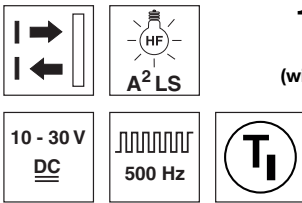


ET 328

Energetic diffuse reflection light scanners

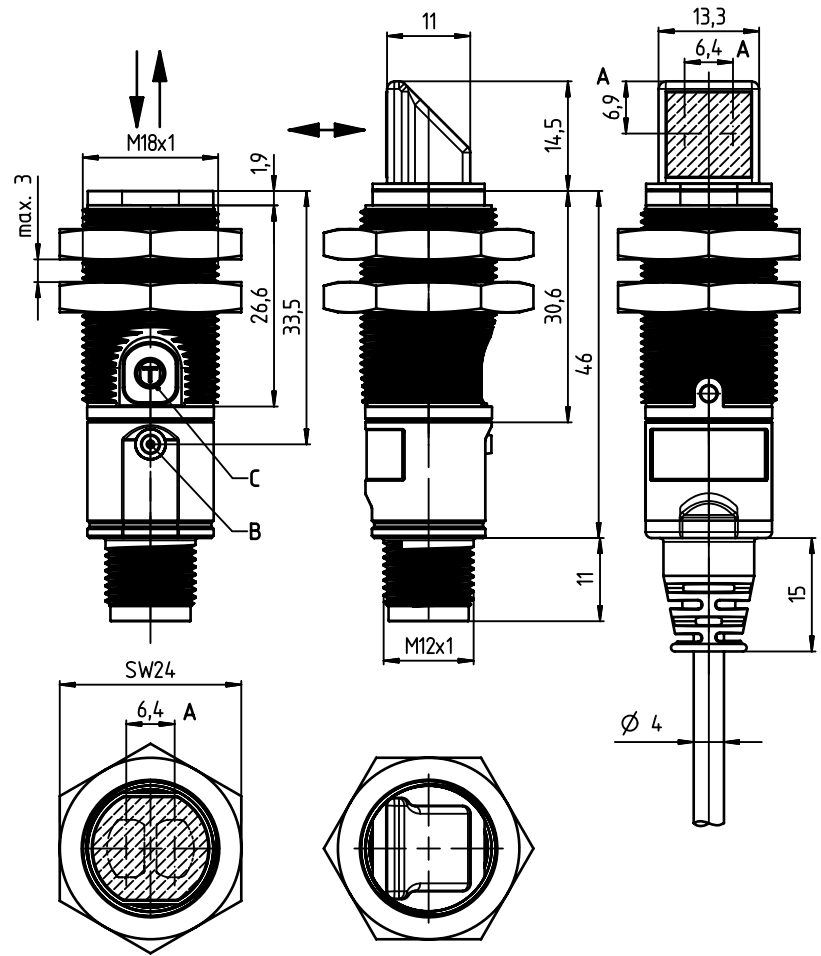
en 01-2013/06 50123665



1 ... 1000mm
5 ... 450mm
(with 90° angular optics)

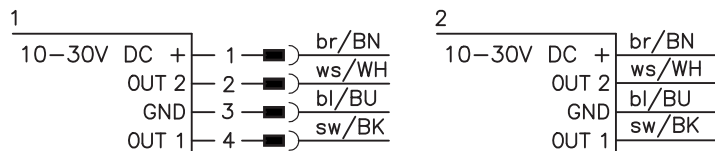
- Energetic diffuse reflection light scanner
- Scanning range adjustment via teach-in
- Visible red light
- Axial and 90° light beam gate for flexible integration
- Sturdy plastic housing with stainless steel threaded sleeve with cylindrical M18x1 design
- Active suppression of extraneous light A²LS
- Fast alignment through *brightVision*®
- Simple fine adjustment via *omni-mount*
- Full control through green and yellow indicator LEDs

Dimensioned drawing



- A Optical axes
- B Indicator diode
- C Teach button

Electrical connection

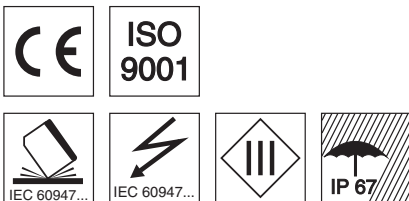


Accessories:

(available separately)

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

We reserve the right to make changes • DS_ET328_en_50123665.fm



Specifications

Optical data

Scanning range limit ¹⁾	axial optics: 1 ... 1000mm
Scanning range ²⁾	90° optics: 5 ... 450mm
Light source	see tables
Wavelength	LED (modulated light) 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
	pin 2: NPN dark switching, pin 4: NPN light switching
	≥ ($U_B - 2.5V$) / ≤ 2.5V
	max. 100mA ³⁾

Signal voltage high/low
Output current

Indicators

Green LED	ready
Yellow LED	reflection (object detected)

Mechanical data

Housing	plastic
Optics cover	plastic
Weight	30g with M12 connector 80g with 2m cable
Connection type	M12 connector, 4-pin cable 2m, 4x0.20mm ²

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

Tables

Axial optics:

1	1	700	1000
2	5	280	400

90° optics:

1	5	350	450
2	15	140	200

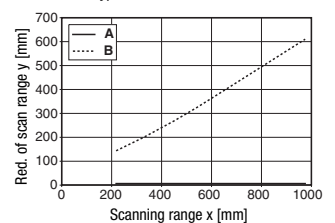
1	white 90%
2	black 6%

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

Diagrams

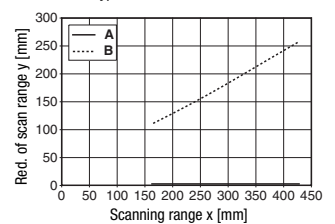
Axial optics:

Typ. black/white behavior

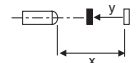


90° optics:

Typ. black/white behavior



- 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.

ET 328

Reflection light scanners

Order guide

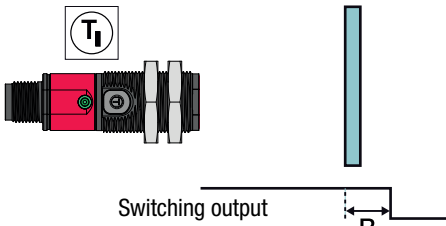
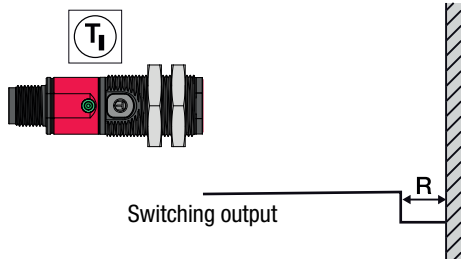
The sensors listed here are preferred types; current information at www.leuze.com.

		Designation	Part no.	
Sensors with axial optics	With M12 connector	Pin 4: PNP light switching, pin 2: PNP dark switching	ET 328.3/4P-M12	50122726
		Pin 4: NPN light switching, pin 2: NPN dark switching	ET 328.3/2N-M12	50122728
	With cable, 2m	Pin 4: PNP light switching, pin 2: PNP dark switching	ET 328.3/4P	50122727
		Pin 4: NPN light switching, pin 2: NPN dark switching	ET 328.3/2N	50122729
Sensors with 90° angular optics	With M12 connector	Pin 4: PNP light switching, pin 2: PNP dark switching	ET 328.W3/4P-M12	50122721
		Pin 4: NPN light switching, pin 2: NPN dark switching	ET 328.W3/2N-M12	50122724
	With cable, 2m	Pin 4: PNP light switching, pin 2: PNP dark switching	ET 328.W3/4P	50122722
		Pin 4: NPN light switching, pin 2: NPN dark switching	ET 328.W3/2N	50122725
Accessories for optimum fastening				
Mounting system <i>omni-mount</i>		BT318B-0M	50121904	
Mounting bracket for standard mounting		BT D18M.5	50113548	
Mounting bracket for <i>omni-mount</i>		BT D21M	50117257	

Part number code

		E	T	3	2	8	.	W	3	/	4	P	-	M	1	2
Operating principle																
ET	Energetic diffuse reflection light scanners															
Series																
328	328 Series															
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															

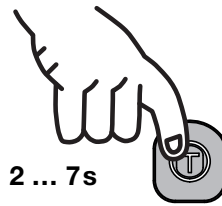
Teach-in method

Teach	Operating level 1	Operating level 2
Standard Teach	<p>Teach on object:</p> <p>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.</p> 	<p>Teach on background:</p> <p>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.</p> 

Operation via teach button

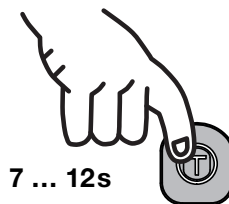
Teach in operating level 1

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



Teach in operating level 2

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



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

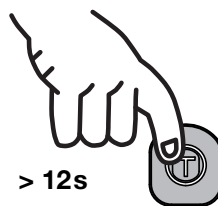
This function permits inversion of the sensors' switching logic.

- 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.



2s YELLOW = light switching

or



flashes GREEN for 2s = dark switching