



Magnetostrictive Level Transmitters

Compact Line



measuring
•
monitoring
•
analysing

NMS



- Measuring length: 300 - 3000 mm
- Accuracy: ± 1 mm
- p_{\max} : 25 bar; t_{\max} : $+90^{\circ}\text{C}$
- 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

KOBOLD companies worldwide:

AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA, CZECHIA, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, SPAIN, SWITZERLAND, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com



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/dm³ 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 x 87 mm cylindrical / PVDF or PP
Medium density	Ø54 mm float min. 0.8 g/cm ³ ; Ø54 mm titanium float min. 0.55 g/cm ³ Ø95 mm float min. 0.55 g/cm ³ Ø124 mm or Ø95 mm titanium float min. 0.4 g/cm ³		
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".



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 °C ... +50 °C)
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, accuracy 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.



Magnetostrictive Level Transmitters Model NMS

Order Details NMS (Example: NMS-SR250E05MS)

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"	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)
		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		
		T400¹⁾ = 1½" TriClamp		
		T40L¹⁾ = 1½" TriClamp, low connection		
		T500¹⁾ = 2" TriClamp		
		T50L¹⁾ = 2" TriClamp, low connection		
		T650 = 2½" TriClamp		
T65L = 2½" TriClamp, low connection				
T800 = 3" TriClamp				
T1H0 = 4" TriClamp				
000U²⁾ = w/o (for sliding sleeve)				

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/dm ³ 3 = Ø53.5 mm titanium float, min. 0.55 kg/dm ³ 4 = Ø50x100 mm titanium ball float, min. 0.45 kg/dm ³ 6 = Ø53.5 mm st. st. 1.4404, min. 0.8 kg/dm ³ 0³⁾ = no float (only for assembly with NBK, includes 2 x mounting brackets)
	For NMS-K 5 = Ø76x87 mm PP float, min. 0.40 kg/dm ³

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

Type	for NMS-S				for NMS-M	for NMS-K		
	Standard	Code "2"	Code "3" ¹⁾	Code "6" ¹⁾	Code "4" ¹⁾	Standard	Standard	Code "5"
Dimensions								
Medium Density (min.)	0.55 kg/dm ³	0.4 kg/dm ³	0.55 kg/dm ³	0.8 kg/dm ³	0.45 kg/dm ³	0.8 kg/dm ³	0.7 kg/dm ³	0.4 kg/dm ³
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.

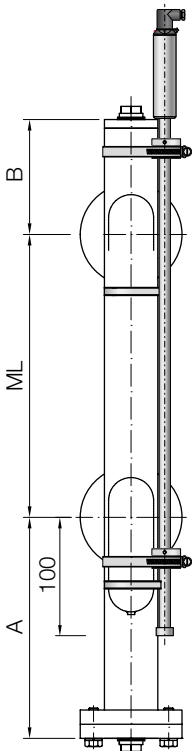


Accessories NMS (Example: ZUB-NMB/S CER25)

Model	Connection/ Material/ Size
ZUB-NMB/S	<p>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</p> <p>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</p>

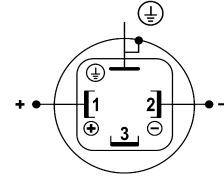
* sliding sleeve CPR25 must be ordered in addition

Sketch for mounting with NBK



Wiring

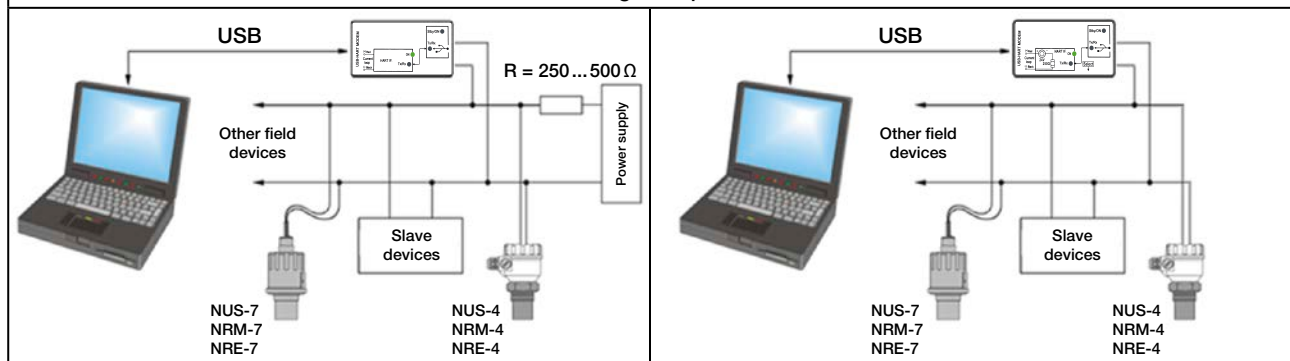
This transmitter is designed to operate on 12.5...36V_{DC} power only.
 The measured voltage on the terminals of the unit should be at least 12.5 V.
 Using transmitter with HART® a terminal resistance with a minimum value of 250 Ω should be applied.



Order Details HART® modem

Order no. HART® modem: HARTCOM-0	Order no. HART® modem: HARTCOM-1
with external 24 V _{DC} transmitter supply and 250 Ω resistor	Loop Powered 24 V _{DC} and 250 Ω integrated resistor

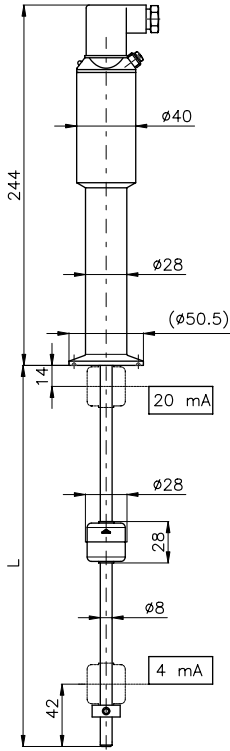
Wiring examples



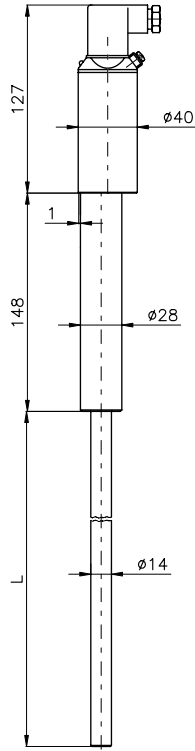
Download of configuration software NUS-NTB-NRM-SW at www.kobold.com

Inactive Zones

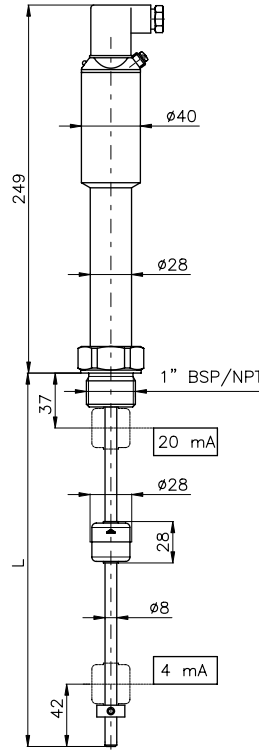
NMS-MT40L



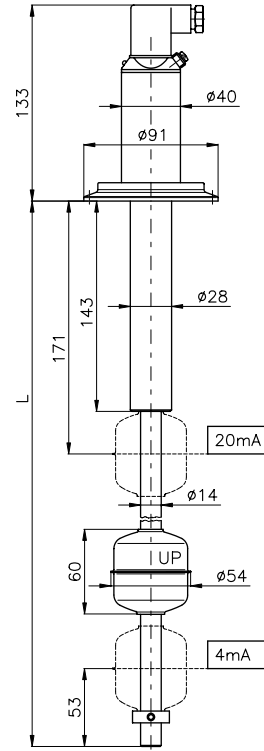
NMS-S000U



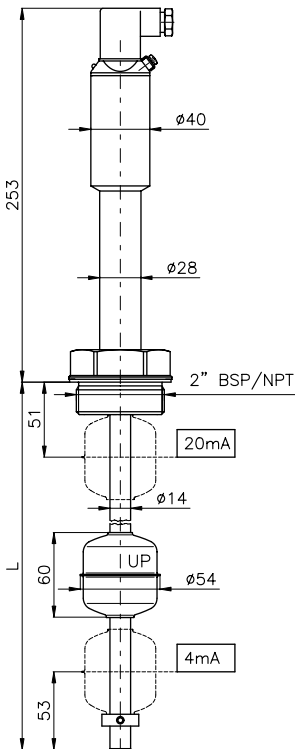
NMS-MR25L
NMS-MN25L



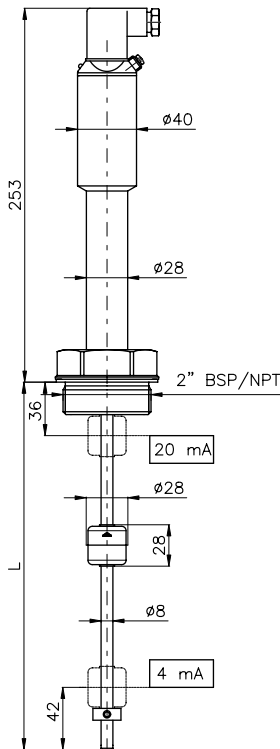
NMS-ST800



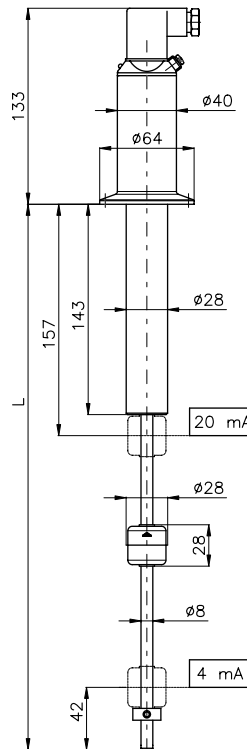
NMS-SR50L
NMS-SN50L



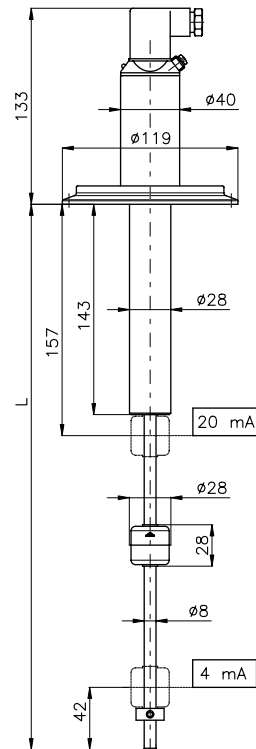
NMS-MR50L
NMS-MN50L



NMS-MT500



NMS-MT1H0

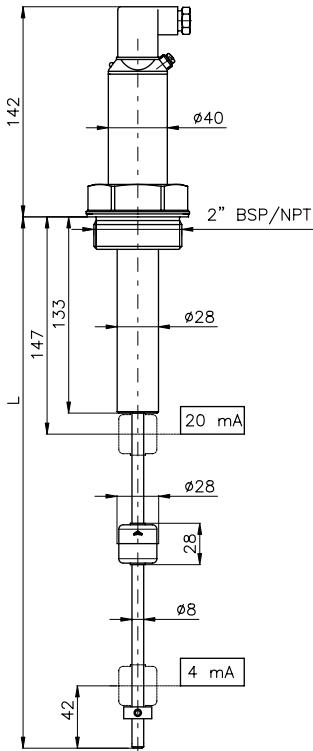




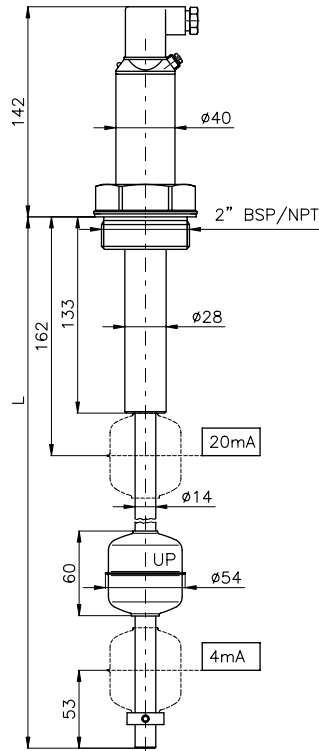
Magnetostrictive Level Transmitters Model NMS

Inactive Zones (continued)

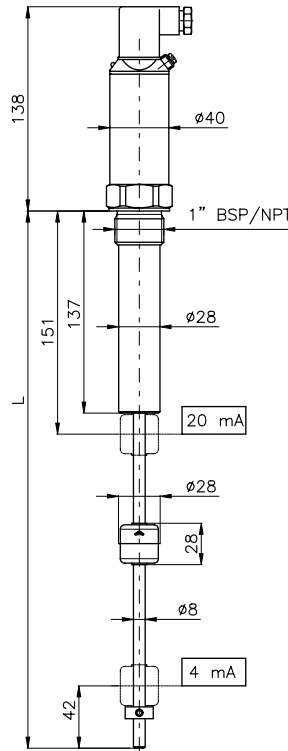
NMS-MR500
NMS-MN500



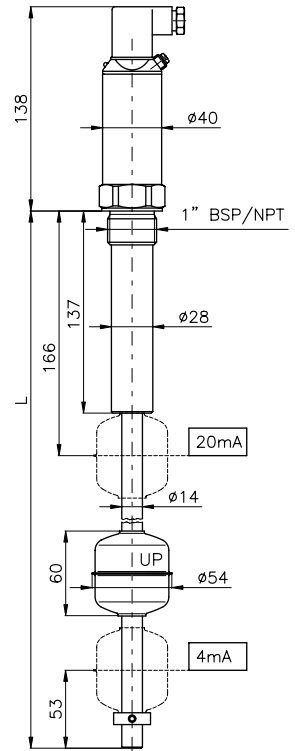
NMS-SR500
NMS-SN500



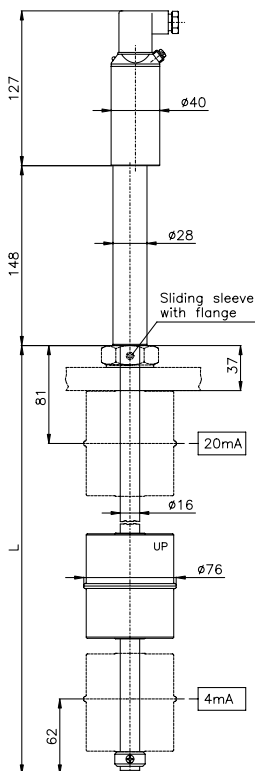
NMS-MR250
NMS-MN250



NMS-SR250
NMS-SN250

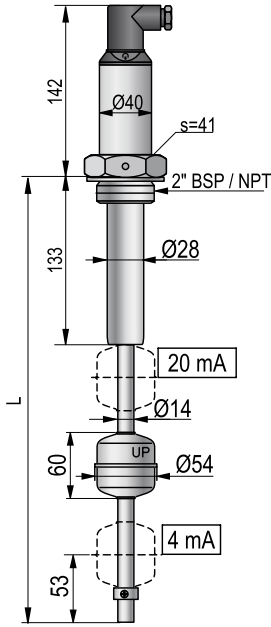


NMS-K

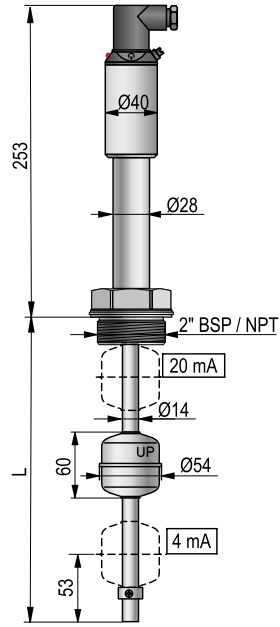


Dimensions [mm]

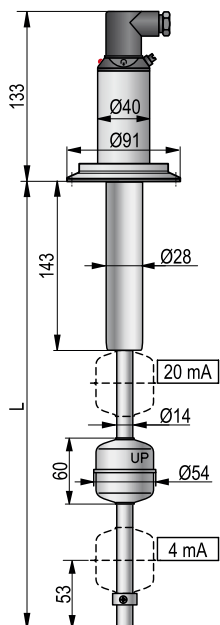
**NMS-SR500 with DIN connector/
NMS-SN500 with DIN connector**



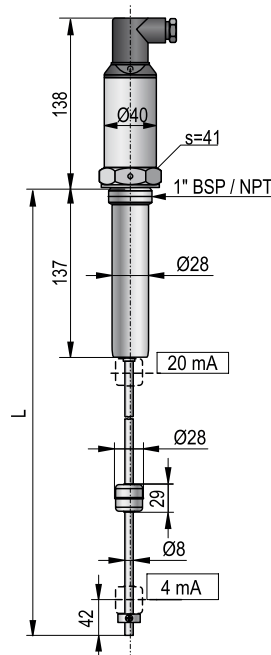
**NMS-SR50L with DIN connector/
NMS-SN50L with DIN connector**



NMS-ST800 with DIN connector

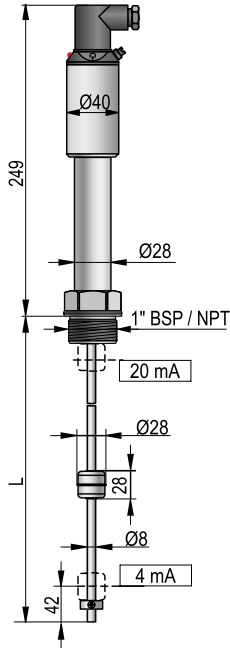


**NMS-MR250 with DIN connector/
NMS-MN250 with DIN connector**

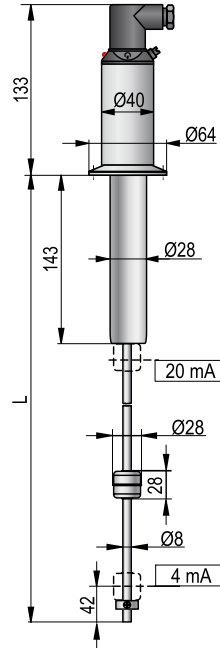


Dimensions [mm] (continued)

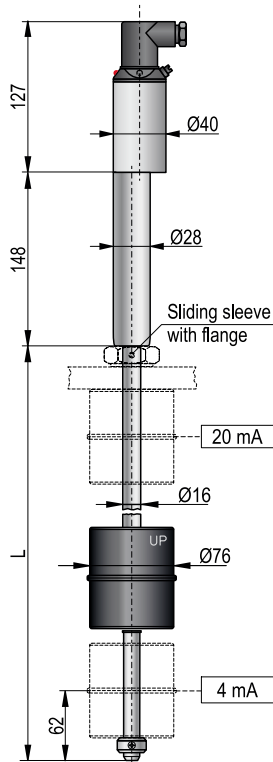
NMS-MR25L with DIN connector/
NMS-MN25L with DIN connector



NMS-MT500 with DIN connector

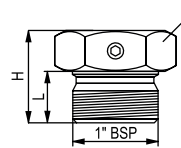


NMS-K000U with DIN connector

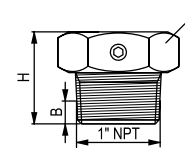


Accessories

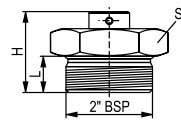
ZUB-NMB/S-CER25



ZUB-NMB/S-CEN25



ZUB-NMB/S-CER50



ZUB-NMB/S-CEN50

