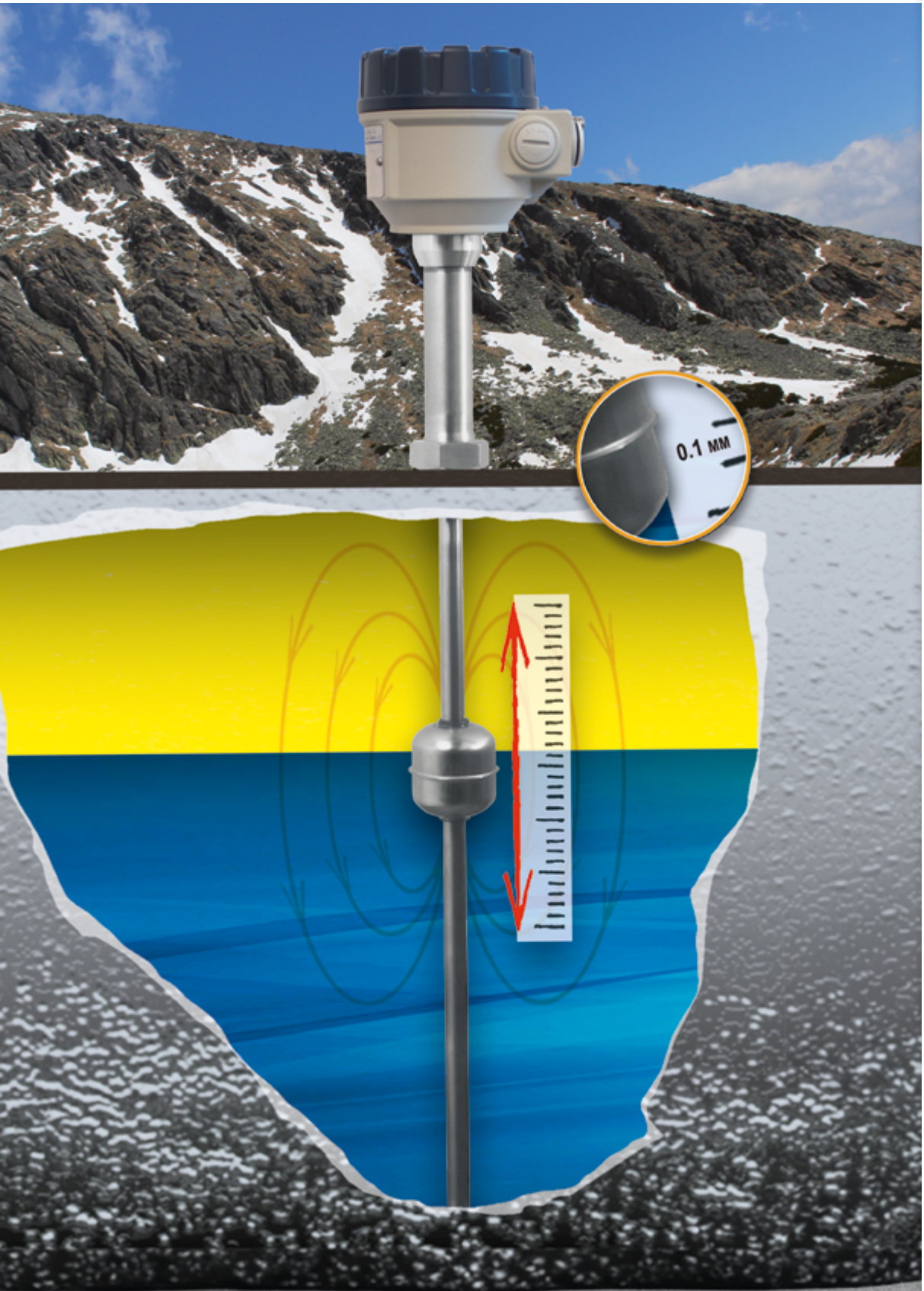
NIVOTRACK

MAGNETOSTRICTIVE COMPACT LEVEL TRANSMITTERS
FOR LIQUIDS



5 YEARS WARRANTY

NIVELCO

LEVEL TRANSMITTERS

NIVOTRACK magnetostrictive level transmitters are an ideal solution for accurate measurement of clean liquids. Their accuracy makes them an excellent choice for custody transfer measurement of liquids such as fuels, solvents and alcohol derivatives. Flexible tube units allow accurate measurements in tanks as high as 15 meters (50 ft). Plastic-coated models can be used with corrosive materials. Intelligent signal processing, communication software and a wide range of accessories make it easy to integrate the transmitter into a process control system.

FEATURES

- 0.1 mm (0.004") or 1 mm (0.04") resolution
- Insertion length up to 15 m (50 ft)
- Compact model
- Rigid or flexible guide tube
- Plastic-coated version for chemical environments
- 4…20 mA and HART® output
- PACTware™ compatible
- Graphic display
- 99-point linearization table
- Measurement optimization
- Volume measurement
- Interface measurement
- ATEX certified versions
- IP67 (IP68)
- 5 year warranty

APPLICATIONS

- Custody Transfer Measurement
- Oil, Gas and Chemical Industry *(ATG – Automatic Tank Gauge)*
- Fuels and gasoline products
- Pharmaceutical Industry
- Alcohol and Beverages, Food Industry
- Installation in bypass tubes possible
- Additional level transmitter for **NIVOFLIP** bypass level indicator

CERTIFICATES

- ATEX (Ex ia G)
- ATEX (Ex d G)
- ATEX (Ex d ia G)
- OIML R 85
- IEC Ex (Ex ia G)
- IEC Ex (Ex d G)
- IEC Ex (Ex d ia G)

MCA–500
mini version

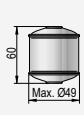
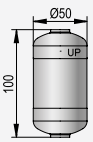
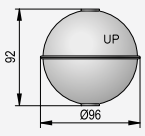
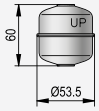
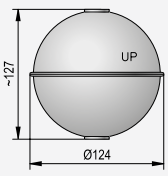
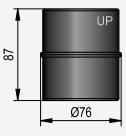
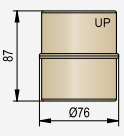
MTA–500
rigid probe

MG☐–500
plastic-coated version

SAP–300
graphic display

MTK–500
flexible probe version

FLOATS

	MBA–505–		MBK–530–2M –400–00	MBA–505–2M–		MBA–505– 2M–900–00	MGU–505– 2M–200-00	MGU–506– 1M–200-00	4w34bs– 16yyyyy[2]
	2X–0C7–10	2M–600-00[1]		800–00[1]	200–00[1]				
Dimensions									
Medium density (min.) [kg/dm³]	0.61	0.45	0.55	0.55	0.8	0.4	0.7	0.4	0.8
Material	Titanium		1.4435	Titanium	1.4404	1.4401	PVDF	PP	1.4404
Medium pressure	16 bar (1.6 MPa)			25 bar (2.5 MPa)			3 bar (0.3 MPa)		10 bar (1 MPa)

(1) Designed for min. 2" process connection

(2) Designed for min. 1" process connection, only order with mini version

TECHNICAL DATA

		Rigid probe	Flexible probe	Plastic-coated rigid probe	Mini version with rigid probe
Measured process value		Liquid level, distance, volume			
Nominal length (L)		0.5…4.5 m (1.5…14.5 ft)	2…15 m (6.5…50 ft)	0.5…3 m (1.5…10 ft)	0.5…1.5 m (1.5…4.5 ft)
Material of the tube		1.4571 (316Ti) stainless steel		PFA-coated stainless steel	1.4571 stainless steel
Highest process pressure [1]		25 bar (2.5 MPa, 363 psi)	16 bar (1.6 MPa, 232 psi)	3 bar (0.3 MPa, 43.5 psi)	10 bar (1 MPa, 145 psi)
Process temperature		−40…+90 °C (−40…+194 °F), see temperature diagram			
Standard float diameter / material [2]		Ø53.5 × 60 mm (Ø2 x 2.35") cylindrical / 1.4404 (316L)	Ø96 mm (Ø4") ball / 1.4435 (316L)	Ø76 × 87 mm (Ø3 x 3.45") cylindrical / PVDF / PP	Ø28 × 28 mm (Ø1 x 1.15") cylindrical 1.4404 (316L)
Medium density		See "Floats"			
Material of wetted parts		Titanium, Stainless Steel		PFA, PVDF, PP	Stainless Steel
Ambient temperature		−40…+70 °C (−40…+158 °F), plastic housing: −25…+70 °C (−13…+158 °F), with display: −25…+70 °C (−13…+158 °F), Ex version: see temperature diagram in the user's manual			
Output	Analog	4…20 mA (limit values: 3.9…20.5 mA)			
	Digital	HART® (lowest loop resistance: 250 Ω)			
	Display	Graphic display (SAP–300)			
Damping time		Adjustable 0…99 s			
Error indication		22 mA or 3.8 mA or holding			
Output load		$R_L = (U_s - 12.5\ V)/0.02\ A$, U_s = supply voltage			
Supply voltage		12.5…36 V DC			
Electrical protection		Class III			
Ingress protection		IP67, IP68 for M□□–5/7□□–9 types (IP68 specification: 4 m water column for 4 hours)			
Process connection		As per order code			
Electric connection		2× M20×1.5 plastic cable glands for Ø6…Ø12 mm (Ø0.23…0.47") cable, + 2× internally threaded ½" NPT connection for protective pipes for 0.5…1.5 mm² (AWG20…15) wire cross section, IP68 protection: up to 20 m (65 ft), LiY-CY 6× 0.5 mm (0.24 × 0.02"), fitted with 500 V cable			
Housing		Plastic (PBT) or painted aluminum or stainless steel			
Weight		1.7 kg (3.75 lb) + m. probe: 0.6 kg/m (0.4 lb/ft)	2.9 kg (6.4 lb) + m. probe: 0.3 kg/m (0.2 lb/ft) + counterweight 3.5 kg (7.7 lb)	1.7 kg (3.75 lb) + m. probe: 0.7 kg/m (0.45 lb/ft)	1.7 kg (3.75 lb) + m. probe: 0.6 kg/m (0.4 lb/ft)

[1] Depends on selected float, with sliding sleeve connection the highest process pressure is 3 bar (0.3 MPa)

[2] Requested float version must be specified in the order

MEASUREMENT DATA

	M□□–□□□–2/4/6/8	M□□–□□□–1/3/5/7, M□□–□□□–A/B/C/D
Resolution [3]	1 mm (0.04")	0.1 mm (0.004")
Nonlinearity [3] [4] (up to 10 m [32.8 ft] order length)	±2 mm (±0.08") or ±0.02% F.S. whichever is greater	±1 mm (0.04") or ±0.01% F.S. whichever is greater
Nonlinearity [3] [4] (above 10 m [32.8 ft] order length)	±3 mm (±0.12") or ±0.02% F.S. whichever is greater	
Hysteresis [5]	±1 mm (±0.04")	±0.25 mm (±0.01") (up to 10 m [32.8 ft] length)
		±1 mm (±0.04") (above 10 m [32.8 ft] length)
Zero span (in LEVEL mode)	Anywhere within the active range	
Measuring Range (reducing)	Minimum distance: 200 mm (7.87"); maximum distance: as per probe length	
Temperature error	0.04 mm / 10 °C (0.0015" / 50 °F) between (−25…+50 °C [−13…+122 °F])	
Current Output Properties	Resolution: 2 µA, accuracy: 10 µA, temperature error: 200 ppm/ °C	

[3] For displayed and HART® transmitted values

[4] Under reference conditions

[5] In case of a different factory setting the accuracy data is not valid!

Ex INFORMATION

	M□□–5/7□□–9 Ex [6]	M□□–5/7□□– –5 Ex, 6 Ex, 7 Ex, 8 Ex	M□□–5/7□□– –C Ex, D Ex	M□□–5/7□□– –A Ex, B Ex
Ex marking (ATEX)	⟨Ex⟩ II 1 G Ex ia IIB T6…T5 Ga		⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T5 Ga/Gb	⟨Ex⟩ II 2 G Ex d IIB T6…T5 Gb
Ex marking (IECEx)	Ex ia IIB T6…T5 Ga		Ex db ia IIB T6 Ga/Gb	Ex db IIB T6…T5 Gb
Nominal length (L)	0.5…15 m (1.64…49 ft)		0.5…10 m (1.64…32.8 ft)	
Cable entry	–	M20×1.5 cable gland	Metal M20×1.5 cable gland Ex d certification	
Cable outer diameter	–	Ø7…Ø13 mm (Ø0.27…Ø0.5")	Ø9…Ø11 mm (Ø0.35…Ø0.43")	
Stock cable	max. 20 m; LiY-CY 6× 0.5 mm; 500 V C < 9 nF; L < 10 µH	–		
Ex supply voltage, Intrinsically safety data	U_i = 30 V I_i = 140 mA P_i = 1 W	U_i = 30 V I_i = 140 mA P_i = 1 W C_i < 15 nF L_i < 200 µH		U_S: 12.5…36 V DC I_i = 140 mA
	ATEX: C_i < 25 nF, L_i < 210 µH			
	IECEx: C_i < 15 nF, L_i < 200 µH			

[6] Caution! The M□□–5□□–9 Ex is rated IP68. The cover, the cable gland, the cable, and the cover plug are glued in place and cannot be opened!

TEMPERATURE PARAMETERS

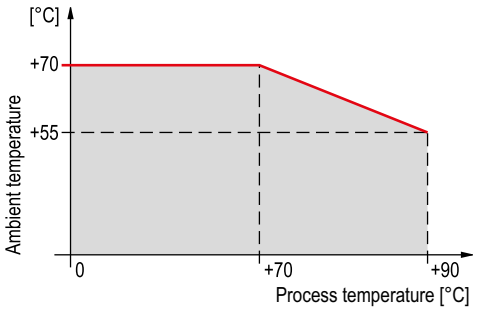
Temperature limits for Ex version

Type	Max. process temperature	Temperature class	Max. ambient temperature
Rigid probe M□A, M□C, M□D, M□G	+80 °C (+176 °F)	T6	+70 °C (+158 °F)
Rigid probe with plastic coating MEU, MGU			
Flexible probe M□K, M□N	+70 °C (+158 °F)		
Rigid probe M□A, M□C, M□D, M□G	+90 °C (+194 °F)	T5	+55 °C (+131 °F)
Rigid probe with plastic coating MEU, MGU			

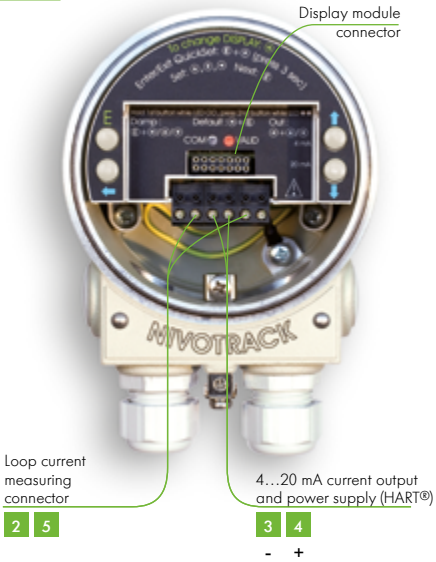
LOWER TEMPERATURE LIMIT

Type	Ex protection type		
	ia	d	d ia
Transmitter MT□, ME□	–40 °C (–40 °F)		
Transmitter with display MB□, MG□, MC□, MM□	–25 °C (–13 °F)		

TEMPERATURE DIAGRAM

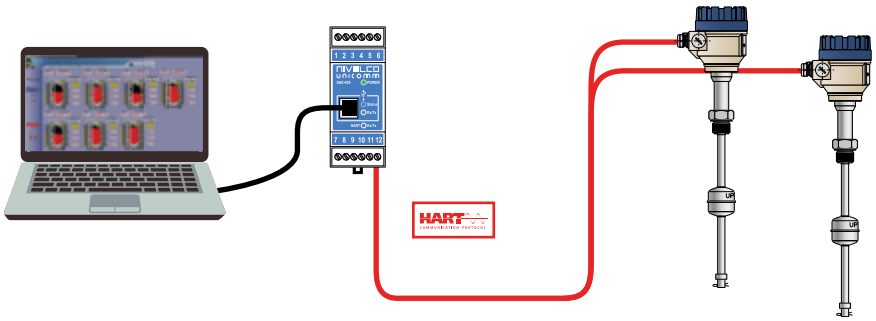


WIRING



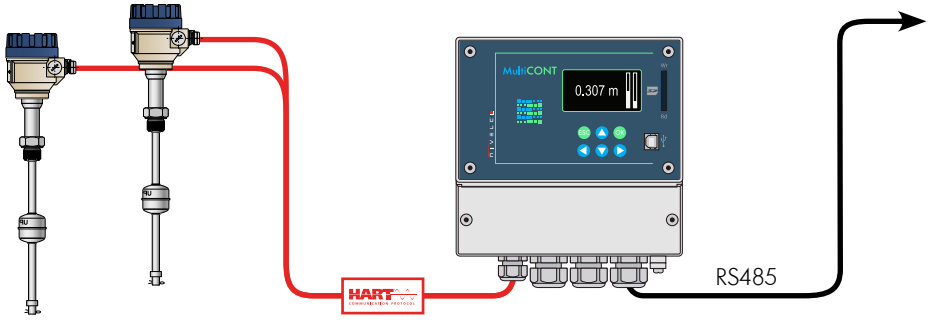
NIVOTRACK TRANSMITTER CONNECTED TO PC

HART® output devices and a **UNICOMM SAK–305** HART®–USB modem can be wired to a PC, while a **UNICOMM SAT–504** HART®–USB/Bluetooth® modem can be used to connect transmitters via Bluetooth®. All measured values can be visualized on the PC screen and the instruments can be programmed remotely via HART® modem. Up to 15 *(non-hazardous)* instruments can be connected to a single HART® loop. Applicable Software: **EView2** configuration software or **NIVISION** process visualization software.



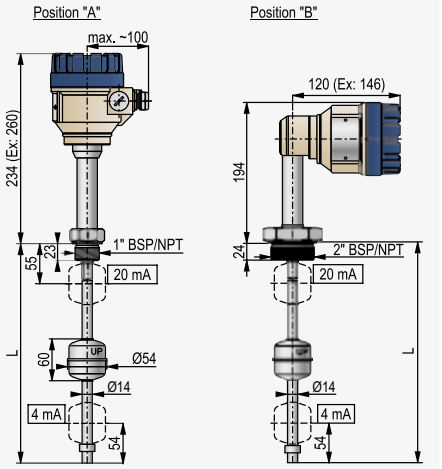
NIVOTRACK TRANSMITTER IN HART® MULTIDROP LOOP

The **MultiCONT** can process digital data from NIVELCO HART®-capable transmitters *(e.g. level, temperature, pressure, pH, dissolved oxygen, etc.)*. The digital *(HART®)* information is processed, displayed and, if necessary, transmitted to a PC via an RS485 communication line. Remote programming of the transmitters is also possible. Visualization on a PC can be accomplished with **NIVISION** process visualization software.

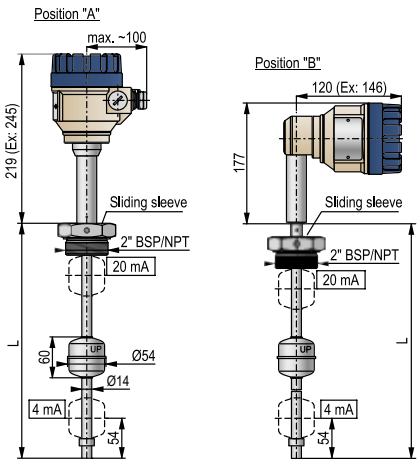


DIMENSIONS

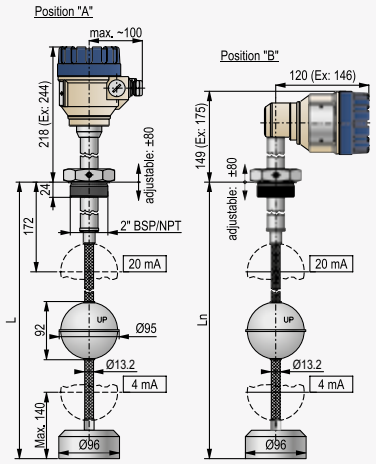
Rigid probe with threaded process connection [MTA / MTD / MTC / MTG]



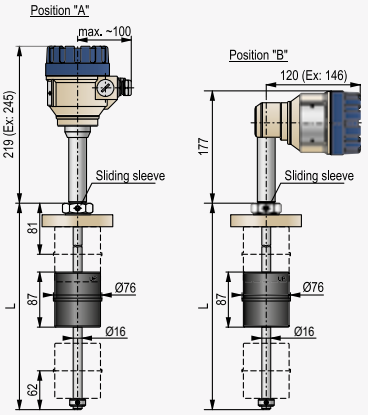
Rigid probe without process connection [MTU]



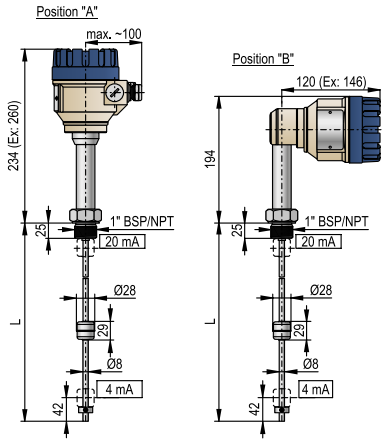
Flexible probe with sliding sleeveand counterweight [MTK / MTN]



Rigid probe with plastic coating without process connection [MEU]

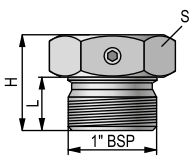


Mini type rigid probe transmitter with threaded process connection [MMA / MMD]

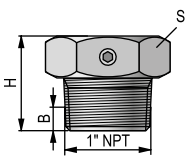


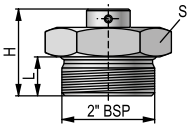
SLIDING SLEEVE

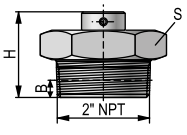
	Material	Process connection	Dimensions			
			S	H	L	B
MBH–105–2M–300–00	1.4571 (316Ti)	1" BSP	41 mm (1.61")	36 mm (1.42")	20 mm (0.79")	–
MBK–105–2M–300–00		2" BSP	60 mm (2.36")	55 mm (2.17")	24 mm (0.94")	–
MBL–105–2M–300–00		1" NPT	41 mm (1.61")	37 mm (1.46")	–	10 mm (0.39")
MBN–105–2M–300–00		2" NPT	60 mm (2.36")	44.5 mm (1.75")	–	11 mm (0.43")
MGH–105–2M–300–00	PVDF	1" BSP	46 mm (1.81")	42 mm (1.65")	22 mm (0.87")	–
MGL–105–2M–300–00		1" NPT			25 mm (0.98")	–



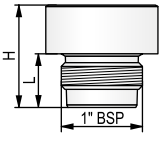
MBH / MBL–105–2M–300–000

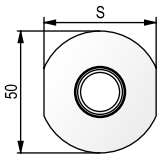






MBK / MBN–105–2M–300–000





MGH–105–2M–300-000

ORDER CODES *(NOT ALL COMBINATIONS ARE AVAILABLE)*

NIVOTRACK – Magnetostrictive Compact Level Transmitters

NIVOTRACK M■■–■■■–■ [1]

Version	Code
Transmitter	T
Transmitter + display	B
Transmitter with plastic coated probe[2]	E
Transmitter + display with plastic coated probe[2]	G
Transmitter mini version[3]	M
Transmitter mini version + display[3]	C

Housing	Code
Painted aluminum	5
Plastic, PBT, fiberglass-reinforced[8]	6
Stainless steel	7
Painted aluminum, "B" head position[9]	E
Plastic, PBT, fiberglass-reinforced[8], "B" head position	F
Stainless steel, "B" head position[9]	G

Probe type / Process connection		Code
Rigid probe[4]	1" BSP	A
	2" BSP	C
	1" NPT	D
	2" NPT	G
	2½" TriClamp	O
	3" TriClamp	P
	4" TriClamp	R
	Without process connection[5]	U
Rigid probe for NIVOFLIP[6]	Without float (up to +90 °C [+194 °F])	L
	Without float (up to +200 °C [+392 °F])	T
Flexible probe[7]	2" BSP	K
	2" NPT	N

Code	Probe length		Code
0	0 m	0 m	0
1	10 m	1 m	1
2	20 m	2 m	2
…	…	…	…
9 m	9	9 m	9
A	10 m		
B	11 m		
C	12 m		
D	13 m		
E	14 m		
F	15 m		

Output / Resolution / Ex [10]		Code
4...20 mA	0.1 mm (0.004")	1
	1 mm (0.04")	2
	0.1 mm (0.004") / Ex ia G	5
	1 mm (0.04") / Ex ia G	6
	0.1 mm (0.004") / Ex d G[11]	A
	0.1 mm (0.004") / Ex d ia G[11]	C
4...20 mA + HART®	0.1 mm (0.004")	3
	1 mm (0.04")	4
	0.1 mm (0.004") / Ex ia G	7
	1 mm (0.04") / Ex ia G	8
	0.1 mm (0.004") / Ex d G[11]	B
	0.1 mm (0.004") / Ex d ia G[11]	D

[1] The order code of an Ex version should end with "Ex". [2] Insertion length up to 3 m (10 ft). [3] Insertion length up to 1.5 m (5 ft). [4] Insertion length up to 4.5 m (14.5 ft). [5] Order threaded sliding sleeve separately. [6] Probe length (up to 5.8 m [19 ft,]) = center to center of NIVOFLIP +300 mm (+11.8") depending on float version and pressure rating. [7] Insertion length up to 15 m (50 ft). [8] Ex version not available. [9] Ex versions are available on request. [10] For custody transfer only models with HART® output, 0.1 mm (0.004") resolution, local display unit can be ordered, with up to 10 m (33 ft) probe length. [11] Probe length up to 10 m (33 ft).

ACCESSORIES

Plug-in graphical display module	SAP–300–0
HART®–USB modem for remote programming with PC	UNICOMM SAT–304–0
HART®–USB/RS485 modem for remote programming with PC, DIN rail mountable	UNICOMM SAK–305–☐
HART®–USB/Bluetooth® modem for remote programming	UNICOMM SAT–504–☐
Multichannel process controller and display unit	MultiCONT PRW–2☐☐–☐
24 V DC power supply, DIN rail mountable	NIPOWER PPK–431–☐
Intrinsically safe isolator module, DIN rail mountable	UNICONT PGK–301–☐ Ex
EView2 configuration software for remote programming with PC	FREE download

Use the NIVELCO Selector to configure your NIVOTRACK to best suit your application.

PROCESS CONNECTIONS[12]

DIN and ANSI flanges (MFT–☐☐☐–☐)

Sliding sleeve 1.4571 (316Ti) or PVDF: 1", 2" BSP/ NPT process connections

EPDM FFKM seals

[12] The above process connections and special seals are ordered separately and must be specified in the text part of the order.

MFT–601

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