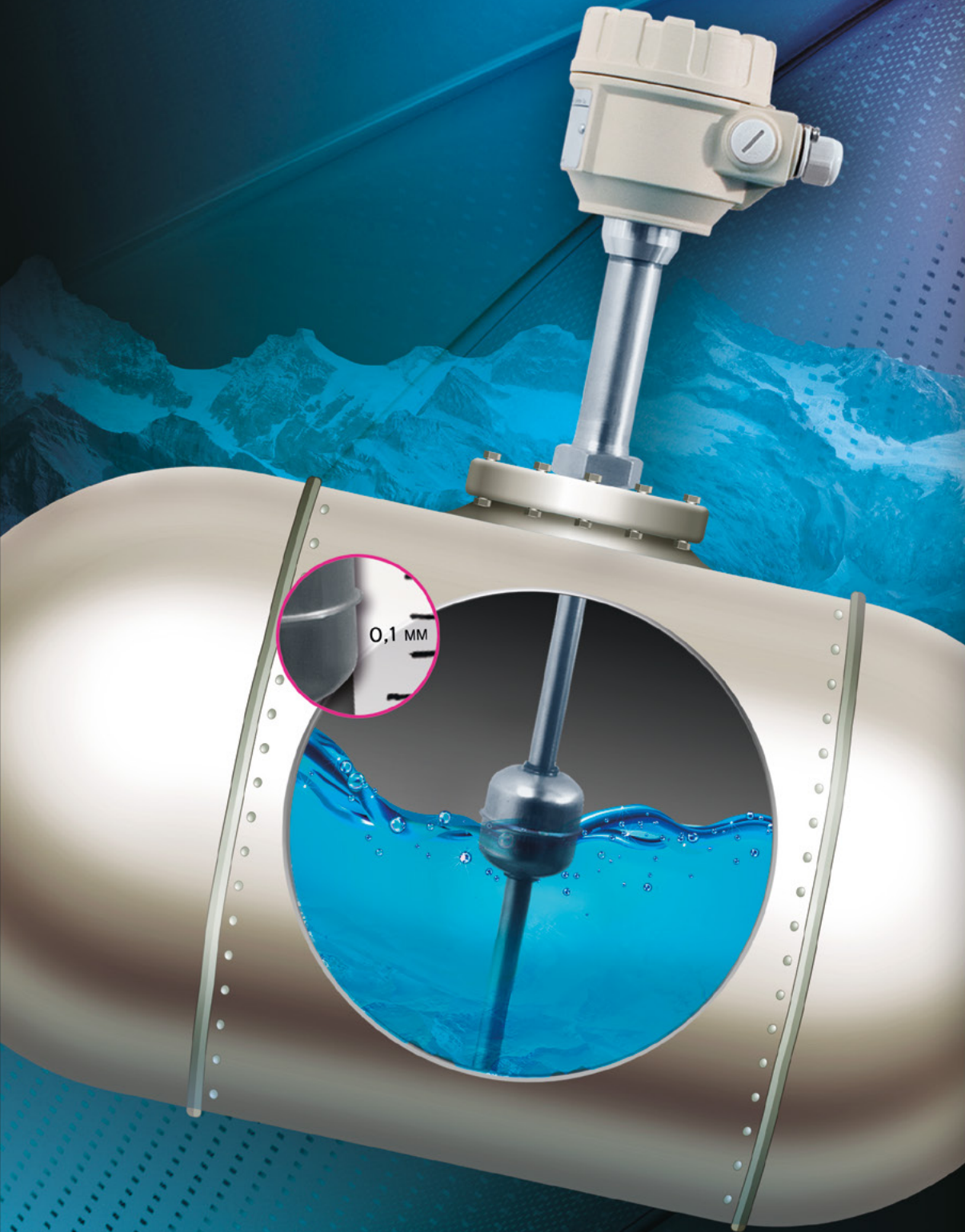


0.1 MM RESOLUTION

# NIVOTRACK

MAGNETOSTRICTIVE LEVEL TRANSMITTERS



3 YEARS WARRANTY @ NIVELCO – WHERE ELSE?

# NIVELCO

LEVEL TRANSMITTERS

## NIVOTRACK MAGNETOSTRICTIVE LEVEL 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
- Ex version
- 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



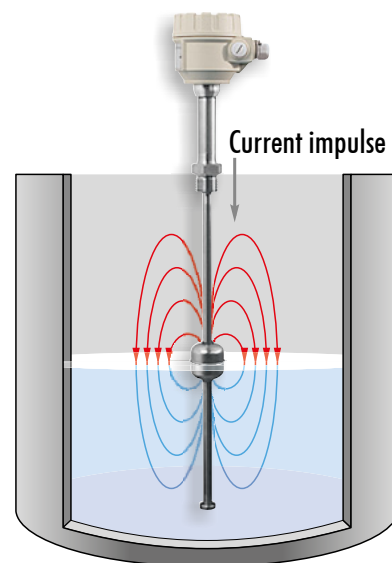
### GENERAL DESCRIPTION

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 magnetostriuctive wire in it. A pulse generated by the electronics travels along the magnetostriuctive 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.



## TECHNICAL DATA

Type	Rigid probe version	Flexible probe version	Plastic coated rigid probe version	Mini version with rigid probe
Measured process value	Liquid level, distance, volume			
Nominal length (L)	0.5 m ... 4.5 m (1.5 ... 14.5 ft)	2 m ... 15 m (6.5 ... 50 ft)	0.5 m ... 3 m (1.5 ... 10 ft)	0,5 m ... 1,5 m (1.5 ... 4.5 ft)
Material of the tube	1.4571 (316 Ti) stainless steel		PFA coated st. steel	1.4571 stainless steel
Max. medium pressure (1)	2.5 MPa (25 bar g / 363 psi g)	1.6 MPa (16 bar g / 232 psi g)	0.3 MPa (3 bar g / 43.5 psi g)	1 MPa (10 bar g / 145 psi g)
Medium temperature	-40 °C ... +90 °C (-40 °F ... 194 °F), see temperature diagram			
Standard float diameter / material (2)	Ø 53.5 x 60 mm (2 x 2.35") cylindrical / 1.4404 (316L)	Ø 96 mm (4") ball / 1.4435 (316L)	Ø 76 x 87 mm (3 x 3.45") cylindrical / PVDF / PP	Ø 28 x 28 mm (1 x 1.15") cylindrical 1.4404 (316L)
Medium density	Depends on the applied float			
Material of wetted parts	Stainless steel: 1.4571, 1.4404 (316 Ti, 316 L)		PFA, PVDF, PP	St. steel: 1.4571, 1.4404
Ambient temperature	-40 °C...+70 °C (-40 °F ... +158 °F), plastic housing: -25 °C...+70 °C (-13 °F ... +158 °F), with display: -25 °C...+70 °C (-13 °F ... +158 °F), Ex type: see temperature diagram			
Output	Analogue	4-20 mA (limit values: 3.9 ... 20.5 mA)		
	Digital	4-20 mA + HART		
	Display	SAP-300 graphic 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	2x M20x1.5 plastic cable glands for 6...12 mm (0.25 ... 0.5 inch) cable + 2x NPT 1/2" internal thread for cable protective pipe terminal block for 0.5...1.5 mm <sup>2</sup> (AWG 20 ... AWG 15) wire cross section Ex type: see „Special data for Ex certified models“ table			
Housing	Paint coated aluminium or plastic (PBT)			
Mass	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) + counter weight 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 maximal pressure is 0.3 MPa (3 bar g / 43.5 psi g)

(2) Requested float type should be specified when placing an order

## MEASUREMENT DATA

Type	1 mm resolution	0.1 mm resolution
Nonlinearity (of the displayed and the transmitted value on the HART line) (3)	± 2 mm or ± 0.02% (± 0.08" or ± 0.02%) F.S. whichever is greater	± 1 mm or ± 0.01% (± 0.04" or ± 0.01%) F.S. whichever is greater
Hysteresis (3)	< ± 1 mm (0.04 inch)	< ± 0.25 mm (0.01 inch)
Zero span (in LEVEL measurement mode)	Anywhere within the active range	
Measurement range (reducing)	Min. range: 200 mm (8 inch); Max. range: as per probe length	
Temperature error	0.04 mm / 10 °C (0.0015 inch / 50 °F) between (-25 °C ... +50 °C) (-13 °F ... +122 °F)	
Current output data	Resolution: 2 µA, Accuracy: 10 µA, Temperature error: 200 ppm/ °C	

(3) Under reference conditions

## SPECIAL DATA FOR Ex CERTIFIED MODELS

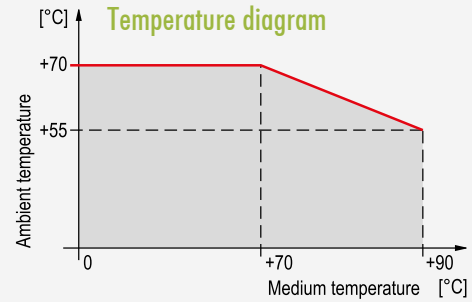
Protection type	ia	d	d ia
Ex marking	ATEX	⊕ II 1 G Ex ia IIB T6...T5 0.5 ... 15 m	⊕ II 2 G Ex d IIB T6...T5 0.5 ... 10 m
	IEC Ex (3)	Ex ia IIB T6 Ga	Ex d IIB T6 Gb
Ex power supply and limit data	U <sub>imax</sub> = 30 V    I <sub>imax</sub> = 140 mA	P <sub>imax</sub> = 1 W    C <sub>i</sub> < 15 nF	Li < 200 µH
Cable gland	Brass Nickel plated M 20 x1.5 cable gland	Brass Nickel plated M 20 x1.5 Ex d approved cable gland	
Cable outer diameter	Ø 7 ...13 mm (0.275 ... 0.55 in)	Ø 9 ...11 mm (0.35 ... 0.45 in)	

(3) Need of IEC Ex is to be specified with order

# TEMPERATURE PARAMETERS

## Temperature limits for Ex version

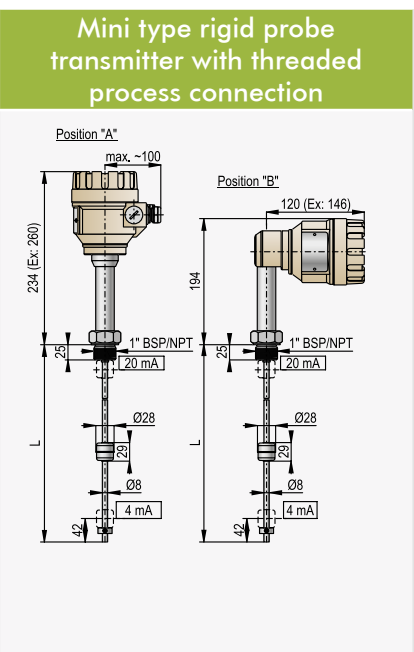
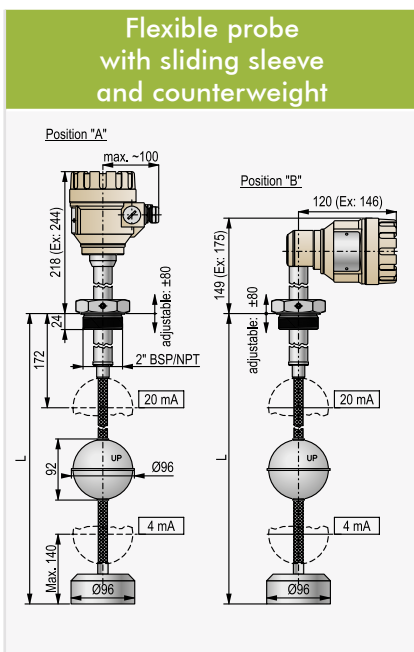
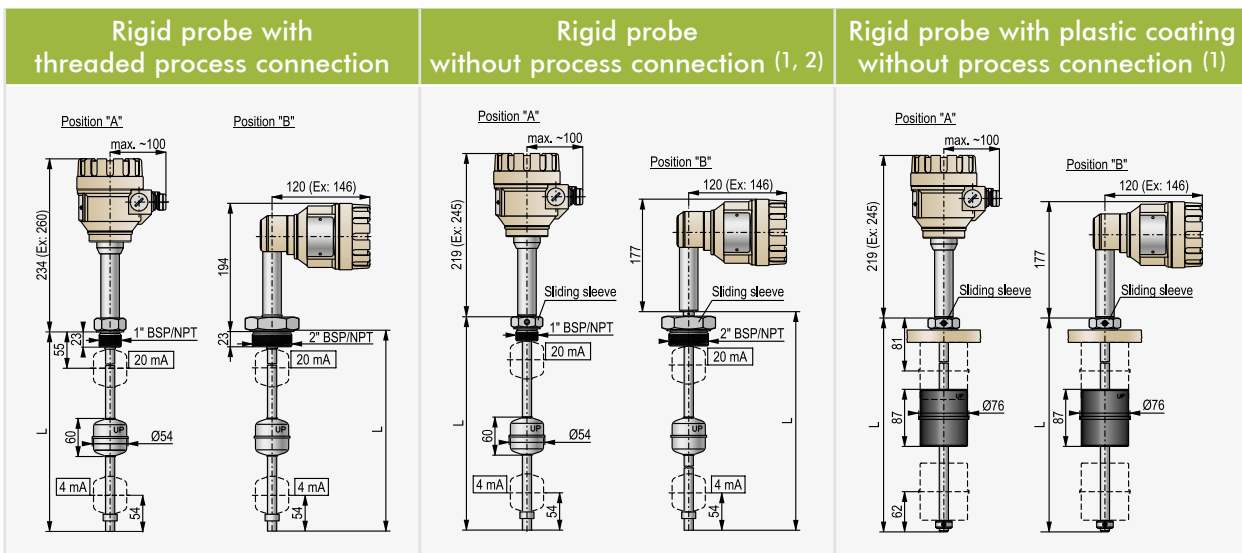
Type	Temp. class	Max. ambient temp.	Max. medium temp.
Rigid probe	T6	70°C (158 °F)	80°C (176 °F)
Rigid or flexible probe with plastic coating			70°C (158 °F)
Flexible probe	T5	55°C (131 °F)	90°C (194 °F)
Rigid or flexible probe with plastic coating			90°C (194 °F)



## Lower temperature limit

Type	Protection type	Protection type		
		ia	d	d ia
Transmitter		-40°C (-40 °F)		
Transmitter with display	ATEX	-25°C (-13 °F)	-20°C (-4 °F)	
	IEC Ex	-25°C (-13 °F)		

## DIMENSIONS



(1) Sliding sleeve and flange to be ordered separately

(2) M□L type is without float

## FLOATS

Type	MBA-505-2M-800-00(1)	MBA-505-2M-200-00(1)	MBK-530-2M-400-00(2)	MBA-505-2M-900-00(2)	MGU-505-2M-200-00(2)	MGU-505-1M-200-00(2)	4w34bs-16yyyyy(3)
Dimensions							
Medium density (min.)	0.55 kg/dm <sup>3</sup> (550 oz/ft <sup>3</sup> )	0.8 kg/dm <sup>3</sup> (800 oz/ft <sup>3</sup> )	0.55 kg/dm <sup>3</sup> (550 oz/ft <sup>3</sup> )	0.4 kg/dm <sup>3</sup> (400 oz/ft <sup>3</sup> )	0.7 kg/dm <sup>3</sup> (700 oz/ft <sup>3</sup> )	0.4 kg/dm <sup>3</sup> (400 oz/ft <sup>3</sup> )	0.8 kg/dm <sup>3</sup> (800 oz/ft <sup>3</sup> )
Material	Titanium	1.4404 (316L)	1.4435 (316L)	1.4401 (316)	PVDF	PP	1.4404 (316L)
Medium pressure	2.5 MPa (25 bar g / 363 psi g)				0.6 MPa (6 bar g / 87 psi g)	0.3 MPa (3 bar g / 43.5 psi g)	1 MPa (10 bar g / 145 psi g)

(1) Designed for min. 2" process connection, only order with rigid probe  
(2) Flange to be ordered separately

(3) Designed for min. 1" process connection, only order with mini type

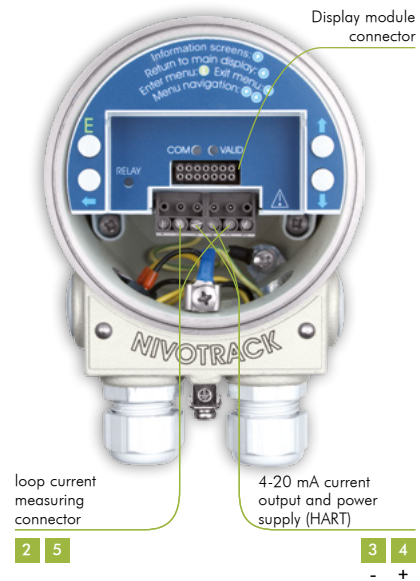
## SLIDING SLEEVE

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	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
MGH-105-2M-300-00	PVDF	1" BSP	46	42	22	-
MGL-105-2M-300-00	PVDF	1" NPT	46	42	22	-

1.4571

PVDF

## WIRING



## NIVOTRACK IN SYSTEM WITH PC



The instrument with HART output can be connected to a PC using an **UNICOMM 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. **EView2** 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 COMBINATION 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 (4)	M
Transmitter mini + display (4)	C

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	

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

Output / Resolution (7) / 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 (5)	A
4-20 mA + HART / 0.1 mm / Ex d (5)	B
4-20 mA / 0.1 mm / Ex d+Ex ia (5)	C
4-20 mA + HART / 0.1 mm / Ex d+Ex ia (5)	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) Insertion length max. 10 m
- (6) Insertion length max. 1.5 m
- (7) For certified level measurement for custody transfer only the HART output with 0.1 mm resolution version including local display unit can be ordered

## ACCESSORIES

### Flanges

MFT ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

Standard / Material	Code	Size		Code
		DIN	ANSI	
DIN / A38	1			
DIN / 1.4571	2	DN50	2"	0
DIN / PP	3	DN65	2 1/2"	1
DIN / A38 + PTFE	4	DN80	3"	2
ANSI / A38	5	DN100	4"	3
ANSI / 1.4571	6	DN125	5"	4
ANSI / PP	7	DN150	6"	5
ANSI / A38 + PTFE	8	DN200	8"	6

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

### Floats

Type	Diameter / Material
MBA-505-2M-200-00	Ø 53.5 mm / 1.4571
MBA-505-2M-800-00	Ø 53.5 mm / Titanium
MBK-530-2M-400-00	Ø 96 mm / 1.4571
MGU-505-2M-200-00	Ø 76 mm / PVDF / PP
MBA-505-2M-900-00	Ø 124 mm / 1.4571
4w34bs16yyyyy	Ø 28 mm / 1.4404

(8) Only for M□Z types

### 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
MGL-105-2M-300-00	1" NPT / PVDF, for plastic coated version

### Other accessories

Type	Description
SAP-300	Plug-in display module
UNICONT PGK-301 Ex	Intrinsically safe isolator power supply module
UNICOMM SAK-305	HART- USB/RS485 modem for remote programming with PC, DIN rail mountable
UNICOMM SAT-304	HART-USB modem for remote programming
FREE download	EView2 configuration software for remote programming with PC

