

## 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 (EHEDG; 3A certificate)
- 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. alcaline 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!

### Order Code

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

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

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

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



**NVS-041**



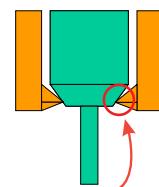
**NVS-081**



**EHG-15/M12**



**EMS-032**



**hygienic  
elastomerfree  
sealing system**

## Specification Level Sensor

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

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

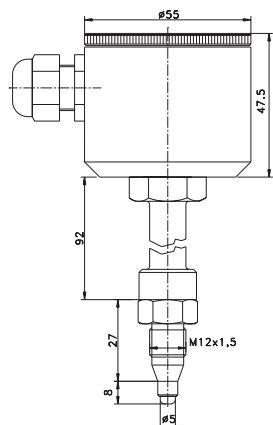
## Level transmitter MNV-1C; MNV-M

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

## Dim. Drawing option spacer



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



Level sensor with  
option spacer  
**NVS-041/H**

## 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!

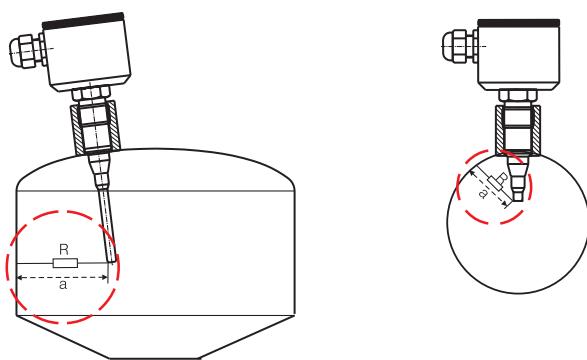
## Startup the Level Sensor

- If necessary cut the electrode to the length you need. Take care that the compound between rod and sensor is not stressed to 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/cm<sup>2</sup>)

R = resistance of the medium

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

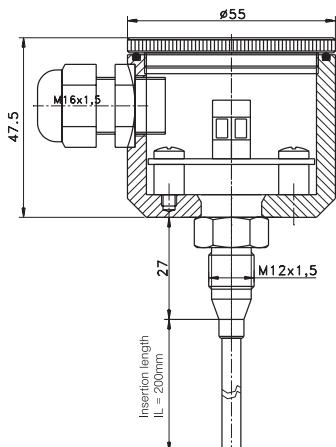
$$\text{NVS-16x/M ; NVS-18x.M} = 20\text{kOhm}$$

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

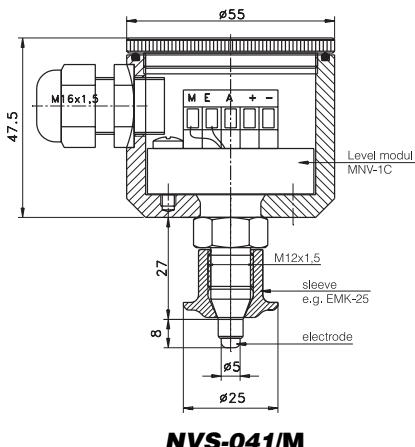
$$\begin{aligned} \text{Distance } a &= 2,5\text{cm}; \text{factor } K: & 2,5/\text{cm} \\ \text{maximum resistance } R_{\max} &: & 100\text{kOhm} \\ \text{minimum conductivity } con_{\min} &: & 1/100\text{kOhm} = 10\mu\text{S} \\ \text{specific minimum conductivity of the medium:} \\ con_{\min} (\mu\text{S}) \times K (1/\text{cm}) &= 10\mu\text{S} \times 2,5/\text{cm} = 25\mu\text{S}/\text{cm} \end{aligned}$$

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.

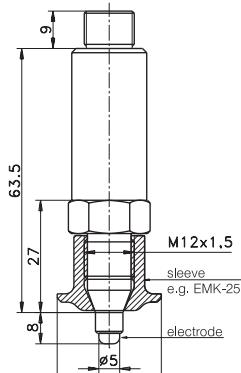
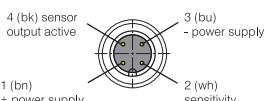
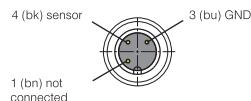
## Dimension Drawings



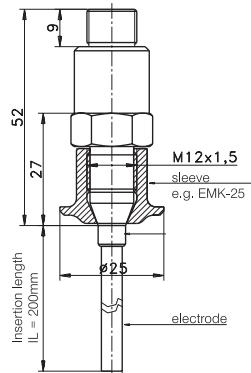
**NVS-043**



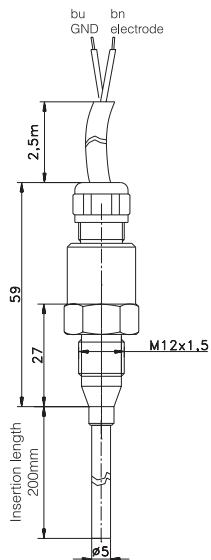
**NVS-041/M**



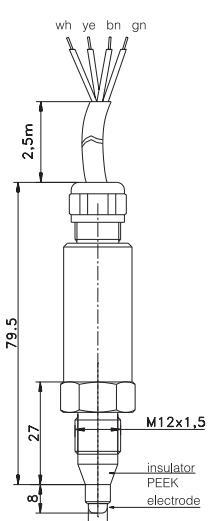
**NVS-061**



**NVS-063/M**



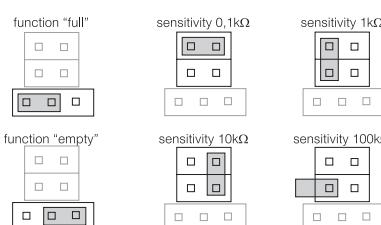
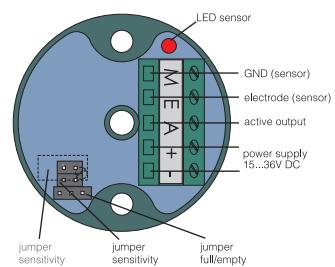
**NVS-083**



**NVS-081/M**

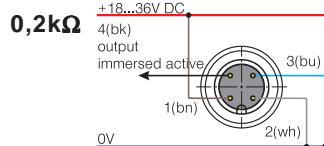
## Electrical Connection

**NVS-041/M; NVS-043/M; NVS-046/M**

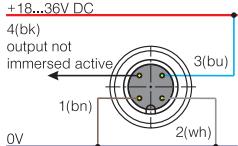


**NVS-061/M; NVS-063/M; NVS-066/M**

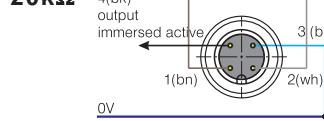
**sensit. active high**



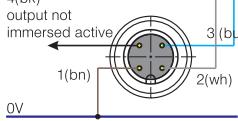
**active low**



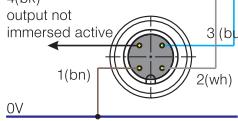
**0,2kΩ**



**2kΩ**

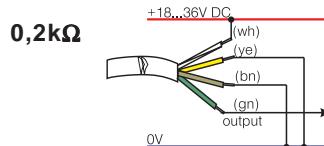


**20kΩ**

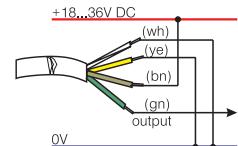


**NVS-081/M; NVS-083/M; NVS-086/M**

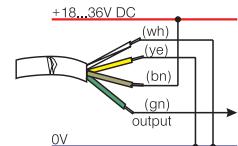
**sensit. active high**



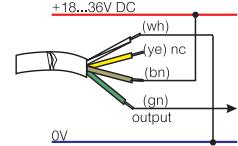
**active low**



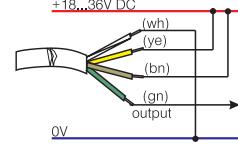
**0,2kΩ**



**2kΩ**



**20kΩ**



# Product Information

NVS -041, -043, -046, -061,  
-063, -066, -081, -083, -086

## 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]	Image of EHG-15/M12 fitting	Technical drawing of EHG-15/M12 fitting
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		

## Overview of all available process connections

Thread size	TriClamp	Dairy flange (DIN 11851)	DRD (press ring optional available)	Varivent-Inline	APV-Inline	
<b>M12 adapter</b>						
<b>Pipe size</b>	AMC-032/10 AMC-032/10			- AMV-032/25 AMV-032/40	- AMA-032/40	

**Adapter for diameter > DN40: look at product information "Level Sensors with G1/2" Thread Hygienic".**