Ultrasonic sensors
237-11204-7 / 237-11204-8

Operating Instructions
following EMC Directive 2014/30/EU

EN

Product description
The ultrasonic sensors described:
- measure the distance to the medium without contacting it and according to their detection area.
- emit an analogous output signal which is proportional to the distance of the medium.
- have a blind zone from which distance measuring is not possible.
- indicate whether an object is positioned within the unchangeably factory-set window limits. LED 1 (lights green).
- indicate whether an object is positioned outside the unchangeably factory-set window limits. LED 2 (lights red).
- have an internal temperature compensation. Due to the self-heating of the ultrasonic sensors the temperature compensation reaches its optimum operating point after an operating time of about 30 minutes.

Regulatory notes
Electrical equipment according to EMC 2014/30/EU

no safety components acc. to machinery directive 2006/42/EC

Enclosure type 1
For use in industrial machinery
NFPA 79 applications only

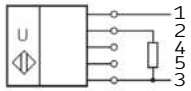
Intended use
Non-contact distance measurement of lubrication oils and greases in the frame of the technical data.

Safety instructions
Read these operating instructions before the installation and commissioning. Installation and electrical connection by authorized qualified personnel only.

Installation and commissioning
- Clean the installation surface. When doing so make sure that no dirt enters the reservoir.
- Mount the ultrasonic sensor with the sensor surface (white area) centrically above the bore (Ø 20 mm) into the reservoir lid.
- Connect the connection cable to the M12 plug.
- Switch the power supply on.

Cleaning
Clean the sensor surface (white area), if it is contaminated.

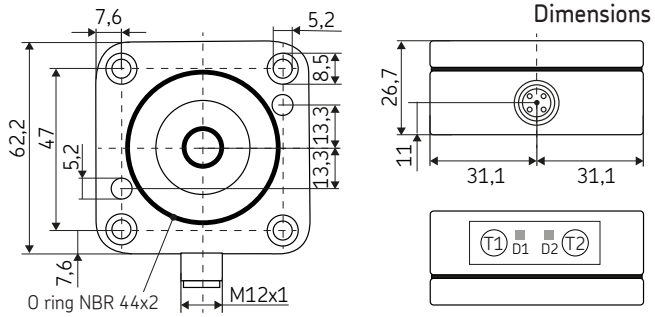
Electrical connection



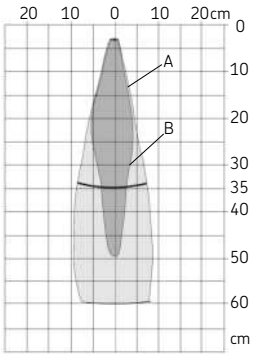
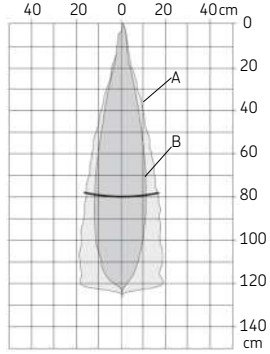
		Colour
1	+ U_B	brown
2	U/I	white
3	- U_B	blue
4	-	black
5	Sync/Com	grey

Display of the switching states		
Reservoir	D1	D2
full	red	red
filled	green	green
empty	red	red

Dimensions



Technical data

Order number	237-11204-7	237-11204-8
Blind zone	0 - 65 mm	0 - 115 mm
Scanning range limit	500 mm	1000 mm
Opening angle of the sound beam	see detection zone	
Ultrasonic frequency	approx. 400 kHz	approx. 200 kHz
Resolution	0, 18 mm	
Repeatability	±0.15 %	
Detection zone in centimetres The dark grey areas indicate the zone in which the standard reflector (pipe) is reliably detected. This is the typical operating range of the sensors, The light grey areas indicate the zone in which a big reflector – like, e.g. a plate – is still detected – provided it is optimally positioned to the sensor. Outside the light grey area an evaluation is not possible any more. A = aligned plate B = tube		
Accuracy	±1 %	
Operating voltage U_B	9 - 30 V DC protected against reverse polarity	
Residual ripple	±10 %	
No-load current consumption	≤ 60 mA	
Housing material	PBT, polyester, ultrasonic transducer: PUR, epoxy resin with glass contents	
Type of connection	5-pole M12 circular socket connector	
Type of protection following EN 60529	IP 67	
Display elements	LED D1 (green / red) LED D2 (green)	
Operating and storage temperature ranges	-40 °C to + 70 °C	
Weight	120 g	
Response delay	272 ms	340 ms
Readiness delay	< 300 ms	
Compliance with standards	DIN EN 60947-5-2	
Current output 4 - 20 mA	$R_L \leq 100\ \Omega$ at 9 V ≤ U_B ≤ 15 V / $R_L \leq 500\ \Omega$ at $U_B \geq 15$ V	
	rising/ falling characteristics	
Power consumption 0 - 10 V	$R_L \geq 100\ \Omega$ at $U_B \geq 15$ V short-circuit-proof rising/ falling characteristics	

Factory settings
Falling characteristic, analogous outlet to current 4-20 mA, 4 mA (empty) 20 mA (full)

Manufacturer: SKF Lubrication Systems Germany GmbH, Heinrich-Hertz-Str. 2-8, DE-69190 Walldorf

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Teach-in

Preliminary notes

The Teach-in allows to adapt the sensor to different reservoir sizes and necessary output characteristics.

SKF Factory settings

Teach-in	activated
Output characteristic	falling edge

LED states

Standard operation,
i. e. object to be detected within the adjusted window limits

	D1	D2
Standard operation	green	Off
Pos. 1 full	red	Off
Pos. 2 empty	red	Off

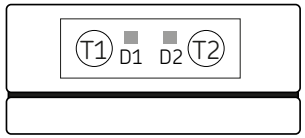
If pushbutton T1 is not pressed, after 5 minutes the sensor returns to standard operation. All changes realized by are accepted.

Deactivate / activate Teach-in

1. Switch the power supply off.
2. Press the T1 pushbutton and at the same time switch on the power supply.
3. Press the T1 pushbutton for 3 seconds.
   ➔ Both LEDs flash simultaneously
4. Release the T1 pushbutton.
   ➔ Both LEDs flash simultaneously.
5. Deactivate / activate the Teach-in by pressing the T1 pushbutton for 1 second.

Teach-in deactivated:	LED D1 off
Teach-in activated	LED D1 on

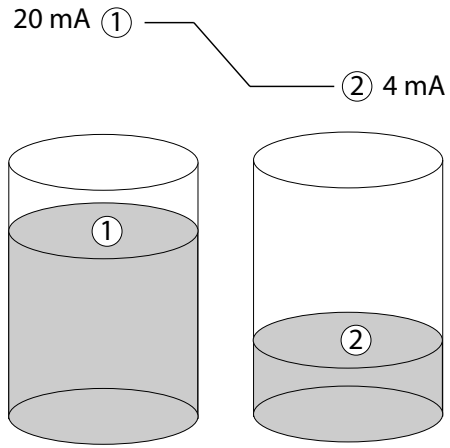
The changes are accepted.
After 10 seconds the sensor automatically returns to standard operation.



Set the window limits

1. Move the object to be detected to position 1 (reservoir full).
2. Press the T1 pushbutton for 3 seconds.
   ➔ Both LEDs flash simultaneously
3. Release the T1 pushbutton.
   ➔ Both LEDs flash simultaneously.
4. Move the object to be detected to position 2 (reservoir empty).
5. Press the T1 pushbutton for 1 seconds.

The changes are accepted.
After 10 seconds the sensor automatically returns to standard operation.



Set the output characteristics

1. Press the T1 pushbutton for 13 seconds.
   ➔ Both LEDs flash alternately.
2. Press the T1 pushbutton for 1 second.
   ➔ LED D2 will continue to flash
   ➔ LED D1 on = rising output characteristics
   ➔ LED D2 on = falling output characteristics.

The changes are accepted. After 10 seconds the sensor automatically returns to standard operation.

Reset to the factory defaults

1. Switch the power supply off.
2. Press pushbutton T1 and at the same time switch on the power supply.
3. Press the T1 pushbutton for 13 seconds.
   ➔ Both LEDs flash alternately.

The changes are accepted.
After 10 seconds the sensor automatically returns to standard operation.

Accessories

237-13442-4	M12 plug, straight
236-10022-6	M12 plug, angled 90°
279235	Adapter kit, 60,90, 120 FM II bucket level sensor

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