

Magnetic Inductive Flow



Characteristics

System	Magnetic-inductive
Evaluation	Flow speed, quantity
Process connection	Several process connections for Hygienic Design, EHEDG certified
Media	Fluid, pasty and slurry media
Process pressure	Max. 10 bar
Media temperature	-20..+120 °C CIP-/SIP-capable

Applications

- Quantity measurement for filling processes
- Monitoring of mixing processes
- Food and beverage
- Chemical industry
- Pharmacy industry
- Cosmetician
- Biotechnology

Product Information

Hygienic Design

Mag Flowmeter MFI447



- Ultra compact size
- High accuracy ($\pm 0.5\%$) of flow speed > 0.5 m/s (1,6 f/s) (optional $\pm 0.3\%$ for tube diameter < 20 mm)
- No moving parts in the process
- Measurement of fluid, pasty and slurry media
- Turnable transmitter housing ($\pm 170^\circ$)
- Programming with touch screen
- EHEDG certified
- CIP-/SIP-capable
- Integrated batch controller (optional)

Characteristics

In the basic principle an electromagnetic flow meter consists of a measuring pipe, a magnetic circle and two electrodes. The measuring pipe will be flown through a medium with a minimum of electrical conductivity. From outside a magnetic field vertically oriented to the flow direction is raised. The induced voltage in the medium will be measured with two opposite installed electrodes. The induced voltage is proportional to the flow velocity of the liquid. With knowledge of the pipe geometry the transmitter calculates the actual flow volume. From this value the data will be derived for the outputs and the integrated totalizer.

The MFI447 is designed for measurement of liquids, pasty or slurry media with a minimum of conductivity from $> 5 \mu\text{S}$.

Technical data

Power supply
 Supply voltage : 18..32 V DC
 Power consumption : max. 5 W
 CE- conformity : EN 61326:05/2007

Ambient condition
 Ambient temperature : -20..+50 °C
 Climate class : EN 60068-2-38
 Vibrations : EN 60068-2-6, GL test2

Approval
 EHEDG : Evaluation Report No. 148/18.10.2007

Measuring range
 Min. conductivity : $> 5 \mu\text{S}$,
 $> 20 \mu\text{S}$ for water

Process temperature : -20..120 °C, 140 °C < 30 min
 CIP-/SIP-cleaning

Process pressure : -1..10 bar
 Process material : coating PFA (FDA conform),
 1.4539 electrodes, tube connection
 1.4435, seal EPDM (FDA conform)
 hygienic design acc. to EHEDG

Process connection : TriClamp, SMS, DIN11851 milk pipe,
 DIN11864 Südmo Aseptic connection,
 Tuchenhagen flange, APV flange

Material

Tube standard	Material	3.1 certificate
DIN 11850 range 1 and 2	1.4404	-
DIN 11866 range A	1.4435	✓
DIN 11866 range B (DIN EN ISO 1127)	1.4435	✓
DIN 11866 range C (ASME)	1.4435	✓
OD-Tube (ASME)	1.4404	-
ISO 2037	1.4404	-

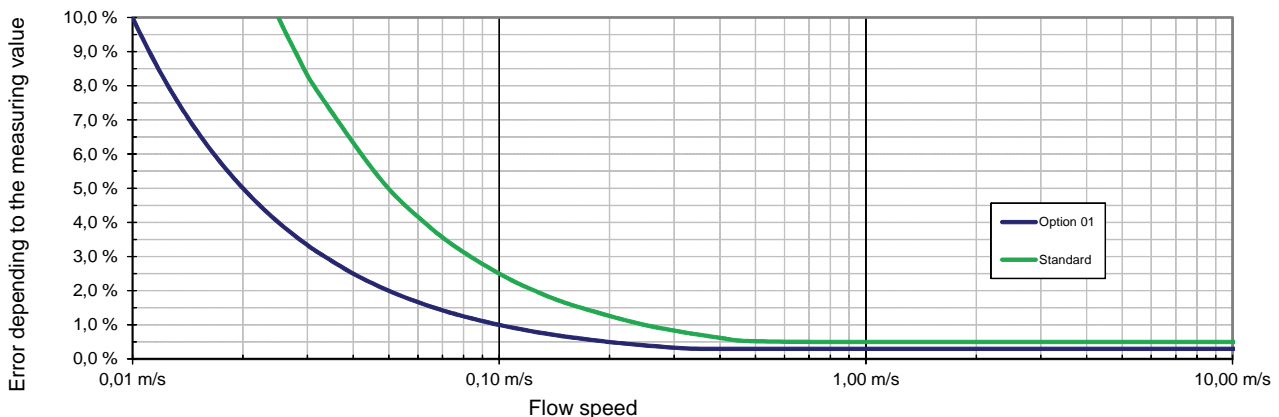
Outputs

Analog : 0/4..20 mA
 Switching outputs : 2 x Transistor PNP / NPN programmable
 max. 32 V DC, 100 mA
 programmable as:
 - impulse output (max. 10 kHz)
 - switching output
 - control input

Electrical connection : M12 plug, 5 pole
 Isolation : Sensor / supply, output / housing
Housing : electronic housing $\varnothing 79$ mm
 Material : 1.4305
 Protection class : IP67 / IP69K
Display : Graphic-LCD background illuminated
 Operation : 3 capacitive buttons

Mistakes reserved, technical specifications subject to change without notice..

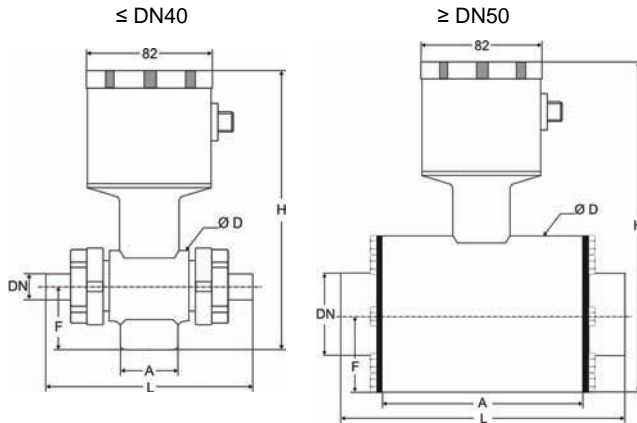
Error table accuracy 0.5 % (standard) and option 01 (0.3 %)



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Dimensions / process connection



Standard dimensions for welding connection

(Dimensions in mm)

Ø MFI DN	Connection DN	D	H	A	F	L
3	10	44	175	37	38.5	127
4	10	44	175	37	38.5	127
6	10	44	175	37	38.5	127
8	10	44	175	37	38.5	127
10	10	44	175	37	38.5	127
15	15	44	175	37	38.5	127
20	20	63	185	42	43	132
25	25	63	194	54	48	149
32	32	78	203	62	53	166
40	40	78	212	67	57	171
50	50	100	208	128	50	173
65	65	116	230	114	58	165
80	80	133	247	114	67	169
100	100	160	275	114	81	199

Valid for DIN 11850 range 1, DIN 11850 range 2 and
 DIN 11866 range A.

Dimensions of additional process connections

(Length over all L [mm])

DIN 11850 range 2 / DIN 11866 range A

DN	TriClamp DIN32676	Milk pipe DIN11851*	Aseptic flange DIN11864-1/ Form A	APV Flange with slot
3..10	163	169	165	--
15	163	169	165	--
20	168	180	174	--
25	192	207	201	197
32	209	230	226	--
40	214	237	233	219
50	216	243	235	221
65	221	245	237	213
80	225	259	253	217
100	255	307	299	247

only for DIN 11850 range 2

OD Tube / DIN 11866 range C

DN	TriClamp inch	Milk pipe DIN11851*	Aseptic flange DIN11864-1/ Form A
¼"	--	--	--
⅜"	--	--	--
½"	143.6	--	200.2
¾"	143.6	--	200.2
1"	175.6	191.0	184.6
1 ½"	267.0	290.0	286.0
2"	267.0	294.0	286.0
2 ½"	280.0	304.0	296.0
3"	225.0	249.0	253.0
4"	255.0	307.0	299.0

* only for OD Tube

DIN 11866 range B (ISO 1127)

DN	TriClamp ISO	Aseptic flange DIN11864-1/ Form A
3..10		168.6
15	162.6	178.6
20		284.0
25	267.0	286.0
32		296.0
40	280.0	253.0
50	225.0	269.0
65		--
80		--
100	--	--

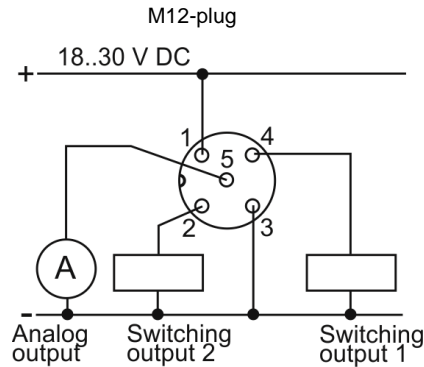
ISO 2037

DN	SMS threaded nozzle
3..10	
15	--
20	
25	179
32	200
40	211
50	213
65	
80	217
100	269

Product Information

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Connection diagram



Cable colors:
 1 = brown, 2 = white, 3 = blue, 4 = black, 5 = grey

Note:
 The MFI will be delivered with a basic device and its process connection. Please state both by order.

Ordering code of the basic device MFI447

MFI447 - 1. - 2. - 3. - 4.

1. Nominal diameter [mm]	003*, 004*, 006*, 008*, 010, 015, 020, 025, 032, 040, 050, 065, 080, 100
2. Electrode material	0 stainless steel 1.4539 (standard)
3. Mounted Electrodes	0 Flush mounted
4. Options	00 without option 01 accuracy ± 0.3 % for DN < 20mm 02 batch controlling

* At tube diameter < DN10 the measuring pipe will be also reduced to a smaller DN.

Ordering code process connection

APF 1. 2. 3. 4.

DIN 11850 range 1 (applications: food & beverage)

1. Connection standard [mm]	1 DIN 11850 range 1
2. Type	1 welded nozzle
3. 0	
4. Tube diameter DN [mm]*	010, 015, 020, 025, 032, 040, 050

DIN 11850 range 2 (applications: food & beverage)

1. Connection standard [mm]	2 DIN 11850 range 2
2. Type	1 welded nozzle 2 TriClamp 3 milk pipe DIN 11851 threaded nozzle 4 aseptic gland DIN 11864
3. 0	
4. Tube diameter DN [mm]*	010, 015, 020, 025, 032, 040, 050, 065, 080, 100

DIN 11866 range A (applications: pharmacy)

1. Connection standard [mm]	3 DIN 11866 range A
2. Type	1 welded nozzle 2 TriClamp 4 aseptic-gland DIN 11864
3. 0	
4. Tube diameter DN [mm]*	006, 008, 010, 015, 020, 025, 032, 040, 050, 065, 080, 100

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DIN 11866 range B (applications: pharmacy)

1. Connection standard [mm]	
4	DIN 11866 range B
2. Type	
1	welding nozzle
2	TriClamp
4	aseptic-gland DIN 11864
3. 0	
4. Tube diameter DN [mm]*	
006, 008, 010, 015, 020, 025, 032, 040, 050, 065, 080, 100	

DIN 11866 range C (applications: pharmacy)

1. Connection standard [mm]	
5	DIN 11866 range C
2. Type	
1	welding nozzle
2	TriClamp (> ½)
4	aseptic gland DIN 11864 (> ½)
3. 0	
4. Tube diameter DN [mm ("")]*	
006 (¼), 008 (3/8), 015 (½), 020 (¾), 025 (1), 040 (1 ½), 050 (2), 065 (2 ½), 080 (3), 100 (4)	

OD-Tube (applications: food & beverage)

1. Connection standard [mm]	
6	OD-Tube
2. Type	
1	welding nozzle
2	TriClamp (> ½)
4	aseptic gland DIN 11864 (> ½)
3. 0	
4. Tube diameter DN [mm ("")]*	
006 (¼), 008 (3/8), 015 (½), 020 (¾), 025 (1), 040 (1 ½), 050 (2), 065 (2 ½), 080 (3), 100 (4)	

ISO 2037 (applications: food & beverage)

1. Connection standard [mm]	
7	ISO 3037
2. Type	
1	welding nozzle
2	TriClamp (> ½)
4	aseptic gland DIN 11864 (> ½)
3. 0	
4. Tube diameter DN [mm]	
025, 032, 040, 050, 065, 080, 100	

Notes to interpretation of the mag flow

Information for mounting (installation position), installation and operation of the device will be find in the instruction manual.

Abrasive media

... existing of a mixture of water and a portion of float elements or solid particles of different grain size, e.g. loam, sand, cement, concrete etc., which can be very sharp edged according to the processing process.
 In dependence of the flow speed this can lead to a clearing away of the inner tube coating and a strong reduction of the product life span.

To avoid this, the following points are to be considered for abrasive media to the applications of magmeters:

- Speak about the case of applications with the manufacturer at first.
- If the device fulfills the standard, select a flow speed (< 1 m/s). This can be reached by the selection of a bigger measuring sensor diameter.
- The ideal installation is to be intended in a vertical mounting.

High adhering media

Sediments and adherents can be avoid by a higher flow speed. This can be reached by the selection of a smaller measuring sensor diameter.

Filmogenic and fatty-media

For this type of media (e.g. cream) peak electrodes will be preferred to use (on request). They reject the isolation of the electrodes (self-cleaning effect). This avoids the error of the measuring signal.

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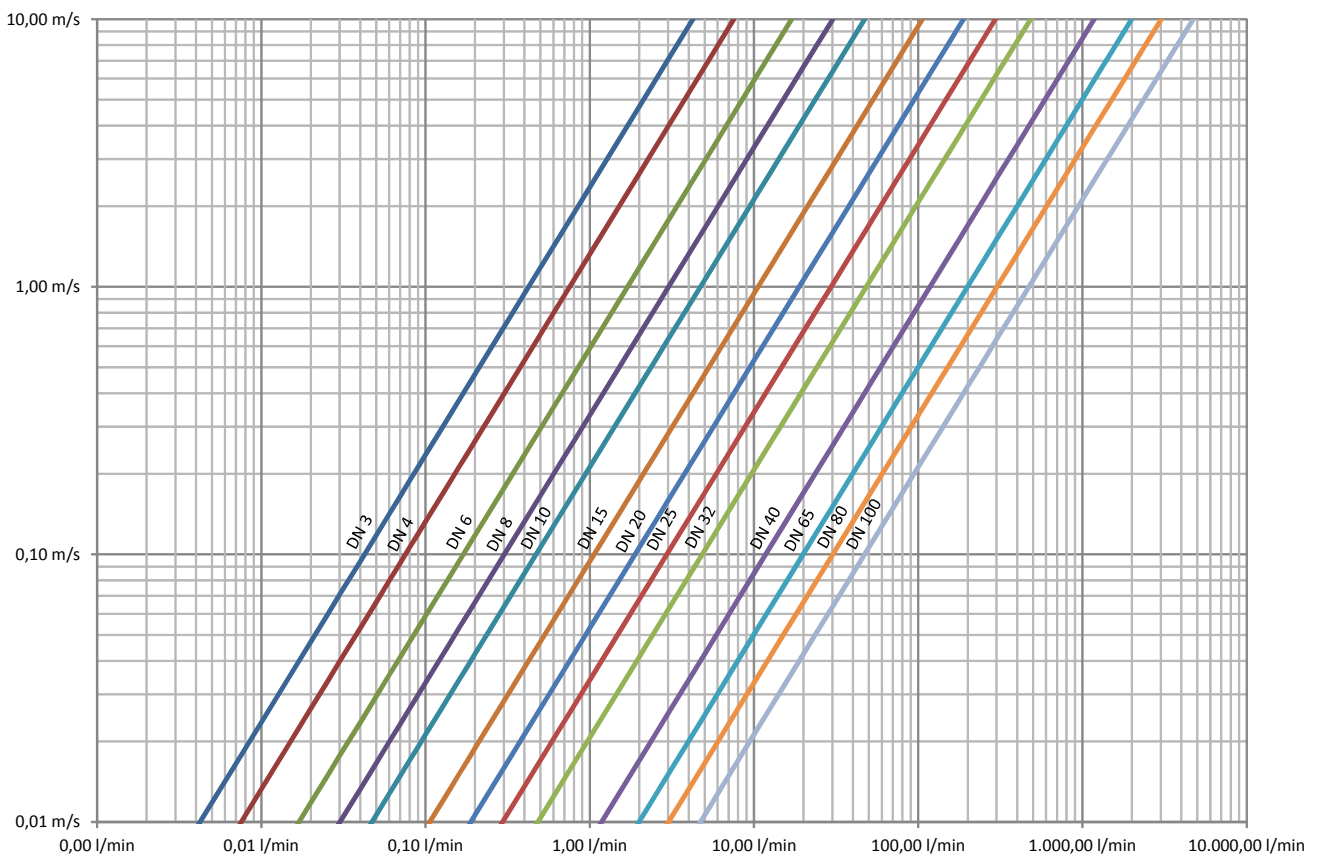
Vacuum stability

The measuring sensor fulfills by his high-quality, vacuum-stability and therefore form-stable smooth lining PFA the highest demands. He is resistant against high fluctuation in temperature (hot cold changing in CIP processes) or vacuum suction which occurs by emptying the tubes.

Dimensioning

At tube diameter < DN10, the measuring pipe has to be reduced to a smaller DN.

Conversion table l/min ↔ m/s



Product Information

Hygienic Design

Product overview

„Industrial Sensors and Instrumentation“

- Temperature
- Flow
- Level / Filling Height
- Analysis
- Humidity
- Pressure
- Weighing Instruments



„Process Instrumentation Hygienic Design“

- GHMadapt
- Temperature
- Flow
- Level / Filling Height
- Analysis



“Laboratory Instrumentation”



„Industrial Electronics“

- Displays / Controller
- Transmitter / Signal conditioning
- Isolating converters
- Safety and Monitoring Devices
- Power Electronics
- Calibration and Testing



“Measuring Data Acquisition”

- Data Logging and Monitoring
- Test Bench Measurement Technology
- Renewable Energies

