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MagFlow 6415
Feature Rich Electromagnetic Flowmeter

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Working Principle

Electromagnetic Flowmeters are based on Faraday's Law of Electromagnetic Induction.

In an Electromagnetic Flowmeter, the magnetic field is generated by a set of coils. As the conductive liquid passes through the electromagnetic field, an electric voltage is induced in the liquid which is directly proportional to its velocity. This induced voltage is perpendicular to both, the liquid flow direction and the electromagnetic field direction. The voltage sensed by the electrodes is further processed by the transmitter to give standardised output signal or displayed in appropriate engineering unit.

The flux density of the electromagnetic field in a given Flowmeter and the distance between the electrodes are constant. Therefore, the induced voltage is only a function of liquid velocity.

$$E = K \times B \times \bar{v} \times D$$

where E : Induced voltage
K : Flow tube constant
B : Magnetic field strength
$\bar{v}$: Mean flow velocity
and D : Electrode spacing

Volume flow is calculated by the equation

$$Q = \bar{v} \times D^2 \times \pi/4$$

Therefore, $$Q = \frac{E \times D \times \pi}{K \times B \times 4}$$

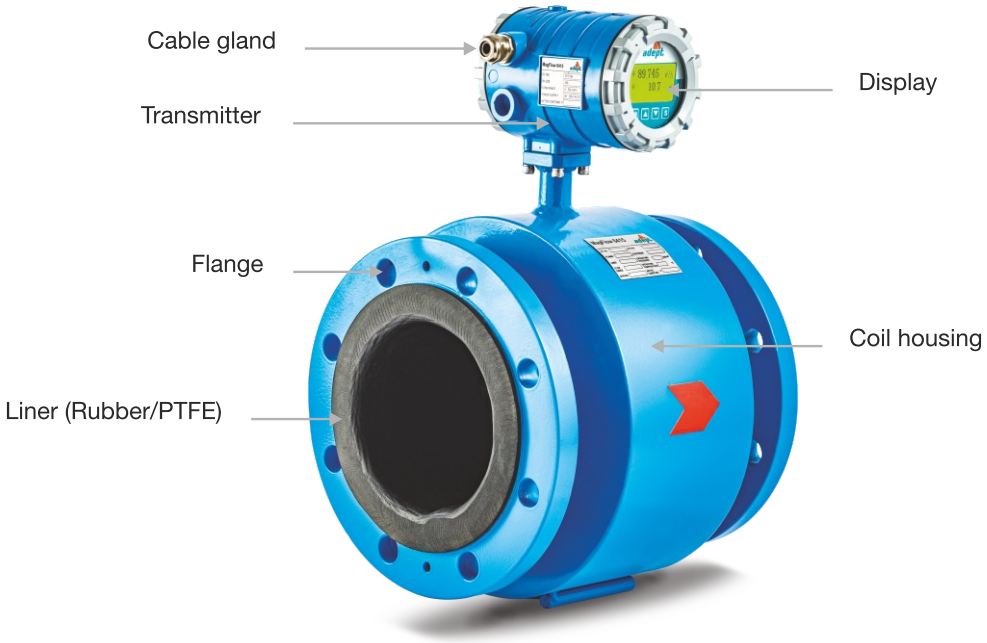
The induced voltage is not affected by the physical properties of liquids like temperature, viscosity, pressure, density and conductivity, as long as the conductivity of the measured liquid is above the minimum threshold level. For reliable measurement, the pipe must be completely full of liquid.

The electromagnetic field coil assembly is excited by pulsed DC technique which eliminates the interfering noise and provides automatic zero correction.

Technical Specifications

Parameters	MagFlow 6415
Nominal dia (mm)	10 to 2000
Working pressure (kg/cm^2)	10, 16, 25, 40
Working temperature	Integral PTFE - 120^{0}C Remote PTFE - 180^{0}C Others - 70^{0}C
Electrode material	SS 316L Std.*
Sensor lining	Std. Rubber*
Display version	Integral/Remote
Measuring tube material	SS 304 Std.*
Sensor housing material	Std. CS*
End connection	Flange/Wafer/Tri-clamp/SMS
Flange standard	ANSI 150*
Measuring range	0.2 to 12 m/sec. Bidirectional
Accuracy % of measured value	±0.5% (±0.2% consult factory)
Repeatability	±0.2% of Span
Display	Graphic LCD
Display units	All standard engineering units in m^3, litre, gallon
Outputs	Std. 4 - 20 mA, Pulse, RS 485
Dual power supply	12 - 60 V DC and 80 - 300 V AC/DC
Protection class for sensor	Std. IP 67 Option - IP 68 for flow tube in remote type
Protection class for transmitter	IP 67
Cable length for remote	Std. 10 m*
Grounding	Built-in electrode
Installation	Inline

MagFlow 6415 Components



Minimum - Maximum Flow Table

Velocity range - 0.2 m/sec. for minimum & 12 m/sec. for maximum

DN in mm	m^3/hr.		LPM		LPS		USGPM	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
10	0.06	3.38	0.94	56.53	0.02	0.94	0.25	14.94
15	0.13	7.63	2.12	127.21	0.04	2.11	0.56	33.61
20	0.23	13.56	3.77	226.15	0.06	3.77	1.00	59.75
25	0.35	21.19	5.89	353.36	0.10	5.88	1.56	93.35
32	0.58	34.91	9.65	578.96	0.16	9.65	2.55	152.95
40	0.90	54.28	15.08	904.63	0.25	15.07	3.98	238.98
50	1.41	84.82	23.56	1413.49	0.39	23.56	6.22	373.40
65	2.39	143.28	39.82	2389.20	0.66	39.80	10.52	631.06
80	3.62	217.08	60.31	3618.55	1.01	60.30	15.93	955.92
100	5.65	339.24	94.23	5653.99	1.57	94.22	24.89	1493.63
125	8.84	530.16	147.24	8834.38	2.45	147.24	38.90	2333.80
150	12.72	763.32	212.03	12721.50	3.53	212.02	56.01	3360.66
200	22.60	1356.00	376.93	22616.00	6.28	376.93	99.58	5974.51
250	35.20	2112.00	588.96	35337.50	9.82	588.96	155.59	9335.18
300	50.89	3053.16	848.10	50886.00	14.14	848.10	224.04	13442.65
350	69.26	4155.72	1154.36	69261.50	19.24	1154.36	304.95	18297.00
400	90.46	5427.84	1507.73	90464.02	25.13	1507.74	398.30	23898.12
450	114.49	6869.64	1908.40	114503.76	31.81	1908.43	504.10	30246.00
500	141.35	8481.00	2355.83	141350.03	39.26	2355.85	622.35	37340.76
600	203.54	12212.52	3392.40	203544.04	56.54	3392.42	896.18	53770.68
700	277.04	16622.40	4618.08	277084.68	76.96	4617.47	1219.90	73193.88
800	365.44	21926.40	6090.65	365439.00	101.51	6090.48	1593.20	95592.24
900	457.98	27478.80	7633.87	458032.32	127.23	7634.04	2016.79	121007.52
1000	568.16	34089.60	9469.50	568169.76	157.82	9469.44	2489.38	149362.92

Installation precautions:

1. Installation location should be such that the Flowmeter will always remain full of liquid.
2. Minimum 5D upstream & 3D downstream straight lengths should be maintained at installation locations where 'D' is the pipe diameter.
3. The Flowmeter installation location should be free of bends, elbows, tees, valves, etc.

Ordering Code: MagFlow 6415

Model Code
M5 -MagFlow 6415

Transmitter Type
I -Integral
R -Remote

Line Size
0010 - 10 (¼")
0015 - 15 (½")
0020 - 20 (¾")
0025 - 25 (1")
0032 - 32 (1.25")
0040 - 40 (1.50")
0050 - 50 (2")
0065 - 65 (2.5")
0080 - 80 (3")
0100 - 100 (4")
0125 - 125 (5")
0150 - 150 (6")
0200 - 200 (8")
0250 - 250 (10")
0300 - 300 (12")
0350 - 350 (14")
0400 - 400 (16")
0450 - 450 (18")
0500 - 500 (20")
0600 - 600 (24")
0700 - 700 (28")
0800 - 800 (32")
0900 - 900 (36")
1000 - 1000 (40")
Any other (Pl. Specify)
Up to DN 2000

Design of Measuring Sensor	
S1 - Flange ANSI 150	S8 - Flange IS 1538
S2 - Flange ANSI 300	S9 - Flange BS 10 Table D
S3 - Flange ANSI 600	S10 - Flange AWWA
S4 - Flange DIN PN 10	S11 - Wafer
S5 - Flange DIN PN 16	S12 - SMS
S6 - Flange DIN PN 25	S13 - Tri Clamp
S7 - Flange DIN PN 40	S14 - Any other (Pl. Specify)

Flange Material
F1 - Carbon Steel
F2 - SS 304
F3 - SS 316
F4 - SS 316L
F5 - Not Applicable

Sensor Lining
L1 - Hard Rubber
L2 - Neoprene
L3 - PTFE
L4 - Polyurethane
L5 - PFA
L6 - Polypropylene

Electrode Material
E1 - SS 316L
E2 - Hastelloy C
E3 - Titanium
E4 - Tantalum
E5 - Platinum
E6 - SS Duplex

Measuring Tube
T1 - SS 304
T2 - SS 316
T3 - SS 316L

Coil Housing
CH1 - Carbon Steel
CH2 - SS 304
CH3 - SS 316
CH4 - SS 316L

Cable Length
C1 - Not Applicable
C2 - 10 meter
C3 - 15 meter
C4 - 20 meter
C5 - 25 meter

Accessories
A1 - Not Required
A2 - Solar Powered
A3 - Flanges
A4 - Flanges with Fasteners & Gaskets
A5 - UPS
A6 - Surge Arrestor
A7- SS 316 Earthing Rings
A8- Ethernet
AX - Combination of any of the above items

Adept Fluidyne Pvt. Ltd.
Corporate Office & Plant 1:
Plot 4, S. No. 17/1-B, Kothrud Ind. Estate,
Kothrud, Pune 411 038 INDIA
T +91 20 2546 4551/2543 1474
E info@adeptfluidyne.com

www.AdeptFluidyne.com