# 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**



## 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 | 00 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 |
| | N | 3.5 m polarized retro-reflective with adjustment |
| | E | Standard emitter |
| | R | 16 m standard receiver |
| | D | 32 m long distance receiver |
| emitter type | 0 | Standard emitter - DECOUT® output |
| | X | Emitter with check |
| emitter | 0 | Standard emitter - DECOUT® output |
| housing material | 0 | Plastic housing |
| | 1 | Metal housing |
| cable / plug output | 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 | - | - | - | - |

# technical specification

background suppression models

| | 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 mm) |
| 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<br>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

| | 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<br>metallic version: 100 g plug / 130 g cable | | | | |

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

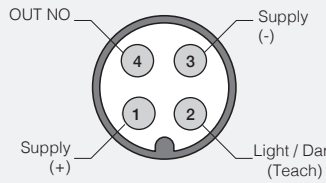
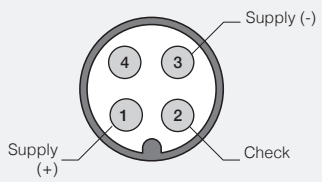
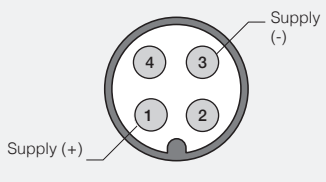
# technical specification

retro-reflective and long distance models

| | retro-reflective | | | through-beam | |
|---|---|---|---|---|---|
| | standard | polarized | | standard | long distance |
| | M*C/00-* | M*P/00-** | MSN/00-** | M*E/**-**<br>M*R/**-** | M*E/**-**<br>M*D/**-** |
| |  | | |  | |
| nominal sensing distance | 4,5 m [1] | 3,5 m [1] | | 16 m | 32 m |
| emission | infrared (880 nm) | red (660 mm) | | 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)<br>≤ 35 mA (emitter with check)<br>≤ 25 mA (receiver) | |
| load current | ≤ 100 mA | | | | |
| leakage current | ≤ 10 µA | | | | |
| output voltage drop | 1,2 V max. IL = 100 mA | | | | |
| output type | DECOUT® (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<br>metallic version: 100 g plug / 130 g cable | | | | |

[1] With 100x100 mm white matt paper [4] Protection guaranteed only with plug cable well mounted

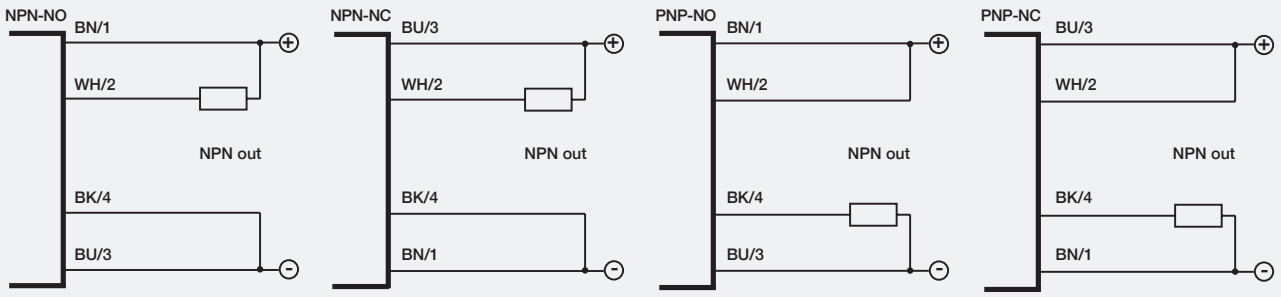
## plug

| M12 | M12 emitter with check | M12 emitter without check |
|---|---|---|
|  |  |  |

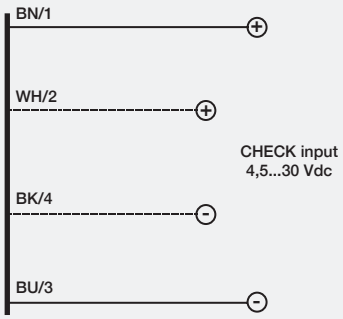


## electrical diagrams of the connections

### DECOUT® output




### emitter with check

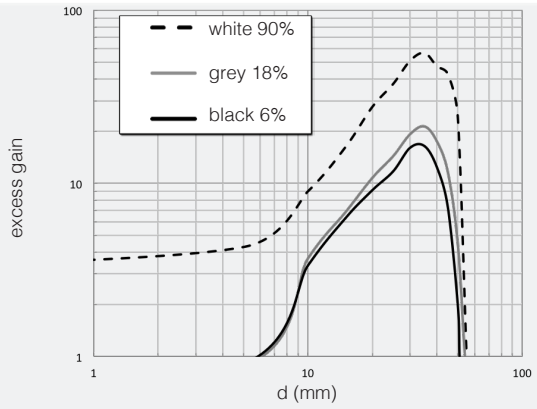



| | |
|---|---|
| BN | brown |
| BU | blue |
| BK | black |
| WH | white |
| PK | pink |
| GY | gray |

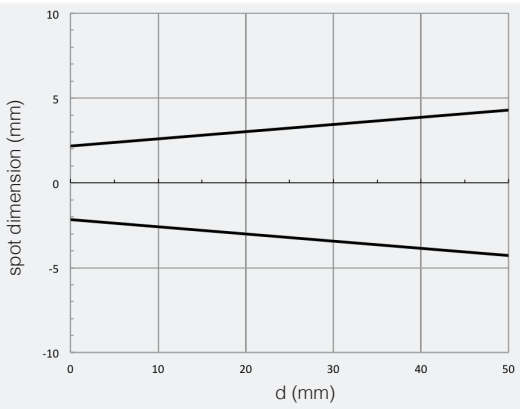
## response diagrams

background suppression models

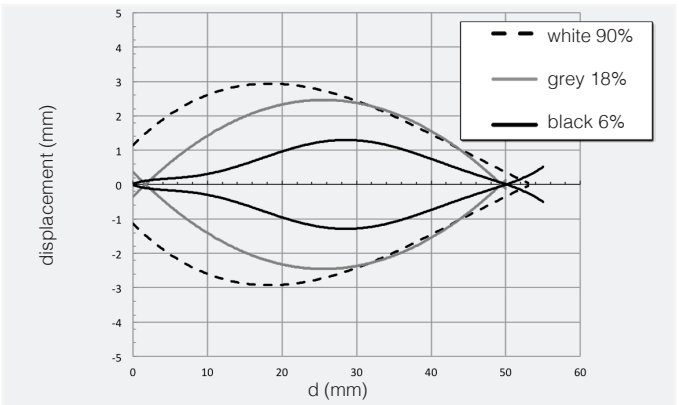
### M*0/**-** excess gain



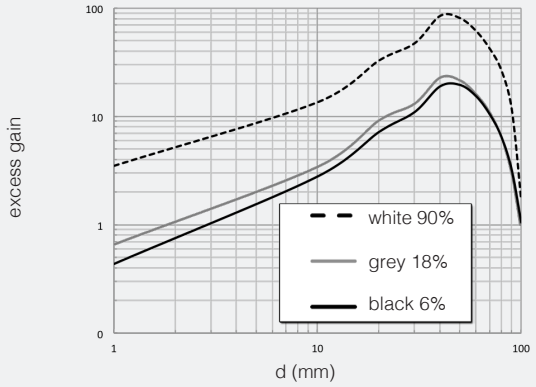

### M*0/**-** spot dimension



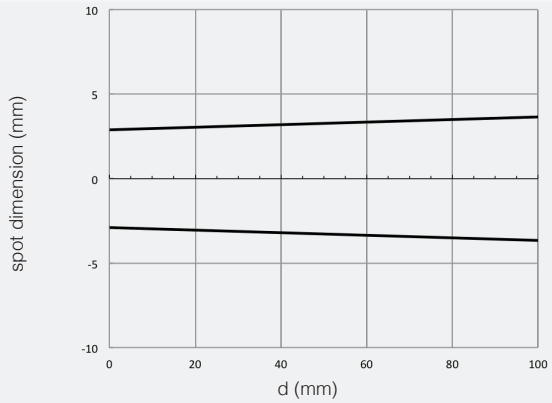
## M*0/**-** parallel displacement



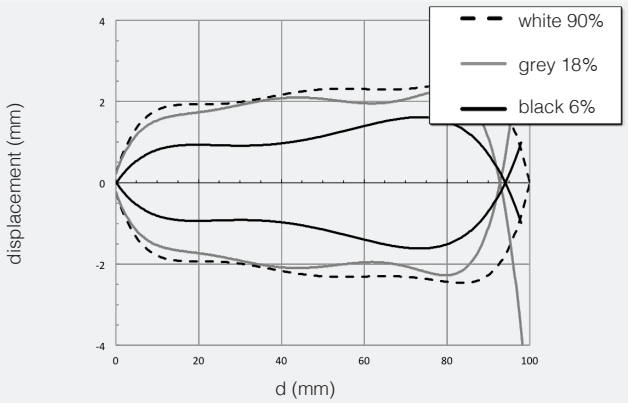

## M*1/**-** excess gain



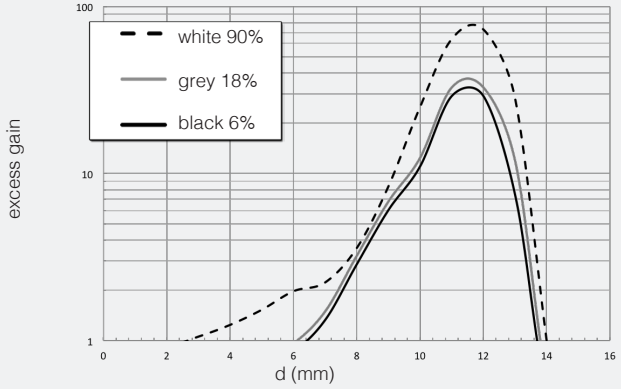

## M*1/**-** spot dimension



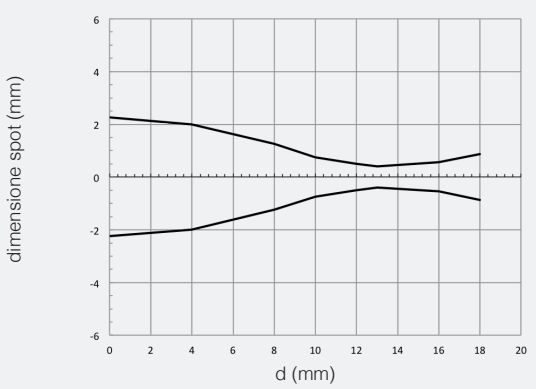

## M*1/**-** parallel displacement



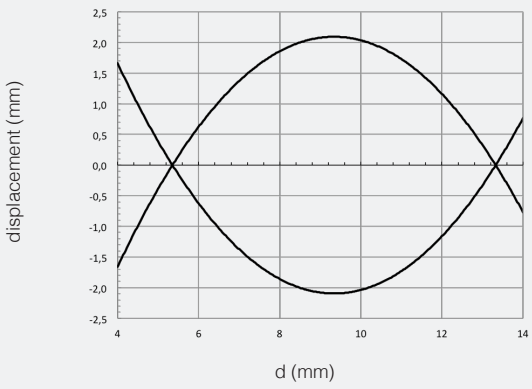

## MST/00-** + STF12 excess gain



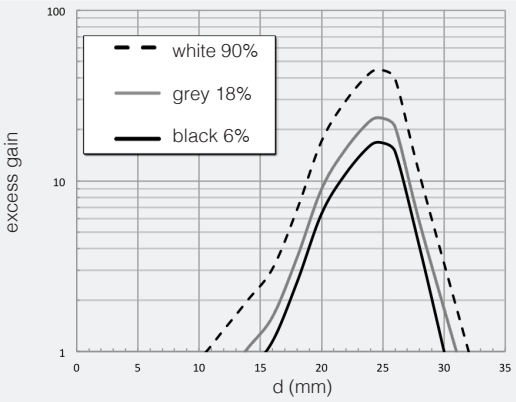

## MST/00-** + STF12 spot dimension




## MST/00-** + STF12 parallel displacement



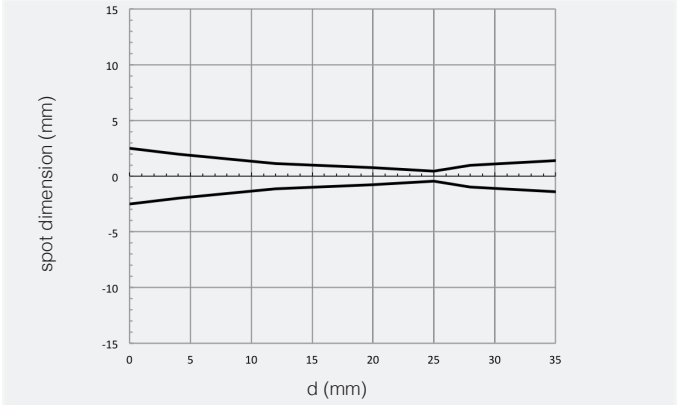

## MST/00-** + STF25 excess gain



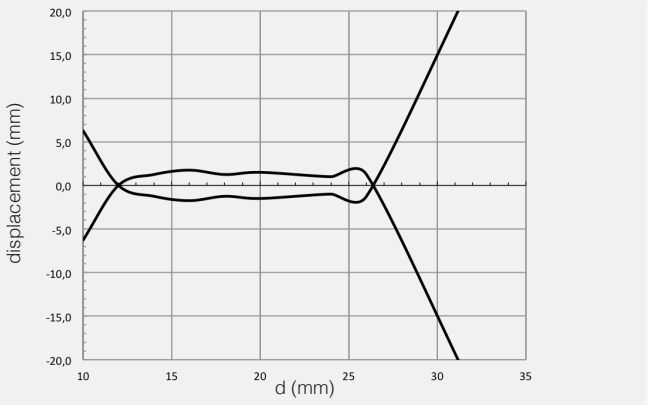
## response diagrams

direct diffuse models

### MST/00-** + STF25 spot dimension



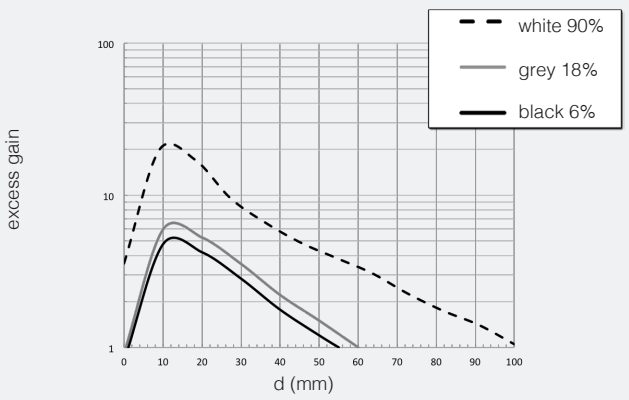

### MST/00-** + STF25 parallel displacement



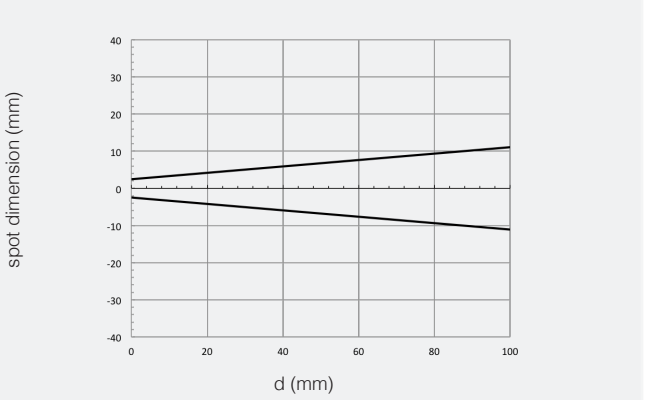

## response diagrams

direct diffuse models

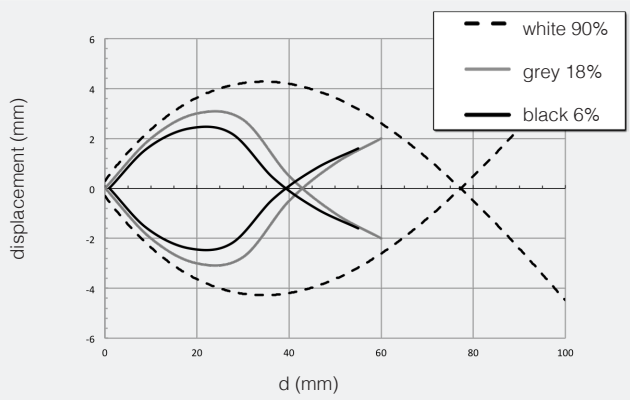
### M*2, M*3/00-** excess gain



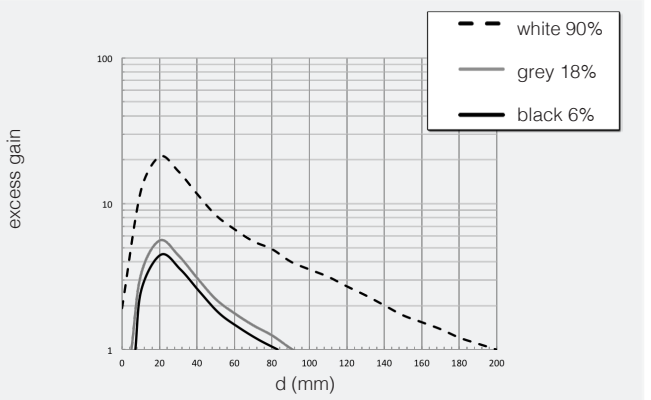

### M*2, M*3/00-** spot dimension



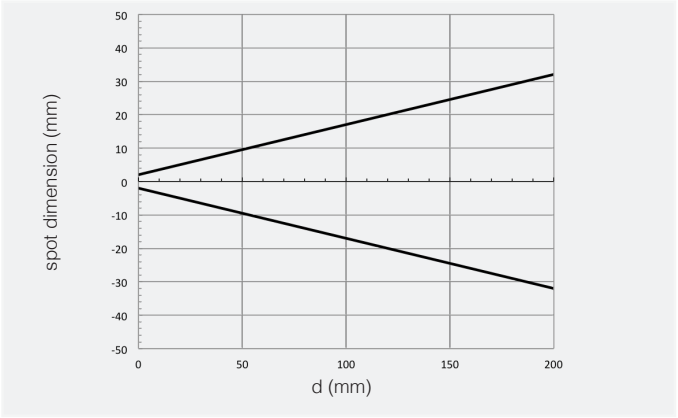

### M*2, M*3/00-** parallel displacement



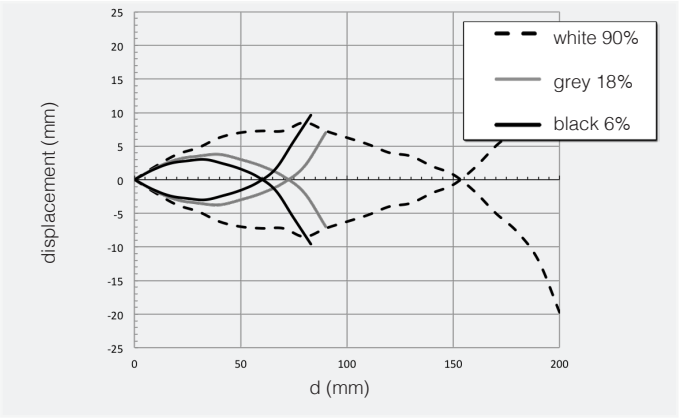

### M*4/00-** excess gain



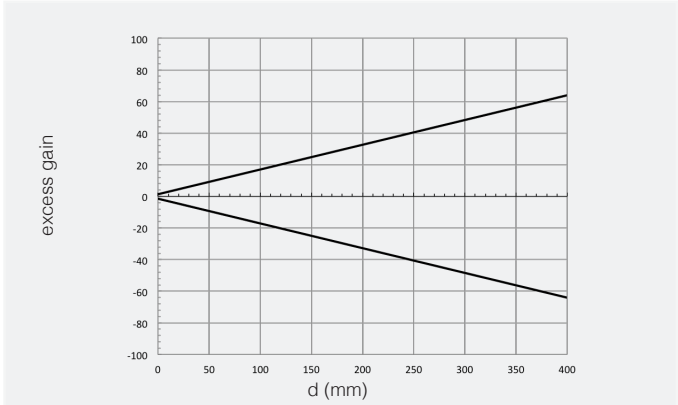
### M*4/00-** dimensione spot



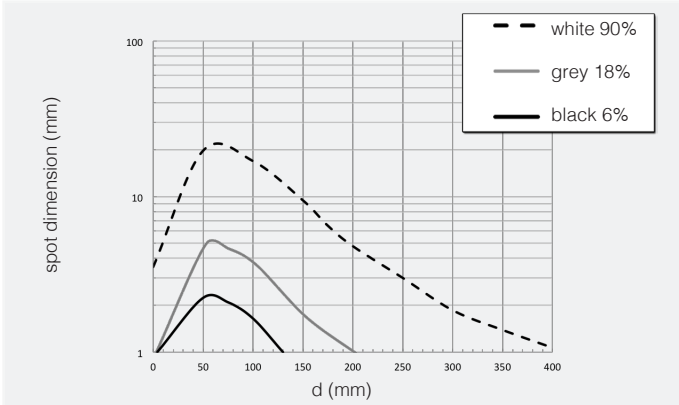

### M*4/00-** parallel displacement



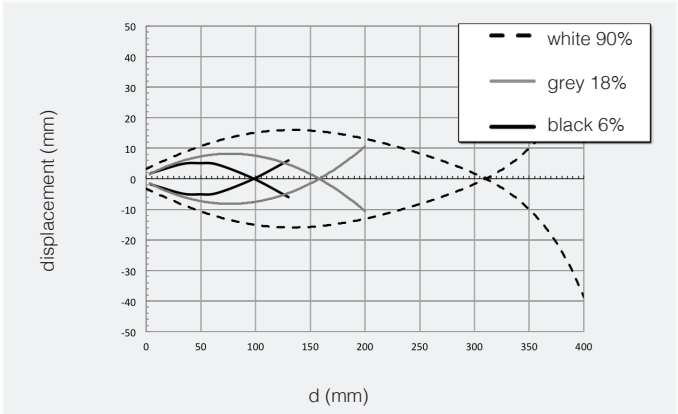

### M*6, M*7**/00-** excess gain




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



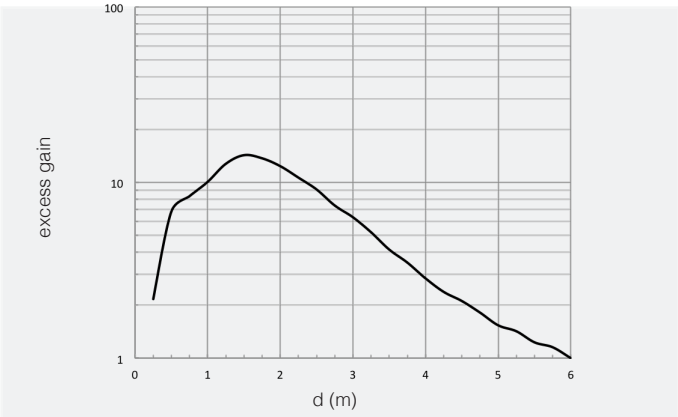

### M*6, M*7**/00-** parallel displacement



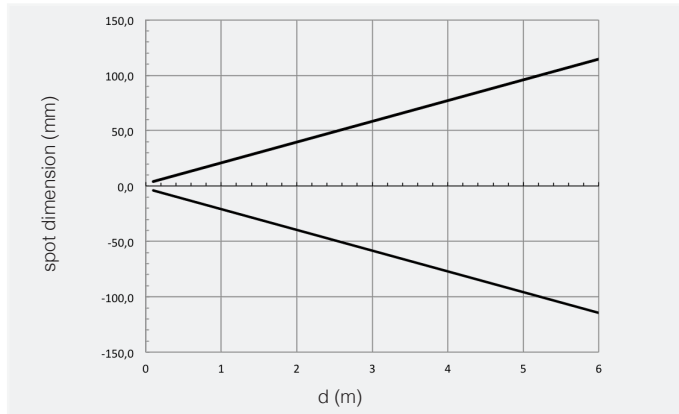

## response diagrams

retro-reflective standard and polarized models

### MSC/**-** excess gain



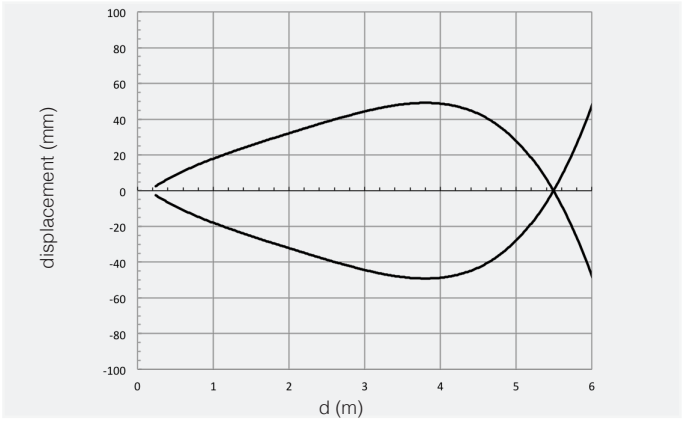

### MSC/**-** spot dimension



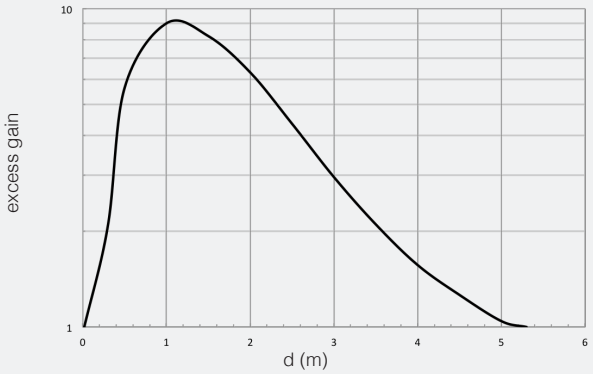
## response diagrams

retro-reflective polarized models (diagrams measured using RL100)

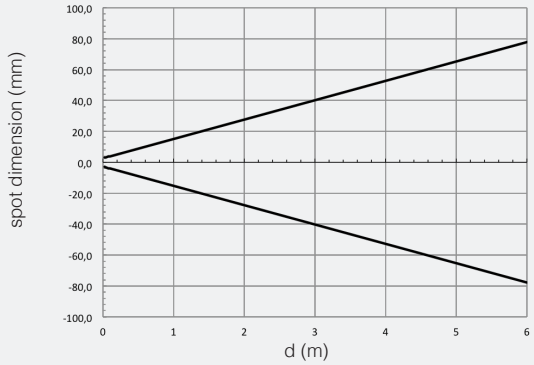
### MSC/**-** parallel displacement



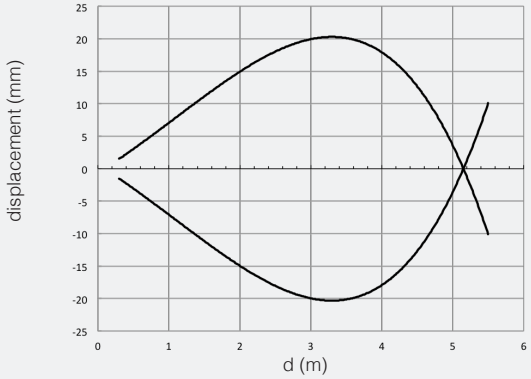

### MSP, MSN/**-** excess gain




### MSP, MSN/**-** spot dimension



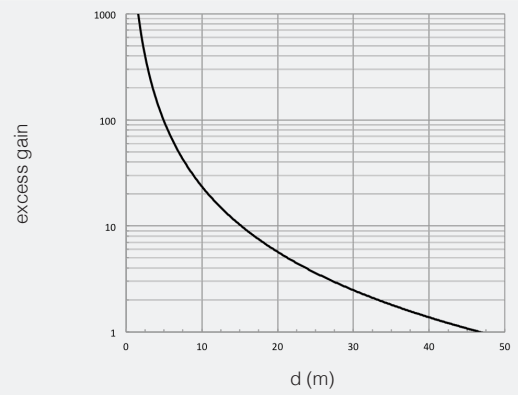

### MSP, MSN/**-** parallel displacement



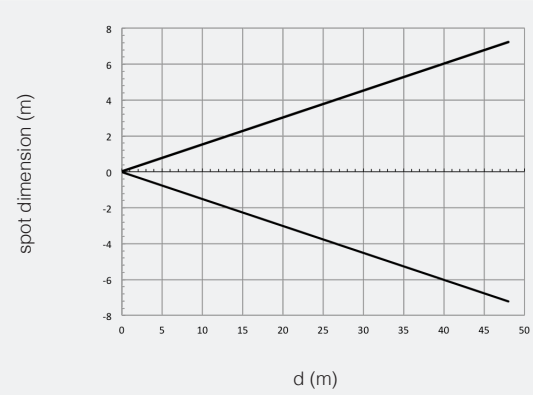

## response diagrams

through-beam standard and long distance models

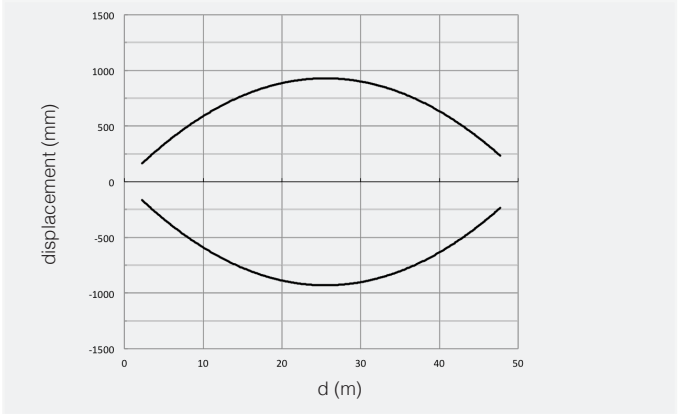
### MSE/**-** - MSD/**-** excess gain



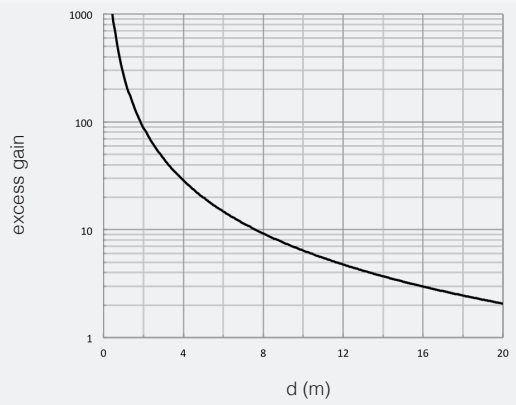

### MSE/**-** - MSD/**-** spot dimension



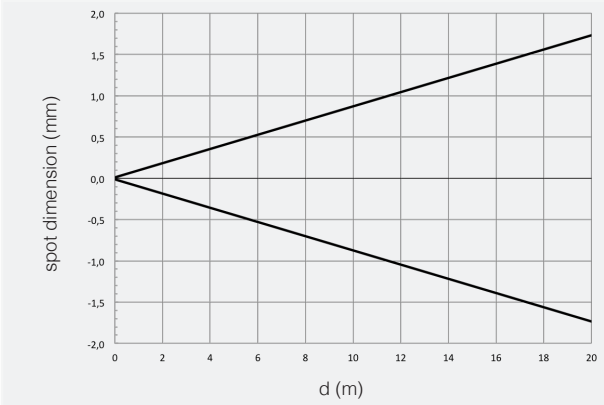
### MSE/**-** - MSD/**-** parallel displacement



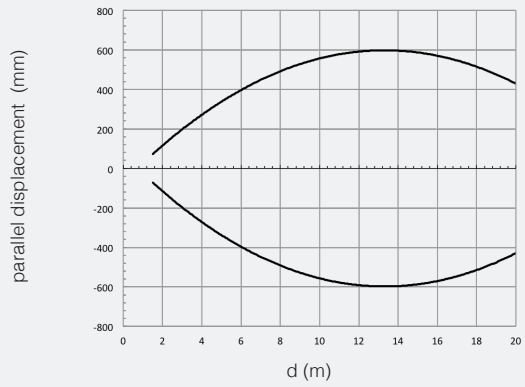

### MSE/**-** - MSR/**-** excess gain




### MSE/**-** - MSR/**-** spot dimension



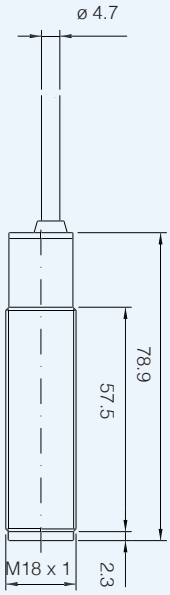

### MSE/**-** - MSR/**-** parallel displacement



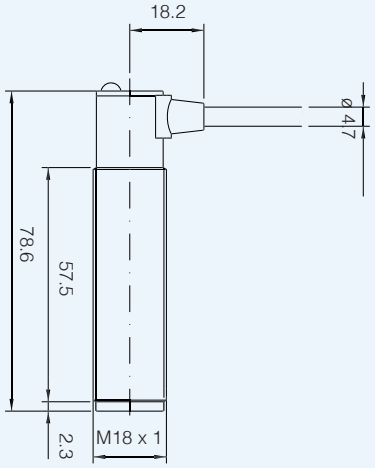

## dimensions (mm)

axial models

### MS*/00-*A

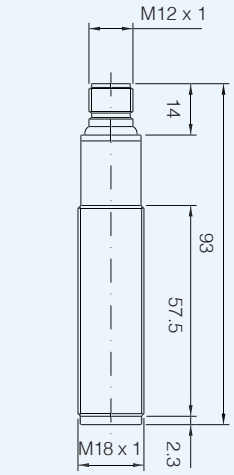
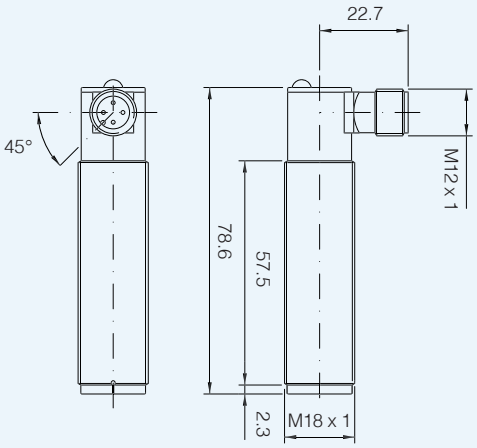



### MS*/00-0C



## dimensions (mm)

axial models

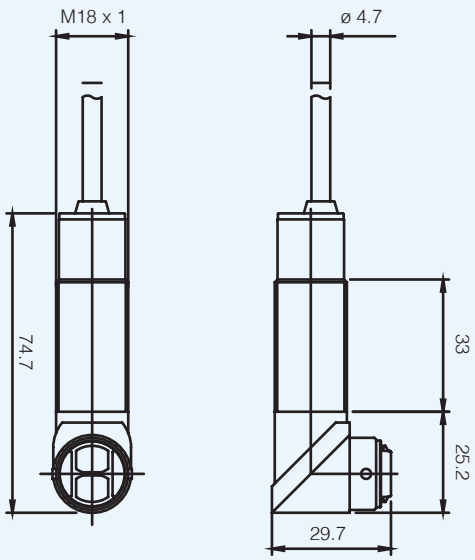
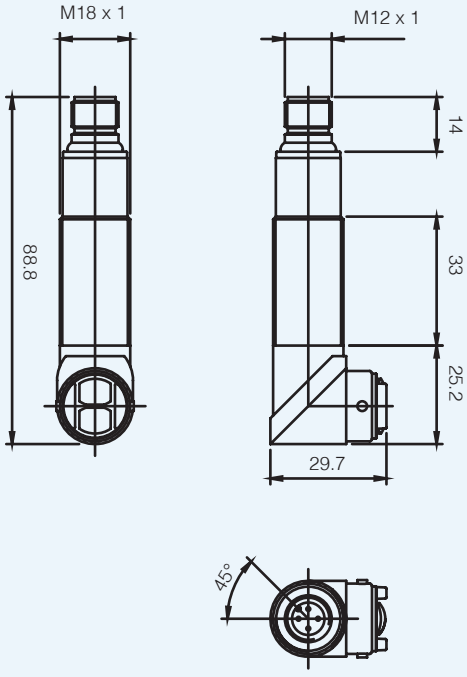
| MS*/00-*E | MS*/00-*K |
|---|---|
|  |  |





## dimensions (mm)

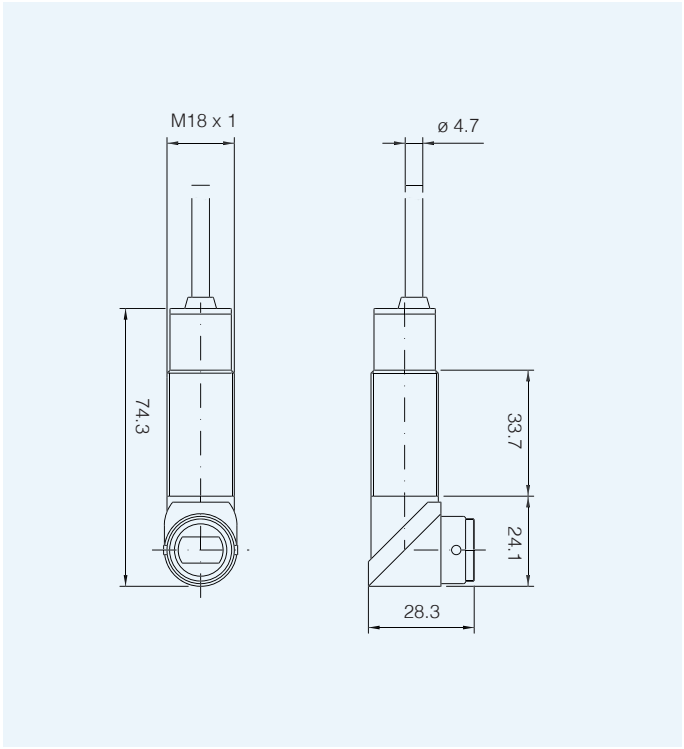
background suppression radial models

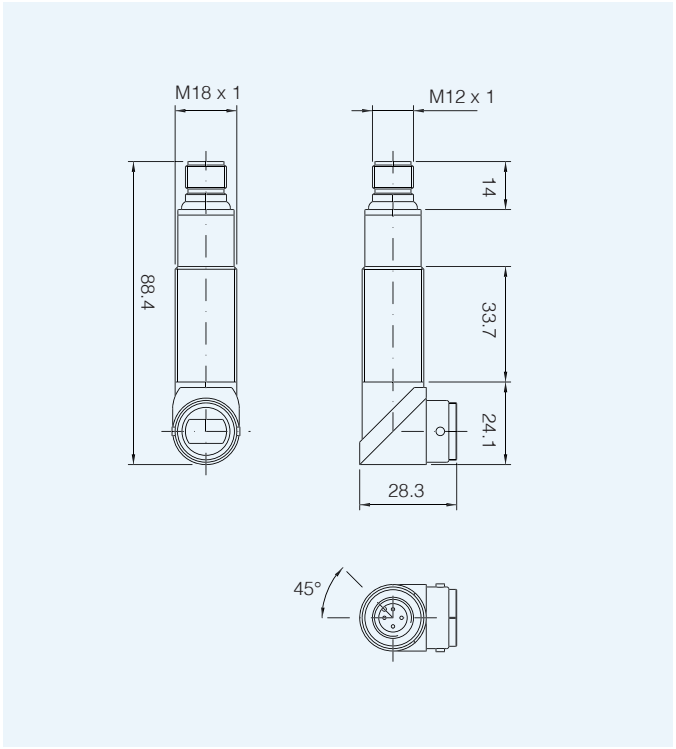
| MP0/00-*A; MP1/00-*A | MP0/00-*E; MP1/00-*E |
|---|---|
|  |  |

## dimensions (mm)

diffuse reflection, retroreflective, polarized, through beam radial models

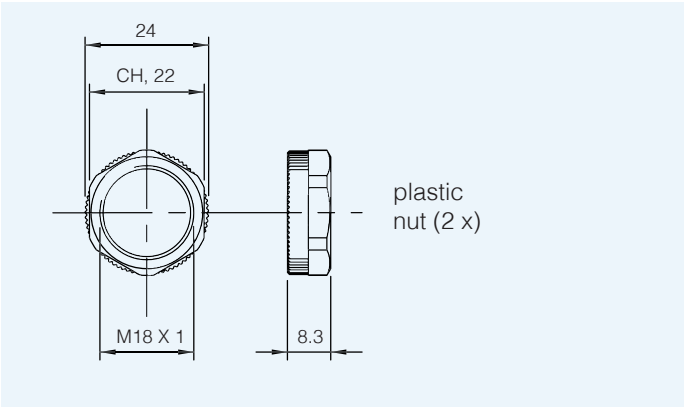
| MP*/00-*A | MP*/00-*E |
|---|---|




## dimensions (mm)

accessories included in all plastic models




## dimensions (mm)

accessories included in all metallic models

