Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Magnetostrictive Level Transmitters

Compact Line

measuring • monitoring • analysing

NMS

HART COMMUNICATION FOUNDATION

- Measuring length: 300 - 3000 mm
- Accuracy: ±1 mm
- p_{max}: 25 bar; t_{max}: +90 °C
- Distance and level measurement
- Standard and mini type versions
- Stainless steel or titanium floats
- IP 65 protection
- HART® communication
- Chemicals, solvents, hydrocarbons
- Level monitoring of tanks
- Interface measurement
- Analogue output: 4 ... 20 mA HART®, 2-wire

N2

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Description

NMS magnetostrictive level transmitters are ideal solutions for high accuracy measurements of clean fluids. Its high precision renders the NMS suitable for measurements of highest demand. Integrating the transmitter into a process control system is easy thanks to the intelligent signal processing and communication software as well as the wide of range of accessories offered.

Operating Principle

A float containing a magnetic disc moves along a guide tube with the specific magnetostrictive wire in it. A pulse generated by the electronics travels along the magnetostrictive wire.

At the point the pulse reaches the float's magnetic field, a torsion develops. Reflected from the torsion point, the pulse creates an acoustic wave that travels back along the wire.

The 4 ... 20 mA output of the transmitter is proportional to the elapsed time between the excitation and detection.

Applications

- Level measurement of liquids, with minimum 0.4 kg/dm^3 density
- Chemical industry
- Power plants
- Oil industry
- Water industry
- Chemicals, solvents, hydrocarbons

Technical Details

Type		Rigid probe version – standard	Rigid probe version – mini	Rigid probe version – plastic coated
Measured process value		Liquid level, distance		
Nominal length (L)		0.3 ... 3.5 m	0.3 ... 1.5 m	0.3 ... 3 m
Material of the tube		1.4571 (316Ti) stainless steel		
Max. medium pressure*		2.5 MPa (25 bar)	1.6 MPa (16 bar)	0.3 MPa (3 bar)
Medium temperature*		-40 ... +90 °C		
Standard float diameter / material		Ø54 x 60 mm cylindrical / 1.4404	Ø28 x 29 mm / 1.4404	Ø76 × 87 mm cylindrical / PVDF or PP
Medium density		Ø54 mm float min. 0.8 g/cm³; Ø54 mm titanium float min. 0.55 g/cm³ Ø95 mm float min. 0.55 g/cm³ Ø124 mm or Ø95 mm titanium float min. 0.4 g/cm³		
Material of wetted parts		Stainless steel: 1.4571 (316Ti), floats: see "Float Selection"		PFA, PVDF, PP
Ambient temperature		-40 ... +70 °C		
Output	Analogue	4 – 20 mA (limit values: 3.9 ... 20.5 mA)		
	Digital communication	HART® (minimum loop resistance: 250 Ω)		
Error indication		Output signal = 22 mA or 3.8 mA		
Output load		$R_t = (U_t - 12.5\ V) / 0.02\ A$, U_t = power supply voltage		
Power supply		12.5 ... 36 V_{DC}		
Electrical protection		Class III		
Ingress protection		IP 65		
Process connection		As per order code		
Electric connection		Hirschmann EN 175 301-803-A (DIN 43650)		
Mass		2.9 kg + measuring probe: 0.6 kg/m	2.9 kg + measuring probe: 0.3 kg/m	2.9 kg + measuring probe: 0.7 kg/m

* Details of non-standard floats can be found under "Float Selection".

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Measurement Data

Resolution (on HART® transmitted value)	1 mm
Nonlinearity (on HART® transmitted value)**	±2 mm or ±0.085% F.S. whichever is greater
Hysteresis (under reference conditions)	±0.25 mm
Zero span (in LEVEL measurement mode)	Anywhere within the active range
Measurement range (reducing)*	Minimal range: 32 mm; Maximum range: see “Dimensions”
Temperature error	0.04 mm / 10 °C (between -25 ºC … +50 ºC)
Current output resolution	0.4 µA
Current output accuracy	33 µA
Current output temperature error	6 ppm / °C

*The accuracy data is only valid for factory default settings
** Under reference conditions, acuracy data only valid in case of factory setting. When used with a bypass float, the values given are not valid. With factory-calibrated float for NBK, accuracy is 5 mm.

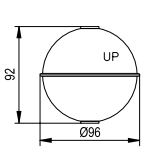
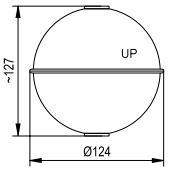
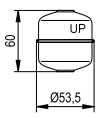
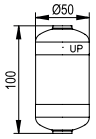
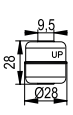
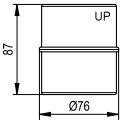
Order Details NMS (Example: **NMS-S R250 E 05 M S**)

Model	Design	Process connection	Housing	Probe length
NMS-	**S** = Rigid probe, Standard version (max. probe length = 3.0 m) **M** = Rigid probe, mini (max. probe length 1.5 m) **K** = PFA coated rigid probe (max. probe length 3 m)	**R250** = G 1" **R25L** = G 1", low connection **R500** = G 2" **R50L** = G 2" low connection **N250** = 1" NPT **N25L** = 1" NPT, low connection **N500** = 2" NPT **N50L** = 2" NPT, low connection **T400** [1] = 1½" TriClamp **T40L** [1] = 1½" TriClamp, low connection **T500** [1] = 2" TriClamp **T50L** [1] = 2" TriClamp, low connection **T650** = 2½" TriClamp **T65L** = 2½" TriClamp, low connection **T800** = 3" TriClamp **T1H0** = 4" TriClamp **000U** [2] = w/o (for sliding sleeve)	**E** = st. steel	**03** = 0.3 m **04** = 0.4 m … **09** = 0.9 m **10** = 1.0 m … **15** = 1.5 m (max. length for NMS-M) … **30** = 3.0 m (max. length for NMS-S/K)

Output/ Electrical Connection	Float options
M = 4…20 mA + HART® / Hirschmann EN 175 301-803-A (DIN 43650)	**S** = Standard float (see table for floats) **For NMS-S** **2** = Ø124 mm st. st. 1.4401 ball float, min. 0.40 kg/dm³ **3** = Ø53.5 mm titanium float, min. 0.55 kg/dm³ **4** = Ø50x100 mm titanium ball float, min. 0.45 kg/dm³ **6** = Ø53.5 mm st. st. 1.4404, min. 0.8 kg/dm³ **0** [3] = no float (only for assembly with NBK, includes 2 x mounting brackets) **For NMS-K** **5** = Ø76x87 mm PP float, min. 0.40 kg/dm³

[1] not for NMS-S
[2] If not used with NBK, optional threaded sliding sleeve should be ordered separately. Not for NMS-M.
[3] Probe length NMS = (150 + ML + B) mm, see sketch on following page and data sheet NBK for details of dimensions.

Float Selection

	for NMS-S					for NMS-M	for NMS-K	
Type	**Standard**	**Code "2"**	**Code "3"** [1]	**Code "6"** [1]	**Code "4"** [1]	**Standard**	**Standard**	**Code "5"**
Dimensions								
Medium Density (min.)	0.55 kg/dm³	0.4 kg/dm³	0.55 kg/dm³	0.8 kg/dm³	0.45 kg/dm³	0.8 kg/dm³	0.7 kg/dm³	0.4 kg/dm³
Material	1.4435	1.4401	Titan	1.4404	Titan	1.4404	PVDF	PP
Medium pressure	16 bar	25 bar			16 bar	10 bar	3 bar	

[1] Designed for min. 2" process connection.

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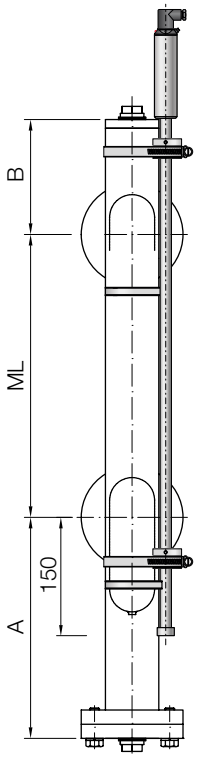
Accessories NMS (Example: **ZUB-NMB/S CER25**)

Model	Connection/ Material/ Size
ZUB-NMB/S	**For NMS-S** **CER25** = Sliding sleeve / stainless steel 1.4571 / 1" BSP **CER50** = Sliding sleeve / stainless steel 1.4571 / 2" BSP **CEN25** = Sliding sleeve / stainless steel 1.4571 / 1" NPT **CEN50** = Sliding sleeve / stainless steel 1.4571 / 2" NPT **For NMS-K** **CPR25** = Sliding sleeve / PVDF (sleeve), PP (flange) / 1" BSP **CPN25** = Sliding sleeve / PVDF (sleeve), PP (flange) / 1" NPT **F6F80*** = PP flange / PVDF (sleeve), PP (flange) / DN80, PN16 **F6F1H*** = PP flange / PVDF (sleeve), PP (flange) / DN100, PN16

* sliding sleeve CPR25 must be ordered in addition

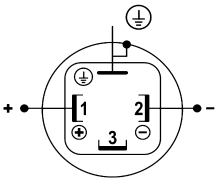
Sketch for mounting with NBK



Wiring

This transmitter is designed to operate on 12.5 ... 36 V_{DC} power only.

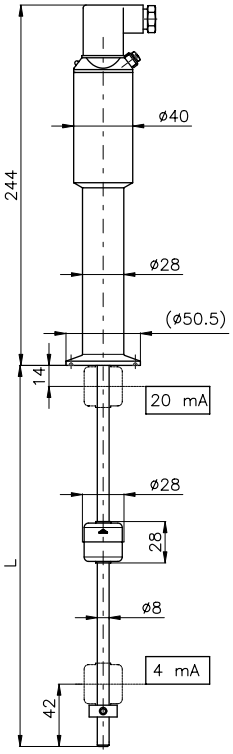
The measured voltage on the terminals of the unit should be at least 12.5 V. Using transmitter with HART® a terminal resistance with a minimum value of 250 Ω should be applied.



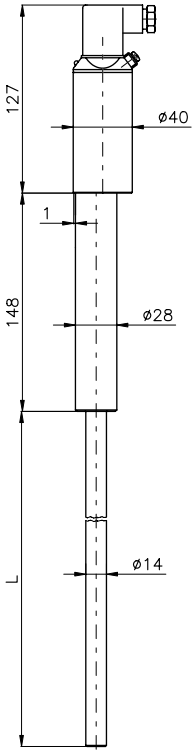
Order code HART® modem: **HARTCOMM** (Download of configuration software NUS-NTB-NRM-SW at www.kobold.com)

Inactive Zones

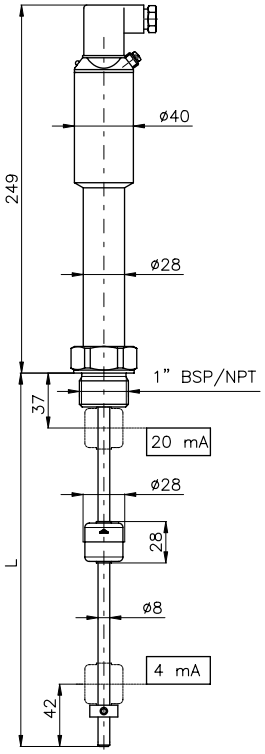
NMS-MT40L



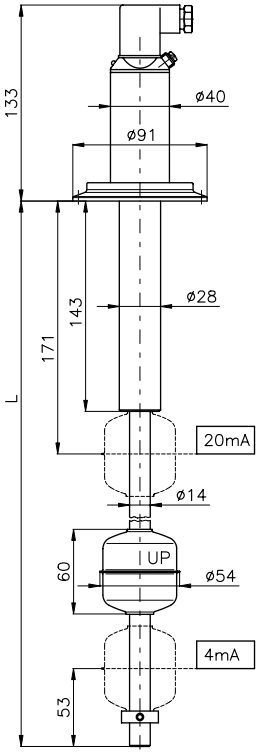
NMS-S000U



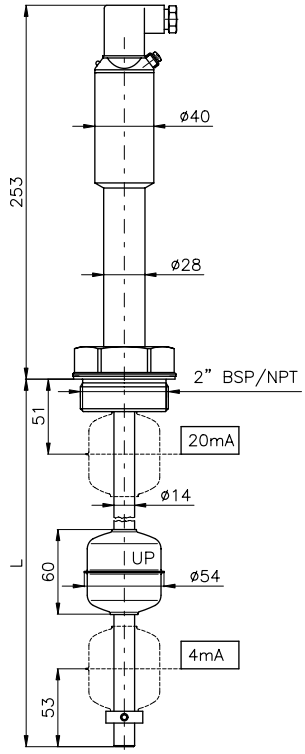
NMS-MR25L
NMS-MN25L



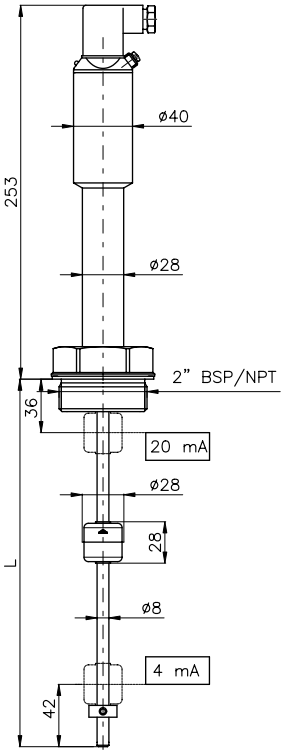
NMS-ST800



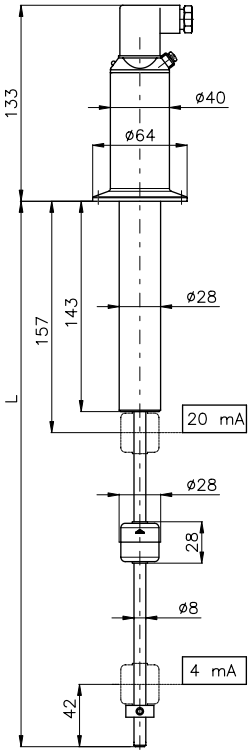
NMS-SR50L
NMS-SN50L



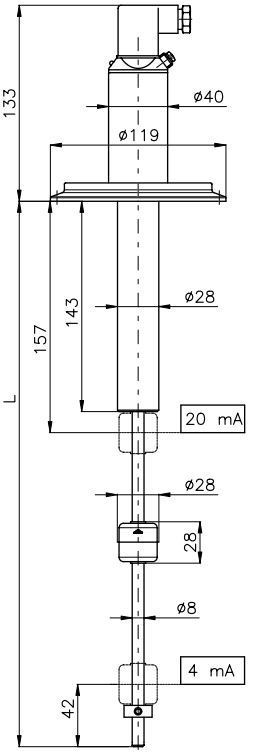
NMS-MR50L
NMS-MN50L



NMS-MT500

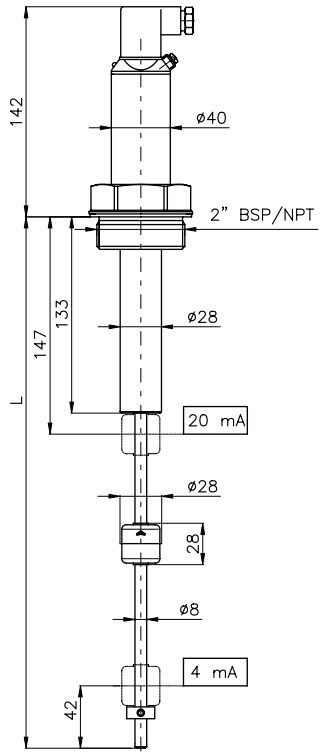


NMS-MT1H0

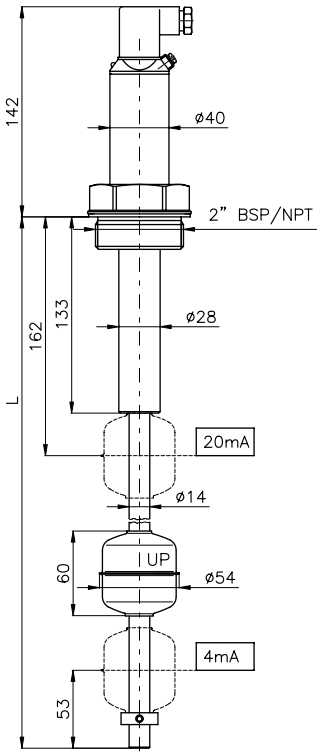


Inactive Zones (continued)

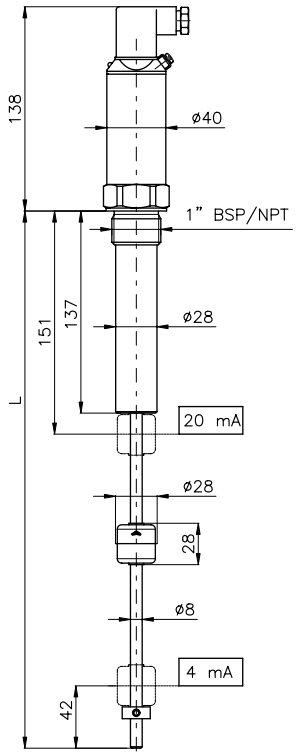
NMS-MR500
NMS-MN500



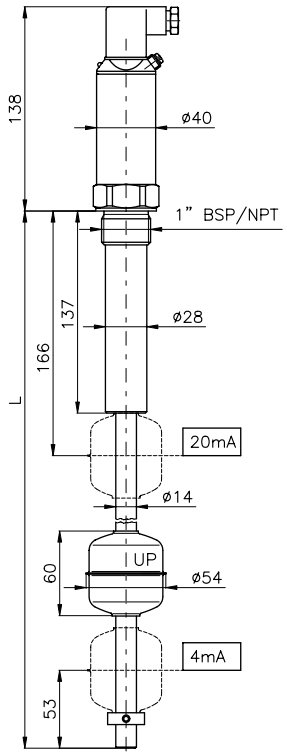
NMS-SR500
NMS-SN500



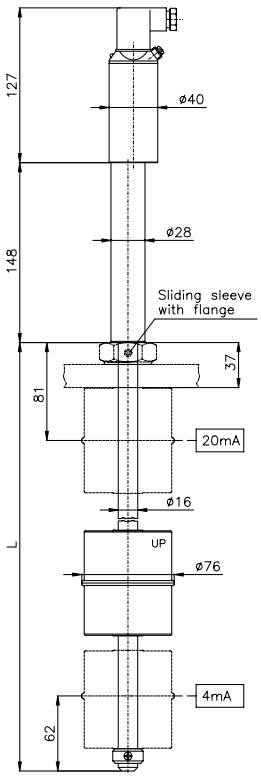
NMS-MR250
NMS-MN250



NMS-SR250
NMS-SN250



NMS-K



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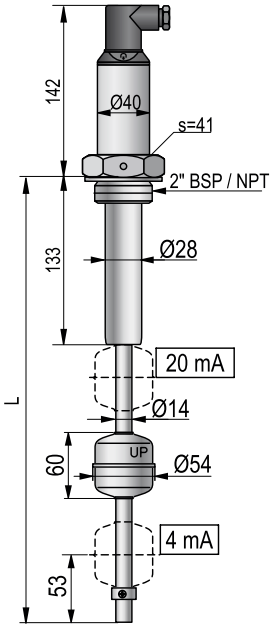
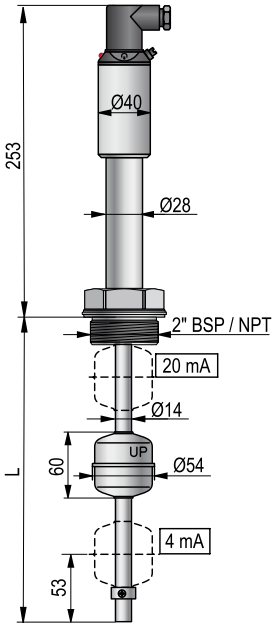
Dimensions [mm]

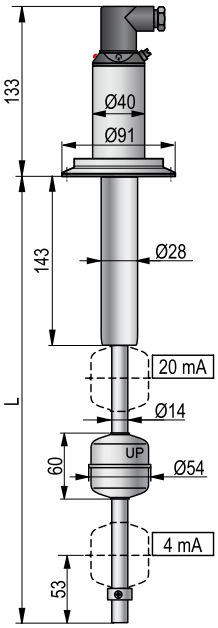
NMS-SR500 with DIN connector/ NMS-SN500 with DIN connector



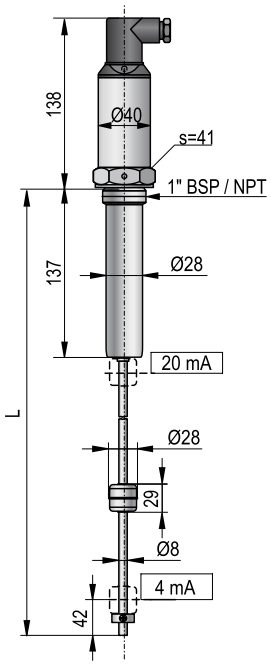
NMS-SR50L with DIN connector/ NMS-SN50L with DIN connector



NMS-ST800 with DIN connector

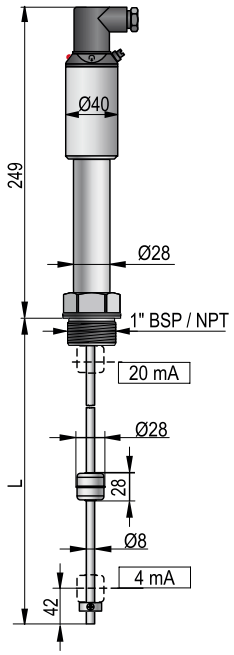


NMS-MR250 with DIN connector/ NMS-MN250 with DIN connector

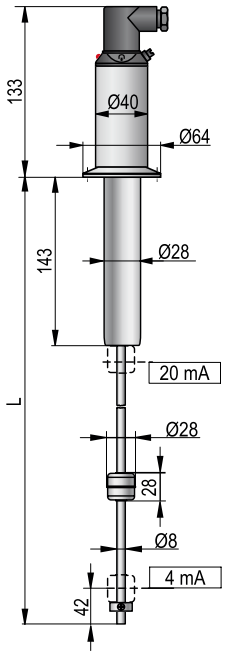


Dimensions [mm] (continued)

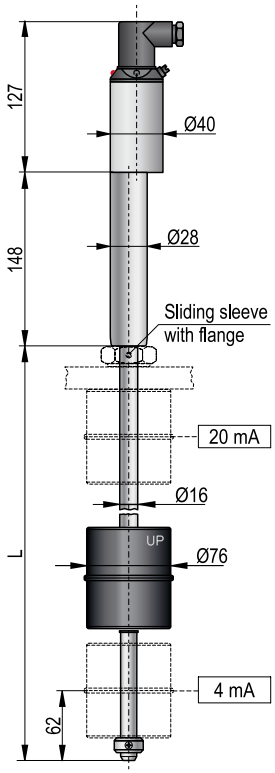
NMS-MR25L with DIN connector/
NMS-MN25L with DIN connector



NMS-MT500 with DIN connector

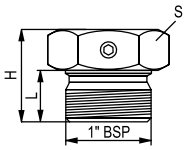


NMS-K000U with DIN connector

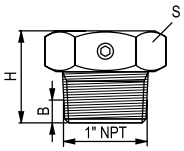


Acessories

ZUB-NMB/S-CER25



ZUB-NMB/S-CEN25



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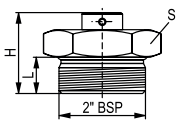
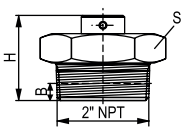


ZUB-NMB/S-CEN50



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