


F 55 – family of photoelectric sensors with high-quality housings

The compact class with long ranges



 made in Germany



Always sparkling clean

Neither bubble baths with aggressive chemicals nor high-pressure rinsing processes with jets of water or steam can damage the tightly sealed stainless steel housings of the F 55 series. No deposits can adhere during the cleaning process due to the completely smooth housing surface with flush inset operating elements.



TYPICAL F 55
























- Glass-fibre-reinforced plastic or stainless steel housings (IP 69K & IP 67, Ecolab)
- Bright, easily visible, light spot with sharp contour even in daylight
- Precise background suppression and minimal black/white-shift
- User-friendly operation of all diffuse variants via electronic Teach-in button or control line
- Laser or LED options
- Two dovetail guides for simple sensor alignment
- Well thought-out mounting accessories

SensoPart sets new standards in the compact class with its F 55 family of photoelectric sensors. The products in this series combine excellent performance data with a robust housing design and many user-friendly details. They guarantee reliable detection by means of focused laser light or red-light LED with precise background suppression.

The sensors of the F 55 series have a very high light intensity: the photoelectric proximity sensor with background suppression, for example, reaches a scanning distance of up to 5000 mm. The bright, sharply contoured light spot is still easily visible even at

long distances and in intense daylight, considerably simplifying commissioning.

The F 55 series covers all standard applications in industrial automation: whether for part detection in the automotive industry or for sorting tasks in machine construction – the sensors excel everywhere with their excellent performance. The food industry-enabled tightly sealed stainless steel variants (IP 69K) with Ecolab certification – rounding out the comprehensive sensor programme – shine in all regards.

| F 55 – Product Overview | | | | | | | |
|--|---------------|---|---|--|---------------------------|---|------|
| | Type of light | | Adjustment | | Scanning distance / range | Special features | Page |
| Photoelectric proximity sensors with background suppression | | | | | | | |
| FT 55- RLH | Laser |  | Potentiometer  | | 800 mm | | 282 |
| FT 55-RL2H | Laser |  | Potentiometer  | | 1000 mm | Precise small-part detection at long scanning distances | 284 |
| FT 55-RLHP | Laser |  | Teach-in  | | 5000 mm | Very long scanning distances | 286 |
| FT 55B-RH | LED | | Potentiometer  | | 800 mm | | 288 |
| FT 55-RH | LED | | Potentiometer  | | 1200 mm | | 290 |
| FT 55-RHM | LED | | Teach-in  | | 550 mm | Stainless steel housing | 292 |
| Photoelectric proximity sensors | | | | | | | |
| FT 55-RL2 | Laser |  | Teach-in  | | 1200 mm | Detection of slightest grey value differences | 294 |
| FT 55-R | LED | | Teach-in  | | 2000 mm | | 296 |
| FT 55-RM | LED | | Teach-in  | | 1750 mm | Stainless steel housing | 298 |
| Retroreflective photoelectric sensors | | | | | | | |
| FR 55-RL0 | Laser |  | Teach-in  | | 20 m | Autocollimation, most accurate small-part detection | 300 |
| FR 55-RL | Laser |  | Teach-in  | | 14 m | | 302 |
| FR 55-R | LED | | Teach-in  | | 14 m | | 304 |
| FR 55-RM | LED | | Teach-in  | | 13 m | Stainless steel housing | 306 |
| Through-beam photoelectric sensors | | | | | | | |
| FS/FE 55-RL | Laser |  | Teach-in  | | 30 m | | 308 |
| FS/FE 55-R | LED | | Teach-in  | | 25 m | | 310 |
| FS/FE 55-RM | LED | | Teach-in  | | 20 m | Stainless steel housing | 312 |

FT 55-RLH

Laser photoelectric proximity sensor with background suppression



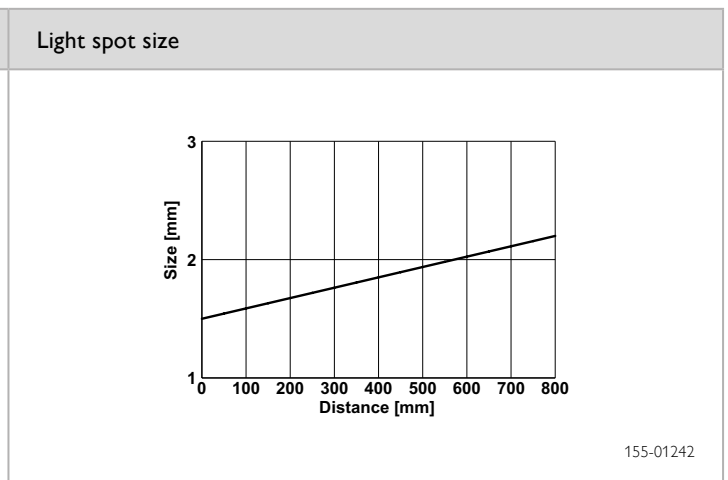
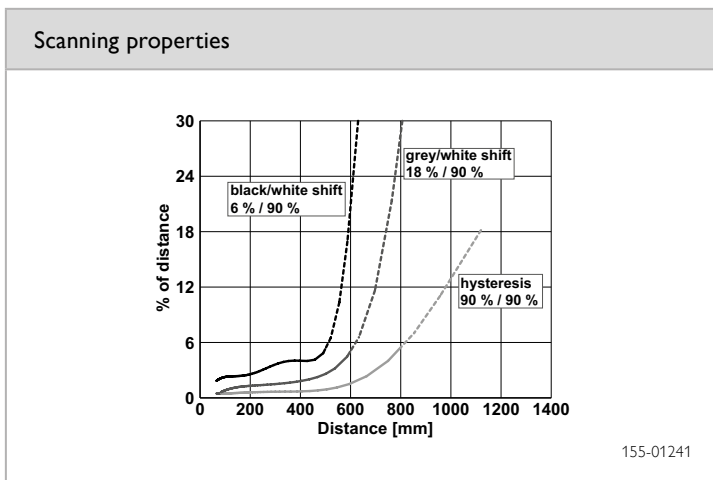
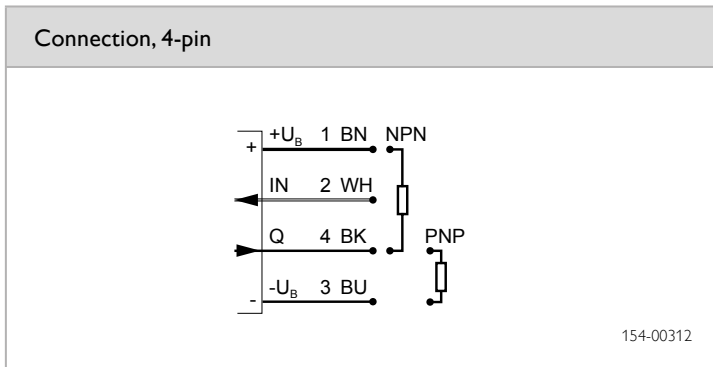
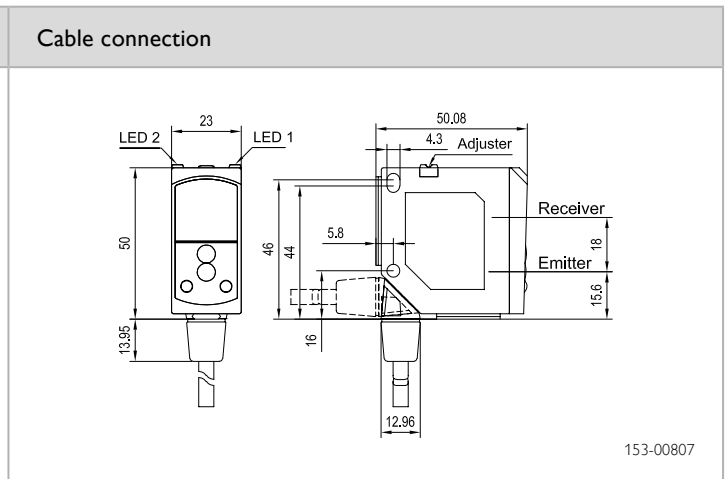
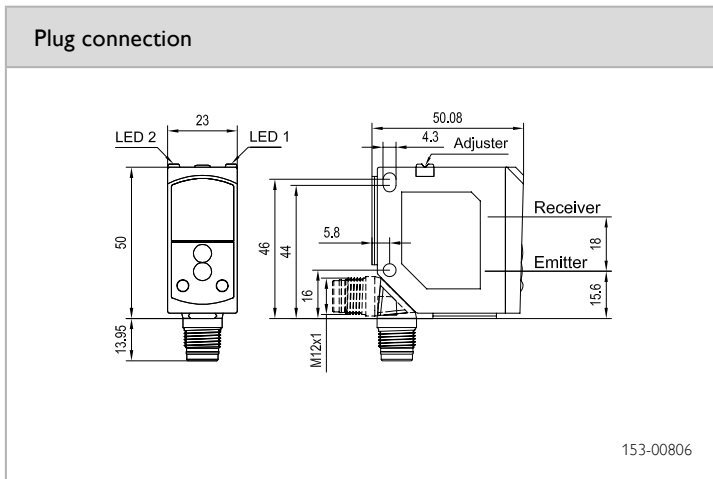
PRODUCT HIGHLIGHTS

- Precisely adjustable background suppression – reliable operation even with highly reflective and glossy backgrounds
- Particularly suitable for the detection of the smallest of objects
- Very small, easily visible laser light spot
- Precise scanning distance adjustment by means of potentiometer
- Plug and cable connection rotatable

| Optical data | | Functions | |
|--|--|---------------------------------|--|
| Scanning distance | 5 ... 800 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | Laser, red, 655 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Scanning distance adjustment | Via potentiometer |
| Laser Class (DIN EN 60825-1: 2008-05) | 1 | Adjustment possibilities | N.O./N.C. via control input |
| | | Default settings | Max. scanning distance (6 %) |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _B | 12 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _B / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 1000 Hz | Weight (cable device) | 125 g |
| Response time | 500 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _B = N.C. -U _B / Open = N.O. | | |

¹ Reference material: white, 90 % reflectivity ² Max. 10 % ripple, within U_B, ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|-----------------|----------------|
| 5 ... 800 mm | PNP | Plug, M12x1, 4-pin | FT 55-RLH-PS-L4 | 623-11018 |
| 5 ... 800 mm | NPN | Plug, M12x1, 4-pin | FT 55-RLH-NS-L4 | 623-11019 |
| 5 ... 800 mm | PNP | Cable, 3 m, 4-wire | FT 55-RLH-PS-K4 | 623-11021 |
| 5 ... 800 mm | NPN | Cable, 3 m, 4-wire | FT 55-RLH-NS-K4 | 623-11022 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 5 ... 800 mm |
| Grey (18 %) | 10 ... 600 mm |
| Black (6 %) | 30 ... 500 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RL2H

Laser photoelectric proximity sensor with background suppression



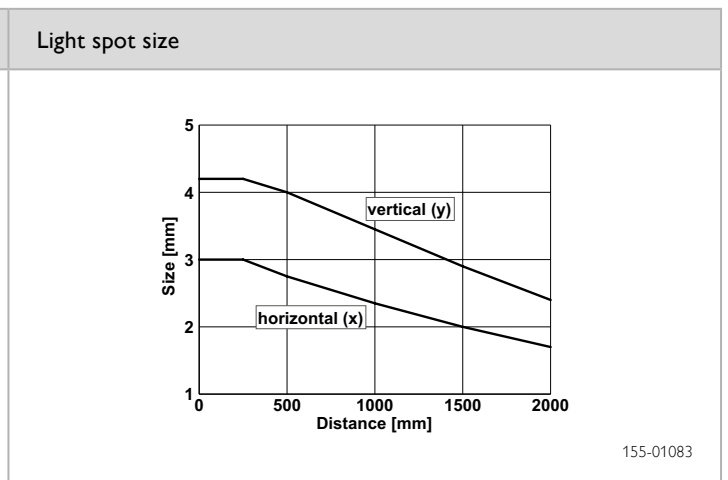
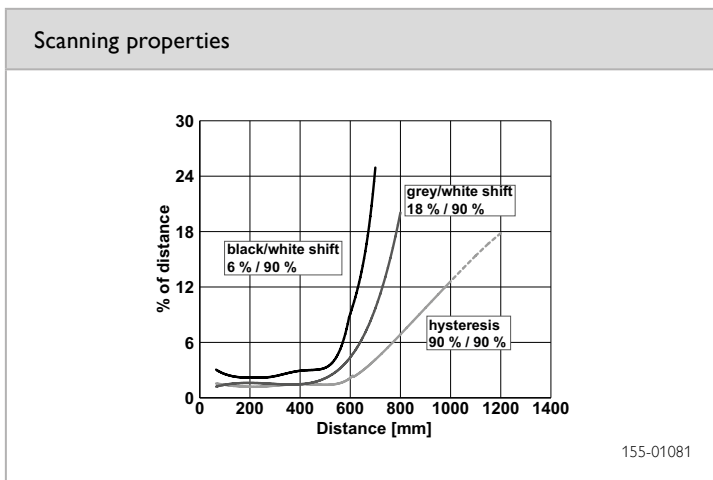
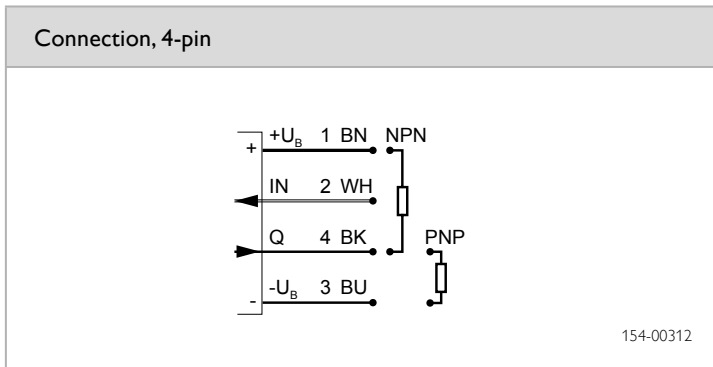
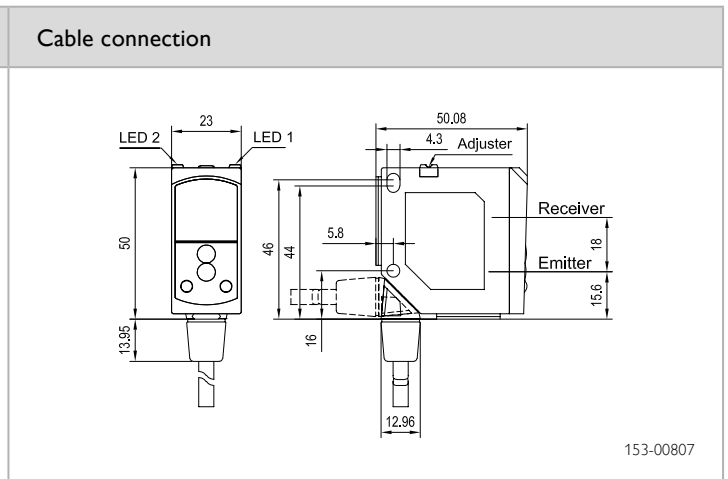
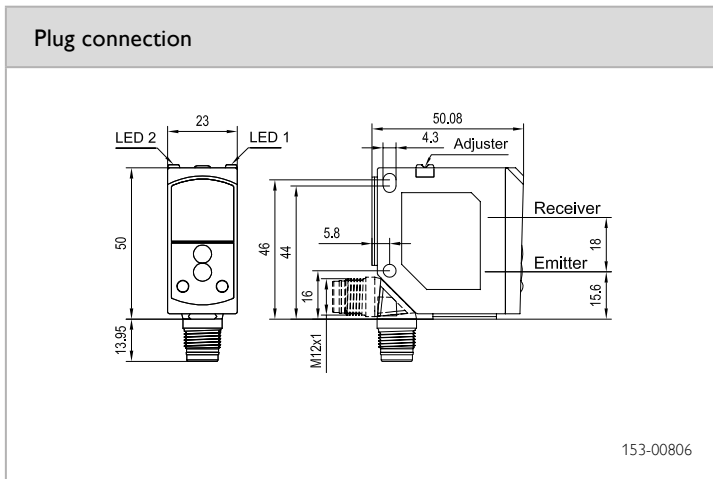
PRODUCT HIGHLIGHTS

- Long scanning distance of 1 m combined with extremely accurate small-part detection
- Precisely adjustable background suppression – reliable operation even with highly reflective and glossy backgrounds
- Very small, easily visible laser light spot
- Precise scanning distance adjustment by means of potentiometer
- Integrated display window for scanning distance adjustment

| Optical data | | Functions | |
|-------------------------------------|--|---------------------------------|--|
| Scanning distance | 5 ... 1000 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | Laser, red, 655 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Scanning distance adjustment | Via potentiometer |
| Laser Class (DIN EN 60825-1:2008-5) | 2 | Adjustment possibilities | N.O./N.C. via control input |
| | | Default settings | $S_n = 500 \text{ mm (6 \%)}$ |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 12 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 1000 Hz | Weight (cable device) | 125 g |
| Response time | 500 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = N.C. -U _b / Open = N.O. | | |

¹ Reference material: white, 90 % reflectivity ² Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|------------------|----------------|
| 5 ... 1000 mm | PNP | Plug, M12x1, 4-pin | FT 55-RL2H-PS-L4 | 623-11006 |
| 5 ... 1000 mm | NPN | Plug, M12x1, 4-pin | FT 55-RL2H-NS-L4 | 623-11007 |
| 5 ... 1000 mm | PNP | Cable, 3 m, 4-wire | FT 55-RL2H-PS-K4 | 623-11009 |
| 5 ... 1000 mm | NPN | Cable, 3 m, 4-wire | FT 55-RL2H-NS-K4 | 623-11010 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 5 ... 1000 mm |
| Grey (18 %) | 10 ... 800 mm |
| Black (6 %) | 15 ... 700 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RLHP

Laser photoelectric proximity sensor with background suppression – Time-of-flight technology (available from Q4/2013)



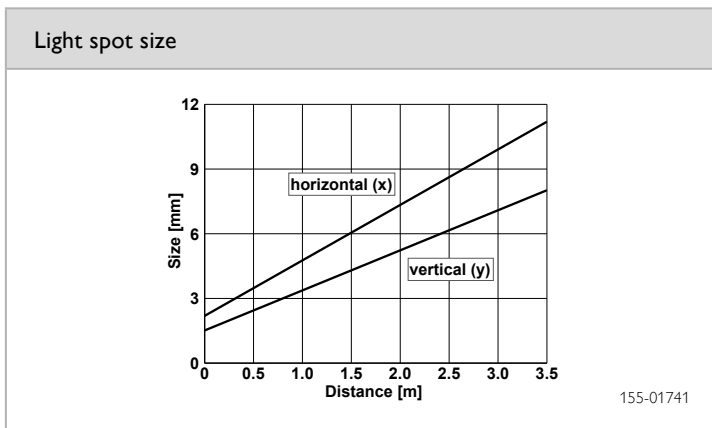
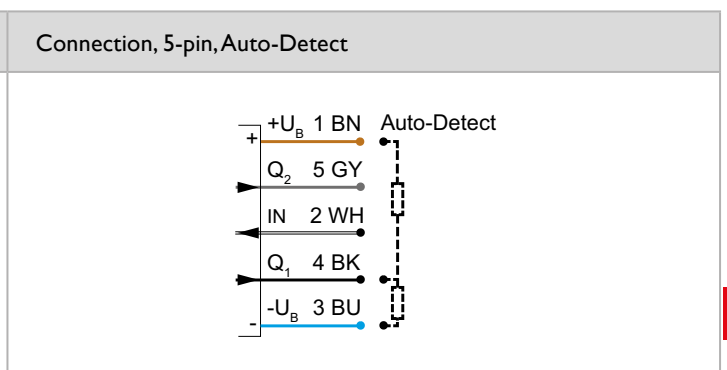
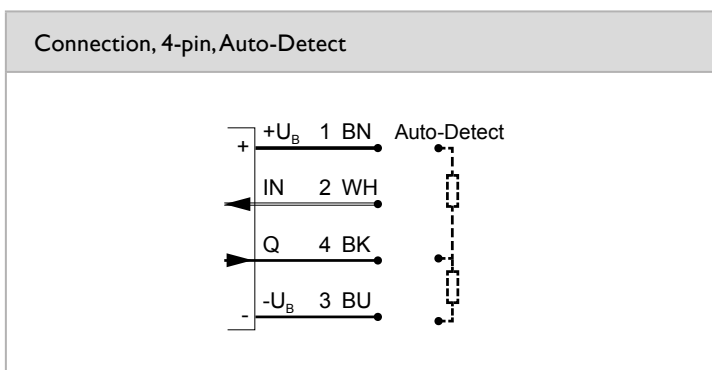
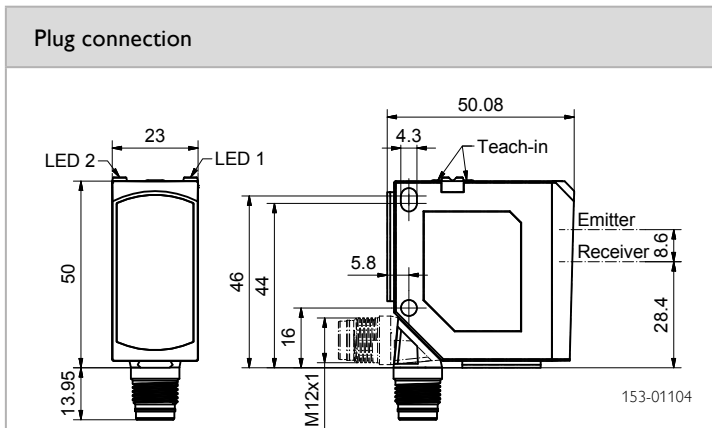
PRODUCT HIGHLIGHTS

- For detection tasks with all object surfaces at high scanning distances
- Reliable object detection even with inclined objects or bright, highly reflective or luminous backgrounds
- Compact housing for an easy integration
- Simple teach-in (also external)
- Clearly visible and precise laser light spot (laser class 1) for an easy alignment and full eye safety

| Optical data | | Functions | |
|-------------------------------------|--|-------------------------------------|---|
| Scanning distance | 0 ... 5 m (see Selection Table) ¹ | Indicator LED 1 green | Operating voltage indicator |
| Adjustment range | 0.1 ... 5 mm | Indicator LED 1 yellow ² | Switching output indicator Q2 |
| Hysteresis | ± 15 ... 20 mm | Indicator LED 2 yellow | Switching output indicator Q resp. Q1 |
| Type of light | Laser, red 650 nm | Scanning distance adjustment | Via Teach-in Button and control input |
| Laser class (DIN EN 60825-1:2008-5) | 1 | Adjustment possibilities | N.O. / N.C. via Teach-in Button and control input |
| | | Default settings | Key lock via control input |
| | | | Max. scanning distance and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage +U _b | 18 ... 30V DC | Dimensions | 50 x 50 x 23 mm ³ |
| No-load current I ₀ | ≤ 60 mA | Enclosure rating | IP 67 & IP 69K ³ |
| Output current I _e Q | ≤ 100 mA | Material, housing | ABS |
| Protection circuits | Reverse polarity protection U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection class | 2 | Type of connection | See Selection table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -40 ... +60 °C |
| Switching output Q | 1 x PNP/NPN/Auto-Detect 2 x PNP/NPN/Auto-Detect | Ambient temperature: storage | -40 ... +80 °C |
| Output function | N.O. / N.C. | Weight (plug device) | 125 g |
| Switching frequency f (ti/tp 1:1) Q | ≤ 500 Hz | Resistance to vibration and impacts | EN 60947-5-2 |
| Response time Q | 1 ms | | |
| Temperature drift | < 0.1 %/K | | |
| Warm-up time | 20 min. | | |
| Control input IN | +U _b = Teach-in -U _b = Button locked Open = normal operation | | |

¹ Reference material 90 % reflectivity ² Only variants with 2 switching outputs ³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part Number | Article number |
|-------------------|------------------|--------------------|---------------------|----------------|
| 0 ... 5 m | 1 x Auto-Detect | Plug, M12x1, 4-pin | FT 55-RLHP2-PNS-L4 | 623-11031 |
| 0 ... 5 m | 2 x Auto-Detect | Plug, M12x1, 5-pin | FT 55-RLHP2-2PNS-L5 | 623-11034 |



| Reference material | Scanning distance |
|--------------------|-------------------|
| White (90 %) | 0.1 ... 5 m |
| Grey (18 %) | 0.1 ... 5 m |
| Black (6 %) | 0.1 ... 3 m |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55B-RH

Photoelectric proximity sensor with background suppression



PRODUCT HIGHLIGHTS

- Precisely adjustable background suppression
- Reliable switching despite differing object colours and surfaces
- Simple alignment thanks to easily visible light spot
- Plug and cable connection rotatable

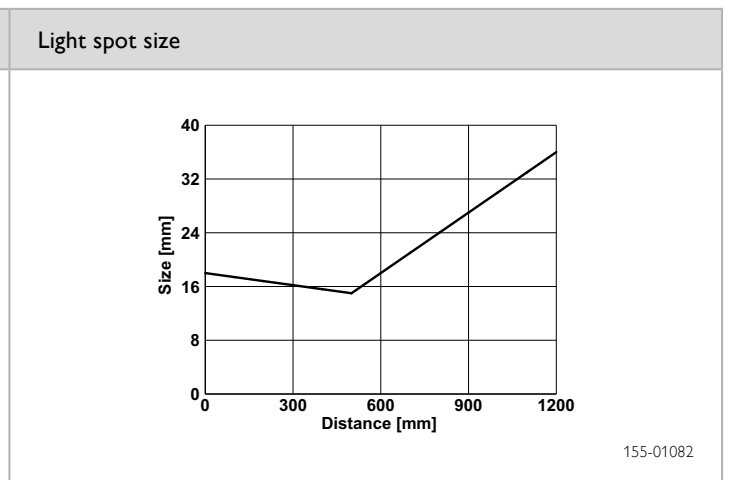
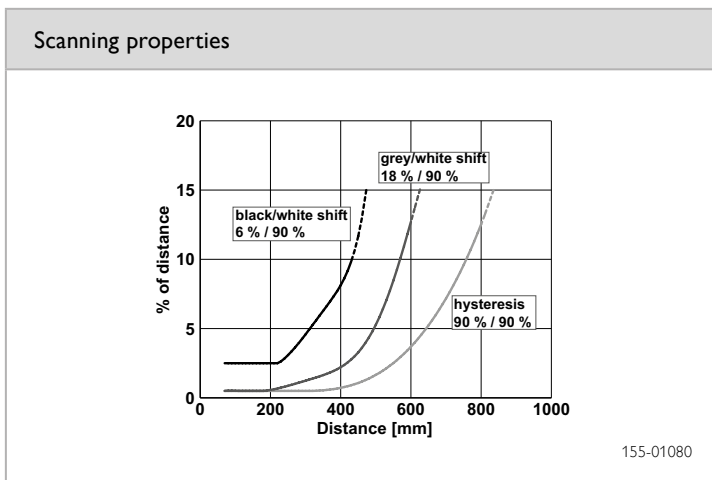
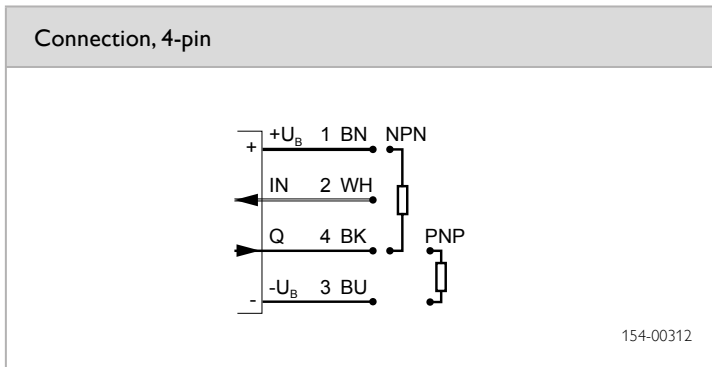
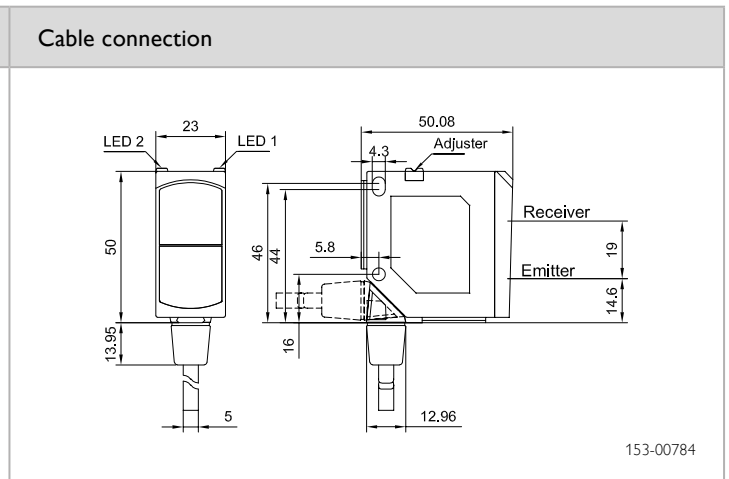
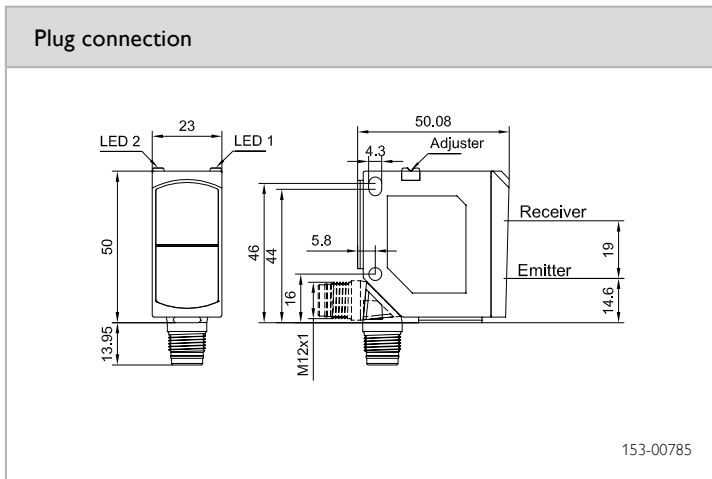
| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Scanning distance | 3 ... 800 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | LED, red, 640 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Scanning distance adjustment | Via potentiometer |
| | | Adjustment possibilities | N.O./N.C. via control input |
| | | Default settings | Max. scanning distance (6 %) |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _B | 10 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _B / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (cable) | 125 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _B = N.C. -U _B / Open = N.O. | | |

¹ Reference material: white, 90 % reflectivity

² Max. 10 % ripple, within U_B, ~ 50 Hz / 100 Hz

³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|-----------------|----------------|
| 3 ... 800 mm | PNP | Plug, M12x1, 4-pin | FT 55B-RH-PS-L4 | 623-11012 |
| 3 ... 800 mm | NPN | Plug, M12x1, 4-pin | FT 55B-RH-NS-L4 | 623-11013 |
| 3 ... 800 mm | PNP | Cable 3 m, 4-wire | FT 55B-RH-PS-K4 | 623-11014 |
| 3 ... 800 mm | NPN | Cable 3 m, 4-wire | FT 55B-RH-NS-K4 | 623-11015 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 3 ... 800 mm |
| Grey (18 %) | 5 ... 600 mm |
| Black (6 %) | 15 ... 450 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RH

Photoelectric proximity sensor with background suppression



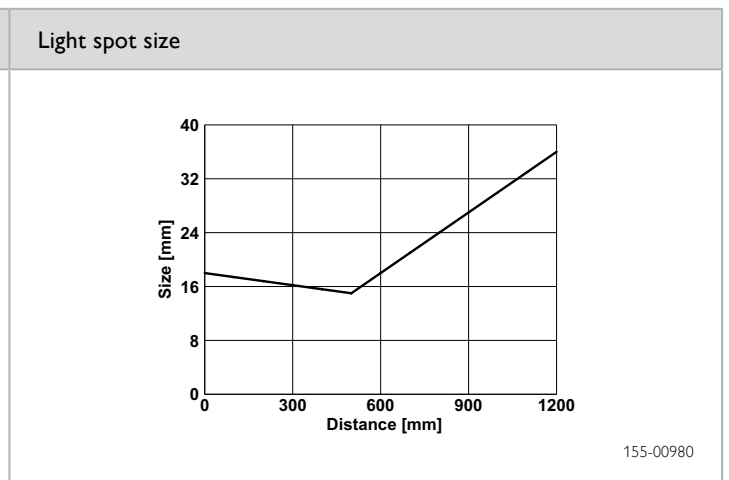
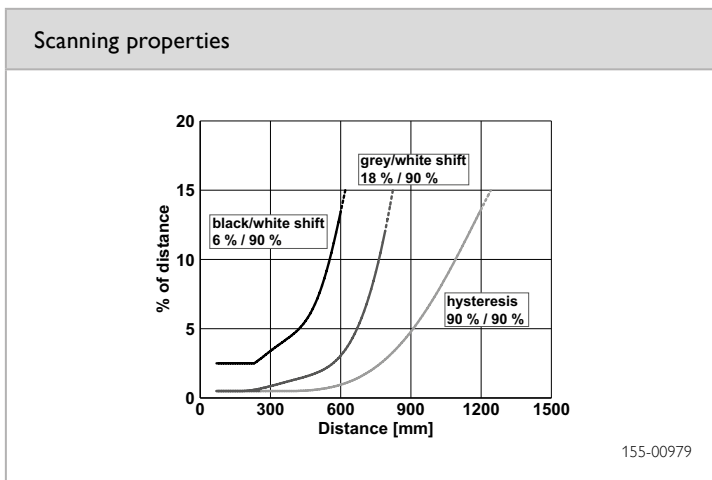
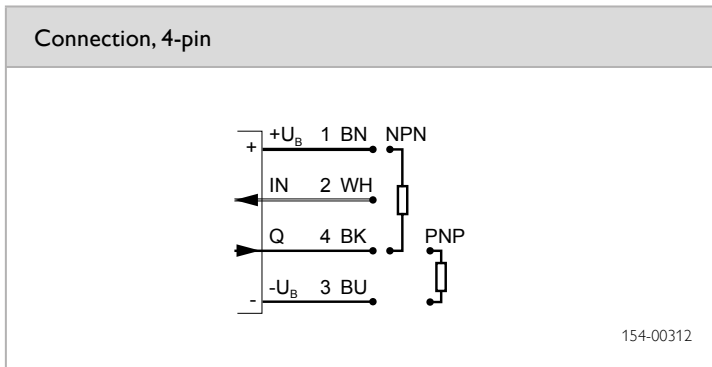
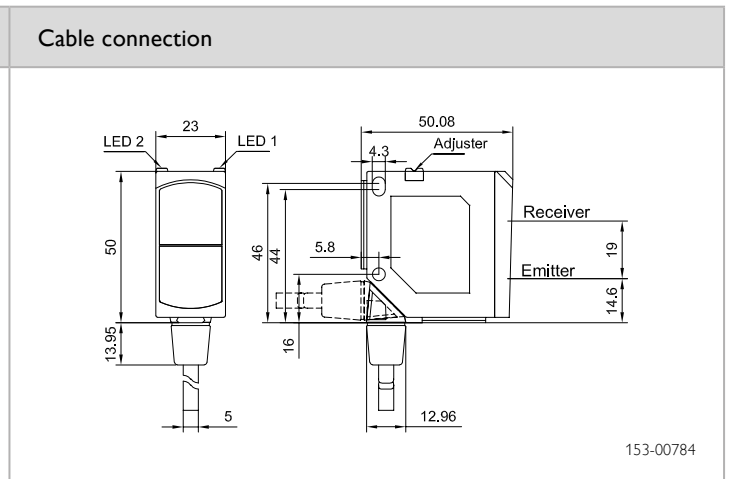
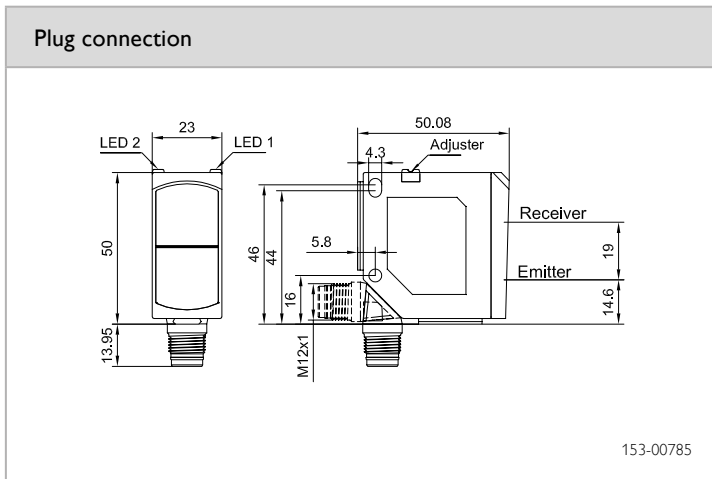
PRODUCT HIGHLIGHTS

- Long scanning distance of 1.20 m
- Precisely adjustable background suppression – reliable operation even with highly reflective and glossy backgrounds
- Reliable suppression of ambient light, such as sunlight and halogen lamps
- Precise scanning distance adjustment by means of potentiometer

| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Scanning distance | 3 ... 1200 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | LED, red, 640 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Scanning distance adjustment | Via potentiometer |
| | | Adjustment possibilities | N.O./N.C. via control input |
| | | Default settings | S _n = 500 mm (6 %) |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (cable device) | 125 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = N.C. -U _b / Open = N.O. | | |

¹ Reference material: white, 90 % reflectivity ² Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|----------------|----------------|
| 3 ... 1200 mm | PNP | Plug, M12x1, 4-pin | FT 55-RH-PS-L4 | 623-11000 |
| 3 ... 1200 mm | NPN | Plug, M12x1, 4-pin | FT 55-RH-NS-L4 | 623-11001 |
| 3 ... 1200 mm | PNP | Cable, 3 m, 4-wire | FT 55-RH-PS-K4 | 623-11003 |
| 3 ... 1200 mm | NPN | Cable, 3 m, 4-wire | FT 55-RH-NS-K4 | 623-11004 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 3 ... 1200 mm |
| Grey (18 %) | 5 ... 800 mm |
| Black (6 %) | 10 ... 600 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RHM

Photoelectric proximity sensor with background suppression – stainless steel housing



PRODUCT HIGHLIGHTS

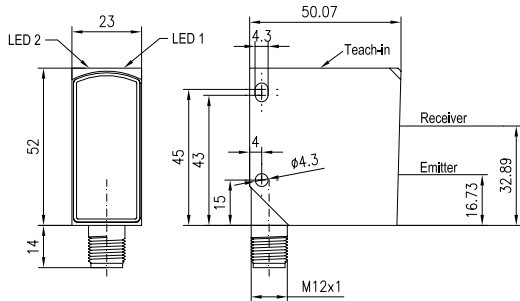
- Minimum black / white-shift for reliable switching regardless of object colour and surface
- Stable stainless steel housing – ideal for use in hygiene zones
- Housing concept designed for intensive cleaning processes in the food industry
- Sensor adjustment via teach-in and control input

| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Scanning distance | 3 ... 550 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Adjustment range | 100 ... 550 mm ¹ | Indicator LED, yellow | Switching output indicator / functional reserve indicator |
| Type of light | LED, red, 640 nm | Scanning distance adjustment | Via Teach-in button and control input |
| Light spot size | See diagram | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. scanning distance and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 52 x 50.07 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | Stainless steel, 316L |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Power On Delay | < 300 ms | Type of connection | See Selection Table |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: operation | -20 ... +60 °C |
| Output function | N.O./N.C. | Ambient temperature: storage | -20 ... +80 °C |
| Switching frequency, f (ti/tp 1:1) | ≤ 400 Hz | Weight (plug device) | 145 g |
| Response time | 1.25 ms | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: white, 90 % reflectivity ² Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

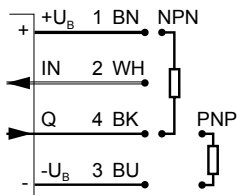
| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|-----------------|----------------|
| 3 ... 550 mm | PNP | Plug, M12x1, 4-pin | FT 55-RHM-PS-L4 | 623-11025 |
| 3 ... 550 mm | NPN | Plug, M12x1, 4-pin | FT 55-RHM-NS-L4 | 623-11026 |

Plug connection



153-00800

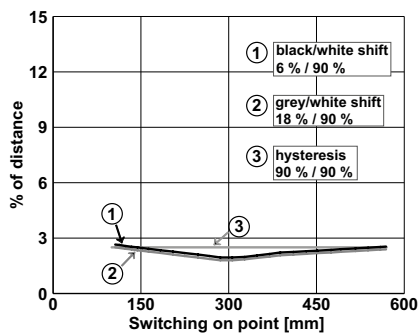
Connection, 4-pin



154-00312

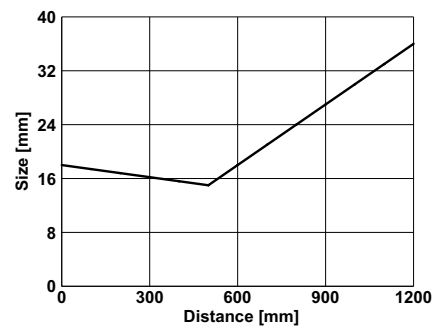
8

Scanning properties



155-01286

Light spot size



155-00980

| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 3 ... 550 mm |
| Grey (18 %) | 12 ... 550 mm |
| Black (6 %) | 20 ... 550 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RL2

Diffuse laser photoelectric proximity sensor



PRODUCT HIGHLIGHTS

- Differentiation of even the slightest of grey value differences
- Sensor adjustment via teach-in and control input
- Very small, easily visible laser light spot
- Plug and cable connection rotatable

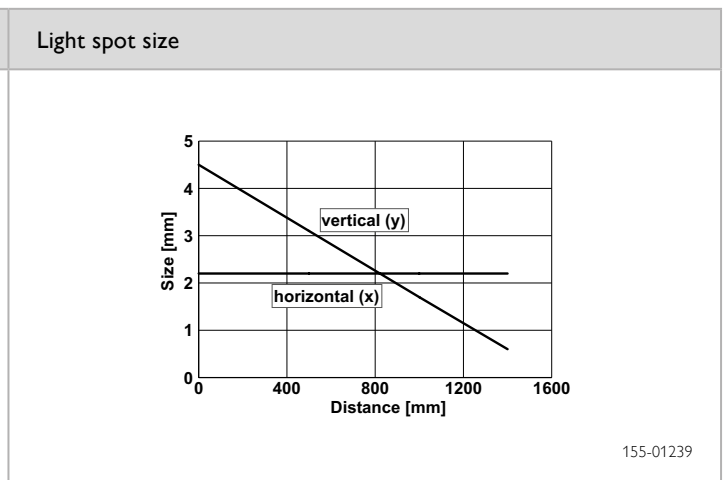
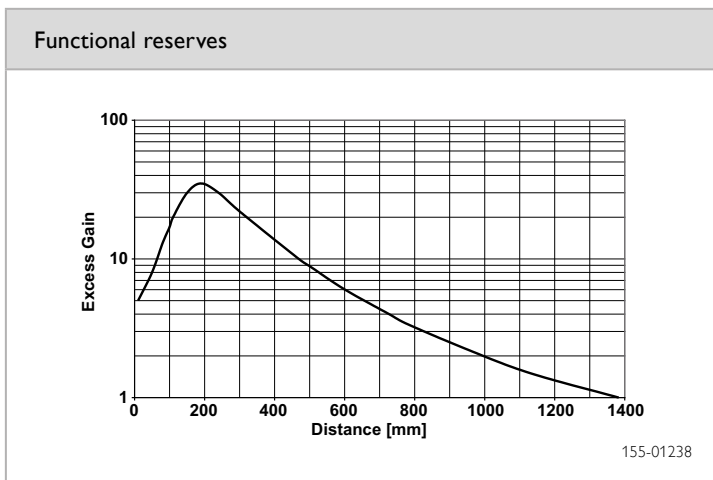
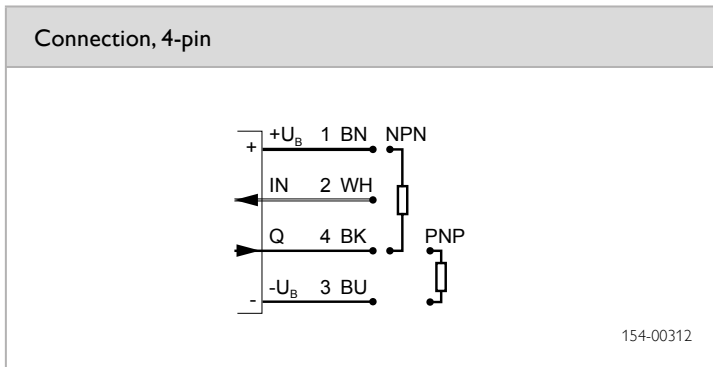
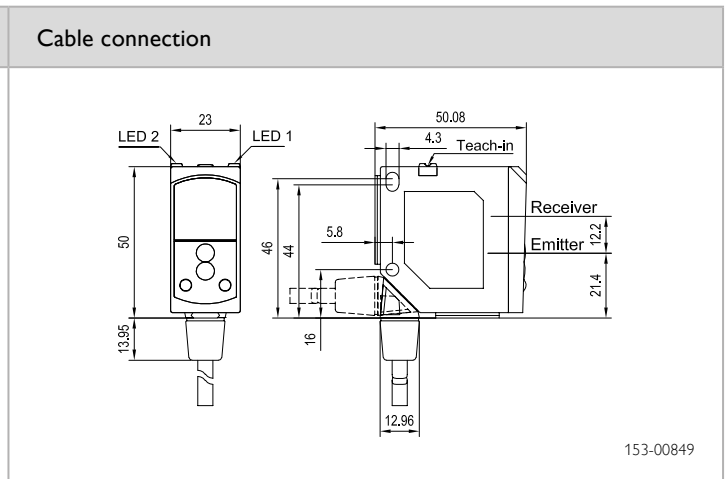
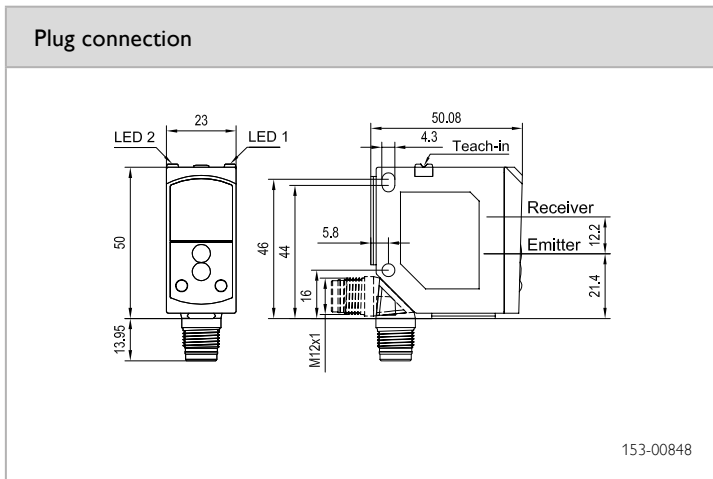
| Optical data | | Functions | |
|-------------------------------------|--|---------------------------------|--|
| Scanning distance | 5 ... 1200 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | Laser, red, 655 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Sensitivity adjustment | Via Teach-in button and control input |
| Laser Class (DIN EN 60825-1:2008-5) | 2 | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| Hysteresis | ≤ 15 % | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. scanning distance and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (cable device) | 125 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: white, 90 % reflectivity

² Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz

³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|-----------------|----------------|
| 5 ... 1200 mm | PNP | Plug, M12x1, 4-pin | FT 55-RL2-PS-L4 | 622-21006 |
| 5 ... 1200 mm | NPN | Plug, M12x1, 4-pin | FT 55-RL2-NS-L4 | 622-21007 |
| 5 ... 1200 mm | PNP | Cable, 3 m, 4-wire | FT 55-RL2-PS-K4 | 622-21009 |
| 5 ... 1200 mm | NPN | Cable, 3 m, 4-wire | FT 55-RL2-NS-K4 | 622-21010 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 5 ... 1200 mm |
| Grey (18 %) | 10 ... 700 mm |
| Black (6 %) | 100 ... 400 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-R

Diffuse photoelectric proximity sensor



PRODUCT HIGHLIGHTS

- Differentiation of even the slightest of grey value differences
- Sensor adjustment via teach-in and control input
- Simple alignment thanks to easily visible light spot
- Plug and cable connection rotatable

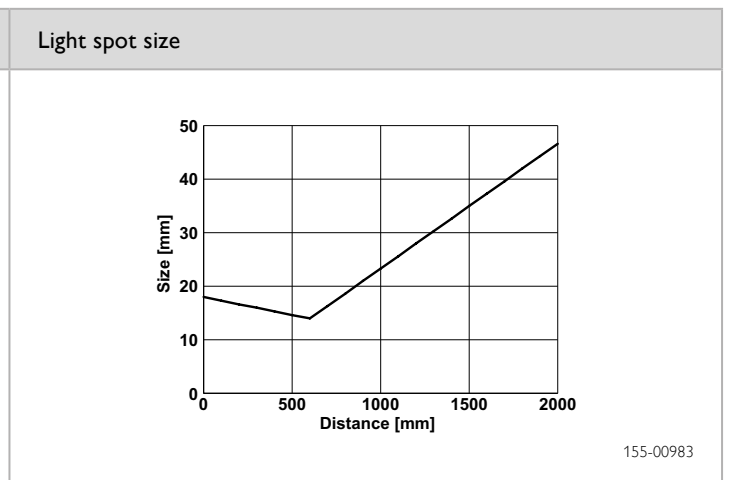
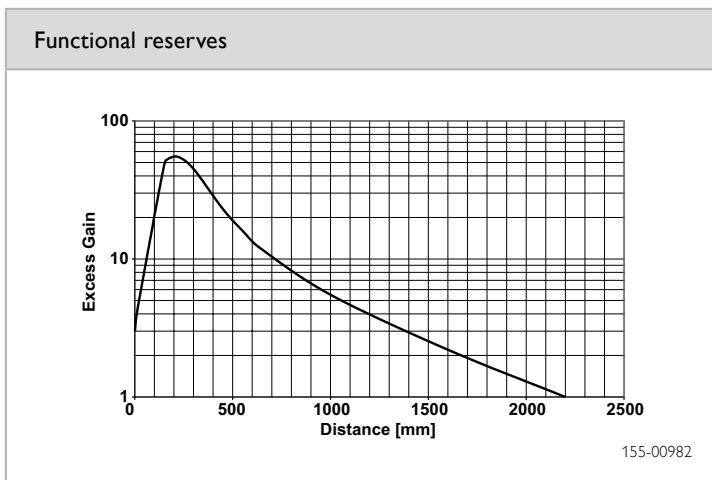
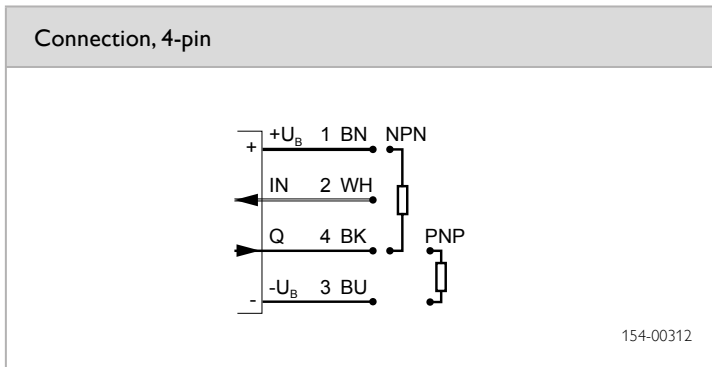
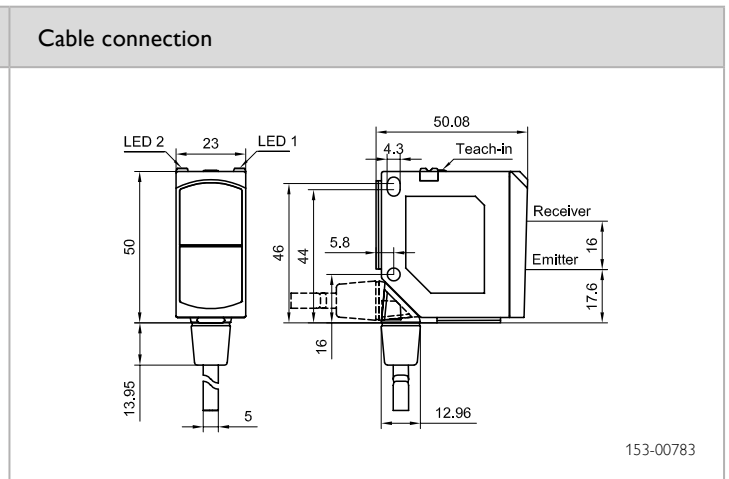
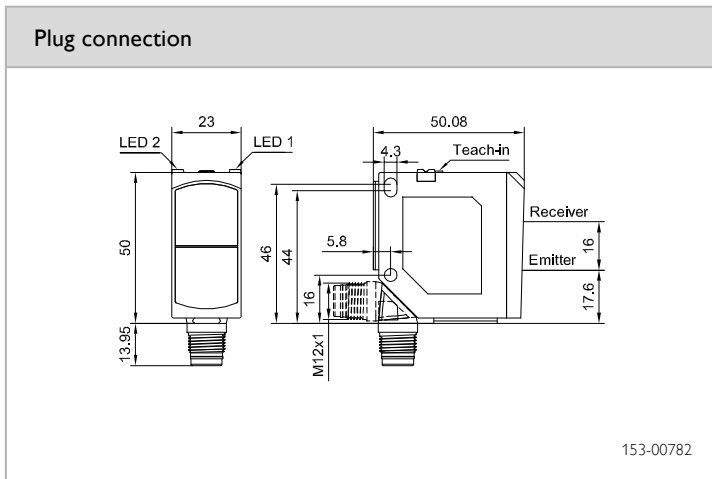
| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Scanning distance | 5 ... 2000 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | LED, red, 640 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Sensitivity adjustment | Via Teach-in button and control input |
| | | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. scanning distance and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _B | 10 ... 30V DC ² | Dimensions | 50 x 50.08 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _B / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (cable device) | 125 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _B = teach-in -U _B = button locked Open = normal operation | | |

¹ Reference material: white, 90 % reflectivity

² Max. 10 % ripple, within U_B, ~ 50 Hz / 100 Hz

³ With connected IP 67 / IP 69K plug

| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|---------------|----------------|
| 5 ... 2000 mm | PNP | Plug, M12x1, 4-pin | FT 55-R-PS-L4 | 622-21000 |
| 5 ... 2000 mm | NPN | Plug, M12x1, 4-pin | FT 55-R-NS-L4 | 622-21001 |
| 5 ... 2000 mm | PNP | Cable, 3 m, 4-wire | FT 55-R-PS-K4 | 622-21003 |
| 5 ... 2000 mm | NPN | Cable, 3 m, 4-wire | FT 55-R-NS-K4 | 622-21004 |



| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 5 ... 2000 mm |
| Grey (18 %) | 10 ... 1200 mm |
| Black (6 %) | 90 ... 600 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FT 55-RM

Diffuse photoelectric proximity sensor – stainless steel housing



PRODUCT HIGHLIGHTS

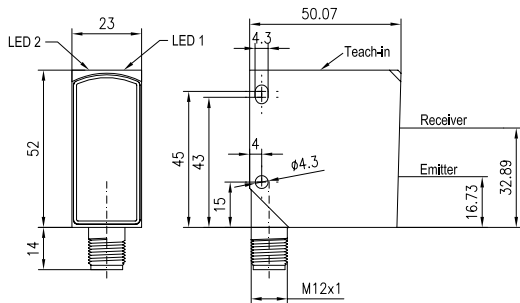
- Stable stainless steel housing – ideal for use in hygiene zones, e.g. in the food and beverages industries
- Housing concept designed for intensive cleaning processes
- Sensor adjustment via teach-in and control input
- Simple alignment thanks to easily visible light spot

| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Scanning distance | 0 ... 1750 mm ¹ | Indicator LED, green | Operating voltage indicator |
| Type of light | LED, red, 640 nm | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Light spot size | See diagram | Sensitivity adjustment | Via Teach-in button and control input |
| | | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. scanning distance and N.O. |
| | | | |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 52 x 50.07 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | Stainless steel, 316L |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Power On Delay | < 300 ms | Type of connection | See Selection Table |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: operation | -20 ... +60 °C |
| Output function | N.O./N.C. | Ambient temperature: storage | -20 ... +80 °C |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (plug device) | 138 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: white, 90 % reflectivity ² Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

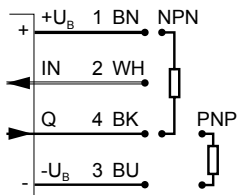
| Scanning distance | Switching output | Type of connection | Part number | Article number |
|-------------------|------------------|--------------------|----------------|----------------|
| 0 ... 1750 mm | PNP | Plug, M12x1, 4-pin | FT 55-RM-PS-L4 | 622-21012 |
| 0 ... 1750 mm | NPN | Plug, M12x1, 4-pin | FT 55-RM-NS-L4 | 622-21013 |

Plug connection



153-00800

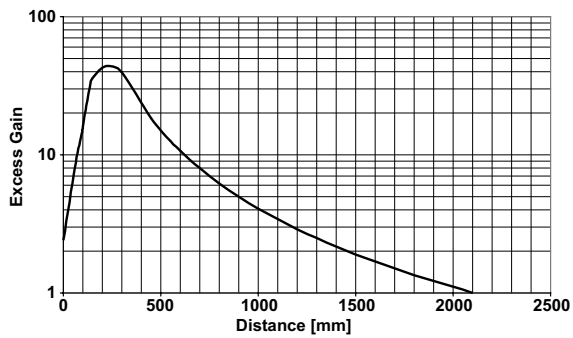
Connection, 4-pin



154-00312

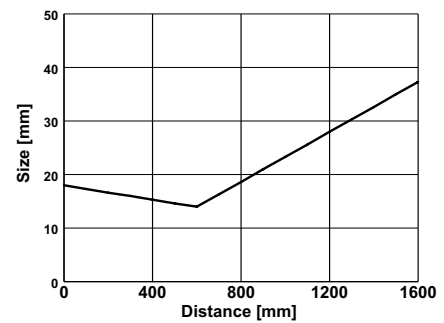
8

Functional reserves



155-01163

Light spot size



155-01111

| Reference material | Detection range |
|--------------------|-----------------|
| White (90 %) | 0 ... 1750 mm |
| Grey (18 %) | 15 ... 1100 mm |
| Black (6 %) | 90 ... 550 mm |

Accessories

| | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FR 55-RLO

Autocollimation laser retroreflective photoelectric sensor



PRODUCT HIGHLIGHTS

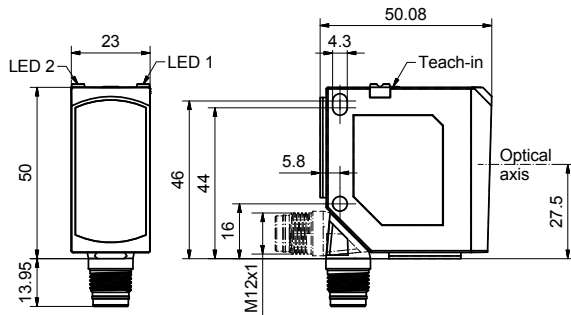
- Reliable small-part detection from a size of 0.2 mm at a scanning distance of 0–5 m
- Precise front-edge detection even in fastest automation processes thanks to a high switching frequency of 5 kHz
- Reliable detection of objects through the smallest of openings thanks to autocollimation; therefore sensor can be placed outside any danger zone
- No blind zone - detection from a range of 0 mm

| Optical data | | Functions | |
|--|--|---------------------------------|--|
| Limit range | 0 ... 25 m ¹ | Indicator LED, green | Operating voltage indicator |
| Operating range | 0 ... 20 m ¹ | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | Laser, red, 655 nm | Sensitivity adjustment | Via Teach-in button and control input |
| Light spot size | See diagram | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| Laser Class (DIN EN 60825-1:2008-5) | 1 | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| Polarising filter | Yes | Default settings | Max. range and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 50 x 50.08 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | See Selection Table | Vibration and impact resistance | EN 60947-5-2 |
| Response time | See Selection Table | | |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: R5/L reflector ² Max. 10 % ripple, within U_b ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

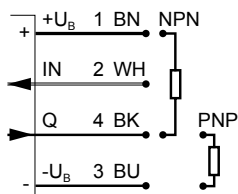
| Switching frequency f (ti/tp 1:1) ² | Response time | Switching output | Type of connection | Part number | Article number |
|--|---------------|------------------|--------------------|------------------|----------------|
| ≤ 5 kHz | 100 μs | PNP | Plug M12x1, 4-pin | FR 55-RLO1-PS-L4 | 621-11021 |
| ≤ 5 kHz | 100 μs | NPN | Plug M12x1, 4-pin | FR 55-RLO1-NS-L4 | 621-11022 |
| ≤ 2,5 kHz | 200 μs | PNP | Plug M12x1, 4-pin | FR 55-RLO2-PS-L4 | 621-11023 |
| ≤ 2,5 kHz | 200 μs | NPN | Plug M12x1, 4-pin | FR 55-RLO2-NS-L4 | 621-11024 |

Plug connection



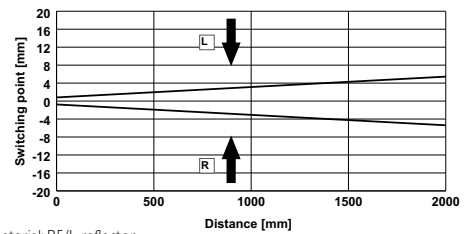
153-01090

Connection, 4-pin



154-00312

Lateral object approach

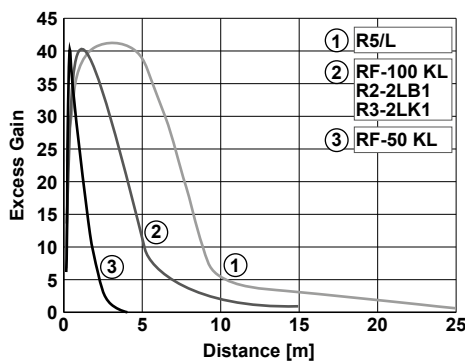


Reference material: R5/L reflector

155-01724

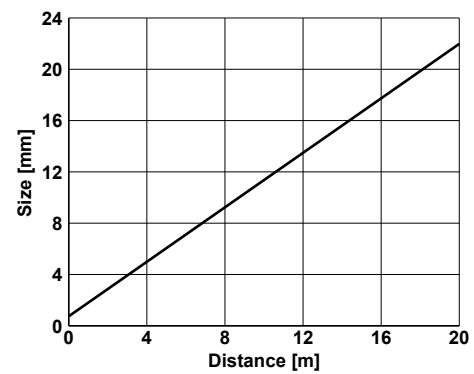
8

Functional reserves



155-01723

Light spot size



155-01722

| Reflector | Operating range (min./max. reflector distance) | Accessories | |
|-----------|---|-------------------|----------------|
| | | Connection cables | From Page A-32 |
| R5/L | 0 ... 20 m | Brackets | From Page A-4 |
| RF-100 KL | 0 ... 15 m | | From Page A-4 |
| R2-2LB1 | 0 ... 15 m | | |
| R3-2LK1 | 0 ... 15 m | | |
| RF-50 KL | 0 ... 3 m | | |

FR 55-RL

Laser retroreflective photoelectric sensor



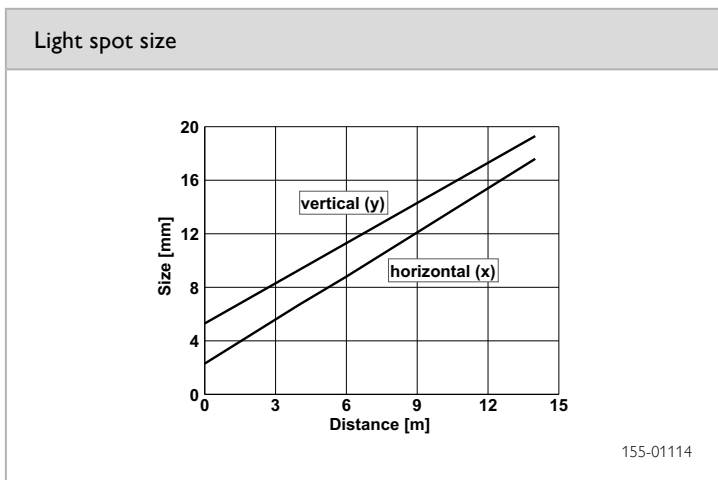
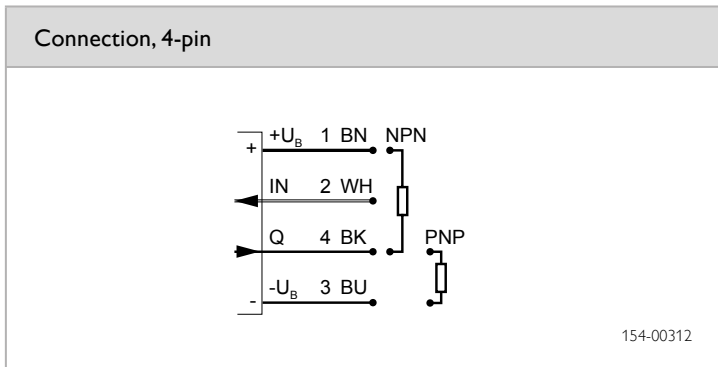
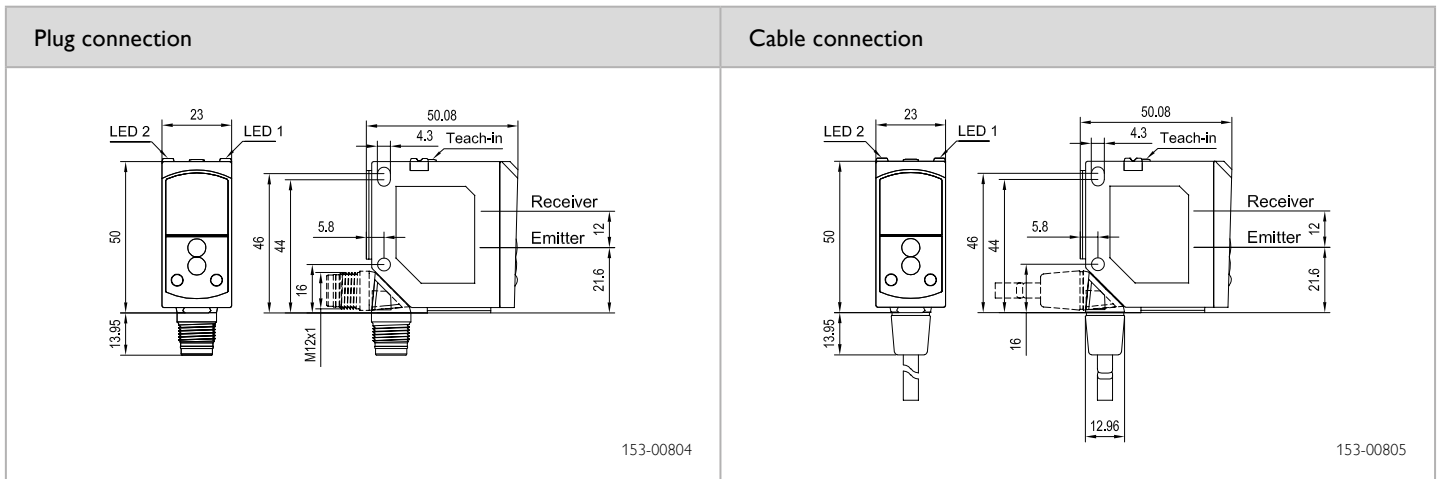
PRODUCT HIGHLIGHTS

- Particularly suitable for the detection of the smallest of objects – smallest detectable part < 2 mm
- Bright, precise laser light spot in Laser Class 1
- Suitable for a wide variety of different reflectors
- Sensor adjustment via teach-in and control input

| Optical data | | Functions | |
|--|---|---------------------------------|--|
| Limit range | 0.3 ... 14 m ¹ | Indicator LED, green | Operating voltage indicator |
| Operating range | 0.3 ... 12 m ¹ | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | Laser, red, 655 nm | Sensitivity adjustment | Via Teach-in button and control input |
| Light spot size | See diagram | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| Laser Class (DIN EN 60825-1:2008-5) | 1 | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| Polarising filter | Yes | Default settings | Max. range and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 50 × 50.08 × 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 2000 Hz | Weight (cable device) | 125 g |
| Response time | 250 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in - U _b = button locked Open = normal operation | | |

¹ Reference material: R5/L reflector ² Max. 10 % ripple, within U_b ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|----------------|----------------|
| 0.3 ... 12 m | PNP | Plug, M12x1, 4-pin | FR 55-RL-PS-L4 | 621-11006 |
| 0.3 ... 12 m | NPN | Plug, M12x1, 4-pin | FR 55-RL-NS-L4 | 621-11007 |
| 0.3 ... 12 m | PNP | Cable, 3 m, 4-wire | FR 55-RL-PS-K4 | 621-11009 |
| 0.3 ... 12 m | NPN | Cable, 3 m, 4-wire | FR 55-RL-NS-K4 | 621-11010 |



| Reflector / reflective foil* | Operating range |
|------------------------------|-----------------|
| R5/L | 0.3 ... 12 m |
| RF-100 KL* | 0.2 ... 6 m |

Accessories

| | |
|-------------------|----------------|
| Reflectors | From Page A-16 |
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |

FR 55-R

Retroreflective photoelectric sensor



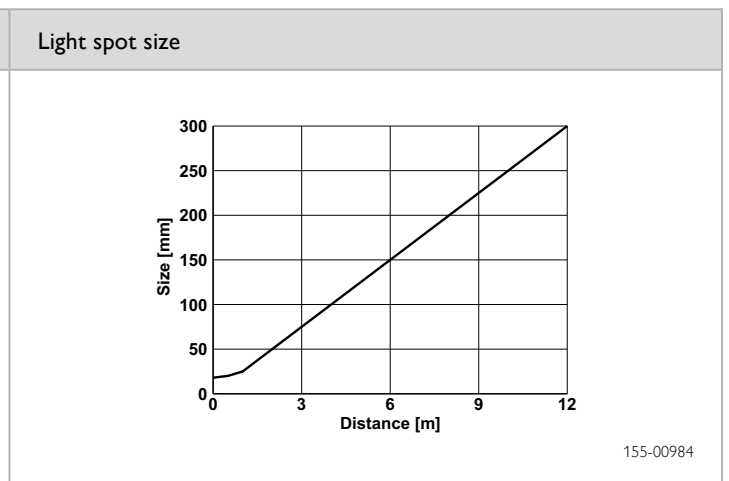
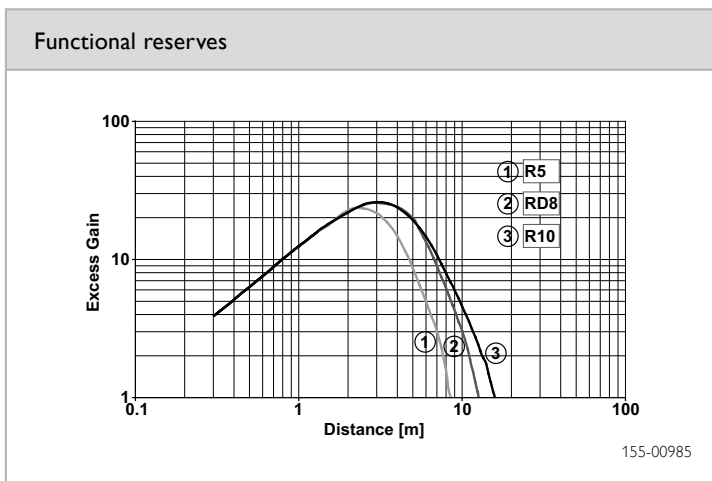
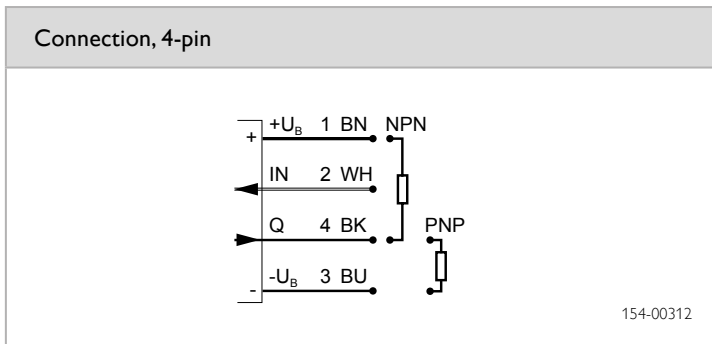
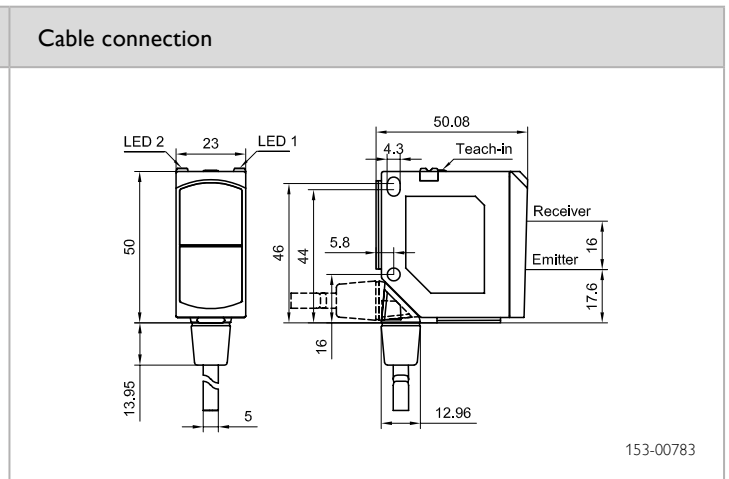
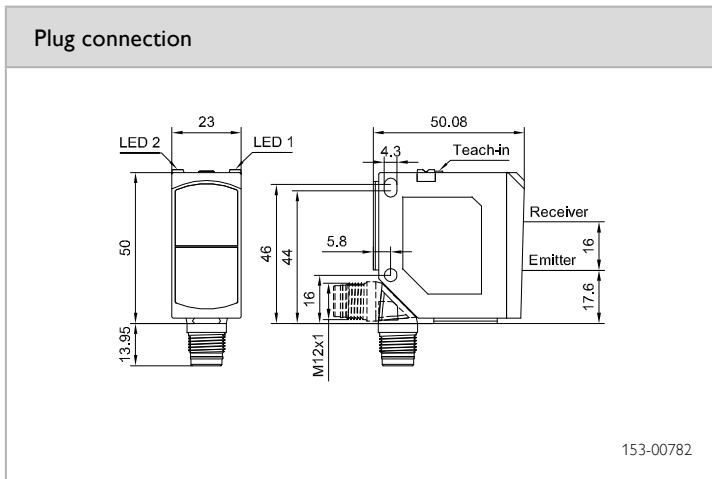
PRODUCT HIGHLIGHTS

- Simple alignment thanks to easily visible light spot
- Suitable for a wide variety of different reflectors
- Sensor adjustment via teach-in and control input
- Plug and cable connection rotatable

| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Limit range | 0.3 ... 14 m ¹ | Indicator LED, green | Operating voltage indicator |
| Operating range | 0.3 ... 12 m ¹ | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | LED, red, 640 nm | Sensitivity adjustment | Via Teach-in button and control input |
| Light spot size | See diagram | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| Polarising filter | Yes | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | S _n = 8 m and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 50 x 50.08 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (cable device) | 125 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: R10 reflector ² Max. 10 % ripple, within U_b ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|---------------|----------------|
| 0.3 ... 12 m | PNP | Plug, M12x1, 4-pin | FR 55-R-PS-L4 | 621-11000 |
| 0.3 ... 12 m | NPN | Plug, M12x1, 4-pin | FR 55-R-NS-L4 | 621-11001 |
| 0.3 ... 12 m | PNP | Cable, 3 m, 4-wire | FR 55-R-PS-K4 | 621-11003 |
| 0.3 ... 12 m | NPN | Cable, 3 m, 4-wire | FR 55-R-NS-K4 | 621-11004 |



| Reflector / reflective tape* | Operating range | Accessories | |
|------------------------------|-----------------|-------------------|----------------|
| R10 | 0.3 ... 12 m | Reflectors | From Page A-16 |
| RD8 | 0.3 ... 10 m | Connection cables | From Page A-32 |
| R5 | 0.3 ... 6 m | Brackets | From Page A-4 |
| RF-100 KL* | 0.25 ... 6 m | | |

FR 55-RM

Retroreflective photoelectric sensor – stainless steel housing



PRODUCT HIGHLIGHTS

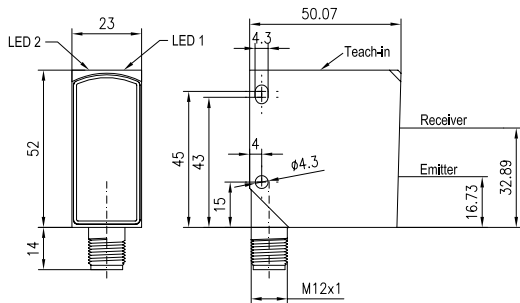
- Stable stainless steel housing – ideal for use in hygiene zones, e.g. in the food and beverages industries
- Housing concept designed for intensive cleaning processes
- Sensor adjustment via teach-in and control input
- Simple alignment thanks to easily visible light spot

| Optical data | | Functions | |
|------------------------------------|--|---------------------------------|--|
| Limit range | 0.4 ... 13 m ¹ | Indicator LED, green | Operating voltage indicator |
| Operating range | 0.4 ... 11 m ¹ | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | LED, red, 640 nm | Sensitivity adjustment | Via Teach-in button and control input |
| Light spot size | See diagram | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| Polarising filter | Yes | Adjustment possibilities | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | S _n = 8 m and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ² | Dimensions | 52 x 50.07 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ³ |
| Output current, I _e | ≤ 100 mA | Material, housing | Stainless steel, 316L |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Power On Delay | < 300 ms | Type of connection | See Selection Table |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: operation | -20 ... +60 °C |
| Output function | N.O./N.C. | Ambient temperature: storage | -20 ... +80 °C |
| Switching frequency, f (ti/tp 1:1) | ≤ 600 Hz | Weight (plug device) | 138 g |
| Response time | 830 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN | +U _b = teach-in -U _b = button locked Open = normal operation | | |

¹ Reference material: R10 reflector ² Max. 10 % ripple, within U_b ~ 50 Hz / 100 Hz ³ With connected IP 67 / IP 69K plug

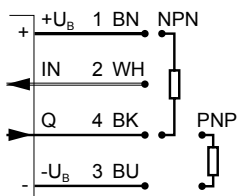
| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|----------------|----------------|
| 0.4 ... 11 m | PNP | Plug, M12x1, 4-pin | FR 55-RM-PS-L4 | 621-11012 |
| 0.4 ... 11 m | NPN | Plug, M12x1, 4-pin | FR 55-RM-NS-L4 | 621-11013 |

Plug connection



153-00800

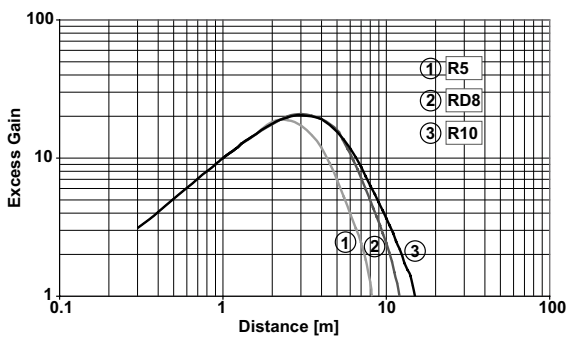
Connection, 4-pin



154-00312

8

Functional reserves



155-01162

Light spot size



155-01112

| Reflector | Operating range | Accessories | |
|-----------|-----------------|-------------------|----------------|
| R10 | 0.4 ... 11 m | Reflectors | From Page A-16 |
| RD8 | 0.4 ... 9 m | Connection cables | From Page A-32 |
| R5 | 0.4 ... 6 m | Brackets | From Page A-4 |

FS/FE 55-RL

Laser through-beam photoelectric sensor



PRODUCT HIGHLIGHTS

- Long range combined with precise laser light spot for extremely accurate small-part detection
- High switching frequency for the reliable detection of even the most rapid processes
- Sensor adjustment via teach-in and control input
- Plug and cable connection rotatable

| Optical data | | Functions | |
|--|--|-------------------------------------|--|
| Limit range | 0 ... 30 m | Indicator LED, green | Operating voltage indicator |
| Operating range | 0 ... 25 m | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | Laser, red, 655 nm | Indicator LED, red (receiver) | Alignment indicator |
| Light spot size | See diagram | Sensitivity adjustment (receiver) | Via Teach-in button and control input |
| Laser Class (DIN EN 60825-1:2008-5) | 1 | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities (receiver) | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. range and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _B | 10 ... 30V DC ¹ | Dimensions | 50 x 50.08 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30mA | Enclosure rating | IP 69K & IP 67 ² |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _B / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 3500 Hz | Weight (cable device) | 125 g |
| Response time | 140 μs | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN (receiver) | +U _B = teach-in -U _B = button locked Open = normal operation | | |
| Control input, TEST (transmitter) | +U _B = Test (transmitter off) -U _B / Open = normal operation | | |

¹ Max. 10 % ripple, within U_B, ~ 50 Hz / 100 Hz ² With connected IP 67 / IP 69K plug

| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|----------------|----------------|
| 0 ... 25 m | PNP | Plug, M12x1, 4-pin | FE 55-RL-PS-L4 | 620-21006 |
| 0 ... 25 m | NPN | Plug, M12x1, 4-pin | FE 55-RL-NS-L4 | 620-21007 |
| 0 ... 25 m | - | Plug, M12x1, 4-pin | FS 55-RL-L4 | 620-11002 |
| 0 ... 25 m | PNP | Cable, 3 m, 4-wire | FE 55-RL-PS-K4 | 620-21009 |
| 0 ... 25 m | NPN | Cable, 3 m, 4-wire | FE 55-RL-NS-K4 | 620-21010 |
| 0 ... 25 m | - | Cable, 3 m, 4-wire | FS 55-RL-K4 | 620-11003 |

| | |
|--|---|
| <p>Plug connection (transmitter)</p> <p>153-00808</p> | <p>Cable connection (transmitter)</p> <p>153-00809</p> |
| <p>Plug connection (receiver)</p> <p>153-00812</p> | <p>Cable connection (receiver)</p> <p>153-00813</p> |

| | |
|---|--|
| <p>Connection, transmitter, 4-pin</p> <p>154-00315</p> | <p>Connection, receiver, 4-pin</p> <p>154-00312</p> |
|---|--|

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|--|--|
| <p>Functional reserves</p> <p>155-01138</p> | <p>Light spot size</p> <p>155-01139</p> |
|--|--|

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|--------------------|----------------|----------|---------------|
| Accessories | | | |
| Connection cables | From Page A-32 | Brackets | From Page A-4 |

FS/FE 55-R

Through-beam photoelectric sensor



PRODUCT HIGHLIGHTS

- Alignment indicator and easily visible light spot for simple alignment of the through-beam system
- Test input to check sensor pair function
- Sensor adjustment via teach-in and control input
- Plug and cable connection rotatable

| Optical data | | Functions | |
|------------------------------------|--|-------------------------------------|--|
| Limit range | 0 ... 25 m | Indicator LED, green | Operating voltage indicator |
| Operating range | 0 ... 20 m | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | LED, red, 640 nm | Indicator LED, red (receiver) | Alignment indicator |
| Light spot size | See diagram | Sensitivity adjustment (receiver) | Via Teach-in button and control input |
| | | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities (receiver) | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. range and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _B | 10 ... 30V DC ¹ | Dimensions | 50 x 50.08 x 23 mm ³ |
| No-load current, I ₀ | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ² |
| Output current, I _e | ≤ 100 mA | Material, housing | PC-ABS |
| Protective circuits | Reverse-polarity protection, U _B / short-circuit protection (Q) | Material, front screen | PMMA |
| Protection Class | 2 | Type of connection | See Selection Table |
| Power On Delay | < 300 ms | Ambient temperature: operation | -20 ... +60 °C |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: storage | -20 ... +80 °C |
| Output function | N.O./N.C. | Weight (plug device) | 35 g |
| Switching frequency, f (ti/tp 1:1) | ≤ 500 Hz | Weight (cable device) | 125 g |
| Response time | 1 ms | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN (receiver) | +U _B = teach-in -U _B = button locked Open = normal operation | | |
| Control input, TEST (transmitter) | +U _B = Test (transmitter off) -U _B / Open = normal operation | | |

¹ Max. 10 % ripple, within U_B, ~ 50 Hz / 100 Hz ² With connected IP 67 / IP 69K plug

| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|---------------|----------------|
| 0 ... 20 m | PNP | Plug, M12x1, 4-pin | FE 55-R-PS-L4 | 620-21000 |
| 0 ... 20 m | NPN | Plug, M12x1, 4-pin | FE 55-R-NS-L4 | 620-21001 |
| 0 ... 20 m | – | Plug, M12x1, 4-pin | FS 55-R-L4 | 620-11000 |
| 0 ... 20 m | PNP | Cable, 3 m, 4-wire | FE 55-R-PS-K4 | 620-21003 |
| 0 ... 20 m | NPN | Cable, 3 m, 4-wire | FE 55-R-NS-K4 | 620-21004 |
| 0 ... 20 m | – | Cable, 3 m, 4-wire | FS 55-R-K4 | 620-11001 |

| | |
|--|---|
| <p>Plug connection (transmitter)</p> <p>153-00787</p> | <p>Cable connection (transmitter)</p> <p>153-00786</p> |
| <p>Plug connection (receiver)</p> <p>153-00790</p> | <p>Cable connection (receiver)</p> <p>153-00791</p> |

| | |
|---|--|
| <p>Connection, transmitter, 4-pin</p> <p>154-00315</p> | <p>Connection, receiver, 4-pin</p> <p>154-00312</p> |
|---|--|

| | |
|--|--|
| <p>Functional reserves</p> <p>155-00986</p> | <p>Light spot size</p> <p>155-00994</p> |
|--|--|

| | | | |
|--------------------|----------------|----------|---------------|
| Accessories | | | |
| Connection cables | From Page A-32 | Brackets | From Page A-4 |

FS/FE 55-RM

Through-beam photoelectric sensor – stainless steel housing



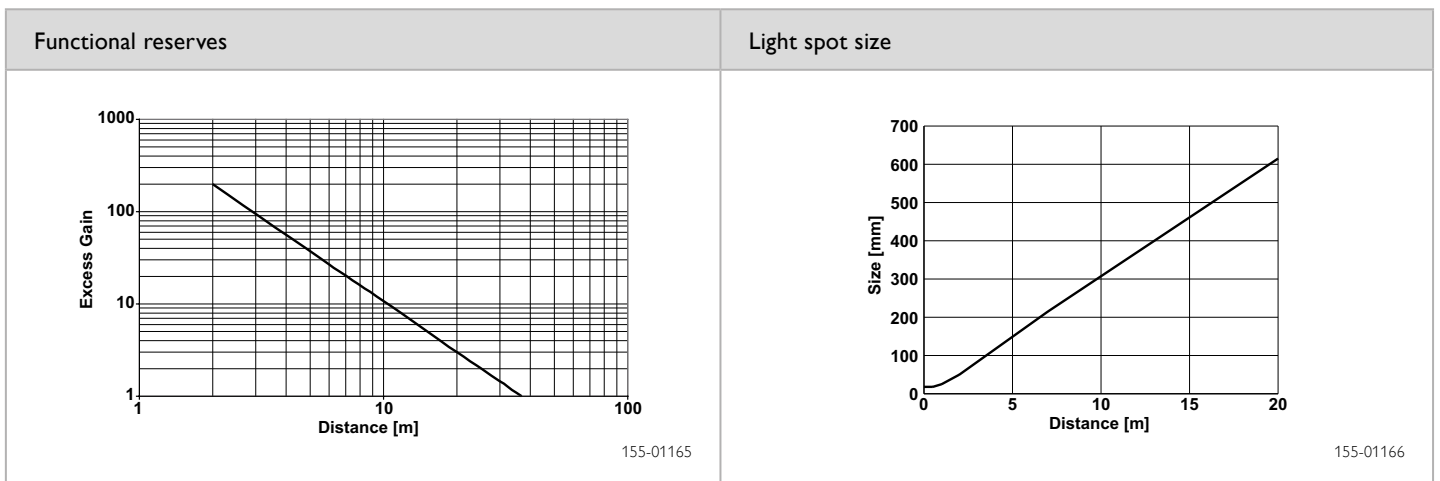
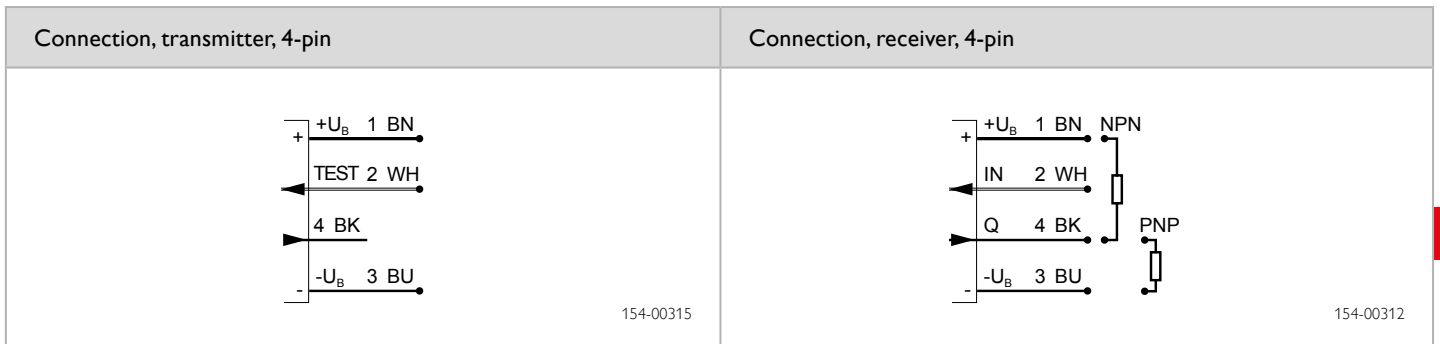
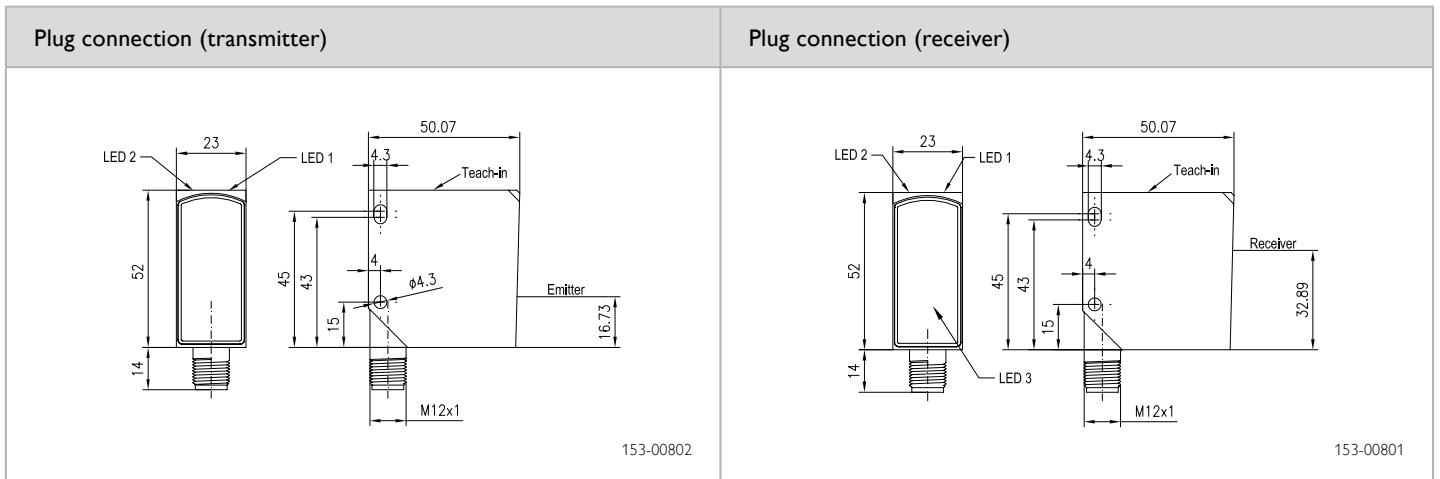
PRODUCT HIGHLIGHTS

- Stable stainless steel housing – ideal for use in hygiene zones, e.g. in the food and beverages industries
- Housing concept designed for intensive cleaning processes
- Sensor adjustment via teach-in and control input
- Simple alignment thanks to easily visible light spot and alignment indicator

| Optical data | | Functions | |
|------------------------------------|--|-------------------------------------|--|
| Limit range | 0 ... 20 m | Indicator LED, green | Operating voltage indicator |
| Operating range | 0 ... 15 m | Indicator LED, yellow | Switching output indicator / contamination indicator |
| Type of light | LED, red, 640 nm | Indicator LED, red (receiver) | Alignment indicator |
| Light spot size | See diagram | Sensitivity adjustment (receiver) | Via Teach-in button and control input |
| | | Teach-in modes | Mode 1: during running process Mode 2: during standing process |
| | | Adjustment possibilities (receiver) | N.O./N.C. via Teach-in button and control input Button lock via control input |
| | | Default settings | Max. range and N.O. |
| Electrical data | | Mechanical data | |
| Operating voltage, +U _b | 10 ... 30V DC ¹ | Dimensions | 52 x 50.07 x 23 mm ³ |
| No-load current, I _o | ≤ 30 mA | Enclosure rating | IP 69K & IP 67 ² |
| Output current, I _e | ≤ 100 mA | Material, housing | Stainless steel, 316L |
| Protective circuits | Reverse-polarity protection, U _b / short-circuit protection (Q) | Material, front screen | PMMA |
| Power On Delay | < 300 ms | Type of connection | See Selection Table |
| Switching output, Q | PNP/NPN (see Selection Table) | Ambient temperature: operation | -20 ... +60 °C |
| Output function | N.O./N.C. | Ambient temperature: storage | -20 ... +80 °C |
| Switching frequency, f (ti/tp 1:1) | ≤ 500Hz | Weight (plug device) | 138 g |
| Response time | 1 ms | Vibration and impact resistance | EN 60947-5-2 |
| Control input, IN (receiver) | +U _b = teach-in -U _b = button locked Open = normal operation | | |
| Control input, TEST (transmitter) | +U _b = Test (transmitter off) -U _b / Open = normal operation | | |

¹ Max. 10 % ripple, within U_b, ~ 50 Hz / 100 Hz ² With connected IP 67 / IP 69K plug

| Operating range | Switching output | Type of connection | Part number | Article number |
|-----------------|------------------|--------------------|----------------|----------------|
| 0 ... 15 m | PNP | Plug, M12x1, 4-pin | FE 55-RM-PS-L4 | 620-21012 |
| 0 ... 15 m | NPN | Plug, M12x1, 4-pin | FE 55-RM-NS-L4 | 620-21013 |
| 0 ... 15 m | – | Plug, M12x1, 4-pin | FS 55-RM-L4 | 620-11004 |



| Accessories | |
|-------------------|----------------|
| Connection cables | From Page A-32 |
| Brackets | From Page A-4 |