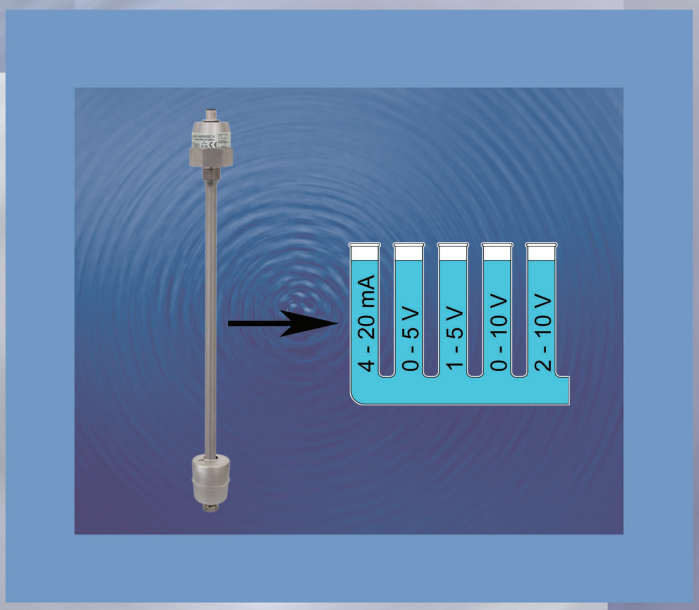
NSQ
level indicators

using the float method
for use in small tanks



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Jola Spezialschalter GmbH & Co. KG sells only business-to-business (B2B).

The units described in this documentation may only be installed, connected, started up, serviced and replaced by suitably qualified personnel!

Subject to deviations from the diagrams and technical data.

The details in this brochure are product specification descriptions and do not constitute assured properties in the legal sense.

NSQ ... level indicators

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NSQ ... level indicators

Construction and mode of operation

A NSQ ... level indicator consists of:

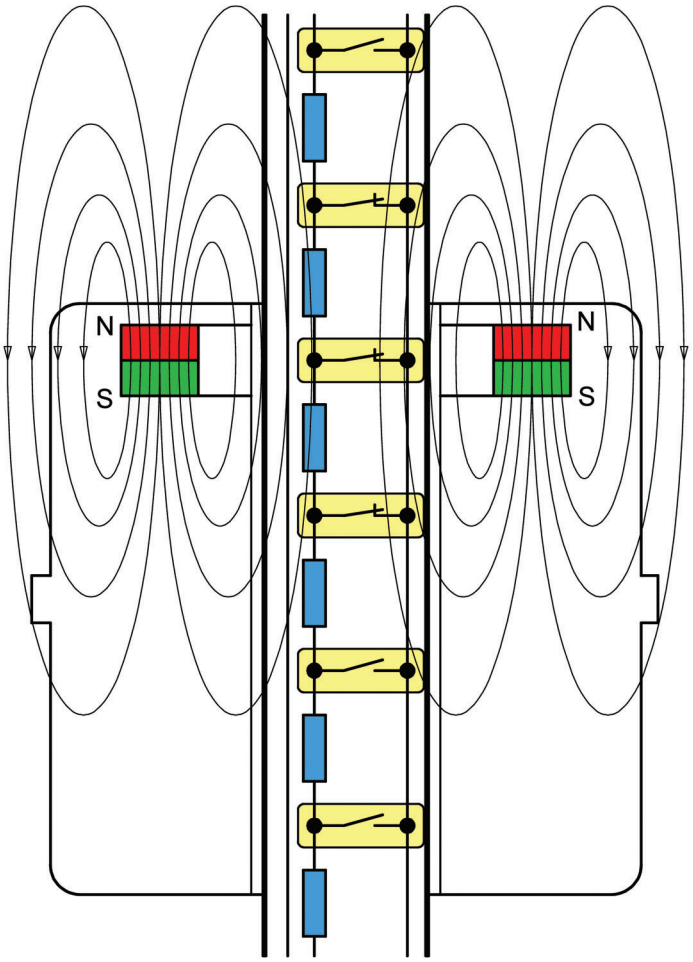
- **a sensor**
  (Resistances are activated by a float via reed contacts)

and

- **a current loop transmitter or a resistance-voltage transducer**
  (An electronic unit integrated in the connection head of the level indicator converts the resistance values into a load-independent current signal or a voltage signal).
  Alternatively, the corresponding resistance value can be tapped directly.

A float with built-in permanent magnet moves up and down with the liquid level on the probe tube of the NSQ ... level indicator. Inside the probe tube, there is a chain made up of reed contacts and series-connected resistors. The magnet in the float switches the reed contacts which are at the same position as the float. This results in a quasi-continuous height-proportional resistance measurement.

The change in resistance resulting from the upward and downward motion of the float is converted via a module integrated in the connection head of the NSQ ... level indicator into a load-independent current signal or a voltage signal which is proportional to the level of the liquid.



NSQ ... level indicators

Areas of application

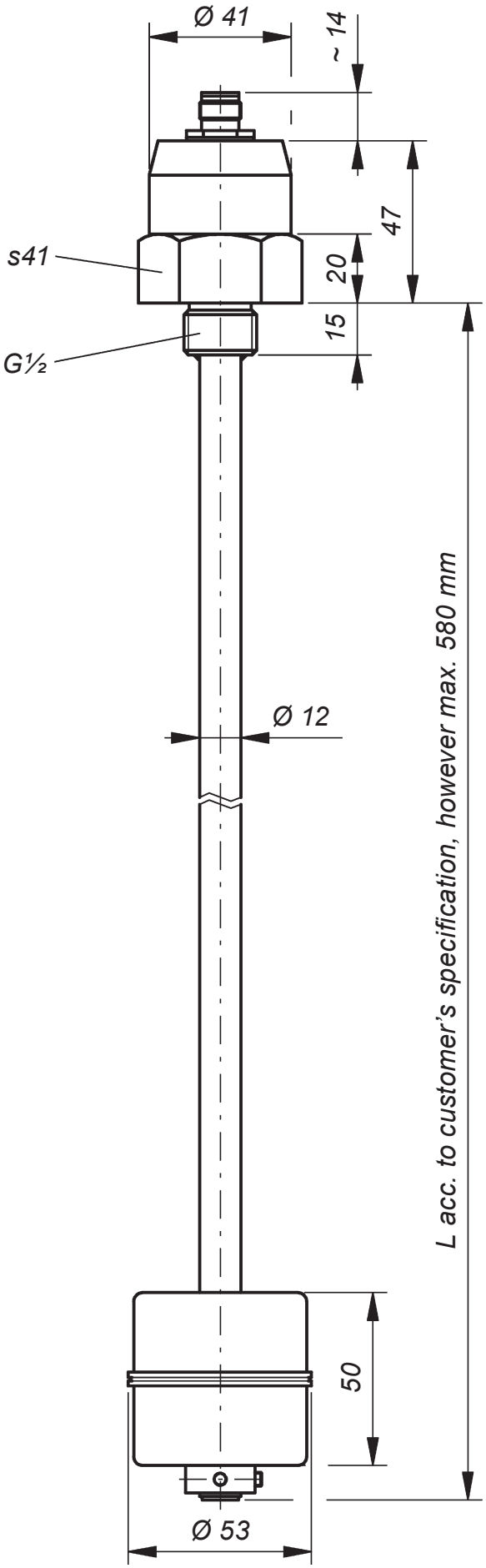
NSQ ... level indicators

<u>are suitable:</u>

- for use in small tanks
- for use with thin-fluid liquids without or with only low solid content
- for a multitude of standard output signals:
  4-20 mA
  0-5 V
  1-5 V
  0-10 V
  2-10 V
  or to be used as a resistance transmitter.
  The desired version must be specified when ordering.
- for forwarding the analogue signal to the downstream electronics (PLC, DDC, etc.) via a space-saving M12 male connector (female on request) with IP65 protection class.

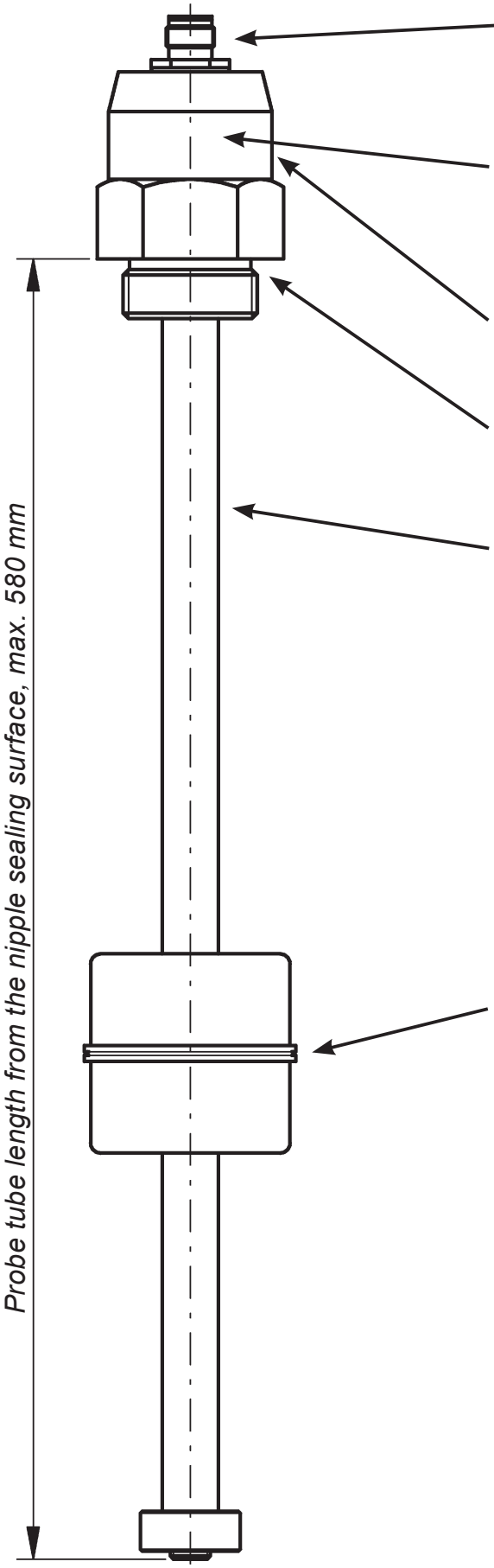
<u>Are not suitable:</u>

- for use in liquids that are prone to deposit formation, adhesion or crystallisation which might hinder the movement of the float on the probe tube
- for use in liquids with permanently moving surface
- for use on vibrating machines.



NSQ ... level indicators

Possible combinations



A-code M12 male or female connector

With electronic unit for
4-20 mA,
0-5 V or 1-5 V,
0-10 V or 2-10 V
or for use as a resistance transmitter

Connection head made of
PP or stainless steel 316Ti

Screw-in nipple: G½ (only suitable for the stainless steel probe tube), G1, G1½ or G2

Screw-in nipple / probe tube:
stainless steel 316Ti: 12 mm Ø probe tube
PP or PVDF: 14 mm Ø probe tube

PK float
(only suitable for the stainless steel probe tube)
PP,
29 mm Ø x 50 mm,
(mounting through G1 socket possible)
for liquids with a density ≥ 0.85 g/cm³

P float
PP,
53 mm Ø x 50 mm,
(mounting through G2 socket possible)
for liquids with a density ≥ 0.8 g/cm³

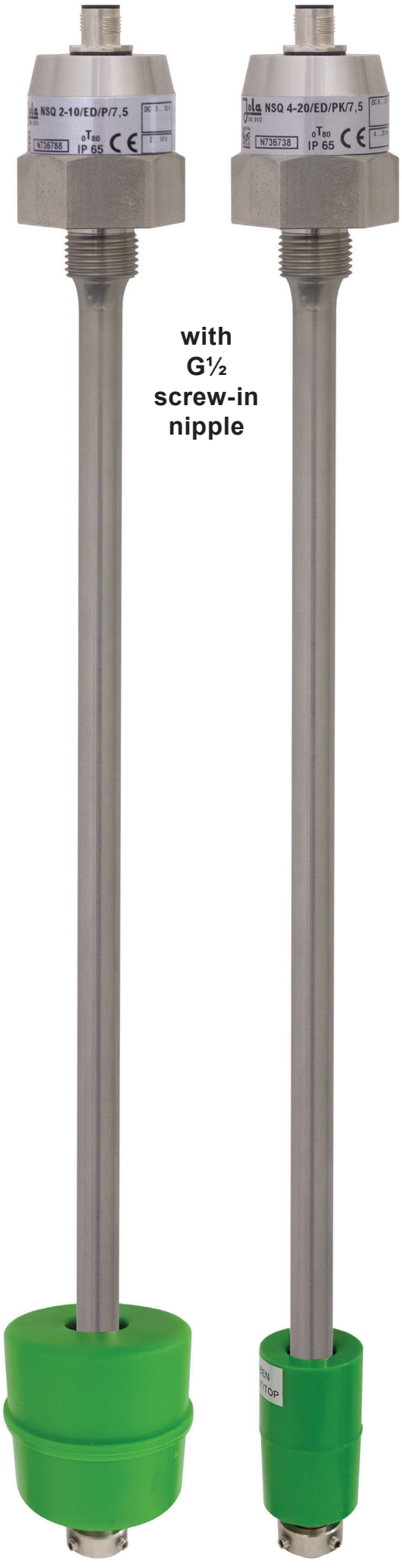
PVDF float
PVDF,
53 mm Ø x 50 mm,
(mounting through G2 socket possible)
for liquids with a density ≥ 1 g/cm³

E2 float
stainless steel 316Ti,
44,5 mm Ø x 52 mm,
(mounting through G1½ socket possible)
for liquids with a density ≥ 0.95 g/cm³

Reverse operation on request
(e.g. for mounting from the bottom or
for falling signal)

NSQ .-../ED/P/7.5 and NSQ .-../ED/PK/7.5 level indicators

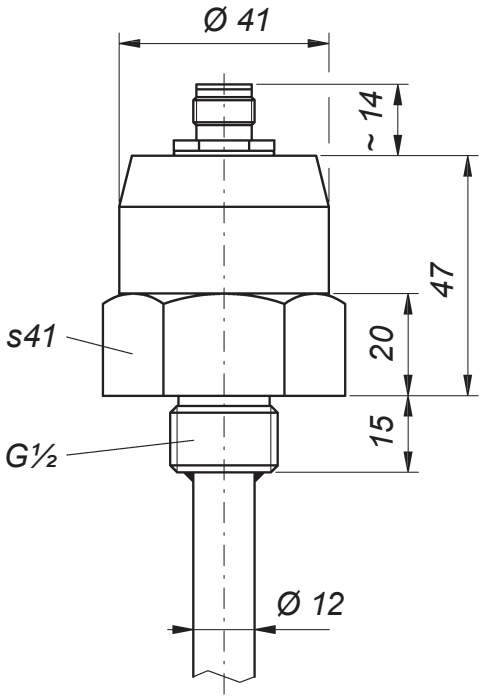
Technical data	NSQ 4-20/ED/P/7.5 NSQ 0-5/ED/P/7.5 NSQ 1-5/ED/P/7.5 NSQ 0-10/ED/P/7.5 NSQ 2-10/ED/P/7.5	NSQ 4-20/ED/PK/7.5 NSQ 0-5/ED/PK/7.5 NSQ 1-5/ED/PK/7.5 NSQ 0-10/ED/PK/7.5 NSQ 2-10/ED/PK/7.5
Level indicator part 1 (mechanical)	**Sensor**	
Probe tube: • material • diameter • length • max. length	stainless steel 316Ti 12 mm according to customer's specification within the max. length 580 mm	
Screw-in nipple	G½	G1, on request: G½, G1½ or G2
	G1, G1½ or G2	
Float	PP, 53 mm Ø x 50 mm,	29 mm Ø x 50 mm,
	mounting through socket possible G2,	G1,
	for liquids with a density ≥ 0.8 g/cm³	≥ 0.85 g/cm³
Connection head	PP, on request: stainless steel 316 Ti, approx. 41 mm Ø x 27 mm, with male M12 connector (female on request), IP65	
Mounting orientation	vertical	
Temperature range	0°C to + 80°C, other temperatures on request	
Pressure resistance at + 20°C	max. 2 bar, however only for hydraulic pressures and not suitable for pressure in line with the Pressure Equipment Directive 2014/68/EU	
Measuring principle	the magnet of the float activates series-connected resistances via reed contacts. This provides a quasi-continuous height-proportional measuring signal.	
Measuring precision	distance between 2 reed contacts: 7.5 mm	
Level indicator Part 2 (electrical)	**see page 5-2-13**	



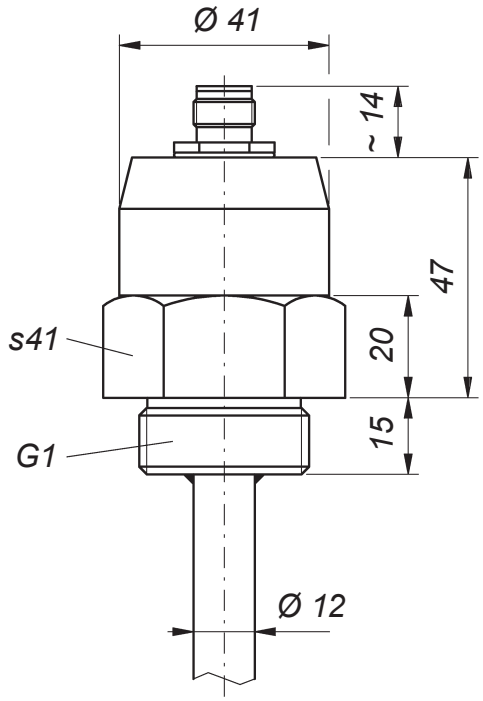
with G½ screw-in nipple

NSQ .-../ED/P/7.5 **NSQ .-../ED/PK/7.5**

NSQ .-../ED/../7.5 with G½ screw-in nipple

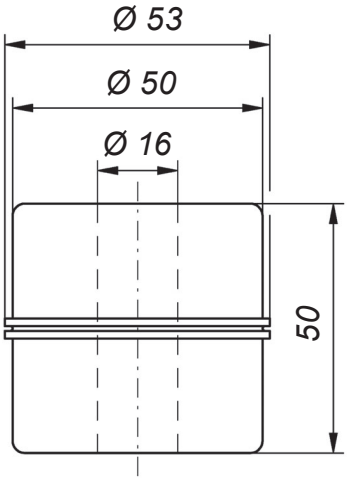


NSQ .-../ED/../7.5 with G1 screw-in nipple

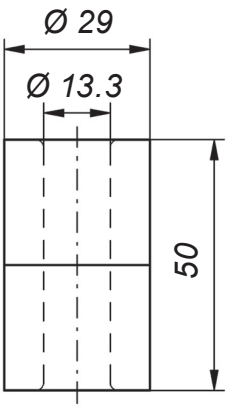


Float for

NSQ .-../ED/P/7.5



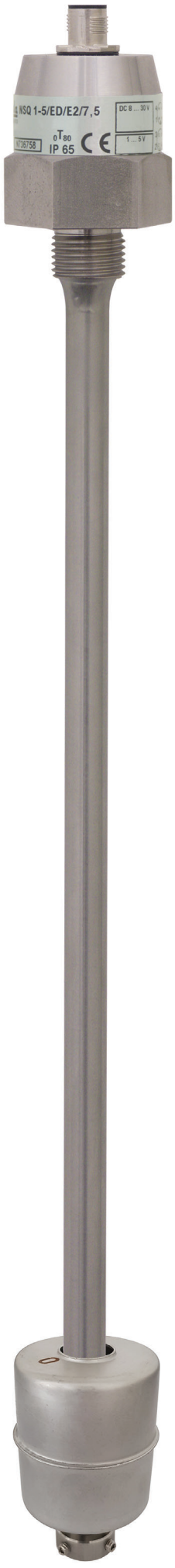
NSQ .-../ED/PK/7.5

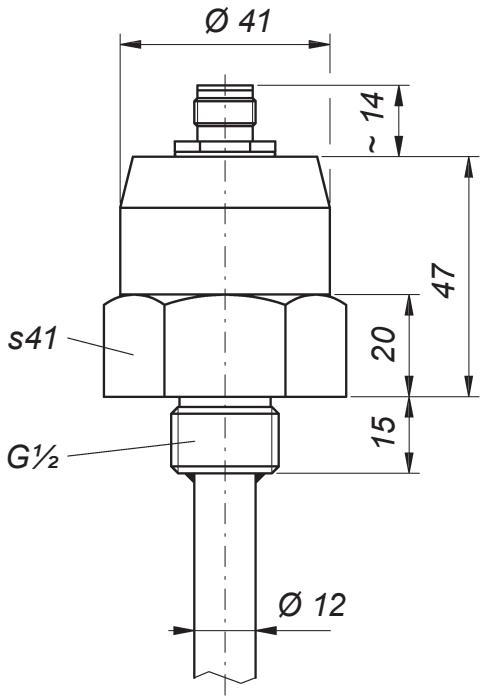


NSQ .-../ED/E2/7.5
level indicators

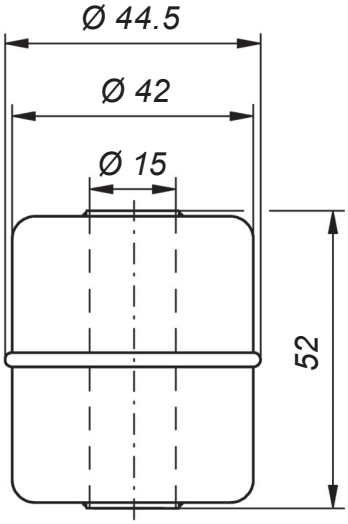
Technical data	NSQ 4-20/ED/E2/7.5 NSQ 0-5/ED/E2/7.5 NSQ 1-5/ED/E2/7.5 NSQ 0-10/ED/E2/7.5 NSQ 2-10/ED/E2/7.5
Level indicator part 1 (mechanical)	**Sensor**
Probe tube: • material • diameter • length • max. length	 stainless steel 316Ti 12 mm according to customer's specification within the max. length 580 mm
Screw-in nipple	G½ on request: G1, G1½ or G2
Float	stainless steel 316Ti, 44.5 mm Ø x 52 mm, mounting through G1½ socket possible, for liquids with a density ≥ 0.85 g/cm³
Connection head	PP, on request : stainless steel 316 Ti, approx. 41 mm Ø x 27 mm, with male M12 connector (female on request), IP65
Mounting orientation	vertical
Temperature range	0°C to + 80°C, other temperatures on request
Pressure resistance at + 20°C	max. 2 bar, however only for hydraulic pressures and not suitable for pressure in line with the Pressure Equipment Directive 2014/68/EU
Measuring principle	the magnet of the float activates series-connected resistances via reed contacts. This provides a quasi-continuous height-proportional measuring signal.
Measuring precision	distance between 2 reed contacts: 7.5 mm
Level indicator Part 2 (electrical)	**see page 5-2-13**

NSQ .-../ED/E2/7.5





Float for NSQ .-../ED/E2/7.5



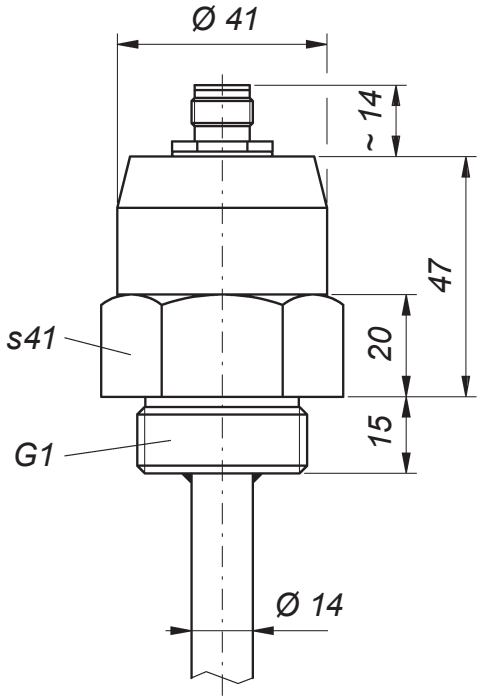
NSQ .-../P/P/7.5 and NSQ .-../PVDF/D/7.5 level indicators

Technical data	NSQ 4-20/P/P/7.5 NSQ 0-5/P/P/7.5 NSQ 1-5/P/P/7.5 NSQ 0-10/P/P/7.5 NSQ 2-10/P/P/7.5	NSQ 4-20/PVDF/D/7.5 NSQ 0-5/PVDF/D/7.5 NSQ 1-5/PVDF/D/7.5 NSQ 0-10/PVDF/D/7.5 NSQ 2-10/PVDF/D/7.5
Level indicator part 1 (mechanical)	**Sensor**	
Probe tube: • material • diameter • length • max. length	PP 14 mm according to customer's specification within the max. length 580 mm	PVDF
Screw-in nipple	G1, on request: G2 on request: with G2 reducing nipple made of PP	
Float	PP, 53 mm Ø x 50 mm, mounting through G2 socket possible, for liquids with a density ≥ 0.8 g/cm³	PVDF ≥ 1 g/cm³
Connection head	PP, on request: stainless steel 316 Ti, approx. 41 mm Ø x 27 mm, with male M12 connector (female on request), IP65	
Mounting orientation	vertical	
Temperature range	0°C to + 80°C, other temperatures on request	
Pressure resistance at + 20°C	max. 2 bar, however only for hydraulic pressures and not suitable for pressure in line with the Pressure Equipment Directive 2014/68/EU	
Measuring principle	the magnet of the float activates series-connected resistances via reed contacts. This provides a quasi-continuous height-proportional measuring signal.	
Measuring precision	distance between 2 reed contacts: 7.5 mm	
Level indicator Part 2 (electrical)	**see page 5-2-13**	

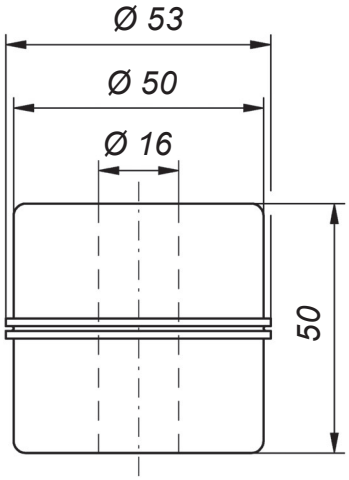
NSQ .-../P/P/7.5

NSQ .-../PVDF/D/7.5

NSQ .-../P/P/7.5
or
NSQ .-../PVDF/D/7.5



Float for
NSQ .-../P/P/7.5
or
NSQ .-../PVDF/D/7.5



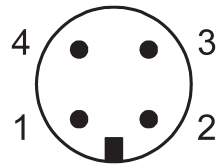
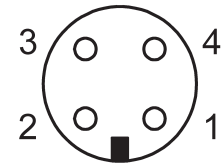
NSQ ... level indicators

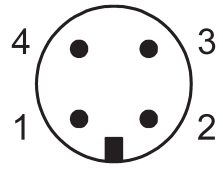
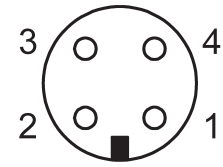
Technical data	NSQ ...	
Level indicator Part 2 (electrical)	**current-loop transmitter** **current output 4-20 mA**	**resistance-voltage transducer voltage output 0-5 V or 1-5 V or 0-10 V or 2-10 V**
Measuring electronics	2 wires	3 wires
	(reverse polarity and short circuit protected)	
Setting possibility	factory setting from 0 to 100 % for the entire signal range corresponding to the total lift of the float on the probe tube. A customer-specific setting is possible on request.	
Power supply	max. DC 30 V, min. 6 V for the current output, min. 8 V for the 5 V output, min. 13 V for the 10 V output, each up to max. 30 V	
Measuring signal	with rising float: 0 ... 100 % = for instance 0 ... 5 V When the float has got lost, the measuring signal is at the maximum and corresponds to the measuring signal given when the float has reached the upper end of the measuring range of the level indicator.	
Connectable load at current output	max. load resistance, which results from: supply voltage minus 6 V divided by 20 mA	—
Connectable load at voltage output	—	≥ 10 kΩ, other value on request
Connection	via M12 male or female connector	
Pin assignment:		
• male	1: signal + 2: not connected	1: + supply 2: not connected
• female	3: signal – 4: not connected	3: GND 4: analog output
	other pin assignment on request	
EMC	• for interference emission in accordance with the appliance-specific requirements for households, business and commerce as well as small companies • for interference immunity in accordance with the appliance-specific requirements for industrial companies	

The level indicators can also be designed for reverse operation, e.g. for mounting from the bottom or for falling signal.

NSQ ... level indicators

M12 connector with standardised assignment

• Male connector for 4-20 mA current output	
	1 : signal + 2 : not connected 3 : signal – 4 : not connected
• Female connector for 4-20 mA current output	
	1 : signal + 2 : not connected 3 : signal – 4 : not connected

• Male connector for 0-5 V or 1-5 V or 0-10 V or 2-10 V voltage output	
	1 : + supply 2 : not connected 3 : GND 4 : analog output
• Female connector for 0-5 V or 1-5 V or 0-10 V or 2-10 V voltage output	
	1 : + supply 2 : not connected 3 : GND 4 : analog output