Level meter

BA

- Level metering and monitoring of liquids
- Robust design
- Clear 90°-scale
- Transmitter with HART or PROFIBUS-PA or FF as option

Function

The displacer rod, which is attached to a measuring spring using a chain, immerses into the liquid and is subject to a buoyant force proportional to the mass of the displaced liquid.
Every change in the weight of the rod corresponds to a change in the length of the spring and is therefore a measure of the liquid level. The longitudinal expansion of the spring, i.e. the travel of the rod, will be transmitted from the measuring space to the indicator unit by means of a magnetic coupling. The basic version of the indicator unit consists of a scale with a pointer for displaying the liquid level. As an option, the indicator unit may be equipped with electrical transmitters for remote display or with limit switches.
If the device cannot be installed from above, because, for example, a stirrer is mounted in the container, a special displacement vessel is available for lateral installation.
Since the buoyancy of the displacer rod depends on the density of the measured medium, it must have been designed for the specific liquid to be measured.

Application

The BA-type level indicator is suitable for level measurement of liquid products in open containers and in containers under pressure. The device is based on Archimedes' principle.

Applications: level metering, monitoring, adjusting and control.

The meter's design makes it ideal for processes under difficult and rough operating conditions.

The devices are available with additional electrical equipment for process monitoring and control.

- A large spectrum of wetted materials
- Magneto-resistive signal transmission
- Stilling well for rough conditions (optional)
- High-temperature application (max. 250
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Technical data

Sensor

Materials:	Stainless steel, Hastelloy other materials on request
Process connection:	DN 50 flange acc. EN 1092, ASME B16.5, DIN 2512, special connections on request
Nominal pressure:	PN 40, ASME Cl 150 / 300
Density range:	400 ... 2.000 g/l
Process temperature:	-40°C ... 250°C
Ambient temperature:	-40°C … 80°C
Ingress protection:	IP 65 (EN 60529)

Explosive area Catagory 2

Identification	II 2G Ex h IIC T6...T2 Gb

Ambient temperature	Process temperature	Identification
Depending on the built-in electrical acessories and / or indicator with extended arm and / or higher built: -40°C .. max. 65°C with switch -40°C .. max. 70°C with ES transmitter -40°C .. max. 80°C at pure mechanical device	-40°C .. 100°C	II 2G Ex h IIC T6...T5 Gb II 2D Ex h IIIC T85°C…T100°C Db
	-40°C .. 150°C	II 2G Ex h IIC T6...T3 Gb II 2D Ex h IIIC T85°C…T150°C Db
	-40°C .. 250°C	II 2G Ex h IIC T6...T2 Gb II 2D Ex h IIIC T85°C…T250°C Db

Accuracy

Liquid:	± 5 mm of actual value ± 0,2% with transmitter (ES)
Display	Aluminum (stove-enameled) Stainless steel (as option)
Outputs	inductive switch inductive switch (safety design) micro switch Transmitter others on request
Ambient temperature:	-40°C ... 80°C (at pure mechanical device) -40°C … 70°C (with ES transmitter) -40°C … 65°C (with switch)

Transmitter

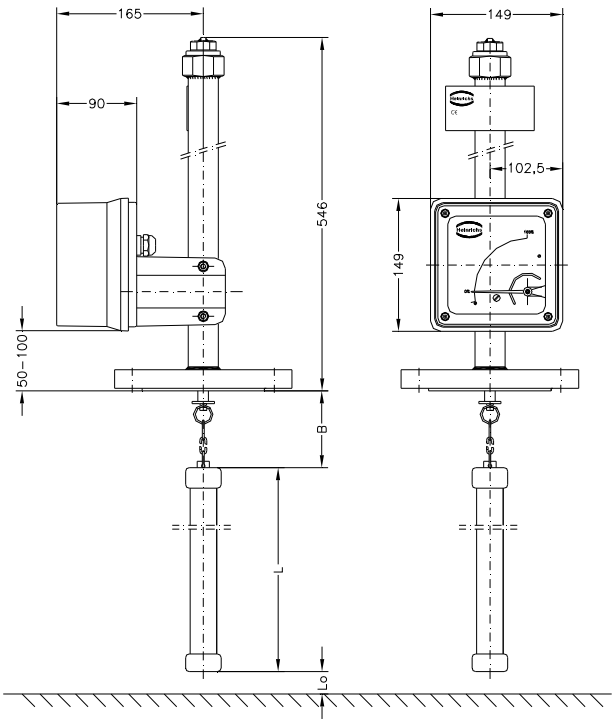
ES with HART-protocol
ES with HART-protocol and 2 NAMUR-switches
ES with HART-protocol and 1 NAMUR-switch / 1 pulse output
ES with Profibus-PA ®
ES with Foundation FIELDBUS ®

Power supply:	14 - 30 VDC
Output:	passive, galvanically isolated
Currency:	4-20 mA
Binary 1 and 2:	U_i=30 V, I_i=20mA, P_i=100 mW
Ambient temperature:	-40°C up to +70°C
Ingress protection:	IP 20 (EN60529)

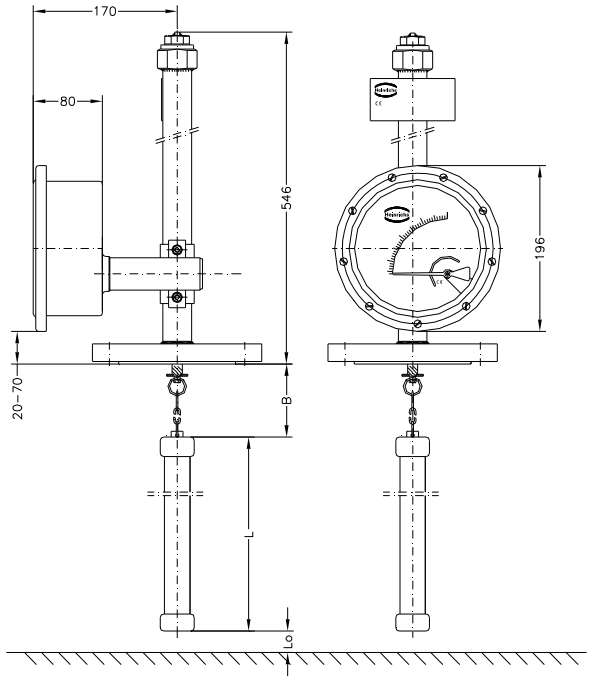
Certification	
Explosion protection:	DMT 00 ATEX E 075
Type of protection:	II 2G Ex ia IIC T6 Gb
CE-Marking:	Explosion Protection Directive 2014/34/EU
Electromagnetic compatibility:	EMC-Directive 2014/30/EU EN 61000-6-3:2012 (emissions residential environments) EN 61000-6-2:2011 (immunity for industrial environments) EN 55011:2011 1999 Group 1, Class B (radio interference) EN 61000-4-2 to DIN EN 61000-4-6 EN 61000-4-8 EN 61000-4-11 EN 61000-4-29 EN 61326

Dimension with standard indicator

Aluminum indicator housing



Indicator housing made of stainless steel



For further information see device description BA_BA_XX_en.
Subjects to change without notice.

Model Code

BA	Level meter				
-	Armature	Approval (vessel)	Displacement rod	Pressure rating	Process temperature
S0	Stainless steel	Category 2	316L / 316TI	16 bar / 150 lbs	-40° to +250°C
XX	Special on request				
	Length of displacer rod (Length in mm.)				Model
XXXX	Displacer rod	Use our sizing program to determine the displacer rod!			S0
	Displacer rod for interface detection				Model
0	without				S0
1	with	minimum difference of density 150 g/l			S0
	Process connection				Model
321B	DN50 PN40 Form B1 DIN EN 1092-1				S0
206R	2" Class 150 RF ASME B16.5-2003				S0
226R	2" Class 300 RF ASME B16.5-2003				S0
321D	DN50 PN40 Form D DIN EN 1092-1				S0
206J	2" Class 150 RTJ ASME B16.5-2003				S0
226J	2" Class 300 RTJ ASME B16.5-2003				S0
331B	DN80 PN40 Form B1 DIN EN 1092-1				S0

208R	3" Class 150 RF ASME B16.5-2003		S0
228R	3" Class 300 RF ASME B16.5-2003		S0
331D	DN80 PN40 Form D DIN EN 1092-1		S0
208J	3" Class 150 RTJ ASME B16.5-2003		S0
228J	3" Class 300 RTJ ASME B16.5-2003		S0
335B	DN100 PN16 Form B1 DIN EN 1092-1		S0
210R	4" Class 150 RF ASME B16.5-2003		S0
230R	4" Class 300 RF ASME B16.5-2003		S0
335D	DN100 PN16 Form D DIN EN 1092-1		S0
210J	4" Class 150 RTJ ASME B16.5-2003		S0
230J	4" Class 300 RTJ ASME B16.5-2003		S0
XXXX	Special on request		S0
	Ventilation		
0	without		
-	**Indicating part**		
S	Standard indicating housing		
T	Standard display housing with pressure compensation		
E	Stainless steel indicating housing IP67		
	Indicating unit design	Indicating part mounting	Process temperature
0	standard	on vessel on reference vessel	max. 100°C max. 150°C
H	100 mm higher built with 4 heat sinks, for mounting on vessel.	on vessel	max. 150°C
K	100 mm higher built with 4 heat sinks, add. 100 mm extended, for mounting on vessel.	on vessel	max. 250°C
V	100 mm extended,, for mounting on reference vessel.	on reference vessel	max. 250°C
X	Special on request		
	Product scale		
1	%-Scale (Water)		
2	Measuring range-Scale (Water)		
3	Double-scale (acc. customer requirement)		
4	%-Scale (Media)		
5	Measuring range-Scale (Media)		
X	Special on request		
	Electrical output		Ambient temperature
0	without		
1	1 x inductive switch, Type SJ 3,5 N		SIL1[7)]
2	2 x inductive switch, Type SJ 3,5 N		SIL1[7)]
3	1 x inductive switch, Type SJ 3,5 SN (safety design)		SIL1[7)]
4	2 x inductive switch, Type SJ 3,5 SN (safety design)		SIL1[7)]
6	Transmitter ES with HART-protocol, 4-20 mA, EEx ia		SIL1[7)]
7	Transmitter ES with HART-protocol, 4-20 mA, EEx ia / 2x NAMUR-switch		SIL1[7)]
8	Transmitter ES with HART-protocol, 4-20 mA, EEx ia / 1x NAMUR-switch, 1x pulse output		SIL1[7)]
9	Transmitter ES with Profibus PA, EEx ia		
C	1 x microswitch		
D	2 x microswitch		
E	1 x inductive switch, Type SB 3,5-E2, three wire		
F	2 x inductive switch, Type SB 3,5-E2, three wire		
G	Proximity switch NCB2-12GM40-ZO		
I	Transmitter ES with HART-protocol and counter module		
K	Transmitter ES Fieldbus Foundation		
X	Special on request		

-	Accessory
0	without
X	with (separate specification necessary)
	Certificates
	Calibration Certificate
	Certificate of compliance with the order, 2.1
	Test report, 2.2
	Inspection certificate 3.1 with material certificate (DIN EN 10204:2004)
	Inspection certificate 3.2 with material certificate (DIN EN 10204:2004)

VG	Displacement vessel (Bypass)		
-	**Wetted materials**		
	Armature, process connection DN25/1", BA flange connection DN50/2"	Pressure rating	Process temperature
S0	Material 316L / 316TI	16/40 bar, 150/300 lbs	-40° to +250°C
XX	Special on request		-40° to +250°C
	Socket distance		Model
XXXX	for head connection DN50, 2"	Length in mm	S
	for head connection DN80, 3"		S
	for head connection DN100, 4"		S
	Special on request		S
-	**Process connection, vertical assembled**		Model
309B	DN25 PN40 Form B1 DIN EN 1092-1		S
203R	1" Class 150 RF ASME B16.5-2003		S
223R	1" Class 300 RF ASME B16.5-2003		S
309D	DN25 PN40 Form D DIN EN 1092-1		S
203J	1" Class 150 RTJ ASME B16.5-2003		S
223J	1" Class 300 RTJ ASME B16.5-2003		S
321B	DN50 PN40 Form B1 DIN EN 1092-1		S
206R	2" Class 150 RF ASME B16.5-2003		S
226R	2" Class 300 RF ASME B16.5-2003		S
322D	DN50 PN40 Form D DIN EN 1092-1		S
206J	2" Class 150 RTJ ASME B16.5-2003		S
226J	2" Class 300 RTJ ASME B16.5-2003		S
XXXX	Special on request		S
-	**BA flange connection, on top assembled**		Model
321B	DN50 PN40 Form B1 DIN EN 1092-1		S
206R	2" Class 150 RF ASME B16.5-2003		S
226R	2" Class 300 RF ASME B16.5-2003		S
321D	DN50 PN40 Form D DIN EN 1092-1		S
206J	2" Class 150 RTJ ASME B16.5-2003		S
226J	2" Class 300 RTJ ASME B16.5-2003		S
331B	DN80 PN40 Form B1 DIN EN 1092-1		S
208R	3" Class 150 RF ASME B16.5-2003		S
228R	3" Class 300 RF ASME B16.5-2003		S
331D	DN80 PN40 Form D DIN EN 1092-1		S
208J	3" Class 150 RTJ ASME B16.5-2003		S
228J	3" Class 300 RTJ ASME B16.5-2003		S
335B	DN100 PN16 Form B1 DIN EN 1092-1		S
336B	DN100 PN40 Form B1 DIN EN 1092-1		S
210R	4" Class 150 RF ASME B16.5-2003		S
230R	4" Class 300 RF ASME B16.5-2003		S
335D	DN100 PN16 Form D DIN EN 1092-1		S
336D	DN100 PN40 Form D DIN EN 1092-1		S
210J	4" Class 150 RTJ ASME B16.5-2003		S
230J	4" Class 300 RTJ ASME B16.5-2003		S
XXXX	Special on request		S

	Drain plug, flange, valve	Model
0	without	
S	Drain plug G ½"	S
N	Drain plug ½" NPT (f)	S
F	Drain flange DN25 PN40 Form B1 DIN EN 1092-1	S
A	Drain flange 1" Class 150 RF ASME B16.5-2003	S
V	Drain: needle valve G ½" (f); max. 120°C	S
X	Special on request	S

	Accessory
0	without
X	with (separate specification necessary)

SR	Stilling well		
-	**Wetted materials**		
S	Stainless steel	for head connection DN50, 2"	
S	Stainless steel	for head connection DN80, 3"	
S	Stainless steel	for head connection DN100, 4"	
X	Special on request		
	Length		Model
XXXX	for head connection DN50, 2"	Length in mm	S
	for head connection DN80, 3"		S
	for head connection DN100, 4"		S
	Special on request		S
-	**Head connection, sandwich flange design**		Model
321B	DN50 PN40 Form B1 DIN EN 1092-1		S
206R	2" Class 150 RF ASME B16.5-2003		S
226R	2" Class 300 RF ASME B16.5-2003		S
321D	DN50 PN40 Form D DIN EN 1092-1		S
206J	2" Class 150 RTJ ASME B16.5-2003		S
226J	2" Class 300 RTJ ASME B16.5-2003		S
331B	DN80 PN40 Form B1 DIN EN 1092-1		S
208R	3" Class 150 RF ASME B16.5-2003		S
228R	3" Class 300 RF ASME B16.5-2003		S
331D	DN80 PN40 Form D DIN EN 1092-1		S
208J	3" Class 150 RTJ ASME B16.5-2003		S
228J	3" Class 300 RTJ ASME B16.5-2003		S
335B	DN100 PN16 Form B1 DIN EN 1092-1		S
336B	DN100 PN40 Form B1 DIN EN 1092-1		S
210R	4" Class 150 RF ASME B16.5-2003		S
230R	4" Class 300 RF ASME B16.5-2003		S
335D	DN100 PN16 Form D DIN EN 1092-1		S
336D	DN100 PN40 Form D DIN EN 1092-1		S
210J	4" Class 150 RTJ ASME B16.5-2003		S
230J	4" Class 300 RTJ ASME B16.5-2003		S
XXXX	Special on request		S

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