microsonic
Ultrasonic Sensors

Instruction manual
wms Ultrasonic Sensors for connection to a wms controller wms-4/4D and wms-4/4I

Product description
- The wms sensors require a connection to a wms controller or to the customer´s own control and signal evaluation equipment.

Important instructions for assembly and application
All employee and plant safety-relevant measures must be taken prior to assembly, start-up, or maintenance work (see operation manual for the entire plant and the operator instruction of the plant).
The sensors are not considered as safety equipment and may not be used to ensure human or machine safety!
The wms sensors indicate a **blind zone**, in which the distance cannot be measured. The **operating range** indicates the distance of the sensor that can be applied with normal reflectors with sufficient function reserve. When using good reflectors, such as a calm water surface, the sensor can also be used up to its **maximum range**. Objects that strongly absorb (e.g. plastic foam) or diffusely reflect sound (e.g. pebble stones) can also reduce the defined operating range.

Assembly instructions
☞ Assemble the sensor at the installation location.
☞ Plug in the connector cable to the M 12 connector.

		colour
1	+U_B	brown
3	-U_B	blue
4	Echo	black
2	Transmitter	white

Fig.2: Pin assignment with view onto the sensor plug and colour code of the connection cable

☞ Connect the sensor to the wms controller respectively to your own control and signal evaluation equipment according to Fig.2.

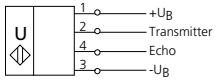
Signal input »Transmitter«
A signal on the input makes the wms sensor emitting a sound pulse. For this a open collector output has to earth the »transmitter« signal input for the time given in the technical data table below.

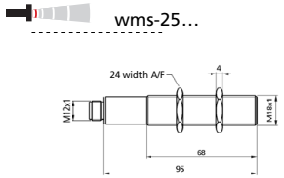
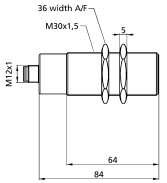
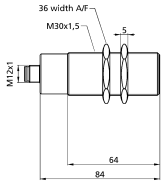
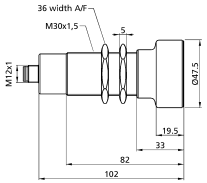
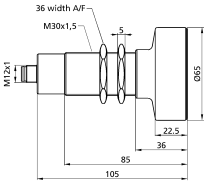
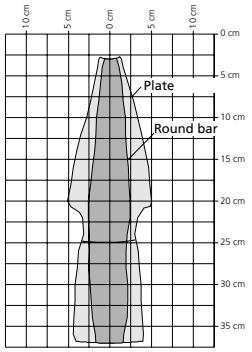
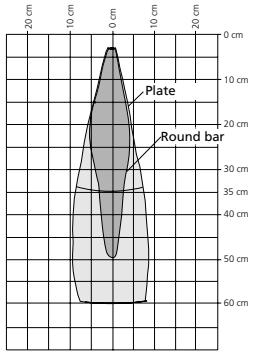
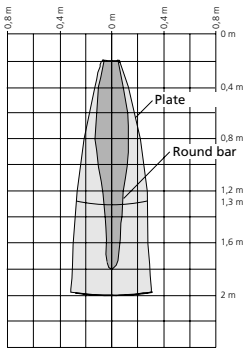
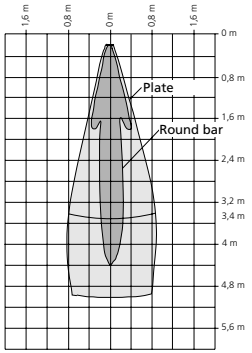
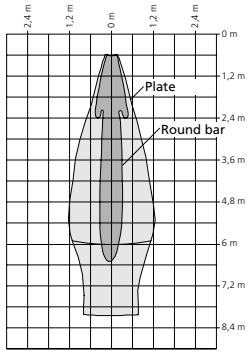
Signal output »Echo«
The signal output »Echo« subsequently transmitts all echo signals received depending on the duration as 1-bit values (echo yes/no).

89/336/EWG CE

MV-DO-074368-166266

Technical data



	wms-25...	wms-35...	wms-130...	wms-340...	wms-600...
					
Blind zone	30 mm (40 mm)[1]	6 mm (70 mm)[1]	200 mm	350 mm	800 mm
Operating range	250 mm	350 mm	1.300 mm	3.400 mm	6.000 mm
Maximum range	350 mm	600 mm	2.000 mm	5.000 mm	8.000 mm
Transducer frequency	320 kHz	400 kHz	200 kHz	120 kHz	80 kHz
Resolution, sampling range	0,35 mm	0,18 mm	0,18 mm	0,18 mm	0,18 mm
Angle of beam spread	Please see detection zones	Please see detection zones	Please see detection zones	Please see detection zones	Please see detection zones
Reproducibility	± 0,15 %	± 0,15 %	± 0,15 %	± 0,15 %	± 0,15 %
Accuracy	Temperature drift 0,17%/K	Temperature drift 0,17%/K	Temperature drift 0,17%/K	Temperature drift 0,17%/K	Temperature drift 0,17%/K
Detection zones for different objects: The dark grey areas are determind with a thin round bar (10 or 27 mm dia.) and indicate the typical operating range of a sensor. In order to obtain the light grey areas, a plate (500 x 500 mm) is introduced into the beam spread from the side. In doing so, the optimum angle between plate and sensor is always employed. This therefore indicates the maximum detection zone of the sensor. It is not possible to evaluate ultrasonic reflections outside this area.					
Operating voltage U_B / Voltage ripple	10 V bis 30 V DC, reverse polarity protection / ± 10 %				
No-load current	30 mA	30 mA	30 mA	30 mA	30 mA
Housing	Brass sleeve, nickel-plated, plastic parts: PBT; Ultrasonic transducer: polyurethane foam, epoxy resin with glass content				
Class of protection to EN 6052	IP67	IP67	IP67	IP67	IP67
Type of connection	5-pin initiator plug, brass, nickel-plated				
Operating temperature	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C
Storage temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Weight	80 g	200 g	200 g	260 g	320 g
Signal input (Transmitter)	Controlled by open collector (npn); $I_C \geq 3$ mA, $U_{CE} \geq 30$ V				
Recommended tramsmitted pulse length	25 µs	80 µs	150 µs	300 µs	350 µs
Recommmended measuring cycle time	8 ms	12 ms	20 ms	40 ms	65 ms
Signal output (Echo)	Positive-switched (pnp), I_{max} = 10 mA, short-circuit-proof and reverse polarity protection				
With wms-4/4 D controller					
Switching hysteresis	2 mm	3 mm	10 mm	30 mm	60 mm
Switching frequency	5 Hz	5 Hz	4 Hz	3 Hz	2 Hz
With wms-4/4 I controller					
Response time, analogue output	85 ms	95 ms	105 ms	140 ms	220 ms
Order No.	**wms-25/RT/HV/M18**	**wms-35/RT**	**wms-130/RT**	**wms-340/RT**	**wms-600/RT**

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