Optical sensors | Ultrasonic sensors | Inductive sensors | Capacitive sensors | Vision sensors and systems

# FT 25-W and FT 25-RGB

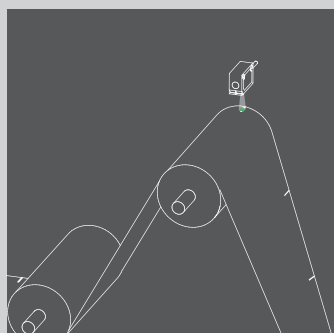White-light and multi-colour contrast sensor

# FT 25 – Contrast sensor

Miniature housing, maximum performance

made in Germany

Rod mounting MBD F 25ST *allows user-friendly and precise sensor alignment (see accessories).*

### Areas of application:

• Printing machines
• Labelling machines
• Horizontal packaging machines
• Vertical packaging machines
• Bottling plants

## TYPICAL FT 25 W/-RGB

• Precise detection of any printed marks

• High positioning accuracy thanks to minimum response time

• High switching frequency of 25 kHz with miniature housing

• Small, precise light spot with sharp contour for easy sensor alignment and detection of even the smallest of printed marks

• Feedback via light spot (simple, comprehensible, clearly defined)

• Dynamic, static or external teach-in

• White-light LED or RGB diode ⬤ options available

• High depth of field

# Screw on – connect - go.

## Simple change from standard housing to miniature housing.
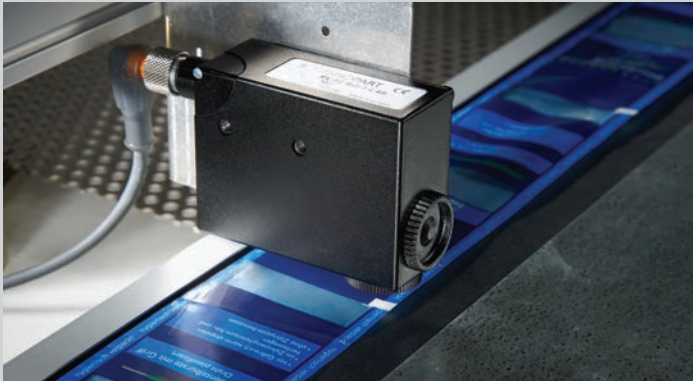
*Out with the old, in with the new: The contrast sensors from the F 25 series are assembly and connection compatible with the conventional standard housing (image on the left). The fastening bores are aligned in the same distance from each other. The integrated cable with a M12-connector fits to the corresponding mating connector.*

The new FT 25-W/-RGB series is significantly smaller than the conventional standard housing and simultaneously offers the best performance data. With the help of the MZ F 25 bracket, a simple change from the large standard housing to the compact miniature housing is possible – without additional assembly. The most efficient solution for your application.

### Smaller
The FT 25-RGB is a fast contrast sensor with multi-colour-analysis in a compact miniature housing ($34 \times 20 \times 12$ mm$^3$). Depending on the object colour, the sensor selects the ideal transmission colour (red, green or blue) and thereby reliably recognizes even the smallest of differences in contrast.

### Faster
With a minimal response of 20 μs, a minimal jitter of 10 μs and a switching frequency of up to 25 kHz,

it allows for high positioning accuracy and secure detection even in very fast processes.

### More precise
Due to the bright light spot with an oblong, sharp contour ($1 \times 4$ mm$^2$) and a high depth of field of +/- 3 mm, even very small printed marks and vibrating and shimming objects (e.g. paper webs or foils) are reliably recognized.

### More communicative
After the teach-in, the „speaking light spot" provides the user feedback about the quality of the calibrated contrast.

- Light spot blinks green: Good contrast
- Light spot blinks blue: Weak contrast
- Light spot blinks red: Inadequate contrast



*Compatible light exit and focal positions:*
*The sensor mounted on the MZ F 25 bracket, compared to the conventional standard housing, has an identical focal position at 9 mm and 18 mm.*
*Dependent upon on which of the four possible positions the sensor is mounted, this applies both for horizontal and vertical light emission.*

# FT 25-W

## White-light contrast sensor



CE
IP 69k
ECOLAB
c UL us LISTED

## PRODUCT HIGHLIGHTS

- Precise detection of the slightest contrast differences
- Very robust operation despite fluttering and glossy objects
- Simple alignment through very precise and easily visible light spot
- Housings that are many times smaller than standard housings – and offer better performance
- Very high positioning accuracy with 10 μs scanning

| Optical data | |
|---|---|
| Scanning distance | 12 mm |
| Depth of field | ± 2.5 mm |
| Type of light | White LED, 400 … 780 nm |

| Functions | |
|---|---|
| Indicator LED, green | Operating voltage indicator |
| Indicator LED, yellow | Switching output indicator |
| Sensitivity adjustment | Via teach-in button and control line |
| Teach-in modes | Mode 1: with running process |
| | Mode 2: with standing process |
| Adjustment possibilities | LO / DO via Teach-in button and control line |
| | Button lock via control input |

| Electrical data | |
|---|---|
| Operating voltage, $+U_B$ | 10 … 30 V DC[1] |
| No-load current, $I_0$ | ≤ 25 mA |
| Output current, le | ≤ 100 mA |
| Protective circuits | Reverse-polarity protection, $U_B$ / short-circuit protection (Q) |
| Protection Class | 2 |
| Standby time | < 300 ms |
| Switching output, Q | Push-pull |
| Output function | LO / DO |
| Switching frequency, f (ti/tp 1:1)[2] | (See Selection Table) |
| Response time | (See Selection Table) |
| Jitter (electrical) | (See Selection Table) |

| Mechanical data | |
|---|---|
| Dimensions | $34 \times 20 \times 12$ mm[3] |
| Enclosure rating | IP 69K & IP 67[3] |
| Material, housing | ABS |
| Material, front screen | PMMA |
| Type of connection | (See Selection Table) |
| Ambient temperature: operation | -20 … +55 °C[4] |
| Ambient temperature: storage | -20 … +80 °C |
| Weight (plug device) | 10 g |
| Weight (integrated cable) | 20 g |
| Vibration and impact resistance | EN 60947-5-2 |

[1] Max. 10 % ripple, within $U_B$, ~ 50 Hz / 100 Hz    [2] f = 1 / (T × Nyq × 2)    [3] With connected IP 67 / IP 69K plug    [4] UL: -20 … +50 °C

| Switching frequency, f (ti/tp 1:1)[2] | Response time | Jitter (electrical) | Type of connection | Part number | Article number |
|---|---|---|---|---|---|
| ≤ 25000 Hz | ≤ 20 μs | 10 μs | Metal plug, M8x1, 4-pin | FT 25-W1-GS-M4M | 607-21013 |
| ≤ 25000 Hz | ≤ 20 μs | 10 μs | Integrated cable: 150 mm with plug M12x1, 4-pin | FT 25-W1-GS-KL4 | 607-21012 |
| ≤ 10000 Hz | ≤ 50 μs | 25 μs | Plug, M8x1, 4-pin | FT 25-W2-GS-M4 | 607-21014 |
| ≤ 10000 Hz | ≤ 50 μs | 25 μs | Integrated cable: 150 mm with plug M12x1, 4-pin | FT 25-W2-GS-KL4 | 607-21015 |

## Plug connection



153-00995

## Integrated cable



153-00996

## Connection, 4-pin

| | | | | |
|---|---|---|---|---|
| + | +U_B | 1 | BN | Push-Pull |
| | IN | 2 | WH | |
| | Q | 4 | BK | |
| - | -U_B | 3 | BU | |



154-00320

## Signal process



155-01647

## Accessories

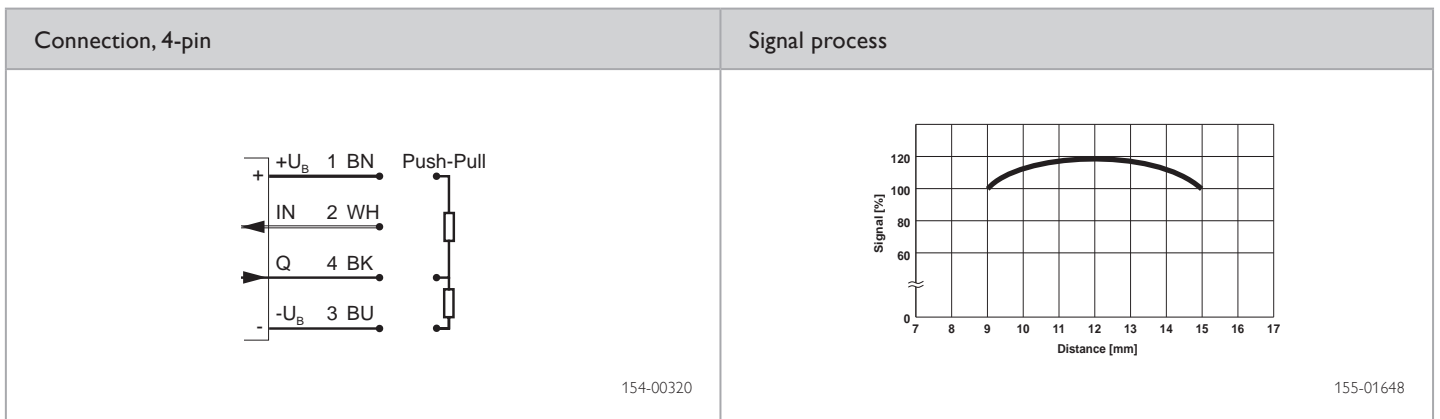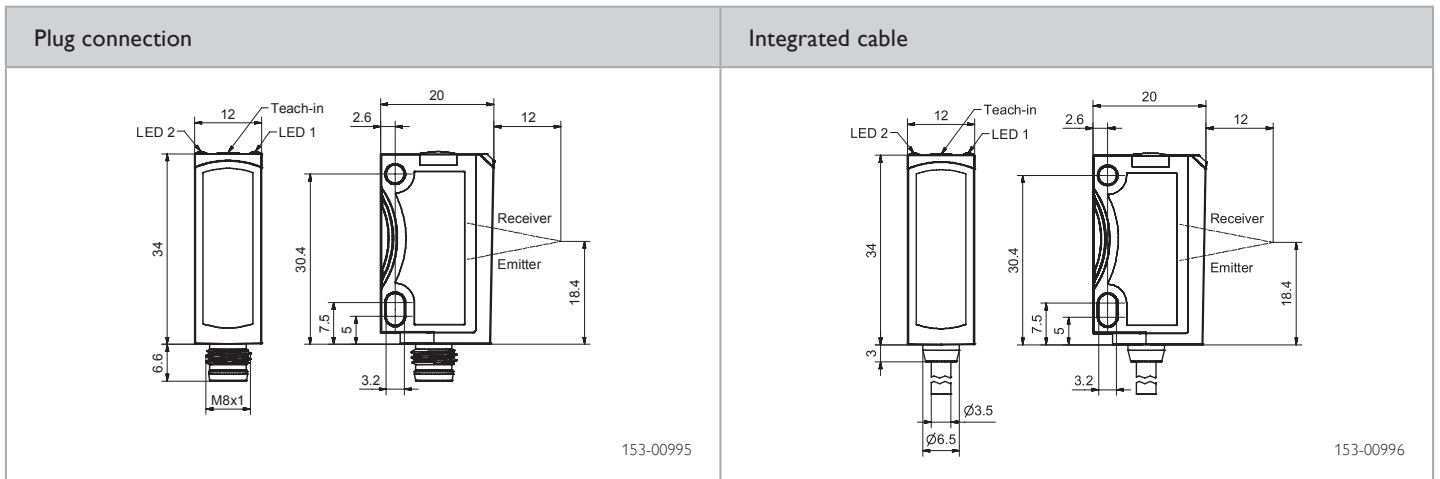| | |
|---|---|
| Connection cables | See accessories |
| Brackets | See accessories |

# FT 25-RGB

Multi-colour contrast sensor



## PRODUCT HIGHLIGHTS

- Precise detection of the slightest of contrast differences through multi-colour RGB evaluation
- Very robust operation despite fluttering and glossy objects
- Simple alignment thanks to very precise and easily visible light spot
- Communication via 3-colour light spot (simple, comprehensible, clearly defined)
- Very accurate positioning due to rapid scanning rate of 10 μs

### Optical data

| | |
|---|---|
| Scanning distance | 12 mm |
| Depth of field | ± 3 mm |
| Type of light | Red LED, 633 mm<br>Green LED, 525 nm<br>Blue LED, 460 mm |

### Functions

| | |
|---|---|
| Indicator LED, green | Operating voltage indicator |
| Indicator LED, yellow | Switching output indicator |
| Sensitivity adjustment | Via teach-in button and control line |
| Teach-in modes | Mode 1: with running process<br>Mode 2: with standing process |
| Adjustment possibilities | LO / DO via Teach-in button and control line<br>Button lock via control input |

### Electrical data

| | |
|---|---|
| Operating voltage, $+U_B$ | 10 … 30 V DC[1] |
| No-load current, $I_0$ | ≤ 25 mA |
| Output current, Ie | ≤ 100 mA |
| Protective circuits | Reverse-polarity protection, $U_B$ / short-circuit protection (Q) |
| Protection Class | 2 |
| Standby time | < 300 ms |
| Switching output, Q | PNP / NPN, push-pull |
| Output function | LO / DO |
| Switching frequency, f (ti/tp 1:1)[2] | (See Selection Table) |
| Response time | (See Selection Table) |
| Jitter (electrical) | (See Selection Table) |

### Mechanical data

| | |
|---|---|
| Dimensions | 34 × 20 × 12 mm³ |
| Enclosure rating | IP 69K & IP 67³ |
| Material, housing | ABS |
| Material, front screen | PMMA |
| Type of connection | (See Selection Table) |
| Ambient temperature: operation | -20 … +55 °C[4] |
| Ambient temperature: storage | -20 … +80 °C |
| Weight (plug device) | 10 g |
| Weight (integrated cable) | 20 g |
| Vibration and impact resistance | EN 60947-5-2 |

[1] Max. 10 % ripple, within $U_B$, ~ 50 Hz / 100 Hz     [2] f = 1 / (T × Nyq × 2)     [3] With connected IP 67 / IP 69K plug     [4] UL: -20 … +50 °C
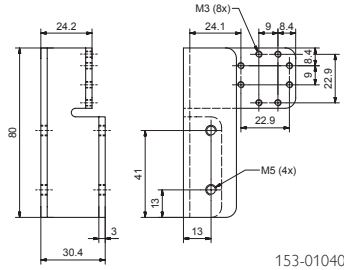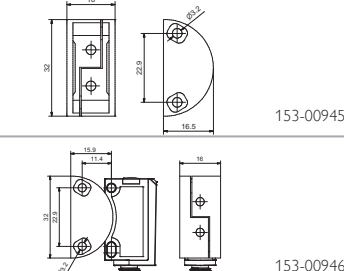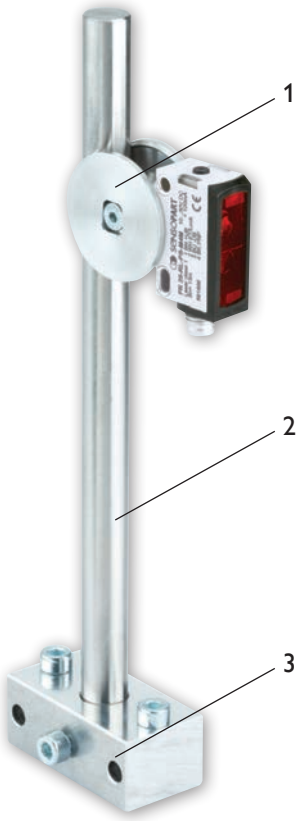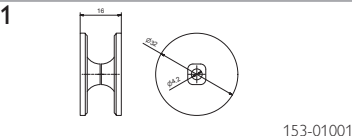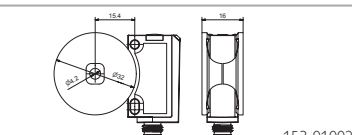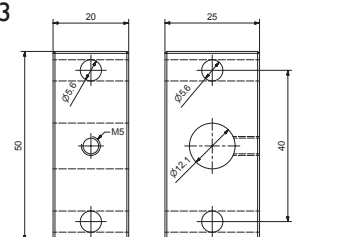
| Switching frequency, f (ti/tp 1:1)[2] | Response time | Jitter (electrical) | Type of connection | Part number | Article number |
|---|---|---|---|---|---|
| ≤ 25000 Hz | ≤ 20 μs | 10 μs | Metal plug, M8×1, 4-pin | FT 25-RGB1-GS-M4M | 607-21011 |
| ≤ 25000 Hz | ≤ 20 μs | 10 μs | Integrated cable: 150 mm with plug M12×1, 4-pin | FT 25-RGB1-GS-KL4 | 607-21010 |
| ≤ 10000 Hz | ≤ 50 μs | 25 μs | Plug, M8×1, 4-pin | FT 25-RGB2-GS-M4 | 607-21017 |
| ≤ 10000 Hz | ≤ 50 μs | 25 μs | Integrated cable: 150 mm with plug M12×1, 4-pin | FT 25-RGB2-GS-KL4 | 607-21018 |

## Plug connection
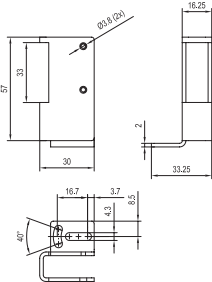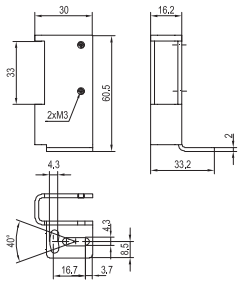


153-00995

## Integrated cable



153-00996

## Connection, 4-pin

| | | | Push-Pull |
|---|---|---|---|
| + | +U$_B$ | 1 BN | |
| | IN | 2 WH | |
| | Q | 4 BK | |
| - | -U$_B$ | 3 BU | |

154-00320

## Signal process



155-01648
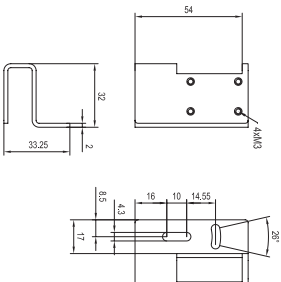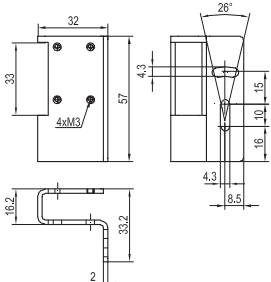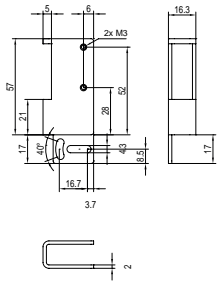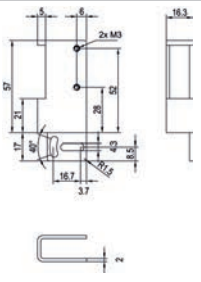
## Accessories

| Connection cables | See accessories |
|---|---|
| Brackets | See accessories |
| | |

# Accessories

## Brackets
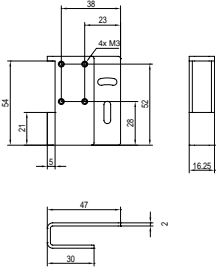
| Brackets for F 25 | | | |
|---|---|---|---|

| | | Part number / Article number | MZ F 25 / 661-01003 |
|---|---|---|---|
| | 153-01040 | Description | Mounting adapter for FT 25 contrast sensors with horizontal or vertical light exit options, with screws<br>Material: stainless steel V2A |
| | | Suitable for | FT 25-W…-KL4<br>FT 25-W…-KL4 |

| | | Part number / Article number | MBD F 25 / 661-01000 |
|---|---|---|---|
| | 153-00945<br>153-00946 | Description | Dovetail clamp mounting, adjustable ± 15°, with screws<br>Material: anodised aluminium |
| | | Suitable for | F 25 |

| | | Part number / Article number | MS F 20 / 558-41000 |
|---|---|---|---|
| | 153-00241 | Description | Mounting bracket with screws<br>Material: nickel-plated steel |
| | | Suitable for | F 20<br>F 25<br>UT 20<br>FL 20 |

| | 1 | Part number / Article number | MBD F 25ST / 661-01001 |
|---|---|---|---|
| | 153-01001<br>153-01002 | Description | Bracket for dovetail on M12 rod, with clamping screw<br>Material: aluminium |
| | | Suitable for | F 25 |

| | 2 | | | Part number / Article number | MST 45-20 / 543-11005<br>MST 45-30 / 543-11006<br>MST 45-40 / 543-11007 |
|---|---|---|---|---|---|
| | x = 200 | MST 45-20 | | Description | Mounting rod with M6 internal thread<br>Material: aluminium |
| | x = 300 | MST 45-30 | | Suitable for | MB ST1 · MP 45<br>MBD F 25ST · MZ 45<br>MS F88-2 · MG 45<br>MS F88-3 |
| | x = 400 | MST 45-40 | 153-00545 | | |

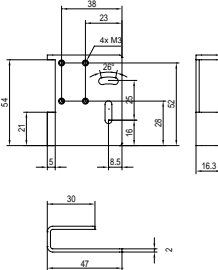| | 3 | Part number / Article number | MB ST1 / 661-01002 |
|---|---|---|---|
| | 153-01000 | Description | Bracket for M12 rods, with clamping screw<br>Material: aluminium |
| | | Suitable for | MST 45-20<br>MST 45-30<br>MST 45-40 |

## Brackets for F 25

| | | | |
|---|---|---|---|
|  | <br>153-01017 | Part number / Article number | MSP F 20-11 / 558-41006 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20     UT 20-150<br>F 25     UT 20-S150<br>FL 20    UT 20-240 |
|  | <br>153-00296 | Part number / Article number | MSP F 20-1 / 558-41004 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20<br>F 25<br>UT 20<br>FL 20 |
|  | <br>153-00908 | Part number / Article number | MSP F 20-23 / 558-41011 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20     UT 20-150<br>F 25     UT 20-S150<br>FL 20    UT 20-240 |
|  | <br>153-00297 | Part number / Article number | MSP F 20-2 / 558-41005 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20     UT 20-150<br>F 25     UT 20-S150<br>FL 20    UT 20-240 |
|  | <br>153-00973 | Part number / Article number | MSP F 20-13 / 558-41008 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20     UT 20-150<br>F 25     UT 20-S150<br>FL 20    UT 20-240 |
|  | <br>153-00972 | Part number / Article number | MSP F 20-12 / 558-41007 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20     UT 20-150<br>F 25     UT 20-S150<br>FL 20    UT 20-240 |

# Accessories

Brackets

| Brackets for F 25 | | | |
|---|---|---|---|
|  | <br>153-00974 | Part number / Article number | MSP F 20-21 / 558-41009 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20    UT 20-150<br>F 25    UT 20-S150<br>FL 20   UT 20-240 |
|  | <br>153-00975 | Part number / Article number | MSP F 20-22 / 558-41010 |
| | | Description | Protective sensor angle bracket with screws, very robust<br>Material: stainless steel V2A |
| | | Suitable for | F 20    UT 20-150<br>F 25    UT 20-S150<br>FL 20   UT 20-240 |

# Accessories

Cables

| Part number | Article number | Description |
|---|---|---|
| **M8, 4-pin** | | |
| K4-2m-G-PUR | 902-50801 | 2 m, straight, PUR |
| K4-5m-G-PUR | 902-51617 | 5 m, straight, PUR |
| K4-10m-G-PUR | 902-51610 | 10 m, straight, PUR |
| K4-2m-W-PUR | 902-50803 | 2 m, 90°, PUR |
| K4-5m-W-PUR | 902-51618 | 5 m, 90°, PUR |
| K4-10m-W-PUR | 902-51629 | 10 m, 90°, PUR |
| K4-2m-W-PL-PUR | 902-51642 | 2 m, 90°, PUR, with indicator LED |
| K4-5m-W-PL-PUR | 902-51643 | 5 m, 90°, PUR, with indicator LED |
| CM4 FG-E-5m-PVC | 902-50221 | 5 m, straight, PVC, with hex nut SW 9 stainless steel (IP 69K) |
| CM4 FW-E-5m-PVC | 902-50222 | 5 m, 90°, PVC, with hex nut SW 9 stainless steel (IP 69K) |
| **M12, 4-pin** | | |
| L4-2m-G-PUR | 902-50805 | 2 m, straight, PUR |
| L4-5m-G-PUR | 902-51612 | 5 m, straight, PUR |
| L4-10m-G-PUR | 902-51628 | 10 m, straight, PUR |
| L4-2m-W-PUR | 902-50807 | 2 m, 90°, PUR |
| L4-5m-W-PUR | 902-51602 | 5 m, 90°, PUR |
| L4-2m-W-PL-PUR | 902-50808 | 2 m, 90°, PUR, with indicator LED |
| L4-5m-W-PL-PUR | 902-51603 | 5 m, 90°, PUR, with indicator LED |
| L4-10m-W-PL-PUR | 902-51604 | 10 m, 90°, PUR, with indicator LED |
| L4S-2m-G-PVC | 902-51632 | 2 m, straight, PVC, shielded |
| L4S-5m-G-PVC | 902-51634 | 5 m, straight, PVC, shielded |
| L4S-2m-W-PVC | 902-51633 | 2 m, 90°, PVC, shielded |
| L4S-5m-W-PVC | 902-51635 | 5 m, 90°, PVC, shielded |
| CL4 FG-E-5m-PVC | 902-50219 | 5 m, straight, PVC, with hex nut SW 14 stainless steel (IP 69K) |
| CL4 FW-E-5m-PVC | 902-50220 | 5 m, 90°, PVC, with hex nut SW 14 stainless steel (IP 69K) |
| L4F/L4M-0,48 PUR | 902-51670 | Extension cable, M12 (90°) to M12 (straight), 0.48 m, PUR |

# We look ahead.

Yesterday, today and in the future.

"We gauge ourselves not by what is possible today, but by our vision of what can be achieved" – this has been our motto since the foundation of SensoPart in 1994. Our goal is to always be a step ahead and to be able to offer our customers the most innovative sensor for industrial automation.

With our easy to integrate VISOR® Vision sensors and our compact laser sensors with an amazing background suppression made in Germany, we stick up to this motto.

Get ready – we still have a lot of ideas for the future.

| SENSOR TECHNOLOGY | VISION |
| --- | --- |
| Light barriers | Vision sensors |
| Proximity switches | Smart cameras |
| Laser sensors | Vision systems |
| Miniature sensors | Object detection |
| Distance sensors | Object measurement |
| Colour sensors | Colour detection |
| Contrast sensors | Code reading |
| Anti-collision sensors | Lighting |
| Slot sensors | Lenses |
| Fibre-optic amplifiers | |
| Inductive sensors | |
| Capacitive sensors | |
| Ultrasonic sensors | |