

## VTFM100 - Electromagnetic Flow Meter

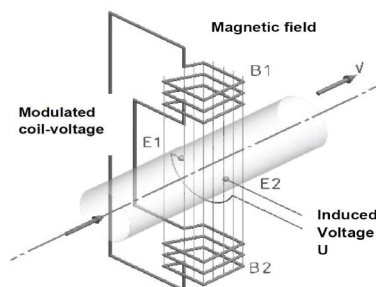
- ▶ No moving parts - easy to maintain; No pressure drop due to no choked flow parts.
- ▶ Wide measuring range: DN10... DN500
- ▶ Suitable for measuring all kinds of acid, alkali, salt and mud, pulp, pulp and other media
- ▶ Digital LCD displays instantaneous and cumulative quantities
- ▶ Wide temperature range: -20°C... 180 °C
- ▶ High reliability, output can be used directly in PLC
- ▶ Full digital processing, strong anti-interference ability, reliable measurement, high precision



VTFM100 electromagnetic flowmeter is designed based on Faraday's law of electromagnetic induction: When the conductive liquid cuts the magnetic force in the magnetic field, the conductive potential is generated in the conductor. When the flow rate is measured, the conductive liquid flows through the magnetic field perpendicular to the flow direction at the speed of  $V$ . The conductive liquid flow induces a voltage that is proportional to the average flow rate. And through the cable to the converter through intelligent processing, to achieve the instantaneous fluid flow, accumulated flow display and flow data and communication between the control system.

### Specifications

Applicable medium	Liquid with conductivity $> 5 \mu\text{s/cm}$
Velocity range	0.25...10m/s
Nominal diameter	DN25...DN500
Accuracy	$\pm 0.5\%$ of reading ( $\pm 0.2\%$ optional)
Repeatability	$+0.15\%$ of flow rate
Operating voltage	18-36VDC
Output signal	Current: 4...20mA Pulse: frequency 0...1KHz
Operating pressure	DN10...DN65: $\leq 2.5\text{Mpa}$ DN80...DN150: $\leq 1.6\text{Mpa}$ DN200...DN500: $\leq 1.0\text{Mpa}$ (Customization available)
Electrode material	316 stainless steel
Lining material	Neoprene CR PTFE F4
Housing, flange material	Carbon Steel (standard)
Excitation method	Low frequency rectangle wave, High frequency excitation
Medium Temp	-20°C...90°C...130°C...180°C (Refer to lining material)
Ambient Temp	Sensor -40°C...80°C; Converter -15°C...60°C
Ambient humidity	$\leq 85\% \text{RH}$ (20°C)
Power consumption	less than 20W
Structure	Integral type, Remote type
Electrical connection	M12X1.5
Grounding	Grounding ring, grounding electrode, grounding pipe
EX-proof	Exd ib II BT4
Process connection	Flange
Protection class	IP65



### Applications

- ▶ Tap water supply field
- ▶ Industrial wastewater field
- ▶ Strong acid liquid industrial field
- ▶ Food industry
- ▶ Paper industry

**Detail the main technical parameters**

Applicable medium: Conductive liquids are liquids with a conductivity > 5us/cm in normal measurement. Generally, the conductivity of distilled water is 5us/cm, and that of tap water is 100us/cm.

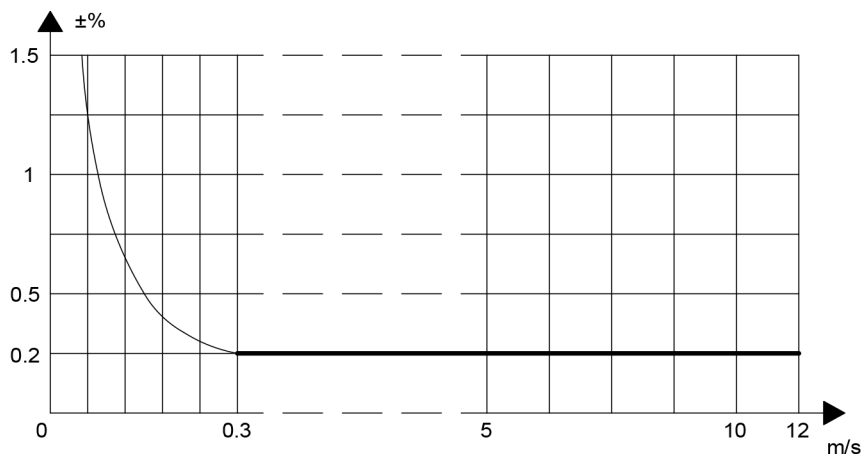
The conductivity of other acids, bases and salts can be referred to the following table:

Liquid	Conductivity(S/CM)	Liquid	Conductivity(S/CM)
Hydrochloric acid(40%)	$51.52 \times 10^{-2}$	Potassium chloride(21%)	$28.1 \times 10^{-2}$
Nitric acid(62%)	$49.04 \times 10^{-2}$	Potassium iodide(55%)	$42.26 \times 10^{-3}$
Phosphoric acid(70%)	$14.73 \times 10^{-2}$	Potassium nitrate(22%)	$16.25 \times 10^{-2}$
Sulfuric acid(85%)	$98.5 \times 10^{-3}$	Potassium hydroxide(42%)	$42.12 \times 10^{-2}$
Ethanol(95%)	$2.6 \times 10^{-7}$	Potassium sulphate(5%)	$45.8 \times 10^{-3}$
Acetic acid(70%)	$2.35 \times 10^{-4}$	Sodium carbonate(15%)	$83.6 \times 10^{-3}$
Propanoic acid(70%)	$8.5 \times 10^{-7}$	Sodium chloride(26%)	$21.51 \times 10^{-2}$
Butyric acid(70%)	$5.6 \times 10^{-7}$	Sodium nitrate(30%)	$16.06 \times 10^{-2}$
Formic acid(40%)	$98.4 \times 10^{-4}$	Sodium hydroxide(50%)	$82 \times 10^{-3}$
Hydrofluoric acid(30%)	$34.11 \times 10^{-2}$	Sodium sulfate(15%)	$88.6 \times 10^{-3}$
Hydriodic acid(5%)	$13.32 \times 10^{-2}$	Ammonium hydroxide(30%)	$1.93 \times 10^{-4}$
Cupric chloride(35%)	$69.9 \times 10^{-3}$	Ammonium chloride(25%)	$40.25 \times 10^{-2}$
Cupric nitrate(35%)	$10.62 \times 10^{-2}$	Ammonium nitrate(50%)	$36.33 \times 10^{-2}$
Copper sulfate(17.5%)	$45.8 \times 10^{-3}$	Ammonium sulfate(31%)	$23.21 \times 10^{-2}$

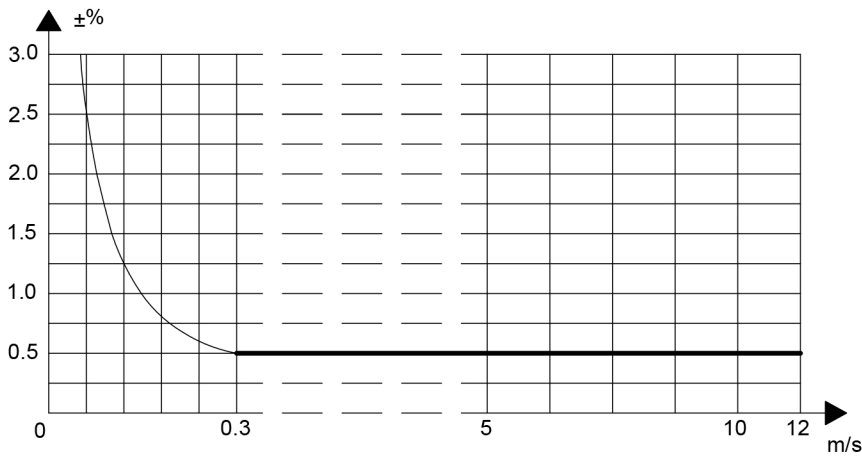
**Accuracy:  $\leq \pm 0.25\%$ ,  $\leq \pm 0.5\%$  under reference conditions**

Reference conditions for precision calibration:	
Item	Parameters
medium temperature	20°C±3°C
ambient temperature	21°C±3°C
pressing	1 bar
supply voltage	24±1%
settling time	25min
Straight pipe section (inlet)	10XDN(DN≤1200/48")
	5XDN(DN>1200/48")
Straight pipe section (outlet)	5XDN(DN≤1200/48")
	3XDN(DN>1200/48")
Fluid state	Uniform flow distribution

**Accuracy Curve of electromagnetic flowmeter system (±0.25%)**



Accuracy Curve of electromagnetic flowmeter system ( $\pm 0.25\%$ )



Caliber selection

DN	Measurable m <sup>3</sup> /h	Useful measuring m <sup>3</sup> /h	DN	Measurable m <sup>3</sup> /h	Useful measuring m <sup>3</sup> /h
DN10	0.0142~3.3912	0.0848~2.862	DN300	12.717~3052	76.302~2543
DN15	0.0318~7.6302	0.1908~6.3585	DN350	17.31~4154	103.86~3461
DN20	0.0566~13.5648	0.3392~11.304	DN400	22.61~5425	135.65~4521
DN25	0.0883~21.195	0.5298~17.6625	DN450	28.62~6867	171.68~5722
DN32	0.1447~34.7258	0.8682~29.9382	DN500	35.33~8478	211.95~7065
DN40	0.2661~54.2592	1.3565~45.216			
DN50	0.3533~84.78	2.1195~70.65			
DN65	0.5970~143.28	3.5819~119.39			
DN80	0.9044~217.03	5.4259~180.86			
DN100	1.413~339.12	8.478~282.6			
DN125	2.2079~529.87	13.2468~441.56			
DN150	3.1793~763	19.0755~635.85			
DN200	5.652~1356	33.912~1130.4			
DN250	8.8313~2119	52.9875~1766			

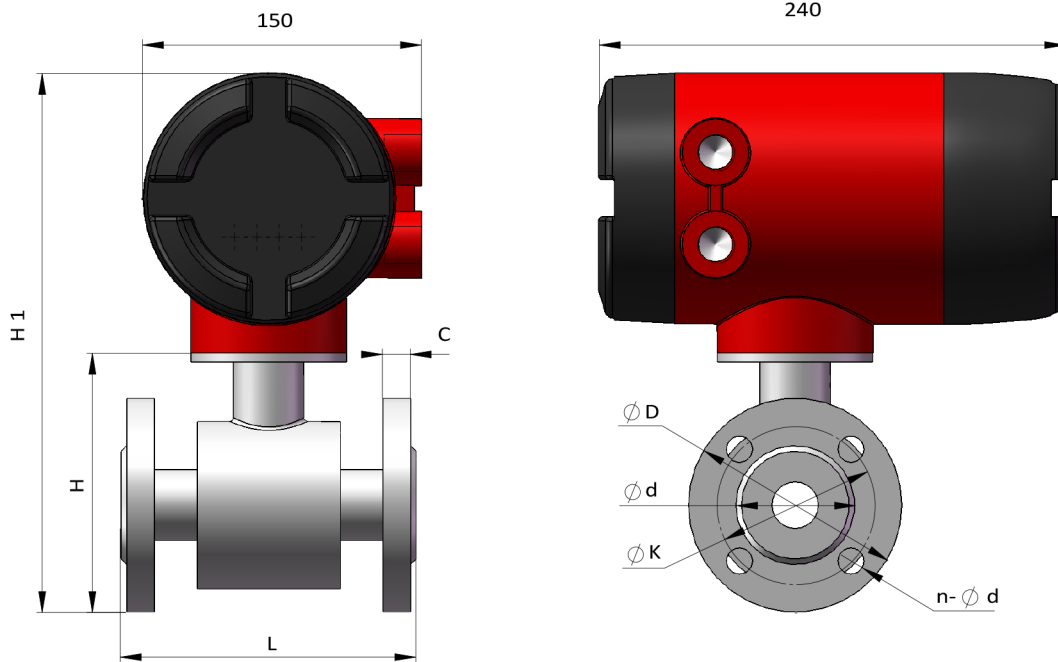
Lining material selection

Lining material	Symbol	Property	Maximum Temperature	Applicable liquid	Applicable caliber
Neoprene	CR	Medium wear resistance, resistance to acid, alkali and salt solution of general concentration	<60°C	Tap water, industrial water, sea water	≥DN50
PTFE	F4	Chemical stability, resistance to boiling hydrochloric acid, sulfuric acid, aqua regia, concentrated alkali corrosion	<160°C	Caustic acid, alkali and salt solution	≥DN10

Electrode material selection

Material	Corrosion resistance
316L	Application: 1. For industrial water, domestic water, sewage and other corrosive medium 2. Weakly corrosive acid, alkali, salt solution

Dimensional drawing (mm)

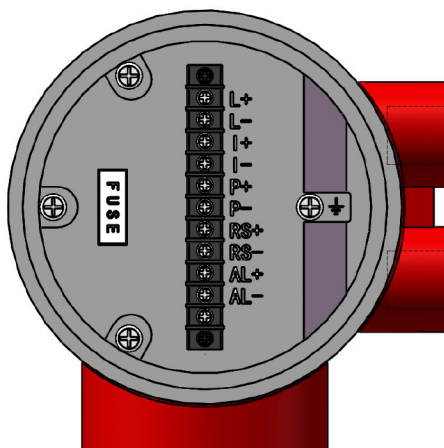


## Flange Dimensions in inches (mm)

DN	L (mm)	H	H1	H2	D	K	n- $\phi$ d	C	Pressure	Kg
DN10	160	130	247	180	95	65	4- $\phi$ 14	14	PN4.0	6.6
DN15		135	252	185	95	65	4- $\phi$ 14	14		6.5
DN20		143	260	193	105	75	4- $\phi$ 14	16		6.4
DN25	160	123	240	173	115	85	4- $\phi$ 14	16		6.2
DN32	165	150	267	200	140	100	4- $\phi$ 18	18		7.2
DN40	195	160	277	210	150	110	4- $\phi$ 18	18		8.3
DN50	200	173	290	223	165	125	4- $\phi$ 18	20		10.0
DN65	195	183	300	233	185	145	4- $\phi$ 18	20	PN1.6	10.5
DN80	200	206	323	256	200	160	8- $\phi$ 18	20		11.4
DN100	245	225	342	275	235	180	8- $\phi$ 18	22		14.5
DN125	250	255	372	305	250	210	8- $\phi$ 18	22		17.5
DN150	300	287	405	337	285	240	8- $\phi$ 22	24		23.0
DN200	350	344	461	395	340	295	12- $\phi$ 22	26		32.0
DN250	400	396	512	446	395	350	12- $\phi$ 22	26		44.0
DN300	500	450	565	500	445	400	12- $\phi$ 22	28	PN1.0	56.0
DN350		510	625	560	500	460	16- $\phi$ 22	30		71.0
DN400	600	560	675	610	565	515	16- $\phi$ 26	32		94.0
DN450		610	725	660	615	565	20- $\phi$ 26	35		106.0
DN500		660	775	710	670	620	20- $\phi$ 26	38		129.0

FLOW

## Wiring



Serial number	Symbol	Description	Comments
1	L+ or L	DC24V+ or AC85-265V Power supply	Power the DC24 or AC220
2	L- or N	DC24V+ or AC85-265V Power supply	Power the DC24 or AC221
3	I+	4 to 20MA Output +	Load resistance $\leq$ 500 $\Omega$
4	I-	4 to 20MA Output -	
5	P+	Pulse+	Frequency or pulse output is passive load current $\leq$ 20mA
6	P-	Pulse-	
7	RS+	RS485+	
8	RS-	RS485-	
9	AL+	Alarm	
10	AL-	Alarm	

## Model Number

FLOW

OrderNO.	Type	DN	OrderNO.	Type	DN
Lining material:Neoprene CR		mm	Lining material:PTFE F4		mm
VTFM10010	VTFMI100DN10KCCOBDP	10	VTFM11010	VTFMI100DN10KFCOBDP	10
VTFM10015	VTFMI100DN15KCCOBDP	15	VTFM11015	VTFMI100DN15KFCOBDP	15
VTFM10020	VTFMI100DN20KCCOBDP	20	VTFM11020	VTFMI100DN20KFCOBDP	20
VTFM10025	VTFMI100DN25KCCOBDP	25	VTFM11025	VTFMI100DN25KFCOBDP	25
VTFM10032	VTFMI100DN32KCCOBDP	32	VTFM11032	VTFMI100DN32KFCOBDP	32
VTFM10040	VTFMI100DN40KCCOBDP	40	VTFM11040	VTFMI100DN40KFCOBDP	40
VTFM10050	VTFMI100DN50KCCOBDP	50	VTFM11050	VTFMI100DN50KFCOBDP	50
VTFM10065	VTFMI100DN65KCCOBDP	65	VTFM11065	VTFMI100DN65KFCOBDP	65
VTFM10080	VTFMI100DN80KCCOBDP	80	VTFM11080	VTFMI100DN80KFCOBDP	80
VTFM10100	VTFMI100DN100KCCOBDP	100	VTFM11100	VTFMI100DN100KFCOBDP	100
VTFM10125	VTFMI100DN125KCCOBDP	125	VTFM11125	VTFMI100DN125KFCOBDP	125
VTFM10150	VTFMI100DN150KCCOBDP	150	VTFM11150	VTFMI100DN150KFCOBDP	150
VTFM10200	VTFMI100DN200KCCOBDP	200	VTFM11200	VTFMI100DN200KFCOBDP	200
VTFM10250	VTFMI100DN250KCCOBDP	250	VTFM11250	VTFMI100DN250KFCOBDP	250
VTFM10300	VTFMI100DN300KCCOBDP	300	VTFM11300	VTFMI100DN300KFCOBDP	300
VTFM10350	VTFMI100DN350KCCOBDP	350	VTFM11350	VTFMI100DN350KFCOBDP	350
VTFM10400	VTFMI100DN400KCCOBDP	400	VTFM11400	VTFMI100DN400KFCOBDP	400
VTFM10450	VTFMI100DN450KCCOBDP	450	VTFM11450	VTFMI100DN450KFCOBDP	450
VTFM10500	VTFMI100DN500KCCOBDP	500	VTFM11500	VTFMI100DN500KFCOBDP	500