



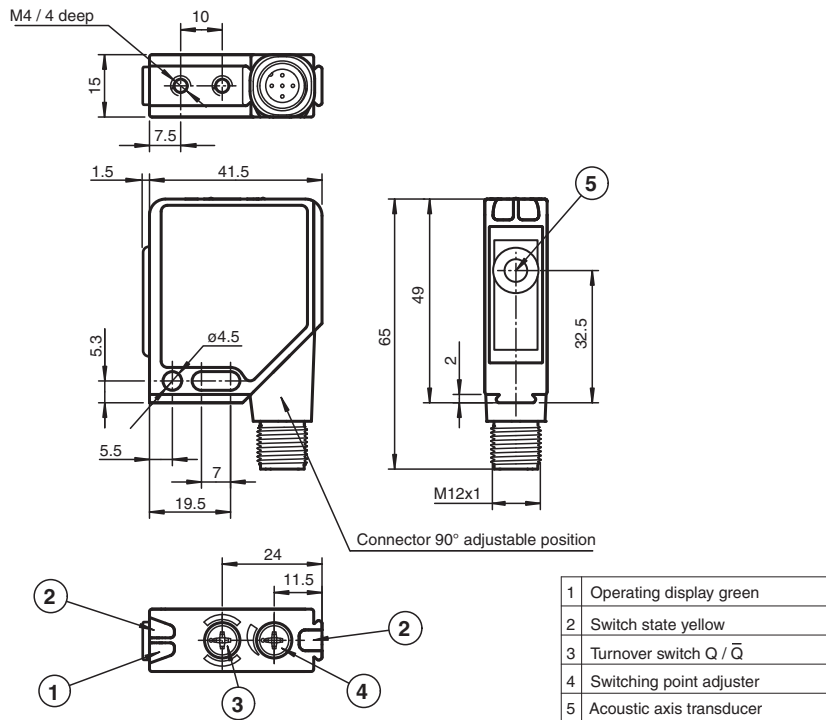
## Ultrasonic sensor UB250-F12P-EP-V15

- Switching point adjustment via potentiometer
- Selectable sound lobe width
- Synchronization options
- Very small unusable area
- Push-pull output
- Temperature compensation

Ultrasonic direct detection sensor



### Dimensions



### Technical Data

#### General specifications

Sensing range	20 ... 250 mm
Adjustment range	25 ... 250 mm
Dead band	0 ... 20 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 400 kHz
Response delay	approx. 20 ms

#### Indicators/operating means

LED green	Operating display
LED yellow	switch output

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

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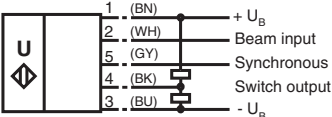
**PEPPERL+FUCHS**

## Technical Data

LED red		solid: stop plate switch point adjuster flashing: error
<b>Electrical specifications</b>		
Operating voltage	$U_B$	10 ... 30 V DC , ripple 10 % <sub>SS</sub>
No-load supply current	$I_0$	≤ 25 mA
<b>Input/Output</b>		
Synchronization		1 synchronous connection, bi-directional 0-level: $-U_B \dots +1$ V 1-level: $+4$ V ... $+U_B$ input impedance: > 12 kΩ synchronization pulse: ≥ 100 μs, synchronization interpulse period: ≥ 2 ms
Synchronization frequency		
Common mode operation		max. 200 Hz
Multiplex operation		≤ 200/n Hz, n = number of sensors
<b>Input</b>		
Input type		1 input for sound lobe adjustment small sound beam: $-U_B \dots +1$ V wide sound beam: $+4$ V ... $+U_B$ or open input input impedance: > 10 kΩ switching delay: 1 s
<b>Output</b>		
Output type		Push-pull output, short-circuit protected, reverse polarity protected
Rated operating current	$I_e$	200 mA , short-circuit/overload protected
Default setting		Switching point: 250 mm output behavior: NO contact
Voltage drop	$U_d$	≤ 3 V
Repeat accuracy		≤ 1 %
Switching frequency	f	20 Hz
Range hysteresis	H	1 % of the set operating distance
Temperature influence		± 1.5 % of full-scale value
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards		EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012
<b>Approvals and certificates</b>		
UL approval		cULus Listed, General Purpose
CSA approval		cCSAus Listed, General Purpose
<b>Ambient conditions</b>		
Ambient temperature		-15 ... 70 °C (5 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
<b>Mechanical specifications</b>		
Connection type		Connector M12 x 1 , 5-pin
Degree of protection		IP54
Material		
Housing		Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC
Transducer		epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass		60 g

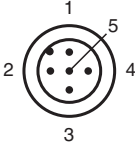
Connection

**Standard symbol/Connections:**  
(version EP, pnp/npn)



Core colours in accordance with EN 60947-5-2.

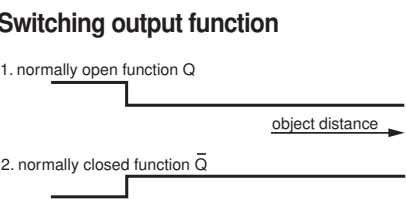
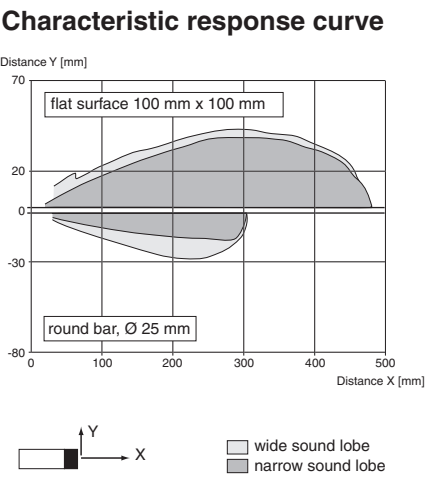
Connection Assignment



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



Accessories

	<b>OMH-K01</b>	dove tail mounting clamp
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## Accessories

	<b>OMH-K02</b>	dove tail mounting clamp
	<b>OMH-K03</b>	dove tail mounting clamp
	<b>OMH-01</b>	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	<b>OMH-06</b>	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	<b>OMH-MLV12-HWG</b>	Mounting bracket for series MLV12 sensors
	<b>OMH-MLV12-HWK</b>	Mounting bracket for series MLV12 sensors
	<b>V15-G-2M-PVC</b>	Female cordset single-ended M12 straight A-coded, 5-pin, PVC cable grey

## Additional Information

### Synchronisation

To suppress mutual influence, the sensor is equipped with a synchronisation connection. If this is not activated, the sensor works with an internally generated clock. Synchronisation of multiple sensors can be achieved in the following ways.

#### External synchronisation

The sensor can be synchronized by external application of a square wave voltage. A synchronisation impulse on the synchronisation input leads to the execution of one measurement cycle. The impulse width must be larger than 100 µs. The measurement cycle starts with the falling flank. A low level > 1 sec or an open synchronisation input puts the sensor in normal mode. A high level on the synchronisation input deactivates the sensor.

Two operational modes are possible

1. Multiple sensors are controlled using the same synchronisation signal. The sensors work in synch.
2. The synchronisation impulses are cyclically fed to only one sensor at a time. The sensors work in multiplex mode.

#### Autosynchronisation

The synchronisation connections of up to 10 sensors are connected together. These sensors then work in multiplex mode after power is switched on. The activation delay is increased corresponding to the number of synchronised sensors.

#### Note:

If the synchronisation option is not used, the sync. input should be connected to ground (0V), or the sensor connected using a V1 connector cable (4-pin).

### Selection of beam characteristics

By switching the beam input, the activation characteristics of the ultrasound sensor can be selected. If the beam input is open or connected to +U<sub>B</sub>, the sensor works with a wide ultrasonic cone. A beam input connected to -U<sub>B</sub> causes the sensor to work with a narrower ultrasonic cone. This setting is preferred when an object in the vicinity of the sensor is close to the ultrasonic beam, and should be suppressed. The characteristic of the ultrasonic cone can be changed during sensor operation. Switching the sound cone characteristics becomes active one second after the change to the signal level at the beam input.

### Setting the switch point

The ultrasonic sensor possesses a switch output, of which the switching point can be set simply and precisely using the built-in 12-position potentiometer. Using the switch Q /  $\bar{Q}$  which is also easy to find on the upper side of the sensor, the effective direction of the switching output can be selected.

There are two different output functions which can be selected

1. one switching point, normally open
2. one switching point, normally closed

### LED display

	Opening function (Q\)	Closing function (Q)
<b>LED green:</b>	Power On	
LED yellow:	Switch state Object outside switching area, or no object	Switch state Object detected in switching area
LED red	Potentiometer for setting of switch point at "limit"	
LED red flashing	Ultrasonic error	