

NIVOTRACK magnetostrictive level transmitters are an ideal solution for high-accuracy measurement of clean fluids. Their level of precision makes them an excellent choice for the custody transfer measurement of liquids such as fuels, solvents, and alcohol derivatives. Flexible tube units make accurate measurements possible in tanks as high as 15 meters. Models with plastic coating can be used with aggressive materials. Integrating the transmitter into a process control system is easy due to the intelligent signal processing and communication software and the wide range of accessories offered.

FEATURES

- 0.1 mm or 1 mm resolution
- Insertion length up to 15 m
- Compact model
- Rigid or flexible guide tube
- Plastic-coated version for chemicals
- 4...20 mA and HART® output
- Graphic display
- 99 point linearization table
- Measurement optimization
- Volume measurement
- ATEX certified variants
- IP67 (IP68)
- 5 years warranty

APPLICATIONS

- Custody transfer measurement
- Oil, gas and chemical industry
(ATG – Automatic Tanking Gauge)
- Fuels and gasoline products
- Pharmaceutical industry
- Alcohols and beverages, food industry
- Installation in bypass tubes possible
- Supplementary level transmitter for NIVOFLIP magnetic flip 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-505-2M-600-00 ⁽¹⁾	MBA-505-2M-800-00 ⁽¹⁾	MBA-505-2M-200-00 ⁽¹⁾	MBK-530-2M-400-00	MBA-505-2M-900-00	MGU-505-2M-200-00	MGU-506-1M-200-00	4w34bs-16yyyyy ⁽²⁾
Dimensions								
Medium density (min.)	0.45 kg/dm ³	0.55 kg/dm ³	0.8 kg/dm ³	0.55 kg/dm ³	0.4 kg/dm ³	0.7 kg/dm ³	0.4 kg/dm ³	0.8 kg/dm ³
Material	Titanium		1.4404	1.4435	1.4401	PVDF	PP	1.4404
Medium pressure	25 bar (2.5 MPa)					6 bar (0.6 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	2...15 m	0.5...3 m	0.5...1.5 m
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)	16 bar (1.6 MPa)	3 bar (0.3 MPa)	10 bar (1 MPa)
Medium temperature		-40...+90 °C, see temperature diagram			
Standard float diameter / material ⁽²⁾		Ø53.5 × 60 mm cylindrical / 1.4404 (316L)	Ø96 mm ball / 1.4435 (316L)	Ø76 × 87 mm cylindrical / PVDF / PP	Ø28 × 28 mm cylindrical 1.4404 (316L)
Medium density		See "Floats"			
Material of wetted parts		Stainless steel: 1.4571, 1.4404 (316Ti, 316 L)		PFA, PVDF, PP	Stainless steel: 1.4571, 1.4404
Ambient temperature		-40...+70 °C, plastic housing: -25...+70 °C, with display: -25...+70 °C, Ex variant: 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		$R_L = (U_i - 12.5 \text{ V})/0.02 \text{ A}$, $U_i =$ power supply voltage			
Power supply		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 Ø7...Ø13 mm cable + Two internally threaded ½" NPT connection for protective pipes for 0.5...1.5 mm ² wire cross section, IP68 protection: up to 20 m, LiY-CY 6×0.5 mm, fitted with 500 V cable			
Housing		Plastic (PBT) or powder-coated aluminum or stainless steel			
Weight		1.7 kg + m. probe: 0.6 kg/m	2.9 kg + m. probe: 0.3 kg/m + counterweight 3.5 kg	1.7 kg + m. probe: 0.7 kg/m	1.7 kg + m. probe: 0.6 kg/m

⁽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	0.1 mm
Nonlinearity ^{(3) (4)} (up to 10 m order length)	±2 mm or ± 0.02% F.S. whichever is greater	±1 mm or ±0.01% F.S. whichever is greater
Nonlinearity ^{(3) (4)} (above 10 m order length)	± 3 mm or ± 0.02% F.S. whichever is greater	
Hysteresis ⁽⁵⁾	±1 mm	±0.25 mm (up to 10 m length)
		±1 mm (above 10 m length)
Zero span (in LEVEL mode)	Anywhere within the active range	
Measuring Range (reducing)	Minimum distance: 200 mm; maximum distance: as per probe length	
Temperature error	0.04 mm / 10 °C between (-25...+50 °C)	
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□□-9Ex ⁽⁶⁾	M□□-5/7□□-5Ex, 6Ex, 7Ex, 8Ex	M□□-5/7□□-CEx, DEx	M□□-5/7□□-AEx, BEx
Ex marking (ATEX)	⊕ II 1 G Ex ia IIB T6...T5 Ga		⊕ II 1/2 G Ex d ia IIB T6...T5 Ga/Gb	⊕ II 2 G Ex d IIB T6...T5 Gb
Ex marking (IECEx)	Ex ia IIB T6...T5 Ga		Ex db ia IIB T6...T5 Ga/Gb	Ex db IIB T6...T5 Gb
Nominal length (L)	0.5...15 m		0.5...10 m	
Cable entry	-	M20×1.5 cable gland	Metal M20×1.5 cable gland Ex d certification	
Cable outer diameter	-	Ø7...Ø13 mm	Ø9...Ø11 mm	
Stock cable	max. 20 m; LiY-CY 6x0.5 mm; 500 V C < 9 nF; L < 10 µH		-	
Ex power supply, Intrinsically safety data	$U_i = 30 \text{ V}$ $I_i = 140 \text{ mA}$ $P_i = 1 \text{ W}$ $C_i < 25 \text{ nF}$ $L_i < 210 \text{ µH}$		$U_i = 30 \text{ V}$ $I_i = 140 \text{ mA}$ $P_i = 1 \text{ W}$ $C_i < 15 \text{ nF}$ $L_i < 200 \text{ µH}$	
			$U_i: 12.5...36 \text{ V DC}$ $I_i = 140 \text{ mA}$	

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

NIVOTRACK M-500/M-600 with rigid probe **5 years**

2-wire compact magnetostrictive level transmitter for liquids with stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M	□ □ - □ □ □ - □ □
T	Transmitter
B	Transmitter with local LCD display

Process connection

M	□ □ - □ □ □ - □ □
A	1" BSP
C	2" BSP
D	1" NPT
G	2" NPT
O	2½" TriClamp
P	3" TriClamp
R	4" TriClamp
U	Without process connection for sliding sleeve
L	* Without float, for NIVOFLIP (max. 5.8 m, max. +90 °C)
T	* Without float, for NIVOFLIP (max. 5.8 m, max. +200 °C)

* Probe length = center to center of NIVOFLIP + 300 mm or 400 mm as per float version and pressure rating

Housing

M	□ □ - □ □ □ □ - □ □
5	Aluminum (powder-coated)
6	Plastic, PBT, fiberglass-reinforced(Ex version not available)
7	Stainless steel

Probe length**

M	□ □ □ - □ □ □ □ □ - □ □
nn	0,5...1 m
oo	1,1...3 m; sold by the 100 mm

nn = 05...10 : 0,5...1 m
oo = 11...30 : 1,1...3 m, ** 3...4,5 m as per special offer

Output / Resolution / Certificates / El. connection

M	□ □ □ - □ □ □ □ □ - □ □
1	4...20 mA / 0,1 mm
2	4...20 mA / 1 mm
3	4...20 mA + HART® / 0,1 mm
4	4...20 mA + HART® / 1 mm
5	4...20 mA / 0,1 mm / Ex ia G
6	4...20 mA / 1 mm / Ex ia G
7	4...20 mA + HART® / 0,1 mm / Ex ia G
8	4...20 mA + HART® / 1 mm / Ex ia G
A	4...20 mA / 0,1 mm / Ex d G
B	4...20 mA + HART® / 0,1 mm / Ex d G
C	4...20 mA / 0,1 mm / Ex d ia G
D	4...20 mA + HART® / 0,1 mm / Ex d ia G
E	4...20 mA + HART® / 0,1 mm / I, Zone1, AEx db / NPT ½" (dual compartment)

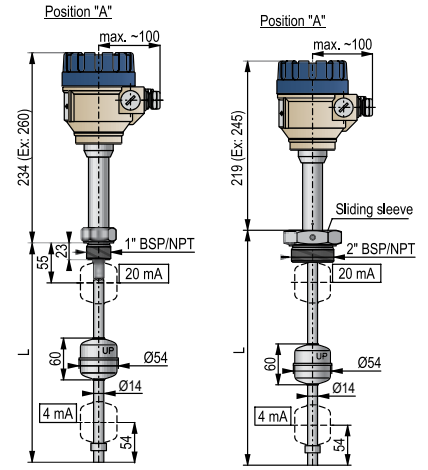
For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length.
Need of IEC Ex is to be specified in the text part of the order.

Available on request (must be specified in the text of the order)

- Ø96 mm stainless steel (1.4404) ball float (for min. 0.55 kg/dm³ liquids)
- Ø124 mm stainless steel (1.4401) ball float (for min. 0.4 kg/dm³ liquids)
- Ø53.5 mm titanium float (for min. 0.55 kg/dm³ liquids)
- Ø50x100 mm titanium float (min. 0.45 kg/dm³)
- Side viewed "B" head position model

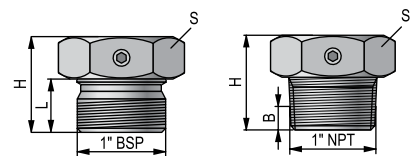
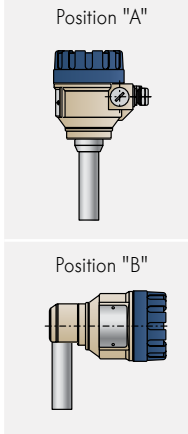
Accessories sold separately; see relevant page for details

MBH-105-2M-300-00	Sliding sleeve, 1.4571, 1" BSP
MBK-105-2M-300-00	Sliding sleeve, 1.4571, 2" BSP
MBL-105-2M-300-00	Sliding sleeve, 1.4571, 1" NPT
MBN-105-2M-300-00	Sliding sleeve, 1.4571, 2" NPT
S A P - 3 0 0 - 0	Graphic plug-in display module
S A T - 3 0 4 - 0	HART®-USB modem
S A T - 5 0 4 - □	HART®-USB/Bluetooth® modem
S A K - 3 0 5 - 2	HART®-USB/RS485 modem
S A K - 3 0 5 - 6	HART®-USB/RS485 modem / [Ex ia G]

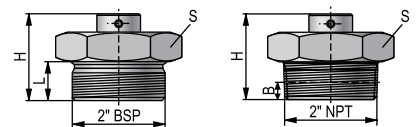


MTA / MTD-500 / 600 MTU-500 / 600

Housing position



MBH / MBL-105-2M-300-00



MBK / MBN-105-2M-300-00

Type	Material	Proc. conn.	Dimensions			
			S (mm)	H (mm)	L (mm)	B (mm)
MBH-105-2M-300-00	1.4571	1" BSP	41	36	20	-
MBK-105-2M-300-00	1.4571	2" BSP	60	55	24	-
MBL-105-2M-300-00	1.4571	1" NPT	41	37	-	10
MBN-105-2M-300-00	1.4571	2" NPT	60	44.5	-	11

NIVOTRACK M-500/M-600 with plastic-coated rigid probe **5 years**

2-wire compact magnetostrictive level transmitter for liquids with plastic-coated stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M	U	-	-	-	-	-	-
E	Transmitter						
G	Transmitter with local LCD display						

Process connection

M	U	-	-	-	-	-
U	Without process connection for sliding sleeve					

Housing

M	U	-	-	-	-	-
5	Aluminium (powder-coated)					
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)					
7	Stainless steel					

Probe length

M	U	-	-	-	-	-
nn	0,5...1 m					
oo	1.1...3 m; sold by the 100 mm					
nn = 05...10 : 0,5...1 m						
oo = 11...30 : 1,1...3 m						

Output / Resolution / Certificates

M	U	-	-	-	-	-
1	4...20 mA / 0,1 mm					
2	4...20 mA / 1 mm					
3	4...20 mA + HART® / 0,1 mm					
4	4...20 mA + HART® / 1 mm					
5	4...20 mA / 0,1 mm / Ex ia G					
6	4...20 mA / 1 mm / Ex ia G					
7	4...20 mA + HART® / 0,1 mm / Ex ia G					
8	4...20 mA + HART® / 1 mm / Ex ia G					
A	4...20 mA / 0,1 mm / Ex d G					
B	4...20 mA + HART® / 0,1 mm / Ex d G					
C	4...20 mA / 0,1 mm / Ex d ia G					
D	4...20 mA + HART® / 0,1 mm / Ex d ia G					

For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length.

Need of IEC Ex is to be specified in the text part of the order.

The material of the float (PVDF or PP) must be specified in text of the order. The standard float material is PVDF.

Available on request (must be specified in the text of the order)

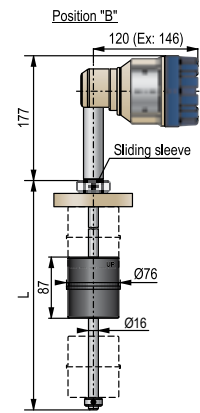
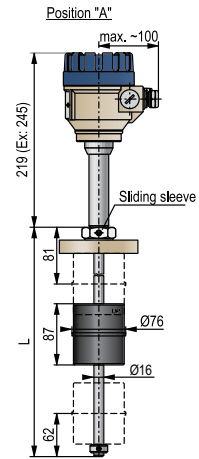
Side viewed "B" head position model

Process connection

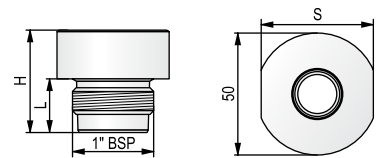
MGH-105-2M-300-00	Sliding sleeve: 1" BSP
MGL-105-2M-300-00	Sliding sleeve: 1" NPT
M F T - 3 2 1 - 2	PP flange DN80, PN16 + 1" BSP sliding sleeve must be ordered
M F T - 3 3 1 - 2	PP flange DN100, PN16 + 1" BSP sliding sleeve must be ordered

Accessories sold separately; see relevant page for details

S A P - 3 0 0 - 0	Graphic plug-in display module
S A T - 3 0 4 - 0	HART®-USB modem
S A T - 5 0 4 -	HART®-USB/Bluetooth® modem
S A K - 3 0 5 - 2	HART®-USB/RS485 modem
S A K - 3 0 5 - 6	HART®-USB/RS485 modem / [Ex ia G]



MEU-500 / 600



MGH-105-2M-300-000

Type	Material	Proc. conn.	Dimensions		
			S (mm)	H (mm)	L (mm)
MGH-105-2M-300-00	PVDF	1" BSP	46	42	22
MGL-105-2M-300-00		1" NPT			25

NIVOTRACK M-500/M-600 mini version with rigid probe

5 years

2-wire compact magnetostrictive level transmitter for liquids
mini version with stainless steel rod probe with 0.1 mm or 1 mm resolution

Version

M - -

M	Transmitter
C	Transmitter with local LCD display

Process connection

M - -

A	1" BSP
D	1" NPT
J	1½" TriClamp
M	2" TriClamp
O	2½" TriClamp
P	3" TriClamp
R	4" TriClamp

Housing

M - -

5	Aluminum (powder-coated)
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)
7	Stainless steel

Probe length

M - -

nn	0,5...1 m
oo	1,1...1,5 m; sold by the 100 mm

nn = 05...10 : 0,5...1 m

oo = 11...15 : 1,1...1,5 m

Output / Resolution / Certificates

M - -

1	4...20 mA / 0.1 mm
2	4...20 mA / 1 mm
3	4...20 mA + HART® / 0.1 mm
4	4...20 mA + HART® / 1 mm
5	4...20 mA / 0.1 mm / Ex ia G
6	4...20 mA / 1 mm / Ex ia G
7	4...20 mA + HART® / 0.1 mm / Ex ia G
8	4...20 mA + HART® / 1 mm / Ex ia G

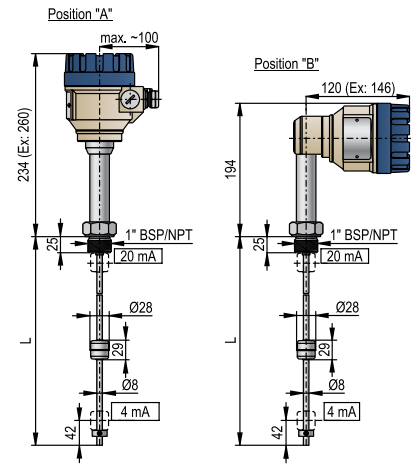
Need of IEC Ex is to be specified in the text part of the order

Available on request must be specified in the text of the order

Side viewed "B" head position model

Accessories sold separately; see relevant page for details)

S A P - 3 0 0 - 0	Graphic plug-in display module
S A T - 3 0 4 - 0	HART®-USB modem
S A T - 5 0 4 - <input type="checkbox"/>	HART®-USB/Bluetooth® modem
S A K - 3 0 5 - 2	HART®-USB/RS485 modem
S A K - 3 0 5 - 6	HART®-USB/RS485 modem / [Ex ia G]



MMA / MMD-500 / 600

NIVOTRACK M-500/M-600 with flexible probe

5 years

2-wire compact magnetostrictive level transmitter for liquids with stainless steel cable probe and weight with 0.1 mm or 1 mm resolution

Version

M	□	-	□	□	□	-	□
T	Transmitter						
B	Transmitter with local LCD display						

Process connection

M	□	-	□	□	□	-	□
K	2" BSP						
N	2" NPT						

Housing

M	□	□	-	□	□	□	-	□
5	Aluminum (powder-coated)							
6	Plastic, PBT, fiberglass-reinforced (Ex version not available)							
7	Stainless steel							

Probe length

M	□	□	-	□	□	□	-	□
n n	2...3 m							
o o	3.1...15 m; sold by the 100 mm							
nn = 20...30	: 2...3 m							
oo = 31...F0	: 3,1...15 m							

Output / Resolution / Certificates

M	□	□	-	□	□	□	-	□
1	4...20 mA / 0.1 mm							
2	4...20 mA / 1 mm							
3	4...20 mA + HART® / 0.1 mm							
4	4...20 mA + HART® / 1 mm							
5	4...20 mA / 0.1 mm / Ex ia G							
6	4...20 mA / 1 mm / Ex ia G							
7	4...20 mA + HART® / 0.1 mm / Ex ia G							
8	4...20 mA + HART® / 1 mm / Ex ia G							
A	4...20 mA / 0.1 mm / Ex d G (up to 10 m)							
B	4...20 mA + HART® / 0.1 mm / Ex d G (up to 10 m)							
C	4...20 mA / 0.1 mm / Ex d ia G (up to 10 m)							
D	4...20 mA + HART® / 0.1 mm / Ex d ia G (up to 10 m)							

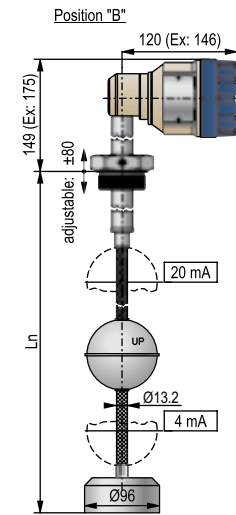
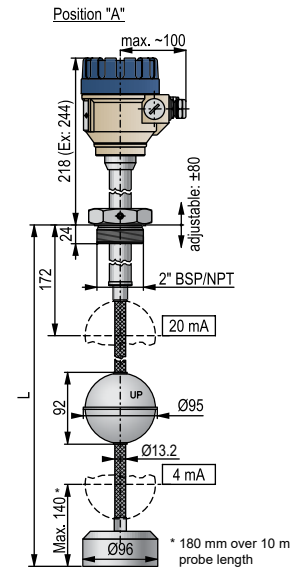
For custody transfer only models with HART output, 0.1 mm resolution, local display unit can be ordered, with up to 10 m probe length. Need of IEC Ex is to be specified in the text part of the order.

Available on request (must be specified in the text of the order)

Ø124 mm ball float (for min. 0.4 kg/dm³ liquids)
Side viewed "B" head position model

Accessories sold separately; seerelevant page for details

S A P - 3 0 0 - 0	Graphic plug-in display module
S A T - 3 0 4 - 0	HART®-USB modem
S A T - 5 0 4 - □	HART®-USB/Bluetooth® modem
S A K - 3 0 5 - 2	HART®-USB/RS485 modem
S A K - 3 0 5 - 6	HART®-USB/RS485 modem / [Ex ia G]



MTK / MTN-500 / 600