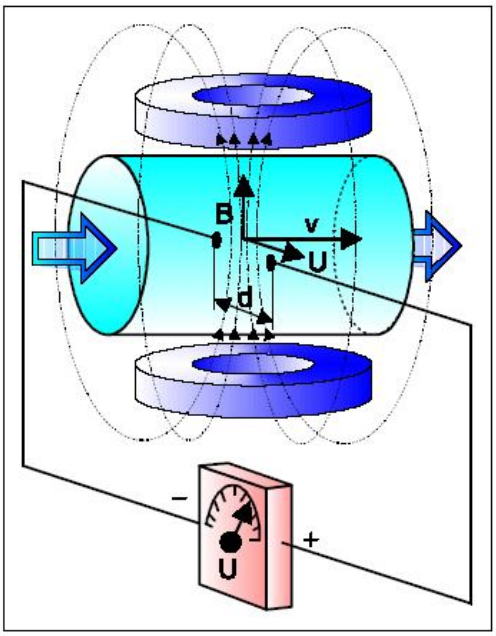
Magnetic Flowmeters

Features

The induction flow meter TEMD is a device for measurement of volume flow rates of conductive fluids in a closed pipeline.It allows measurement in both directions,with high accuracy and in wide range of flow rates (0.1 - 10 m/s). The minimum required conductivity of measured medium is 5 µS/cm.The evaluation unit enables displaying of measured values on a two-line alphanumeric display and changing of many measuring device operational parameters from a keypad. It has got two binary outputs available (frequency, pulses,limit states),as well as an active current output and a digital communication feature.User can change all output functions and parameters during operation.



Measurement Principle

An induction flow meter is a device for volume flow measurement of electrically conductive fluids. The measurement principle is based on Farraday's law of electromagnetic induction. A sensor consists of a non-magnetic tube coated internally with non-conductive lining,measuring electrodes and two coils generating an electromagnetic field. Flowing fluid creates a conductor. Magnetic field induces voltage **U** in this conductor. It is proportional to magnetic induction **B**,distance of electrodes **d** (conductor length) and flow rate **v**. **U = B x d x v.** Since magnetic induction and distance of electrodes are fixed, the induced voltage is proportional to the flow rate of fluid in the tube. The flow rate multiplied by the cross-section of the tube gives the volume flow rate. **Q = v x S.**

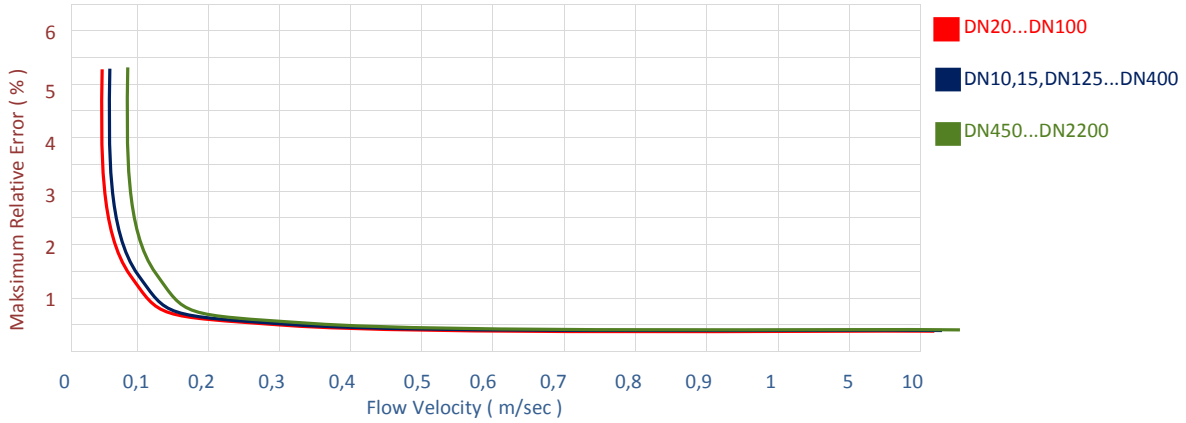
			
REMOTE */TEMD-RM..*	COMPACT */TEMD-CM..*	INFRARED CONTROL */TEMD-IC..*	TRANSMITTER*/TEMD-TR..*

Measuring Ranges

*According to 0,1...10 m/sec.

DN		*Flow Range (l/sec)		*Flow Range (m^3/h)	
mm	**inch**	**Q**min	**Q**max	**Q**min	**Q**max
10	¼”	0,0078	0,785	0,0282	2,827
15	½”	0,0176	1,767	0,0636	6,361
20	¾”	0,0314	3,141	0,1130	11,3
25	1”	0,0490	4,908	0,1767	17,67
32	1 ¼”	0,0804	8,042	0,2895	28,95
40	1 ½”	0,1256	12,65	0,4523	45,23
50	2”	0,1963	19,63	0,7068	70,68
65	2 ½”	0,3318	33,18	1,194	119,4
80	3”	0,5026	50,26	1,809	180,9
100	4”	0,7853	78,53	2,827	282,7
125	5”	1,227	122,7	4,417	441,7
150	6”	1,767	176,6	6,361	636,1
200	8”	3,141	314,1	11,30	1130
250	10”	4,908	490,8	17,67	1767
300	12”	7,068	706,8	25,44	2544
350	14”	9,621	962,1	34,63	3463
400	16”	12,56	1256	45,23	4523
450	18”	15,90	1590	57,25	5725
500	20”	19,63	1963	70,68	7068
600	24”	28,27	2827	101,7	10178
700	28”	38,48	3848	138,5	13854
800	32”	50,26	5026	180,9	18095
900	36”	63,61	6361	229	22902
1000	40”	78,53	7853	282,7	28274
1200	48”	113,09	11309	407,15	40715
1400	56”	153,93	15393	554,17	55417
1600	64”	201,06	20106	723,82	72382
1800	72”	254,46	25446	916,08	91608
2000	80”	314,15	31415	1130,97	113097
2200	88”	380,13	38013	1368,47	136847

Accuracy



Sensor Spesifications

		Types			
Sensor Variant	**Spesification**	**TEMD-RM**	**TEMD-CM**	**TEMD-IC**	**TEMD-TR**
Control principle	**DC Pulse**	●	●	●	●
Excitation coil insulation cl.	**E**	●	●	●	●
Inner diameter	**DN10...DN2200**	●	●	●	●
Mounting joint	**Flanged DIN**	●	●	●	●
	Flanged ANSI	O	O	O	O
	BS	O	O	O	O
	DIN 11 851 for Food	O	O	O	O
Enclosure	**IP67**	●	●	●	●
	IP68	O	O	O	O
Measuring tube material	**Stainless Steel**	●	●	●	●
Sensor cover material	**Carbon Steel**	●	●	●	●
	Stainless Steel	O	O	O	O
Flange material	**Carbon Steel**	●	●	●	●
	Stainless Steel	O	O	O	O
Sensing electrode material	**Stainless Steel AISI316L**	●	●	●	●
	Titanium	O	O	O	O
	Hastelloy-B	O	O	O	O
	Hastelloy-C	O	O	O	O
	Platinum	O	O	O	O
	Tantalum	O	O	O	O
Lining material	**Hard Rubber**	●	●	●	●
	Soft Rubber	O	O	O	O
	PTFE	O	O	O	O
	PE	O	O	O	O
Medium temp. max. *	**0°C...+60°C**	●	●	●	●
	-20°C...+180°C	O	O	O	O
Ambient Temperature	**-30°C...+60°C**	●	●	●	●
Standard pressure load Pressure range	**PN6,PN10,PN16,PN40**	●	●	●	●
Special Design	**Unit for explosion hazard environment—ZONE 2**	O	O	O	O

o : optional

Electronic Controller Spesifications

		Types			
Controller Variant	**Spesification**	**TEMD-RM**	**TEMD-CM**	**TEMD-IC**	**TEMD-TR**
Medium electric conductivity	**≥5 µS/cm / ≥20 µS/cm for de-mineralised water**	•	•	•	•
Input resistance	**10^{10} Ohms**	•	•	•	•
Measuring accuracy	**±0,5 % of measured value between 0,3 and 10 m/sec, ±0,2 % as optional**	•	•	•	•
Measuring filtration	**Adjustable in multiple modes**	•	•	•	
Elimination of small flows	**Adjustable by 0.1 %**	•	•	•	
Instant flow	**Bi-directional (l/sec, l/min, cu. m^3/h, gallon/min,etc.)**	•	•	•	
Total flow	**Bi-directional (m3,l, gallons)**	•	•	•	
Zero flow	**Automatic zero point set-up**	•	•	•	
Values display	**Graphic display, 132 × 64 pixels**			•	
	Alphanumeric LCD, 2 × 16 characters, with backlight	•	•		
Set-up	**Infrared contactless/Data**			•	
Optional modes	**Empty pipeline detection/Dosing**	•	•	•	
Analogue output (active)	**4(0) to 20 mA/500 Ohms**	•	•	•	•
Impulse output or Frequency output selectable	**Flow volume (x·cu.m) per impulse**	•	•	•	•
	Standard 0 to 1 kHz/0 to 10 kHz max. (30 V/20 mA/DC)	•	•	•	•
Alarm output 1	**selectable**	•	•	•	
Alarm output 2	**selectable**	•	•	•	
Power supply (AC ^ DC)	**90 to 250V/50 to 60Hz/10 VA 24 V/ > 0,5 A/DC**	•	•	•	•
Data communication	**RS 232**	O	O	O	O
	RS 485	O	O	O	O
	HART	O	O	O	O
	Modbus – RTU	O	O	O	O
	Profibus	O	O	O	O
Power supply (AC ^ DC)	**90 to 250V/50 to 60Hz/10 VA 24 V/ > 0,5 A/DC**	•	•	•	•
Enclosure	**IP 67 (NEMA 5)**	•	•	•	
	IP65 (NEMA 3)				•
Ambient temperature	**−20°C ... +60°C**	•	•	•	•
Accessories on request	**Infrared remote control**			•	

o : optional

Ordering

EMD.									Description
Transmitter	TR								Blind Transmitter,no display
	CM								Compact Design
	IC								Compact Design and Infrared control
	RM								Remote Type (Please specify cable length)
Line Size		0010							DN10
		0015							DN15
		0020							DN20
		0025							DN25
		0032							DN32
		0040							DN40
		0050							DN50
		0065							DN65
		0080							DN80
		0100							DN100
		0125							DN125
		0150							DN150
		0200							DN200
		0250							DN250
		0300							DN300
		0350							DN350
		0400							DN400
		0450							DN450
		0500							DN500
		0600							DN600
		0700							DN700
		0800							DN800
		0900							DN900
		1000							DN1000
		1200							DN1200
		1400							DN1400
		1600							DN1600
		1800							DN1800
		2000							DN2000
		2200							DN2200
Flange Rating			06						PN06 DIN
			10						PN10 DIN
			16						PN16 DIN
			40						PN40 DIN
			XX						Please specify
Electrode Material				00					AISI 316 L
				01					Titanium
				02					Tantalum
				03					Hastelloy – C
				04					Hastelloy – B
				05					Platinium
Lining					01				Hard Rubber
					02				PTFE
					03				PE
Power Supply						AC			85...250V AC
						DC			20...36V DC

+									Description
Communication	NN								None
	01								RS-232
	02								RS-485
	03								Modbus-RTU
	04								HART
	05								Profibus
Enclosure		01							IP67
		02							Flameproof “ex d”
Grounding Ring			NN						None
			01						Steel
			02						Stainless Steel
			XX						Please Specify
Body Material				CS					Carbon Steel
				SS					Stainless Steel
Accuracy Class					02				±0,2%
					05				±0,5%