



### Model Number

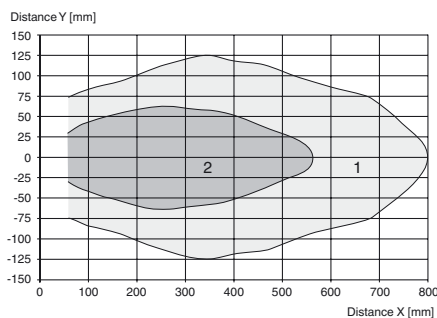
UC500-F65-E8R2-V15

### 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

Release date: 2012-07-12 14:43 Date of issue: 2013-10-25 235136\_eng.xml

### Technical data

#### General specifications

Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Unusable area	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
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#### Limit data

Permissible cable length	max. 300 m
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#### 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 reduced sensitivity by 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 $I_f$	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
Protection degree	IP65
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Installation position	any position
Mass	500 g

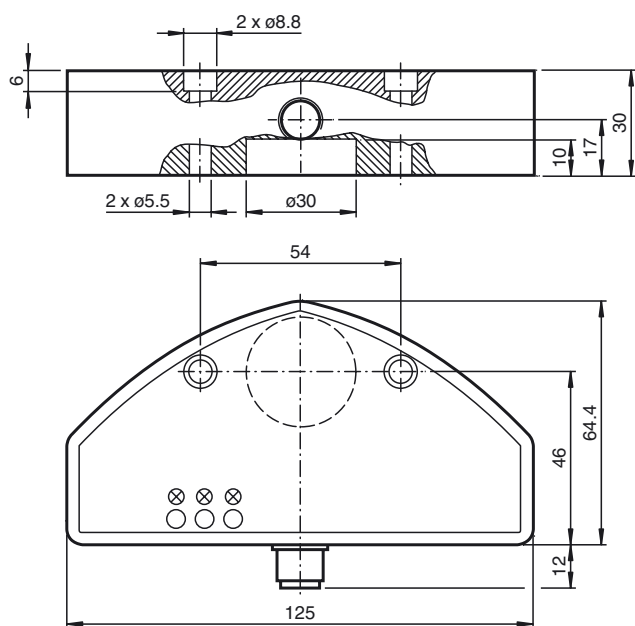
#### Compliance with standards and directives

Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

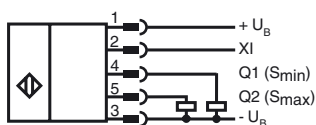
#### Approvals and certificates

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

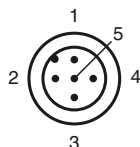
Dimensions



Electrical Connection



Pinout

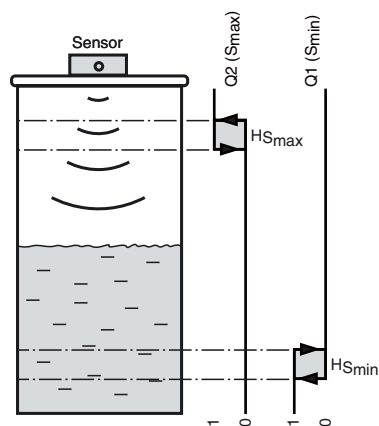


Wire colors in accordance with EN 60947-5-2

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

Additional Information

Function of the switching outputs



## 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-PUR

Female cordset, M12, 5-pin, PUR 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.



**Model Number**

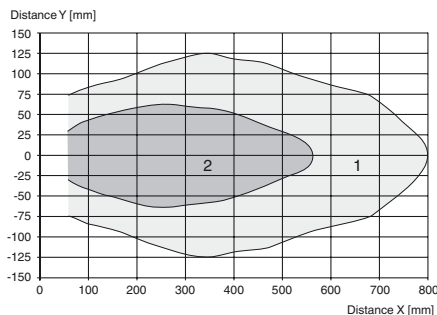
UC500-F65-FE2R2-V15

**Features**

- Level indication
- Frequency output
- 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

Release date: 2012-07-12 14:43 Date of issue: 2013-10-25 235150\_eng.xml

**Technical data**

**General specifications**

Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Unusable area	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
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**Limit data**

Permissible cable length	max. 300 m
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**Indicators/operating means**

LED green	Power on
LED yellow	solid: switching state switch output 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 reduced sensitivity by 20% ... 0%
Ripple	≤ 10 %
No-load supply current $I_0$	≤ 60 mA

**Input**

Input type	1 Function input
Input voltage	≤ Operating voltage
Level	low level : 0 ... 3 V high level : ≥ 15 V

**Output**

Output type	1 Frequency output
Rated operating current $I_e$	300 mA
Default setting	60 mm ... 300 mm
Linearity	≤ 1.5 %
Output frequency	frequency : 30 ... 250 Hz ( 300 ... 2500 Hz ) , adjustable

**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 , 4-pin
Protection degree	IP65
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Installation position	any position
Mass	500 g

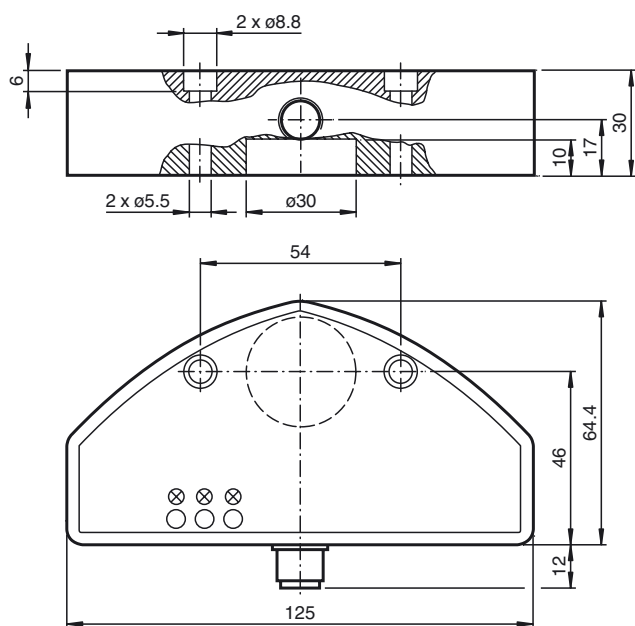
**Compliance with standards and directives**

Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

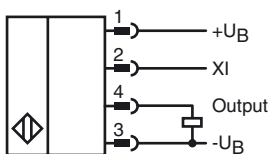
**Approvals and certificates**

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

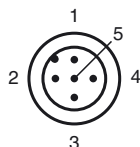
Dimensions



Electrical Connection



Pinout

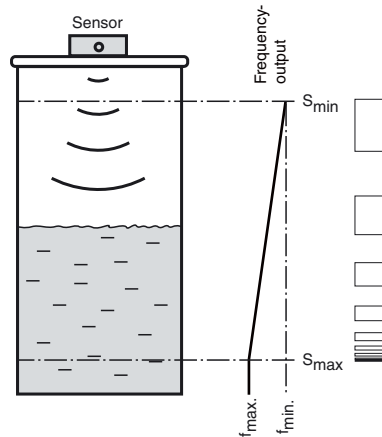


Wire colors in accordance with EN 60947-5-2

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

Additional Information

Function of the output



## Accessories

### V1-G-2M-PUR

Female cordset, M12, 4-pin, PUR cable

### V1-G-2M-PVC

Female cordset, M12, 4-pin, PVC cable

### V1-W-2M-PUR

Female cordset, M12, 4-pin, PUR cable

### V1-W-2M-PVC

Female cordset, M12, 4-pin, PVC cable

### 3RX4000-PF

PC interface

## Application ranges

The design and function of this ultrasonic sensor make it ideal for filling level applications in small containers. The device has a frequency output. The frequency of the output signal is a measure of the current filling level.

## 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 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  $S_{max}$
- Frequency range
- Blind zone
- Averaging

Special programming options are available on request.

## Operation

The filling level of a container is detected within the detection range. Filling levels between the measuring range limits ( $S_{min}$ ,  $S_{max}$ ) are displayed in the form of a rectangular signal with variable frequency. The frequency output delivers the smallest frequency value at filling level  $S_{min}$  and the highest frequency at filling level  $S_{max}$ . The frequency 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. The sensor 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, 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).



**Model Number**

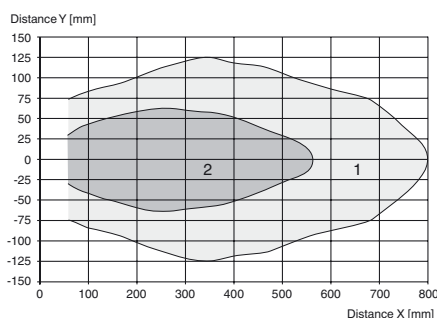
UC500-F65-IE2R2-V15

**Features**

- Level indication
- 1 analog output, 4-20 mA current source
- 1 switch output
- 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

**Technical data**

**General specifications**

Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Unusable area	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
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**Limit data**

Permissible cable length	max. 300 m
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**Indicators/operating means**

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

**Electrical specifications**

Rated operating voltage $U_e$	24 V DC
Operating voltage $U_B$	15 ... 30 V (including ripple) In supply voltage interval 15 ... 20 V reduced sensitivity by 20% ... 0%
Ripple	≤ 10 %
No-load supply current $I_0$	≤ 60 mA

**Input**

Input type	1 Function input
Input voltage	≤ Operating voltage
Level	low level : 0 ... 3 V high level : ≥ 15 V

**Switching output**

Output type	1 switch output PNP, NO
Default setting	60 ... 500 mm
Operating current $I_L$	≤ 300 mA , short-circuit/overload protected
Voltage drop	≤ 3 V

**Analog output**

Output type	1 current output 4 ... 20 mA , rising slope
Default setting	60 ... 500 mm
Linearity error	≤ 1.5 %
Load resistor	≤ 300 Ω

**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
Protection degree	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**

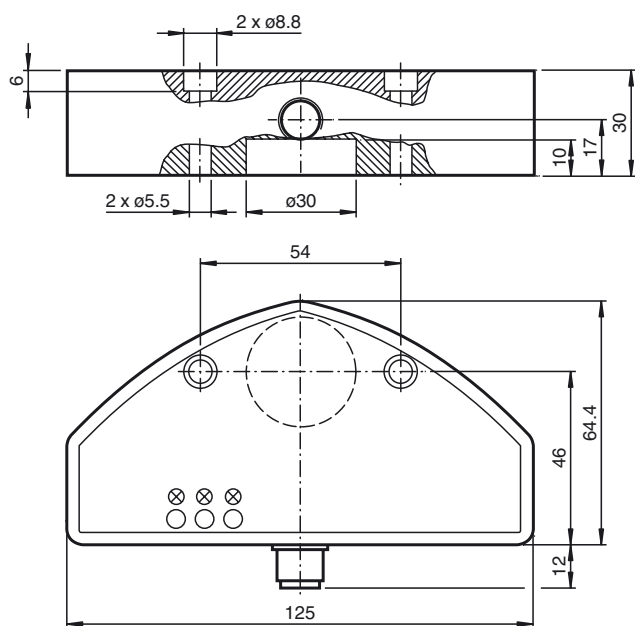
Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

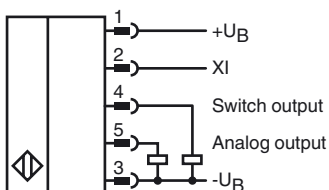
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

Release date: 2012-07-12 14:43 Date of issue: 2013-10-25 235141\_eng.xml

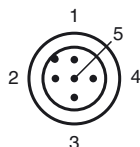
Dimensions



Electrical Connection



Pinout

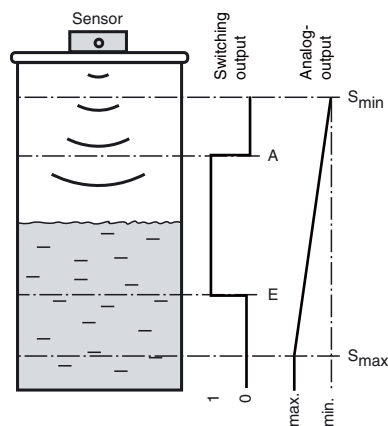


Wire colors in accordance with EN 60947-5-2

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

Additional Information

Function of the outputs





## 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-PUR

Female cordset, M12, 5-pin, PUR cable

### V15-W-2M-PVC

Female cordset, M12, 5-pin, PVC cable

### 3RX4000-PF

PC interface

## 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).



**Model Number**

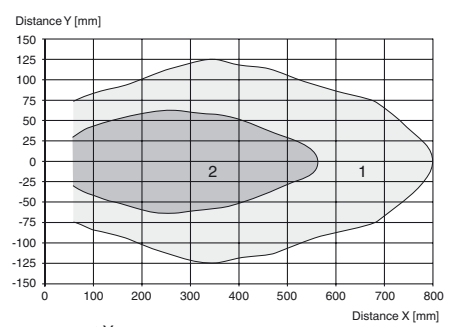
**UC500-F65-IE2R2-V15-Y235144**

**Features**

- Level indication
- 1 analog output, 0-20 mA current source
- 1 switch output
- 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

Release date: 2012-07-12 14:43 Date of issue: 2013-10-25 235144\_eng.xml

**Technical data**

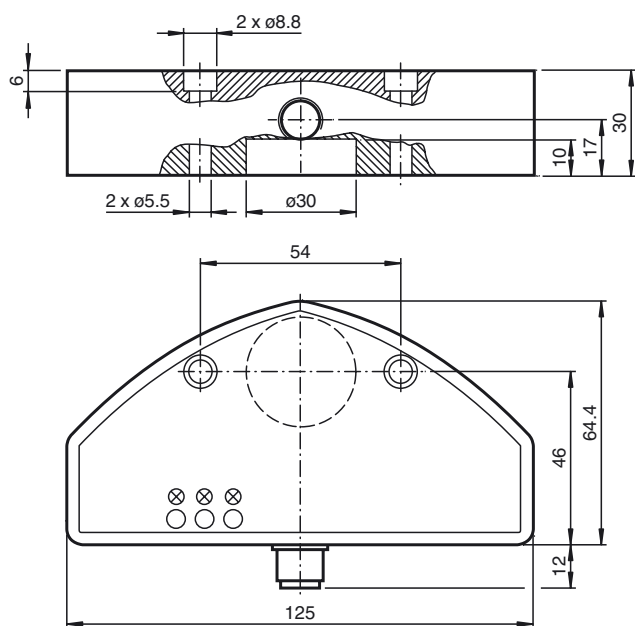
<b>General specifications</b>	
Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Unusable area	0 ... 60 mm
Standard target plate	10 mm x 10 mm
Transducer frequency	approx. 300 kHz
<b>Nominal ratings</b>	
Time delay before availability $t_v$	250 ms
<b>Limit data</b>	
Permissible cable length	max. 300 m
<b>Indicators/operating means</b>	
LED green	Power on
LED yellow	solid: switching state switch output flashing: misadjustment
<b>Electrical specifications</b>	
Rated operating voltage $U_e$	24 V DC
Operating voltage $U_B$	15 ... 30 V (including ripple) In supply voltage interval 15 ... 20 V reduced sensitivity by 20% ... 0%
Ripple	≤ 10 %
No-load supply current $I_0$	≤ 60 mA
<b>Input</b>	
Input type	1 Function input
Input voltage	≤ Operating voltage
Level	low level : 0 ... 3 V high level : ≥ 15 V
<b>Switching output</b>	
Output type	1 switch output PNP, NO
Default setting	60 ... 500 mm
Operating current $I_L$	≤ 300 mA , short-circuit/overload protected
Voltage drop	≤ 3 V
<b>Analog output</b>	
Output type	1 current output 0 ... 20 mA , rising slope
Default setting	60 ... 500 mm
Linearity error	≤ 1.5 %
Load resistor	≤ 300 Ω
<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 ± 1 mm
<b>Mechanical specifications</b>	
Connection type	Connector M12 x 1 , 5-pin
Protection degree	IP65
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Installation position	any position
Mass	500 g
<b>Compliance with standards and directives</b>	
Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

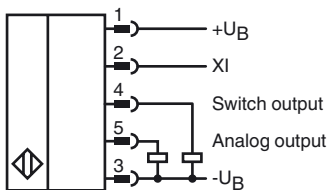
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V



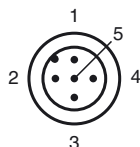
**Dimensions**



**Electrical Connection**



**Pinout**

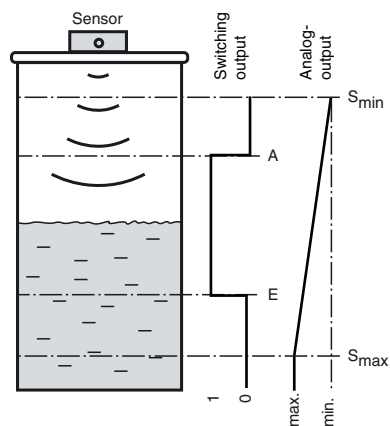


Wire colors in accordance with EN 60947-5-2

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

**Additional Information**

**Function of the outputs**



## 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-PUR

Female cordset, M12, 5-pin, PUR cable

### V15-W-2M-PVC

Female cordset, M12, 5-pin, PVC cable

### 3RX4000-PF

PC interface

## 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

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**Model Number**

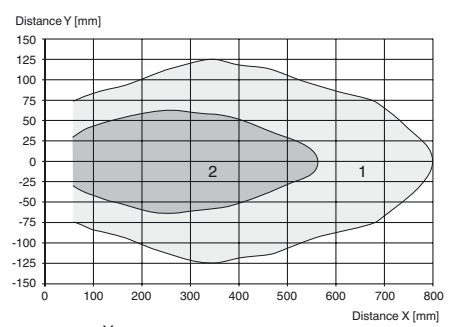
**UC500-F65-UE2R2-V15**

**Features**

- Level indication
- 1 analog output, 0-10 V voltage source
- 1 switch output
- 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

Release date: 2012-07-12 14:43 Date of issue: 2013-10-25 235147\_eng.xml

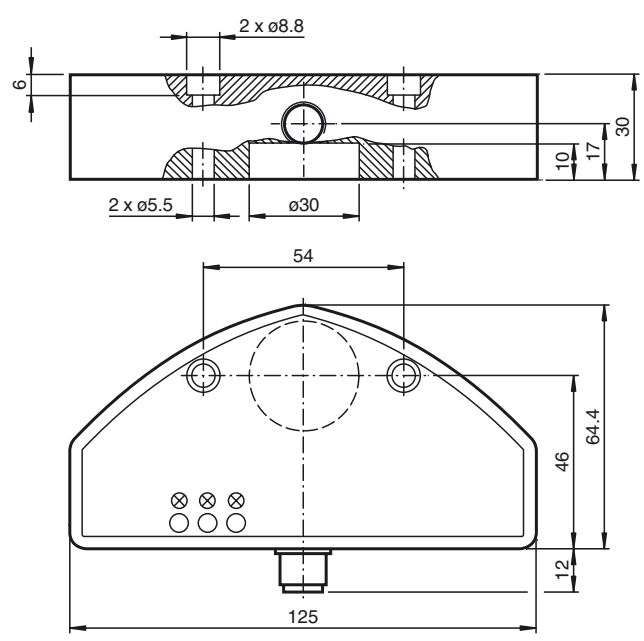
**Technical data**

<b>General specifications</b>	
Sensing range	60 ... 500 mm
Adjustment range	60 ... 500 mm
Unusable area	0 ... 60 mm
Standard target plate	10 mm x 10 mm
Transducer frequency	approx. 300 kHz
<b>Nominal ratings</b>	
Time delay before availability $t_v$	250 ms
<b>Limit data</b>	
Permissible cable length	max. 300 m
<b>Indicators/operating means</b>	
LED green	Power on
LED yellow	solid: switching state switch output flashing: misadjustment
<b>Electrical specifications</b>	
Rated operating voltage $U_e$	24 V DC
Operating voltage $U_B$	15 ... 30 V (including ripple) In supply voltage interval 15 ... 20 V reduced sensitivity by 20% ... 0%
Ripple	≤ 10 %
No-load supply current $I_0$	≤ 60 mA
<b>Input</b>	
Input type	1 Function input
Input voltage	≤ Operating voltage
Level	low level : 0 ... 3 V high level : ≥ 15 V
<b>Switching output</b>	
Output type	1 switch output PNP, NO
Default setting	60 ... 500 mm
Operating current $I_L$	≤ 300 mA , short-circuit/overload protected
Voltage drop	≤ 3 V
<b>Analog output</b>	
Output type	1 voltage output 0 ... 10 V , rising slope
Default setting	60 ... 500 mm
Linearity error	≤ 1.5 %
Load resistor	≤ 2 kΩ
<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 ± 1 mm
<b>Mechanical specifications</b>	
Connection type	Connector M12 x 1 , 5-pin
Protection degree	IP65
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Installation position	any position
Mass	500 g
<b>Compliance with standards and directives</b>	
Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

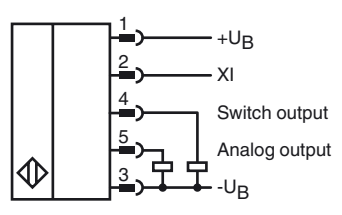
<b>Approvals and certificates</b>	
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V



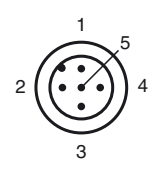
**Dimensions**



**Electrical Connection**



**Pinout**

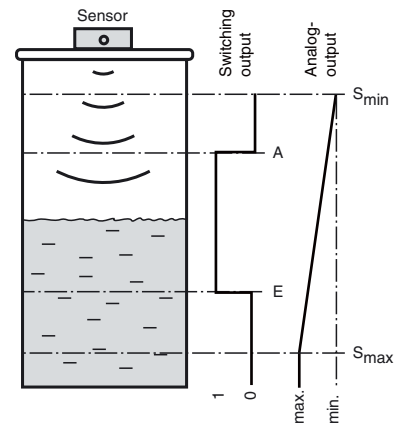


Wire colors in accordance with EN 60947-5-2

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

**Additional Information**

**Function of the outputs**



## 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-PUR

Female cordset, M12, 5-pin, PUR cable

### V15-W-2M-PVC

Female cordset, M12, 5-pin, PVC cable

### 3RX4000-PF

PC interface

## 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

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