FT 318B

Reflection light scanners with fading

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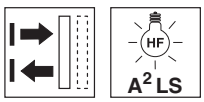
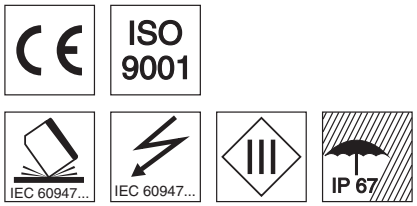


1 … 280 mm
2 … 120 m
(with 90° angular optics)

- Diffuse reflection light scanners with fading
- V-optics allow for reliable detection of dark objects in the short range
- Scanning range adjustment via teach-in
- Visible red light
- Axial and 90° light beam gate for flexible integration
- Active suppression of extraneous light A^2LS
- Fast alignment through *brightVision®*
- Simple fine adjustment via *omni-mount*
- Embedded mounting option
- Full control through green and yellow indicator LEDs
- Robust plastic housing acc. to IP 67 for industrial application

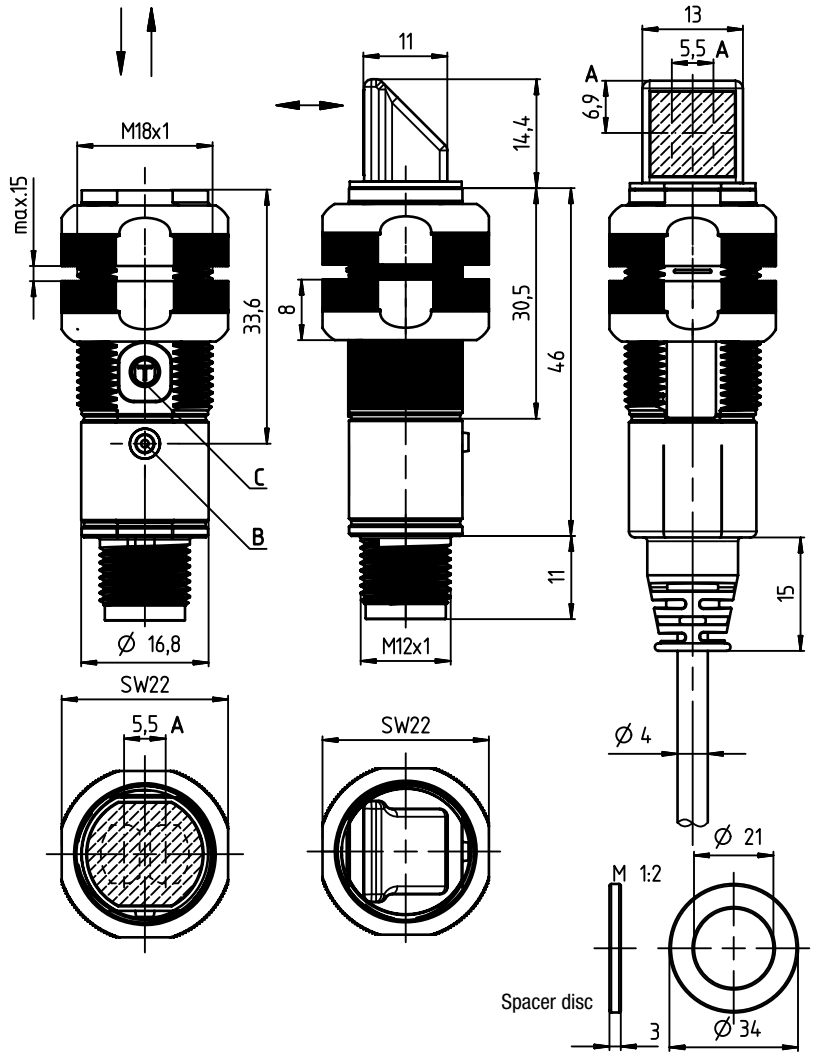


Accessories:

(available separately)

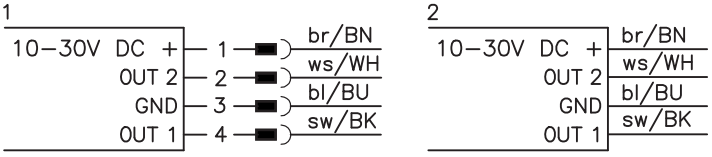
- Mounting systems (BT D18M.5, BT D21M, BT 318…)
- M12 connectors (KD …)
- Ready-made cables (K-D …)

Dimensioned drawing



A Optical axes
B Indicator diode
C Teach button

Electrical connection



Specifications

Optical data

Scanning range limit [1]		axial optics: 1 … 280mm 90° optics: 2 … 120mm
Scanning range [2]		see tables
Light source		LED (modulated light)
Wavelength		620nm (visible red light)

Timing

Switching frequency		500Hz
Response time		1ms
Delay before start-up		≤ 300ms

Electrical data

Operating voltage U_B		10 … 30VDC (incl. residual ripple)
Residual ripple		≤ 15% of U_B
Open-circuit current		≤ 20mA
Switching output	…/4P…	2 PNP transistor outputs pin 2: PNP dark switching, pin 4: PNP light switching
	…/2N…	2 NPN transistor outputs pin 2: NPN dark switching, pin 4: NPN light switching
Signal voltage high/low		≥ (U_B-2.5V)/≤ 2.5V
Output current		max. 100mA [3]

Indicators

Green LED	ready
Yellow LED	reflection (object detected)

Mechanical data

Housing	plastic
Optics cover	plastic
Weight	20g with M12 connector 70g with 2m cable
Connection type	M12 connector, 4-pin cable 2m, 4x0.20mm²

Environmental data

Ambient temp. (operation/storage)	-40°C … +60°C/-40°C … +70°C
Protective circuit [4]	2, 3
VDE safety class	III
Protection class	IP 67
Light source	exempt group (in acc. with EN 62471)
Standards applied	IEC 60947-5-2

1) Scanning range limit: typical scanning range
2) Scanning range: ensured scanning range
3) Sum of the output currents for both outputs, 50mA when ambient temperatures > 40°C
4) 2=polarity reversal protection, 3=short circuit protection for all outputs

Fading: black/white error < 50%

Example axial optics:

Adjustment 160mm, white 90%

- **Detection**:
  Black object, 6%, is detected at approx. 100mm

Adjustment 120mm, black 6%

- **Situation in the background**:
  White object, 90%, is no longer detected at a distance > 200mm

Example 90° angular optics

Adjustment 85mm, white 90%

- **Detection**:
  Black object, 6%, is detected at approx. 50mm

Adjustment 65mm, black 6%

- **Situation in the background**:
  White object, 90%, is no longer detected at a distance > 110mm

Tables

Axial optics:

1	1	215	280
2	5	125	160

90° optics:

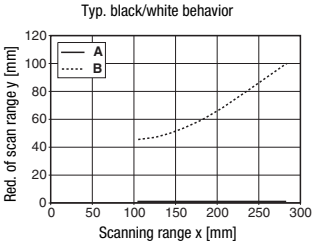
1	2	100	120
2	8	65	80

1	white 90%
2	black 6%

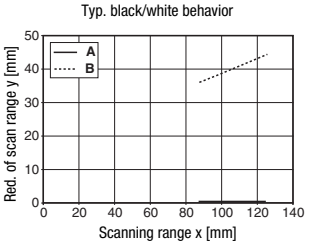
Scanning range [mm]
Typ. scanning range limit [mm]

Diagrams

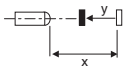
Axial optics:



90° optics:



A white 90%
B black 6%



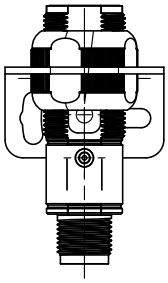
Remarks

- **Approved purpose:**
  This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.
- With the set scanning range, a tolerance of the scanning range limits is possible depending on the reflection properties of the material surface.

Mounting options

Standard mounting

Alignment of the supplied mounting nuts with flat side towards the mounting sheet.
Mounting bracket BT D18M.5 is recommended for standard mounting.

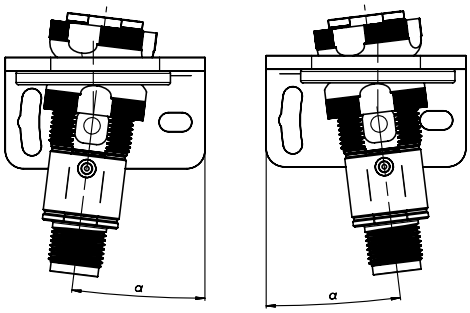


Omni-mount

Omni-mount makes fine adjustment of the sensors possible in a very simple and economical manner. For this type of mounting, the mounting nuts are used with the round side towards the mounting device. The mounting sheet must have a bore hole of approx. 21 mm in diameter. The special molding of the mounting nuts together with the spacer disc included in the delivery contents allows form-locking fastening of the sensors at different adjustment angles. The maximum possible tilt angle depends on the thickness of the mounting sheet. Mounting bracket BT D21M is recommended for *omni-mount*.

Mounting sheet thickness	Max. adjustment angle
2 mm	+/- 5°
4 mm*)	+/- 8°

*) Corresponds to the thickness of the BT D21M mounting bracket



Embedded mounting

Embedded mounting, e.g. into a materials handling belt, is possible via the BT 318P-LS mounting support.
The supports can be used either for fastening the axial sensors or for sensors with 90° optics.

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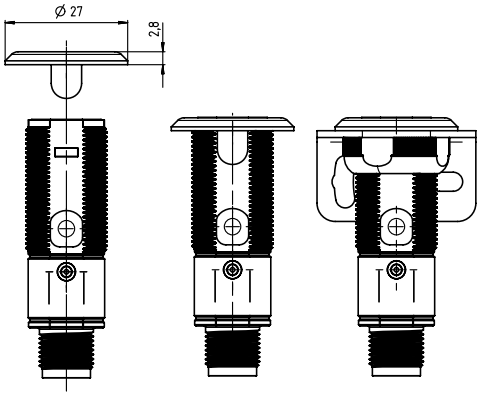


Order guide

The sensors listed here are preferred types; current information at www.leuze.com.

		Designation	Part no.
Sensors with axial optics			
With M12 connector	Pin 4: PNP light switching, pin 2: PNP dark switching	FT 318B.3/4P-M12	50122554
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT 318B.3/2N-M12	50122556
With cable, 2m	Pin 4: PNP light switching, pin 2: PNP dark switching	FT 318B.3/4P	50122555
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT 318B.3/2N	50122557
Sensors with 90° angular optics			
With M12 connector	Pin 4: PNP light switching, pin 2: PNP dark switching	FT 318B.W3/4P-M12	50122550
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT 318B.W3/2N-M12	50122552
With cable, 2m	Pin 4: PNP light switching, pin 2: PNP dark switching	FT 318B.W3/4P	50122551
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT 318B.W3/2N	50122553
Accessories for optimum fastening			
Support for embedded mounting	Collective packaging with 10 supports	BT 318P-LS	50117258
Mounting bracket for standard mounting		BT D18M.5	50113548
Mounting bracket for *omni-mount*		BT D21M	50117257

Part number code

F	T	3	1	8	B	.	W	3	/	4	P	-	M	1	2

Operating principle

FT	Diffuse reflection light scanners with fading

Series

318B	Series 318B

Equipment

.3	Axial optics, Teach-in via teach button
.W3	90° angular optics, Teach-in via teach button

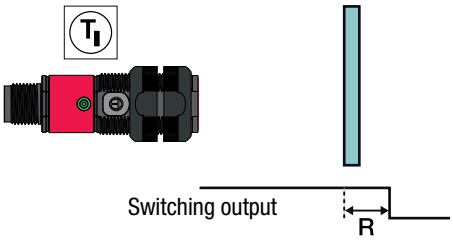
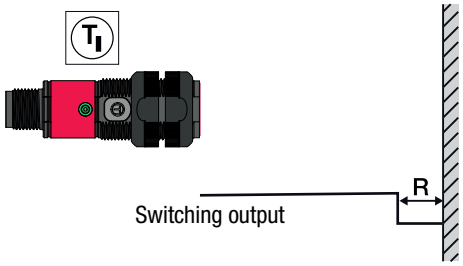
Switching output/function /OUT1OUT2 (OUT1 = Pin 4, OUT2 = Pin 2)

4	PNP, light switching
P	PNP, dark switching
2	NPN, light switching
N	NPN, dark switching
X	Pin not used

Electrical connection

-M12	M12 connector, 4-pin
N/A	Cable, standard length 2m

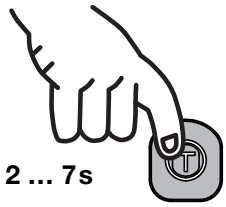
Teach-in method

Teach	Operating level 1	Operating level 2
Standard Teach	**Teach on object:** In this teach version, the switching distance is set so that the object that is in the beam path during the teach is detected with a tight reserve. The additional distance by which the scanning range is increased in relation to the distance to the teach object is designated as reserve **R**. All objects up to a bit above the distance of the object used in the teach are thus detected.  	**Teach on background:** This teach is only suitable for applications with a fixed background. The teach is carried out without an object. The scanning range is placed in front of the teach object with reserve **R**. The scanning range is set by the teach so that detection stops just short of the background. 

Operation via teach button

Teach in operating level 1

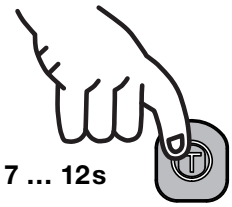
- Press teach button until the **yellow** LED flashes.
- Release teach button.
- Ready.



LED **yellow**
flashes at 3Hz

Teach in operating level 2

- Press teach button until green and yellow LEDs flash **alternately**.
- Release teach button.
- Ready.



flashes **yellow** and **green**
alternately
with 3Hz

Adjusting the switching behavior of the switching output – light/dark switching

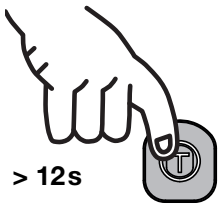
This function permits inversion of the sensors' switching logic.

- Press teach button until the **green** LED flashes.
- Release teach button.
- The LED then displays the changed switching logic **for 2s**:

  YELLOW
  Continuous light = switching outputs **light switching** (in the case of complementary sensors, Q1 (pin 4) light switching, Q2 (pin 2) dark switching), this means output active when object is detected.

  GREEN
  Flashing light = switching outputs **dark switching** (in the case of complementary sensors, Q1 (pin 4) dark switching, Q2 (pin 2) light switching), this means output inactive when object is detected.

- Ready.



LED **green**
flashes at 3Hz

2s YELLOW =
light switching

or

flashes **GREEN for 2s =**
dark switching