

Battery-Powered Electromagnetic Flowmeter Type M5000

Description

The M5000 is a battery-powered electromagnetic flow meter with a very high accuracy even at very low flows. The excellent repeatability as well as the above-average battery life makes this innovative water meter indispensable for the water market. Typical applications are leak detection in water networks, water consumption measurements and irrigation plants.

The meter is best suited for applications without a power supply where exact consumption or flow rates are required. Of course, the M5000 can also be used with an available power supply. The meter can be powered with main voltage and in case of a main failure, it is powered by an internal battery. Important data are consequently saved.

The M5000 has been designed for very harsh environmental measurement conditions. The meter has no moving parts and can be used to measure water containing particles like sand or gravel. The M5000 is encased in an IP67 housing (optional IP68), which makes it a reliable meter even when submerged.

The standard meter is equipped with an internal datalogger which can read-out via an IrDA or RS232 interface with ModBus® RTU protocol. The collected data can also be retrieved via radio frequency or GSM/GPRS. The data can thus be centrally compiled and evaluated.

M5000 can be checked without process interruption with the Verification Device.

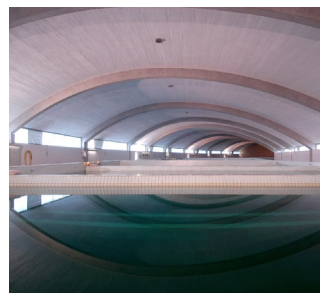


Measuring principle

The operating principle of the electromagnetic flow meter is based on Faraday's law of magnetic induction: The voltage induced across any conductor, as it moves at right angles through a magnetic field, is proportional to the velocity of that conductor. The voltage induced within the fluid is measured by two diametrically opposed internally mounted electrodes. The induced signal voltage is proportional to the product of the magnetic flux density, the distance between the electrodes and the average flow velocity of the fluid.

Features

- **Up to 12 years battery life span,**
- **Accuracy better than $\pm 0,4\%$,**
- **Measuring range of 0,03 to 12 m/s,**
- **Sizes from DN 15 to DN 600,**
- **ACS, OIMLR49-1 and MID MI-001 approved,**
- **LCD display,**
- **IP 67 / IP 68 protection class,**
- **RS232, IrDA, Modbus® interfaces,**
- **Integrated Datalogger function,**
- **Verification Device.**



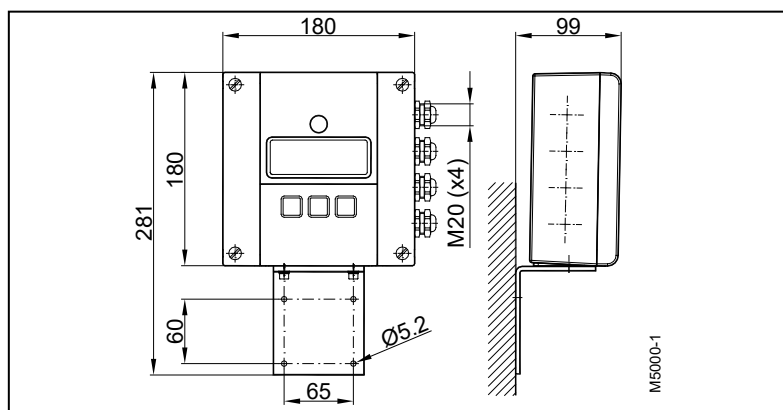
Verification device

All important parameters of the flow meter are measured, protocolled and evaluated. The accuracy of the amplifier and of the in-/outputs as well as the functionality of the detector are measured without process interruption more easily, more precisely and better secured.

The verification device enables to check the perfect and exact functionality of the electromagnetic flow meters types M2000 and M5000 on site in regular time intervals at a low cost and without interruption of the process. The device is verifying that the MAG meter's calibration is still ranging between $\pm 1\%$ of the primary factory calibration.



Dimensions of converter



Technical data

Power supply	Internal Lithium batteries 3,6 V Optional battery back-up model (AC)
Sizes	DN 15 to DN 600 (PTFE / hard rubber)
Battery life span	6 years, optional 12 years
Display	LCD, 2 lines
Programming	3 keys
Measuring range	0,03 – 12 m/s
Accuracy	$\geq 0,5$ m/s better than $\pm 0.4\%$ accuracy of rate $< 0,5$ m/s $\pm 2,5$ mm/s of rate
Repeatability	0.1%
Minimum fluid conductivity	≥ 20 $\mu\text{s/cm}$
Flow direction	Bidirectional
Low-flow detection	Separate electrode
Digital outputs	4 x open collector, passive 30 VDC/20 mA, max. 100 Hz
Status outputs	Min./max. alarm, flow direction, failure report
Serial communication	RS232, ModBus® RTU, IRDA External AMR or GSM/GPRS module (optional)
Datalogger	Integrated
Low-flow cut off	0-10%
Pulse width	Programmable up to 500 ms.
Housing	Powder coated cast aluminium
Protection class	IP67 (IP68 optional)
Cable entry	Signal cable (outputs) M20
Signal cable	From detector M20
Remote version	Max. 30 m
Ambient temperature	-20°C to 60°C

Wireless data recording

Fuji Electric offers the possibility to record wireless the measuring data you are getting from our flow meters. Those data are transmitted to and filed on a central server via a GPRS module. The information can be retrieved, visualised, evaluated and downloaded via a password protected access; the password is set by the customer.

Advantages

- Low investment costs,
- Cost saving as against classical data recording,
- Wireless measuring sites,
- Access via internet independently from location,
- Optimization of global applications,
- Ideal for measuring sites in difficult areas,
- High flexibility thanks to the extremely small space requirement and quick installation of the GPRS module,
- Makes service, maintenance and putting into operation easier.

Applications

- Consumption monitoring and leakage reduction in water supply systems,
- Precise flow metering in large channels and rivers for the monitoring of navigability and issue of flooding forecasts,
- Monitoring and alarm of overflow basins for rainwater, sewage plants, storm water overflow plants,
- Control of irrigation plants,
- Level monitoring, alarm for automatical filling and connection to the supplying system.



Detector type VI

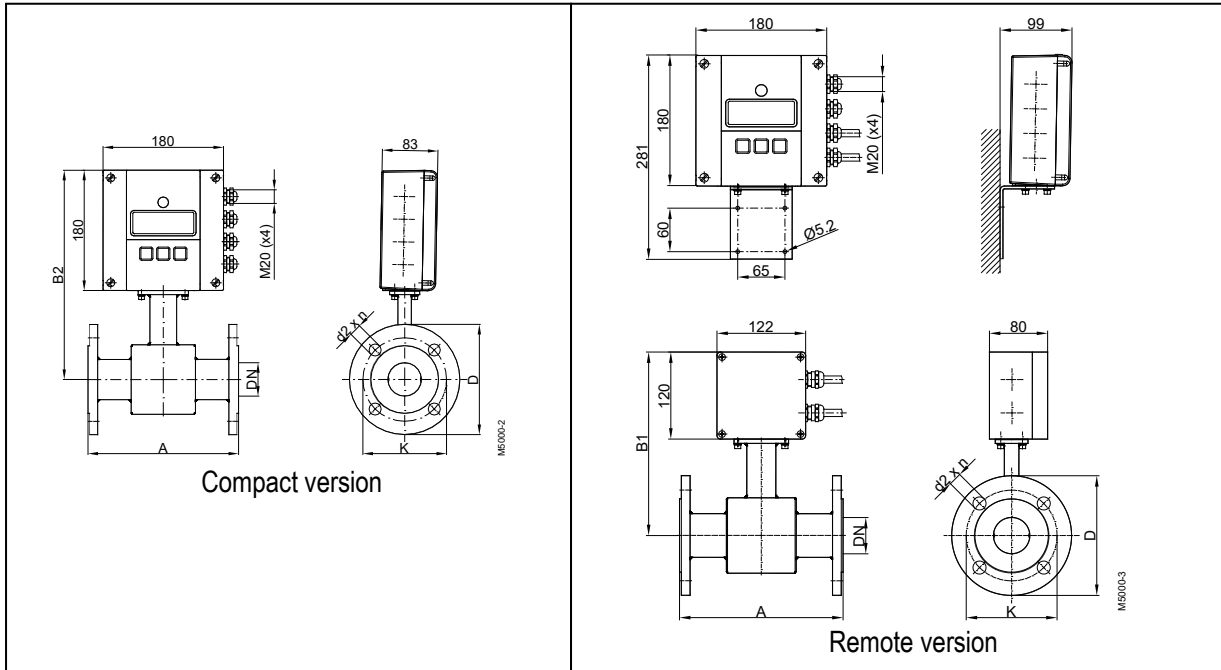
Flange process connection



The electromagnetic detector type VI is available with different flange process connections (DIN, ANSI, JIS, AWWA, etc.) and liners like hard rubber or PTFE. Available in sizes from DN 15 to DN 600 and nominal pressures up to PN 100, the detector type VI is best suited for a variety of flow counting applications in the water industry.

Size	DN 15 – 600 (1/2" ... 24")		
Process connections	Flange: DIN, ANSI, JIS, AWWA, etc		
Nominal pressure	up to PN 100		
Protection class	IP67, optional IP68		
Min. conductivity	≥ 20 µS/cm		
Liner materials	Hard rubber	from DN 25	0°C up to +80°C
	PTFE	DN 6 – 600	-40°C up to +150°C
Electrodes materials	Hastelloy C (standard), Tantal Platinum / Gold plated, Platinum / Rhodium		
Housing	Steel / Optional stainless steel		
Approval	WRAS, KTW, NSF-61, DVGW-W270 and ACS for drinking water (Hard rubber only) OIMLR49-1 and MID MI-001		

Dimensions (mm)



DN		A*	B1	B2	with ANSI-flanges			with DIN-flanges		
					∅ D	∅ K	∅ d2xn	∅ D	∅ K	∅ d2xn
15	1/2"	200	238	298	88,9	60,3	15,9 x 4	95	65	14 x 4
20	3/4"	200	238	298	98,4	69,8	15,9 x 4	105	75	14 x 4
25	1"	200	238	298	107,9	79,4	15,9 x 4	115	85	14 x 4
32	1 1/4"	200	253	313	117,5	88,9	15,9 x 4	140	100	18 x 4
40	1 1/2"	200	253	313	127	98,4	15,9 x 4	150	110	18 x 4
50	2"	200	253	313	152,4	120,6	19 x 4	165	125	18 x 4
65	2 1/2"	200	271	331	177,8	139,7	19 x 4	185	145	18 x 4
80	3"	200	271	331	190,5	152,4	19 x 4	200	160	18 x 8
100	4"	250	278	338	228,6	190,5	19 x 8	220	180	18 x 8
125	5"	250	298	358	254	215,9	22,2 x 8	250	210	18 x 8
150	6"	300	310	370	279,4	241,3	22,2 x 8	285	240	22 x 8
200	8"	350	338	398	342,9	298,4	22,2 x 8	340	295	22 x 12
250	10"	450	362	422	406,4	361,9	25,4 x 12	395	350	22 x 12
300	12"	500	425	485	482,6	431,8	25,4 x 12	445	400	22 x 12
350	14"	550	450	510	533,4	476,2	28,6 x 12	505	460	22 x 16
400	16"	600	475	535	596,9	539,7	28,6 x 16	565	515	26 x 16
450	18"	600	500	560	635,0	577,8	31,7 x 16	615	565	26 x 20
500	20"	600	525	585	698,5	635,0	31,7 x 20	670	620	26 x 20
550	22"	600	550	610	749,3	692,1	34,9 x 20	---	---	---
600	24"	600	588	648	812,8	749,3	34,9 x 20	780	725	30 x 20
Standard										
with ANSI-flanges		from 1/2" – 24"			150 lbs					
with DIN flanges		from DN 15 – 200			PN 16					
		from DN 250 – 600			PN 10					
* ISO 13359 from DN 15 to DN400										

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