

FMI100 – Electromagnetic Flow Meter

- ▶ No moving parts – easy to maintain; No pressure drop due to no choked flow parts.
- ▶ Medium conductivity could be as low as 5µs/cm. With appropriate lining, FEM100 is good for acidic, alkali, neutral salts solutions. High accuracy: ±0.5%, ±0.3%
- ▶ FEM100 is for volume flow rate measuring, which is independent to flow pressure, temperature, density and viscosity
- ▶ Since the induced voltage is generated in the space filling with magnetic field, which is pipe average cross-section area, only a shorter straight pipe section is needed upstream and downstream, typically 5D upstream and 3D downstream.
- ▶ Corrosion resistance and abrasion resistance can be achieved by choosing appropriate materials for the wetted parts(lining and extrode)
- ▶ Converter features: High reliability; high accuracy; lower power consumption; stable "Zero" output; easy to use; LCD displayer for flow velocity, total flow rate etc
- ▶ Dual direction measuring – forward flow and reverse flow
- ▶ LCD displayer, easy to learn and use
- ▶ 16 bit embedded processor: high speed, high accuracy, low frequency rectangle wave excitation; stable performance. lower power consumption
- ▶ Strong interference resistance capability, high mesuring accuracy
- ▶ Digital output: RS485, RS232, Hart and Modbus



The operation of FMI100 is based upon Faraday's Law, which states the voltage(E) induced across any conductor as it moves at right angles through a magnetic field(B) is proportional to the velocity(V) of that conductor. For FEM100, the conductor is the conductive medium.

$$E=KBVD$$

E = The voltage generated in a conductor. K = Constant.

B = The magnetic field strength. V = The velocity of the conductive medium.

D = The distance between probes.

E will be processed and output as standard electrical signal.

Applications

- ▶ Conductive liquid with conductivity $\geq 5\mu\text{s/cm}$ (the conductivity of raw water is 100...5005µs/cm)
- ▶ Acidic, alkali and neutral salts solutions
- ▶ Mud, slurry, paper pulp etc.
- ▶ Petrochemical, power plant, metallurgy, textile, food, pharmaceutical, paper industry, environment protection, water conservancy

Flow Range m3/h

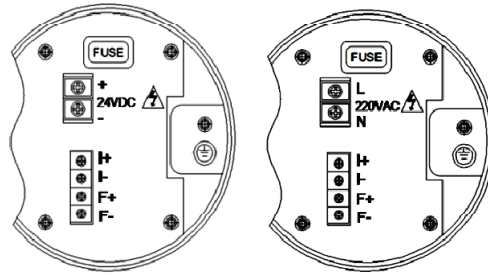
Nominal	Measurable	Useful measuring	Nominal	Measurable	Useful measuring
10	0.0142~3.3912	0.0848~2.826	300	12.717~3052	76.302~2543
15	0.0318~7.6302	0.1908~6.3585	350	17.31~4154	103.86~3461
20	0.0566~13.5648	0.3392~11.304	400	22.61~5425	135.65~4521
25	0.0883~21.195	0.5298~17.6625	450	28.62~6867	171.68~5722
32	0.1447~34.7258	0.8682~29.9382	500	35.33~8478	211.95~7065
40	0.2261~54.2592	1.3565~45.216	600	50.87~12208	305.2~10173
50	0.3533~84.78	2.1195~70.65	700	69.24~16616	415.4~13847
65	0.5970~143.28	3.5819~119.39	800	90.44~21703	542.6~18086
80	0.9044~217.03	5.4259~180.86	900	114.46~27468	686.7~22890
100	1.413~339.12	8.478~282.6	1000	141.3~33912	847.8~28260
125	2.2079~529.87	13.2468~441.56	1200	203.5~48833	1221~40694
150	3.1793~763	19.0755~635.85	1400	277~66467	1662~55389
200	5.652~1356	33.912~1130.4	1600	361.8~86814	2171~72345
250	8.8313~2119	52.9875~1766	1800	457.9~109874	2747~91562

Specifications

Velocity range	0.25 – 10m/s
Nominal diameter	DN10...DN1000
Applicable medium	Liquid with conductivity > 5µs/cm
Accuracy	0.25%, 0.5%
Repeatability	±0.15% of flow rate
Operating voltage	220VAC±10%; 24VDC±10% Lithium-ion battery
Output signal	Current: 4...20mA
	Pulse: frequency 0-1KHZ
	Communication protocol: RS485, RS232, HART, Modbus (optional)
Operating pressure	DN10—DN65: ≤2.5Mpa
	DN80—DN150: ≤1.6Mpa
	DN200—DN1200: ≤1.0Mpa
	(Customization available)
Electrode material	Platinum, Hastelloy, 316 stainless steel, Tantalum, Titanium, Wolfram Carbide
Lining material	PTFE(≥DN25), Neoprene(≥DN65), F46, Polyurethane
Housing, flange material	Carbon Steel(standard), stainless steel (customizable)
Excitation method	Low frequency rectangle wave, High frequency excitation
Excitation current	160mA
Medium Temp.	-20℃~90℃~130℃~180℃(Refer to lining material)
Ambient Tmp.	Sensor: -40℃~80℃; Converter: -15℃~60℃
Ambient humidity	≤85%RH (20℃)
Power consumption	less than 20W
Structure	Integral type, Remote type
Electrical connection	M20×1.5
Grounding	Grounding ring, grounding electrode, grounding pipe
Exproof	ib II BT4
Process connection	Flange
Protection class	Integral type: IP65; Remote type: IP65 or IP68
Lining material	PTFE(≥DN25), Neoprene(≥DN65), F46, Polyurethane
Optional surge absorber	Protect the interface and converter, good for harsh applications
Auto "zero" calibration	See manual for details
Self-monitoring and diagnostic functions	Catch errors of citation circuit, electrode circuit as well as convert and alert
Empty and full pipe detection	Detect empty or full pipe by capacitance technology
Instantaneous/total flow rate /dual direction flow	Measuring both forward and reverse flow
Adjust flow direction on-line function	See manual for details
Multiple flow rate unit available	m3/h, l/h, kg/h, t/h, m3/m. l/m.
Damping time set	From 0.5 to 199.5S
Small signal removal	Adjustable in 0-10%, no pulse output for any signal less than settings.
Small flow rate removal	Adjustable in 0-10%, no pulse output for any signal less than settings.
Multiple outputs selectable	4~20mA, 0 ~5KHz, pulse.
Display	Display instantaneous flow rate in percentage, instantaneous flow rate and total flow rate at same time.
Totalizer reset	See manual for details
Totalizer pre-set	See manual for details
Multiple excitation frequency selectable	6.25 Hz/12.5 Hz/25Hz
Power supply selectable	DC: 18V~36V or AC: 85V~265V

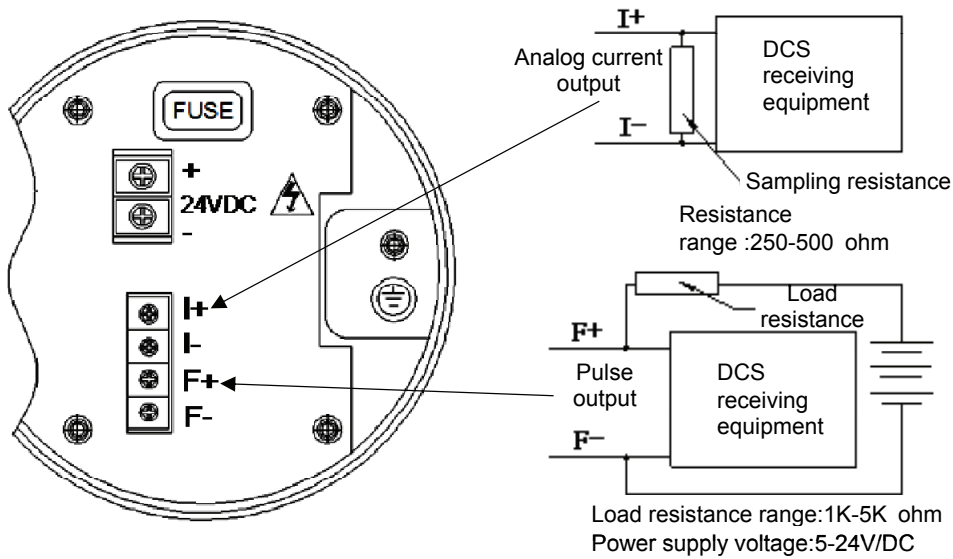
FLOW

Wiring 1 (Integral type)



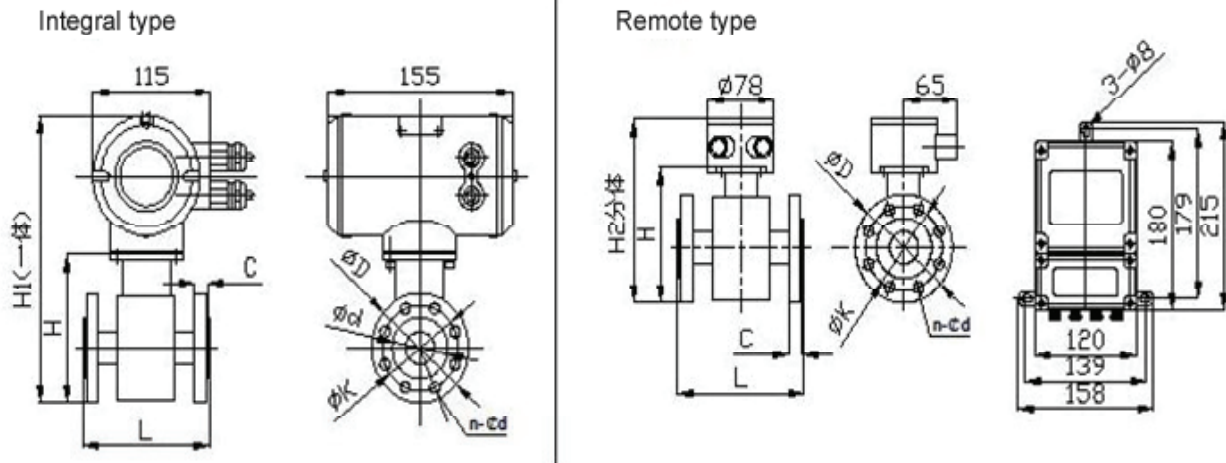
	Symbol	Description	Comments
L	L	AC 85~265v power supply	Ac220v power supply
N	N	AC 85~265v power supply	Ac220v power supply
+	+	DC 18~36v power supply +	24v+ Power supply
-	-	DC 18~36v power supply -	24v- Power supply
1	I+	4~20mA output+	Load resistance $\leq 500\Omega$
2	I-	4~20mA output-	
3	F+	Pulse output +	Passive pulse output , Load current $\leq 20\text{mA}$
4	F-	Pulse output -	

Wiring 2 - connecting to control system (Integral type)



1. Connecting for analog current output: 4~20mA DC signal output, Max. load resistance 500 ohm.
2. Connecting for passive pulse output: Transistor output, Pulse frequency 0~5kHz, load current 20mA.

Dimensions in inches (mm)



DN	L (mm)	H	H1	H2	D	K	n- ϕ d	C	Pressure	Weight(kg)
10	160(F46)	130	247	180	95	65	4- ϕ 14	14	PN4.0	6.6
15		135	252	185	95	65	4- ϕ 14	14		6.5
20		143	260	193	105	75	4- ϕ 14	16		6.4
25	160 (PTFE)	123	240	173	115	85	4- ϕ 14	16		6.2
32	165 (F46)	150	267	200	140	100	4- ϕ 18	18		7.2
40	195 (PTFE)	160	277	210	150	110	4- ϕ 18	18		8.3
50	200 (F46)	173	290	223	165	125	4- ϕ 18	20		10
65	195 (PTFE)	183	300	233	185	145	4- ϕ 18	20	PN1.6	10.5
80	200	206	323	256	200	160	8- ϕ 18	20		11.4
100	245 (PTFE)	225	342	275	235	180	8- ϕ 18	22		14.5
125	250	255	372	305	250	210	8- ϕ 18	22		17.5
150	295 / 300	287	405	337	285	240	8- ϕ 22	24		23
200	345 / 350	344	461	395	340	295	12- ϕ 22	26	32	
250	395 / 400	396	512	446	395	350	12- ϕ 22	26	44	
300	495 / 500	450	565	500	445	400	12- ϕ 22	28	56	
350		510	625	560	500	460	16- ϕ 22	30	71	
400	595 / 600	560	675	610	565	515	16- ϕ 26	32	94	
450		610	725	660	615	565	20- ϕ 26	35	106	
500		660	775	710	670	620	20- ϕ 26	38	129	
600		770	885	820	780	725	20- ϕ 30	42	203	
700	700	910	1025	960	895	840	24- ϕ 30	30	320	
800	800	1020	1135	1070	1010	950	24- ϕ 34	32	450	
900	900	1120	1235	1170	1110	1050	28- ϕ 34	34	580	
1000	1000	1220	1335	1270	1220	1160	28- ϕ 36	34	700	
1200	1200	1410	1525	1460	1400	1340	32- ϕ 33	60	900	
1400	1400	1620	1735	1670	1620	1560	36- ϕ 36	68	1150	
1600	1600	1850	1965	1900	1880	1760	40- ϕ 36	76	1450	
1800	1800	2040	2155	2100	2045	1970	44- ϕ 39	84	1780	
2000	2000	2250	2365	2300	2265	2180	48- ϕ 42	92	2100	

Order Code

FMI :	Electromagnetic flow meter
100 :	Series #
Nominal diameter :	DN0010...DN1000 (Customizable)
Output type	
N :	No output
A :	4...20mA output
P :	Pulse output
N :	No display
C :	LCD display

FMI	100	DN0100	A	N	K	F	1	B	D
------------	------------	---------------	----------	----------	----------	----------	----------	----------	----------

Electrode material

- K : 316L stainless steel
- H : Hastelloy
- T : Titanium
- D : Tantalum
- S : Customization

Lining material

- F : F4(Teflon)
- P : PUR(Polyurethane)
- S : Customization

Communication protocol

- 0 : No communication protocol
- 1 : RS485(Modbus protocol)
- 2 : RS232(Modbus protocol)
- 4 : Hart protocol

A : No grounding ring

B : Grounding ring

Power supply

- T : AC 85~265v
- D : DC 18~36v
- L : Lithium-ion battery

Special Order on Request

- ▶ Electrical / Process Connection