Technical data

General specifications

Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Dead band	0 ... 60 mm
Standard target plate	10 mm x 10 mm
Transducer frequency	approx. 300 kHz

Nominal ratings

Time delay before availability t_v	250 ms

Limit data

Permissible cable length	max. 300 m

Indicators/operating means

LED green	Power on
LED yellow 1	solid: switching state switch output 1 flashing: misadjustment
LED yellow 2	solid: switching state switch output 2 flashing: misadjustment

Electrical specifications

Rated operating voltage U_e	24 V DC
Operating voltage U_B	12 ... 30 V (including ripple) In supply voltage interval 12 ... 20 V sensitivity reduced to 20% ... 0%
Ripple	≤ 10 %
No-load supply current I_0	≤ 60 mA

Input

Input type	1 program input Teach-In of S_{min}
Input voltage	≤ Operating voltage
Level	low level : 0 ... 3 V (Teach-In active) high level : ≥ 15 V (Teach-In inactive)
Pulse length	≥ 150 ms

Output

Output type	2 switch outputs PNP, NO
Rated operating current I_e	150 mA , short-circuit/overload protected
Default setting	Switching distance "full", S_{max}: 80 mm Switching distance "empty", S_{min}: 450 mm Switching hysteresis "full", H_{Smax}: 20 mm Switching hysteresis "empty", H_{Smin}: 100 mm average value "full", M_{Smax}: 20 average value "empty", M_{Smin}: 110
Voltage drop U_d	≤ 3 V
Switch-on delay t_{on}	80 ms
Repeat accuracy	± 0.45 mm
Off-state current I_r	0.01 mA
Temperature influence	≤ ± 1.5 %

Ambient conditions

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 ± 1 mm

Mechanical specifications

Connection type	Connector 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

Compliance with standards and directives

Standard conformity	
Standards	EN 60947-5-2:2007 + A1:2012 IEC 60947-5-2:2007 + A1:2012

Approvals and certificates

UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

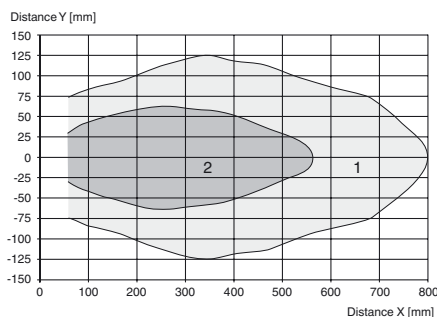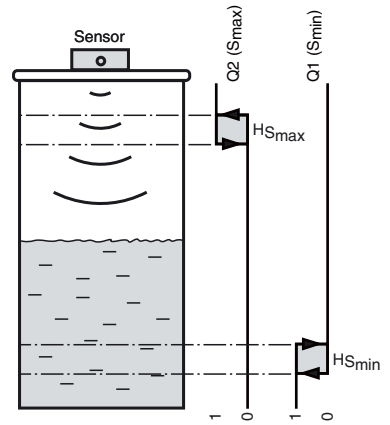CE   CSA c...US   c (UL) US

Model Number

UC500-F65-E8R2-V15

Features

- **Level indication**
- **2 switch outputs**
- **Program input**
- **Programmable by means of Interface (see accessories) and SON-PROG**
- **Synchronization options**
- **Temperature compensation**

Diagrams

Characteristic response curve

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

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

Pepperl+Fuchs Group   USA: +1 330 486 0001   Germany: +49 621 776 4411   Singapore: +65 6779 9091
www.pepperl-fuchs.com   fa-info@us.pepperl-fuchs.com   fa-info@de.pepperl-fuchs.com   fa-info@sg.pepperl-fuchs.com

PEPPERL+FUCHS
SENSING YOUR NEEDS

1

Dimensions

2 x ø8.8

6

30

10

17

2 x ø5.5   ø30

54

64.4

46

12

125

Additional Information

Function of the switching outputs

Sensor

Q2 (S$_{max}$)

Q1 (S$_{min}$)

HS$_{max}$

HS$_{min}$

1   0   1   0

Electrical Connection

1   + U$_B$

2   XI

4   Q1 (S$_{min}$)

5   Q2 (S$_{max}$)

3   - U$_B$

Pinout

1

5

2   4

3
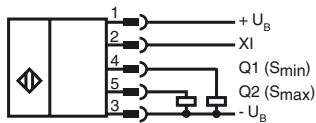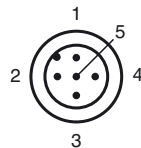
Wire colors in accordance with EN 60947-5-2

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

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

PEPPERL+FUCHS

SENSING YOUR NEEDS

Accessories

V15-G-2M-PUR
Female cordset, M12, 5-pin, PUR cable

V15-G-2M-PVC
Female cordset, M12, 5-pin, PVC cable

V15-W-2M-PVC
Female cordset, M12, 5-pin, PVC cable

3RX4000-PF
PC interface

Applications
The design and functionality makes this sensor best suitable for level detection applications in small containers or tanks. The device provides 2 switching outputs Q1 (S_{min}) and Q2 (S_{max}). Special distances can be assigned to each of them - e. g. the minimum and maximum levels in a tank can be evaluated and displayed. The parameters can be programmed with SONPROG or with an automatic setup (Teach-In).

Mounting and Connection
All parts are accommodated in a fully enclosed housing. The ultrasonic transducer is set back in the housing, so it is protected. Because of the built-in sealing the sensor can be used as a closure with integrated level detection. The opening of the tank must have a diameter of 26 mm. The sensor is fixed by means of two M5 screws. The sensor has a 5 pin M12 x 1 connector. The BERO has built-in polarity reversal as well as short-circuit and overload protection. Where there is electrical interference, shielded cables are recommended.

Setup
The two ranges, the associated hysteresis and the average value are preset at the factory (see technical data). The parameters can be programmed with SONPROG or with an automatic setup (teach-in). Teach-in can be done by means of the keys of the interface (accessories) or the function input XI.

Automatic Setup (Teach-in)
With this function the minimum level S_{min} can be set. The following steps must be performed in the correct order:
1. Fill the tank up to the required minimum level or place an object at the required distance.
2. Apply "low" signal (0 to 3 V) to the function input XI - e.g. connect XI via a key to 0 V, or connect it via a PLC to "LOW"). The LED "S_{min}" flashes, then. The sensor is disabled; it's learning the distance. The signal duration must be at least 150 ms.
3. Remove signal from XI - e.g. disconnect it from the function input XI, connect it to +U_B or connect it via a PLC to "HIGH").
   Important! As long as the function input XI is connected to "low", the sensor is disabled.

SONPROG
With SONPROG the following parameters can be programmed:
* Start or end of both switching ranges S_{min} and S_{max}
* Hysteresis (HS_{max}, HS_{min})
* Blind zone
* Sensing range
* Average value
* Switching output S_{min} NC / NO

Customer specific programming is available on request.

Operation
The level of liquid inside a tank is detected within the sensing range. If the level reaches one of the two switching levels (S_{min}, S_{max}), then the corresponding output will be set active. Both switching levels are equipped with a switching hysteresis (HS_{min}, HS_{max}). The switching status of each output is indicated by the corresponding yellow LED. If the filling level is in between the 2 switching levels, both of the outputs are in off state.

Objects inside the blind zone will cause error signals. Therefore the user has to mount the sensor that way that the level cannot be inside the blind zone.

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

Pepperl+Fuchs Group   USA: +1 330 486 0001   Germany: +49 621 776 4411   Singapore: +65 6779 9091
www.pepperl-fuchs.com   fa-info@us.pepperl-fuchs.com   fa-info@de.pepperl-fuchs.com   fa-info@sg.pepperl-fuchs.com

PEPPERL+FUCHS
SENSING YOUR NEEDS

3