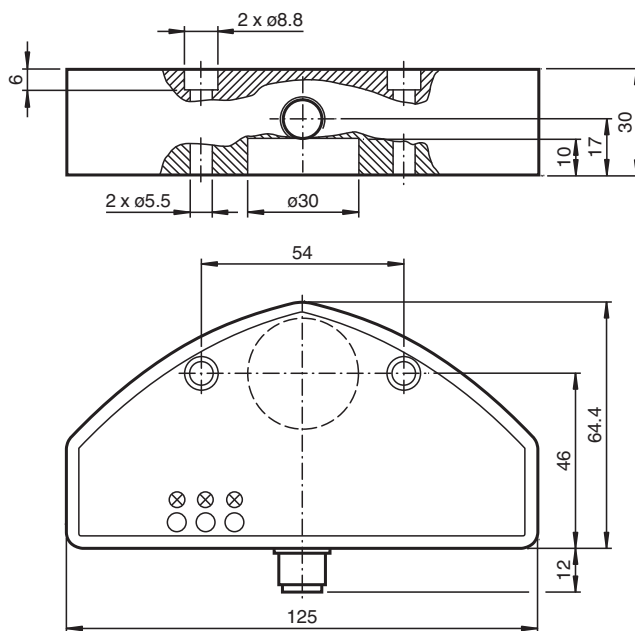


## Ultrasonic sensor UC2500-F65-IE2R2-V15

- Level indication
- 1 analog output, 4-20 mA current source
- 1 switch output
- Programmable by means of Interface (see accessories) and SONPROG
- Synchronization options
- Temperature compensation



### Dimensions



### Technical Data

#### General specifications

|                       |                 |
|-----------------------|-----------------|
| Sensing range         | 250 ... 2500 mm |
| Adjustment range      | 250 ... 2500 mm |
| Dead band             | 0 ... 250 mm    |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency  | approx. 120 kHz |

#### Nominal ratings

|                                |       |        |
|--------------------------------|-------|--------|
| Time delay before availability | $t_v$ | 250 ms |
|--------------------------------|-------|--------|

#### Limit data

|                          |            |
|--------------------------|------------|
| Permissible cable length | max. 300 m |
|--------------------------|------------|

Release date: 2020-03-24 Date of issue: 2021-02-05 Filename: 235143\_eng.pdf

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

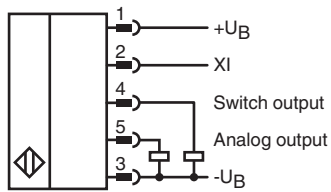
Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

 **PEPPERL+FUCHS**

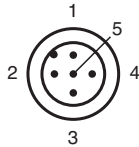
## Technical Data

|                                                 |       |                                                                                                            |
|-------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------|
| <b>Indicators/operating means</b>               |       |                                                                                                            |
| LED green                                       |       | Power on                                                                                                   |
| LED yellow                                      |       | solid: switching state switch output<br>flashing: misadjustment                                            |
| <b>Electrical specifications</b>                |       |                                                                                                            |
| Rated operating voltage                         | $U_e$ | 24 V DC                                                                                                    |
| Operating voltage                               | $U_B$ | 15 ... 30 V (including ripple)<br>In supply voltage interval 15 ... 20 V sensitivity reduced to 20% ... 0% |
| Ripple                                          |       | $\leq 10 \%$                                                                                               |
| No-load supply current                          | $I_0$ | $\leq 60 \text{ mA}$                                                                                       |
| <b>Input</b>                                    |       |                                                                                                            |
| Input type                                      |       | 1 Function input                                                                                           |
| Input voltage                                   |       | $\leq$ Operating voltage                                                                                   |
| Level                                           |       | low level : 0 ... 3 V<br>high level : $\geq 15 \text{ V}$                                                  |
| <b>Switching output</b>                         |       |                                                                                                            |
| Output type                                     |       | 1 switch output PNP, NO                                                                                    |
| Default setting                                 |       | 250 ... 2500 mm                                                                                            |
| Operating current                               | $I_L$ | $\leq 300 \text{ mA}$ , short-circuit/overload protected                                                   |
| Voltage drop                                    |       | $\leq 3 \text{ V}$                                                                                         |
| <b>Analog output</b>                            |       |                                                                                                            |
| Output type                                     |       | 1 current output 4 ... 20 mA , rising ramp                                                                 |
| Default setting                                 |       | 250 ... 2500 mm                                                                                            |
| Linearity error                                 |       | $\leq 1.5 \%$                                                                                              |
| Load resistor                                   |       | $\leq 300 \Omega$                                                                                          |
| <b>Compliance with standards and directives</b> |       |                                                                                                            |
| Standard conformity                             |       |                                                                                                            |
| Standards                                       |       | EN 60947-5-2:2007+A1:2012<br>IEC 60947-5-2:2007 + A1:2012<br>EN 60947-5-7:2003<br>IEC 60947-5-7:2003       |
| <b>Approvals and certificates</b>               |       |                                                                                                            |
| UL approval                                     |       | cULus Listed, General Purpose                                                                              |
| CCC approval                                    |       | CCC approval / marking not required for products rated $\leq 36 \text{ V}$                                 |
| <b>Ambient conditions</b>                       |       |                                                                                                            |
| Ambient temperature                             |       | -25 ... 70 °C (-13 ... 158 °F)                                                                             |
| Storage temperature                             |       | -40 ... 85 °C (-40 ... 185 °F)                                                                             |
| Shock resistance                                |       | 30 g , 11 ms period                                                                                        |
| Vibration resistance                            |       | 10 ... 55 Hz , Amplitude $\pm 1 \text{ mm}$                                                                |
| <b>Mechanical specifications</b>                |       |                                                                                                            |
| Connection type                                 |       | Connector plug M12 x 1 , 5-pin                                                                             |
| Degree of protection                            |       | IP65                                                                                                       |
| Material                                        |       |                                                                                                            |
| Housing                                         |       | PBT                                                                                                        |
| Transducer                                      |       | epoxy resin/hollow glass sphere mixture; polyurethane foam                                                 |
| Installation position                           |       | any position                                                                                               |
| Mass                                            |       | 500 g                                                                                                      |

## Connection



## Connection Assignment

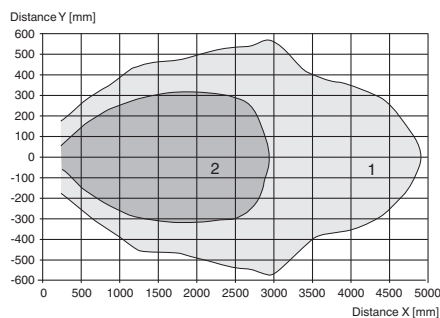


Wire colors in accordance with EN 60947-5-2

|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |
| 5 | GY | (gray)  |

## Characteristic Curve

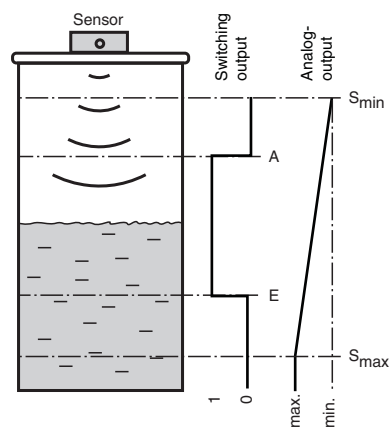
### Characteristic response curve



Curve 1: flat surface 100 mm x 100 mm  
Curve 2: round bar, Ø 25 mm

Characteristic Curve

Function of the outputs



Accessories

|                                                                                     |              |                                                                         |
|-------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------|
|    | V15-G-2M-PUR | Female cordset single-ended M12 straight A-coded, 5-pin, PUR cable grey |
|    | V15-G-2M-PVC | Female cordset single-ended M12 straight A-coded, 5-pin, PVC cable grey |
|   | V15-W-2M-PVC | Female cordset single-ended M12 angled A-coded, 5-pin, PVC cable grey   |
|  | 3RX4000-PF   | PC interface                                                            |

## Additional Information

### Application ranges

The design and function of this ultrasonic sensor make it ideal for filling level applications in small containers. The device has a switch output and an analogue output. With the switch output, a specific filling level in a tank can be signalled directly. The analogue output represents the current level as an analogue output variable.

### Assembly and connection

All components are contained in an encapsulated housing. The ultrasonic converter is in a slightly recessed position in the housing. The integrated circumferential seal allows the sensor to be used directly as a closure with integrated filling level measurement. The tank opening must have a diameter of 26 mm. It can be mounted on the tank using 2 M5 screws. The electrical connection is based on a 5-pin device connector, M12 x 1. The connections are protected against reverse polarity, short circuits and overloads. Shielded cables are recommended if there is electrical interference.

### Setting

As delivered, the switch-on and switch-off point, the measuring range limits and the averaging are fixed (see Technical data). They can subsequently be adapted to the application via SONPROG using the interface (see Accessories).

### SONPROG

The following parameters can be changed via SONPROG:

- Measuring range limits  $S_{min}$  and  $S_{max}$
- Switch-on and switch-off points (A, E)
- Blind zone
- Averaging

Special programming options are available on request.

### Operation

The filling level of a container is detected within the detection range. When the filling level reaches the switch-on or switch-off point (E or A), the switch output reacts according to its setting. The switching statuses of the switch output are signalled by the yellow LEDs. If the level is between the switching points A and E, the output is active.

Filling levels between the measuring range limits ( $S_{min}$ ,  $S_{max}$ ) are displayed in the form of an analogue output signal at the analogue output. The analogue output delivers its minimum value at filling level  $S_{min}$  and its maximum value at filling level  $S_{max}$ . The characteristic between the two measuring range limits is linear.

Objects in the blind zone cause false signals. Install in such a way that the filling level cannot enter the blind zone.

### Function input XI

The sensor is placed in standby mode by connecting a low level at the function input XI (blocked release). The sensors then performs no measurements. The outputs retain the most recent status. As soon as function input XI is disconnected from the low level or a high level is connected (release), the sensor resumes its normal function.

The function input XI can be used during operation for the synchronisation of multiple sensors. This can be done by connecting external signals, e.g. from a controller (external synchronisation) or by simply connecting the function inputs of all sensors to be synchronised (internal synchronisation).