

Level Sensor with M12 Thread Hygienic



Application

- Level detection of fluid and conductive media in vessels and pipes (min. conductivity 1µS/cm but depending on the transmitter)

Application Examples

- Full- / empty detection in vessels
- Dry running protection of pumps
- Overfill protection in dosing plants

Hygienic Design / Process Connection

- Hygienic and easy cleanable measurement point (3-A certificate, EHEDG permit)
- Elastomer free sealing system, the connection will be without gaps and crevices (see Product Info 'Processconnection')
- CIP- / SIP-cleanable up to 140°
- Food compatible materials according to FDA
- Sensor completely made of stainless steel and PEEK isolation of PFA
- Adapters available for all current process connections

Features

- Defined position of the cable entry
- Available with or without integrated level transmitter
- Different electrical connections available
- Individual shortening and twisting of the rod is possible
- Compact housing for pipes from DN15

Options / Accessories

- High temperature version available (with neck tube 100mm)
- Cable version (NVS-08x) available with different cable lengths

Selection of the right sensor type

- Coating
For foamy, adhesive (e.g. yoghurt) and wetting media (e.g. alkaline solutions), we suggest to use a sensor with a coated rod. Sensors with bright rod are suitable for watery, not adhesive and not wetting media.
- Temperature
If a sensor with integrated level transmitter **MNV** is needed, we suggest to use the high temperature versions if the medium temperature is higher than 100°C (option **H**).

Attention: Use only Negele weld-in systems, to ensure a safe function of the measurement point!

Conditions for a measuring point according to 3-A-Standard 74-03:

- The sensors NVS-041A, -061A, -081A are approved according to the 3-A-Standard.
- Only with the build-in system CLEANadapt (EMZ, EMK, EHG with tube > DN25, ISO 20 und 1", Adapter AMC, AMV, AMA and AMB) allowed.
- The welding seam by using of EMZ, EMK has to correspond with 3-A-Standard 74-03, D6.1.4: "The minimum radii for fillets of welds in product contact surfaces shall be not less than ¼ in. (6.35 mm) except that the minimum radii for such welds may be 1/8 in. (3.18 mm) when the thickness of one or both parts joined is less than 3/16 in. (4.76 mm).
- Self draining has to be warranted by the build-in position (pos. 1, 2, or 3).
- The process connection needs a self-draining leakage hole.



NVS-041



NVS-066/M



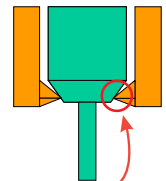
NVS-081



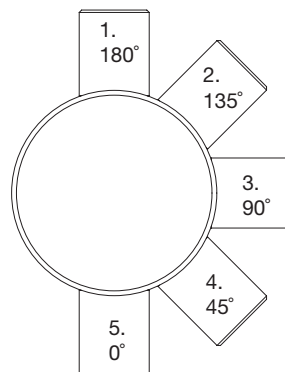
EHG-15/M12



EMS-032



hygienic elastomerfree sealing system



Specification Level Sensor

Process connection	hygienic	Weld-in fitting e.g. EMk-032 or EHG-... / M12
	torque	5...10 Nm
Rod length (cutable)	NVS-041;061;081 NVS-043;046;063 -066;083;086	3 mm 200 mm
Material	Connection head	303 (1.4305)
	Rod / Electrode	316L (1.4404)
	Isolator	PEEK (acc. to FDA)
	Coating	PFA (acc. to FDA)
Pressure		max. 10 bar
Temperature range	process / cleaning*	140 °C
	ambient*	-10...+60 °C
Electr. connection	cable entry	M16x1,5 (PG)
	plug-in	M12-plug 303 (1.4305) 3/4pol.
	cable 2,5 m	
	with level transmitter	Silicone 2x0,5 mm ²
	without level transmitter	PVC 4x0,25 mm ²
Protection class		IP69K

* If a level transmitter is integrated, please take care about the temperature specification of the level transmitter (see below).

Level transmitter MNV-1C; MNV-M

Temperature	operating	-10...+60 °C
	storage	-20...+60 °C
Humidity	without condensate	0...95 % r. H.
Power Supply		15...36 V DC
Electrode E1	voltage	1,5...2 V AC / 300 Hz
		no DC signal
Sensitivity selectable	MNV-1C	0,1; 1; 10; 100 kOhm
	MNV-M	0,2; 2; 20 kOhm
Output	short-circuit-proof	active 50 mA
Delay	fix	0,5 s
Switching logic		
min/max selectable	MNV-1C	via jumpers
	MNV-M	polarisation of supply

Mounting Instructions

- Take attention of the maximum torque when you build in the sensor!
- To guarantee a safe function, take a look on a good electrical connection between process connection and pipe or vessel.
Do not use any kind of sealing band like e.g. Teflon tape!
- If the stub sensor (e.g. NVS-041) is used in pipes, take care that the electrode will emerge if the pipe runs out. We propose to install the sensor in vertical pipes.
- Vessel resp. pipe wall must be of metal!
- For mounting and demounting the sensor, please use the spanner flat only! Do not use the connection head!

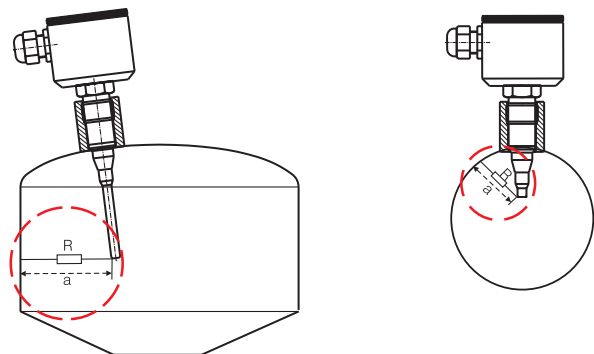
Startup the Level Sensor

- If necessary cut the electrode to the length you need. Take care that the compound between rod and sensor is not stressed too much. Do not damage the coating of the rod on the sensor side!
- Strip the isolation of coated rods at the sensor tip. 5mm are most time enough.
- Screw the sensor into the fitting. Electrical connection according page 3. Take care of the coating when you mount the sensor!

Startup the level transmitter MNV-1C, MNV-M

- connect the module to power supply
- setup the switching logic (description see page 3)
- select the lowest sensitivity (0,1k) (description see page 3)
- wetting the electrode with the medium with the lowest conductivity
- if the output is switching, the setup is finished
- if the output is not switching, increase the sensitivity until the output is switching. Setup is finished.

Calculation of the minimum conductivity of the medium



a = shortest absolute length between vessel/pipe and electrode

K = geometric factor for the distance a (a/cm²)

R = resistance of the medium

$$R_{\max}: \text{NVS-14x/M} = 100 \text{ kOhm}$$

$$\text{NVS-16x/M ; NVS-18x.m} = 20 \text{ kOhm}$$

Example for the calculation of the minimum conductivity with NVS-141/M

Distance a = 2,5 cm; factor K: 2,5/cm
 maximum resistance R_{\max} : 100 kOhm
 minimum conductivity con_{\min} : 1/100 kOhm = 10 μS

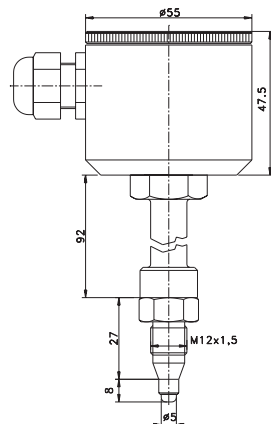
specific minimum conductivity of the medium:
 $\text{con}_{\min} (\mu\text{S}) \times K (1/\text{cm}) = 10 \mu\text{S} \times 2,5/\text{cm} = 25 \mu\text{S}/\text{cm}$

If the conductivity of your medium is lower than the calculated value the NVS-141/M can be used if the distance is reduced by another sensor position.



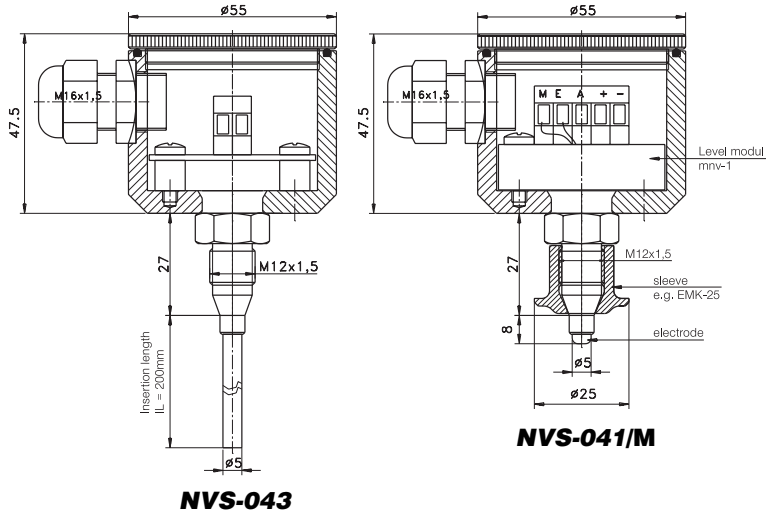
Level sensor
NVS-041/M with
level transmitter
MNV-1C

Dim. Drawing option spacer

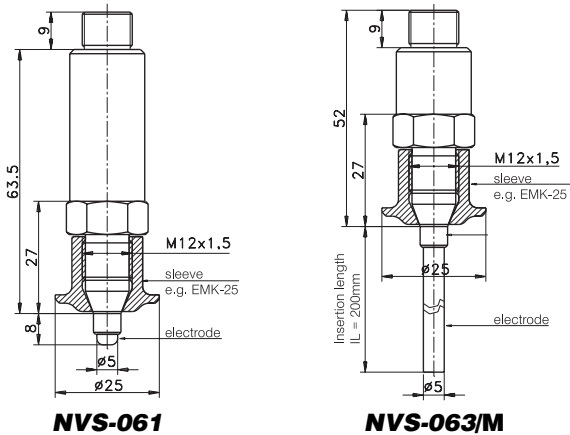
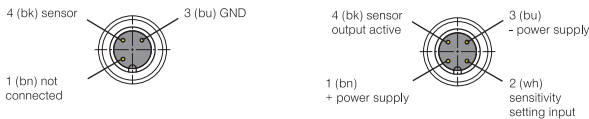
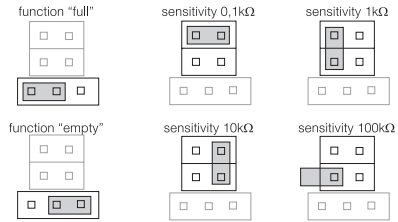
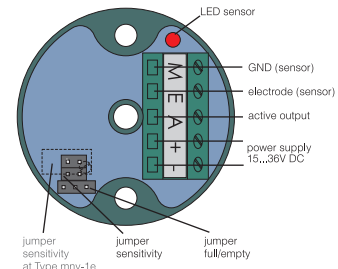


Level sensor with
option spacer
NVS-041/H

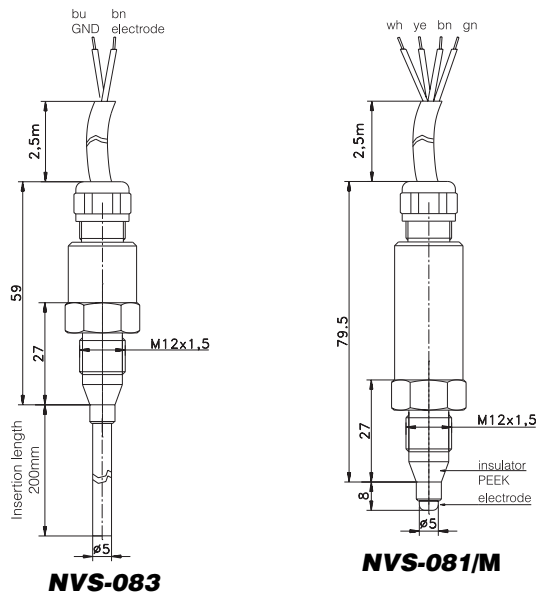
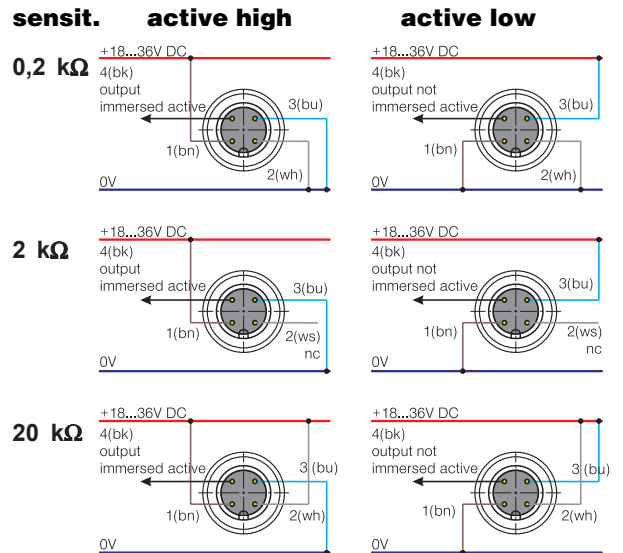
Dimension Drawings



Electrical Connection NVS-041/M; NVS-043/M; NVS-046/M



NVS-061/M; NVS-063/M; NVS-066/M



NVS-081/M; NVS-083/M; NVS-086/M

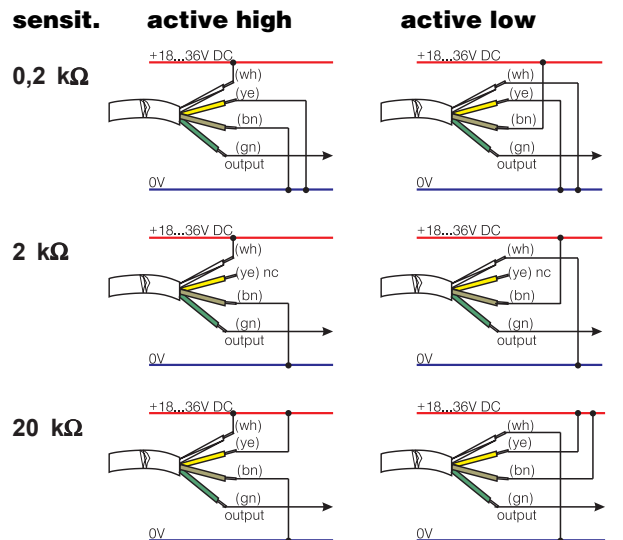






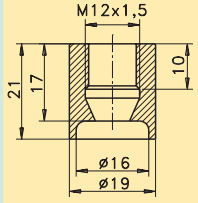
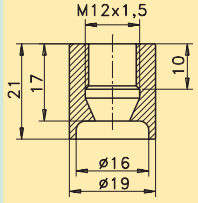

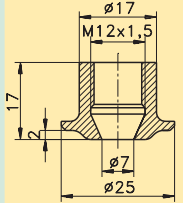
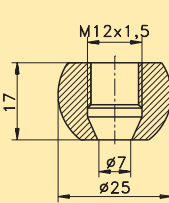
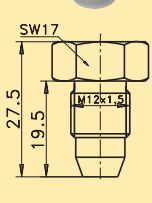


Table Torque

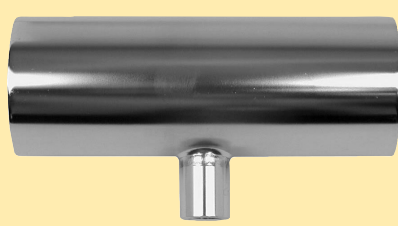
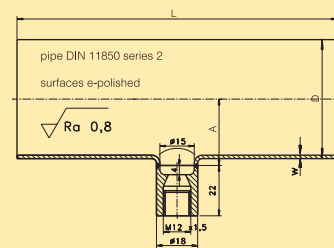
Thread size	Sealing system	Torque min. [Nm]	Torque max. [Nm]
M12x1,5	PEEK/SS	5	10

Process connection M12 hygienic

Cylindrical weld-in fitting (standard)	Cyl. fitting with weld-on ring (standard)	Cylindrical fitting with control-holes	Weld-in fitting with collar	Weld-in ball	Dummy flange BST
	for installation in pulled-out pipes		for thick-walled vessels	for sloped installation	to close existing measurement point
					
					
EMS-032			EMK-032	KEM-032	BST-030

Dimension table EHG... / M12

Type	DN	L [mm]	A [mm]
EHG-15 / M12	15	70	10
EHG-25 / M12	25	100	15
EHG-40 / M12	40	120	22
EHG-50 / M12	50	140	29
EHG-65 / M12	65	160	38
EHG-80 / M12	80	180	46

Order Code

Model: Connection head Ø55mm; electrical type	rod (electrode)	connection via cable entry rod length	level transmitter MNV	high temp. version	open circuit alarm
NVS-041	stub	3 mm*	X without	X without	X without
NVS-043	bright	200 mm**	M (with MNV-1C)	H (spacer 92 mm)	D (100 kOhm, only without MNV)
NVS-046	coated				
Model: Connection head Ø18mm; electrical type	rod (electrode)	connection via M12-plug rod length	level transmitter MNV	high temp. version	open circuit alarm
NVS-061	stub	3 mm*	X without	X without	X without
NVS-063	bright	200 mm**	M (with MNV-M)	H (spacer 92 mm)	D (100 kOhm, only without MNV)
NVS-066	coated				
Model: Connection head Ø18mm; electrical type	rod (electrode)	connection via fixed cable rod length	level transmitter MNV	high temp. version	open circuit alarm
NVS-081	stub	3 mm*	X without	X without	X without
NVS-083	bright	200 mm**	M (with MNV-M)	H (spacer 92 mm)	D (100 kOhm, only without MNV)
NVS-086	coated				

Order example: **NVS-046 / 200 / M / H**

* only for NVS-041; -061; -081

** only for NVS-043; -046; -063; -066; -083; -086