

JUMO GmbH & Co. KG

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JUMO Instrument Co. Ltd.

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JUMO Process Control, Inc.

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JUMO MAERA S25

Level Probe

Applications

Level and liquid level measurements¹

- in rainwater cisterns
- for graywater recycling
- in heating oil and diesel oil tanks
- in AUS32 (better known under the designation „AdBlue®“ in Europe, „DEF“ in North America, or „ARLA 32“ in Brazil)

Brief description

The JUMO MAERA S25 level probe can be used for hydrostatic liquid level measurement in tanks, for levels from 2.50 m to 10 mWC (water column).

There is usually a pressure compensation tube integrated in the cable to compensate for ambient pressure. A cost-optimizing approach has been adopted for this level probe, by encasing a standard cable in a protective tube. The protective tube then implements the pressure compensation.

For additional, interesting information, see the "level probes - hydrostatic level and liquid level measurement" brochure.

Customer benefits

- **Economy**
Development is based on sensor technology that has proved its worth a thousand times over in the pressure transmitters of the JUMO MIDAS product family. Digital compensation and calibration of the sensor assembly save time and cost. Optimum use is made of materials by keeping dimensions small. A standard cable is encased in a protective tube suitable for the application. The result of all this is an excellent price/performance ratio.
- **Process safety**
Because the measuring and calibrating system is fully automatic, the high level of quality of every level probe is assured throughout. The crucial element is a piezoresistive measuring cell, safe and reliable with a high overload resistance.
- **Two-wire polarity reversal protection**
Polarity reversal protection ensures maximum safety on startup for level probes with a two-wire output, protecting the measuring instrument from destruction during startup.



Type 401015 with
process connection 707

Key features

- Measuring ranges: 0 to 0.25/0.4/0.6/1 bar (0 to 50 °C)
- Piezoresistive silicon sensor
- Sensor-technology that has proved its worth a thousand times over
- Two-wire polarity reversal protection

¹ Although these recommendations are based on many years of experience, deviation is possible in some cases.
We would be happy to provide you with additional information or details of other applications.

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Technical data

General information

Reference conditions	DIN 16086 and EN 60770
Sensor	
Principle of measurement	silicon sensor with stainless steel separating diaphragm (piezoresistive)
Pressure transfer medium	synthetic oil
Permissible load change	> 10 million, 0 to 100 % measuring range
Mounting location	vertical/suspended on the cable

Measuring range

Relative pressure	The measuring ranges start at 0 bar.				
Measuring range	0.25	0.4	0.6	1	bar
Overload capacity	0.75	1.2	1.8	3	bar
Bursting pressure	1	1.6	2.4	4	bar

Output

Analog output	
Current	
Output 405	4 to 20 mA, two wires
Voltage	
Output 412	0.5 to 4.5 V DC, three wires, ratiometric 10 to 90 % of the supply voltage
Output 415	0 to 10 V DC, three wires
Output 418	1 to 5 V DC, three wires
Output 420	1 to 6 V DC, three wires
Jump response	
T_{90}	≤ 10 ms
Burden	
Current	
4 to 20 mA, two wires	$R_L \leq (U_B - 10 \text{ V})/0.02 \text{ A} (\Omega)$
Voltage	
0.5 to 4.5 V DC, three wires	$R_L \geq 20 \text{ k}\Omega$
0 to 10 V DC, three wires	$R_L \geq 10 \text{ k}\Omega$
1 to 5 V DC, three wires	$R_L \geq 10 \text{ k}\Omega$
1 to 6 V DC, three wires	$R_L \geq 10 \text{ k}\Omega$

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Mechanical properties

It is vital to note the resistance of the materials to the medium!

Process connection	
Material	
Process connection 567	stainless steel 316L
Process connection 707	stainless steel 316 Ti
Measurement diaphragm	
Material	stainless steel 316L
Housing	
Material	stainless steel 304
Protective cap	
Material	rigid PVC
Weight	90 g (without cable)
Diameter	27 mm

Ambient conditions

Permissible temperatures	
Medium	0 to 50 °C The instrument must not be allowed to freeze in the medium! The medium may make it necessary to impose a restriction.
Storage	-20 to +80 °C, dry
Electromagnetic compatibility	
Interference emission ^a	Class B
Interference immunity ^b	industrial requirements
Enclosure protection^c	IP68, immersible to 20 m

^a as defined by EN 61326-1

^b as defined by EN 61326-2-3

^c as defined by EN 60529

Accuracy

Relative pressure					
Measuring range	0.25	0.4	0.6	1	bar
Linearity^a	0.3	0.3	0.3	0.3	% of FS
Accuracy at 20 °C ^b	0.5	0.5	0.5	0.5	% of FS
Overall accuracy at 0 to 50 °C ^c	1	1	1	1	% of FS
Long-term stability^d	0.3 % of FS per year				

^a linearity based on limit point setting

^b includes: linearity, hysteresis, repeatability, deviation from initial (offset) and final values of measuring range

^c includes: linearity, hysteresis, repeatability, deviation from initial (offset) and final values of measuring range, thermal effect on initial value of measuring range and span

^d reference conditions as defined by EN 61298-1

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Auxiliary power

Supply voltage U_B^a	
4 to 20 mA, two wires, output 405	10 to 30 V DC, nominal voltage 24 V DC
0.5 to 4.5 V DC, three wires, output 412	5 V DC
0 to 10 V DC, three wires, output 415	11.5 to 30 V DC, nominal voltage 24 V DC
1 to 5 V DC, three wires, output 418	10 to 30 V DC, nominal voltage 24 V DC
1 to 6 V DC, three wires, output 420	10 to 30 V DC, nominal voltage 24 V DC
Reverse polarity protection	yes (two wire)
Max. power consumption	≤ 25 mA
Circuit	SELV

^a Peak voltages must not exceed or fall below the values specified for the power supply!

Electrical connection

Stranded core PVC cable, encased in a LD-PE or PA protective tube (in contact with the medium)

Because of ambient pressure compensation, the mounting of the level probe must not pinch the protective tube encasing the cable. A hose endpiece is included among the items supplied. It is also essential to ensure that moisture cannot get into the protective tube.

Protective tube	
Material	LD-PE, PA
Color	natural
External diameter	8 mm
Bending radius	approx. 120 mm It is vital to take into account that if the protective tube is kinked or pinched, this will prevent ambient pressure compensation.
Permissible medium temperatures	-5 to +80 °C (subject to the medium and the level probe)
Yield stress	
PE protective tube	10 M Pa
PA protective tube	22 M Pa

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Connection diagram

Connection		Terminal assignment
		Cable
4 to 20 mA, two wires, output 405		
Supply voltage 10 to 30 V DC	U _B /S+ 0 V/S-	white brown
0.5 to 4.5 V DC ratiometric, output 412		
Supply voltage 5 V DC	U _B 0 V/S- S+	white brown green
0 to 10 V DC, three wires, output 415		
Supply voltage 11.5 to 30 V DC	U _B 0 V/S- S+	white brown green
1 to 5 V DC, three wires, output 418 1 to 6 V DC, three wires, output 420		
Supply voltage 10 to 30 V DC	U _B 0 V/S- S+	white brown green

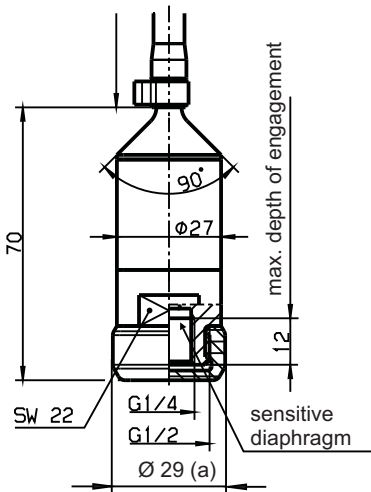
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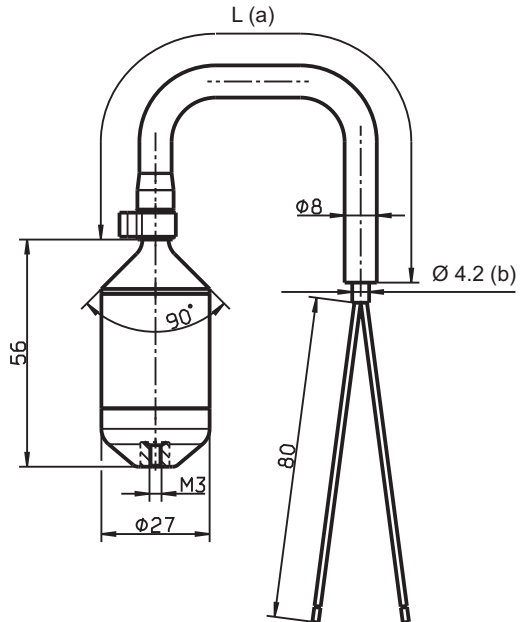


Process connection dimensions



Process connection 567

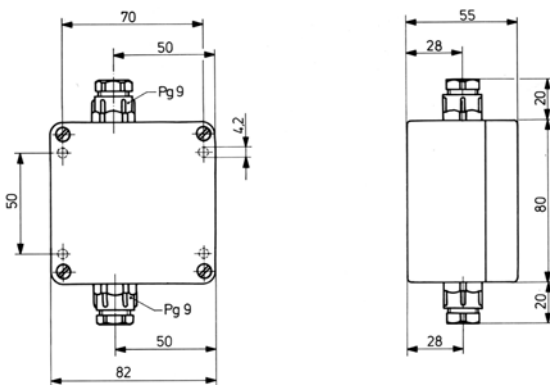
- a The protective cap has three holes ($\varnothing 3$) and protects the housing against contact corrosion, and the sensitive separating diaphragm



Process connection 707

- a Cable length as required by customer
- b $\varnothing 4.6$ for three-wire output

Dimensions of accessories



Terminal box with pressure compensation

Part no.: 00061206

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Order details

(1) Basic type

401015 JUMO MAERA S25

(2) Basic type extension

000 none
 999 special design

(3) Relative pressure measuring range overpressure

451 0 to 0.25 bar
 452 0 to 0.4 bar
 453 0 to 0.6 bar
 454 0 to 1.0 bar

(4) Output

405 4 to 20 mA, two wires
 412 0.5 to 4.5 V DC, three wires
 415 0 to 10 V DC, three wires
 418 1 to 5 V DC, three wires
 420 1 to 6 V DC, three wires

(5) Process connection

707 M3 x 0.5 internal
 567 internal G 1/4

(6) Process connection material

20 stainless steel

(7) Electrical connection

11 fixed cable and protective tube

(8) Protective tube

1 PE protective tube, e. g. suitable for use in rainwater in a cistern
 2 PA protective tube, e. g. suitable for use in heating oil

(9) Cable length "L"

005 5 m
 010 10 m
 025 25 m

(10) Extra code

000 none

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Order code	<input type="text"/>	/ <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	/ <input type="text"/>
Order example	401015	/ 000	- 452	- 405	- 707	- 20	- 11	- 1	- 005	/ 000

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Accessories

Article	Part No.
Terminal box with pressure compensation (can only be used with the hose endpiece)	00061206