



## Magnetic-Inductive Flow Meter/Totalizer

Special · for Liquids



measuring  
·  
monitoring  
·  
analysing



- Measuring range:  
0.01 - 10 m/s
- No pressure loss with  
pipe restrictions
- Measurement result not  
affected by density, viscosity  
or temperature
- Analogue/frequency and  
status output
- High accuracy:  
0.5% of measured value
- Can be fully emptied,  
with nothing remaining
- Turndown ratio 1000 : 1



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**Model:**  
PMH-...



### Description

The new KOBOLD flow meter model PMH works according to the magnetic-inductive principle. In line with Faraday's law, a voltage is induced in a conductor which moves in a magnetic field. The conducting measured medium corresponds with moving conductor. The voltage induced is proportional to the flow velocity and thus a measure of the volume rate of the flow. Minimum electrical conductivity of 5  $\mu\text{S}/\text{cm}$  of the medium is a prerequisite. The induced voltage is fed to an instrument amplifier by two measuring electrodes which are in contact with the measured medium. The defined tube diameter is used to calculate the volumetric flow. Measurement is independent of the medium and its physical properties, such as density, viscosity and temperature.

### Fields of application

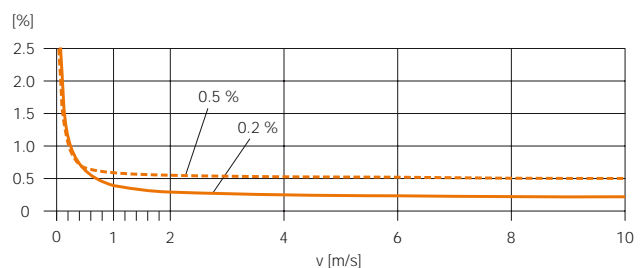
All volume flows of liquid media with electrical conductivity > 5  $\mu\text{S}/\text{cm}$  (for demineralized water > 20  $\mu\text{S}/\text{cm}$ ) can be measured.

- acids, alkalis
- pastes, slurries
- drinking water, waste water
- sewage sludge
- beer, wine, milk, mineral water
- spirits, molasses, fruit juice
- soft cheese etc.

### Technical details (Electronics)

Measuring range:	0.01 - 10 m/s
Turndown ratio:	> 1000 : 1
Minimum conductivity:	$\geq 5 \mu\text{S}/\text{cm}$ (liquids in general) $\geq 20 \mu\text{S}/\text{cm}$ (demineralized water)
Accuracy	
pulse output:	$\pm 0.5 \% \text{ f.s.} \pm 1 \text{ mm/s}$
current output:	additional typically $\pm 5 \mu\text{A}$

### Measurement error [%] of measured value



Repeatability:	$\pm 0.1 \% \text{ f.s.} \pm 0.5 \text{ mm/s}$
Calibration:	3 measuring points; 0.5 % 3 measuring points; 0.2 %
Media temperature at 40° C ambient temperature:	-40...+130° C (PTFE-gasket) -20...+150° C (PFA-gasket) -20...+180° C (PFA-gasket, high temperature)
Storage temperature:	-10 to +50° C
Ambient temperature:	-20 to +60° C
Max. pressure:	PN 40 / 25 / 16 / 10 (depending on nominal size) class 150 / 300 (depending on nominal size)
Inlet pipe straight:	$\geq 5 \times \text{DN}$
Outlet pipe straight:	$\geq 2 \times \text{DN}$
<b>Materials</b>	
Case material:	aluminium-casting powder-coated
Flange material:	
DIN:	steel ST37-2; stainless steel 1.4571
ANSI:	A105, 316L
Lining:	PFA or PTFE
Electrode material:	stainless steel 1.4435 or hastelloy C-22
Process flange:	DIN or ANSI flange
Cable entry fitting:	M20x1.5; 1/2 NPT; G 1/2



Switching/status output:	open collector, max. 30 V <sub>DC</sub> / 250 mA, configurable for: error messages, medium monitoring, direction of flow, limit values
Current output:	active/passive selectable; upper range value adjustable active: 0/4 - 20 mA, R <sub>L</sub> < 700 Ω passive: 4 - 20 mA; max 30 V <sub>DC</sub> ; R <sub>I</sub> ≤ 150 Ω
Pulse / frequency output:	passive, open collector, 30 V <sub>DC</sub> , 250 mA, electrically isolated, programmable as pulse or frequency output
Frequency output:	end frequency 2 - 1000 Hz (f <sub>max</sub> = 1250 Hz), mark to space ratio 1 : 1, pulse width max. 10 s
Pulse output:	pulse value and pulse polarity selectable, max. pulse width adjustable, (0.5 - 2000 ms)
Status input:	U = 3 - 30 V <sub>DC</sub> , R <sub>I</sub> = 5 kΩ configurable for: totalizer reset, measured-value suppression, reset error messages.
Creep suppression:	switching points for creep selectable
Galvanic isolation:	all circuits for inputs, outputs and auxiliary power are galvanically isolated.
Display:	LCD, illuminated, two lines - with 16 digits each, measured value /status indication, totalizer
Power supply:	85 - 260 V <sub>AC</sub> , 45 - 65 Hz 20 - 55 V <sub>AC</sub> , 45 - 65 Hz / 16 - 62 V <sub>DC</sub>
Power consumption:	< 15 VA (AC version) < 15 W (DC version)
Switching current:	max. 13.5 A (< 50 ms) at 24 V <sub>DC</sub> max. 3 A (< 5 ms) at 260 V <sub>AC</sub>
Protection:	IP 67
EMC:	EN 61326 Namur recommendation NE 21
Vibration resistance:	to 2 g (in accordance with IEC 68-2-6)
Weights:	see table dimensions

**Selection of nominal sizes**

The nominal size of the measuring sensor is normally determined by the pipe diameter. When flow volumes are known the table below can be used to decide whether the ideal flow velocity of approximately 2 - 3 m/s must be observed. If necessary, the nominal size of the measuring sensor can be reduced to increase the flow velocity. Higher installation costs can often be compensated by the low price of a transducer of smaller nominal size.

The flow velocity should be adapted to the physical properties of the measured medium:

- abrasive media: v < 2 m/s  
(putty, lime milk, ore wash etc.)
- blooming media: v > 2 m/s  
(for example, waste water sludge)



Nominal size		Recommended flow min/max upper range value (v ~ 0.3 or 10 m/s)	upper range value (v ~ 2.5 m/s)	Factory settings	
[mm]	[inch]			pulse value (~ 2 pulses/s)	creep (v ~ 0.04 m/s)
25	1"	9...300 dm <sup>3</sup> /min	75 dm <sup>3</sup> /min	0.50 dm <sup>3</sup>	1 dm <sup>3</sup> /min
32	1 ¼"	15...500 dm <sup>3</sup> /min	125 dm <sup>3</sup> /min	1.00 dm <sup>3</sup>	2 dm <sup>3</sup> /min
40	1 ½"	25...700 dm <sup>3</sup> /min	200 dm <sup>3</sup> /min	1.50 dm <sup>3</sup>	3 dm <sup>3</sup> /min
50	2"	35...1100 dm <sup>3</sup> /min	300 dm <sup>3</sup> /min	2.50 dm <sup>3</sup>	5 dm <sup>3</sup> /min
65	2 ½"	60...2000 dm <sup>3</sup> /min	500 dm <sup>3</sup> /min	5.00 dm <sup>3</sup>	8 dm <sup>3</sup> /min
80	3"	90...3000 dm <sup>3</sup> /min	750 dm <sup>3</sup> /min	5.00 dm <sup>3</sup>	12 dm <sup>3</sup> /min
100	4"	145...4700 dm <sup>3</sup> /min	1200 dm <sup>3</sup> /min	10.00 dm <sup>3</sup>	20 dm <sup>3</sup> /min
125	5"	220...7500 dm <sup>3</sup> /min	1850 dm <sup>3</sup> /min	15.00 dm <sup>3</sup>	30 dm <sup>3</sup> /min
150	6"	20...600 m <sup>3</sup> /h	150 m <sup>3</sup> /h	0.025 m <sup>3</sup>	2.5 m <sup>3</sup> /h
200	8"	35...1100 m <sup>3</sup> /h	300 m <sup>3</sup> /h	0.05 m <sup>3</sup>	5.0 m <sup>3</sup> /h
250	10"	55...1700 m <sup>3</sup> /h	500 m <sup>3</sup> /h	0.05 m <sup>3</sup>	7.5 m <sup>3</sup> /h
300	12"	80...2400 m <sup>3</sup> /h	750 m <sup>3</sup> /h	0.10 m <sup>3</sup>	10 m <sup>3</sup> /h

Order details (example: **PMH-25 E A 0 1 1 A 1 W**)

Nom. size	Model	Lining	Connection	Gasket/ Electrode material	Calibration/ approval	Design
DN 25	<b>PMH-25</b>	E = PTFE lining A = PFA lining B = PFA lining, high temperature	A=steel flange PN 40 (up to DN 150) B=steel flange PN 25 (as of DN 200) C=steel flange PN 16 (as of DN 65) D=steel flange PN 10 (as of DN 200) F=st. steel flange PN 40 (up to DN 150) G=st. steel flange PN 25 (as of DN 200) H=st. steel flange PN 16 (as of DN 65) K=st. steel flange PN 10 (as of DN 200) L=ANSI flange CI 150; A105* M=ANSI flange CI 300; A105** R=ANSI flange CI 150; 316L* S=ANSI flange CI 300; 316L**	0 = without gasket/ 1.4435 1 = without gasket/ Hastelloy 22	1 = 0.5 % - calibration 2 = 0.2 % - calibration	1 = compact version 4 = separate version with 5 m of cables 5 = separate version with 10 m of cables 7 = separate version specify cable length in the plain text
DN 32	<b>PMH-32</b>					
DN 40	<b>PMH-40</b>					
DN 50	<b>PMH-50</b>					
DN 65	<b>PMH-65</b>					
DN 80	<b>PMH-80</b>					
DN 100	<b>PMH-1H</b>					
DN 125	<b>PMH-1Z</b>					
DN 150	<b>PMH-1F</b>					
DN 200	<b>PMH-2H</b>					
DN 250	<b>PMH-2F</b>					
DN 300	<b>PMH-3H</b>					

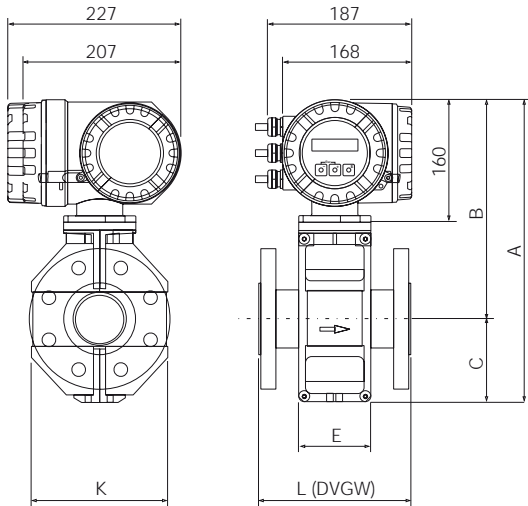
\*(only DN 25 / 40 / 50 / 80 / 100 / 150 / 200 / 250 / 300)

\*\* (only DN 25 / 40 / 50 / 80 / 100 / 150)

Order details (continuation)

Cable gland	Power supply	Output
A = thread: M20x1.5 including Screwing B = thread: ½ NPT C = thread: G ½	1 = 85 - 260 V, 50/60 Hz 2 = 20 - 55 V, 50/60 Hz and 16 - 62 V <sub>DC</sub>	W = current output A = current and frequency output D = current, frequency status output; status input

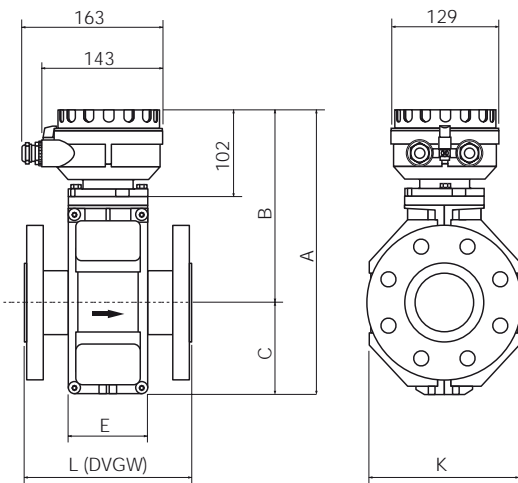
**Dimensions**



DN	L	A	B	C	K	E	Weight	
DIN [mm]	ANSI [inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	
25	1"	200	341	257	84	120	94	7.3
32	-	200	341	257	84	120	94	8.0
40	1 1/2"	200	341	257	84	120	94	9.4
50	2"	200	341	257	84	120	94	10.6
65	-	200	391	282	109	180	94	12.0
80	3"	200	391	282	109	180	94	14.0
100	4"	250	391	282	109	180	94	16.0
125	-	250	472	322	150	260	140	21.5
150	6"	300	472	322	150	260	140	25.5
200	8"	350	527	347	180	324	156	35.3
250	10"	450	577	372	205	400	156	48.5
300	12"	500	627	397	230	460	166	57.5

Mounting length (L) always the same, regardless of selected nominal pressure.

**Separate version**



DN	L	A	B	C	K	E	Weight	
DIN [mm]	ANSI [inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	
25	1"	200	286	202	84	120	94	5.3
32	-	200	286	202	84	120	94	6.0
40	1 1/2"	200	286	202	84	120	94	7.4
50	2"	200	286	202	84	120	94	8.6
65	-	200	336	227	109	180	94	10.0
80	3"	200	336	227	109	180	94	12.0
100	4"	250	336	227	109	180	94	14.0
125	-	250	417	267	150	260	140	19.5
150	6"	300	417	267	150	260	140	23.5
200	8"	350	472	292	180	324	156	33.3
250	10"	450	522	317	205	400	156	46.5
300	12"	500	572	342	230	460	166	55.5

Mounting length (L) always the same, regardless of selected nominal pressure.

## Pressure Measurement

Bourdon Tube Pressure Gauges · All St. Steel Pressure Gauges  
Membrane Diaphragm Seals · Diaphragm Pressure Gauges  
Contact Manometer · Digital Manometer · Pressure Transducer  
Pressure Sensors



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