

FG4000 - electromagnetic flow meter



The FG4000 magnetic flow meter is primarily designed for a wide range of industrial applications. Flow is determined on the electromagnetic induction principle that allows measuring it without any mechanical parts in the metering profile, which results in virtually no pressure drop.

The FG4000 flow meter is a highly reliable instrument that offers accurate flow measurement in liquids at long-term stability. This flow meter further features a wide flow range while maintaining measurement accuracy with fast response to flow fluctuations. An alphanumeric display and three membrane keys provide comfortable operation. Last but not least, accent is put on design user-friendliness, such as easy access to the connectors.

The basic structure comprises a rigid aluminium casting that allows four positions of the flowtube in a horizontal or vertical pipe line while the correct operation position of the stainless steel front panel with display and membrane keys is always provided. The FG4000 flow meter advanced industrial design satisfies stringent requirements for mechanical as well as chemical resistance

thus allowing to use the instrument under most rigorous conditions. The flow meter has ingress rating IP67 while its increased resistance against electromagnetic interference in compliance with category E2 pursuant to EN ISO 4064-5 may be stressed.

The FG4000 measuring unit allows you to connect a wide range of electromagnetic sensors from the most commonly used flanged, sandwich, threaded, food grade to customized versions, limited only by the dimensions given by the technical possibilities.

Integration of flowmeters into third-party extension systems, such as control, visualization and other systems, is enabled by standard pulse or analogue outputs. For a more sophisticated systems, the communication interface with open MeterBUS, RS485 (ModBUS, BitBUS, ASCII, simple), RS232 (ModBUS, Simple) protocols is determined.

The flowmeter can be equipped with an empty pipe detection function. This function is for cases where the permanent flooding requirement of the sensor can not be met.

The measuring unit is also available as an ECONOMIC variant (without the display and keypad). This option is for applications where the flowmeter only serves as a flow and volume variable to the parent system.

Principal Features:

- Wafer, flanged or custom flowtubes
- compact or split design
- applicability in chemical and food industries as well as in potable water treatment (stainless steel flowtube)
- customizable view of measurement values on display
- operation setup (flow conversion coefficient, type of communication and its transmission rate, measuring dynamics, etc.) using membrane keys or application software
- flowtube replaceability (each flowtube has its own calibration constants)
- accessories – installation set (iron, stainless steel or made to customer specifications)
- Visual application software
- bidirectional flow measurement (separate counter for each direction)
- self-diagnostics – instrument status indicated on display
- volumetric monitoring on up to 5 resettable flow rate totalizers (counters)
- monitoring of maximum flow reached within a time interval
- option to connect up to two external devices (flow meters) to pulse inputs and to display their flow rate and volume information
- easy integration into other manufacturers' host systems using pulse frequency modulation or analogue outputs
- optional temperature measurement module
- archiving of date time stamped measurement data for up to one year in non-volatile memory
- uptime records
- power failure and error condition records

FG4000 flow meter specifications:

• Measure unit:	comfort, economic (without display and keypad)
• Measuring range:	1 :40 ($\pm 0,5\%$ for MPE standard); 1:500 ($Q_0=0,2\% Q_{max}$)
• Accuracy:	$\pm 0.5\%$ ($\pm 0.003\text{m/s}$) in range from Q_{min} to Q_{max}
• Minimum liquid conductivity:	$>5\mu\text{S/cm}$ – common liquids; $\geq 20\mu\text{S/cm}$ – demineralized water
• Power supply:	230 VAC (+10%;-15%) 50–60Hz; optionally 120VAC, 24VAC, 24VDC
• Power demand:	10 VA
• IEC 536 protection class:	I
• Ingress protection rating:	IP67
• Meter finish:	powder paint (RAL 8023)
• Ambient temperature range:	0–70°C; recommended 15–55°C
• Pulse output 1:	in range 0.0001–1600 p/dm ³ (maximum value depends on flowtube inner diameter)
• Pulse output 2:	state – signalization of the negative flow; pulse – negative volume (bidirectional flow)
• Pulse inputs:	2× range (0.0001–1000 p/dm ³) to display flow and/or volume measured by external
• Empty pipe detection:	yes (optional)
• Communication modules:	RS485, RS422, RS232, M-Bus, ... (optional)
• Communication protocols:	SIMPLE, ModBUS, BitBUS, ASCII , MBUS
• Analogue outputs:	4–20mA, 0–10V (optional)
• Archive:	hourly, monthly, errors,... (optional)

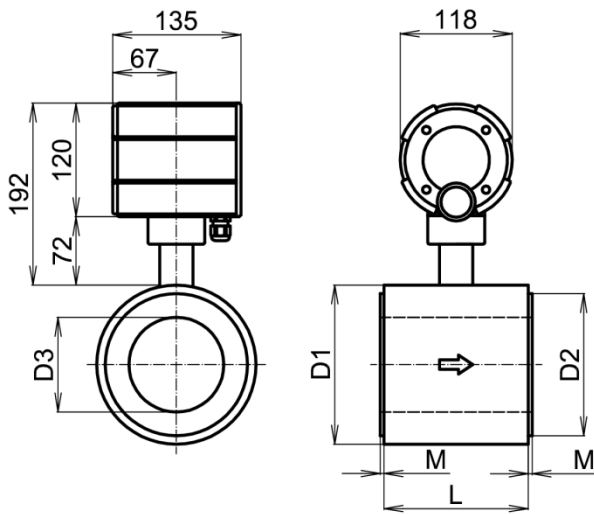
Flowtubes included:

• Flowtube nominal inner diameter:	DN10 through DN600
• Flowtube design:	flange, wafer, DIN 11851 threading, DIN 32676 clamp, G threading, ...
• Flowtube connection:	compact; split – 4m cabling (optionally up to 40m)
• Flowtube liner:	hard or soft rubber; PTFE; ECTFE
• Electrodes:	316L grade (1.4571) stainless steel; Hastelloy C; platinum; tantalum; titanium
• Nominal pressure:	DIN, EN1092: PN10, PN16, PN25, PN40; ANSI: 150lb, 300lb
• Temperature range of liquid under	0–150°C (PTFE); 0–90°C (rubber)
• Flowtube finish:	powder paint (RAL 7043); brushed stainless steel
• Ingress protection rating:	IP67 (IP68 optionally)

Dimensions of flow meter:

(For dimensions of flow tubes see the concrete model)

Compact design:



Split design:

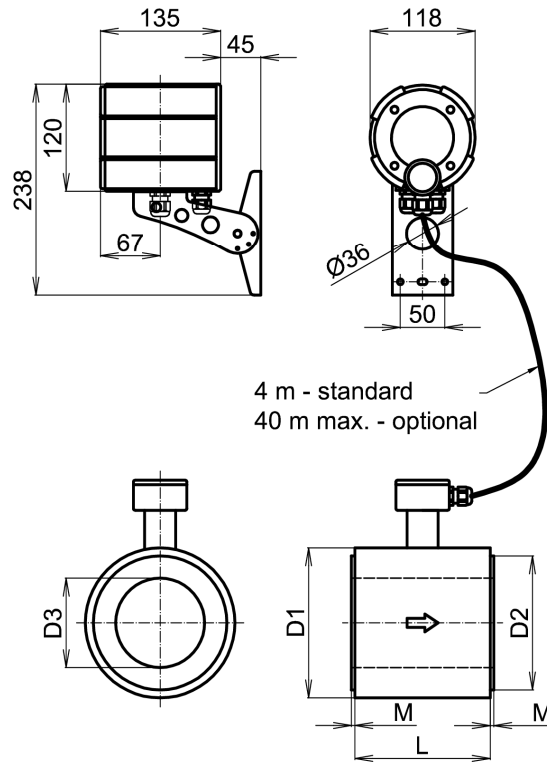


Table of included inner diameters:

FG 4000	Flanged flowtubes „F“																			
	Wafer flowtubes „W“																			
	Wafer flowtubes – stainless steel „W-ss“																			
DN	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Q ₀ (m ³ /h)	0,01	0,02	0,03	0,04	0,07	0,11	0,17	0,29	0,43	0,68	1,06	1,53	2,7	4,2	6,1	8,3	10,9	13,7	17,0	24,4
Q ₁ (m ³ /h)	0,08	0,19	0,34	0,53	0,87	1,36	2,12	3,58	5,43	8,48	13,2	19,1	34,0	53,0	76,0	104	136	172	212	305
Q ₃ (m ³ /h)	3,39	7,63	13,6	21,2	34,7	54,3	84,8	143	217	339	530	763	1360	2120	3050	4160	5431	6867	8480	12200
k (Imp/ dm ³)	1600	700	400	200	150	100	60	35	25	15	10	7	4	2,5	1,6	1,25	1	0,75	0,5	0,4

Legends:

DN - Flowtube nominal inner diameter, Q₀ – Starting flow, Q₁ – Minimal flow, Q₃ - Maximal flow, k – Maximal constant of flow conversion