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JUMO NESOS R03 LS

Float switch with reference vessel

Applications

- Limit level measurement of liquids in storage tanks, containers, oil sumps, and tanks
- Water and wastewater treatment
- Mechanical and plant engineering
- Shipbuilding
- Energy technology
- Swimming pool technology

Brief description

Limit level measurement is carried out according to Archimedes' principle for liquids. The float moves along the guide tube as the level rises or falls. The magnet in the float actuates the reed contact(s) installed in the guide tube with its magnetic field. The switching status of the reed contact can be evaluated and further processed by downstream electronic components, relays, or contactors. Alarms, pumps, signal lamps, valves, and horns are typically switched via a contact protection relay.

For applications where there is a shortage of space during installation in the tank from above, the float switch is suitable for side mounting due to the type of design. This means that the design type can also be used for reliable limit level measurement in applications with unstable media.

Depending on the variant ordered, various electrical connections, floats, numbers of contacts, positions of contacts, and contact functions (SPST-NO [N/O contact], SPST-NC [N/C contact], SPDT-CO [changeover contact]) are available.

With the optional temperature sensor or temperature switch, both the limit level measurement and the temperature can be recorded via just one measuring point. Variants for monitoring the reed contact temperature are also available.



Type 408303

Customer benefits

- Cost-effective installation and mounting, e.g. due to spring-cage terminals (Push In®)
- Reduced operating costs due to maintenance-free device design
- Price-performance ratio optimized through the use of standard components

Special features

- Shipbuilding approval available
- Limit level measurement if there is a shortage of space or unstable media
- Painted aluminum housing for improved chemical resistance
- Temperature sensor/switch available

Approvals and approval marks



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Technical data

General Information

Function principle	Magnetic float switch with reed contact					
Installation position (vertical)	±30°					
Switching point accuracy ^a	±2 mm					
Pressure range (nominal pressure)	-1 to +6 bar					
Switching function (potential-free)	10 SPST-NO		11 SPST-NC		12 SPDT-CO	
Switching voltage (max.) ^b	AC 230 V	DC 230 V	AC 230 V	DC 230 V	AC 230 V	DC 230 V
Switching capacity (max.) ^b	100 VA	100 W	100 VA	100 W	60 VA	60 W
Switching current (max.) ^b	1 A	1 A	1 A	1 A	1 A	1 A

^a Measured, dry

^b The values must also be adhered to in combination.

	Pt100	Pt1000	Temperature switch, N/C contact, max. 2.5 A, AC 230 V, cos φ 0.95 [0.6], 2.5 A [1.6 A]
Measuring range	-30 to +150 °C	-30 to +150 °C	Indicate switching point specification in plain text
Accuracy	DIN Class B according to DIN EN 60751 the limit deviation in °C is as follows: ±(0.3 + 0.005 t) t = temperature in °C regardless of prefix sign		Tolerance ±5 K Hysteresis 30 K ±15 K

Mechanical features

Float	Shape	Material	Outer diameter	min. density kg/m ³	Weight in grams
044	Cylinder	AISI 316	44	750	43
045	Cylinder, e-polished	AISI 316	44	750	43

Float	Medium density kg/m ³					
	700	800	900	1000	1200	1400
	Immersion depth mm					
044		44.5	39.5	35.6	29.6	25.4
045		44.5	39.5	35.6	29.6	25.4

Materials	The chemical resistance of the materials should be considered for the application.
Parts in contact with medium For example, process connection, float 044, 045, guide tube	Aluminum, AISI 316, zinc-plated steel
Parts not in contact with medium Connection housing, cube-shaped, small Connection housing, cube-shaped, large	Aluminum, painted Aluminum, painted
Clamping range Cable fitting Terminal block	Diameter 6 to 12 mm 0.14 to 2.5 mm ²
Weight	1200 g

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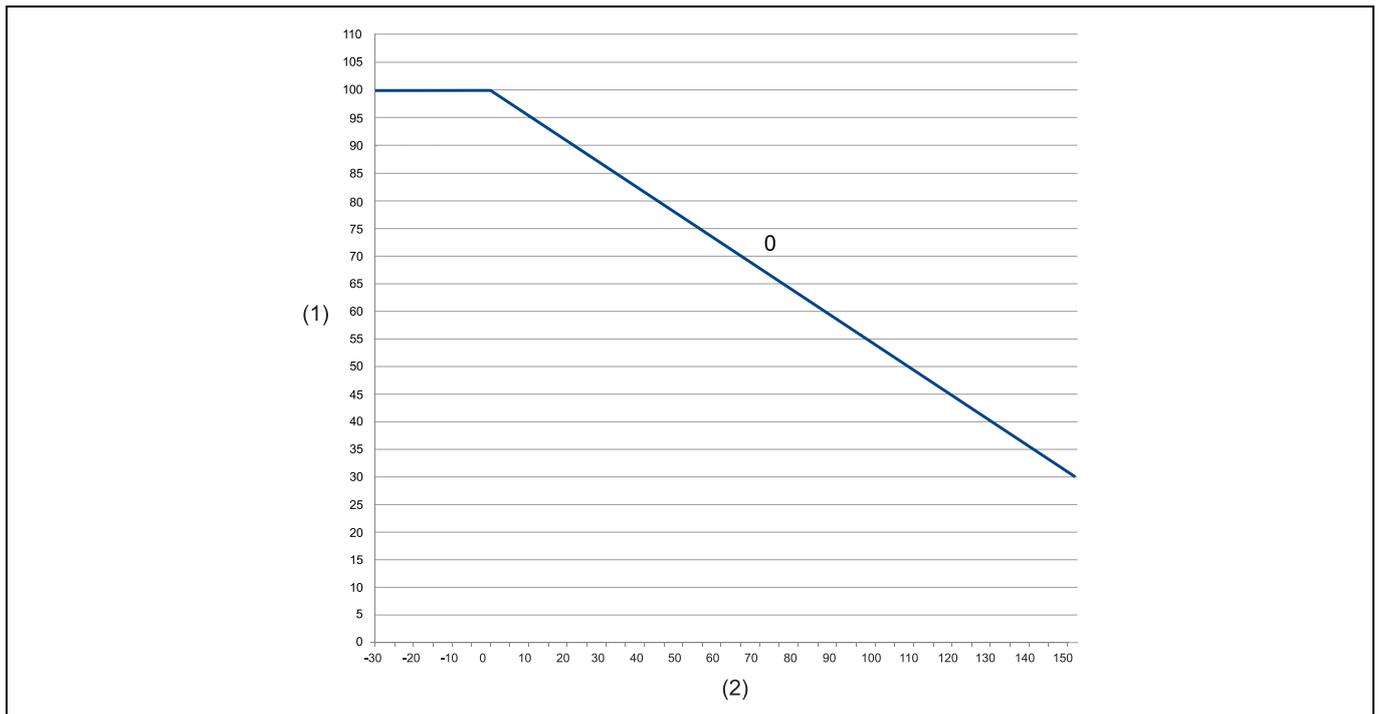


Environmental influences

Moisture	
Operation	100 % rel. humidity including condensation on the product outer shell
Storage	90 % rel. humidity without condensation
Protection type	IP66, according to IEC 60529
Vibration	0.7 g at 2 to 13.2 Hz, according to IEC 60068-2-6
Ambient temperature for electrical connection	Note dependency of extension tube length on process temperature, see diagram below.
Connection housing, cube-shaped, small	-30 to +100 °C
Connection housing, cube-shaped, large	-30 to +100 °C
Process temperature	for guide tube with float
Parts in contact with medium (e.g. guide tube with float)	-30 to +150 °C

Maximum ambient temperature depending on the extension tube length and process temperature

Connection housing small and large, extension tube length in mm



(1) Maximum ambient temperature

(2) Medium temperature

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DNV GL Testing agency Certificate/certification numbers Inspection basis Valid for	DNV GL TAA00001VR Class Guidelines CG 0339, November 2016 Type 408303/062
EAC ^a Testing agency Certificate/certification numbers Inspection basis Valid for	СИСТЕМА КАЧЕСТВА Д-DE.HP15.B.06254/20 Standard TR TS 020/2011 Type 408303/...

^a Russian documentation upon request

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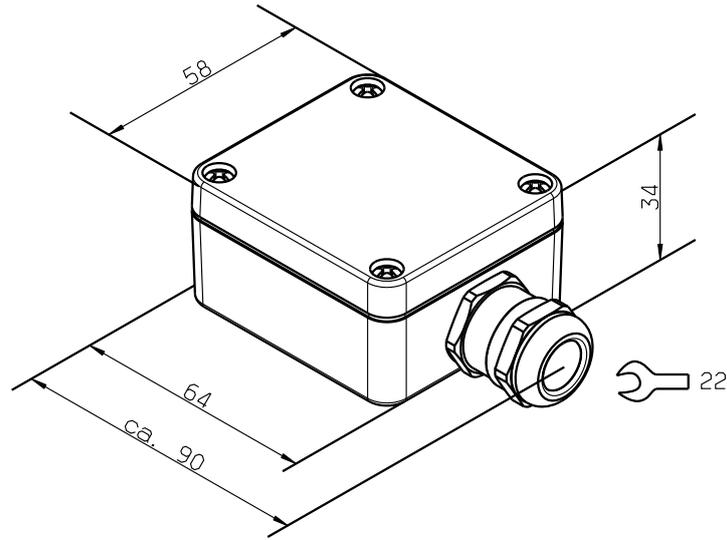


Dimensions

Electrical connection

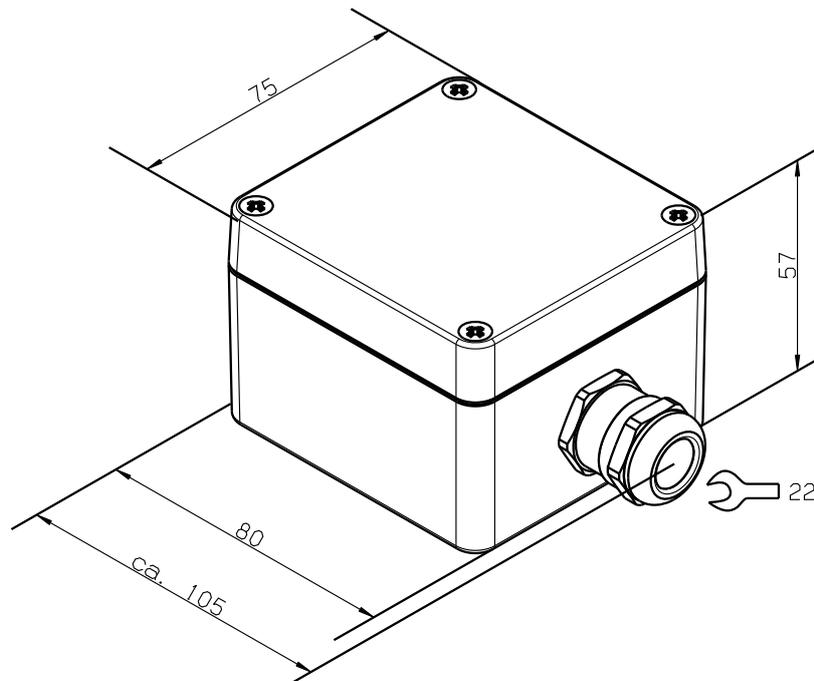
130

Connection housing, cube-shaped, small



131

Connection housing, cube-shaped, large



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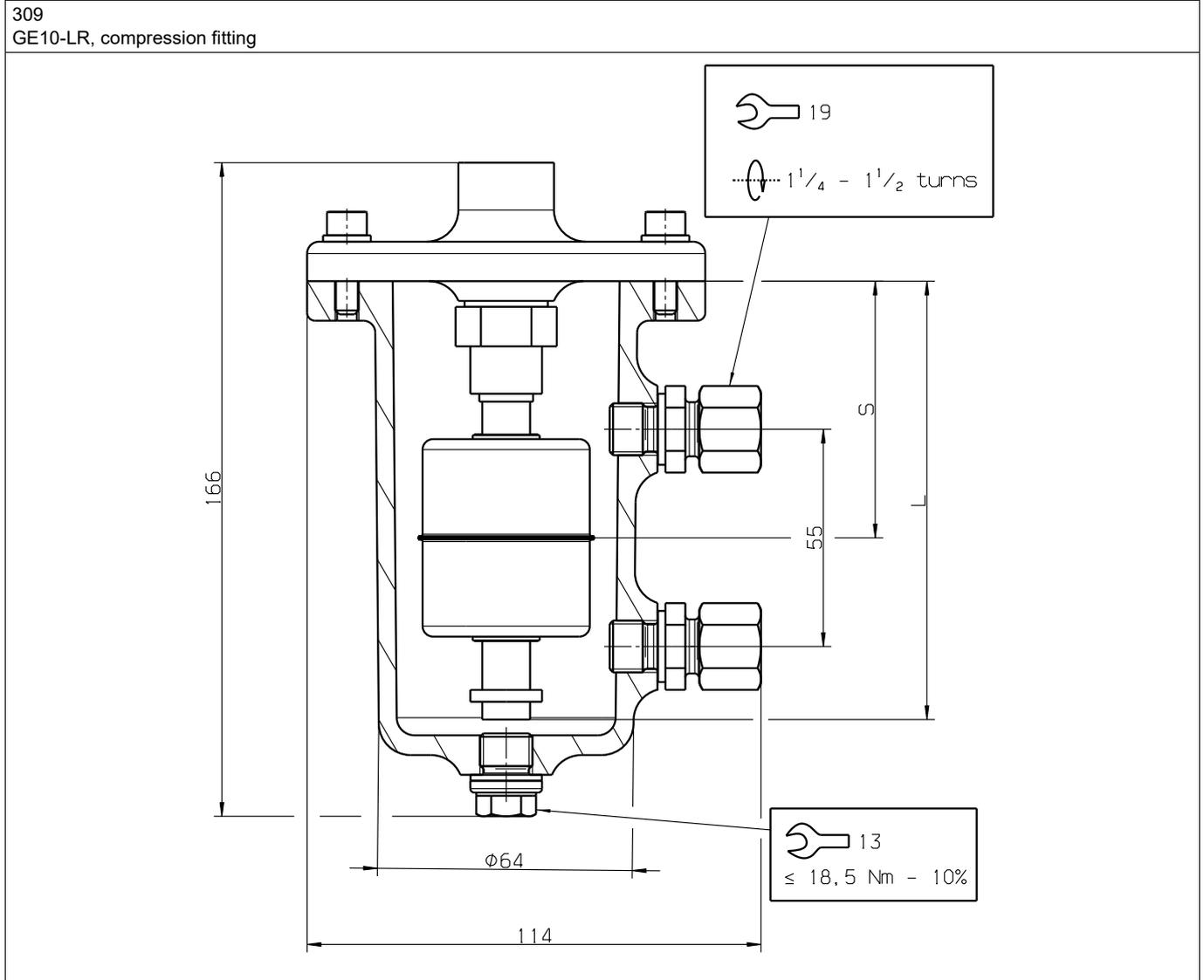
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Process connection

Housing with process connection



- L Guide tube length
- S Contact position (switching point) in mm

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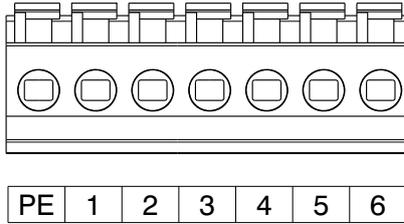
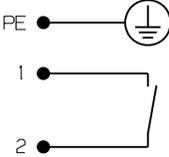
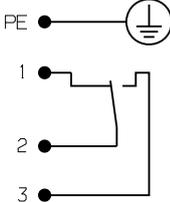
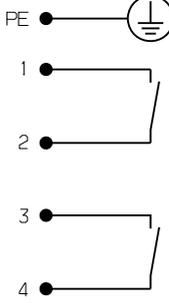
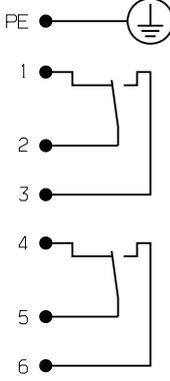
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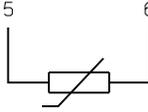
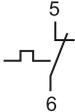
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Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.

Number of contacts		
	Identical for small connection housing (electrical connection 130) and large connection housing (electrical connection 131)	
	SPST-NO/NC	SPDT-CO
1		
2		
Protection rating according to DIN EN 61140	1	1
Creepage distances in mm according to DIN EN 61010-1	1.5	1.5

Pt100 ^a	
Pt1000 ^a	
Temperature switch ^a	

^a Variant only possible with 1 contact, only available with basic type extension 000

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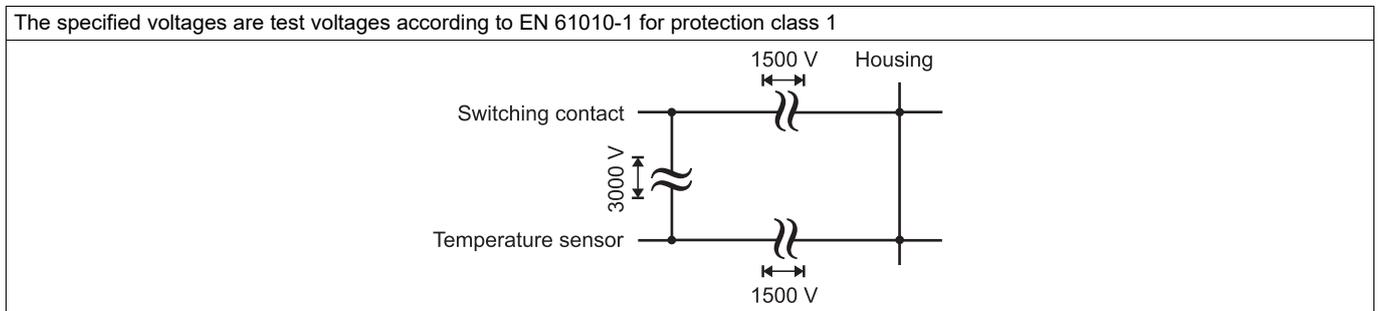


NAMUR circuit, switching signal according to DIN EN 60947-5-6

Versions with NAMUR circuitry may only be operated with switching voltages $DC \leq 15\text{ V}$. A NAMUR circuit is assigned to each switching contact. Depending on the selected electrical connection, the wiring diagram is identical to the above. The NAMUR circuit can be used to detect line faults (line break, short-circuit) in a suitable evaluation unit (e.g. see Ex-i isolating amplifier accessories).

	SPST-NO/NC	SPDT-CO
Scheme		
Example: 1 switching contact with silicone cable		

The galvanic isolation is realized according to the following figure:



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Order details

	(1) Basic type
408303	JUMO NESOS R03 LS – Float switch with reference vessel
	(2) Basic type extension
000	None
062	Shipbuilding approval
999	Special version
	(3) Electrical connection
130	Connection housing, cube-shaped, small
131	Connection housing, cube-shaped, large
999	Special version
	(4) Housing material
20	CrNi (stainless steel)
66	Al (aluminum)
	(5) Process connection
309	GE10-LR, compression fitting
999	According to customer requirements
	(6) Guide tube length L
20 - 114	20 to 114 mm
	(7) Float
044	Cylinder, stainless steel, diameter 44, density 750 kg/m ³
045	Cylinder, stainless steel, diameter 44, density 750 kg/m ³ , e-polished
	(8) Switching function
10	SPST-NO, NO contact (100 VA/AC 230 V/1 A)
11	SPST-NC, NC contact (100 VA/AC 230 V/1 A)
12	SPDT-CO, single-pole changeover contact (60 VA/AC 230 V/1 A)
	(9) Number of contacts
1	1 contact
2	2 contacts
	(10) Position of contact 1^a
65	65 mm
10 - 84	Specifications in plain text
	(11) Position of contact 2^a
0	None
65	65 mm
10 - 84	Specifications in plain text
	(12) Extra codes
000	None
005	Integrated temperature sensor Pt1000 ^b
007	Integrated temperature sensor Pt100 ^b
009	Temperature switch, NC contact ^c
019	Temperature monitoring of reed contact, Pt1000 ^b
663	NAMUR circuit ^d
954	Technical passport
976	Guide tube diameter 14 mm

^a The contact positions are observed from the process connection toward the guide tube end.

^b The temperature sensor is positioned at the end of the guide tube.

^c Specify switching temperature in plain text. The temperature switch is positioned at the end of the guide tube.

^d Not available for shipbuilding approval.

⇒ For details on the dimensioning of the guide tube length L depending on the respective process connection, see Operating manual B 408301, chapter 3.2.

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Order code (1) / (2) - (3) - (4) - (5) - (6) - (7) -

Order example 408303 / 000 - 130 - 66 - 309 - 111 - 044 -

(8) - (9) - (10) - (11) / (12)

12 - 1 - 65 - 00 / 000

Stock version

Order code	Part no.
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408303/062-130-66-309-111-044-12-2-65-65/000	00699604
408303/062-999-66-309-111-044-12-2-65-65/000	00701215
408303/062-130-66-309-111-044-12-1-65-0/000	00704746