Distance sensor

VDM28-50-R1/73c/136

- Retroreflective laser distance sensor
- Measuring method PRT (Pulse Ranging Technology)
- Accurate, clear, and reproducible measuring results
- Red laser as the light emitter
- Laser class 1, eyesafe

Universal distance sensor, measurement to reflector, measuring method PRT, 50 m detection range, red laser light, laser class 1, push-pull output, M12 plug
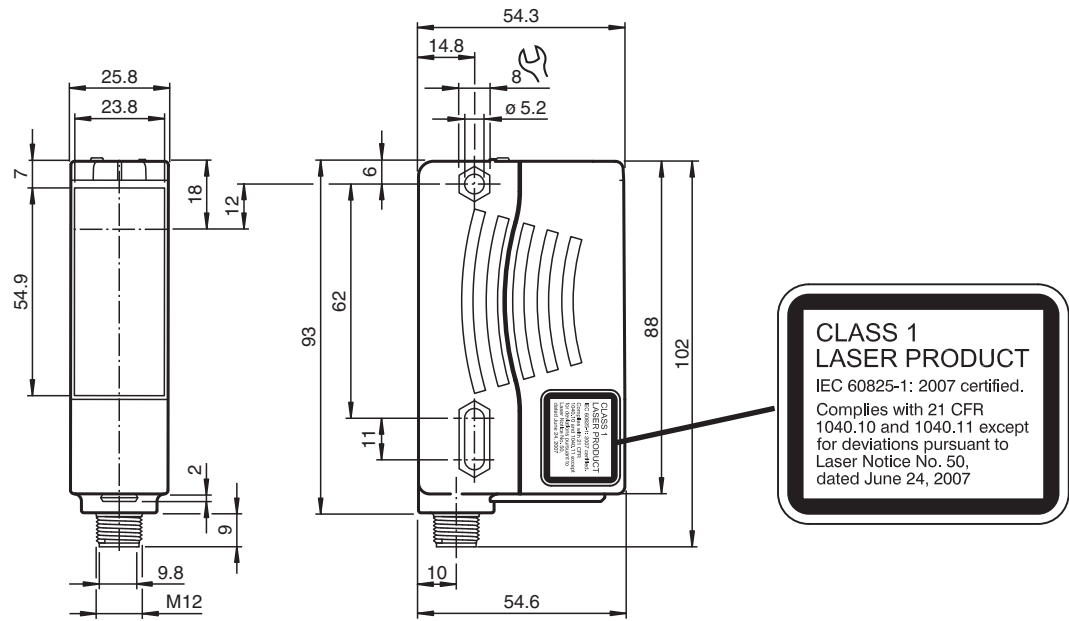
CE · □ · cULus · UKCA · ⚠

Function

The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.2 ... 50 m and an absolute accuracy of 25 mm.
The compact housing of the Series 28 photoelectric sensors, with dimensions of 88 mm (height), 26 mm (width) and 54 mm (depth), make it the smallest device available in its class.

Application

- Object identification or object classification
- Positioning
- Level measurement
- Collision avoidance/distance measurement
- Compartment occupied checks
- Rack fine positioning
- Stack height control
- Coil measurement
- Dip monitoring
- Lift height checks
- Opening impulse sensor and closing edge monitoring on automatic doors, industrial gates, and barrier systems
- Vehicle detection for traffic engineering purposes (e. g., monitoring of individual parking spaces)
- Height measurement in tunnels and entranceways
- Anti-collision protection on automated transport systems

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Dimensions

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified.
Complies with 21 CFR
1040.10 and 1040.11 except
for deviations pursuant to
Laser Notice No. 50,
dated June 24, 2007

Technical Data

General specifications

Measuring range	0.2 ... 50 m
Reference target	OFR-100/100
Light source	laser diode typ. service life 85,000 h at Ta = +25 °C
Light type	modulated visible red light
Laser nominal ratings	
Note	LASER LIGHT , DO NOT STARE INTO BEAM
Laser class	1
Wave length	660 nm
Beam divergence	< 1.5 mrad
Pulse length	approx. 4 ns
Repetition rate	250 kHz
max. pulse energy	< 1.5 nJ
Angle deviation	max. ± 2°
Measuring method	Pulse Ranging Technology (PRT)
Diameter of the light spot	< 50 mm at a distance of 50 m at 20 °C
Ambient light limit	50000 Lux
Functional safety related parameters	
$MTTF_d$	200 a
Mission Time (T_M)	10 a
Diagnostic Coverage (DC)	0 %
Indicators/operating means	
Operation indicator	LED green
Function indicator	2 LEDs yellow for switching state
Teach-in indicator	Teach-In: LED green/yellow equiphase flashing; 2.5 Hz Teach Error:LED green/yellow non equiphase flashing; 8.0 Hz
Control elements	5-step rotary switch for operating modes selection (threshold setting and operating modes)
Control elements	Switch for setting the threshold values

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Technical Data

Electrical specifications

Operating voltage	U_B	10 ... 30 V DC , class 2
Ripple		10 % within the supply tolerance
No-load supply current	I_0	≤ 70 mA / 24 V DC
Time delay before availability	t_v	< 1.5 s at 20 °C

Output

Signal output		2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Switching frequency	f	50 Hz
Response time		10 ms

Conformity

Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4
Laser safety	IEC 60825-1:2014

Measurement accuracy

Absolute accuracy	± 25 mm
Repeat accuracy	< 5 mm

Approvals and certificates

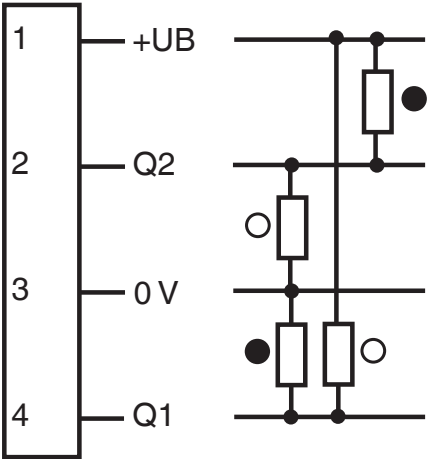|	
Protection class	III
UL approval	cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval	CCC approval / marking not required for products rated ≤36 V
FDA approval	IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice 56, dated May 8, 2019.

Ambient conditions

Ambient temperature	-30 ... 55 °C (-22 ... 131 °F)
Storage temperature	-30 ... 70 °C (-22 ... 158 °F)

Mechanical specifications

Degree of protection	IP67
Connection	4-pin, M12 x 1 connector
Material	
Housing	plastic
Optical face	PMMA
Mass	90 g
Dimensions	
Height	88 mm
Width	25.8 mm
Depth	54.6 mm

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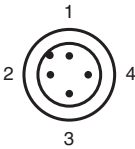
Connection Assignment

Option:

○ = Light on
● = Dark on

Connection Assignment

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Assembly
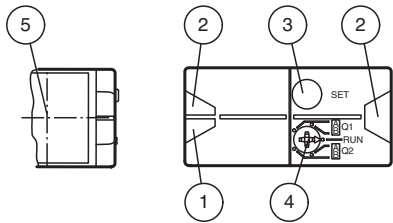
1	Operating display	green
2	Signal display	yellow
3	TEACH-IN button	
4	Mode rotary switch	
5	Laser output	

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Application

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Teach-In

You can use the rotary switch to select the output **Q1** or **Q2** and the relevant switching threshold A or B for teaching in.
The yellow LEDs indicate the current state of the selected output.

To store a switching threshold (distance measured value), press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 2 s). Teach-In starts when the "SET" button is released.
A successful Teach-In is indicated by rapidly alternating flashing (2.5 Hz) of the yellow and green LEDs.

An unsuccessful Teach-In is indicated by alternating flashing (8 Hz) of the yellow and green LEDs.

After an unsuccessful Teach-In, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance measured values for the switching thresholds A and B:
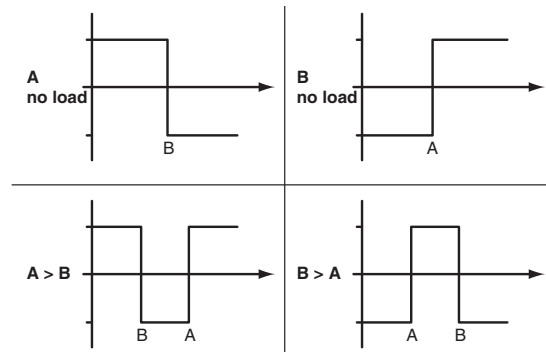
Every taught-in switching threshold can be retaught (overwritten) by pressing the SET button again.

Pressing and holding the "SET" button for > 5 s completely deletes the taught-in value. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed.

Default setting:
In general, no switching points are set at the factory. The outputs are switched to low.

Reset to default settings:
- Set the rotary switch to the "RUN" position
- Press and hold the "SET" button until the yellow and green LEDs stop flashing in phase (approx. 10 s)
- If the green LED lights up, the procedure is complete.

Error messages:
- Short circuit: In the event of a short circuit at the sensor output, the green LED flashes with a frequency of approx. 4 Hz.

- Teach error:In the event of a teach error, the yellow and green LEDs flash alternately with a frequency of approx. 8 Hz.

Note!

The difference in the taught-in distance measured values for the switching thresholds A and B must be greater than the switching hysteresis set in the sensor.
On delivery, the switching hysteresis is 15 mm.

If the difference in the taught-in measured values is the same as or smaller than the set switching hysteresis, the sensor will visually signal an unsuccessful Teach-In. The last distance measured value that was taught in will not be adopted by the sensor.

Select a new distance measured value for switching threshold A or B with a greater difference between the switching thresholds.
Teach in this distance measured value on the sensor again.

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