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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 <sup>a</sup>	±2 mm			
Pressure range (nominal pressure)	-1 to +6 bar			
Switching function (potential-free)	10 SPST-NO		11 SPST-NC	
Switching voltage (max.) <sup>b</sup>	AC 230 V	DC 230 V	AC 230 V	DC 230 V
Switching capacity (max.) <sup>b</sup>	100 VA	100 W	60 VA	60 W
Switching current (max.) <sup>b</sup>	1.0 A	1.0 A	1.0 A	1.0 A

Switching function (potential-free)	12 SPDT-CO	
Switching voltage (max.) <sup>b</sup>	AC 230 V	DC 230 V
Switching capacity (max.) <sup>b</sup>	60 VA	60 W
Switching current (max.) <sup>b</sup>	1.0 A	1.0 A

<sup>a</sup> Measured, dry

<sup>b</sup> 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 <sup>3</sup>	Weight in grams
044	Cylinder	AISI 316	44	750	43
045	Cylinder	AISI 316	44	750	43
744	Cylinder	Ti Gr 2	44	750	37

Float	Medium density kg/m <sup>3</sup>					
	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
744		37.6	33.4	30	25	21.5

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Materials <sup>a</sup>	
Parts in contact with medium For example, process connection, float, guide tube	Aluminum, AISI 316, zinc-plated steel, for titanium 744 float
Parts not in contact with medium	
Connection housing, cube-shaped, small (electrical connection 130)	Aluminum, painted
Connection housing, cube-shaped, large (electrical connection 131)	Aluminum, painted
Clamping range	
Cable fitting	Diameter 6 to 12 mm
Terminal block	0.14 to 2.5 mm <sup>2</sup>
Weight	1200 g

<sup>a</sup> The chemical resistance of the materials should be considered for the application.

## Environmental influences

Moisture	
Operation	100 % rel. humidity including condensation on the product outer shell
Storage	90 % rel. humidity without condensation
Protection type <sup>a</sup>	IP66
Vibration <sup>b</sup>	0.7 g at 2 to 13.2 Hz
Ambient temperature for electrical connection <sup>c</sup>	
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

<sup>a</sup> In accordance with IEC 60529

<sup>b</sup> In accordance with IEC 60068-2-6

<sup>c</sup> Note dependency of extension tube length on process temperature, see diagram below.

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

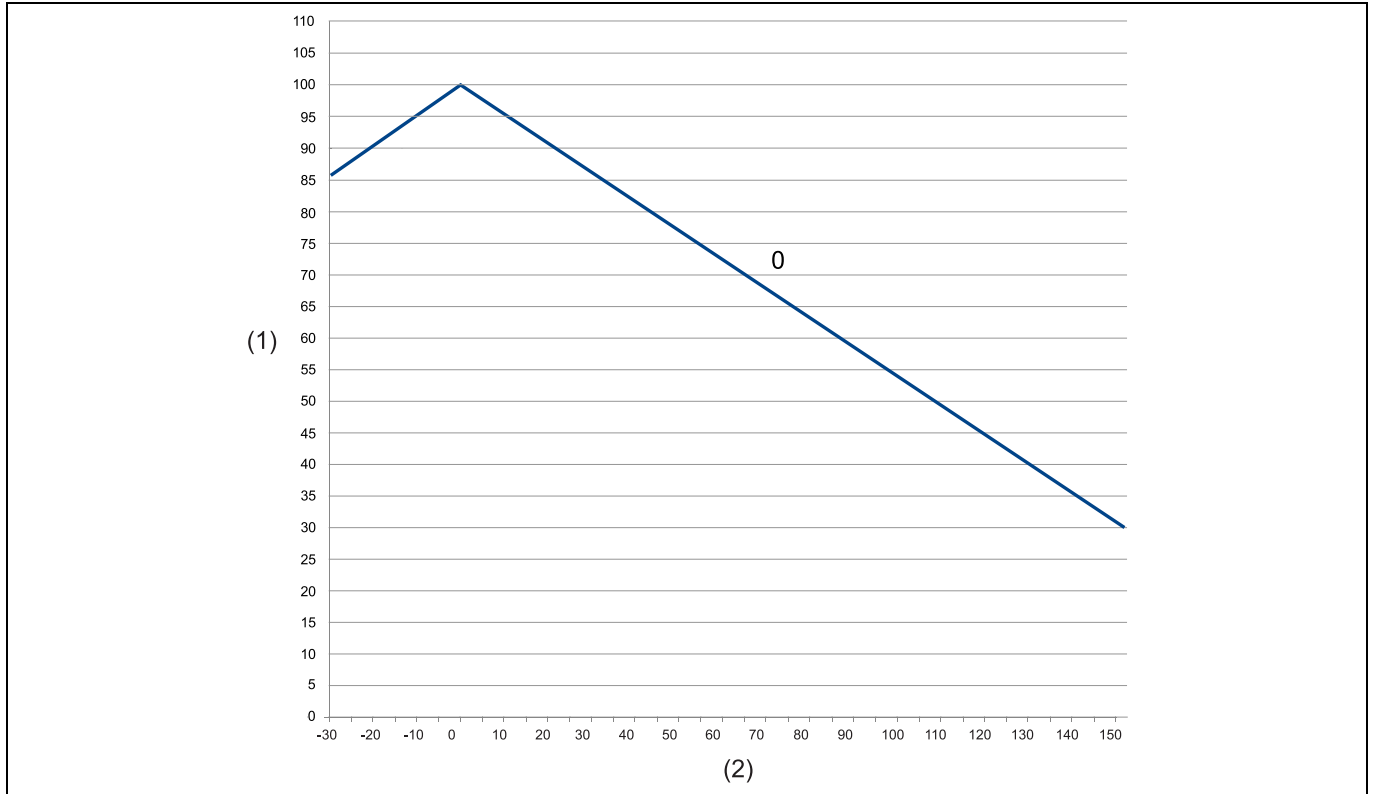


Fig. 0-1 Connection housing small and large, extension tube length in mm

- (1) Maximum ambient temperature
- (2) Medium temperature

**Approvals and approval marks**

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
DNV GL	DNV GL	TAA00001VR	Class guidelines CG 0339, November 2016	Type 408303/062

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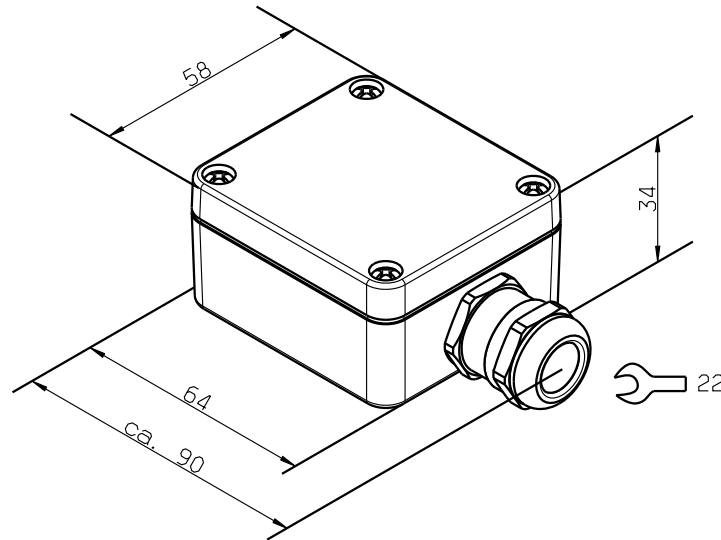
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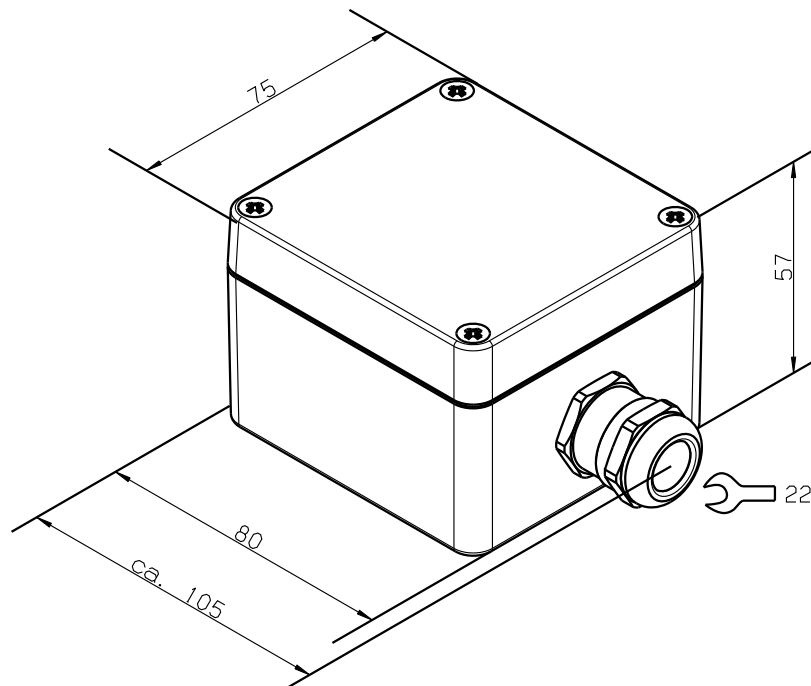
## Dimensions

### Electrical connection

130  
Connection housing, cube-shaped, small



131  
Connection housing, cube-shaped, large



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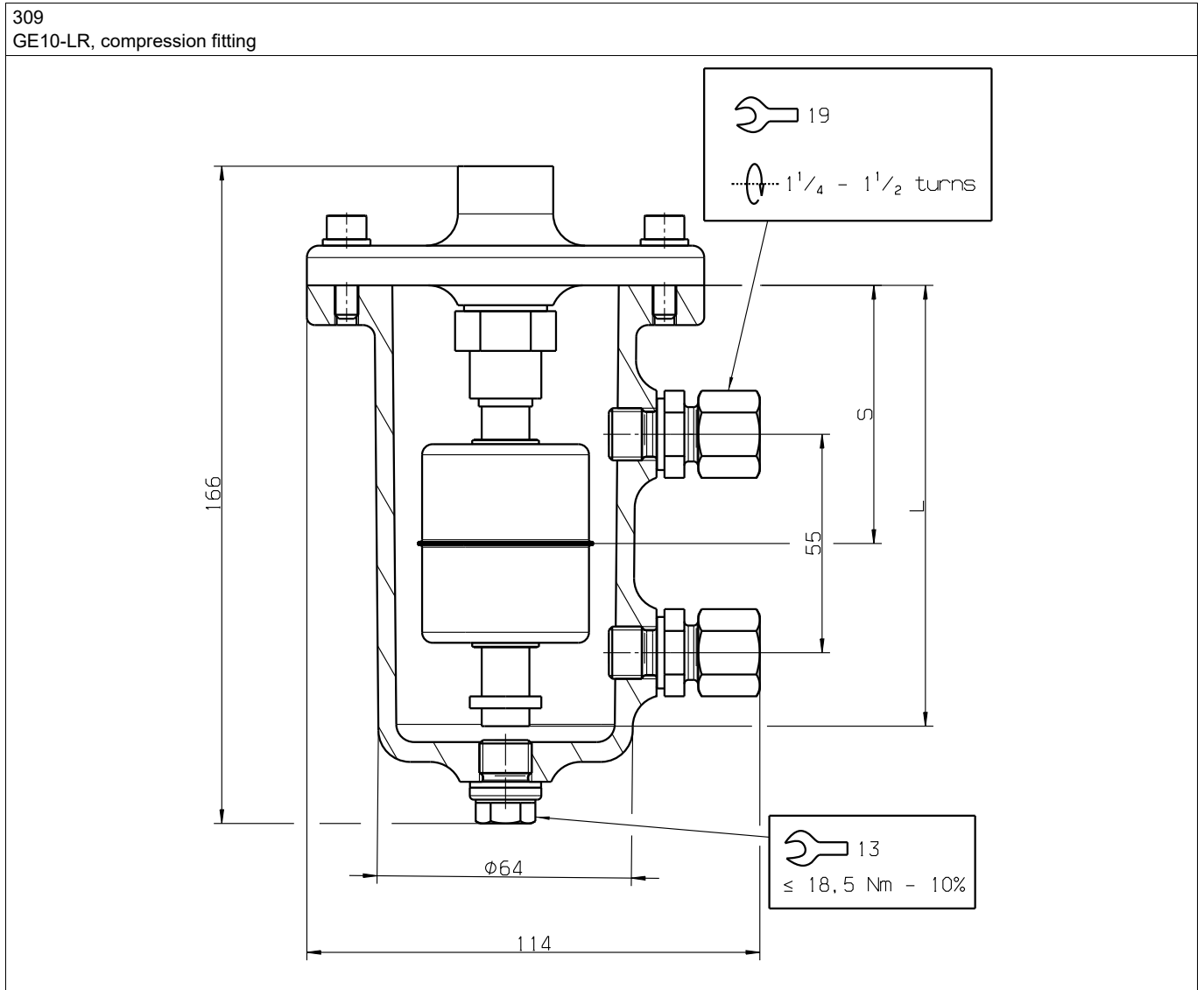
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## Process connection

### Housing with process connection

309  
 GE10-LR, compression fitting



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

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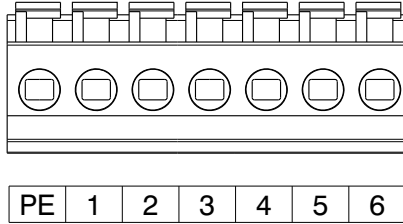
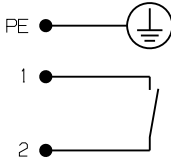
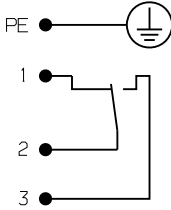
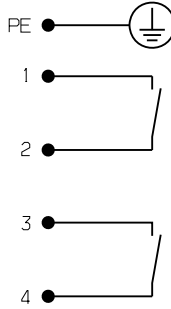
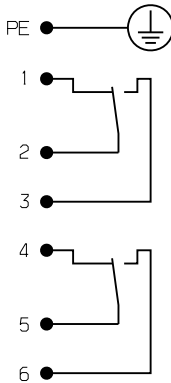
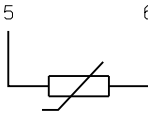
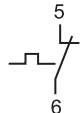
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## Connection diagram

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 <sup>a</sup>	1	1
Creepage distances in mm <sup>b</sup>	1.5	1.5
Pt100 <sup>c</sup>		
Pt1000 <sup>c</sup>		
Temperature switch <sup>c</sup>		

<sup>a</sup> According to DIN EN 61140

<sup>b</sup> According to DIN EN 61010-1

<sup>c</sup> Variant only possible with 1 contact, only available with basic type extension 000

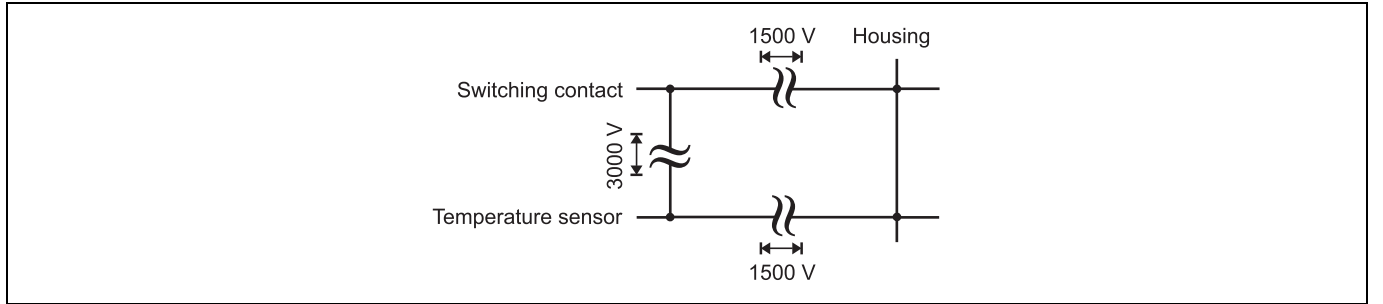
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The galvanic isolation is realized according to the following figure.  
The specified voltages are test voltages according to EN 61010-1 for protection class 1:





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## Order details

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

<sup>a</sup> The dimensioning is in mm in relation to the contact/reference surface (threaded bushing of the container/tank wall) of the selected process connection (for details see operating manual, chapter 3.2).

<sup>b</sup> The contact positions are observed from the process connection toward the guide tube end (for details see operating manual, chapter 3.2).

<sup>c</sup> The extra code is not available when selecting „shipbuilding approval“ (basic type extension 062).

<sup>d</sup> Specification of switching point in plain text

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	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
<b>Order code</b>		/		-		-		-		-		-		-
<b>Order example</b>	408303	/	000	-	130	-	66	-	309	-	111	-	044	-
			(8)		(9)		(10)		(11)		(12)			
				-		-		-		/				
			12	-	1	-	65	-	00	/	000			