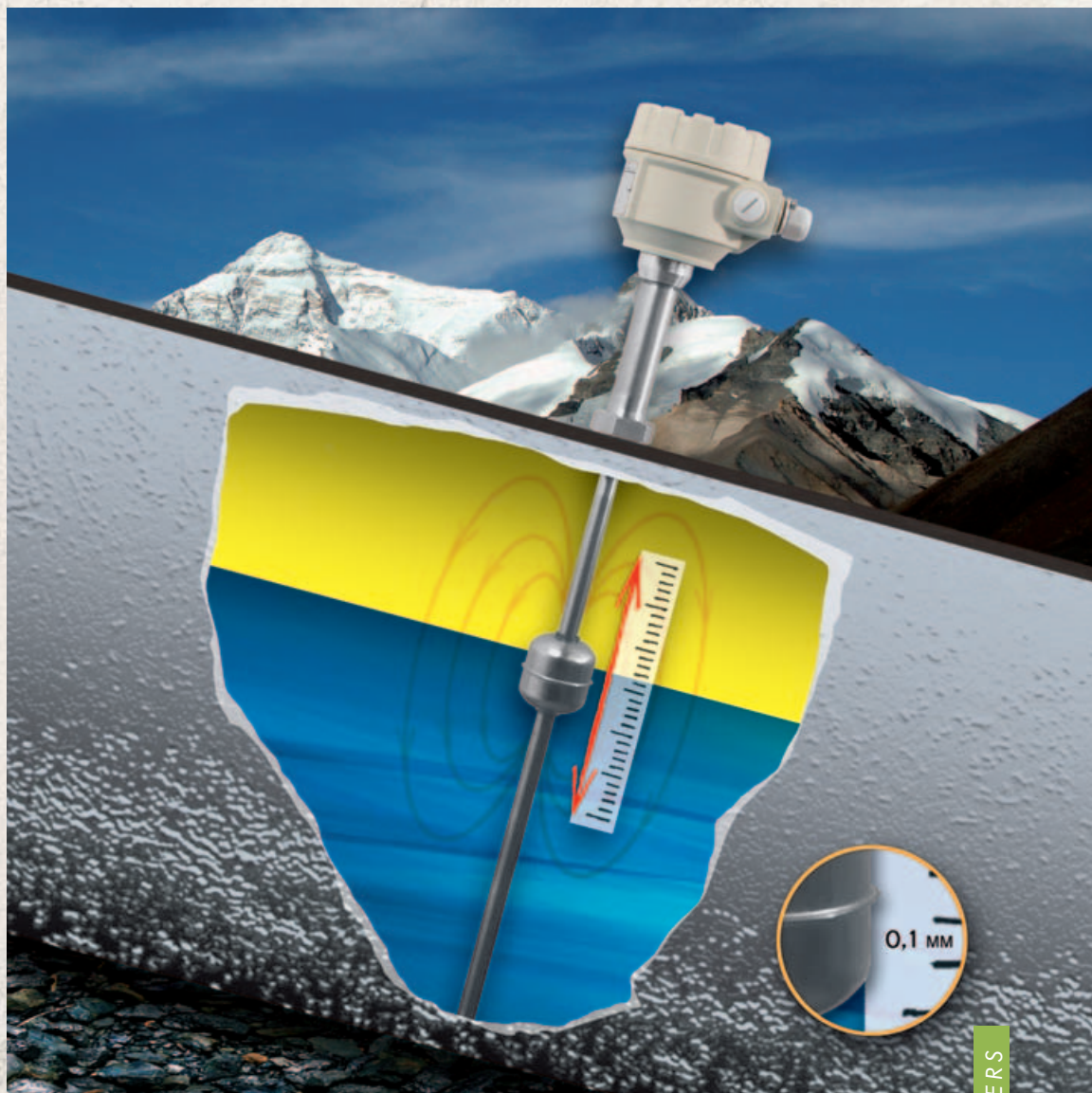


0.1 mm resolution

NIVOTRACK

MAGNETOSTRICTIVE TRANSMITTERS



LEVEL TRANSMITTERS



OUR PROFESSION IS YOUR LEVEL

NIVOTRACK MAGNETOSTRICTIVE TRANSMITTERS

MAIN FEATURES

- 0.1 mm or 1 mm resolution
- Insertion length maximum 15 m
- Rigid or flexible guide tube
- Plastic coated version for chemicals
- 4-20 mA and HART output
- Graphical display
- 99 point linearization table
- Measurement optimisation
- Volume measurement
- ATEX certified versions
- OIML R85 certification

APPLICATIONS

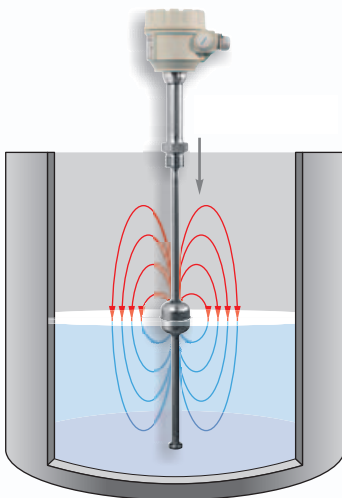
- Custody transfer measurement
- Oil and gas industry
- Fuels and gasoline products
- Pharmaceutical industry
- Chemical industry
- Food industry
- Alcohols and beverages
- Installation in bypass tubes feasible
- Supplementary level transmitter for NIVOFLIP magnetic flip indicator



GENERAL DESCRIPTION

NIVOTRACK magnetostriuctive transmitters are an ideal solution for high accuracy measurement of clean fluids. Its high precision renders the NIVOTRACK suitable for custody transfer measurement of liquids such as fuels, solvents, alcohol derivatives etc. Units with flexible tube do not only make this accurate measurement for higher tanks possible, but offer a more convenient way for shipment and installation. Plastic coated versions of the NIVOTRACK substantially expand the field of application by a wide range of aggressive materials.

Integrating the transmitter into a process control system is easy thanks to the intelligent signal processing and communication software as well as the wide 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.

POSITION OF THE DISPLAY

Vertical and horizontal display position is offered for optimal mounting in your application.

„A“ position



„B“ position



TECHNICAL DATA

Type	Rigid probe version	Flexible probe version	Rigid probe, plastic coating	Flexible probe, plastic coating
Measured process value	Liquid level, distance, volume			
Nominal length (L)	0.5 m ... 4.5 m Mini type: max. 1.5 m	2 m ... 15 m	0.5 m ... 3 m	2 m ... 10 m
Material of the tube	Stainless steel: DIN 1.4571		PFA coated stainless steel	
Max. medium pressure*	2.5 MPa (25 bar) Mini type: 1 MPa (10 bar)	1.6 MPa (16 bar)	0.3 MPa (3 bar)	
Medium temperature	-40 °C ... +90 °C see temperature diagram			
Resolution	0.1 mm or 1 mm			
Linearity with dry calibration	± 0.25 mm or ± 1 mm			
Temperature coefficient	0.04 mm / 10 °C (-40...+70 °C)			
Range span	Maximum range: see dimensions ; Minimum range: 200 mm			
Zero point offset	Anywhere within the range			
Standard float diameter / material**	Ø 53.5 x 60 mm cylinder / 1.4404	Ø 95 mm ball / 1.4404	Ø 76 x 87 mm cylinder / PVDF / PP	
Medium density	Depends on the applied float			
Material of wetted parts	Stainless steel: DIN 1.4571, 1.4404		PFA, PVDF, PP	
Ambient temperature	-40 °C...+70 °C, plastic housing: -25°C...+70°C, with display: -25...+70°C, Ex: see temperature diagram			
Output	Analogue	4...20 mA (limit values: 3.9 ... 20.5 mA)		
	Serial comm.	HART (close end resistor: 250 ohm)		
	Display	SAP-300 graphical display		
Damping time	Adjustable 0 s ... 99 s			
Error indication	22 mA or 3.8 mA or holding			
Output load	$R_t = (U_t - 12.5V) / 0.02 A$, $U_t =$ power supply voltage			
Power supply	12.5 V ... 36 V DC			
Electrical protection	Class III.			
Ingress protection	IP 67			
Process connection	as per order code			
Electric connection	Cable gland M 20 x 1.5, cable outer diameter: d=6 ...12 mm, wire cross section: max.1.5 mm ²			
Housing	Paint coated aluminium or plastic (PBT)			
Mass	1.7 kg + m. probe: 0.6 kg/m	2.9 kg + m. probe: 0.3 kg/m + counter weight: 3.5 kg	1.7 kg + m. probe: 0.7 kg/m	1.7 kg + m. probe: 0.4 kg/m + counter weight: 3.5 kg

* Depends on selected float

** Requested float type should be specified when placing an order

SPECIAL DATA FOR EX CERTIFIED MODELS

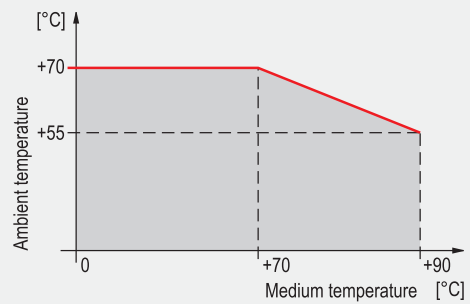
Protection type	ia	d	d ia
EX marking	ATEX Ⓜ II 1 G Ex ia IIB T6...T5 0.5 ... 15 m	ATEX Ⓜ II 2 G Ex d IIB T6...T5 0.5 ... 10 m	ATEX Ⓜ II 1/2 G Ex d ia IIB T6...T5 0.5 ... 10 m
Power supply and signal circuit limits	$U_{i\max} = 30 V$	$I_{i\max} = 140 mA$	$P_{i\max} = 1 W$ $C_i < 60 nF$ $L_i < 200 \mu H$
Cable gland	Steel M 20 x1.5 cable gland	Steel M 20 x1.5 Ex d approved cable gland	
Cable outer diameter	Ø 7 ...13 mm	Ø 9 ...11 mm	

TEMPERATURE PARAMETERS

Temperature limits for Ex version

Type	Temp. class	Max. ambient temp.	Max. medium temp.
Rigid probe	T6	70°C	80°C
Rigid or flexible probe with plastic coating			70°C
Flexible probe	T5	55°C	90°C
Rigid or flexible probe with plastic coating			90°C

Temperature diagram



Lower temperature limit

Type	Protection type		
	ia	d	d ia
Transmitter	-40°C		
Transmitter with display	-25°C	-20°C	

DIMENSIONS

Rigid probe with threaded process connection	Rigid probe without process connection (1, 2)	Rigid probe with plastic coating without process connection (1)
Flexible probe with sliding sleeve and counterweight	Flexible probe with plastic coating, with sliding sleeve, flange and counterweight (1)	Mini type rigid probe transmitter with threaded process connection

(1) Sliding sleeve and flange to be ordered separately

(2) M□L type is without float

FLOATS

Type	MBA-505-2M-200-00*	MBK-530-2M-400-00**	MBA-505-2M-900-00**	MGU-505-2M-200-00**	MCA-504-3M-000-00*	
Dimensions						
Medium density (min.)	0.8	0.55	0.4	0.7	0.4	0.7
Medium pressure	2.5 MPa (25 bar)	1.6 MPa (16 bar)	2.5 MPa (25 bar)	0.6 MPa (6 bar)	0.3 MPa (3 bar)	1 MPa (10 bar)
Material		1.4404		PVDF	PP	316L

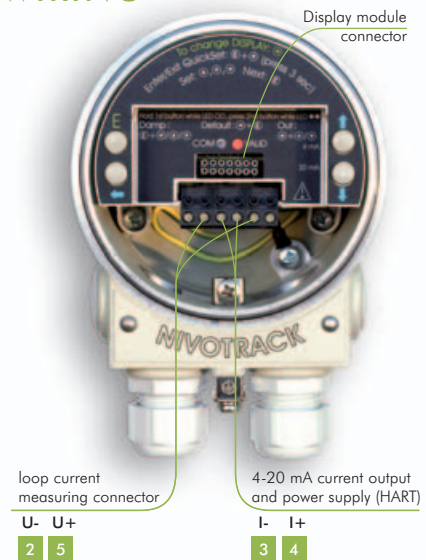
* Designed for min. 2" process connection, only order with rigid probe

** Flange to be ordered separately

SLIDING SLEEVE

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	70	43	24	-
MBL-105-2M-300-00	1.4571	1" NPT	41	38	-	≈ 10
MBN-105-2M-300-00	1.4571	2" NPT	70	43	-	≈ 11
MGH-105-2M-300-00	PVDF	1" BSP	46	42	22	-

WIRING



NIVOTRACK IN SYSTEM WITH PC



The instrument with HART output can be connected to a PC using a SAT-304 or SAK-305 HART USB modem. Max. 15 normal (non Ex) instruments can be connected to a HART line. Measured values can be visualised and/or the instruments can be programmed via digital HART communication. Applicable software: **EView** configuration software or **NIVISION** process visualization software.

NIVOTRACK IN A HART MULTIDROP LOOP

MultiCONT can handle a max. of 15 HART capable transmitters (4 Ex-version transmitters). The digital (HART) information is processed, displayed and if needed it can be transmitted via RS485 communication line to a PC. Remote programming of the transmitters is also possible. Visualisation on PC can be accomplished with **NIVISION** process visualisation software.



ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOTRACK magnetostrictive level transmitters

NIVOTRACK M ■ ■ ■ ■ ■ ■ ■ 1

Type	Code
Transmitter	T
Transmitter + display ²	B
Transmitter with plastic coated probe	E
Transmitter + display with plastic coated probe ²	G
Transmitter mini ⁷	M
Transmitter mini + display ⁷	C

Probe type / Process connection	Code
Rigid / 1" BSP	A
Rigid / 2" BSP	C
Rigid / 1" NPT	D
Rigid / 2" NPT	G
Rigid / w/o process conn. ⁴	U
Rigid / for NIVOFLIP w/o process conn. & float	L
Flexible / 2" BSP	K
Flexible / 2" NPT	N
Flexible / w/o process conn. ⁵	Z

Housing	Code
Aluminium	5
Plastic ³	6

Code	Probe length	Code
0	0 m	0
1	1 m	0.1 m
2	2 m	0.2 m
⋮	⋮	⋮
9	9 m	0.9 m
A	10 m	
B	11 m	
C	12 m	
D	13 m	
E	14 m	
F	15 m	

Output / Resolution / Ex	Code
4-20 mA / 0.1 mm	1
4-20 mA / 1 mm	2
4-20 mA + HART / 0.1 mm	3
4-20 mA + HART / 1 mm	4
4-20 mA / 0.1 mm / Ex ia	5
4-20 mA / 1 mm / Ex ia	6
4-20 mA + HART / 0.1 mm / Ex ia	7
4-20 mA + HART / 1 mm / Ex ia	8
4-20 mA / 0.1 mm / Ex d ⁶	A
4-20 mA + HART / 0.1 mm / Ex d ⁶	B
4-20 mA / 0.1 mm / Ex d + Ex ia ⁶	C
4-20 mA + HART / 0.1 mm / Ex d + Ex ia ⁶	D

- 1) The order code of an Ex version should end in „Ex“
- 2) The position of the display (A or B) should be specified in the order
- 3) Not available in Ex version
- 4) Threaded sliding sleeve should be ordered separately
- 5) Sliding sleeve with flange should be ordered separately
- 6) Insertion length max. 10 m
- 7) Insertion length max. 1.5 m

ACCESSORIES

Flanges

MFT ■ ■ ■ ■ ■ ■ ■

Standard / Material	Code
DIN / A38	1
DIN / 1.4571	2
DIN / PP	3
DIN / A38 +, PTFE	4
ANSI / A38	5
ANSI / 1.4571	6
ANSI / PP	7
ANSI / A38 + PTFE	8

Size		Code
DIN	ANSI	
DN50	2"	0
DN65	2 1/2"	1
DN80	3"	2
DN100	4"	3
DN125	5"	4
DN150	6"	5
DN200	8"	6

Pressure	Code
PN16 / 150 psi	1
PN25 / 300 psi	2

1) Only for M□Z types

Instr. connection	Code
1" BSP	2
2" BSP	3
1" NPT	5
2" NPT	6
Sliding sleeve	A ¹

Floats

Type	Diameter / Material
MBA-505-2M-200-00	Ø 53,5 mm / 1.4571
MBK-530-2M-400-00	Ø 95 mm / 1.4571
MGU-505-2M-200-00	Ø 76 mm / PVDF / PP
MBA-505-2M-900-00	Ø 124 mm / 1.4571
MCA-504-3M-000-00	Ø 27 mm / 316L

Other accessories

Type	Description
SAP-300	Plug-in display module
SAT-304 / SAK-305	HART-USB / RS485 modem
SAS-302	EView software

Threaded sliding sleeve

Type	Process connection
MBH-105-2M-300-00	1" BSP
MBK-105-2M-300-00	2" BSP
MBL-105-2M-300-00	1" NPT
MBN-105-2M-300-00	2" NPT
MGH-105-2M-300-00	1" BSP / PVDF, for plastic coated version

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