M12 pig-tail
- Selectable LO/DO output state
- Completely filled with resin (except background suppression models)
- Complete protection against electrical damages

web content



- Application notes
- Photos
- Catalogue / Manuals



code description

QM R 8 / 0 P - 0 A VE 80

| | | |
|----------------------|-----------|--|
| series | QM | Miniaturized cubic photoelectric sensor 12.8x21x31.2 mm |
| emission | R | RED emission |
| | I | Infrared emission |
| type | B | Direct diffuse with sens. adj. 100 mm |
| | 7 | Direct diffuse with sens. adj. 400 mm |
| | 8 | Direct diffuse with sens. adj. 1,000 mm |
| | 9 | Direct diffuse with sens. adj. 1,500 mm |
| | N | 5 m polarized with sensitive adjustment |
| | C | 7 m reflective with sensitive adjustment |
| | G | 0.05...1.5 m or 0.05...1.0 m for transparent objects with adjustment (R) |
| | L | 0.4...4 m for transparent objects with adjustment |
| | HD | 20 m or 30 m emitter + receiver kit with adjustment (R) |
| | H | Emitter with adjustment |
| | D | 20 m or 30 m receiver without adjustment |
| | S | 30...200 mm or 30...400 mm background suppression (R) |
| emitter | 0 | Emitter without check, LO/DO selectable |
| PNP / NPN output | 0 | Emitter |
| | P | PNP output |
| | N | NPN output |
| housing | 0 | Plastic housing |
| cable / plug output | A | 2 m cable exit |
| | F | M8 4 pin plug cable exit |
| pig tail plug output | | Standard model |
| | VE | M12 pig-tail output ⁽¹⁾ |
| | VF | M8 3 pin pig tail output ⁽¹⁾ |
| cable | VG | M8 4 pin pig tail output ⁽¹⁾ |
| | 80 | 20 cm cable length (pig-tail models) ⁽¹⁾ |
| | | Standard model |

⁽¹⁾ pig-tail models



available models (*)

High performances
miniaturized

| function | distance | emission | adjustment | output type | housing | models | | |
|-------------------------|-----------------|----------|--------------|--------------|-------------|---------------|---------------|------------|
| | | | | | | PNP + NO / NC | NPN + NO / NC | |
| direct diffuse | 100 mm | red | ● | cable | plastic | QMRB/0P-0A | QMRB/0N-0A | |
| | | | | connector M8 | | QMRB/0P-0F | QMRB/0N-0F | |
| | 400 mm | | | IR | | cable | QMR7/0P-0A | QMR7/07-0A |
| | | | | | | connector M8 | QMR7/0P-0F | QMR7/0N-0F |
| | 1.000 mm | red | | cable | | QMI7/0P-0A | QMI7/07-0A | |
| | | | | connector M8 | | QMI7/0P-0F | QMI7/0N-0F | |
| | 1.500 mm | IR | | cable | | QMR8/0P-0A | QMR8/0N-0A | |
| | | | | connector M8 | | QMR8/0P-0F | QMR8/0N-0F | |
| | polarized | 5 m | | red | | cable | QMI9/0P-0A | QMI9/0N-0A |
| | | | | | | connector M8 | QMI9/0P-0F | QMI9/0N-0F |
| | retroreflection | 7 m | | IR | | cable | QMRN/0P-0A | QMRN/0N-0A |
| | | | | | | connector M8 | QMRN/0P-0F | QMRN/0N-0F |
| for transparent objects | 0,05...1,5 m | red | cable | QMIC/0P-0A | QMIC/0N-0A | | | |
| | | | connector M8 | QMIC/0P-0F | QMIC/0N-0F | | | |
| | 0,05...1,0 m | IR | cable | QMRG/0P-0A | QMRG/0N-0A | | | |
| | | | connector M8 | QMRG/0P-0F | QMRG/0N-0F | | | |
| | 0,4...4 m | | cable | QMIG/0P-0A | QMIG/0N-0A | | | |
| | | | connector M8 | QMIG/0P-0F | QMIG/0N-0F | | | |
| emitter | 20 m | red | cable | QMRH/00-0A | | | | |
| receiver | | | connector M8 | QMRH/00-0A | | | | |
| emitter + receiver | 30 m | IR | - | cable | QMRD/0P-0A | QMRD/0N-0A | | |
| | | | connector M8 | - | QMRD/0P-0F | QMRD/0N-0F | | |
| emitter | 30 - 200 mm | red | ● | cable | QMRHD/0P-0A | QMRHD/0N-0A | | |
| receiver | | | connector M8 | ● | QMRHD/0P-0F | QMRHD/0N-0F | | |
| emitter + receiver | 30 - 400 mm | IR | - | cable | QMIH/00-0A | | | |
| | | | connector M8 | - | QMIH/00-0F | | | |
| background suppression | 30 - 200 mm | red | ● | cable | QMID/0P-0A | QMID/0N-0A | | |
| | | | | connector M8 | QMID/0P-0F | QMID/0N-0F | | |
| | 30 - 400 mm | IR | | cable | QMIHD/0P-0A | QMIHD/0N-0A | | |
| | | | | connector M8 | QMIHD/0P-0F | QMIHD/0N-0F | | |
| | | | cable | QMRS/0P-0A | QMRS/0N-0A | | | |
| | | | connector M8 | QMRS/0P-0F | QMRS/0N-0F | | | |
| | | | cable | QMIS/0P-0A | QMIS/0N-0A | | | |
| | | | connector M8 | QMIS/0P-0F | QMIS/0N-0F | | | |

(*) pig tail available models:
 QM**/0*-0AVE80 (pig-tail M12)
 QM**/0*-0AVF80 (pig-tail M8, 3 wires)
 QM**/0*-0AVG80 (pig-tail M8, 4 wires)

technical specification

direct diffuse models

| | QMRB/0*-0* | QMR7/0*-0* | QMR8/0*-0* | QM17/0*-0* | QM19/0*-0* |
|-----------------------------|---|-----------------------|-------------------------|-----------------------|-------------------------|
| |  | | | | |
| nominal sensing distance | 100 mm ⁽¹⁾ | 400 mm ⁽¹⁾ | 1,000 mm ⁽²⁾ | 400 mm ⁽¹⁾ | 1,500 mm ⁽²⁾ |
| minimum sensing distance | 5 mm | - | | | |
| sensitivity adjustment | ● | | | | |
| emission | red (660 nm) | | | infrared (850 nm) | |
| hysteresis | ≤ 10 % | | | | |
| repeatability | 5 % | | | | |
| rotary switch | ● | | | | |
| operating voltage | 10...30 Vdc | | | | |
| power on delay | ≤ 100 ms | | | | |
| ripple | ≤ 10 % | | | | |
| no-load supply current | ≤ 30 mA | | | ≤ 45 mA | |
| load current | ≤ 100 mA | | | | |
| supply current | ≤ 10 μA | | | | |
| output voltage drop | 2 V max. @ 100 mA | | | | |
| maximum load current | ≤ 100 mA | | | | |
| output type | PNP or NPN NO or NC | | | | |
| switching frequency | 1 kHz | 2 kHz | 1 kHz | 2 kHz | 1 kHz |
| power on delay | ≤ 100 ms | | | | |
| power supply protections | polarity reversal, over voltage pulses | | | | |
| output protection | short circuit (auto reset), over voltage pulses | | | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | | |
| temperature range | - 30°C...+ 80°C | | | | |
| temperature drift | 10% | | | | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | |
| external light interference | 3.000 lux (incandescence lamp), 10.000 lux (sunlight) | | | | |
| LEDs | yellow (LO/DO output state) green (excess gain) | | | | |
| housing material | PA66 | | | | |
| optic material | PMMA | | | | |
| tightening torque | 1 Nm ⁽⁴⁾ | | | | |
| weight (approximate) | 10 g connector / 52 g cable | | | | |

⁽¹⁾ White target Kodak 90% 200 x 200 mm ⁽²⁾ White target Kodak 90% 400 x 400 mm ⁽³⁾ Protection guaranteed only with plug cable well mounted ⁽⁴⁾ Screws, nuts and mounting brackets are not included with the sensor (accessories)



technical specification

background suppression models

High performances
miniaturized

| | QMRS/0*-0* | QMIS/0*-0* |
|-----------------------------|--|----------------------------|
| | | |
| nominal sensing distance | 30...200 mm ⁽¹⁾ | 30...400 mm ⁽¹⁾ |
| minimum sensing distance | 5 mm | |
| sensitivity adjustment | ● | |
| emission | red (630 nm) | infrared (850 nm) |
| hysteresis | ≤ 10 % | |
| repeatability | 5 % | |
| rotary switch | ● | |
| operating voltage | 10...30 Vdc | |
| power on delay | ≤ 10 ms | |
| ripple | ≤ 10 % | |
| no-load supply current | ≤ 30 mA | ≤ 45 mA |
| load current | ≤ 100 mA | |
| supply current | ≤ 10 μA | |
| output voltage drop | 2 V max. @ 100 mA | |
| maximum load current | ≤ 100 mA | |
| output type | PNP or NPN NO or NC | |
| switching frequency | 1 kHz | |
| power on delay | ≤ 100 ms | |
| power supply protections | polarity reversal, over voltage pulses | |
| output protection | short circuit (auto reset), over voltage pulses | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | |
| temperature range | - 30°C...+ 80°C | |
| temperature drift | 10% | |
| protection degree | IP67 (EN60529) ⁽²⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | |
| LEDs | yellow (output state LO/DO) | |
| housing material | PA66 | |
| optic material | PMMA | |
| tightening torque | 1 Nm ⁽³⁾ | |
| weight (approximate) | 10 g connector / 52 g cable | |

⁽¹⁾ White target Kodak 90% 200 x 200 mm ⁽²⁾ White target Kodak 90% 400 x 400 mm ⁽³⁾ Protection guaranteed only with plug cable well mounted ⁽⁴⁾ Screws, nuts and mounting brackets are not included with the sensor (accessories)



| | QMRG/0*-0* | QMIG/0*-0* | QMRL/0*-0* |
|-----------------------------|--|-------------------|--------------|
| | | | |
| nominal sensing distance | 1.5 m | 1 m | 4 m |
| minimum sensing distance | 0.05 m | | 0.4 m |
| sensitivity adjustment | ● | | |
| emission | red (630 nm) | infrared (850 nm) | red (630 nm) |
| hysteresis | ≤ 10 % | | |
| repeatability | 5 % | | |
| rotary switch | ● | | |
| operating voltage | 10...30 Vdc | | |
| power on delay | ≤ 100 ms | | |
| ripple | ≤ 10 % | | |
| no-load supply current | ≤ 30 mA | ≤ 45 mA | ≤ 30 mA |
| load current | ≤ 100 mA | | |
| supply current | ≤ 10 μA | | |
| output voltage drop | 2 V max. @ 100 mA | | |
| maximum load current | ≤ 100 mA | | |
| output type | PNP or NPN NO or NC | | |
| switching frequency | 2 kHz | | |
| power on delay | ≤ 100 ms | | |
| power supply protections | polarity reversal, over voltage pulses | | |
| output protection | short circuit (auto reset), over voltage pulses | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | |
| temperature range | - 30°C...+ 80°C | | |
| temperature drift | ≤ 10% | | |
| protection degree | IP67 (EN60529) ⁽¹⁾ | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | |
| LEDs | yellow (output state LO/DO) | | |
| housing material | PA66 | | |
| optic material | PMMA | | |
| tightening torque | 1 Nm ⁽²⁾ | | |
| weight (approximate) | 10 g connector / 52 g cable | | |

⁽¹⁾ Protection guaranteed only with plug cable well mounted ⁽²⁾ Screws, nuts and mounting brackets are not included with the sensor (accessories)



technical specification

polarized models

technical specification

retroreflection models

High performances
miniaturized

| | QMRN/0*-0* |
|-----------------------------|---|
| | |
| nominal sensing distance | 5 m ⁽¹⁾ |
| minimum sensing distance | 5 mm |
| sensibility adjustment | ● |
| emission | red (630 nm) |
| hysteresis | ≤ 10 % |
| repeatability | 5 % |
| rotary switch | ● |
| operating voltage | 10...30 Vdc |
| power on delay | ≤ 100 ms |
| ripple | ≤ 10 % |
| no-load supply current | - |
| load current | ≤ 100 mA |
| supply current | ≤ 10 μA |
| output voltage drop | 2 V max. @ 100 mA |
| maximum load current | ≤ 100 mA |
| output type | PNP or NPN NO or NC |
| switching frequency | 2 kHz |
| power on delay | ≤ 100 ms |
| power supply protections | polarity reversal, over voltage pulses |
| output protection | short circuit (auto reset), over voltage pulses |
| operating temperature range | - 25°C...+ 70°C (without freeze) |
| temperature range | - 30°C...+ 80°C |
| temperature drift | ≤ 10 % |
| protection degree | IP67 (EN60529) ⁽²⁾ |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| external light interference | 3.000 lux (incandescent lamp), 10.000 lux (sunlight) |
| LEDs | yellow (output state LO/DO) green (excess gain) |
| housing material | PA66 |
| optic material | PMMA |
| tightening torque | 1 Nm ⁽³⁾ |
| weight (approximate) | 10 g connector / 52 g cable |

| | QMIC/0*-0* |
|-----------------------------|---|
| | |
| nominal sensing distance | 7 m ⁽¹⁾ |
| minimum sensing distance | 0,02 m @ RL 110 |
| sensibility adjustment | ● |
| emission | infrared (850 nm) |
| hysteresis | ≤ 10 % |
| repeatability | 5 % |
| rotary switch | ● |
| operating voltage | 10...30 Vdc |
| power on delay | ≤ 100 ms |
| ripple | ≤ 10 % |
| no-load supply current | ≤ 45 mA |
| load current | ≤ 100 mA |
| supply current | ≤ 10 μA |
| output voltage drop | 2 V max. @ 100 mA |
| maximum load current | ≤ 100 mA |
| output type | PNP or NPN NO or NC |
| switching frequency | 2 kHz |
| power on delay | ≤ 100 ms |
| power supply protections | polarity reversal, over voltage pulses |
| output protection | short circuit (auto reset), over voltage pulses |
| operating temperature range | - 25°C...+ 70°C (without freeze) |
| temperature range | - 30°C...+ 80°C |
| temperature drift | ≤ 10 % |
| protection degree | IP67 (EN60529) ⁽²⁾ |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| external light interference | 3.000 lux (incandescent lamp), 10.000 lux (sunlight) |
| LEDs | yellow (output state LO/DO) green (excess gain) |
| housing material | PA66 |
| optic material | PMMA |
| tightening torque | 1 Nm ⁽³⁾ |
| weight (approximate) | 10 g connector / 52 g cable |

⁽¹⁾ With RL 110 reflector EG = 2; ⁽²⁾ protection guaranteed only with plug cable well mounted; ⁽³⁾ screws, nuts and mounting brackets are not included with the sensor (accessories).

⁽¹⁾ With RL 110 reflector EG = 2; ⁽²⁾ protection guaranteed only with plug cable well mounted; ⁽³⁾ screws, nuts and mounting brackets are not included with the sensor (accessories).

| | QMRH/0*-0* | QMRD/0*-0* | QMIH/0*-0* | QMID/0*-0* |
|-----------------------------|--|---|---------------------|---|
| |  | | | |
| nominal sensing distance | 20 m ⁽¹⁾ | | 30 m ⁽¹⁾ | |
| minimum sensing distance | - | | | |
| sensibility adjustment | ● | | | |
| emission | red (630 nm) | - | infrared (850 nm) | - |
| hysteresis | ≤ 10 % | | | |
| repeatability | 5 % | | | |
| rotary switch | - | ● | - | ● |
| operating voltage | 10...30 Vdc | | | |
| power on delay | ≤ 100 ms | | | |
| ripple | ≤ 10 % | | | |
| no-load supply current | ≤ 30 mA | | ≤ 45 mA | |
| load current | - | ≤ 100 mA | - | ≤ 100 mA |
| supply current | - | ≤ 10 μA | - | ≤ 10 μA |
| output voltage drop | - | 2 V max. @ 100 mA | - | 2 V max. @ 100 mA |
| maximum load current | - | ≤ 100 mA | - | ≤ 100 mA |
| output type | - | PNP or NPN NO or NC | - | PNP or NPN NO or NC |
| switching frequency | 2 kHz | - | 2 kHz | - |
| power on delay | ≤ 100 ms | | | |
| power supply protections | - | polarity reversal, over voltage pulses | - | polarity reversal, over voltage pulses |
| output protection | - | polarity reversal, over voltage pulses | - | polarity reversal, over voltage pulses |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | |
| temperature range | - 30°C...+ 80°C | | | |
| temperature drift | ≤ 10 % | | | |
| protection degree | IP67 (EN60529) ⁽²⁾ | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | |
| LEDs | yellow (output state LO/DO), 10,000 lux (sunlight) | | | |
| housing material | PA66 | | | |
| optic material | PMMA | | | |
| tightening torque | 1 Nm ⁽³⁾ | | | |
| weight (approximate) | 10 g connector / 52 g cable | | | |

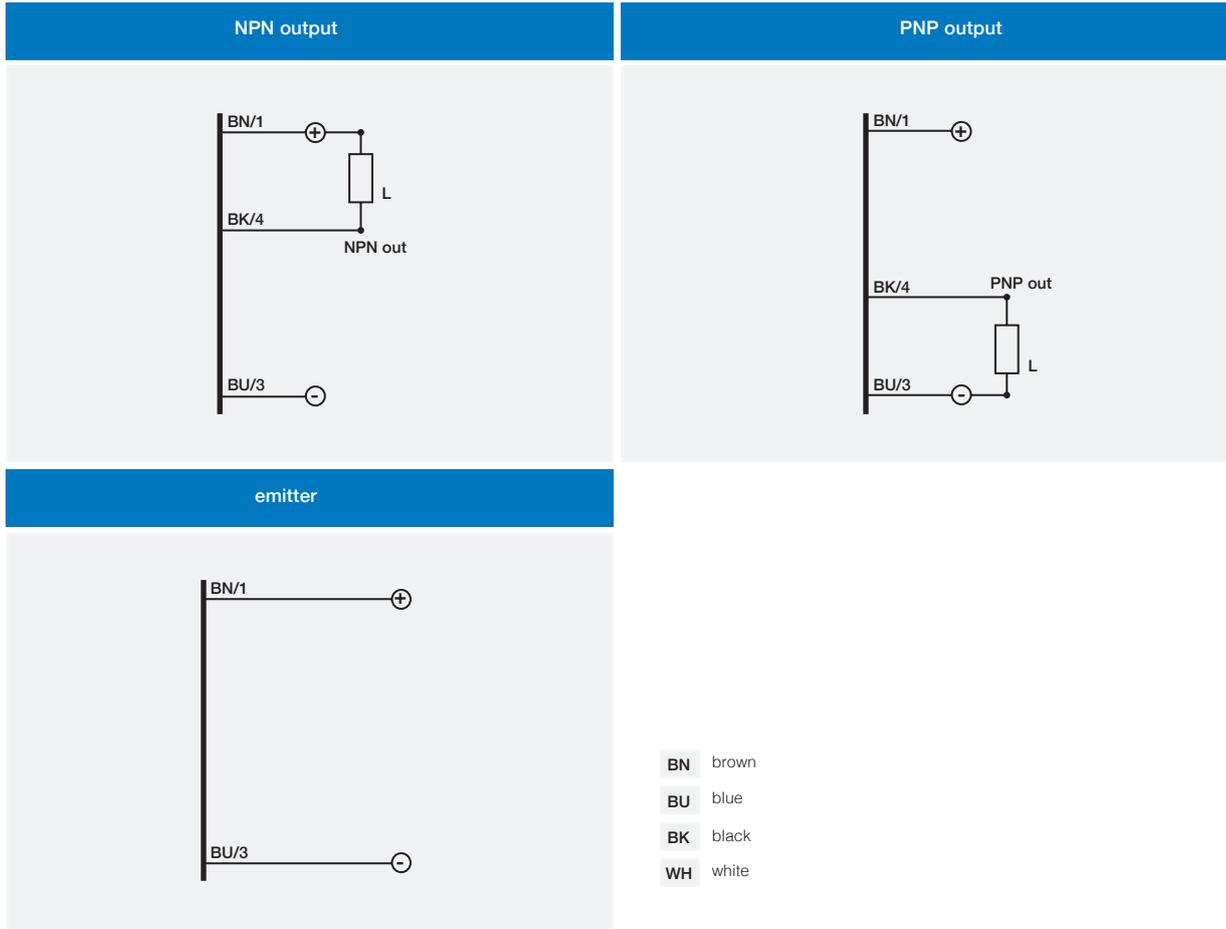
⁽¹⁾ White target Kodak 90% 200 x 200 mm ⁽²⁾ Protection guaranteed only with plug cable well mounted ⁽³⁾ Screws, nuts and mounting brackets are not included with the sensor (accessories)



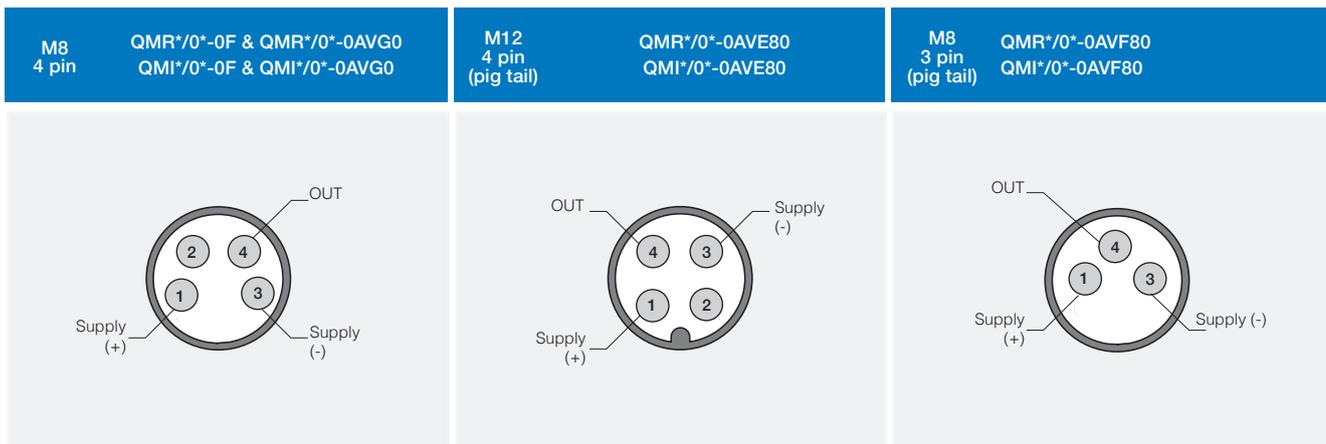
response diagrams

LO/DO selectable output

High performances
miniaturized



plug



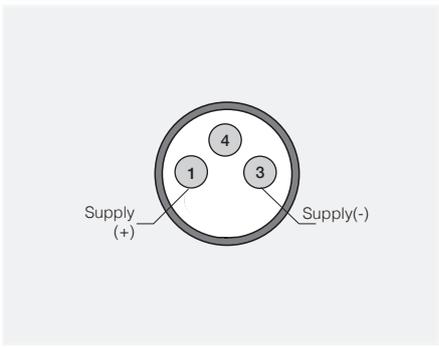
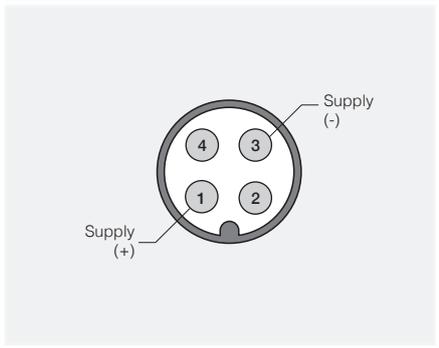
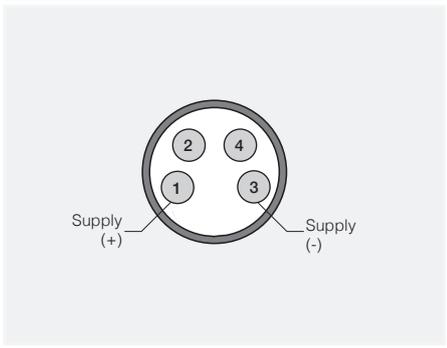
QM



M8
4 pin
QM*H/00-0F & QM*H/00-0AVG80

M12
4 pin
(pig tail)
QM*H/0*-0AVE80

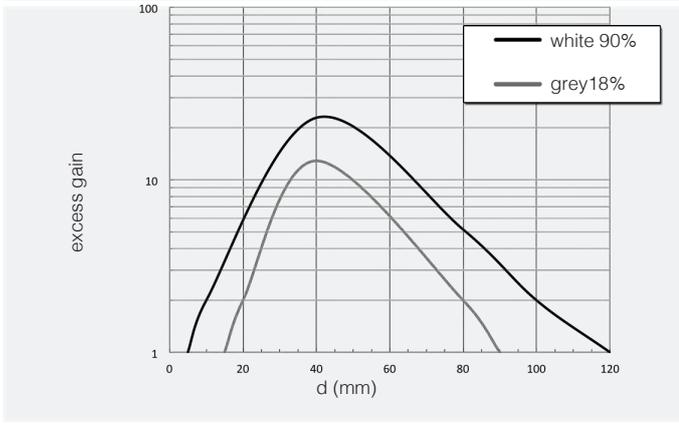
M8
3 pin
(pig tail)
QM*H/0*-0AVF80



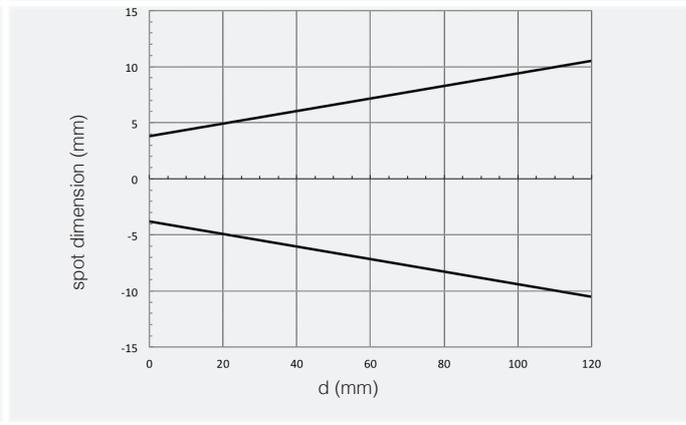
response diagrams

direct diffuse models

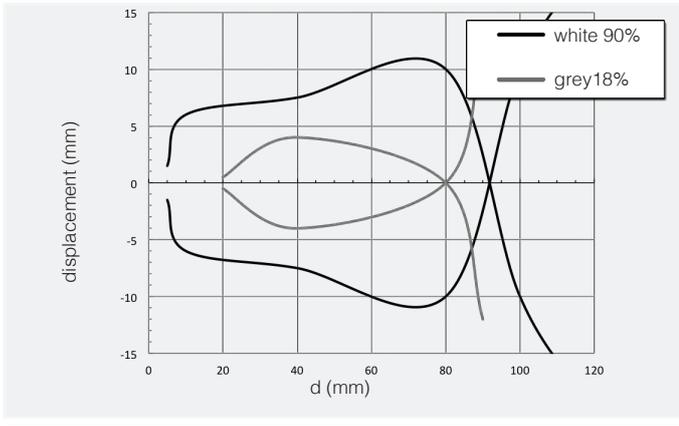
QMRB/**-* excess gain



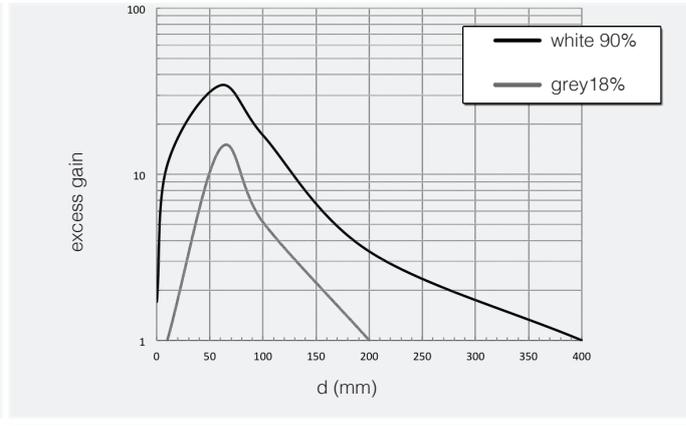
QMRB/**-* spot dimension



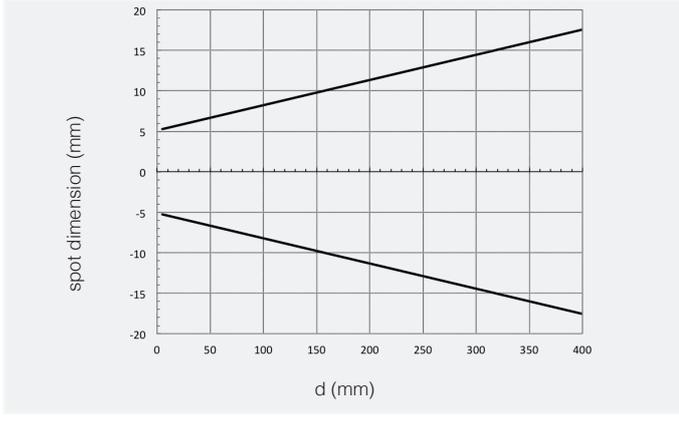
QMRB/**-* parallel displacement



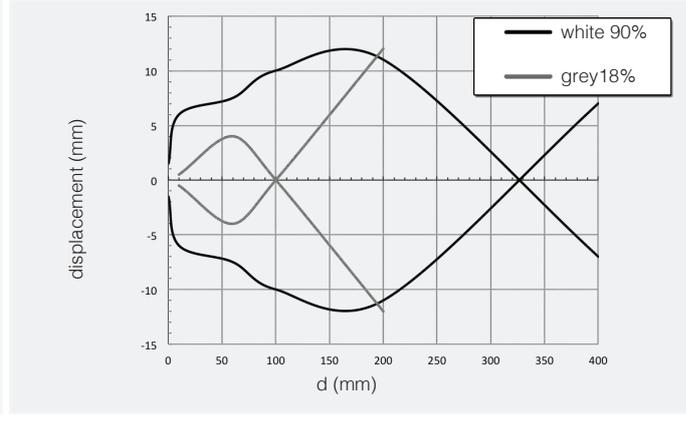
QMR7/**-* excess gain



QMR7/**-* spot dimension



QMR7/**-* parallel displacement



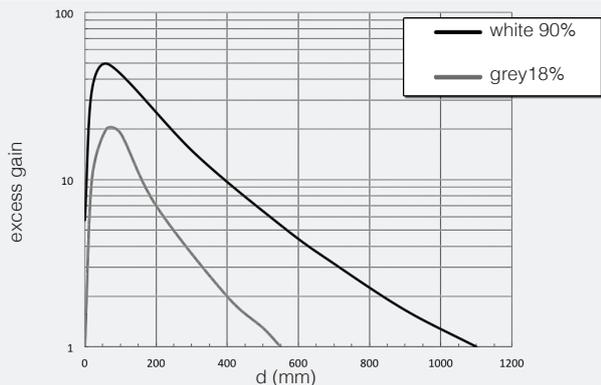


response diagrams

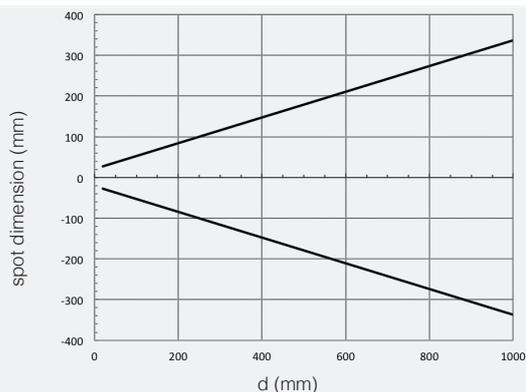
direct diffuse models

High performances
miniaturized

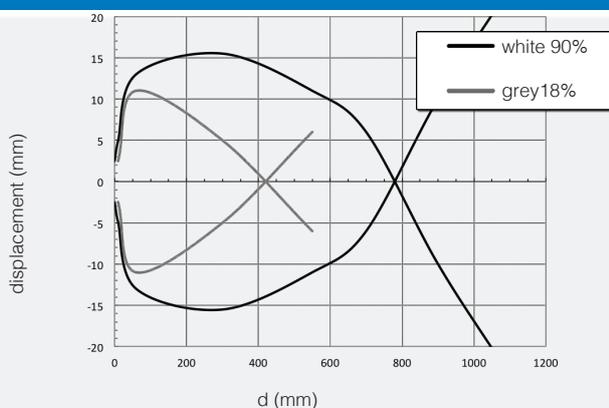
QMR8/**-* excess gain



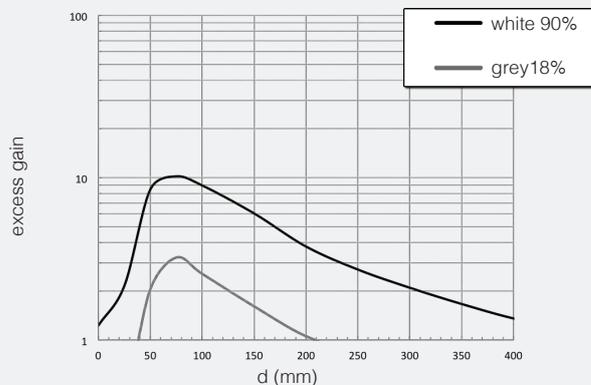
QMR8/**-* spot dimension



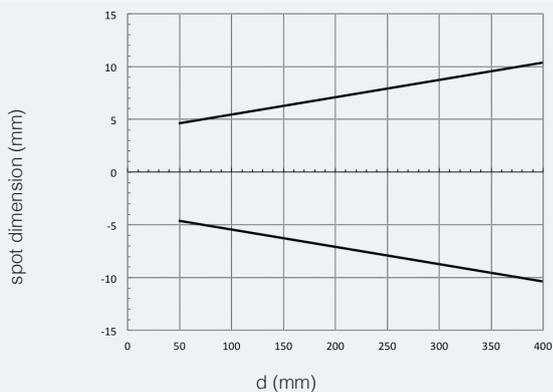
QMR8/**-* parallel displacement



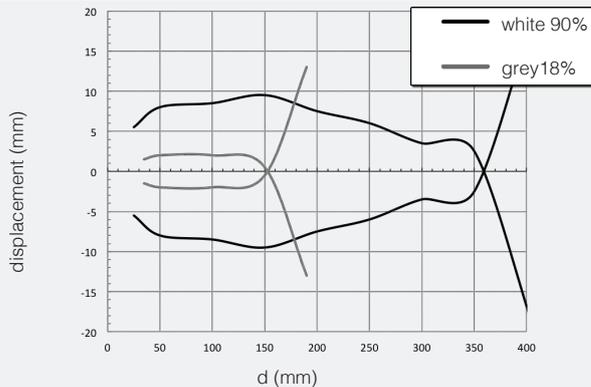
QMI7/**-* excess gain



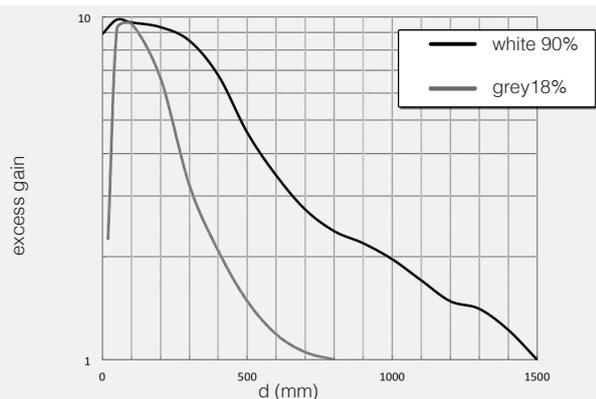
QMI7/**-* spot dimension



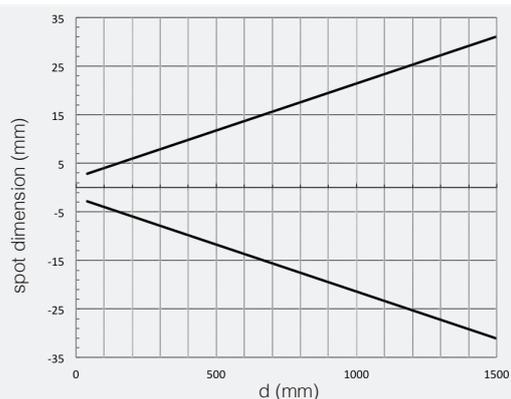
QMI7/**-* parallel displacement

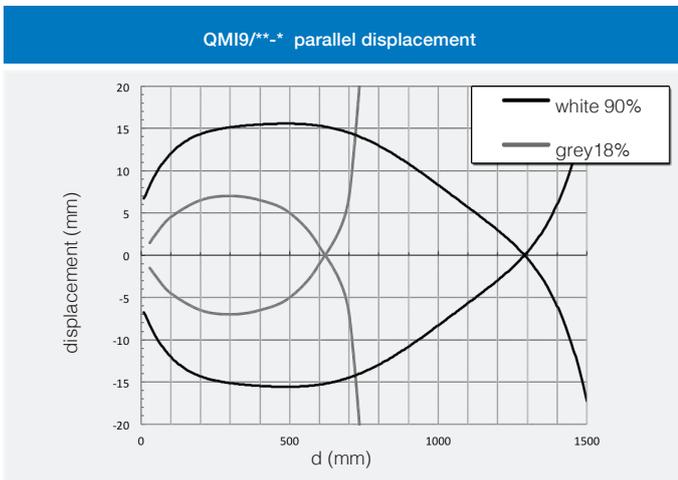


QMI9/**-* excess gain



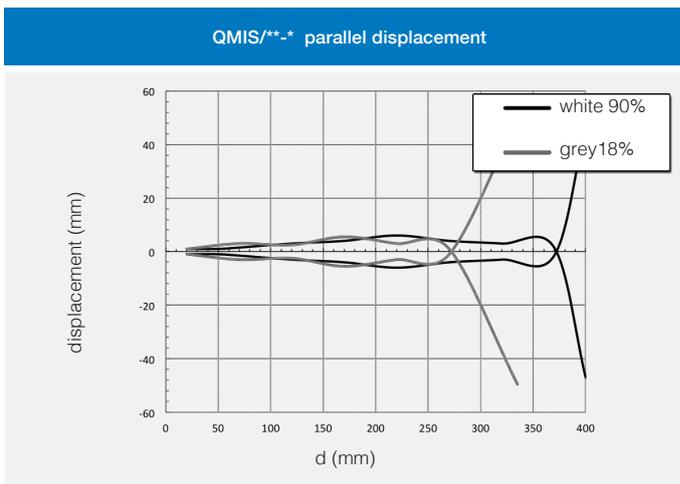
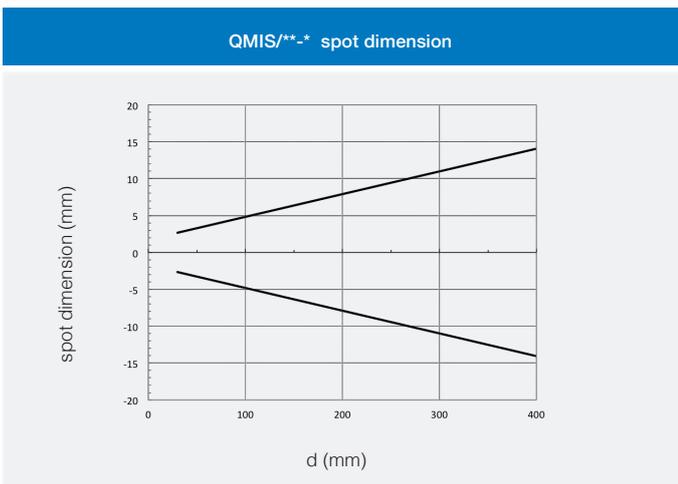
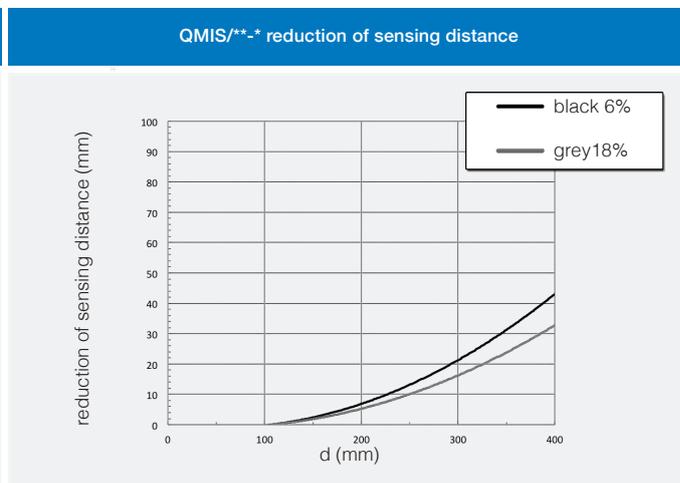
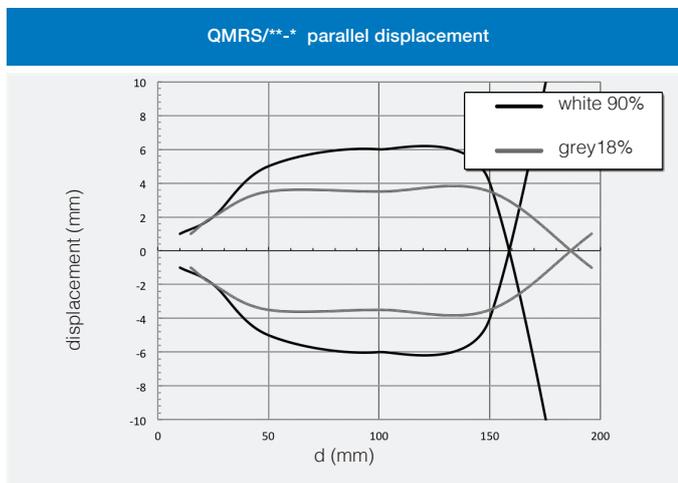
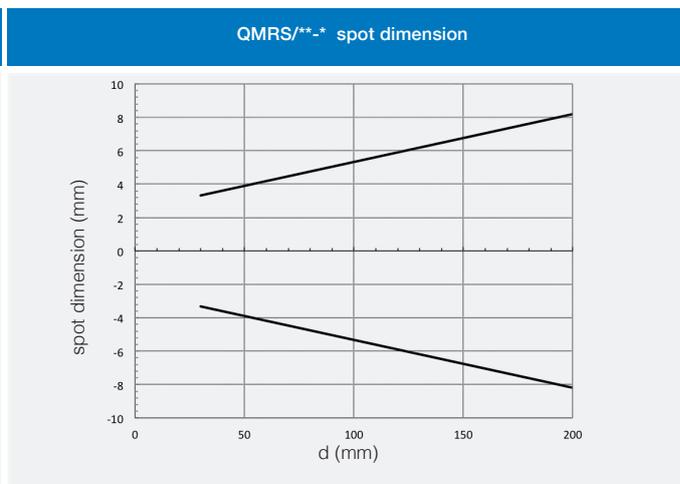
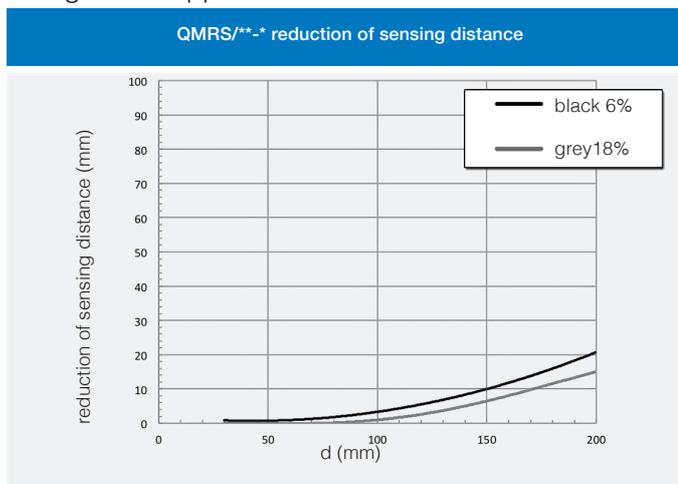
QMI9/**-* spot dimension





response diagrams

background suppression models



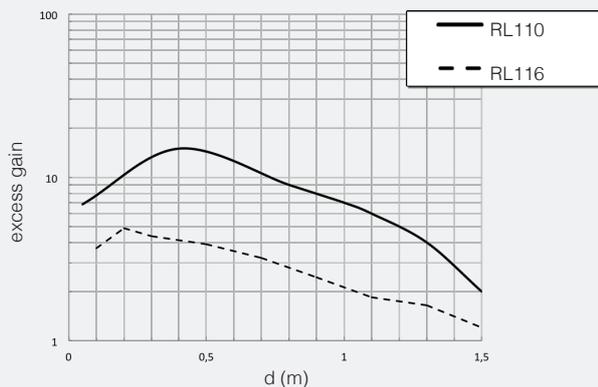


response diagrams

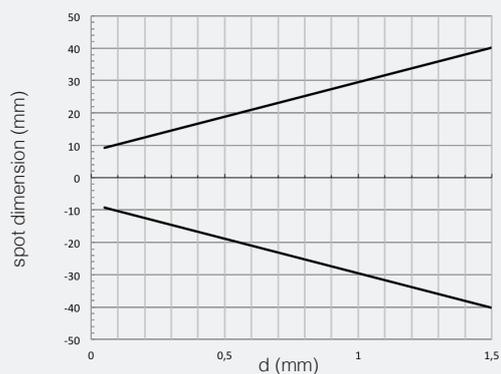
models for transparent objects

High performances
miniaturized

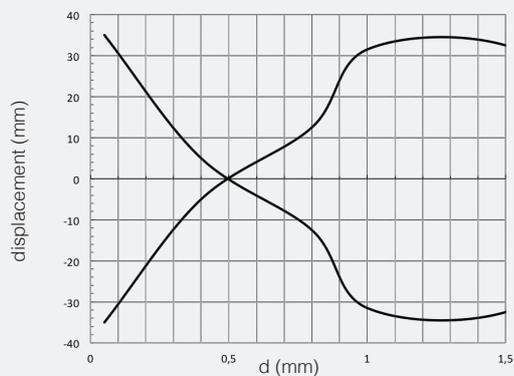
QMRG/**-* excess gain



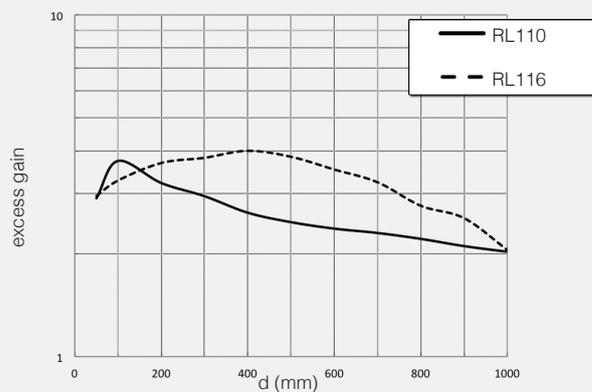
QMRG/**-* spot dimension



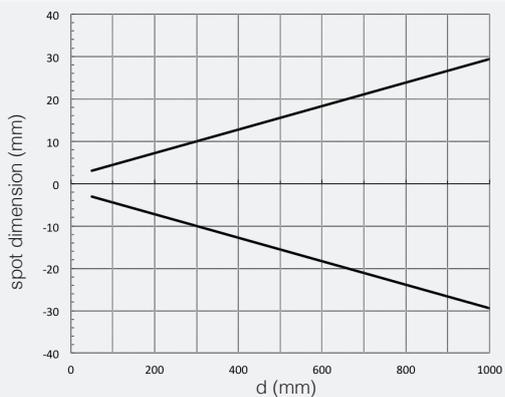
QMRG/**-* parallel displacement



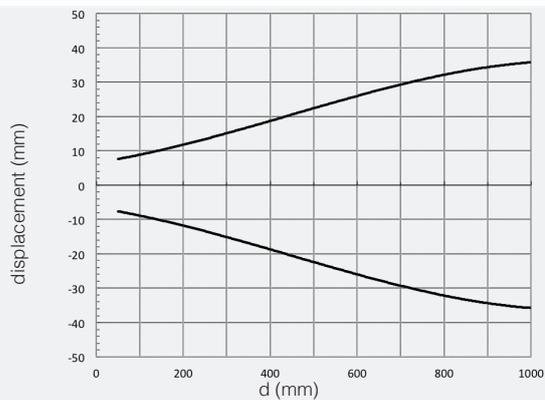
QMIG/**-* excess gain



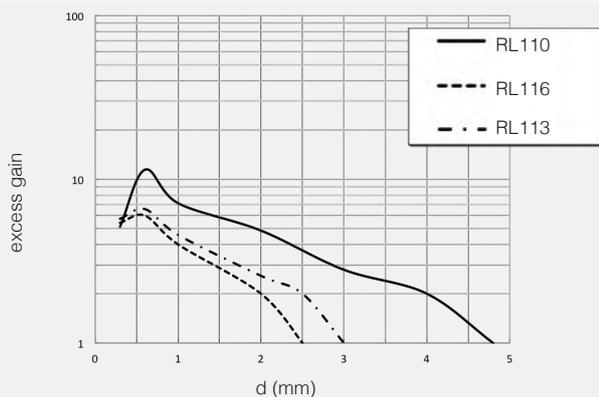
QMIG/**-* spot dimension



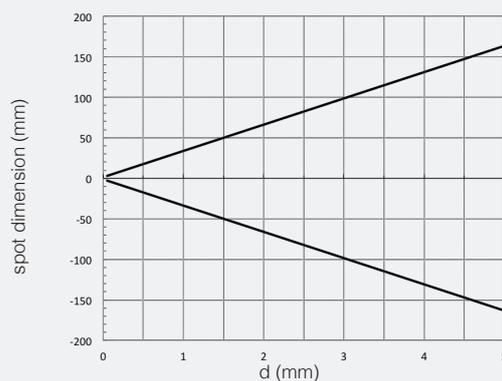
QMIG/**-* parallel displacement



QMRL/**-* excess gain



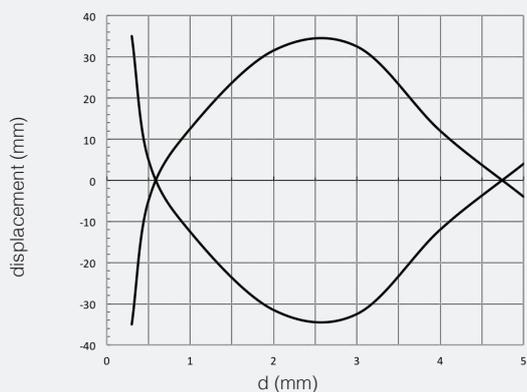
QMRL/**-* spot dimension



QM



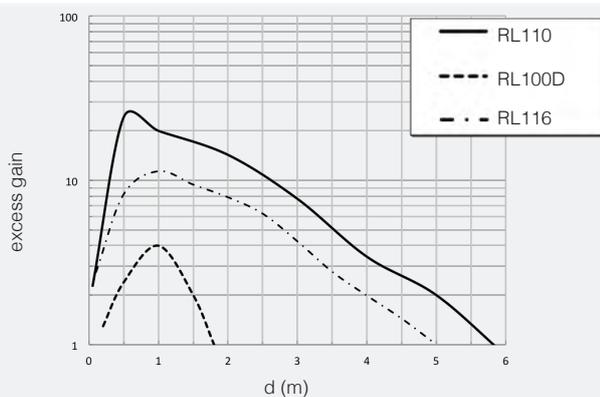
QMRL/**-*parallel displacement



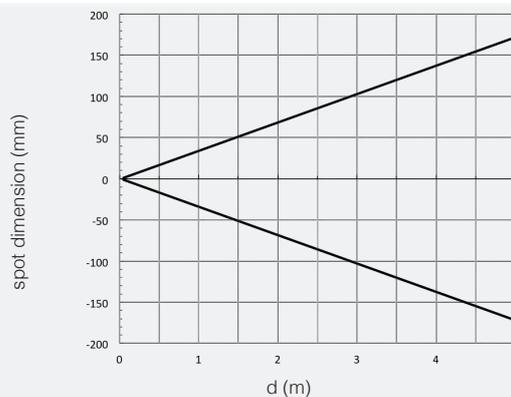
response diagrams

retroreflective polarized models

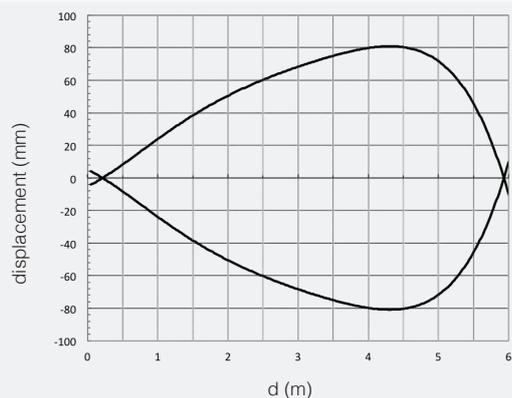
QMRN/**-* excess gain



QMRN/**-* spot dimension



QMRN/**-*parallel displacement



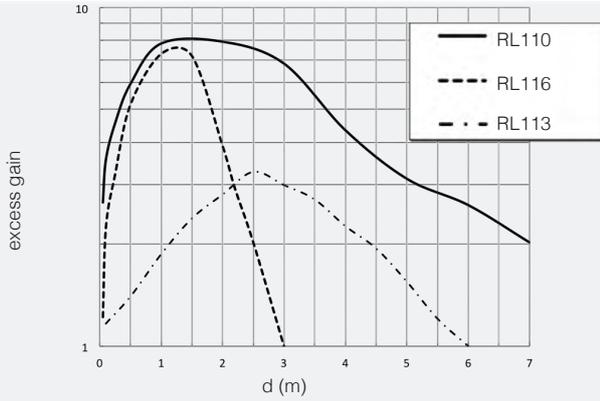


response diagramss

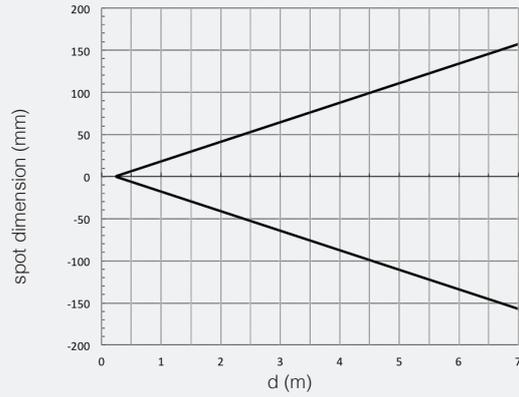
retro-reflective models

High performances
miniaturized

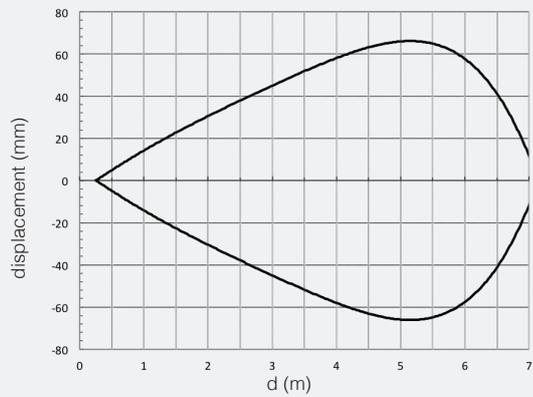
QMIC/**-⁺ excess gain



QMIC/**-⁺ spot dimension



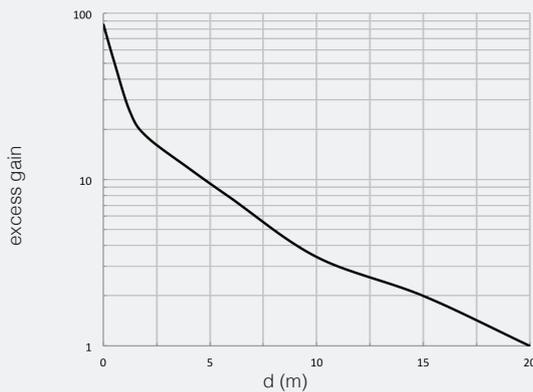
QMIC/**-⁺ parallel displacement



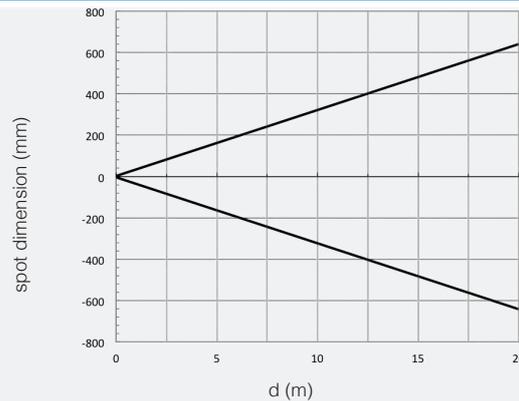
response diagramss

through beam models

QMRHD/**-⁺ excess gain



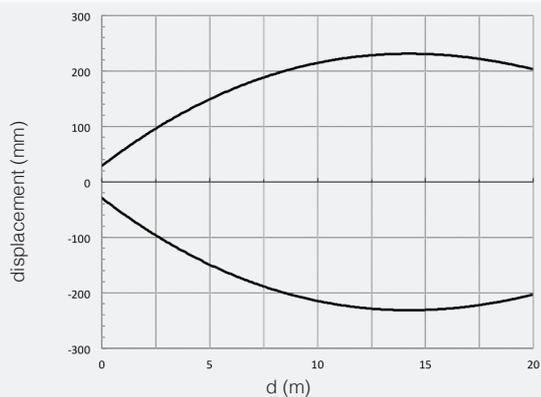
QMRHD/**-⁺ spot dimension



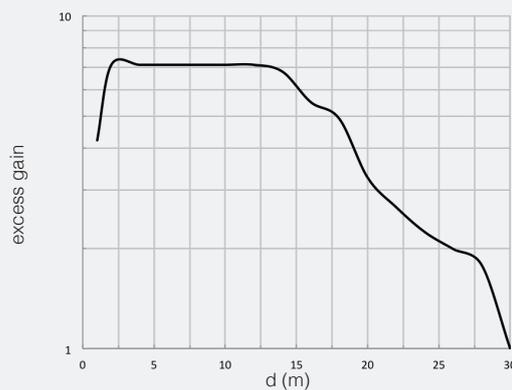
QM



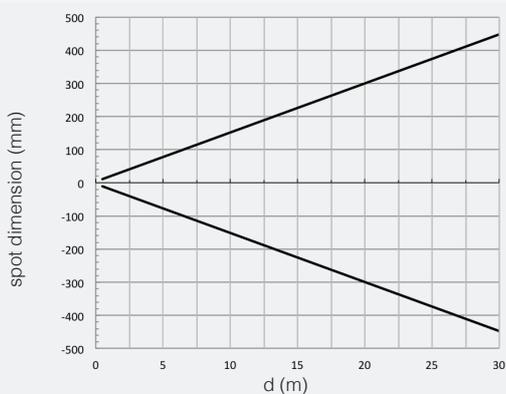
QMRHD/**-*parallel displacement



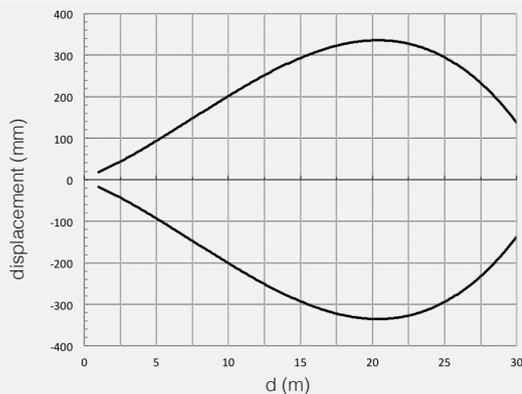
QMIHD/**-* excess gain



QMIHD/**-* spot dimension

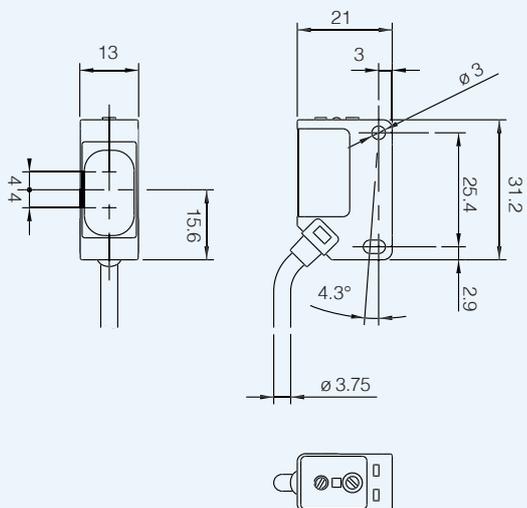


QMIHD/**-*parallel displacement

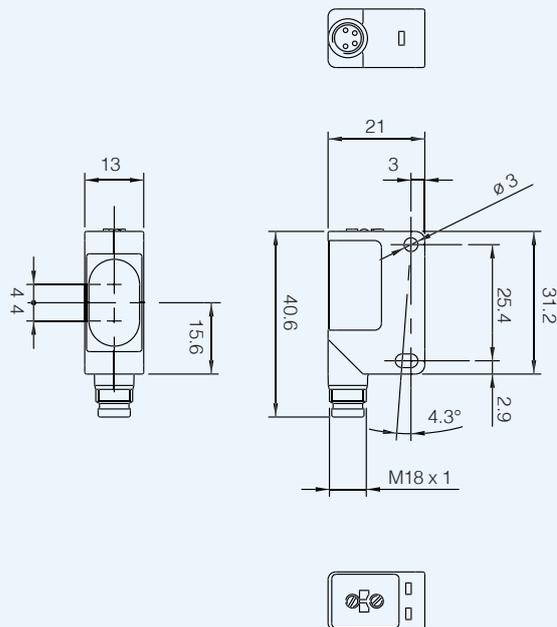


dimensions (mm)

QM**/**-0A



QM**/**-0E





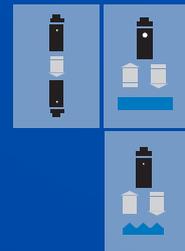
PS series

DC miniaturized cubic photoelectric sensors



features

- Wide range of models: diffuse, retro-reflective, through-beam
- Extremely reduced dimensions
- High sensing distance
- Sensitivity adjustment
- Standard cable exit or M12 plug exit
- LED status indicator
- IP65 protection degree
- Complete protection against electrical damage



DC miniaturized cubic

web content



- Application notes
- Photos
- Catalogue / Manuals



code description

PS 2 / A N - 0 C

| | | |
|---------------------|----|---|
| series | PS | Miniaturized rectangular photoelectric sensor |
| type | 2 | 100 mm diffuse reflection |
| | 4 | 200 mm diffuse reflection |
| | C | 3 m retro-reflective |
| | E | Emitter |
| | R | Receiver |
| NO / NC output | 0 | Emitter / NO/NC selectable output (PSR only) |
| | A | NO output state |
| | C | NC output state |
| NPN / PNP output | 0 | Emitter |
| | N | NPN output |
| | P | PNP output |
| housing | 0 | Plastic housing 2 m |
| cable / plug output | C | Right angle cable exit |
| | E | Right angle M12 plastic plug cable exit |



DC miniaturized cubic

available models

| model | distance | output | 3 wires | | | | 4 wires | |
|--------------------|----------|--------|-----------|-----------|-----------|-----------|-------------|-------------|
| | | | LO NPN | DO NPN | LO PNP | DO PNP | LO / DO NPN | LO / DO PNP |
| diffuse reflection | 100 mm | cable | PS2/AN-0C | PS2/CN-0C | PS2/AP-0C | PS2/CP-0C | - | - |
| | | plug | PS2/AN-0E | - | PS2/AP-0E | - | - | - |
| | 200 mm | cable | PS4/AN-0C | - | PS4/AP-0C | - | - | - |
| | | plug | PS4/AN-0E | - | PS4/AP-0E | - | - | - |
| retro-reflexive | 2 m | cable | - | - | PSC/AP-0C | - | - | - |
| | | plug | - | - | PSC/AP-0E | PSC/CP-0E | - | - |
| through-beam | 4 m | cable | - | - | - | - | PSE/00-0C | |
| | | plug | - | - | - | - | PSE/00-0E | |
| | | cable | - | - | - | - | PSR/0N-0C | PSR/0P-0C |
| | | plug | - | - | - | - | PSR/0N-0E | PSR/0P-0E |

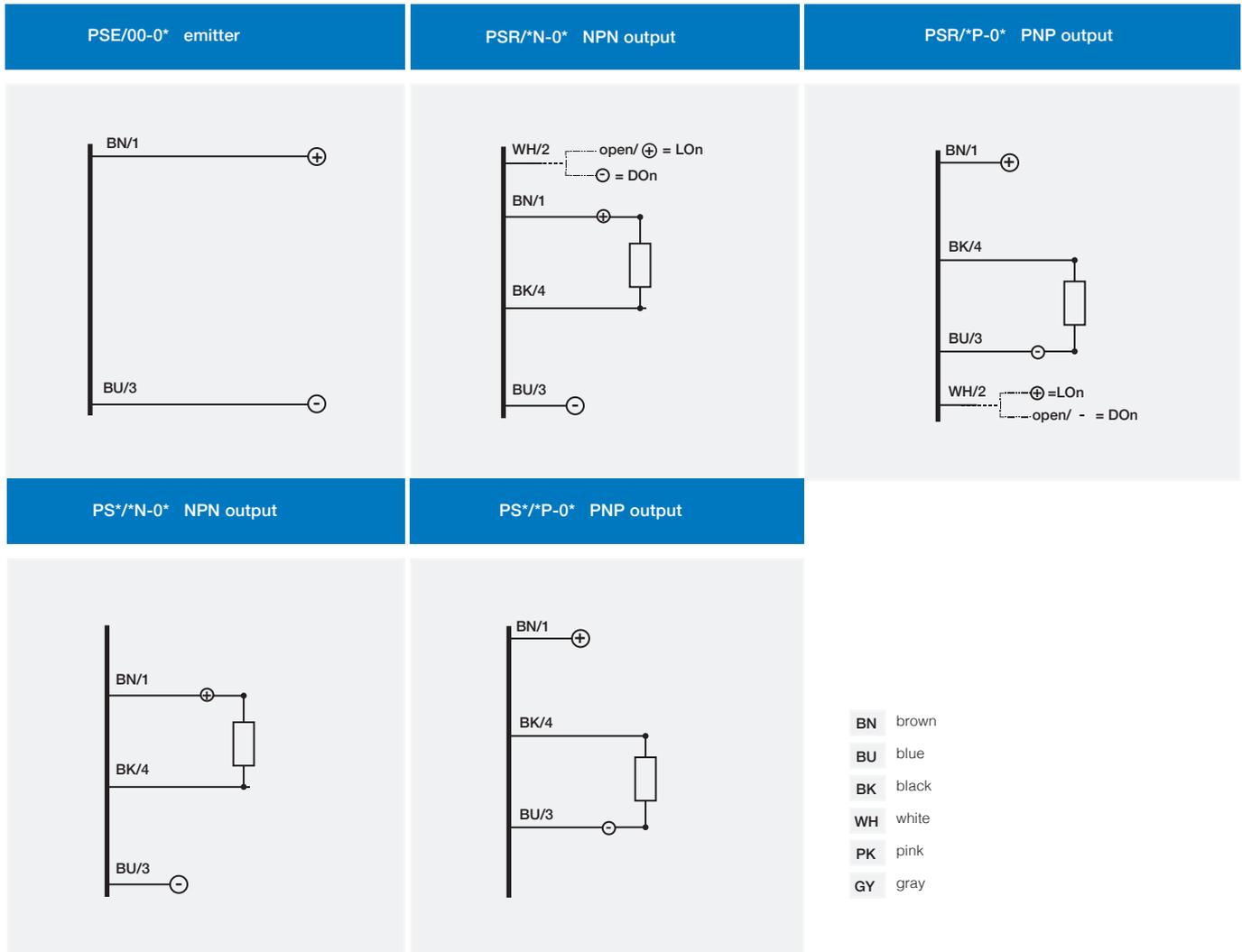
technical specification

| | diffuse reflection | | retro-reflexive | through-beam |
|-----------------------------|--|-----------------------|--------------------|-------------------------------------|
| | PS2/**-0* | PS4/**-0* | PSC/**-0* | PSE/00-0* PSR/**-0* |
| | | | | |
| nominal sensing distance | 100 mm ⁽¹⁾ | 200 mm ⁽¹⁾ | 3 m ⁽²⁾ | 4 m |
| emission | infrared (880 nm) | | | |
| tolerance | + 15 / - 5 % Sn | | | - |
| hysteresis | ≤ 5 % | | ≤ 10 % | |
| operating voltage | 10...30 Vdc max | | | |
| ripple | ≤ 10 % | | | |
| no-load supply current | 30 mA max | | | 25 mA (emitter) 30 mA (receiver) |
| load current | ≤ 100 mA | | | |
| leakage current | ≤ 10 µA @ Vmax | | | |
| output voltage drop | 1.2 Vmax | | | |
| output type | PNP or NPN , NO or NC (NO/NC selectable for PSR models) | | | |
| switching frequency | 100 Hz | | | 25 Hz |
| power on delay | 200 ms | | | |
| temperature range | - 25°C...+ 70°C (without freeze) | | | |
| power supply protections | polarity reversal, transient | | | |
| supply electrical output | short circuit (autoreset) | | | |
| sensitivity adjustment | 1 turn trimmer | | | |
| temperature range | ≤ 10 % Sr | | | |
| protection degree | IP65 (EN60529) ⁽³⁾ | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | |
| LEDs | red (output energized) | | | |
| housing material | ABS | | | |
| optic material | PMMA | | | |
| weight (approximate) | 70 g connector / 140 g cable (20 g mounting bracket ST07) | | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With standard reflector Ø80 mm (RL110 supplied separately) ⁽³⁾ Protection guaranteed only with plug cable well mounted

PS

electrical diagrams of the connections



Notes:

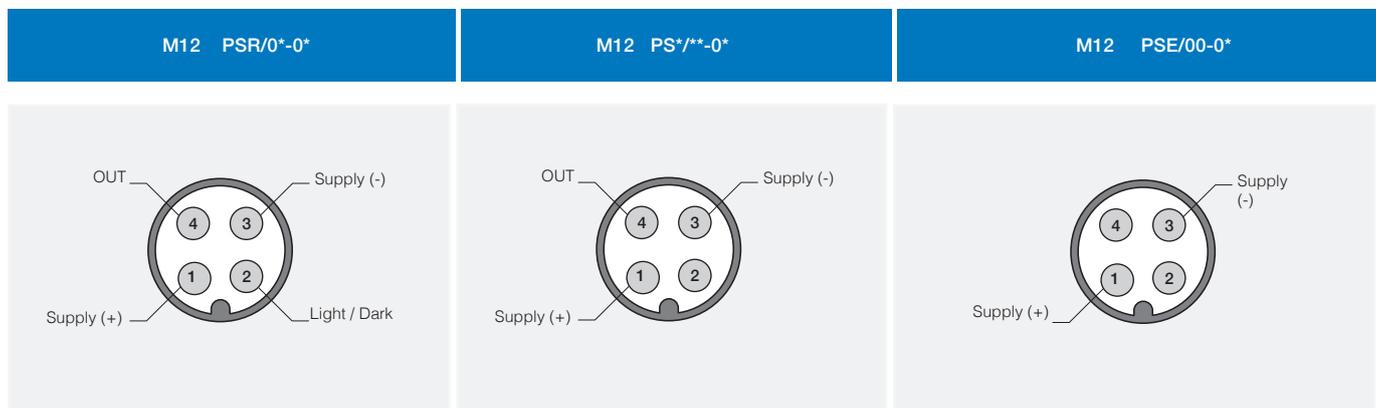
In case of combined load, resistive and capacitive, the maximum admissible capacity $C = 0,1 \mu F$, for maximum output volt-age and current.

Wh (white wire): the cable present on the receiver PSR/0*- 0* allows the output state selection.

NPN output: NO state (white and brown on +), NC state (white and blue on -).

PNP output: NO state (white and blue on -), NC state (white and brown on +).

plug



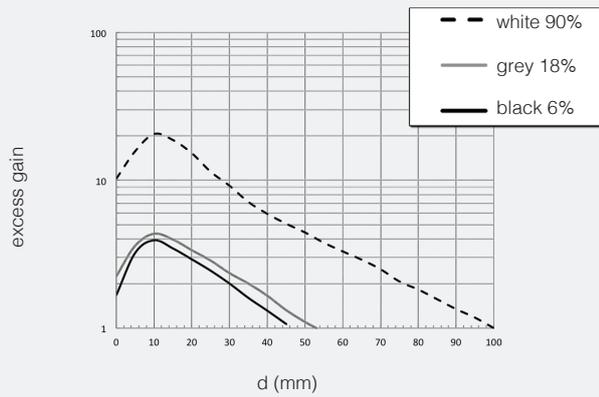


response diagrams

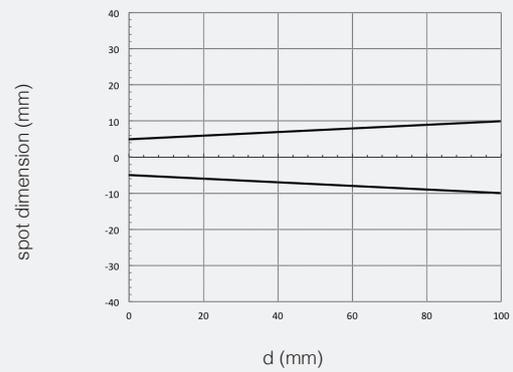
direct reflection models

DC miniaturized cubic

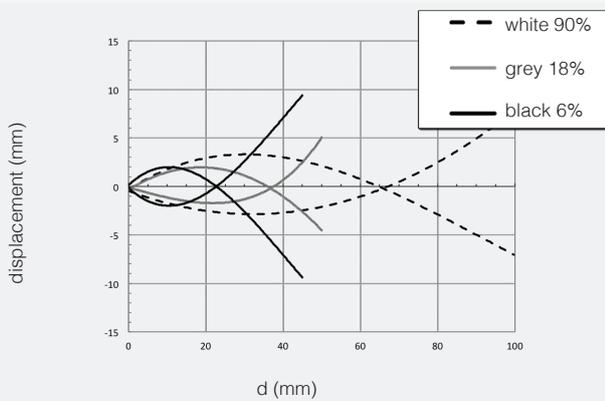
PS2/**-** excess gain



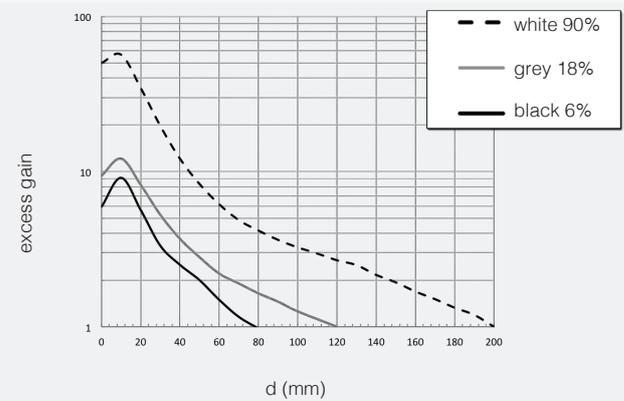
PS2/**-** spot dimension



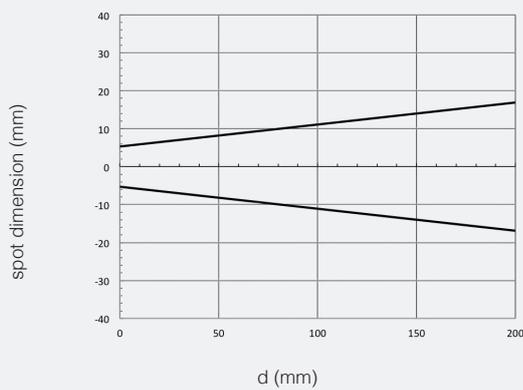
PS2/**-** parallel displacement



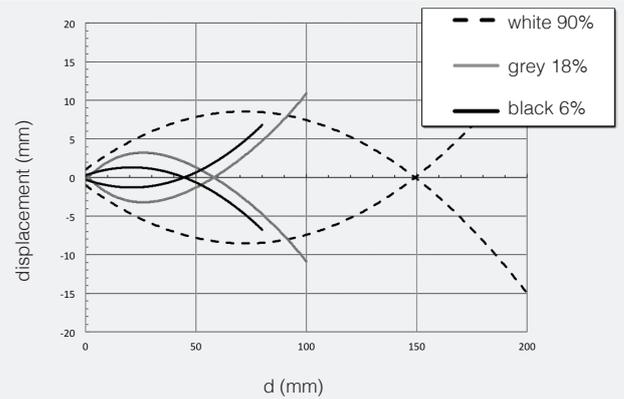
PS4/**-** excess gain



PS4/**-** spot dimension



PS4/**-** parallel displacement



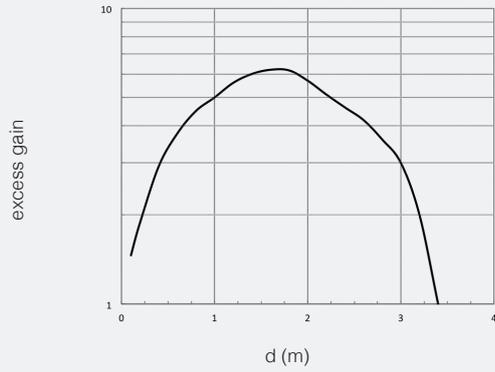
response diagrams

retro-reflective models (detected with RL 110)

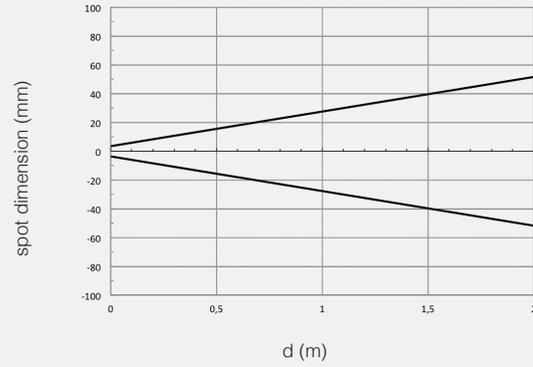


DC miniaturized

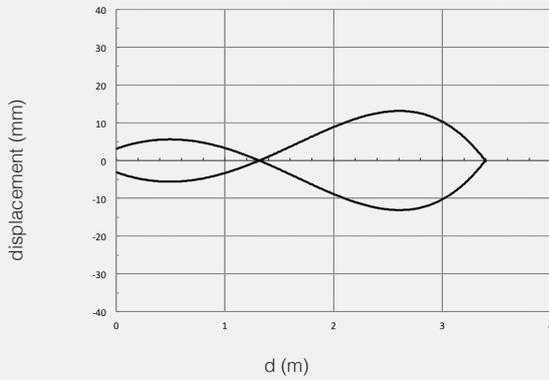
PSC/**_** excess gain



PSC/**_** spot dimension



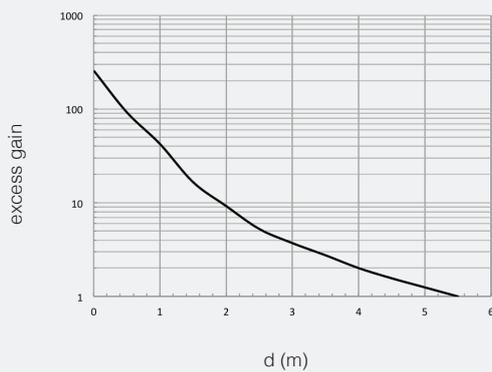
PS2/**_** parallel displacement



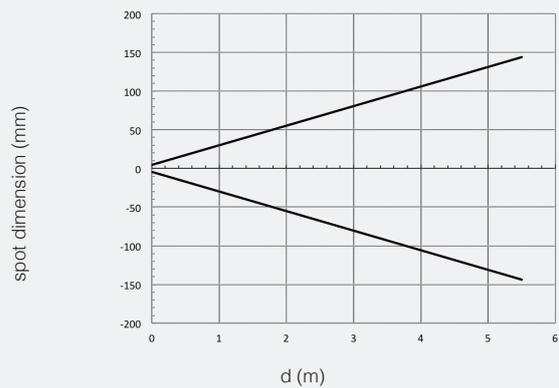
response diagrams

through beam models

PSE/00-0* - PSR/00-0* excess gain



PSE/00-0* - PSR/00-0* spot dimension



PS

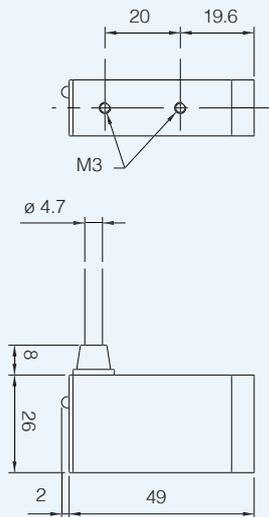


PSE/00-0* - PSR/00-0* parallel displacement

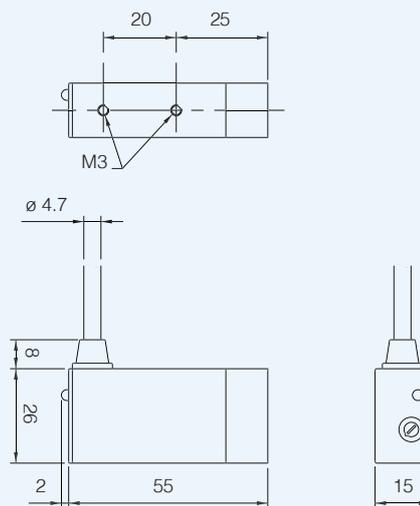


dimensions (mm)

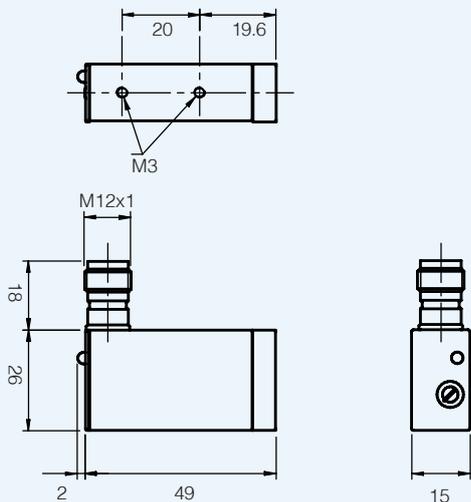
PS2/**-0C - PS4/**-0C



PSC/**-0C - PSE/00-0C - PSR/0*-0C



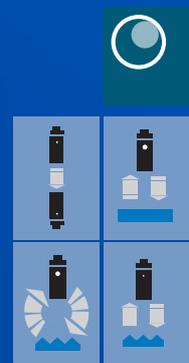
PS+/**-0E





QX series

DC miniaturized cubic photoelectric sensors



DC miniaturized cubic

features

- Axial and right angle optics
- 2 LEDs (threshold and signal margin)
- Visible red light in retro-reflective, polarized and through-beam models
- Long distances capability
- Precision beam
- Fast response time (0,75-0,5 ms)
- NPN-PNP selectable output
- High output current (>300 mA)



web content



- Application notes
- Photos
- Catalogue / Manuals



code description

QX 3 / A 0 - 1 A

| | | |
|-----------------------|-----------|-----------------------------------|
| series | QX | Miniaturized photoelectric sensor |
| type | 3 | Diffuse reflection 300 mm |
| | C | Retro-reflective 5 m |
| | P | Polarized 3 m |
| | X | Emitter with check |
| | R | Receiver 8 m |
| output | A | NO output state |
| | C | NC output state |
| | 0 | Emitter |
| axial / radial optics | 1 | Axial optics |
| | 2 | Right angle optics |
| cable / plug output | A | Cable exit 2 m |
| | F | M8 plug cable exit |
| | E | M12 plug cable exit |

available models

axial optic

| model | distance | cable | | plug M8 | | plug M12 | |
|------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | NO | NC | NO | NC | NO | NC |
| direct diffuse | 300 mm | QX3/A0-1A | QX3/C0-1A | QX3/A0-1F | QX3/C0-1F | QX3/A0-1E | QX3/C0-1E |
| retro-reflective | 5 m | QXC/A0-1A | QXC/C0-1A | QXC/A0-1F | QXC/C0-1F | QXC/A0-1E | QXC/C0-1E |
| polarized | 3 m | QXP/A0-1A | QXC/C0-1A | QXP/A0-1F | QXP/C0-1F | QXP/A0-1E | QXP/C0-1E |
| through-beam | 8 m | QXX/00-1A | | QXX/00-1F | | QXX/00-1E | |
| | | emitter | QXR/A0-1A | QXR/C0-1A | QXR/A0-1F | QXR/C0-1F | QXR/A0-1E |
| receiver | | | | | | | |

QX



DC miniaturized cubic

available models

radial optic

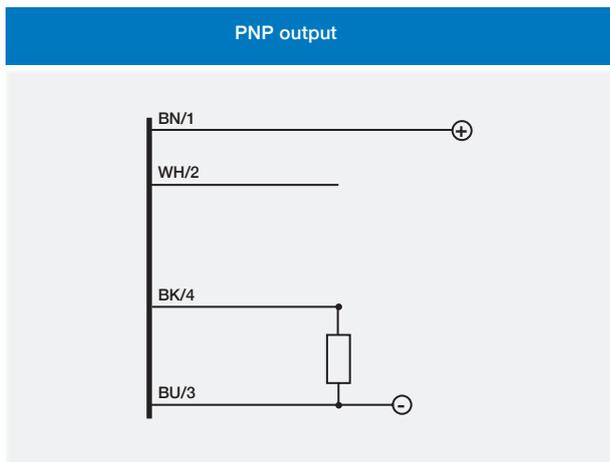
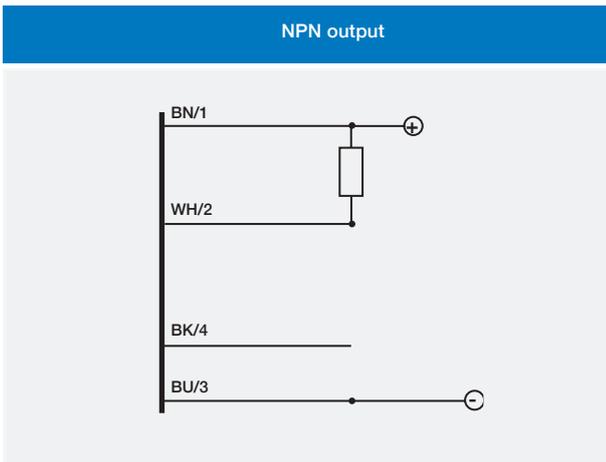
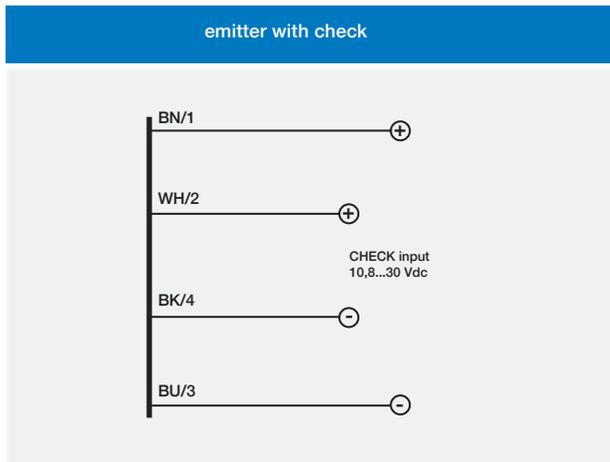
| model | distance | cable | | plug M8 | | plug M12 | |
|------------------|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | NO | NC | NO | NC | NO | NC |
| direct diffuse | 300 mm | QX3/A0-2A | QX3/C0-2A | QX3/A0-2F | QX3/C0-2F | QX3/A0-2E | QX3/C0-2E |
| retro-reflective | 5 m | QXC/A0-2A | QXC/C0-2A | QXC/A0-2F | QXC/C0-2F | QXC/A0-2E | QXC/C0-2E |
| polarized | 3 m | QXP/A0-2A | QXC/C0-2A | QXP/A0-2F | QXP/C0-2F | QXP/A0-2E | QXP/C0-2E |
| through-beam | emitter receiver | QXX/00-2A | | QXX/00-2F | | QXX/00-2E | |
| | | QXR/A0-2A | QXR/C0-2A | QXR/A0-2F | QXR/C0-2F | QXR/A0-2E | QXR/C0-2E |

technical specification

| | diffuse reflection | retro-reflective | polarized | through-beam |
|-----------------------------|---|--|--|---|
| | QX3/*0-** | QXC/*0-** | QXP/*0-** | QXX/*0-** QXR/*0-** |
| nominal sensing distance |  300 mm ⁽¹⁾ |  5 m ⁽²⁾ |  3 m ⁽²⁾ |  8 m |
| emission | infrared (880 nm) | red (660 nm) | | |
| minimum detectable object | see characteristic curves | | | 2 mm |
| tolerance | + 15 % / - 5 % Sn | | | - |
| hysteresis | 10 % | | | |
| repeatability | 5 % | | | |
| operating voltage | 10,8...30 Vdc | | | |
| ripple | 10 % max | | | |
| load current | 20 mA max | | | 20 mA (emitter) 5 mA (receiver) |
| check voltage | - | | | 10,8...30 Vdc (QXX) |
| load current | 300 mA | | | |
| leakage current | 100 µA max at 30 Vdc | | | |
| output voltage drop | 1,2 V max IL = 100 mA | | | |
| output type | PNP or NPN selectable | | | |
| switching frequency | 750 Hz (Tr = 0,5 ms) | | | 500 Hz (Tr = 0,75 ms) |
| power on delay | 200 ms | | | |
| operating temperature range | - 25°C...+ 70°C (without freeze) | | | |
| power supply protections | polarity reversal, transient | | | |
| output protection | short circuit (autoreset) | | | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | |
| LEDs | RED LED (margin low signal) CHECK (QXX) GREEN LED (stability) POWER (QXX) | | | |
| housing material | ABS (glass fiber reinforced) | | | |
| optic material | acrylic | | | |
| weight (approximate) | 30 g connector / 70 g cable (single) | | | |

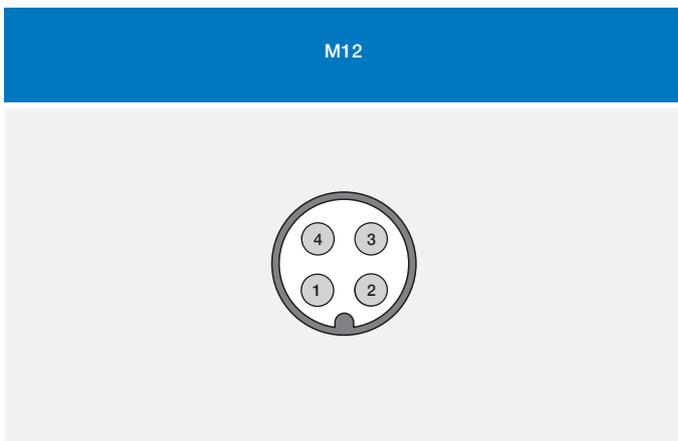
⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With standard reflector Ø80 mm (RL110 supplied separately) ⁽³⁾ Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections



- BN** brown
- BU** blue
- BK** black
- WH** white

plug



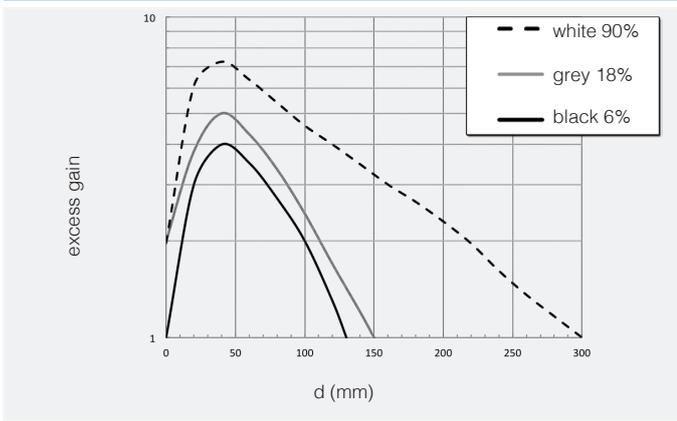


response diagrams

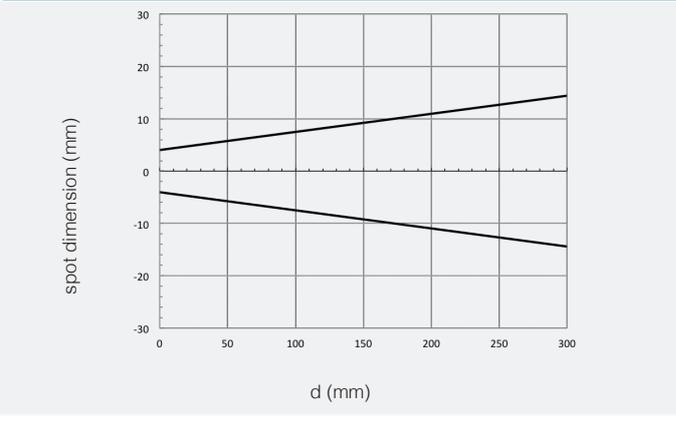
direct reflection models

DC miniaturized cubic

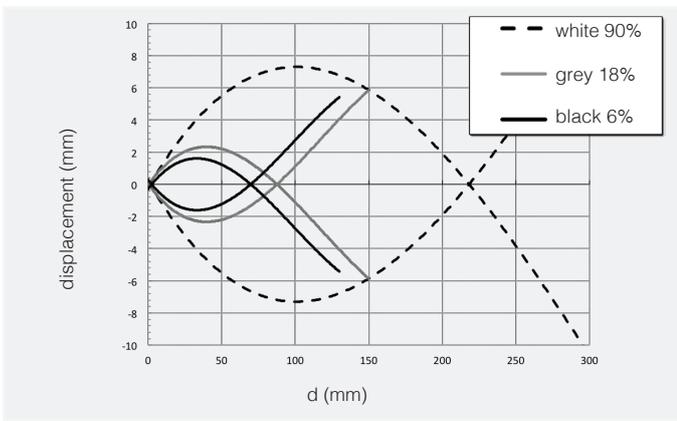
QX3/*0-** excess gain



QX3/*0-** spot dimension



QX3/*0-** parallel displacement

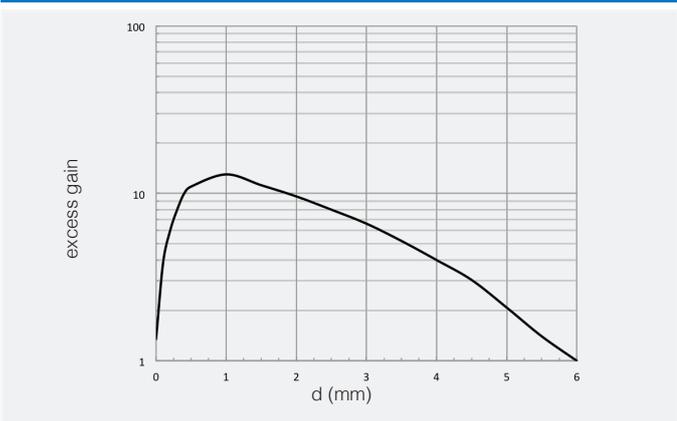


response diagrams

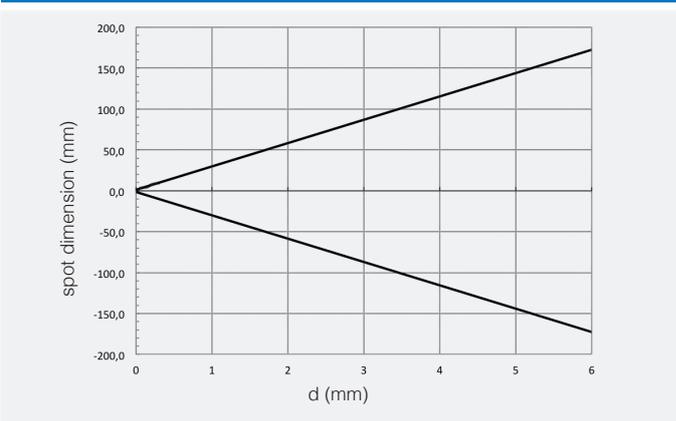
retroreflective models

QX

QXC/*0-** excess gain

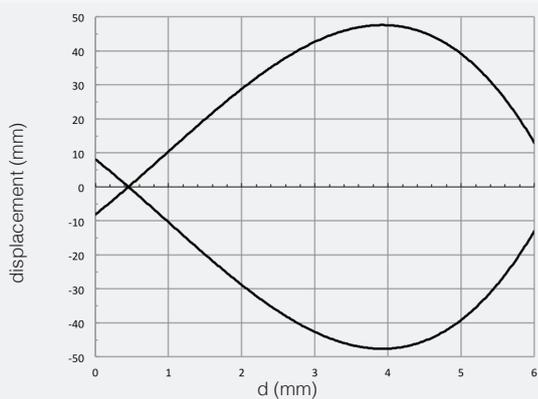


QXC/*0-** spot dimension





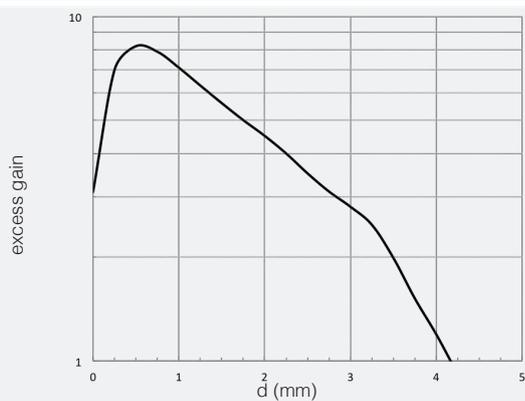
QXC/*0-** parallel displacement



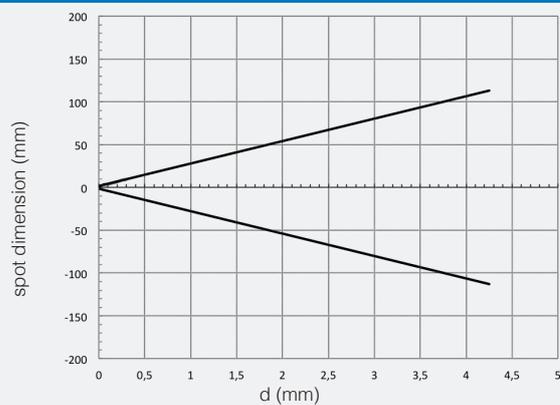
response diagrams

polarized models

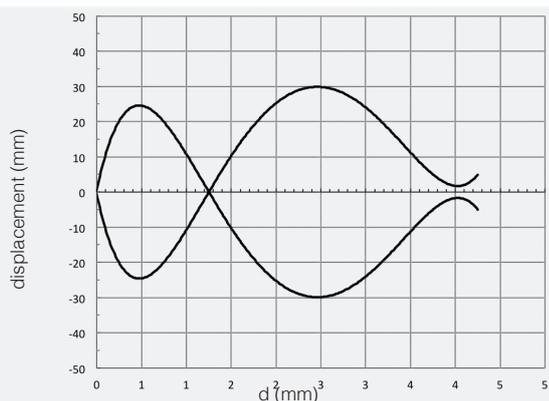
QXP/*0-** excess gain



QXP/*0-** spot dimension



QXP/*0-** parallel displacement



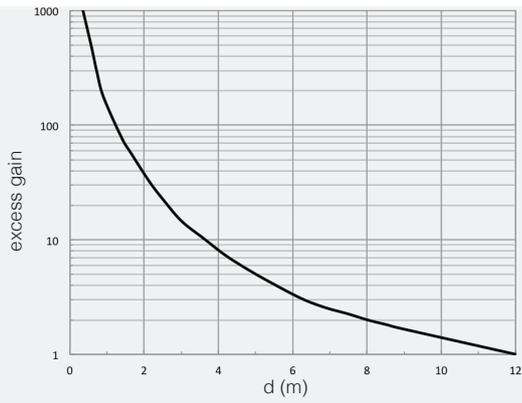


response diagrams

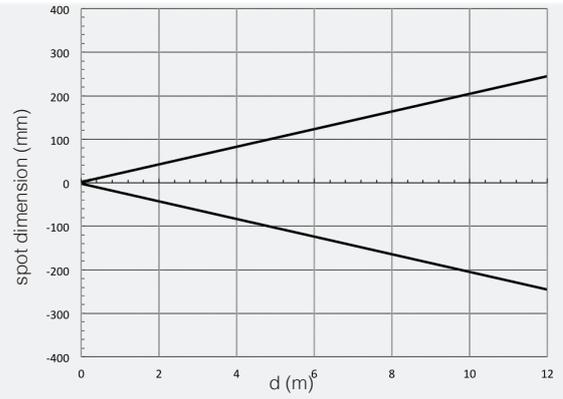
through-beam

DC miniaturized
cubic

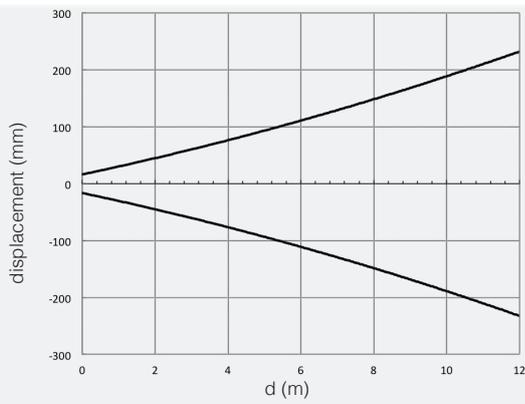
QXX/00-**- QXR/*0-** excess gain

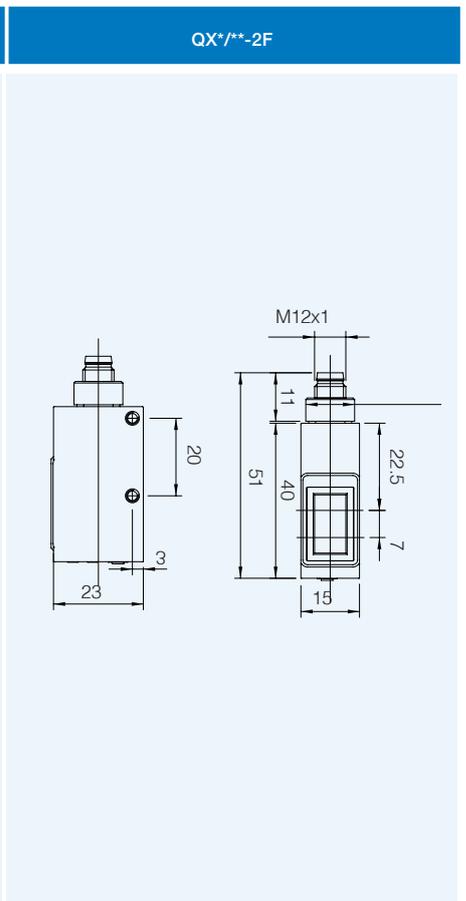
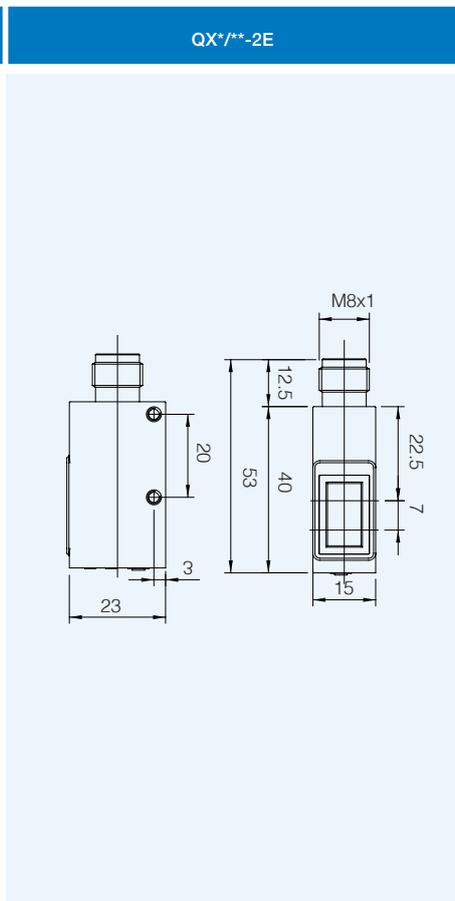
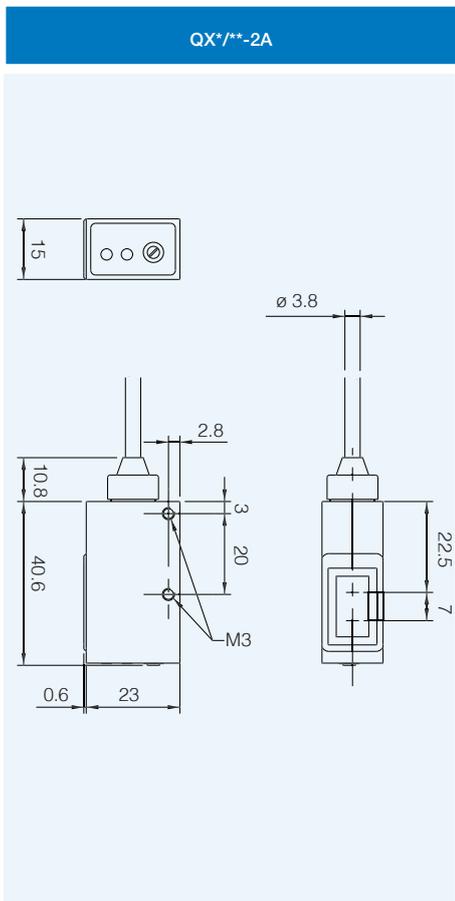
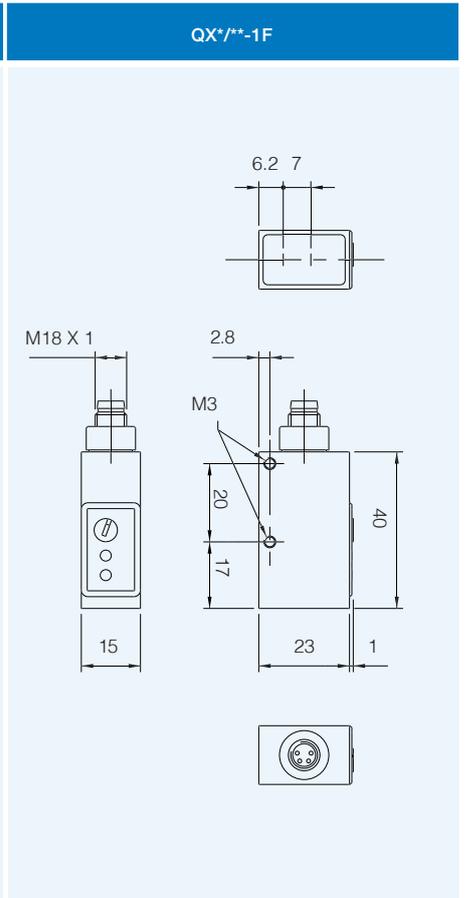
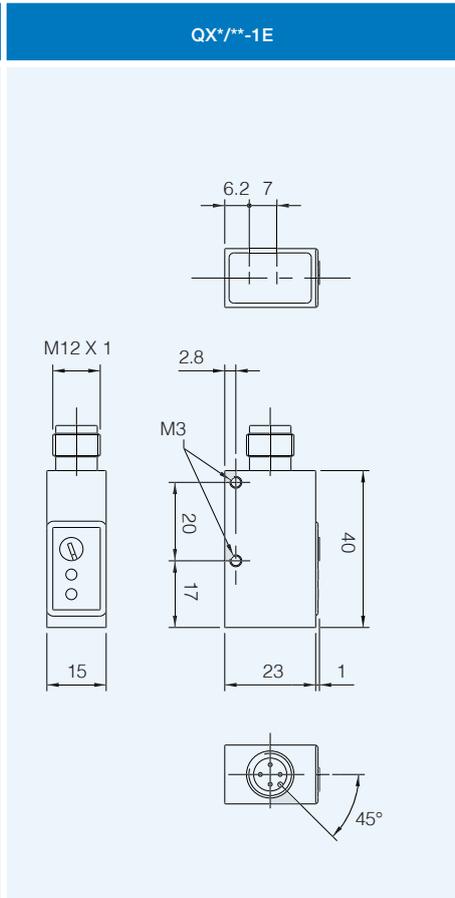
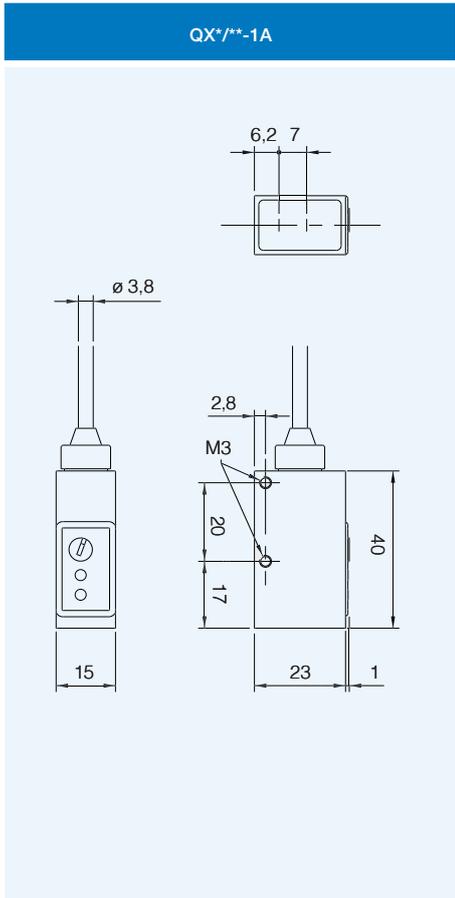


QXX/00-**- QXR/*0-** spot dimension



QXX/00-**- QXR/*0-** parallel displacement







Area containing 20 horizontal light blue lines for taking notes.



BS - BV series

Cubic photoelectric sensors
DECOUT® output - DC or AC



features

- Wide range of models: diffuse, retro-reflective, polarized
- Multifunctional DECOUT® output and logic connection possibilities (DC types)
- Multivoltage 20-253 Vac and T_{RIAC} output with NO/NC selectable (AC types)
- Sensitivity adjustment
- Standard cable exit or M12 plug exit
- LED status indicator
- Completely filled with resin
- High sensing range



web content



- Application notes
- Photos
- Catalogue / Manuals



Cubic DECOUT®
DC or AC

code description

BS 2 / 0 0 - 0 C

| | | |
|---------------------|----|--|
| series | BS | DC - rectangular photoelectric sensor |
| | BV | AC - rectangular multivoltage photoelectric sensor |
| type | 2 | 100 mm diffuse reflection |
| | 4 | 200 mm diffuse reflection |
| | 6 | 400 mm diffuse reflection |
| | 8 | 1600 mm diffuse reflection |
| | C | 8 m retro-reflective |
| NO / NC | 0 | NO / NC selectable output |
| NPN / PNP | 0 | NPN / PNP selectable output DC Triac output AC |
| housing | 0 | Plastic housing |
| cable / plug output | C | Right angle cable exit |
| | E | Right angle M12 plastic plug cable exit |



available models

Cubic DECOUT®
DC or AC

| model | distance | output | DC - DECOUT® | AC - TRIAC |
|--------------------|----------|--------|--------------|------------|
| diffuse reflection | 100 mm | cable | BS2/00-0C | BV2/00-0C |
| | | M12 | BS2/00-0E | BV2/00-0E |
| | 200 mm | cable | BS4/00-0C | BV4/00-0C |
| | | M12 | BS4/00-0E | BV4/00-0E |
| | 400 mm | cable | BS6/00-0C | BV6/00-0C |
| | | M12 | BS6/00-0E | BV6/00-0E |
| | 1.600 m | cable | BS8/00-0C | - |
| | | M12 | BS8/00-0E | - |
| retroreflective | 8 m | cable | BSC/00-0C | BVC/00-0C |
| | | M12 | BSC/00-0E | BVC/00-0E |

technical specification

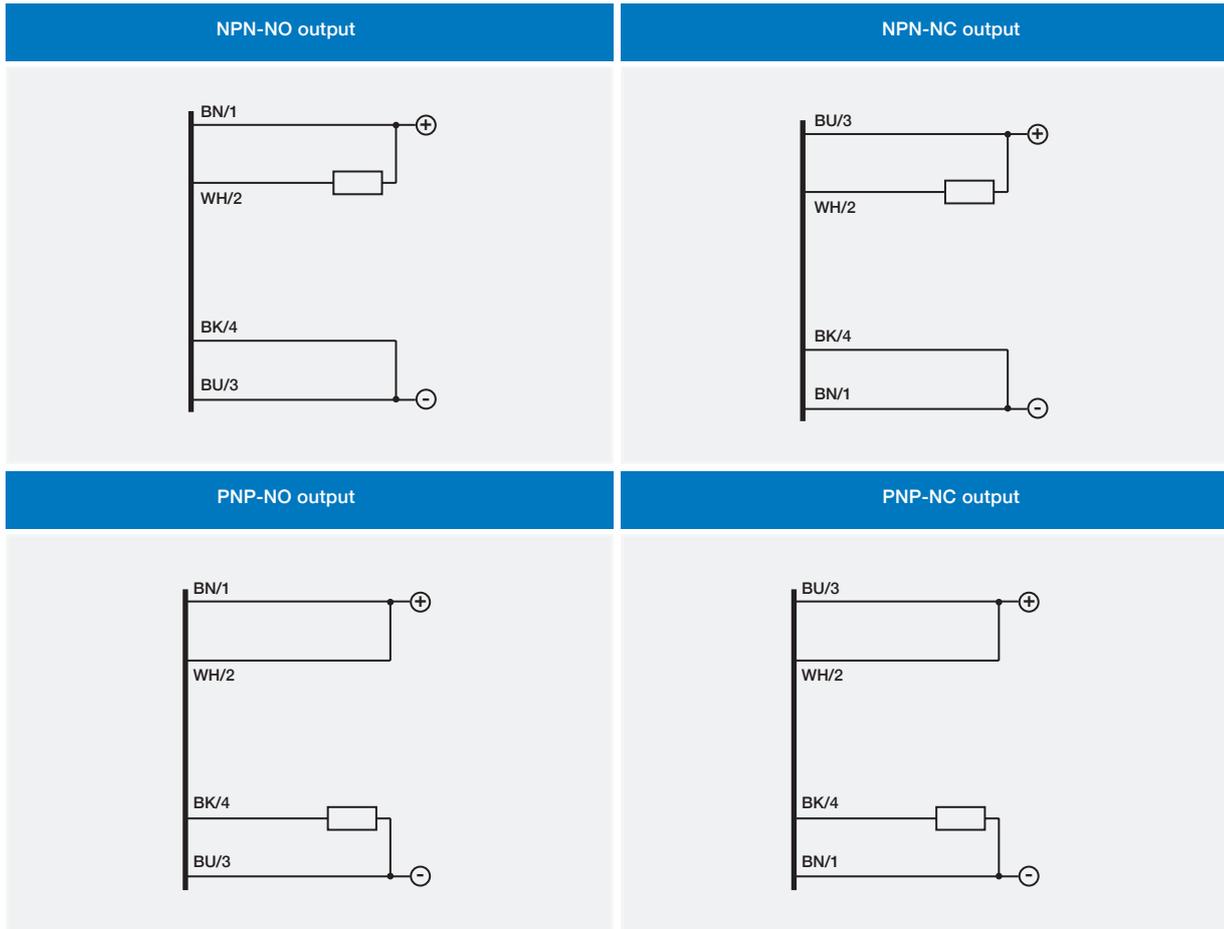
| | diffuse reflection | | | | retrorefl. | diffuse reflection | | | retrorefl. |
|-----------------------------|--|-----------------------|-----------------------|-------------------------|--------------------|-------------------------------------|-----------------------|-----------------------|--------------------|
| | BS2/00-0* | BS4/00-0* | BS6/00-0* | BS8/00-0* | BSC/00-0* | BV2/00-0* | BV4/00-0* | BV6/00-0* | BVC/00-0* |
| nominal sensing distance | 100 mm ⁽¹⁾ | 200 mm ⁽¹⁾ | 400 mm ⁽²⁾ | 1.600 mm ⁽²⁾ | 8 m ⁽³⁾ | 100 mm ⁽¹⁾ | 200 mm ⁽¹⁾ | 400 mm ⁽²⁾ | 8 m ⁽³⁾ |
| emission | infrared (880 nm) | | | | | | | | |
| tolerance | + 15 / - 5 % Sn | | | | | | | | |
| corsa differenziale | 5 % | | | | 10 % | 5 % | | | 10 % |
| repeatability | 5 % | | | | | | | | |
| operating voltage | 10...30 Vdc | | | | | 20...253 Vac / 50...60 Hz | | | |
| ripple | 10 % max | | | | | - | | | |
| no-load supply current | 25 mA | | | | | 1,5 W | | | |
| load current | 100 mA | | | | | 5 mA / 300 m ARMS | | | |
| inrush current | - | | | | | 6 A (ton = 10 ms) | | | |
| leakage current | ≤ 10 µA | | | | | 1,5 m ARMS max (supply V = 253 Vac) | | | |
| output voltage drop | 1,2 Vmax | | | | | 2,5 Vmax | | | |
| output type | DECOUT® (PNP, NPN, N0, NC selectable) | | | | | TRIAC (N0, NC selectable) | | | |
| switching frequency | 80 Hz | | | | | 25 Hz | | | |
| power on delay | 200 ms | | | | | | | | |
| temperature range | - 25°C...+ 70°C (without freeze) | | | | | | | | |
| power supply protections | transient | | | | | | | | |
| supply electrical output | short circuit (autoreset) | | | | | - | | | |
| temperature drift | ≥ 10 % Sr | | | | | | | | |
| protection degree | IP65 (EN60529) ⁽⁴⁾ | | | | | | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | | | | | | |
| external light interference | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | | | | | | | | |
| LEDs | red (output energized) | | | | | | | | |
| housing material | ABS polyetilene (cable exit) | | | | | | | | |
| optic material | PMMA | | | | | | | | |
| weight (approximate) | 185 g (50 g mounting bracket ST01) | | | | | | | | |

⁽¹⁾ With 100x100 mm white matt paper ⁽²⁾ With 200x200 mm white matt paper ⁽³⁾ With standard reflector Ø80 mm (RL110 supplied separately) ⁽⁴⁾ Protection guaranteed only with plug cable well mounted

BS - BV

electrical diagrams of the connections

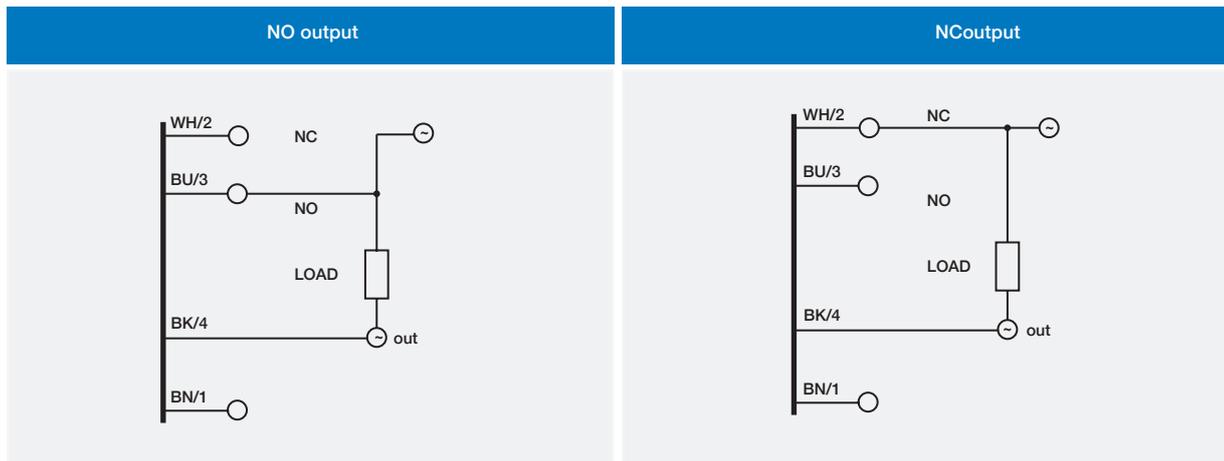
BS*/00-0* DECOU[®] exit ⁽¹⁾



BN brown
BU blue
BK black
WH white

electrical diagrams of the connections

BV*/00-0* T_{RIAC} exit ⁽²⁾



BN brown
BU blue
BK black
WH white

Notes:

⁽¹⁾ In case of combined load, resistive and capacitive, the maximum admissible capacity C = 0,2 µF, for maximum output voltage and current.

⁽²⁾ Through proper wiring for the connection cable BV models in AC permit one to select the output state.

Output state NO:

BLUE = power supply

WHITE = disconnected (isolate on a terminal)

Output state NC:

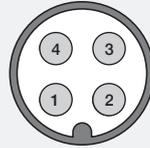
WHITE = power supply

BLUE = disconnected (isolate on a terminal)





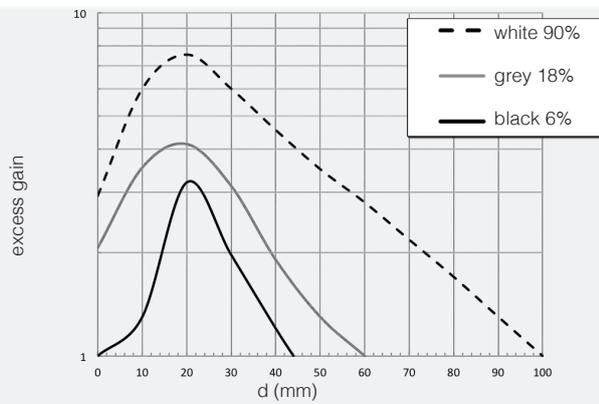
M12



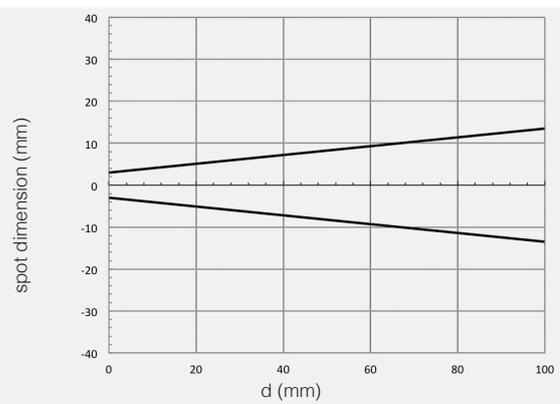
response diagrams

direct diffuse models

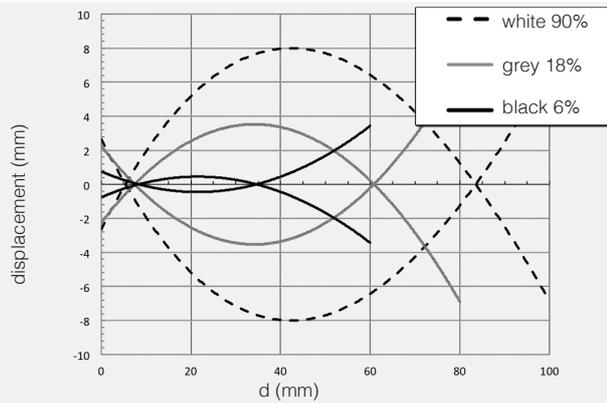
B*2/00-**-** excess gain



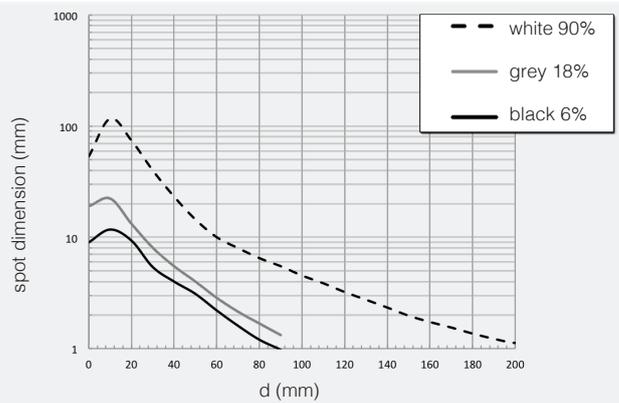
B*2/00-**-** spot dimension



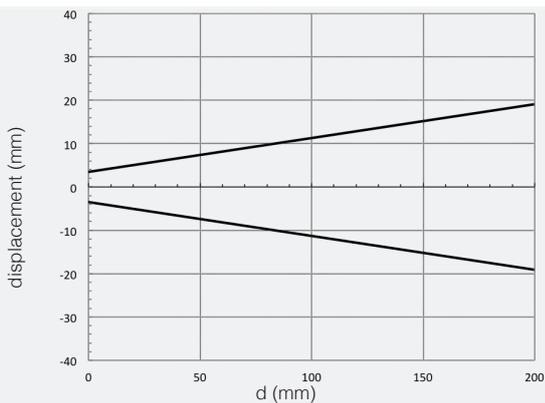
B*2/00-**-** parallel displacement



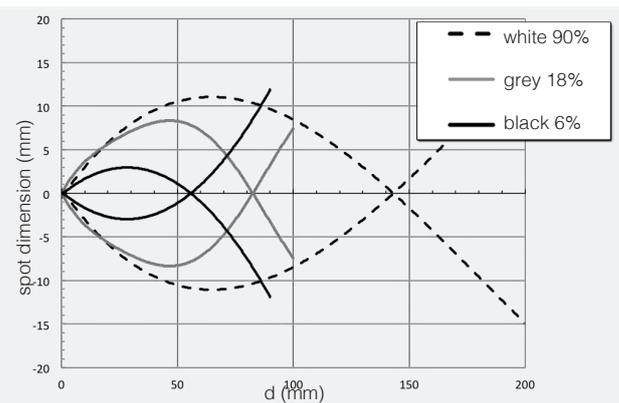
B*4/00-**-** spot dimension



B*4/00-**-** parallel displacement

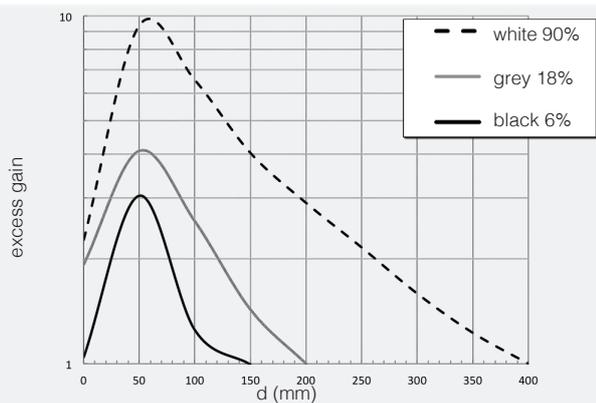


B*4/00-**-** spot dimension

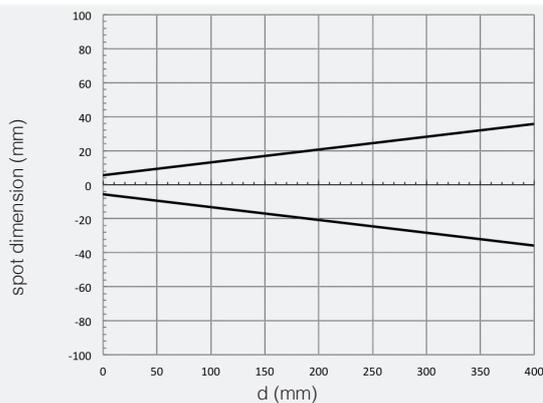




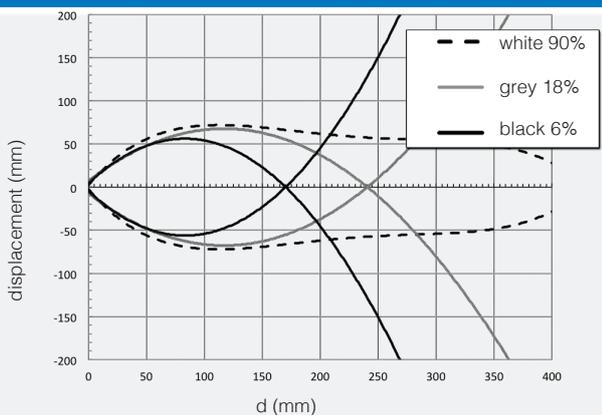
B*6/00-** excess gain



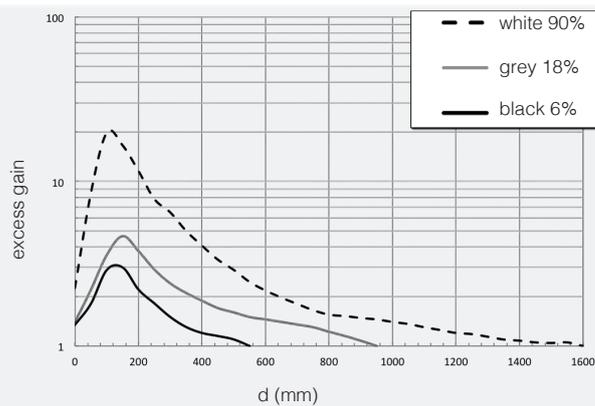
B*6/00-** spot dimension



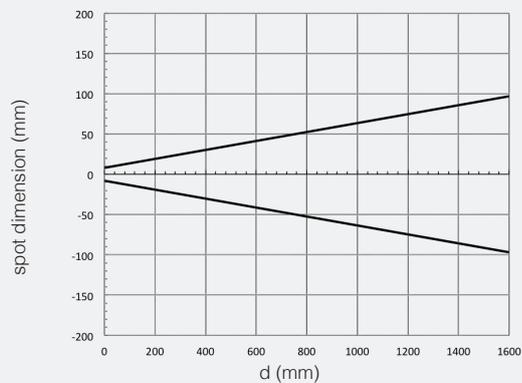
B*6/00-** parallel displacement



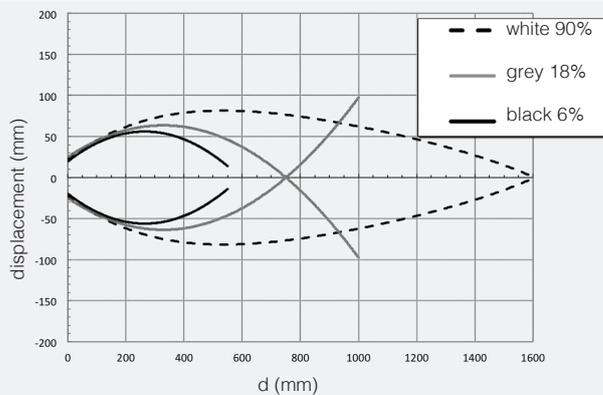
B*8/00-** excess gain



B*8/00-** spot dimension



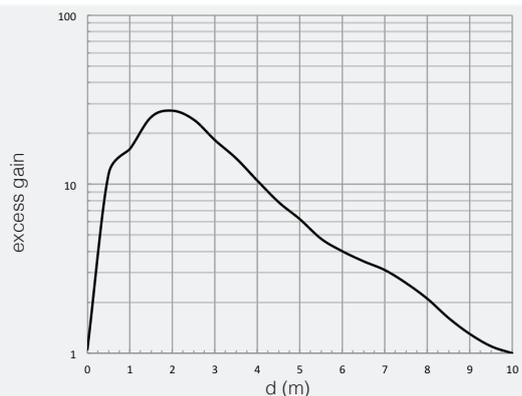
B*8/00-** parallel displacement



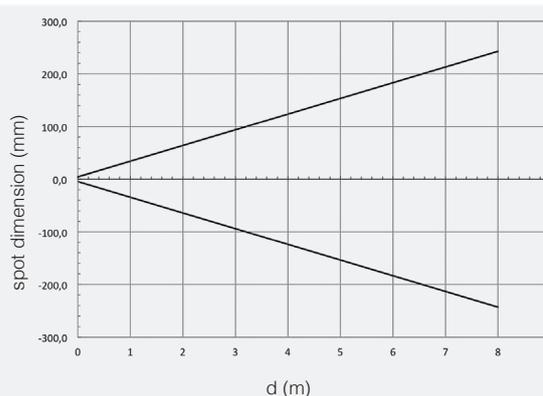
response diagrams

retro-reflective models (diagrams detected with RL110)

B*C/0*-** excess gain



B*C/0*-** spot dimension



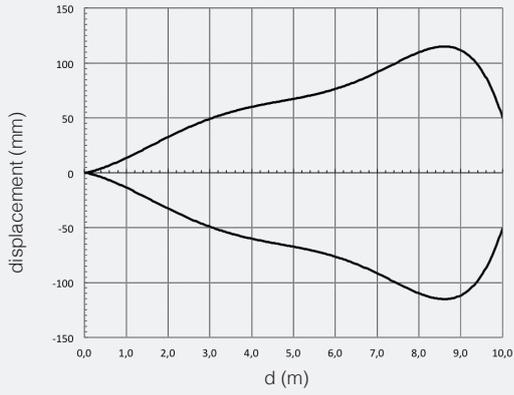


Cubic DECOUT®
DC or AC

response diagrams

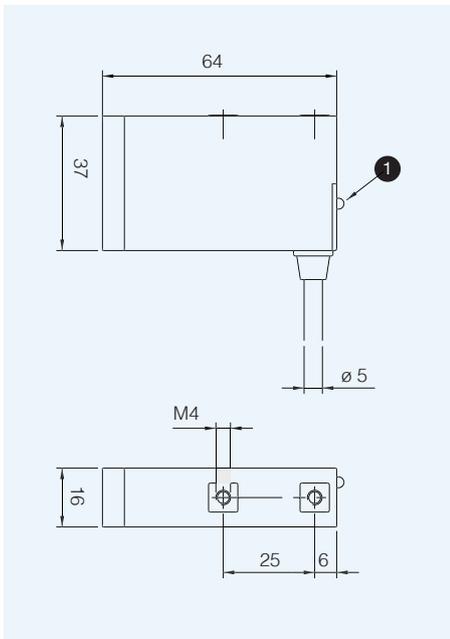
retro-reflective models

B*C/0*~** parallel displacement

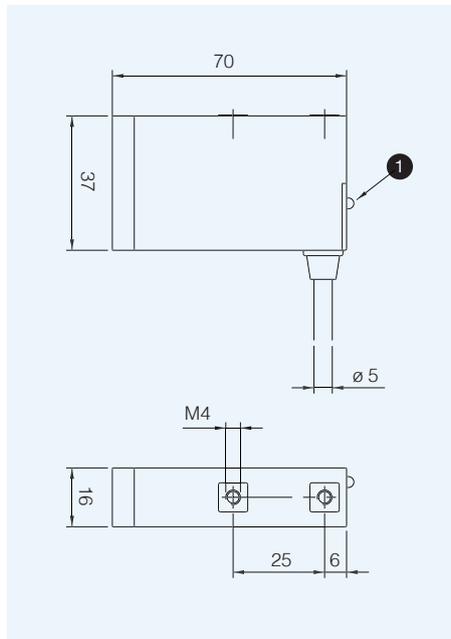


dimensions (mm)

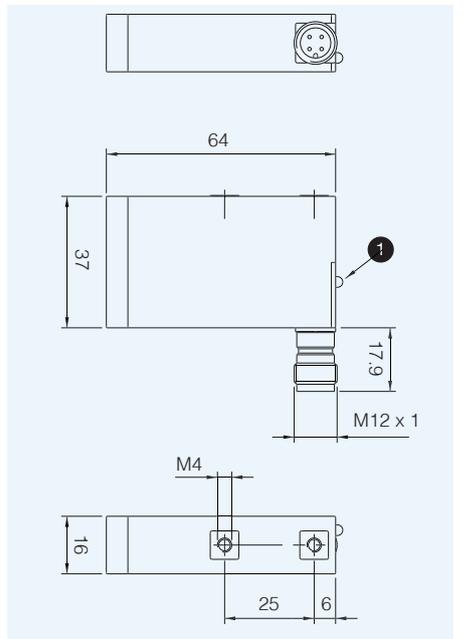
B*2/00-0C - B*4/00-0C - B*6/00-0C - B*8/00-0C



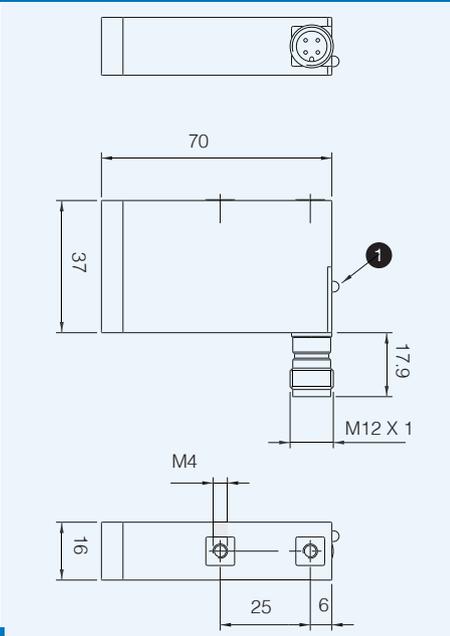
B*C/00-0C



B*2/00-0E-B*4/00-0E-B*6/00-0E-B*8/00-0E



B*C/00-0E



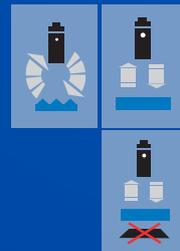
1 red LED (output state)

Plugs CD series - Accessories ST series



Q50 series

Compact cubic 50 x 50 mm
universal photoelectric sensor



Compact cubic
50 x 50 mm

features

- Universal photoelectric sensor, excellent performances and high versatility due to the wide choice of different versions available
- Cable output or revolving connector, NPN/PNP outputs for Vdc models or SPDT relay output for multi -voltage Vdc / Vac models
- Complementary outputs NO + NC available on the Vdc models or selectable output NO/NC available on the multi-voltage Vdc/Vac models
- Totally protected against electrical damages
- Wide choice of optical functions available: Diffuse: 2 m; background suppression: 500 mm; polarized: 6m; through beam: 20 m. Dual multifunction output state LEDs



web content



- Application notes
- Photos
- Catalogue / Manuals



code description

Q50 R N / B 0 - 0 E

| | | |
|-------------------|------------|--|
| series | Q50 | 50 X 50 mm cubic photoelectric sensor |
| emission | I | LED infrared emission |
| | R | LED red emission |
| type | 6 | Diffuse reflection 1 m |
| | 8 | Diffuse reflection 2 m |
| | S | Background Suppression |
| | N | Polarized |
| output | H | Emitter |
| | D | Receiver |
| | B | Complementary output NO + NC |
| emitter | 0 | Emitter NO/ NC selectable |
| | 0 | Emitter, NPN or PNP (Supply Voltage 10 ... 30 Vdc) |
| housing | T | Emitter, Relay SPDT (Supply Voltage 12... 240 Vdc; 24...240 Vac) |
| | 0 | Plastic housing |
| cable/plug output | 0 | Emitter, NPN or PNP (Supply Voltage 10 ... 30 Vdc) |
| | A | Cable 2 m |
| | E | Plug M12 4 pins |

available models

| function | distance | adjustment | DC models | | AC / DC models |
|------------------------|--------------|------------|-------------|---------------|----------------|
| | | | cable | M12 connector | cable |
| diffuse | 1 m | • | Q50I6/B0-0A | Q50I6/B0-0E | Q50I6/OT-0A |
| | 2 m | | Q50I8/B0-0A | Q50I8/B0-0E | Q50I8/OT-0A |
| background suppression | 120...500 mm | | Q50IS/B0-0A | Q50IS/B0-0E | - |
| polarized | 6 m | | Q50RN/B0-0A | Q50RN/B0-0E | Q50RN/OT-0A |
| emitter | 20 m | - | Q50IH/00-0A | Q50IH/00-0E | Q50IH/OT-0A |
| receiver | 20 m | • | Q50ID/B0-0A | Q50ID/B0-0E | Q50ID/OT-0A |



technical specification

direct diffuse models

Compact cubic
50 x 50 mm



| | Q5016/OT-** | Q5016/B0-** | Q5018/OT-** | Q5018/B0-** |
|---|--|---|--|---|
| nominal sensing distance ⁽¹⁾ | 0.1...2 m ⁽¹⁾ | | 0.3...2 m ⁽¹⁾ | |
| sensing range (Sd) | 0.2...2 m ⁽¹⁾ | | 0.5...2 m ⁽¹⁾ | |
| sensitivity adjustment | single-turn potentiometer | | | |
| emission | infrared LED | | | |
| spot dimension | 70 mm @ 500 mm | | 80 mm @ 1 m | |
| rotary switch | single-turn potentiometer | - | single-turn potentiometer | - |
| operating voltage | from 12 to 240 Vdc / from 24 to 240 Vac, 50 to 60 Hz | from 10 to 30 Vdc | from 12 to 240 Vdc / from 24 to 240 Vac, 50 to 60 Hz | from 10 to 30 Vdc |
| ripple | - | ≤ 10 % | - | ≤ 10 % |
| no-load supply current | ≤ 2.5 VA (relè ON) | ≤ 40 mA | ≤ 2.5 VA (relè ON) | ≤ 40 mA |
| load current | - | ≤ 200 mA | - | ≤ 200 mA |
| output voltage drop Ud | - | ≤ 2.5 Vdc @ 200 mA | - | ≤ 2.5 Vdc @ 200 mA |
| maximum load current | 3 A/30 Vdc 3 A/240 Vac | - | 3 A/30 Vdc 3 A/250 Vac | - |
| output type | relay SPDT electrically isolated | PNP or NPN | relay SPDT electrically isolated | PNP or NPN |
| switching frequency | 20 Hz | 500 Hz | 20 Hz | 500 Hz |
| power on delay | ≤ 30 ms | - | ≤ 30 ms | - |
| power supply protections | transients | polarity reversal, transient | transients | polarity reversal, transient |
| output electrical protection | - | short circuit (auto reset) over voltage pulses | - | short circuit (auto reset) over voltage pulses |
| operating temperature range | - 25°C...+ 60°C ⁽²⁾ | | | |
| external light interference | 5,000 lux | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | |
| housing material | body: PC/ABS; optic: PMMA | | | |
| weight (approximate) | 200 g | 105 g plug 200 g cable | 200 g | 105 g plug 200 g cable |

⁽¹⁾ White target 90% 200*200 mm ⁽²⁾ UL omologation: 0...+60 °C ⁽³⁾ Protection guaranteed only with plug cable well mounted



| | Q50IS/0B-** |
|--|--|
| | background suppression |
| | |
| distanza di lavoro nominale ⁽¹⁾ | 120...500 mm ⁽¹⁾ |
| minimum sensing distance | 120 mm |
| sensibility adjustment | single-turn potentiometer |
| emission | infrared LED |
| spot dimension | 30 mm @ 500 mm |
| rotary switch | - |
| operating voltage | 10...30 Vdc (ripple included) |
| ripple | ≤ 10 % |
| no-load supply current | ≤ 40 mA |
| load current | ≤ 200 mA |
| output voltage drop | ≤ 2.5 Vdc @ 200 mA |
| maximum load current | - |
| output type | PNP or NPN |
| switching frequency | 500 Hz |
| power on delay | ≤ 2 ms |
| power supply protections | polarity reversal, over voltage pulses |
| output electrical protection | short circuit (auto reset), over voltage pulses |
| operating temperature range | - 25°C...+ 60°C ⁽²⁾ |
| external light interference | 10,000 lux |
| protection degree | IP67 (EN60529) ⁽³⁾ |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 |
| housing material | body: PC/ABS; optic: PMMA |
| weight (approx) | 105 g plug / 200 g cable |

⁽¹⁾ White target 90% 200*200 mm ⁽²⁾ UL omologation: 0...+60 °C ⁽³⁾ Protection guaranteed only with plug cable well mounted



technical specification

polarized models

Compact cubic
50 x 50 mm

| | Q50RN/OT-** | Q50RN/B0-** |
|------------------------------|--|------------------------------|
| |  | |
| nominal sensing distance Sn | 0.2...6 m ⁽¹⁾ | |
| minimum sensing distance | 200 mm | |
| sensibility adjustment | single-turn potentiometer | |
| emission | red visible LED light | |
| spot dimension | 280 mm @ 3 m | |
| rotary switch | single-turn potentiometer | - |
| operating voltage | from 12 to 240 Vdc/ from 24 to 240 Vac, 50 a 60 Hz | from 10 to 30 Vdc |
| ripple | - | ≤ 10 % |
| no-load supply current | ≤ 2.5 VA (relay ON) | ≤ 40 mA |
| load current | - | ≤ 200 mA |
| output voltage drop | - | ≤ 2.5 VDC @ 200 mA |
| maximum load current | 3 A/30 Vdc 3 A/250 Vac | - |
| output type | relay SPDT electrically isolated | PNP or NPN |
| switching frequency | 20 Hz | 500 Hz |
| power on delay | - | ≤ 1 ms |
| power supply protections | transients | reverse polarity, transients |
| output electrical protection | - | overvoltage, short-circuit |
| operating temperature range | - 25°C...+ 60°C ⁽²⁾ | |
| external light interference | 5,000 lux | |
| protection degree | IP67 (EN60529) ⁽³⁾ | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | |
| housing material | body: PC/ABS; optic: PMMA | |
| weight (approx) | 200 g | 200 g cable 105 g plug |

⁽¹⁾ With RL 110 reflector ⁽²⁾ UL omologation: 0...+60 °C ⁽³⁾ Protection guaranteed only with plug cable well mounted

| | emitter | | receiver | |
|------------------------------|--|---|------------------------------|---|
| | Q50IH/00-** | Q50IH/0T-** | Q50ID/B0-** | Q50ID/0T-** |
| |  | | | |
| nominal sensing distance Sn | 20 mm ⁽¹⁾ | | 20 m ⁽¹⁾ | |
| minimum sensing distance | - | | - | |
| sensibility adjustment | - | | single-turn potentiometer | |
| emission | infrared LED | | - | |
| spot dimension | 880 mm @ 10 m | | - | |
| rotary switch | - | | - | single-turn potentiometer |
| operating voltage | 10...30 Vdc (ripple included) | 12 to 240 Vdc / 24 to 240 Vac, 50 to 60 Hz | da 10 a 30 Vdc | 12 to 240 Vdc / 24 to 240 Vac, 50 to 60 Hz |
| ripple | ≤ 10 % | - | ≤ 10 % | - |
| no-load supply current | ≤ 50 mA | ≤ 2.5 VA (relay ON) | ≤ 40 mA | ≤ 2.5 VA (relay ON) |
| load current | - | | ≤ 200 mA | - |
| output voltage drop | - | | ≤ 2.5 Vdc @ 200 mA | - |
| maximum load current | - | | - | 3 A/30 Vdc 3 A/250 Vac |
| output type | - | | PNP or NPN | relay SPDT electrically isolated |
| switching frequency | - | | 500 Hz | 20 Hz |
| power on delay | - | | ≤ 1 ms | - |
| power supply protections | reverse polarity, transients | transients | reverse polarity, transients | transients |
| output electrical protection | - | | overvoltage, short-circuit | - |
| operating temperature range | - 20°C...+ 60°C ⁽²⁾ | | | |
| external light interference | - | | 10.000 lux | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | |
| EMC | in conformity with the EMC Directive according to EN 60947-5-2 | | | |
| housing material | body: PC/ABS; optic: PMMA | | | |
| weight (approx) | 200 g cable 105 g plug | 200 g | 200 g cable 105 g plug | 200 g |

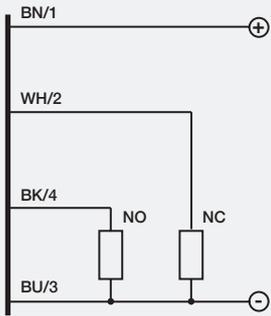
⁽¹⁾ White target 90% 200*200 mm ⁽²⁾ UL omologation: 0...+60 °C ⁽³⁾ Protection guaranteed only with plug cable well mounted



electrical diagrams of the connections

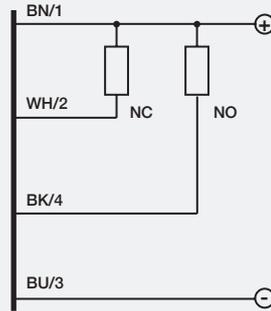
Compact cubic
50 x 50 mm

background suppression, polarized retroreflection and receiver with PNP output

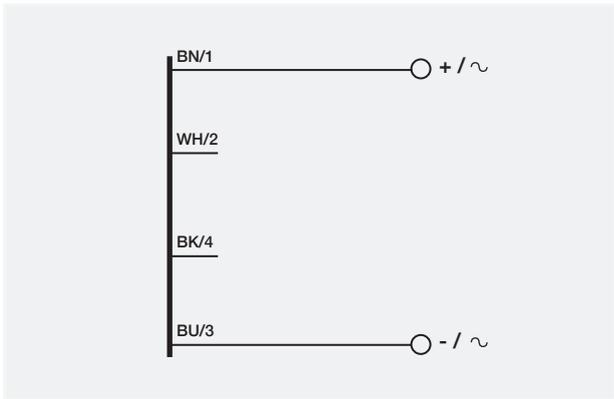
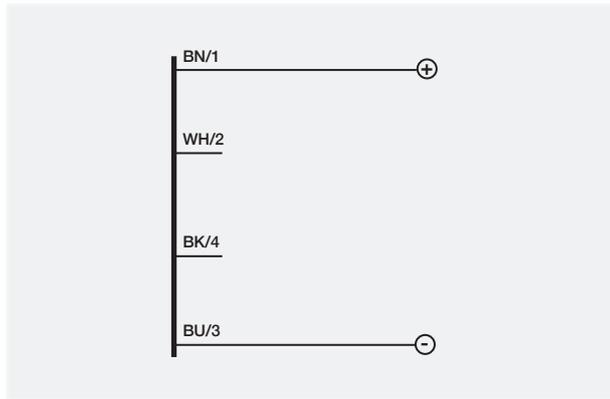


DC emitter

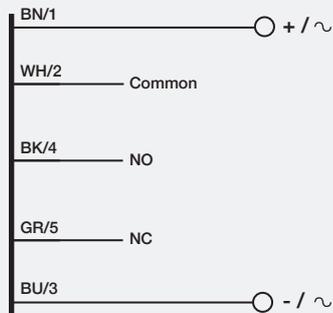
background suppression, polarized retroreflection and receiver with NPN output



AC/DC emitter



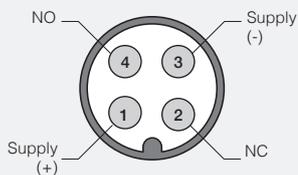
polarized retroreflection and receiver



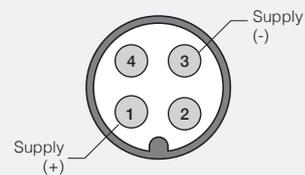
- BN** brown
- BU** blue
- BK** black
- WH** white

plug

M8



M12

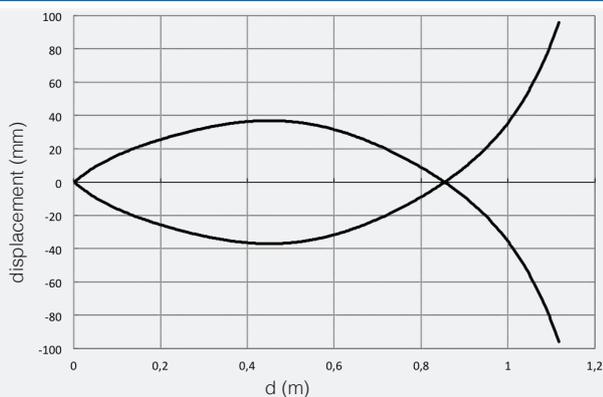


Q50

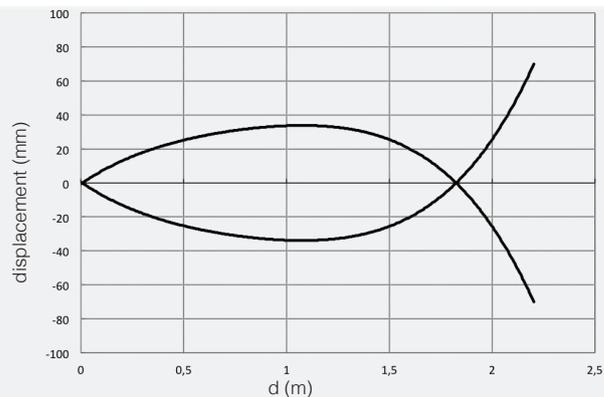
response diagrams

direct reflection models

Q5016/**-** parallel displacement



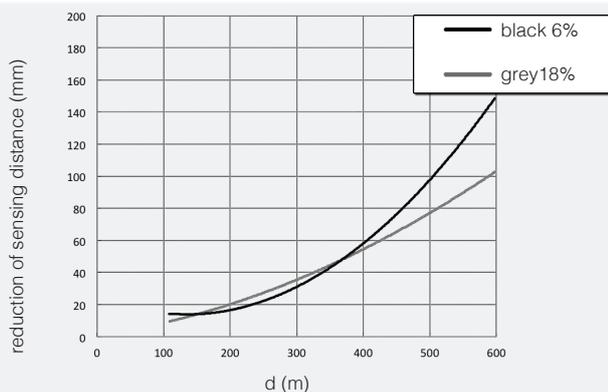
Q5018/**-** parallel displacement



response diagrams

background suppression models

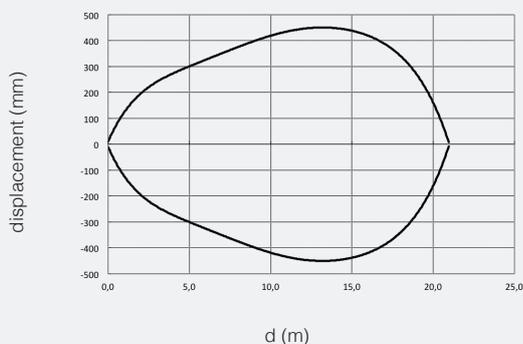
Q501S/**-** reduction of sensing distance



response diagrams

through-beam models

Q501H/**-** & Q501D/**-** Parallel displacement



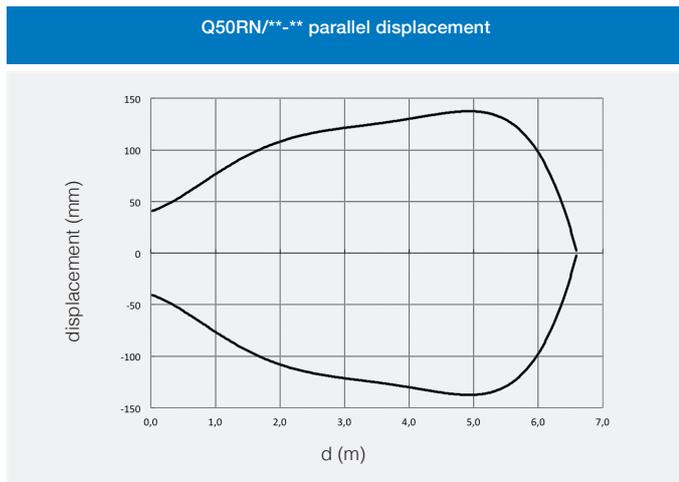
Compact cubic
50 x 50 mm



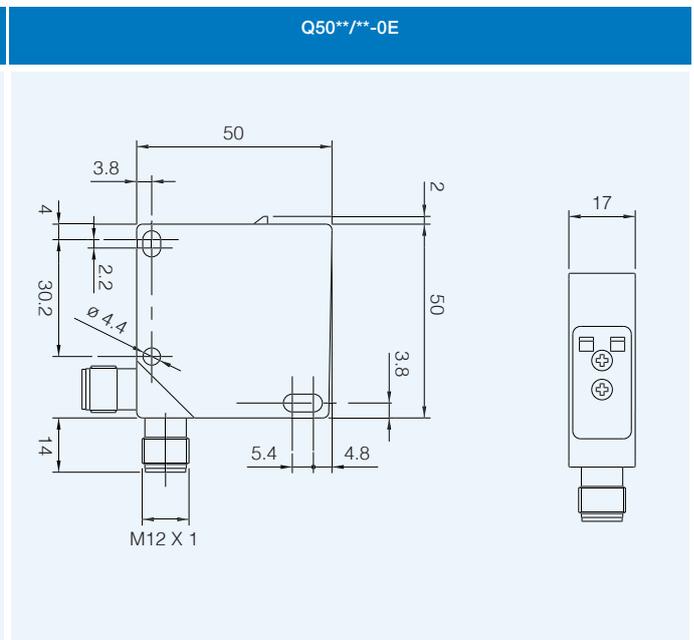
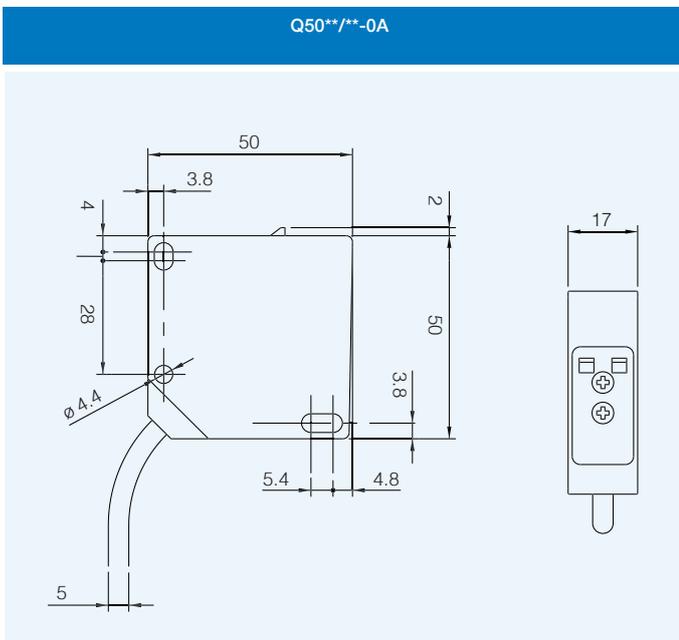
response diagrams

polarized models

Compact cubic
50 x 50 mm

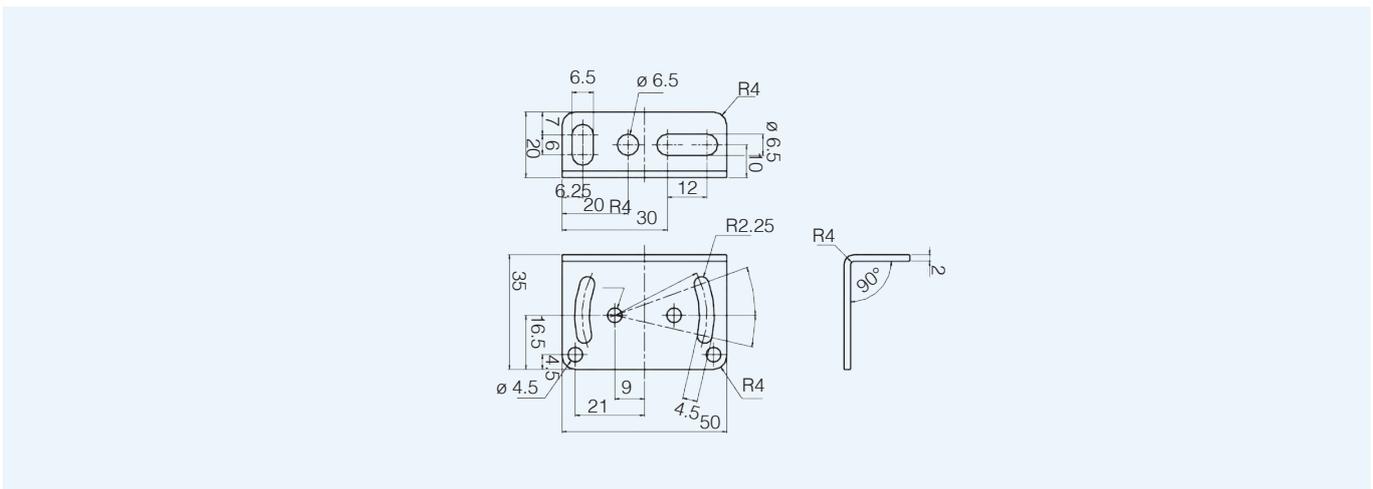


dimensions (mm)



dimensions (mm)

accessories included in all models



Q50



FG series

Compact photoelectric switch sensors with high performances and high detection distances



features

- Cable output or with revolving connector, NPN or PNP output (DC models) and SPDT voltage free relay output (AC models)
- Selectable LO/DO output status
- Totally protected against electrical damages
- Background suppressions models: 310 mm, 600 mm
- Reflex polarized sensitivity adjustment 12 m
- Emitter and Receiver with max detecting range of 50 m
- Double Multifunction LED indicator: output state and using the pointing
- Sensitive adjustment models



web content



- Application notes
- Photos
- Catalogue / Manuals



Cubic
DC - AC compact

code description

FG R W / O P - O A

| | | |
|---------------------|-----------|---|
| series | FG | Compact cubit photoelectric switch |
| emission | R | Visible red emission LED |
| | W | Adjut. dist. background suppression 600 mm |
| type | S | Adjut. dist background suppression 310 mm |
| | N | Reflex polarized sensitivity adjustment 12 m |
| | H | Emitter 50 m |
| | D | Receiver with sensitivity adjustment 50 m |
| supply voltage | HD | Emitter + Receiver with sensitiviity adjustment |
| | 0 | Supply voltage 10...30 Vdc |
| | D | Supply voltage 24...240 Vdc / 24...240 Vac |
| logic output | P | PNP logic output |
| | N | NPN logic output |
| | 0 | Emitter |
| | T | SPDT voltage free relay output |
| cable / plug output | 0 | Plastic housing |
| | A | Cable exit 2 m |
| | E | M12 plug cable exit |

available models

| model | distance | adjustment | cable | | plug M12 | | models AC |
|------------------------|----------|------------|-------------|-------------|-------------|-------------|-------------|
| | | | NPN | PNP | NPN | PNP | |
| background suppression | 310 mm | ● | FGRS/0N-0A | FGRS/0P-0A | FGRS/0N-0E | FGRS/0P-0E | FGRS/DT-0A |
| | 600 mm | | FGRW/0N-0A | FGRW/0P-0A | FGRW/0N-0E | FGRW/0P-0E | FGRW/DT-0A |
| polarized | 12 m | | FGRN/0N-0A | FGRN/0P-0A | FGRN/0N-0E | FGRN/0P-0E | FGRN/DT-0A |
| emitter + receiver | 50 m | | FGRHD/0N-0A | FGRHD/0P-0A | FGRHD/0N-0E | FGRHD/0P-0E | FGRHD/DT-0A |

technical specification

reflex polarized models ⁽¹⁾

| | FGRN/0*-0* | FGRN/DT-0A |
|------------------------------|---|---|
| |  | |
| nominal sensing distance | 12 m | |
| blind zone mm | 0.01 m | |
| scanning distance adjusting | potentiometer 2 turns with position indicator | |
| emission | red visible LED light | |
| spot diameter | approx. 260 mm @ 8 m | |
| rotary switch | control wire | light on |
| supply voltage | 10...30 Vcc (limit value) | 24...240 Vac ⁽²⁾ / 24...240 Vcc |
| ripple | 5 Vpp | - |
| no-load supply current | 35 mA | ≤ 2 VA |
| load current (maximum) | 100 mA | - |
| output voltage drop | 1,8 V max @100 mA | - |
| maximum switching current | - | 3 A...240 Vac ⁽²⁾ 3 A...30 Vcc ⁽²⁾ |
| output type | PNP o NPN open collector | relay SPDT electrically isolated |
| switching frequency | 1.000 Hz max | 33 Hz max |
| response time | 0,15 ms | 15 ms |
| operation temperature range | - 25°C...+ 55°C | |
| power supply protections | overvoltage pulses and polarity reversal | |
| output electrical protection | short circuit, overcurrent, overvoltage | - |
| protection degree | IP67 (EN60529) ⁽³⁾ | |
| ambient light immunity | 3,000 lux (incandescent lamp), 10,000 lux (sunlight) | |
| housing material | PBT corpo; PMMA ottica | |
| cable PVC 2 m | 4 x 0.18 mm ² ø 3.8 mm | 5 x 0.76 mm ² ø 6.3 mm |
| weight (approximate) | 150 g cable 40 g plug | 160 g |

⁽¹⁾ With RL 123 included reflector ⁽²⁾ Ensure spark extinguishing for inductive or capacitive load ⁽³⁾ Protection guaranteed only with plug cable well mounted

technical specification

background suppression



Cubic
DC - AC compact

| | FGRS/0*-0* | FGRW/0*-0* | FGRS/DT-0A | FGRW/DT-0A |
|------------------------------|--|-----------------------------|---|-----------------------------|
| | | | | |
| nominal sensing distance | 90...310 mm ⁽²⁾ | 110...600 mm ⁽²⁾ | 90...310 mm ⁽²⁾ | 110...600 mm ⁽²⁾ |
| blind zone mm | 5...15 mm | 10...35 mm | 5 ÷ 15 mm | 10 ÷ 35 mm |
| scanning distance adjusting | potentiometer 2 turns with position indicator | | | |
| emission | red visible LED light | | | |
| spot diameter | 30 mm @ 300 mm | 30 mm @ 500 mm | 30 mm @ 300 mm | 30 mm @ 500 mm |
| rotary switch | control wire | | light on | |
| supply voltage | 10...30 Vcc (limit value) | | 24...240 Vac ⁽²⁾ / 24...240 Vcc | |
| ripple | 5 Vpp | | - | |
| no-load supply current | 35 mA | | ≤ 2 VA | |
| load current (maximum) | 100 mA | | - | |
| output voltage drop | 1.8 V max @100 mA | | - | |
| maximum switching current | - | | 3 A...240 Vac ⁽²⁾ 3 A...30 Vcc ⁽²⁾ | |
| output type | PNP or NPN open collector | | relay SPDT electrically isolated | |
| switching frequency | 160 Hz max | | 33 Hz massima | |
| response time | 2 ms | | 15 ms | |
| output electrical protection | overvoltage pulses and polarity reversal | | | |
| power supply protections | short circuit, overcurrent, overvoltage | | - | |
| operation temperature range | - 25 ...+ 55° C | | | |
| ambient light immunity | 10,000 Lux minimum sunlight 3,000 Lux min HF lamp | | | |
| protection degree | IP67 (EN60529) ⁽³⁾ | | | |
| housing material | Housing: ABS; optic: PMMA | | | |
| cable PVC 2 m | 4 x 0.18 mm ² ø 3.8 mm | | 5 x 0.76 mm ² ø 6.3 mm | |
| weight (approximate) | 150 g cable 40 g plug | | 160 g | |

⁽¹⁾ White target 90% 100x100 mm ⁽²⁾ Ensure spark extinguishing for inductive or capacitive load ⁽³⁾ Protection guaranteed only with plug cable well mounted



technical specification

through-beam models

Cubic
DC - AC compact

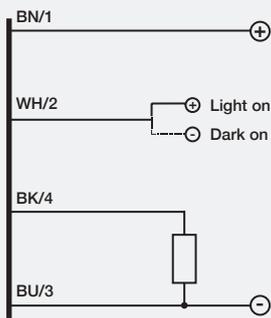
| | FGRHD/0*-0* | | FGRHD/DT-0A | |
|------------------------------|--|--|---|--------------------------------------|
| | FGRH/0*-0* (emitter) | FGRD/0*-0* (receiver) | FGRH/D0-0A (emitter) | FGRD/DT-0A (receiver) |
| | | | | |
| nominal sensing distance | 50 m | | | |
| scanning distance adjusting | potentiometer 2 turns with position indicator | | | |
| emission | red LED light | - | red LED light | - |
| spot diameter | 600 mm @ 20 m | - | 600 mm @ 20 m | - |
| rotary switch | - | control wire | - | light on |
| supply voltage | 10...30 Vcc (limit value) | | 24...240 Vac ⁽²⁾ / 24...240 Vcc | |
| ripple | 5 Vpp | | - | |
| no-load supply current | ≤ 35 mA | ≤ 20 mA | ≤ 20 mA | ≤ 2 mA |
| load current (maximum) | - | 100 mA | - | - |
| output voltage drop | - | 1.8 V max @100 mA | - | |
| maximum switching current | - | | 3 A...240 Vac ⁽¹⁾ 3 A...30 Vcc ⁽¹⁾ | |
| output type | - | PNP or NPN open collector | - | relay SPDT electrically isolated |
| switching frequency | - | 1,000 Hz max | - | 33 Hz max |
| response time | - | 0.5 ms | - | ≤ 15 ms |
| output electrical protection | overvoltage pulses and polarity reversal | | | |
| power supply protections | - | short circuit, overcurrent, overvoltage | - | |
| operation temperature range | - 25 ...+ 55° C | | | |
| ambient light immunity | 10,000 Lux minimum sunlight 3,000 Lux min HF lamp | | | |
| protection degree | IP67 (EN60529) ⁽²⁾ | | | |
| housing material | Housing: ABS; optic: PMMA | | | |
| cable PVC 2 m | 2 x 0.18 mm ² ø 3.8 mm | 4 x 0.18 mm ² ø 3.8 mm | 2 x 0.76 mm ² ø 6.3 mm | 5 x 0.76 mm ² ø 6.3 mm |
| weight (approximate) | 80 g plug 300 g cable 2m | | 310 g | |

⁽¹⁾ Ensure spark extinguishing for inductive or capacitive load ⁽²⁾ Protection guaranteed only with plug cable well mounted

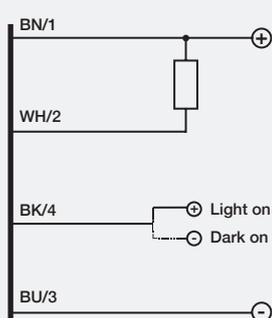
electrical diagrams of the connections



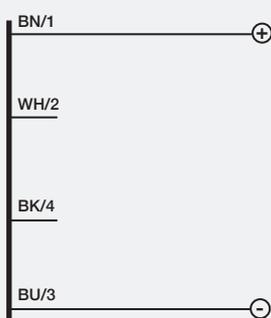
background suppression, polarized, receiver PNP output



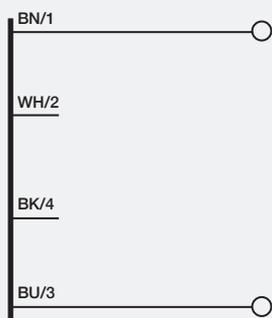
background suppression, polarized, receiver NPN output



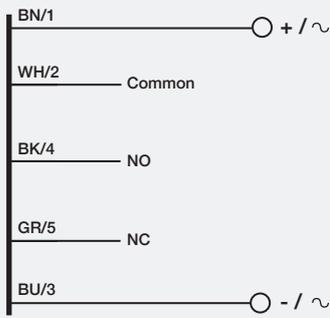
emitter DC



emitter AC/DC



background suppression, reflex with polarizing filter and receiver with relay output

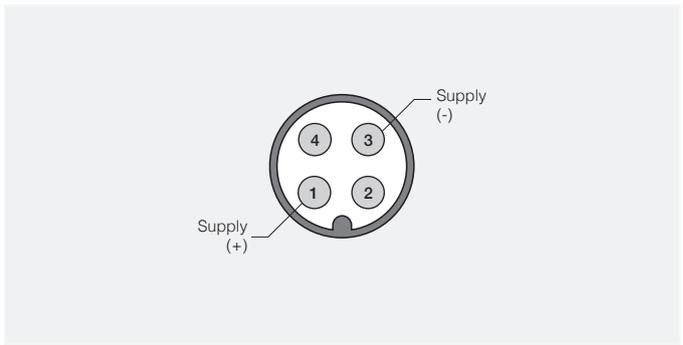
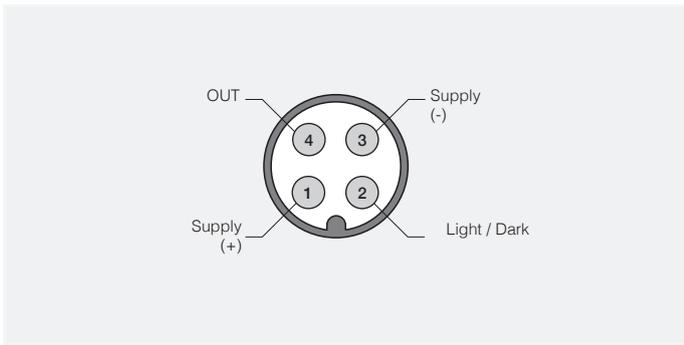


- BN** brown
- BU** blue
- BK** black
- WH** white
- PK** pink
- GY** gray



M12 background suppression, polarized, receiver

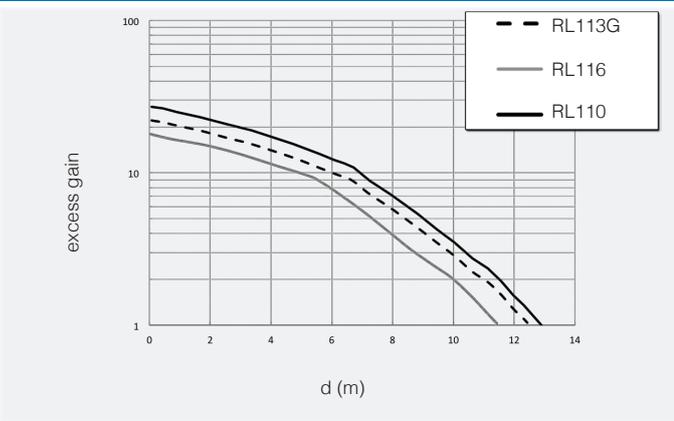
M12 emitter



response diagrams

polarized models

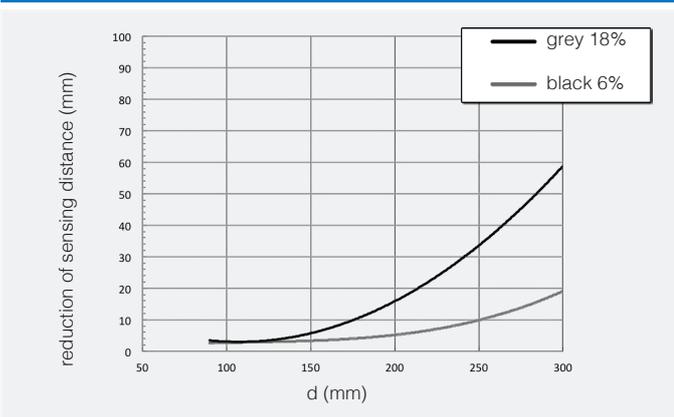
FGRN/**-** excess gain



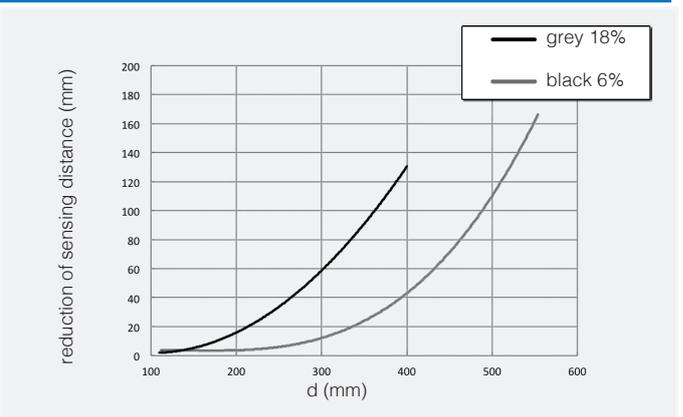
response diagrams

background suppression models

FGRS/**-** reduction of sensing distance

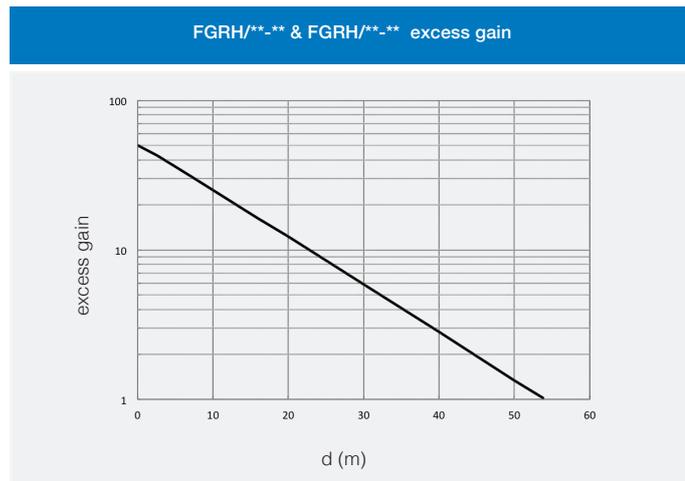


FGRW/**-** reduction of sensing distance

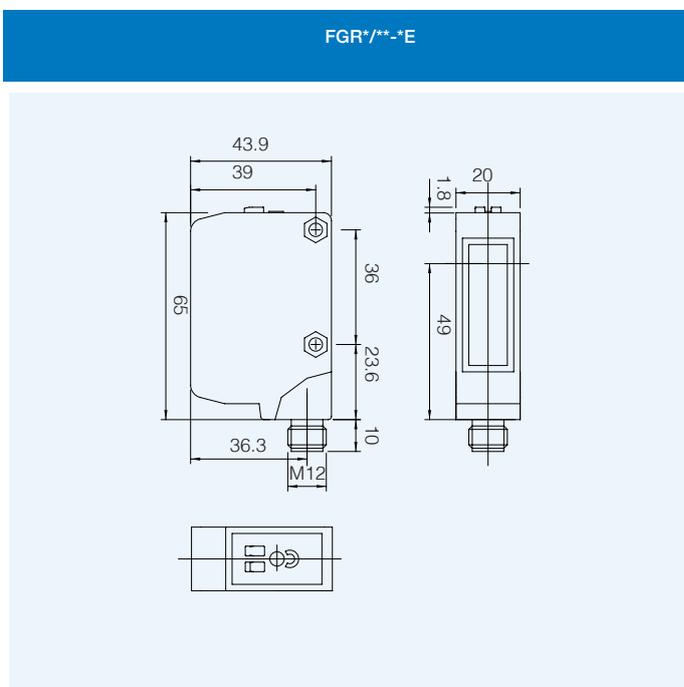
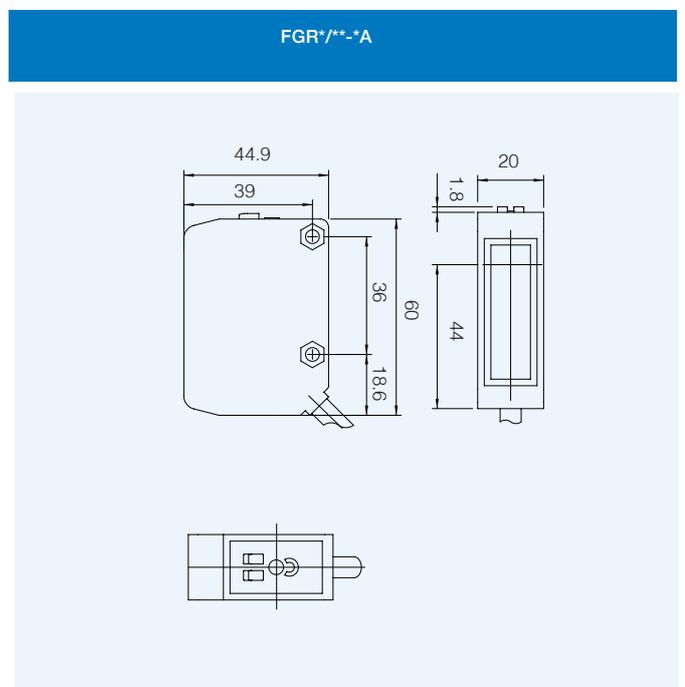


response diagrams

through-beam models

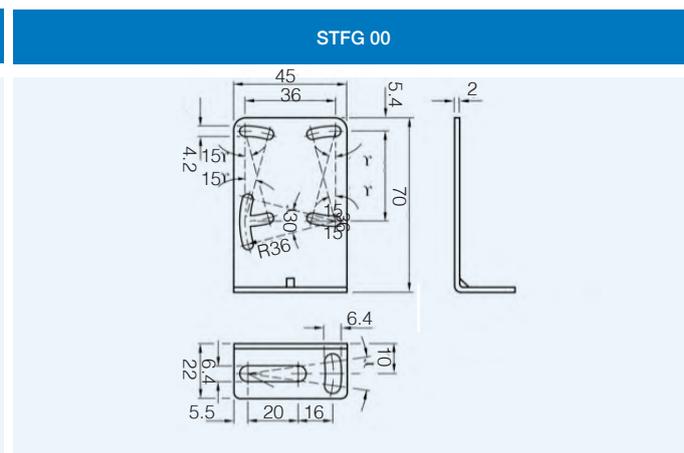
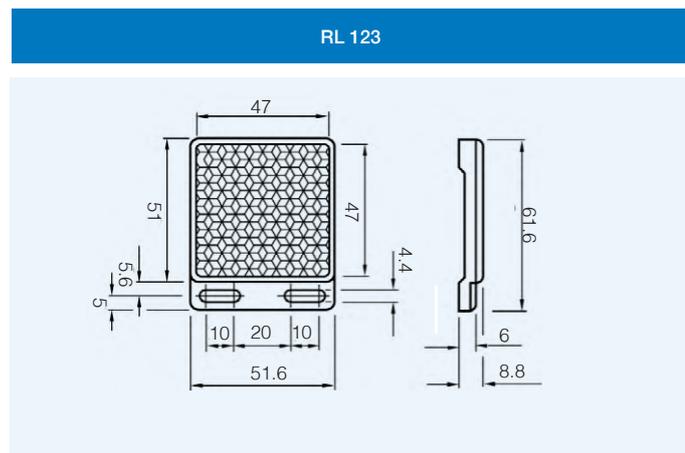


dimensions (mm)



dimensions (mm)

accessories included



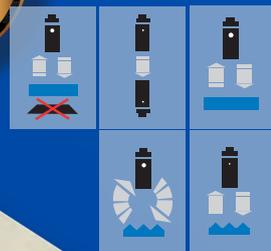


Area containing multiple horizontal light blue lines for taking notes.



RX series

Maxi with static output DC
or with relay output AC/DC



features

- Models: diffuse reflection, retro-reflective, polarized, through-beam and background suppression
- Series with high performances and wide possibilities of installation
- High sensing distance and very small dimensions
- Relay output or multifunctional DECOUT®
- Timer function delay on, delay off, one shot; trimmer for sensitivity adjustment
- Switch reducing the emission for fine detection in through-beam types
- LED alignment indicator with 360° visibility, 2 LED indicators (stable signal, output)
- M12 standard plug cable exit; axial and right angle brackets

web content



- Application notes
- Photos
- Catalogue / Manuals



Maxi with static output DC
or with relay output AC/DC

code description

RX 6 / 00 - 1 A

| | | |
|----------------|-----------|---|
| series | RX | Rectangular photoelectric sensor |
| type | 6 | 1000 mm diffuse reflection |
| | 8 | 2000 mm diffuse reflection |
| | C | 12 m retro-reflective |
| | P | 8 m polarized retro-reflective |
| | S | Background suppression 0,05 - 0,3 m |
| | L | Background suppression 0,25 - 1 m |
| | E | Emitter 20-60 Vdc / 20-253 Vac |
| timer function | R | Receiver |
| | 0 | Without timer function |
| output | T | With timer function |
| | 1 | DECOUT® output / 10-30Vdc |
| fixing slide | 3 | Relay output / 20-60Vdc - 20-253Vac |
| | A | Without fixing slide |
| version | B | With fixing slide |
| | 37 | Standard version |
| | | RX8 model with sensing distance up to 4,5 m |



available models

models without fixing slide

| function | distance (m) | 10...30 Vdc DECOUT® | | 20...60 Vdc / 20...253 Vac | relay |
|------------------------|--------------|---------------------|----------------|----------------------------|----------------|
| | | no timer function | timer function | no timer function | timer function |
| background suppression | 0,05...0,3 | RXS/00-1A | RXS/0T-1A | RXS/00-3A | RXS/0T-3A |
| | 0,25...1 | RXL/00-1A | RXL/0T-1A | RXL/00-3A | RXL/0T-3A |
| diffuse reflection | 1 | RX6/00-1A | RX6/0T-1A | RX6/00-3A | RX6/0T-3A |
| | 2 | RX8/00-1A | RX8/0T-1A | RX8/00-3A | RX8/0T-3A |
| | 4,5 | RX8/00-1A37 | RX8/0T-1A37 | RX8/00-3A37 | RX8/0T-3A37 |
| retroreflective | 12 | RXC/00-1A | RXC/0T-1A | RXC/00-3A | RXC/0T-3A |
| polarized | 6 | RXP/00-1A | RXP/0T-1A | RXP/00-3A | RXP/0T-3A |
| emitter | - | - | - | RXE/00-3A | - |
| emitter with check | - | - | - | - | - |
| receiver | 16...32 | - | - | RXR/00-3A | RXR/0T-3A |

available models

models with fixing slide

| function | distance (m) | 10...30 Vdc DECOUT® | | 20...60 Vdc / 20...253 Vac | relay |
|------------------------|--------------|---------------------|----------------|----------------------------|----------------|
| | | no timer function | timer function | no timer function | timer function |
| background suppression | 0,05...0,3 | RXS/00-1B | RXS/0T-1B | RXS/00-3B | RXS/0T-3B |
| | 0,25...1 | RXL/00-1B | RXL/0T-1B | RXL/00-3B | RXL/0T-3B |
| diffuse reflection | 1 | RX6/00-1B | RX6/0T-1B | RX6/00-3B | RX6/0T-3A |
| | 2 | RX8/00-1B | RX8/0T-1B | RX8/00-3B | RX8/0T-3B |
| | 4,5 | RX8/00-1B37 | RX8/0T-1B37 | RX8/00-3B37 | RX8/0T-3B37 |
| retroreflective | 12 | RXC/00-1B | RXC/0T-1B | RXC/00-3B | RXC/0T-3B |
| polarized | 6 | RXP/00-1B | RXP/0T-1B | RXP/00-3B | RXP/0T-3B |
| emitter | - | - | - | RXE/00-3B | - |
| emitter with check | - | - | - | - | - |
| receiver | 16...32 | - | - | RXR/00-3B | RXR/0T-3B |

Maxi with static output DC
or with relay output AC/DC

technical specification

direct diffuse, retro-reflective, background suppression models and through-beam



Maxi with static output DC or with relay output AC/DC

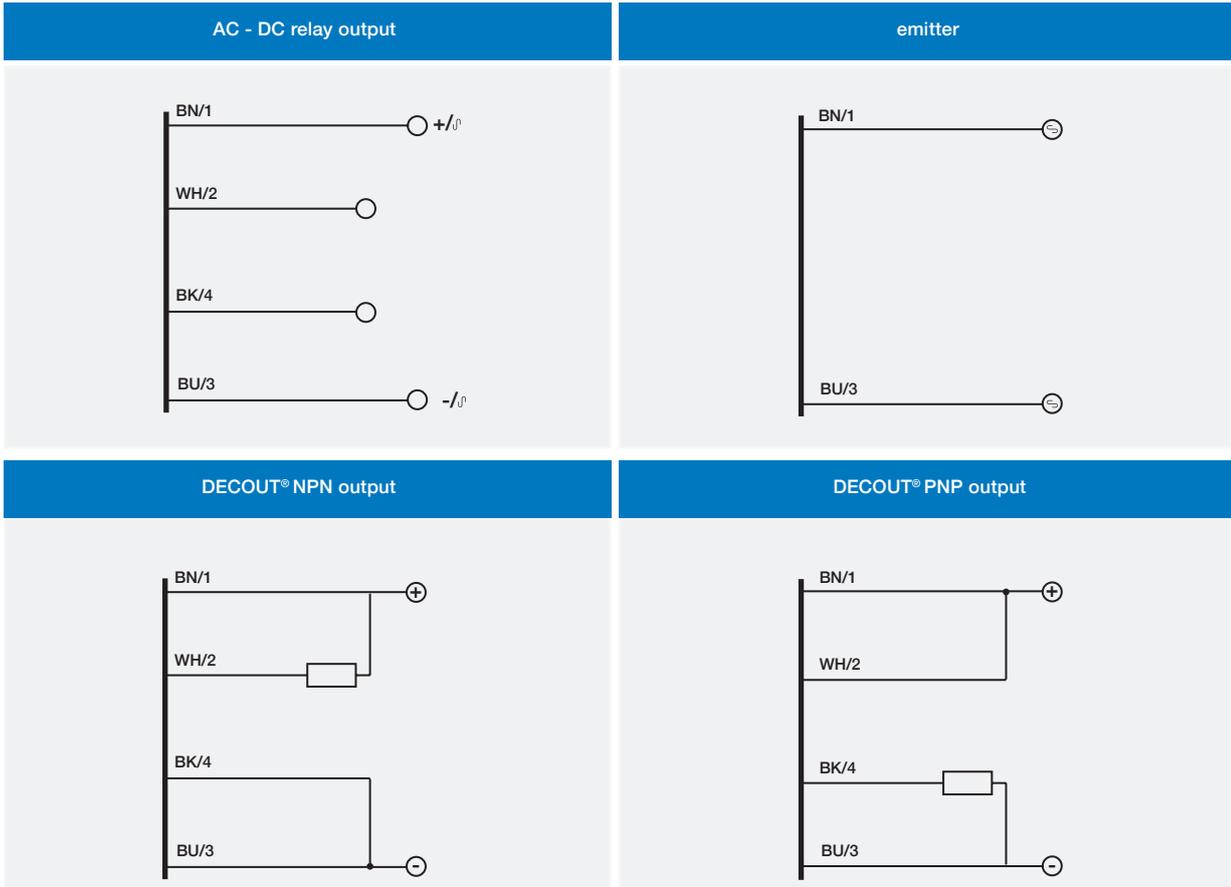
| | static output - DC | | | | | | relay output - AC/DC | | | | | | |
|-------------------------------|--|--------------------|----------------------------------|--------------------|----------------------------------|-------------------------------|------------------------------------|--------------------|----------------------------------|----------------------|---------------------------------|-------------------------------|--|
| | diffuse reflection | | retro-reflective | | diffuse reflection | | diffuse reflection | | retro-reflective | | diffuse reflection | | through-beam |
| | - | | standard | polarized | background suppr. | | - | | standard | polarized | background suppr. | | without check |
| | RX6/0*-1* | RX8/0*-1* | RXC/0*-1* | RXP/0*-1* | RXS/0*-1* | RXL/0*-1* | RX6/0*-3* | RX8/0*-3* | RXC/0*-3* | RXP/0*-3* | RXS/0*-3* | RXL/0*-3* | RXE/0*-3* + RXR/0*-3* |
| nominal sensing distance Sn | 1 m ⁽¹⁾ | 2 m ⁽¹⁾ | 12 m ⁽²⁾ | 6 m ⁽²⁾ | 0,05... 0,3 m ⁽¹⁾ | 0,25... 1 m ⁽¹⁾ | 1 m ⁽¹⁾ | 2 m ⁽¹⁾ | 12 m ⁽²⁾ | 6 m ⁽²⁾ | 0,05... 0,3 m ⁽¹⁾ | 0,25... 1 m ⁽¹⁾ | 16 - 32 m |
| emission | infrared (880 nm) | | red (660 nm) | infrared (880 nm) | | | | red (660 nm) | infrared (880 nm) | | | | |
| tollerance | - 10...+ 30 % | | EG ≥ 2 at Sr | | 0...+ 10 % | | - 10...+ 30 % | | EG ≥ 2 at Sr | | 0...+ 10 % | | EG ≥ 2 at Sr |
| hysteresis | 2...10% of the nominal sensing distance Sn | | | | | | | | | | | | |
| repeatability | 5 % | | | | | | | | | | | | |
| operating voltage | 10...30 Vdc | | | | | | 20...253 Vac / 50 -60 Hz | | | | | | |
| ripple | ≤ 10 % max | | | | | | - | | | | | | |
| no-load supply current | 25 mA | | | 40 mA | | | 25 mA _{RMS} | | | 30 mA _{RMS} | | | 15 mA _{RMS} 30 mA _{RMS} |
| load current | ≤ 100 mA | | | | | | - | | | | | | 3A-250 Vac 3A-30 Vdc (750 VA / 90 W) |
| leakage current | ≤ 10 µA | | | | | | - | | | | | | |
| voltage drop | 1,2V max | | | | | | - | | | | | | |
| output type | static DECOU [®] | | | | | | relay | | | | | | |
| switching frequency | 500 Hz | | | | | | 25 Hz | | | | | | |
| power on delay | 100 ms | | | | | | | | | | | | |
| timing functions | from 0,1s to 10s, deley ON, deley OFF, one shot | | | | | | | | | | | | |
| supply electrical protections | polarity reversal, transient | | | | | | transient (AC), over voltages (DC) | | | | | | |
| output protection | Short circuit (with hold) | | | | | | - | | | | | | |
| temperature range | - 25°C...+ 70°C (without freeze) | | - 25°C...+ 60°C | | - 25°C...+ 70°C (without freeze) | | | | - 25°C...+ 60°C | | - 25°C...+ 70°C | | |
| temperature drift | 10 % Sr | | | | | | | | | | | | |
| protection degree | IP65 (EN60529) ⁽³⁾ | | | | | | | | | | | | |
| external light interference | ≥ 5.000 lux (incandescent lamp) | | ≥ 10.000 lux (incandescent lamp) | | ≥ 5.000 lux (incandescent lamp) | | | | ≥ 10.000 lux (incandescent lamp) | | ≥ 5.000 lux (incandescent lamp) | | 10.000 lux (incandescent lamp) |
| emitter LEDs | - | | | | | | | | | | | | |
| receiver LEDs | rear red (output state), superior red (alignment), green (stable signal) | | | | | | | | | | | | |
| housing material | polycarbonate (glass fiber reinforced) | | | | | | | | | | | | |
| lenses material | plastic | | | | | | | | | | | | |
| weight (approximate) | 145 g without fixing slide / 165 g with fixing slide | | | | | | | | | | | | |

⁽¹⁾ With 100 x 100 mm white matt paper EG=1.5 ⁽²⁾ With standard reflector Ø 80 mm (RL110 supplied seperately) ⁽³⁾ Protection guaranteed only with plug cable well mounted



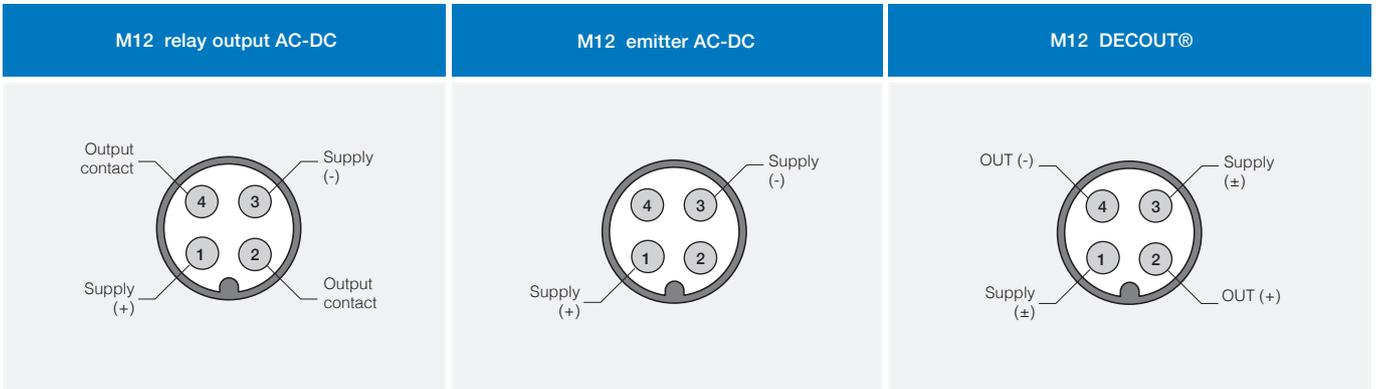
electrical diagrams of the connections

Maxi with static output DC
or with relay output AC/DC



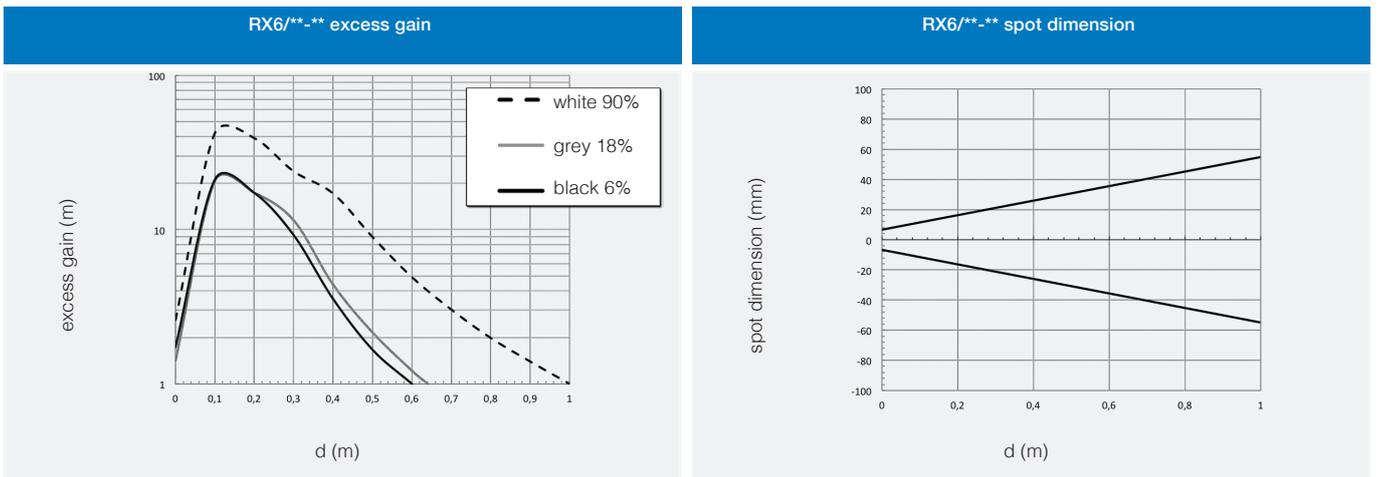
- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

plug



response diagrams

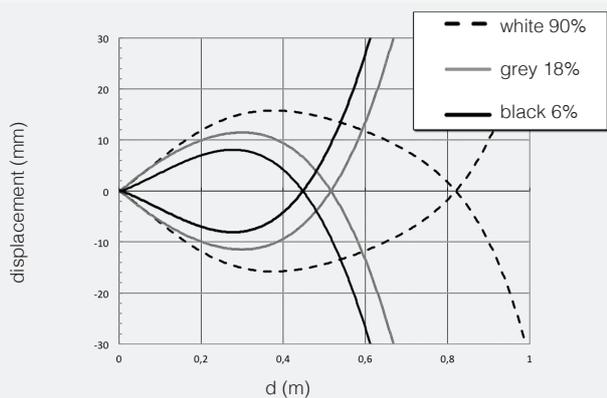
direct diffuse models



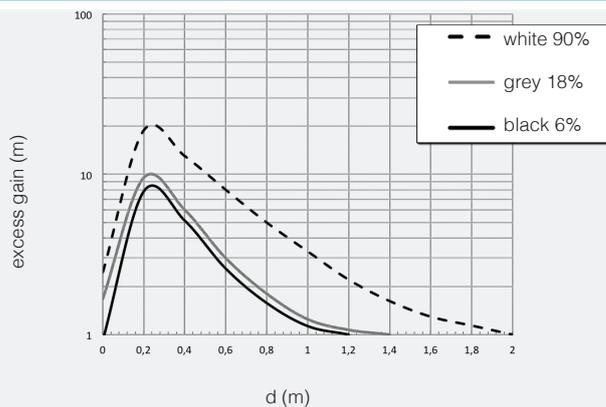
RX



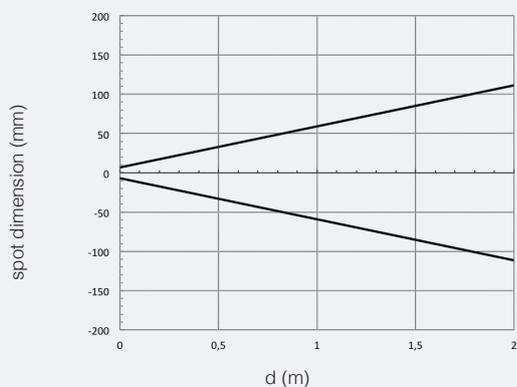
RX6/**-** parallel displacement



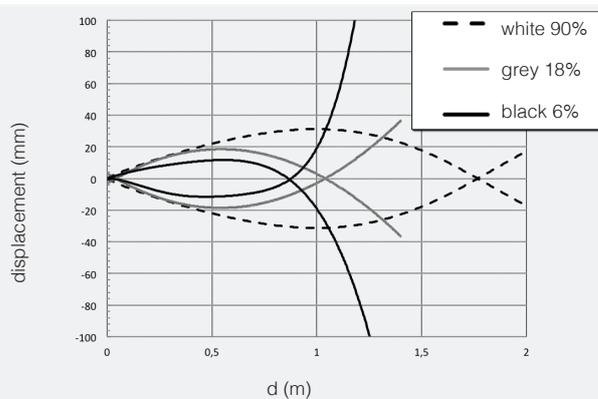
RX8/**-** excess gain



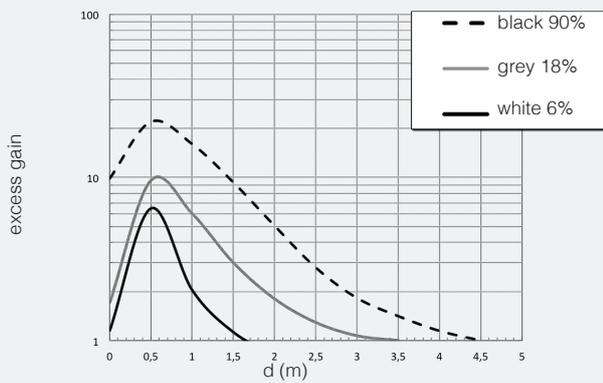
RX8/**-** spot dimension



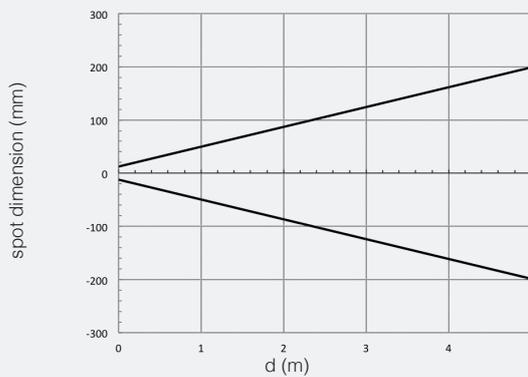
RX8/**-** parallel displacement



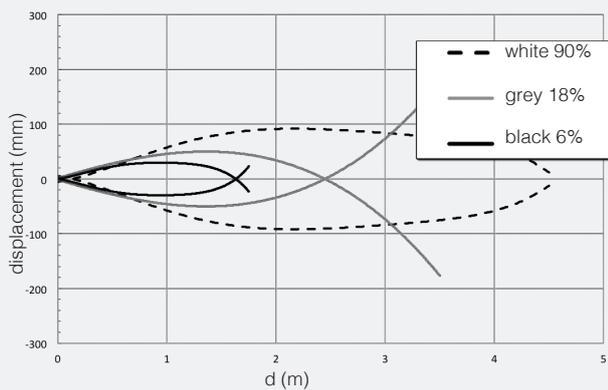
RX8/**-***37 excess gain



RX8/**-***37 spot dimension



RX8/**-***37 parallel displacement



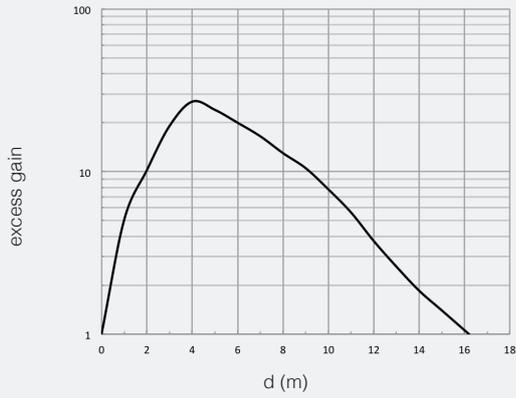


response diagrams

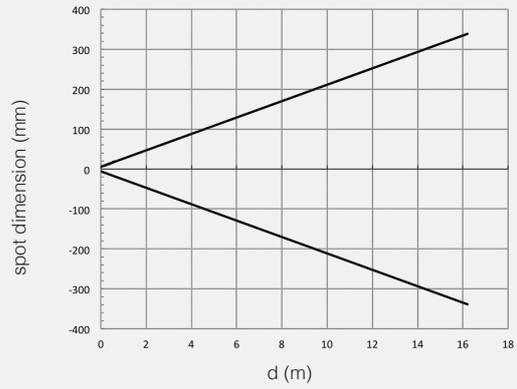
retro-reflective models

Maxi with static output DC
or with relay output AC/DC

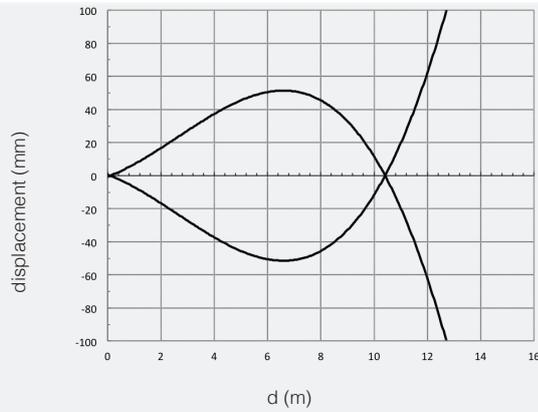
RXC/**-**excess gain



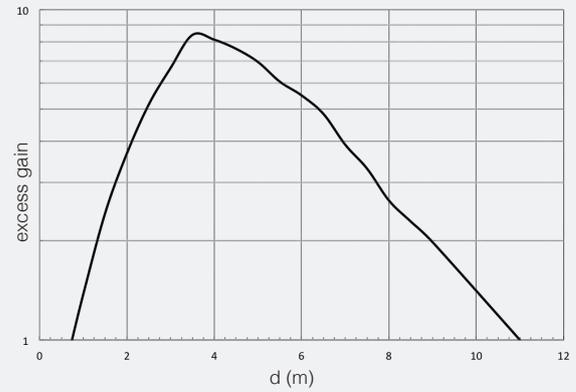
RXC/**-** spot dimension



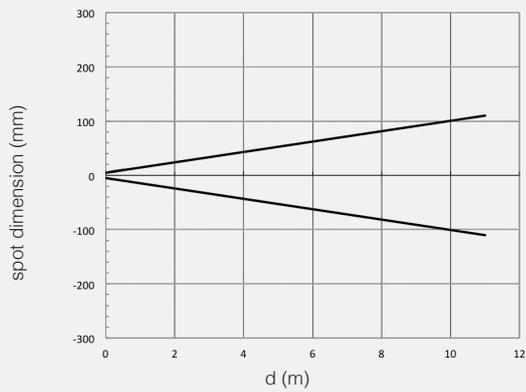
RXC/**-** parallel displacement



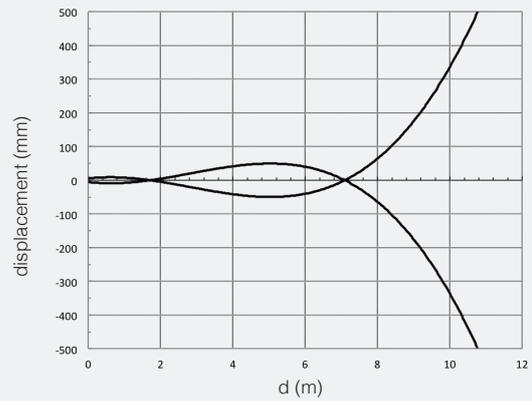
RXC/**-** excess gain



RXC/**-**spot dimension



RXC/**-** parallel displacement



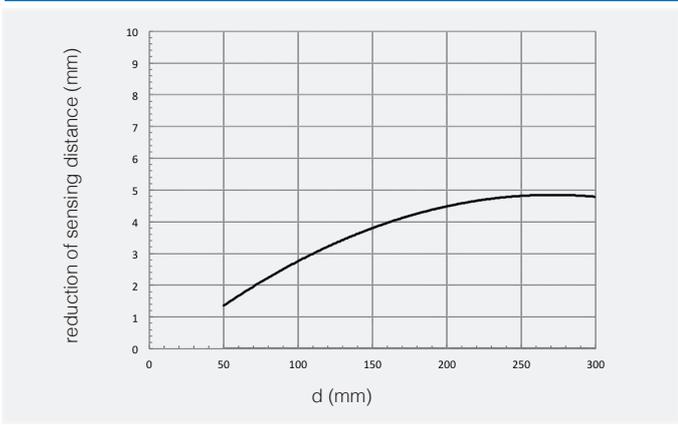
response diagrams

background suppression models

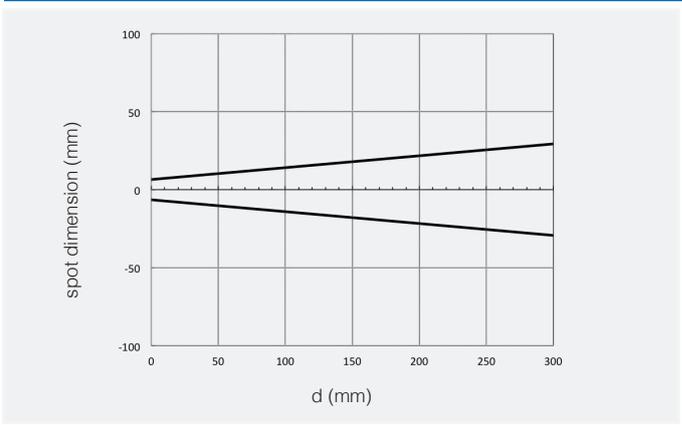


Maxi with static output DC or with relay output AC/DC

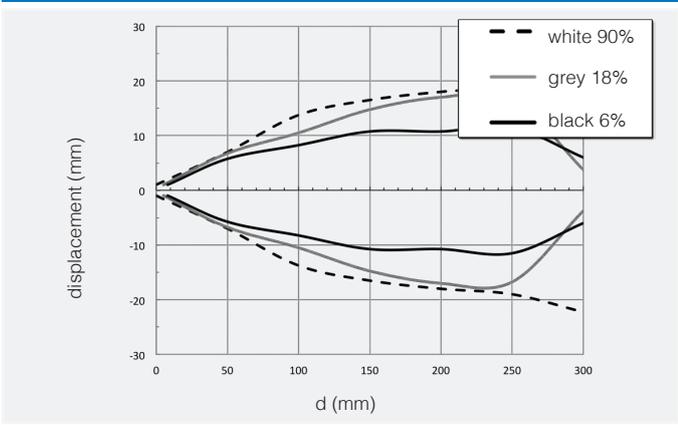
RXS/**-**-** reduction of sensing distance



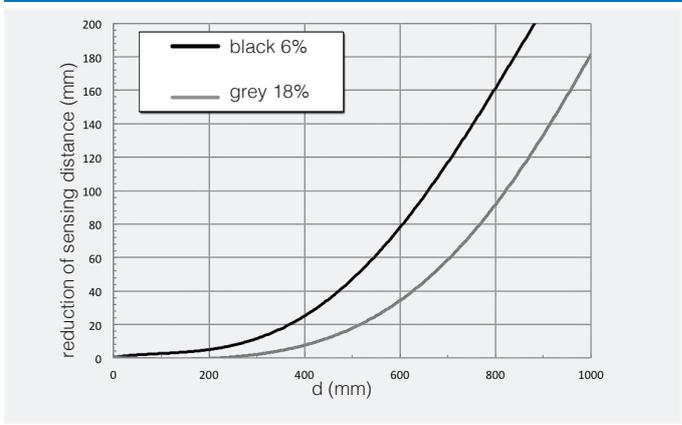
RXS/**-**-** spot dimension



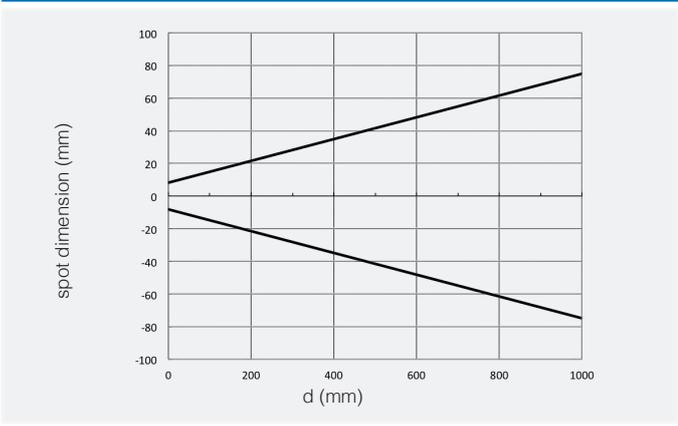
RXL/**-**-** parallel displacement



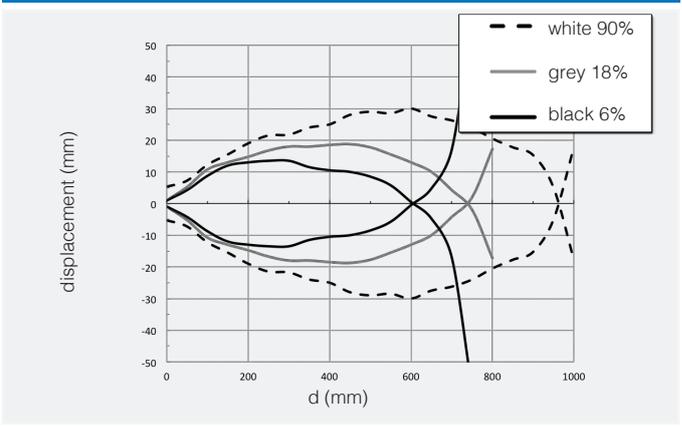
RXL/**-**-** reduction of sensing distance



RXL/**-**-** spot dimension



RXL/**-**-** parallel displacement



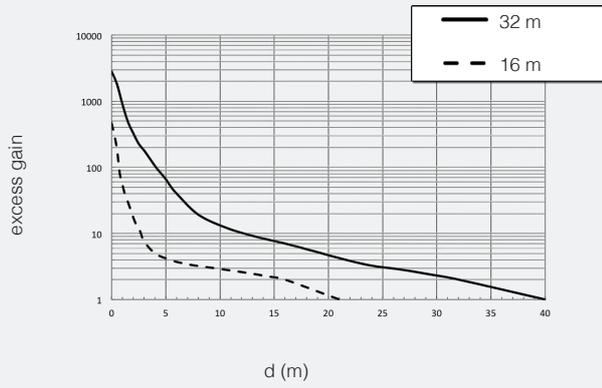


response diagrams

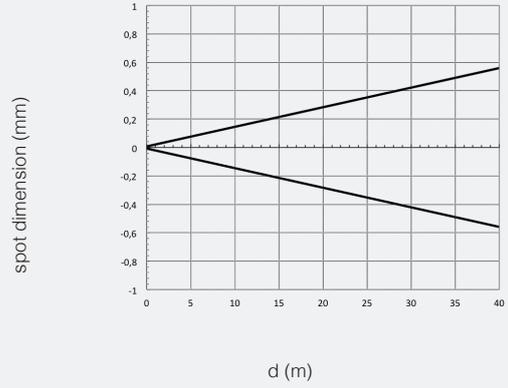
through-beam models

Maxi with static output DC
or with relay output AC/DC

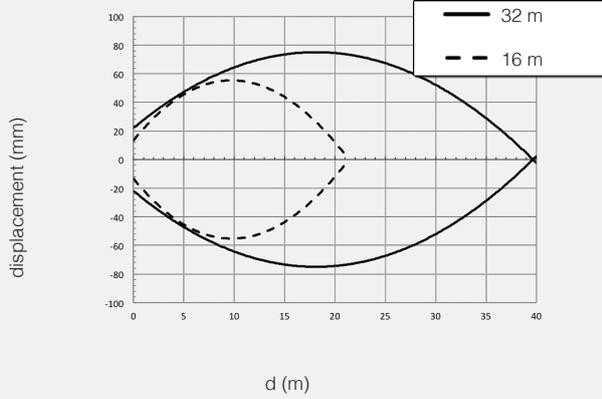
RXE/00-0* - RXR/00-0* excess gain



RXE/00-0* - RXR/00-0* spot dimension

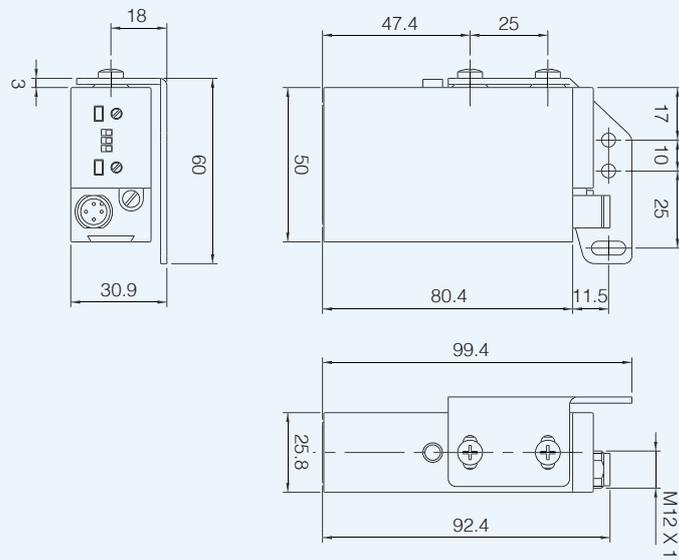


RXE/00-0* - RXR/00-0* parallel displacement





RX*/**-*A



RX*/**-*B

