



Model Number

VDM28-50-R1-IO/73c/136

Distance sensor
with 4-pin, M12 x 1 connector

Features

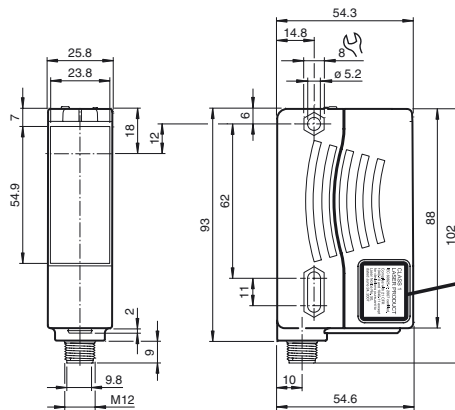
- Retroreflective laser distance sensor
- Measuring method PRT (Pulse Ranging Technology)
- Accurate, clear, and reproducible measuring results
- Red laser as the light emitter
- Version with IO-Link interface
- Laser class 1, eyesafe

Product information

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.

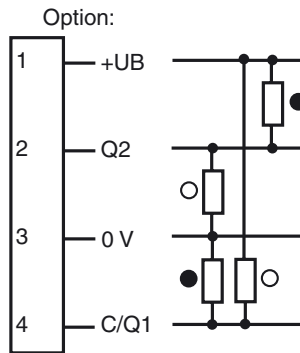
Release date: 2017-10-16 12:26 Date of issue: 2017-12-08 297899_eng.xml

Dimensions



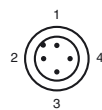
CLASS 1 LASER PRODUCT
IEC 60825-1:2007 certified.
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

Electrical connection



○ = Light on
● = Dark on

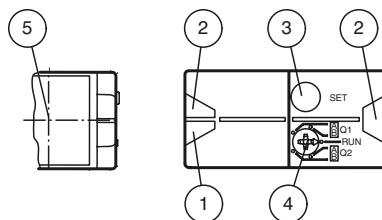
Pinout



Wire colors in accordance with EN 60947-5-2

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

Indicators/operating means



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

Technical data**General specifications**

| | |
|----------------------------|--|
| Measurement 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 |
| Temperature influence | typ. ≤ 0.25 mm/K |

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 |

Electrical specifications

| | | |
|--------------------------------|----------------|--|
| Operating voltage | U _B | 10 ... 30 V DC / when operating in IO-Link mode: 18 ... 30 V |
| 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 |

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 |

Measurement accuracy

| | |
|-------------------|---------|
| Absolute accuracy | ± 25 mm |
| Repeat accuracy | < 5 mm |

Ambient conditions

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

Mechanical specifications

| | |
|----------------------|--------------------------|
| Housing width | 25.8 mm |
| Housing height | 88 mm |
| Housing depth | 54.6 mm |
| Degree of protection | IP67 |
| Connection | 4-pin, M12 x 1 connector |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Mass | 90 g |

Compliance with standards and directives

| | |
|---------------------|--|
| Standard conformity | |
| Product standard | EN 60947-5-2 |
| Laser class | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 |

Approvals and certificates

| | |
|------------------|---|
| Protection class | II, rated voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for products rated ≤ 36 V |

Preferences**Teach-In:****Laserlabel****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

Accessories**PACTware 4.1**
FDT Framework**VDM28 IODD**

IODD for communication with VDM28-IO-Link sensors

VDM28-IO-Link DTM

Device DTM for communication with VDM28-IO-Link sensors

IO-Link-Master02-USB

IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

IO-Link-Master-USB DTM

Communication DTM for use of IO-Link-Master

IODD Interpreter DTM

Software for the integration of IODDs in a frame application (e. g. PACTware)

OMH-05

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

OMH-07-01

Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

OMH-21

Mounting bracket

OMH-22

Mounting bracket

OMH-VDM28-01

Metal enclosure for inserting protective panes or apertures

OMH-VDM28-02

Mounting and fine adjustment device for sensors from the 28 series

OMH-RLK29-HW

Mounting bracket for rear wall mounting

OMH-RL28-C

Weld slag cover model

OMH-K01

dove tail mounting clamp

OMH-K03

dove tail mounting clamp

OFR-100/100

Reflective tape 100 mm x 100 mm

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.

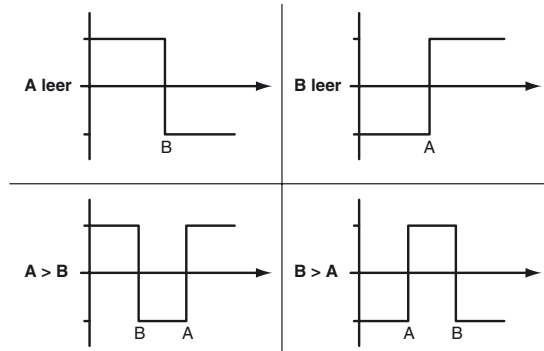
To store a switching threshold (distance measured value), press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 2 s). Teach-In starts when the "SET" button is released.

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.

Laser notice laser class 1

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.