

**JUMO GmbH & Co. KG**  
Delivery address: Mackenrodtstraße 14  
36039 Fulda, Germany  
Postal address: 36035 Fulda, Germany  
Phone: +49 661 6003-0  
Fax: +49 661 6003-607  
Email: mail@jumo.net  
Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
JUMO House  
Temple Bank, Riverway  
Harlow, Essex, CM20 2DY, UK  
Phone: +44 1279 63 55 33  
Fax: +44 1279 62 50 29  
Email: sales@jumo.co.uk  
Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
6733 Myers Road  
East Syracuse, NY 13057, USA  
Phone: +1 315 437 5866  
Fax: +1 315 437 5860  
Email: info.us@jumo.net  
Internet: www.jumousa.com



# JUMO NESOS R01 LS

## Float Switch in Miniature Form

### Applications

- Point level measurement of liquids in storage tanks, containers, oil sumps, and tanks
- Water and wastewater treatment
- Mechanical and plant engineering
- Shipbuilding
- Energy technology
- Tempering equipment

### Brief description

The point level measurement is carried out according to the 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 processed through downstream electronic components, relays or contactors. Alarms, pumps, signal lamps, valves, and horns are typically switched via a contact protection relay.

Compact versions with diameters from 27 mm are available for applications involving low installation heights and tank openings. Variants with a connecting plug help to minimize mounting work.

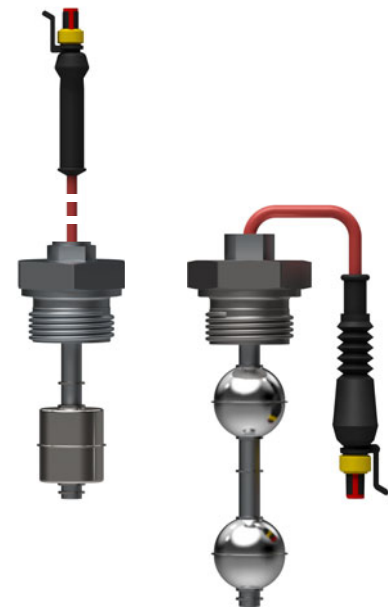
Depending on the variant ordered, various electrical connections, process connections, guide tube lengths, floats, and number of and positions of contacts as well as their function (SPST-NO [N/O contact], SPST-NC [N/C contact], SPDT-CO [changeover contact], and bistable contacts) are available.

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

Variants with an intrinsically safe [Ex i] design and flameproof enclosure [Ex d] are available for applications involving explosion protection, as are approvals for shipbuilding. No isolating switch amplifier is required for installations with a flameproof enclosure.

### Customer benefits

- Cost-effective installation and mounting, due to spring-cage terminals (Push-In®), for example
- Reduced operating costs due to maintenance-free device design
- Price-performance ratio optimized through the use of standard components
- No isolating switch amplifier required for [Ex d] (flameproof enclosure) applications



Type 408301

### Special features

- Approvals and certificates available for explosion protection, shipbuilding, rail-road applications and German Water Resources Act (WHG)
- High switching voltages and switching currents
- Wide media temperature range from -52 to +240 °C
- Wide pressure range from -1 to +35 bar
- Up to 4 switching outputs are user-definable as N/O contact, N/C contact, changeover contact, and bistable contact
- Temperature sensor/temperature switch are available

### Approvals and approval marks



**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Technical data

### General Information

Function principle	Magnetic float switch with reed contact					
Installation position (vertical)	±30°					
Switching point accuracy <sup>a</sup>	±2 mm					
Switching function (potential-free)	01 SPST-NO		02 SPST-NC		03 SPDT-CO	
Switching voltage (max.) <sup>b</sup>	AC 175 V	DC 175 V	AC 175 V	DC 175 V	AC 175 V	DC 175 V
Switching power (max.) <sup>b</sup>	10 VA	10 W	10 VA	10 W	10 VA	10 W
Switching current (max.) <sup>b</sup>	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A

Switching function	10 SPST-NO		11 SPST-NC		15 SPST-NO, bistable	
Switching voltage (max.) <sup>b</sup>	AC 230 V	DC 230 V	AC 230 V	DC 230 V	AC 230 V	DC 230 V
Switching power (max.) <sup>b</sup>	100 VA	100 W	100 VA	100 W	100 VA	100 W
Switching current (max.) <sup>b</sup>	1 A	1 A	1 A	1 A	1 A	1 A

<sup>a</sup> measured, dry

<sup>b</sup> The values must also be adhered to in combination.

	Pt100	Pt1000
Measuring range	-40 to +150 °C	-40 to +150 °C
Accuracy	DIN class B According to DIN EN 60751 the limit deviation in °C is: $\pm(0.3 + 0.005  t )$ $ t $ = temperature in °C regardless of prefix sign	

Special features for products with protection rating 3 (see "Connection diagram") <sup>a</sup>	Switching voltage (max.)	AC ≤ 33 V (AC 46 V peak value)	DC 70 V
--	--------------------------	--------------------------------	---------

<sup>a</sup> Limit values according to EN 61010-1

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Mechanical features

Float	Form	Material	Outer diameter	Min. density kg/m <sup>3</sup>	Pressure range (nominal pressure) in bar	Weight in grams
022	Cylinder	AISI 316 series	22	860	-1 to +16	7
027	Cylinder	AISI 316 series	27	800	-1 to +16	8
028	Cylinder, e-polished	AISI 316 series	27	800	-1 to +16	8
029	Spherical	AISI 316 series	29	900	-1 to +35	8
030	Spherical, e-polished	AISI 316 series	29	900	-1 to +35	8
729	Spherical	Titanium grade 2	29	700	-1 to +15	7

Float	Medium density kg/m <sup>3</sup>					
	700	800	900	1000	1200	1400
	Immersion depth mm					
022			28.7	25.8	21.5	18.4
027		23.6	21	18.9	15.8	13.5
028		23.6	21	18.9	15.8	13.5
029			20.3	18.5	16.2	14.6
030			20.3	18.5	16.2	14.6
729	21.9	19.3	17.5	16.3	14.4	13.1

Materials of parts in contact with medium For example, process connection, float 022, 027, 028, 029, 030, guide tube Float 729	The chemical resistance of the materials should be considered for the application. AISI 316 series  Titanium grade 2
Materials of parts not in contact with medium Cable Cable socket Round plug M12 × 1 Terminal head Ex d Connection housing, cube-shaped, small Connection housing, cube-shaped, large	The chemical resistance of the materials should be considered for the application. PVC or silicone or PUR or RADOX® PBT-GF30 PBT-GF30 Aluminum, painted Aluminum, painted Aluminum, painted
Clamping range Cable fitting  Terminal block	Diameter 6 to 12 mm for connection housing, cube-shaped, small, and connection housing, cube-shaped, large Diameter 6.5 to 11.9 mm for terminal head Ex d Diameter 6 to 8 mm for cable socket 0.14 to 2.5 mm <sup>2</sup> for connection housing, cube-shaped, small 0.14 to 1.5 mm <sup>2</sup> for terminal head Ex d, and connection housing, cube-shaped, large
Weight	300 g for a guide tube length of 100 mm, process connection G 1, and assembled cable measuring 0.4 m with AMP Superseal connector

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Environmental influences

Moisture	
Operation	100 % rel. humidity including condensation on the product outer shell
Storage	90 % rel. humidity without condensation
Protection type for electrical connection	According to DIN EN 60529
Cable	IP68
Cable with AMP Superseal connector	IP67
Cable with M12 connector	IP66
Round plug M12 × 1	IP66
Cable socket	IP65
Terminal head Ex d	IP68
Connection housing, cube-shaped, small	IP66
Connection housing, cube-shaped, large	IP66
Vibration	0.7 g at 13.2 to 100 Hz, according to IEC 60068-2-6
Ambient temperature for electrical connection	Note dependency of extension tube length on process temperature, see diagrams below.
PVC cable	-5 to +80 °C
Silicone cable	-50 to +180 °C
PUR cable	-40 to +90 °C
RADOX® cable	-40 to +120 °C
PVC cable, with AMP Superseal connector	-5 to +80 °C
Silicone cable, with AMP Superseal connector	-40 to +125 °C
PUR cable, with AMP Superseal connector	-40 to +90 °C
PVC cable, with M12 connector	-5 to +80 °C
Silicone cable, with M12 connector	-40 to +85 °C
PUR cable, with M12 connector	-40 to +85 °C
Round plug M12 × 1	-30 to +90 °C
Cable socket	-40 to +125 °C
Terminal head Ex d	-40 to +100 °C
Connection housing, cube-shaped, small	-40 to +100 °C
Connection housing, cube-shaped, large	-40 to +100 °C
Process temperature	
Parts in contact with medium (e.g. guide tube with float)	-40 to +150 °C (standard) -52 to +240 °C (upon request)

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

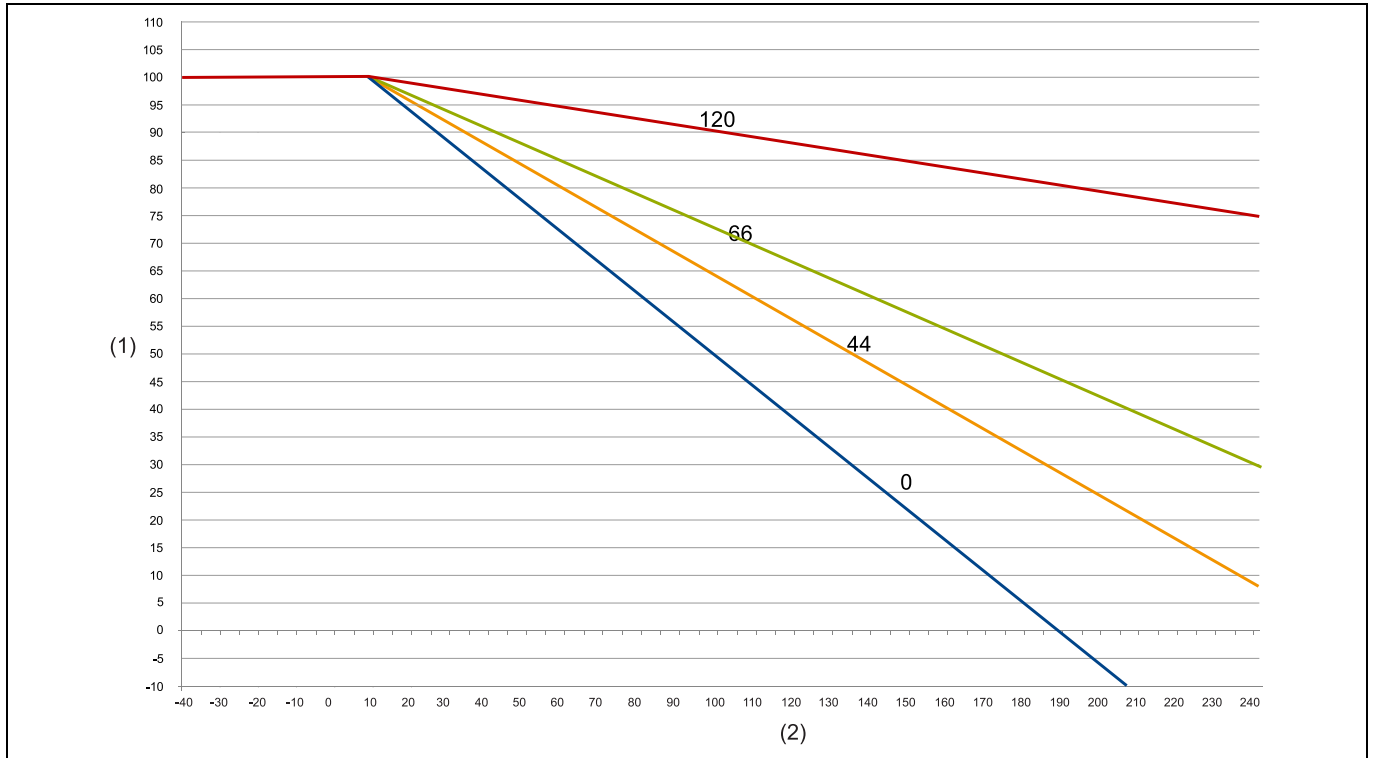
**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



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

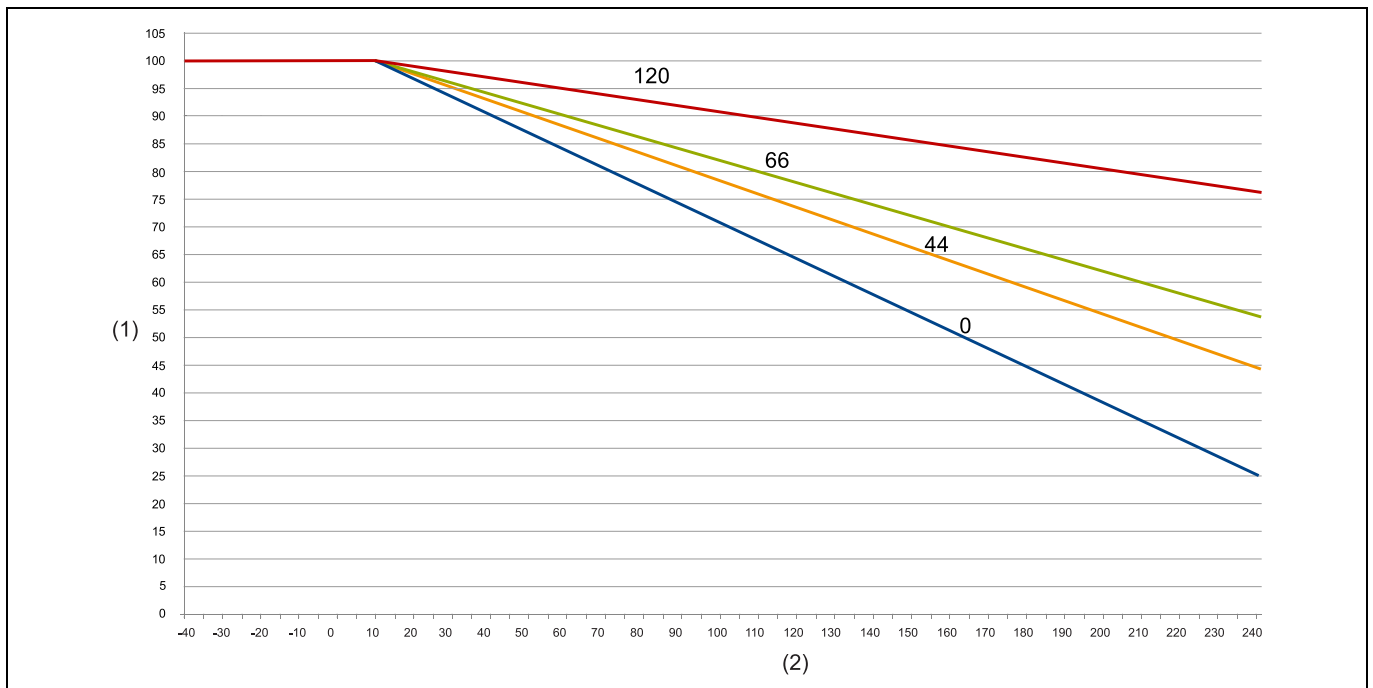
Connection housing small and large, extension tube in mm



(1) Maximum ambient temperature

(2) Medium temperature

Connection housing Ex d, extension tube in mm



(1) Maximum ambient temperature

(2) Medium temperature

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Approvals and approval marks

ATEX, IEC Ex, intrinsically safe, Ex i Testing agency Certificate/certification numbers Inspection basis Valid for	Eurofins Electrosuisse Product Testing AG SEV 18 ATEX 0134 X, IECEX SEV 18.0011X IEC/EN 60079-0, IEC/EN 60079-11, IEC/EN 60079-26, DIN EN ISO 80079-36, DIN EN ISO 80079-37 Type 408301/263, Type 408301/362, Type 408301/662
ATEX, IEC Ex, flameproof enclosure, Ex d Testing agency Certificate/certification numbers Inspection basis Valid for	Eurofins Electrosuisse Product Testing SEV 18 ATEX 0133 X, IECEX SEV 18.0010X IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-26, IEC/EN 60079-31, DIN EN ISO 80079-36, DIN EN ISO 80079-37 Type 408301/264, Type 408301/462, Type 408301/962
DNV GL Testing agency Certificate/certification numbers Inspection basis Valid for	DNV GL TAA00001VR Class Guidelines CG 0339, November 2016 Type 408301/062, Type 408301/662, Type 408301/962
German Water Resources Act (WHG) Testing agency Certificate/certification numbers Inspection basis Valid for	DIBT Z-65.11-608 Approval principles for safety devices for tanks and pipelines, overfill protection (ZG-ÜS) Type 408301/262, Type 408301/263, Type 408301/264
EAC <sup>a</sup> Testing agency Certificate/certification numbers Inspection basis Valid for	СИСТЕМА КАЧЕСТВА Д-DE.HP15.B.06254/20 Standard TR TS 020/2011 Type 408301/...
EAC-Ex <sup>a</sup> Testing agency Certificate/certification numbers Inspection basis Valid for	ПрофиТест EAЭС RU C-DE.HB07.B.00316/20 TR TS 012/2011 Type 408301/263, Type 408301/264, Type 408301/362, Type 408301/462, Type 408301/662, Type 408301/962 – each with extra code 240
Railroad application Testing agency Certificate/certification numbers Inspection basis Valid for	RST Rail System Testing, JUMO NESOS Certificate Railroad application DIN EN 50155, DIN EN 50121-3-2, EN 45545-1, EN 45545-2 Extra code 950

<sup>a</sup> Russian documentation upon request

### NOTE!

The special conditions for use can be found in the type examination certificate, which is available for download on the Internet on the respective product page.

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

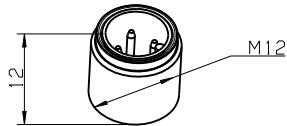
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



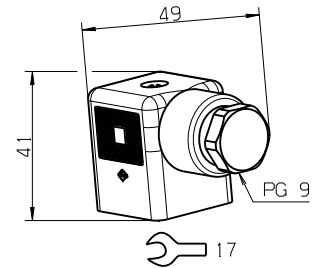
## Dimensions

### Electrical connection

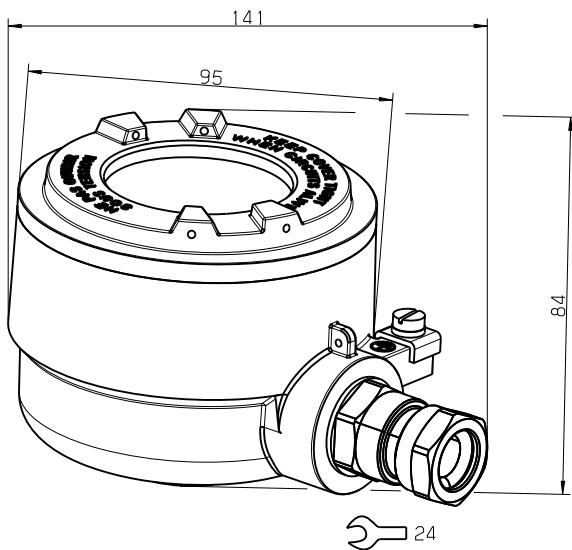
036  
 Round plug M12 × 1



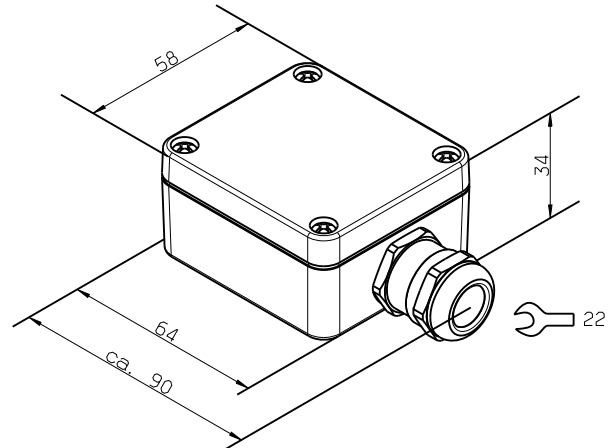
061  
 Cable socket DIN EN 175301-803



115  
 Terminal head Ex d



130  
 Connection housing, cube-shaped, small



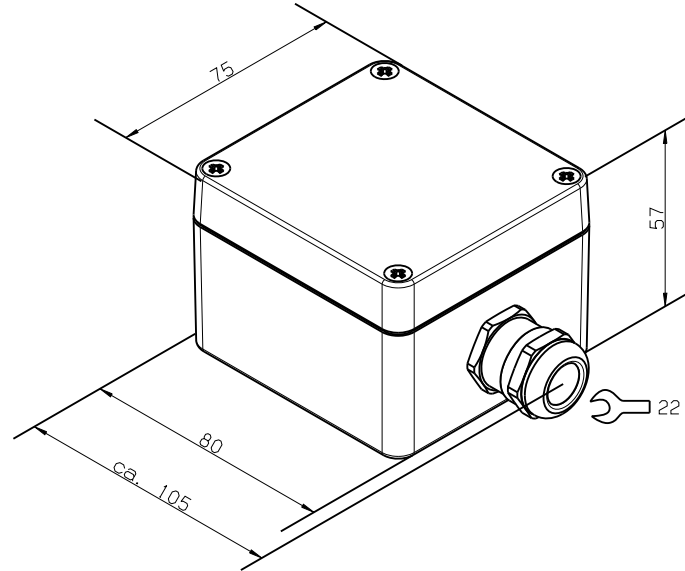
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

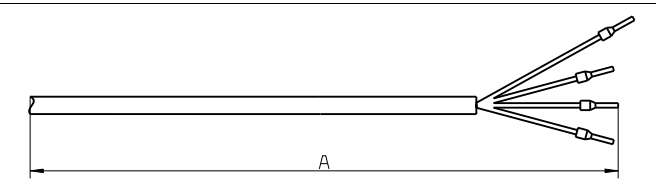
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



131  
 Connection housing, cube-shaped, large

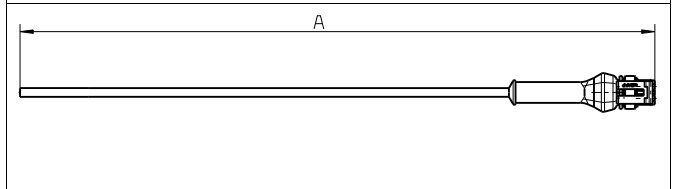


150 PVC, 160 silicone, 170 PUR, 180 RADOX®  
 Cable with ferrules



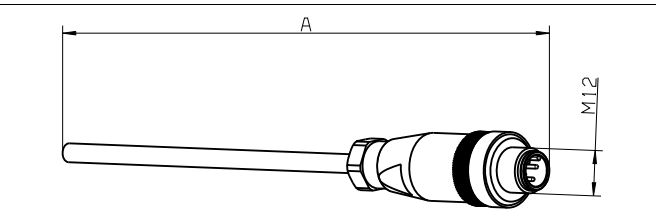
A Cable length, see order details

151 PVC, 161 silicone, 171 PUR  
 Cable with AMP Superseal connector



A Cable length, see order details

152 PVC, 162 silicone, 172 PUR  
 Cable with M12 connector



A Cable length, see order details



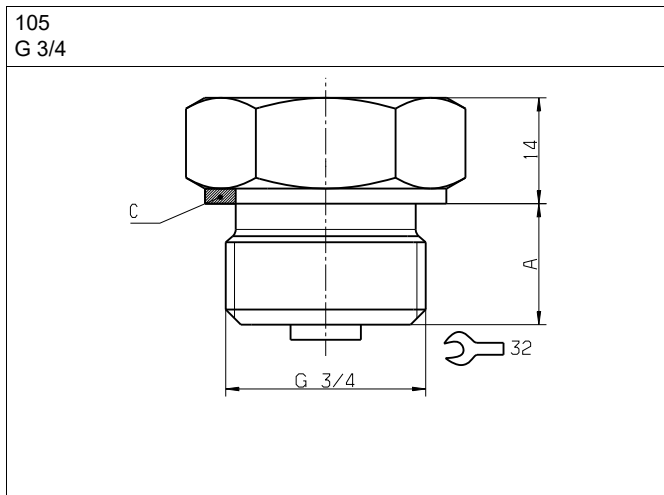
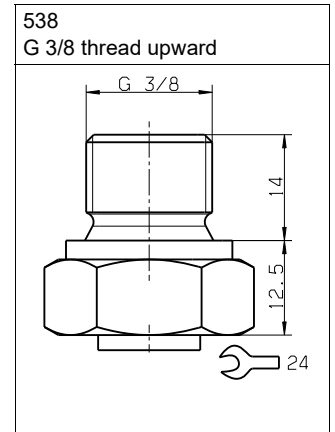
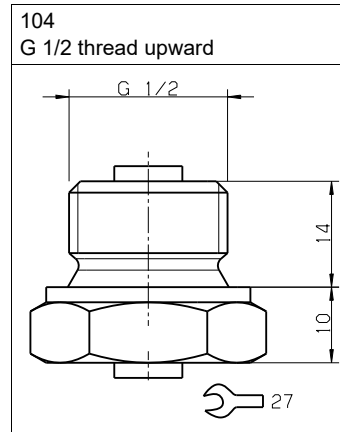
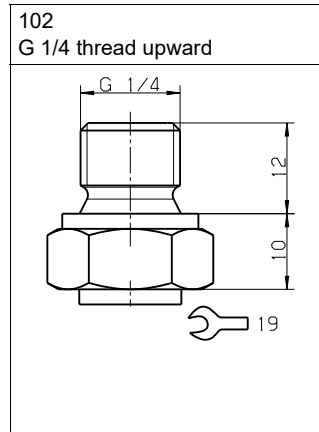
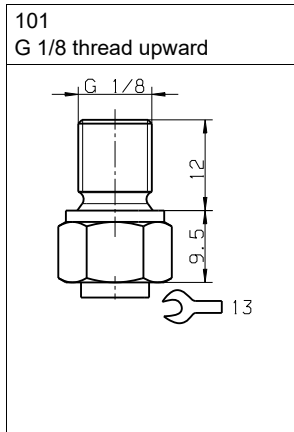
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

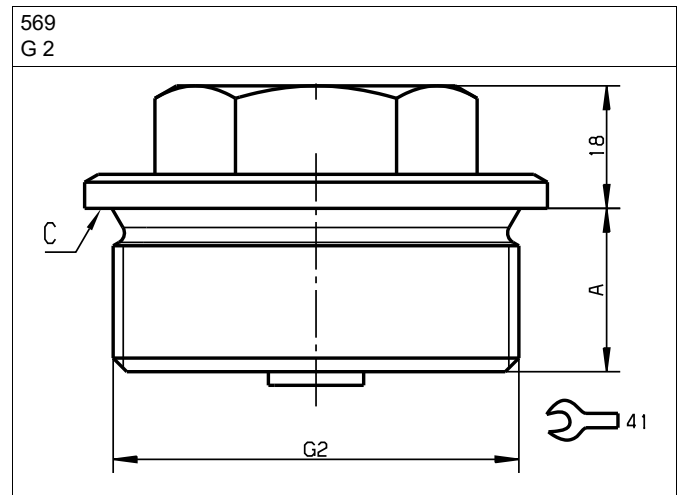
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



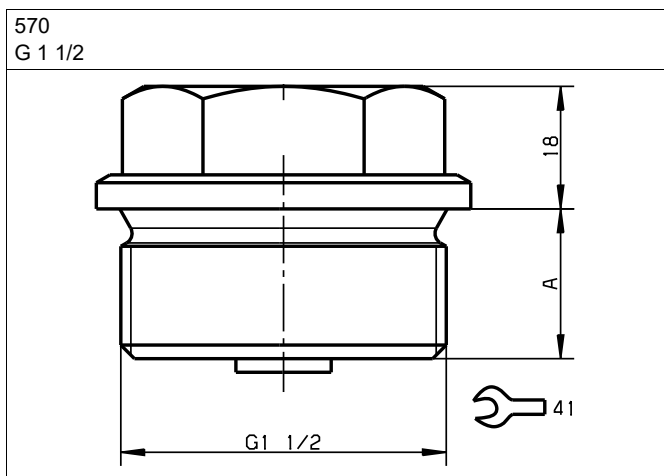
**Process connections**



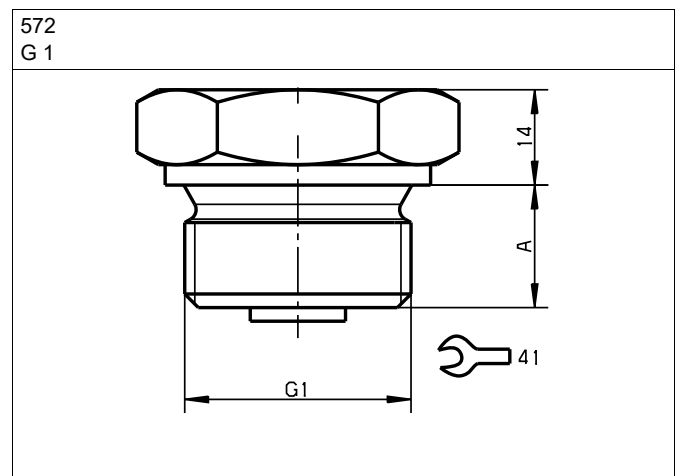
A 16  
 C A seal/O-ring with a thickness of at least 1.5 mm is recommended.



A 24 (25.5 for Ex d)  
 C A seal/O-ring with a thickness of at least 2 mm is recommended.



A 22 (25.5 for Ex d)



A 18 (25.5 for Ex d)

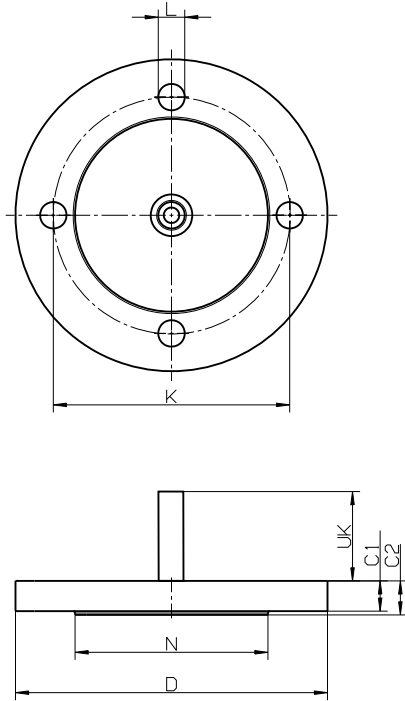
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



Flange according to the following table



Example for extension tube, also available for other process connections;  
 UK = extension tube length + 9 mm

Order code	Flange designation	Hole circle K	Number of holes	Diameter of holes L	Exterior diameter D	Diameter of sealing strip N	Strength of flange C1	Strength of flange including sealing strip C2
729	Flange DN 50, PN40, EN 1092-1, form B1	125	4	18	165	102	17	20

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

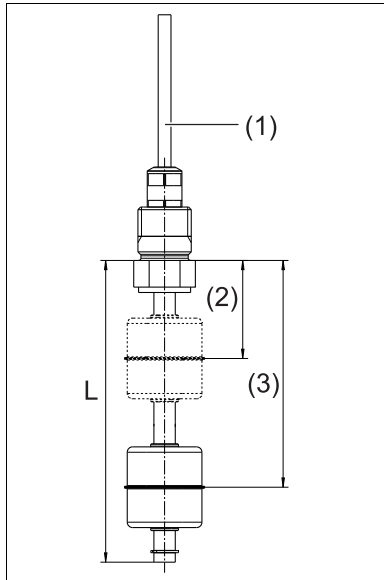
**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com

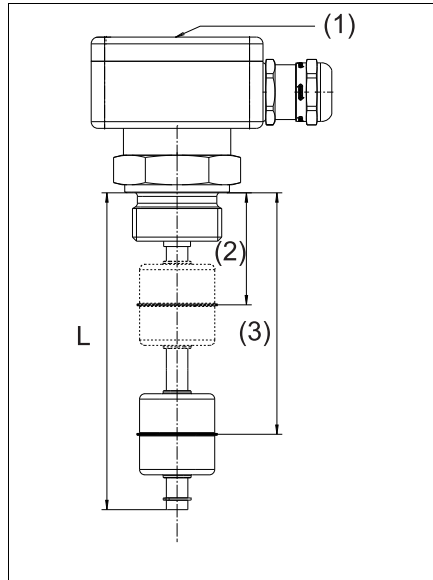


**Notes to the order details**

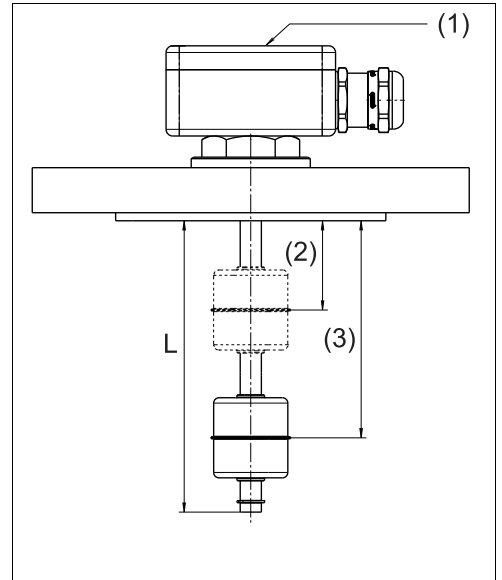
Below are examples for the dimensioning of the guide tube length L, the measuring range start (3) as well as measuring range end (2) depending on the respective process connection.



(1) Process connection  
 „thread upward“



(1) Process connection  
 „thread“



(1) Process connection  
 „flange“

- (2) Position contact 1 (switching point) in mm
- (3) Position contact 2 (switching point) in mm
- L Guide tube length in mm

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## 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.

For product configurations with more than one switching contact, the mixing of hazardous network circuits and SELV circuits is not permitted.

Number of contacts										
	Cable		Cable socket		Connection housing		AMP Superseal connector		Round plug M12	
	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO
1	<p><b>Silicone</b></p> <p><b>PUR</b></p> <p><b>PVC</b></p>	<p><b>Silicone</b></p> <p><b>PUR</b></p> <p><b>PVC</b></p>								
2	<p><b>Silicone</b></p> <p><b>PUR</b></p> <p><b>PVC</b></p>	<p><b>Silicone<sup>a</sup></b></p> <p><b>PVC<sup>b</sup></b></p> <p><b>PUR<sup>c</sup></b></p>					-	-		-

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



Number of contacts										
	Cable		Cable socket		Connection housing		AMP Superseal connector		Round plug M12	
	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO	SPST-NO/NC	SPDT-CO
3	Silicone <sup>a</sup> RD WH RD/BU WH/BU BU BU PVC <sup>b</sup> RD BK BN OG GN YE	-	-	-			-	-		-
4	-	-	-	-			-	-	-	-
Protection rating <sup>d</sup>	prepared for 2 according to EN 61010-1		1	1	1	1	3	3	3	3

<sup>a</sup> According to VDE 0298-4 max. current 0.5 A at max. 175 °C or 1 A at max. 170 °C

<sup>b</sup> According to VDE 0298-4 max. current 0.8 A at max. 75 °C or 1 A at max. 70 °C, not available with shipbuilding approval, shipbuilding approval and explosion protection, intrinsically safe, Ex i, and shipbuilding approval and explosion protection, flameproof enclosure, Ex d.

<sup>c</sup> Only available with protection class 3.

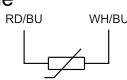
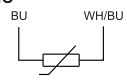
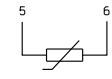
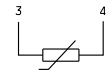
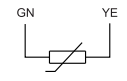
<sup>d</sup> According to DIN EN 61140

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com

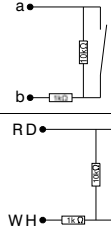
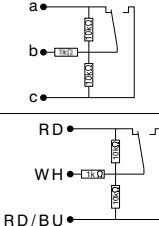


	Cable	Cable socket	Connection housing	AMP Superseal connector	Round plug M12
Temperature sensor Pt100 <sup>a, b</sup>	Silicone <sup>c</sup>  Silicone <sup>d</sup> 	-		-	
Temperature sensor Pt1000 <sup>a, b</sup>	PVC <sup>c</sup> 	-	-	-	-

- <sup>a</sup> Connect all measuring circuits of a product to SELV circuits.
- <sup>b</sup> Assignment is always to terminals with the highest numbers
- <sup>c</sup> For 1x SPST-NO/NC switching contacts
- <sup>d</sup> For 1x SPDT-CO switching contacts

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

Versions with NAMUR circuitry may only be operated with switching voltages DC ≤ 15 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).

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

Legend: cable	BN	Brown	GN	Green
	WH	White	RD	Red
	BU	Blue	YE	Yellow
	PK	Pink	GY	Gray

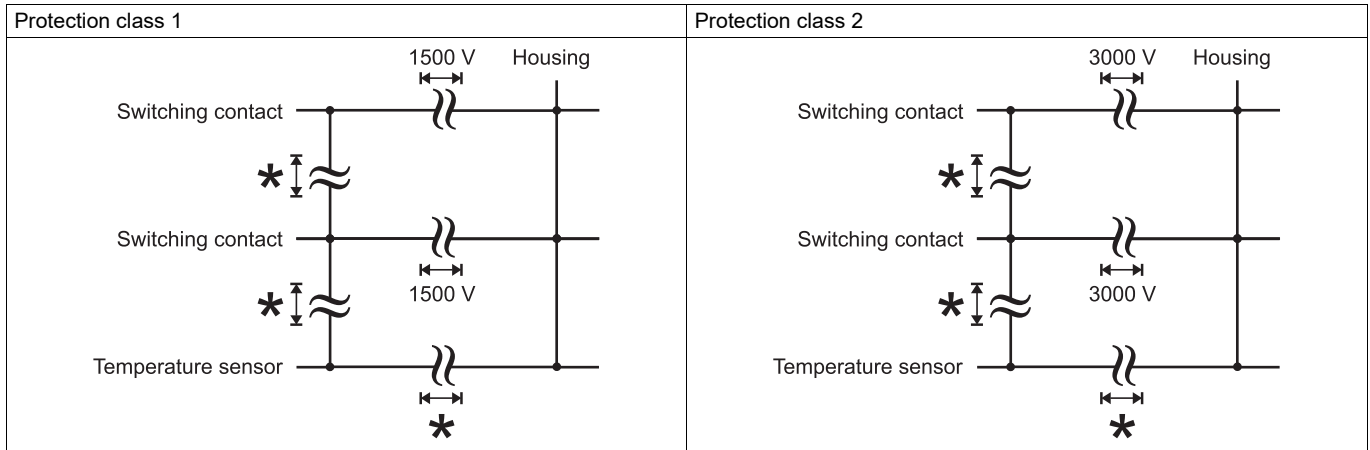
**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



The galvanic isolation is realized according as follows:



**Caution:**

\* Functional galvanic isolation

If connected to a certified intrinsically safe electrical circuit Ex i, the following maximum values are admissible.

Contact function	Max. voltage $U_i$ in V	Max. current $U_i$ in mA	Max. power $P_i$ in mW	Internal inductance in $\mu$ H	Internal capacity in pF
SPST-NO	$\leq 30$	$\leq 100$	$\leq 750$	~0 for cable version 1 $\mu$ H/m connecting cable	~0 for cable version 200 pF/m connecting cable
SPST-NC					
SPDT-CO					

When using explosion-proof versions (intrinsically safe, Ex i, and flameproof enclosure, Ex d) the following values are given.

Contact function	Max. voltage $U_i$ in V	Max. current $U_i$ in mA	Max. power $P_i$ in mW	Internal inductance in $\mu$ H	Internal capacity in pF
Pt100	$\leq 30$	$\leq 55$	$\leq 413$	~0 for cable version 1 $\mu$ H/m connecting cable	~0 for cable version 200 pF/m connecting cable
Pt1000					
NAMUR circuit	$\leq 15$	$\leq 60$	$\leq 225$		

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

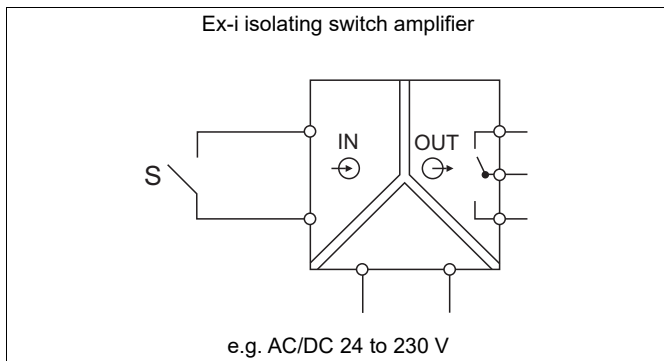
**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Connection examples of versions with explosion protection

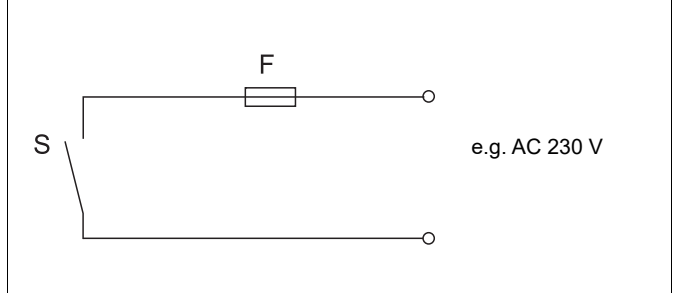
### Float switch (S)

Ex i



Ex d

According to operating manual 408301, chapter 6 on "Installation", the fuse (F) must be selected.





**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



## Order details

	<b>(1) Basic type</b>
408301	JUMO NESOS R01 LS – Float switch in miniature form
	<b>(2) Basic type extension</b>
000	None
062	Shipbuilding approval
262	WHG approval (German Water Resources Act)
263	WHG approval (German Water Resources Act), explosion protection, intrinsically safe, Ex i
264	WHG approval (German Water Resources Act), explosion protection, flameproof enclosure, Ex d
362	Explosion protection, intrinsically safe, Ex i
462	Explosion protection, flameproof enclosure, Ex d
662	Shipbuilding approval and explosion protection, intrinsically safe, Ex i
962	Shipbuilding approval and explosion protection, flameproof enclosure, Ex d
999	Special version
	<b>(3) Electrical connection</b>
036	Round plug M12 × 1
061	Cable socket DIN EN 175301-803, form A
115	Terminal head Ex d
130	Connection housing, cube-shaped, small
131	Connection housing, cube-shaped, large
150	Cable, PVC
151	Cable, PVC with AMP Superseal connector <sup>a</sup>
152	Cable, PVC with M12 connector
160	Cable, silicone
161	Cable, silicone with AMP Superseal connector <sup>a</sup>
162	Cable, silicone with M12 connector
170	Cable, PUR
171	Cable, PUR with AMP Superseal connector <sup>a</sup>
172	Cable, PUR with M12 connector
180	Cable, RADOX®
999	Special version
	<b>(4) Cable length</b>
0	None
2000	2000 mm
5000	5000 mm
100 - 5000	Specifications in plain text (increments of 100 mm)
	<b>(5) Process connection</b>
101	G 1/8 thread upward
102	G 1/4 thread upward
104	G 1/2 thread upward
105	G 3/4
538	G 3/8 thread upward
569	G 2
570	G 1 1/2
572	G 1
729	Flange DN 50, PN40, EN 1092-1, form B1
999	According to customer requirements
	<b>(6) Guide tube length L, diameter 8 mm<sup>b</sup></b>
30 - 500	Specifications in plain text (increments of 50 mm)

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



<b>(7) Float</b>	
022	Cylinder, stainless steel, diameter 27, density 860 kg/m <sup>3</sup>
027	Cylinder, stainless steel, diameter 27, density 800 kg/m <sup>3</sup>
028	Cylinder, stainless steel, diameter 27, density 800 kg/m <sup>3</sup> , e-polished
029	Spherical, stainless steel, diameter 29, density 900 kg/m <sup>3</sup>
030	Spherical, stainless steel, diameter 29, density 800 kg/m <sup>3</sup> , e-polished
729	Spherical, titanium, diameter 29, density 700 kg/m <sup>3</sup>
<b>(8) Number of floats</b>	
1	1 piece
2	2 pieces
3	3 pieces
4	4 pieces
<b>(9) Switching function</b>	
01	SPST-NO, NO contact (10 VA/AC 175 V/0.5 A)
02	SPST-NC, NC contact (10 VA/AC 175 V/0.5 A)
03	SPDT-CO, single-pole changeover contact (10 VA/AC 175 V/0.5 A)
10	SPST-NO, NO contact (100 VA/AC 230 V/1 A)
11	SPST-NC, NC contact (100 VA/AC 230 V/1 A)
15	SPST-NO, NO contact, bistable (100 VA/AC 230 V/1 A)
99	According to customer requirements
<b>(10) Number of contacts</b>	
1	1 contact
2	2 contacts
3	3 contacts
4	4 contacts
<b>(11) Position of contact 1<sup>c</sup></b>	
20 - 470	Specifications in plain text
<b>(12) Position of contact 2<sup>c</sup></b>	
0	None
20 - 470	Specifications in plain text
<b>(13) Position of contact 3<sup>c</sup></b>	
0	None
40 - 470	Specifications in plain text
<b>(14) Position of contact 4<sup>c</sup></b>	
0	None
40 - 470	Specifications in plain text
<b>(15) Extra codes</b>	
000	None
005	Integrated temperature sensor Pt1000 <sup>d</sup>
007	Integrated temperature sensor Pt100 <sup>d</sup>
019	Temperature monitoring of reed contact, Pt1000
240	EAC-Ex approval
307	Extension tube <sup>e</sup>
663	NAMUR circuit <sup>a</sup>
950	Railroad application <sup>f</sup>
954	Technical passport

<sup>a</sup> Not available for shipbuilding approval, shipbuilding approval and explosion protection, intrinsically safe, Ex i, and shipbuilding approval and explosion protection, flameproof enclosure, Ex d.

<sup>b</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.

<sup>c</sup> The contact positions are observed from the process connection toward the guide tube end.

<sup>d</sup> The temperature sensor is positioned at the end of the guide tube

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 Email: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex, CM20 2DY, UK  
 Phone: +44 1279 63 55 33  
 Fax: +44 1279 62 50 29  
 Email: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO Process Control, Inc.**  
 6733 Myers Road  
 East Syracuse, NY 13057, USA  
 Phone: +1 315 437 5866  
 Fax: +1 315 437 5860  
 Email: info.us@jumo.net  
 Internet: www.jumousa.com



- e Specify the extension tube length as a function of the process and ambient temperature (see chapter "Maximum ambient temperature depending on extension tube length and process temperature") in plain text.
  - f The extra code railroad application is only available in connection with electrical connection M12 plug or RADOX® cable.
- ⇒ 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.


<b>Order code</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
<b>Order example</b>	408301	/ 000	- 160	- 1000	- 101	- 47	- 027	- 1	-
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	
		10	- 1	- 23	- 0	- 0	- 0	/ 000	

Minimum order quantity: 1 piece

## Stock version

Order code	Part no.
408301/000-160-1000-104-80-027-1-03-1-55-0-0-0/000	00707701

## Accessories

Designation	Description	Part no.
Ex-i repeater power supply and input isolating amplifier 	The intrinsically safe isolation switching amplifier ensures reliable, galvanic isolation and safe transmission of switching signals in Ex applications. It can be mounted in Ex zone 2. When using the NAMUR circuitry, line break and short circuit can be detected.  Further technical data and the relevant safety regulations can be found in the operating instructions B 707540.0	00734357

## Trademark information

- RADOX® is a registered trademark of Huber+Suhner AG, DE.