Product Information NSS-157 **FOOD**

Potentiometric level switch NSS

Range of application

· Especially for level control of pastes and very adhesive media
· Level monitoring in metallic pipes and vessels
· Product monitoring in pipes
· Minimum conductivity from 1 µS/cm (e.g. dest. water)

Application examples

· Pump protection/dry run protection of mono pumps
· Full/empty detection in metallic pipes and vessels
· Level detection in cream cheese production

Hygienic design/Process connection

· Conforms to 3-A Sanitary Standard 74-06
· All wetted materials are FDA-conform
· Sensor completely made of stainless steel (protection type IP 69 K)
· Complete overview of process connections: see order code
· By using the Negele weld-in sleeve EMZ or the build-in system EHG a flow optimized, hygienic and easy cleanable measurement point will be achieved.

Features

· CIP cleanable up to 100 °C
· High temperature version CIP/SIP cleanable up to 143 °C for 30 min max.
· Potentiometric measurement principle
· Defined PG-position
· Integrated evaluation circuit with 4...20 mA output signal
· Defined empty signal

Options/Accessories

· High temperature version up to 143 °C (with spacer)
· Evaluation electronics VGW-E
· Electrical connection with M12 plug-in
· Pre-assembled connecting cable for M12-plug

Function principle

Potentiometric measurement principle measures the change of voltage ratio between the measurement rod and the metallic pipe or tank wall. Within the media there is an electric flow field, based on electric conductivity and capacitive characteristics. The voltage ratio caused by this field is proportional to the wetted part of the rod.
Because just voltage amplification will be considered, the characteristics of the media, especially electric conductivity, will have no influence on the measurement result. A second measurement principle allows the NSL sensor to recognize a dryrun condition. This eliminates measurement error caused by adhesive media.

Conventional usage

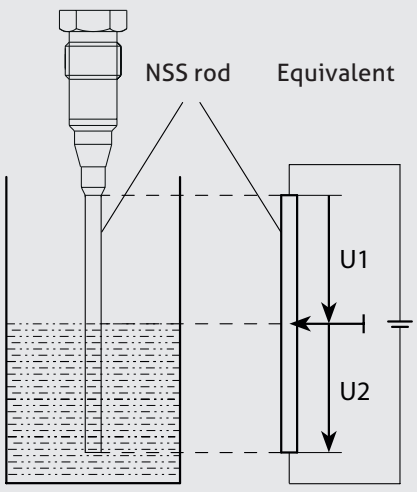
· Not suitable for applications in explosive areas.
· Not suitable for applications in security-relevant equipment (SIL).

Authorizations

FDA 3-A 74-06

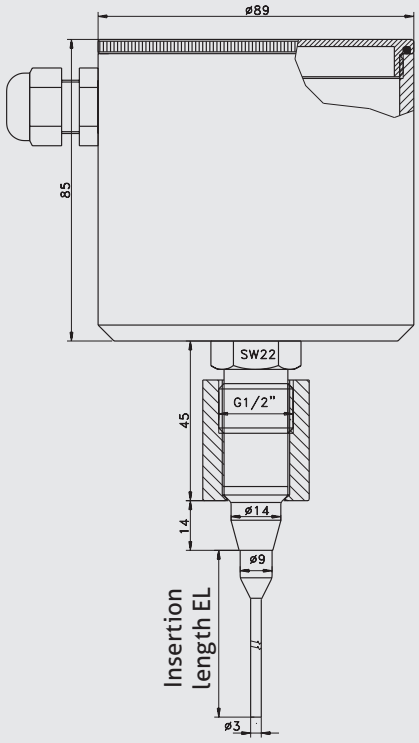
Level switch NSS-157

Functional principle

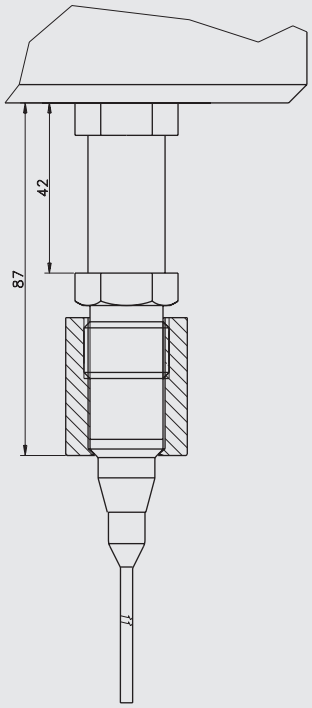


Specification		
Process connection	thread torque	CLEANadapt G1/2" hygienic max. 10 Nm
Operating pressure		max. 16 bar
Materials	head thread connection isolating part rod	stainless steel 1.4305 stainless steel 1.4301 PEEK (FDA approval number: 21CFR1772415) stainless steel 1.4404, Ra ≤0.8 µm
Temperature range	ambient storage process CIP/SIP cleaning	0...50 °C -40...85 °C -10...100 °C 100 °C max. 30 min 143 °C max. 30 min with option "H" (high temperature version)
Resolution		< 0.1 % of upper range value (= rod length)
Linearity		< 1.0 % of upper range value (= rod length)
Response time		< 50 ms
Supply		18...36 V DC
Output	signal burden empty signal	analog 4...20 mA, 2-wire loop max. 500 Ω 2.4 mA (from conductivity > 1 µS/cm)
Electrical connection	cable gland cable connection	M16 x 1.5; 2-pin, 1.5 mm² M12 plug, 1.4301, 4-pin
Protection class	with cable connction M12 with cable gland	IP 69 K IP 67
Weight		approx. 1600 g

Dimensional drawing NSS-157



Dimensional drawing NSS-157 / ... / H

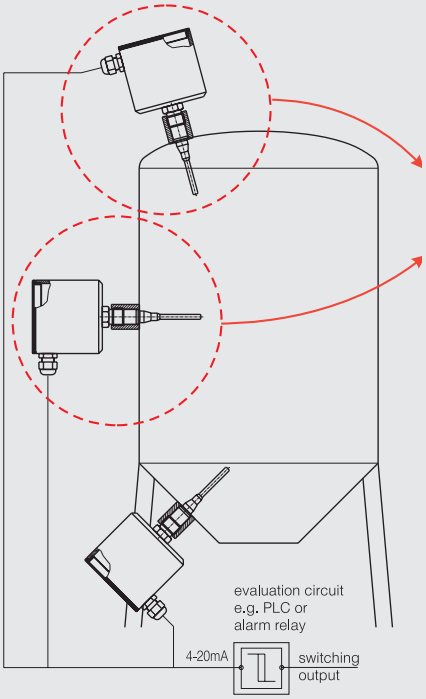


Mechanical installation

- **Attention:** Do not shorten the rod of the level probe!
- To guarantee a trouble-free function of the measurement point give attention to a good electrical contacting of the process connection of the level probe to the pipe or vessel.
- Do not use any isolating sealing materials like Teflon or similar!
- When installing into a pipe the level probe has to be mounted from the bottom side! In this case use the Negele build-in system type EHG. The length of the rod is optimized for these build-in systems.
- When installing into a vessel you can do the mounting from all directions. If you install the level probe from above, give attention to the note of the installation examples (see above)!
- The vessel or pipe has to be made of an electrical conducting material like stainless steel.

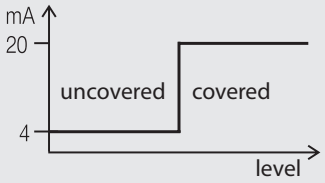
Installation example

level control in vessels; e.g. for full-/empty monitoring



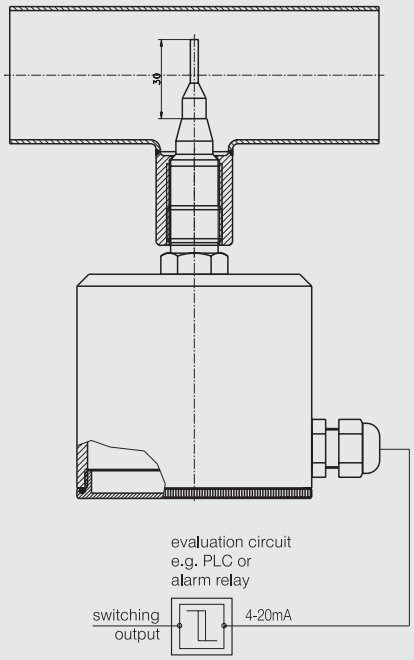
Attention:
If the level probe will be installed into the top of a vessel or horizontally the current output is like the diagram shows:

- probe uncovered: 4 mA
- probe covered: 20 mA



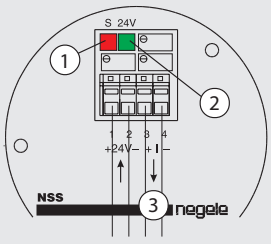
Installation example

installation in pipes
e.g. for dry run protection



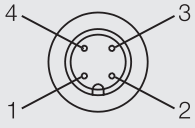
Electrical connection with cable gland

1: LED probe
2: LED power
3: evaluation device;
e. g. limit switch or PLC



Electrical connection of NSK with M12 plug

1: brown	+ power supply
2: white	+ output 4...20 mA
3: blue	- output
4: black	- power supply



Advice | Installation

- Important information: To guarantee a trouble-free function the power supply cable as well as the signal cable should be shielded and grounded at the electric control box.
- The device will be shipped exactly calibrated, thus normally there is no calibration necessary.
- Make the electrical connection according to the electrical connecting plan and apply supply voltage.
- Set the alarm point of the evaluation unit as required. Give attention to the following:
  - A more higher alarm point causes a lower sensitivity to adhesions.
  - When installing the sensor in pipes the setting of the alarm point depends of the filling high that is defined „full".
  - If it is required to monitor the pipe to completely filling high we recommend to set the alarm point between 19 mA and 20 mA.

Conditions for a measuring point according to 3-A Sanitary Standard 74-06

- The sensors NSS-157 conforming to the 3-A Sanitary Standard.
- The sensors are designed for CIP/SIP cleaning. Maximum 143 °C for 30 minutes.
- Only with the build-in system CLEANadapt (EMZ, EMK, Adapter AMC and AMV) allowed.
- Using the weld in sleeve EMZ, EMK the weld must comply to the requirements of the current 3-A Sanitary Standard.
- Mounting position, self draining and the position of the leackage hole must be in accordance to current 3-A Sanitary Standard.

Transport/Storage

- Do not store outside
- Store in an area that is dry and dust-free
- Do not expose to corrosive media
- Protected against solar radiation
- Avoid mechanical shock and vibration
- Storage temperature -40...85 °C
- Relative humidity max. 98 %

Reshipment

- Sensors shall be clean and must not be contaminated with dangerous media and/or heat-conductive paste! Note the advice for cleaning!
- Use suitable transport packaging only to avoid damage of the equipment!

Cleaning/Maintenance

- In case of using pressure washers, dont't point nozzle directly to electrical connections!

Standards and Guidelines

- You have to comply with applicable regulations and directives

Note on CE

- Applicable directives:
  Electromagnetic Compatibility Directive 2014/30/EU
- Compliance with the applicable EU directives is identified by the CE label on the product.
- The operating company is responsible for complying with the guidelines applicable to the entire installation.

Disposal

- Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
- Take the device directly to a specialized recycling company and do not use municipal collection points.

Order Code

NSS-157 (Potentiometric level switch, process connection G1/2" hygienic)

Rod lenght EL

030	(30 mm, for pipe DN50)
045	(45 mm, for pipe DN65)
060	(60 mm, for pipe DN80)
080	(80 mm, for pipe DN100)
100	(100 mm, for pipe DN125)
130	(130 mm, for pipe DN150)
200	(200 mm, for vessels)

Temperature version

X	(standard; for process temperatures up to 100 °C)
H	(high temperature version with spacer: for process temperatures up to 150 °C for 30 minutes)

Electrical connection

X	(cable gland M16 x 1,5)
M12	(M12 plug 1.4305)

NSS-157 / 030 / X / M12

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