



ELECTROMAGNETIC FLOW METER

SALIENT FEATURES

- Indication through LED / LCD.
- Full Bore type.
- Microprocessor based.
- Simple & cost effective construction.
- Provides wide flow ranges.
- Outstanding accuracy.
- Operates over wide ranges of temperature & pressure.
- Easy maintenance as no moving parts.
- Pulsed DC coil excitation.
- Flame-proof, IP-65, IIA, IIB CMRI certified housing.



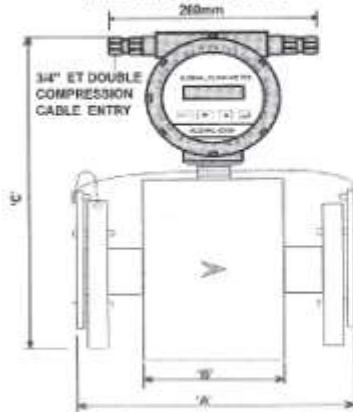
DESCRIPTION

KUSHAL-200M are micro-controller based full bore type electromagnetic flow meter specially used for various industrial applications. These flow transmitters accurately measures the flow rate of conductive liquids & slurries in closed pipes. Due to simple & rigid design the flow transmitter is an obstruction less & maintenance free instrument in place of conventional mechanical flow measuring device. The use of 'Pulsed DC' technology offers highest ability & better measuring accuracy in the form of electrical signal 4 - 20 mA DC linearly proportional to volumetric flow. The instrument is based on Faraday's law of electro-magnetic induction. A magnetic field is generated by the instrument in the flow tube. The fluid flowing through this magnetic field generates a voltage that is proportional to the flow velocity. Corresponding electrical output is provided with respect to measuring voltage.

TECHNICAL SPECIFICATIONS

Media	:	Liquids (Clear)
Viscosity	:	200 cp max
Line Size	:	15 NB to 300 NB
Excitation	:	Pulsed DC coil
Display	:	1) 16 x 2 LCD 2) 4 digit, 0.3" Red LED for Flow Rate Indication & 8 digit, 0.3" Red LED for Totalised Flow Indication
Type of Output	:	4 to 20 mA DC, Isolated
Calibration Range	:	As per requirement (Factory Calibrated)
Accuracy	:	+/- 0.5% F. S.
Linearity	:	+/- 0.5%
Repeatability	:	+/- 1%
Process Temperature	:	150 °C max
Process Pressure	:	10 kg/cm ² max
Material of construction	:	Lining - Neoprene / Rubber / PTFE (Teflon) Flange - MS / SS Electrode - SS 316 Wetted Parts - SS 316 Body - MS
Power Supply	:	1) 230 V AC, 50 Hz +/- 10% 2) 24 V DC, External
Power Consumption	:	< 10 VA
Response Time	:	< 100 mSec
Isolation	:	1.4 KV between Input, Output & Power Supply
Temperature Coefficient	:	+/- 0.1% per °C
Transmitter Enclosure	:	Flame-proof, IP-65, IIA, IIB CMRI certified
Dimensions	:	As per chart on rear
Process Connections	:	ASA B 16.5, Flanged
Mounting	:	In-Line (Horizontal OR Vertical)
Operating Conditions	:	Temperature 0 to 55 °C / Humidity 5 to 95% non condensing

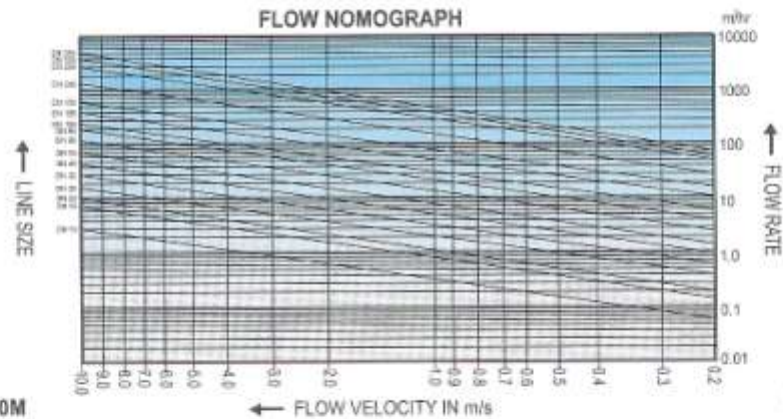
ASSEMBLY DETAILS



LINE SIZE SELECTOR CHART WITH RESPECT TO FLOW RANGE

Line Size (mm)	A (mm)	B (mm)	C (mm)	Liquid Flow Range (m ³ hr)	
				Velocity 2 m/s min	Velocity 6 m/s max
15	152	140	290	0 to 1.5	0 to 4.2
20	152	140	290	0 to 2.25	0 to 6.0
25	202	166	316	0 to 3.5	0 to 11
50	202	166	316	0 to 15	0 to 44
65	332	362	233	0 to 30	0 to 70
100	332	362	233	0 to 57	0 to 175
125	450	336	486	0 to 130	0 to 400
200	450	336	486	0 to 200	0 to 625
250	450	433	583	0 to 350	0 to 1000
300	480	511	661	0 to 490	0 to 1500

FLOW NOMOGRAPH



CODIFICATION OF KUSHAL-200M

- CODE 01 : TYPE OF DISPLAY LCD
- CODE 02 : TYPE OF DISPLAY LED
- CODE 01 : LINING MATERIAL Neoprene
- CODE 02 : LINING MATERIAL Rubber
- CODE 03 : LINING MATERIAL PTFE
- CODE 01 : FLANGE MATERIAL MS
- CODE 02 : FLANGE MATERIAL SS
- CODE 01 : POWER SUPPLY 230 V AC
- CODE 02 : POWER SUPPLY 24 V DC
- CODE 01 : MOUNTING Horizontal
- CODE 02 : MOUNTING Vertical

KUSHAL-200M - 01 - 02 - 01 - 01 - 01



INSERTION ELECTRO MAGNETIC FLOW TRANSMITTER

SALIENT FEATURES

- Insertion type.
- Simple & cost effective construction.
- Provides wide flow ranges.
- Outstanding accuracy.
- Operates over wide ranges of temperature & pressure.
- Easy maintenance as no moving parts.
- Pulsed DC coil excitation.
- Flame-proof, IP-65, IIA, IIB CMRI certified housing.

DESCRIPTION

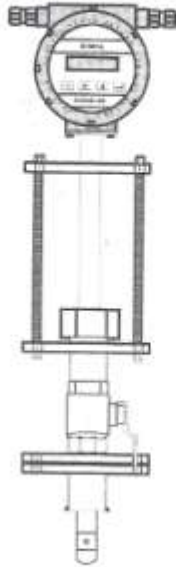
KUSHAL-100 are Insertion type electromagnetic flow transmitter specially used for various industrial applications. These flow transmitters accurately measures the flow rate of conductive liquids & slurries in closed pipes. Due to simple & rigid design the flow transmitter is an obstruction less & maintenance free instrument in place of conventional mechanical flow measuring device. The use of 'Pulsed DC' technology offers highest ability & better measuring accuracy in the form of electrical signal 4-20 mA DC linearly proportional to volumetric flow. The instrument is based on Faraday's law of electro-magnetic induction. A magnetic field is generated by the instrument in the flow tube. The fluid flowing through this magnetic field generates a voltage that is proportional to the flow velocity. Corresponding electrical output is provided with respect to measuring voltage.



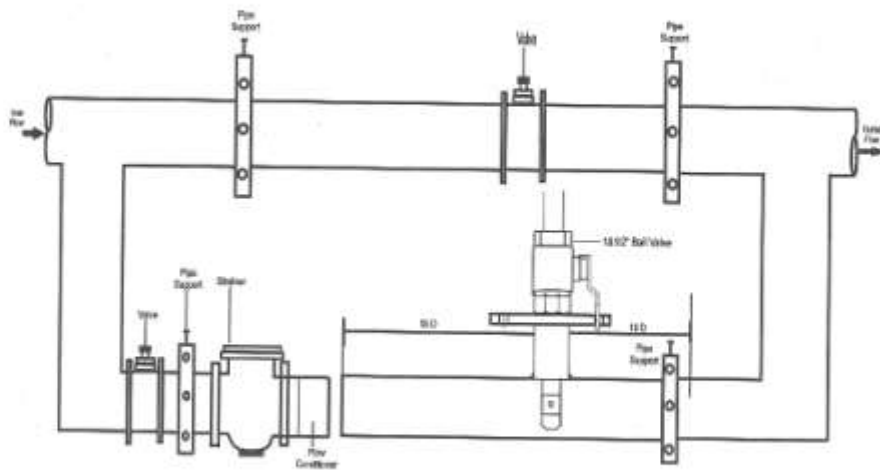
TECHNICAL SPECIFICATIONS

Media	:	Liquids (Clear)
Viscosity	:	200 cp max
Line Size	:	100 NB to 2000 NB
Excitation	:	Pulsed DC coil
Type of Output	:	4 to 20 mA DC
Calibration Range	:	As per requirement (Factory Calibrated)
Accuracy	:	+/- 2% F. S.
Linearity	:	+/- 0.5%
Repeatability	:	+/- 1%
Process Temperature	:	150°C max.
Process Pressure	:	10 kg/cm ² max
Material of construction	:	Electrode - SS 316 Retractable Assembly - MS / SS Wetted Parts - SS 316
Power Supply	:	1) 230 V AC, 50 Hz +/- 10% 2) 24 V DC, External
Power Consumption	:	< 10 VA
Response Time	:	< 100 mSec
Temperature Coefficient	:	+/- 0.01% per °C
Transmitter Enclosure	:	Flame-proof, IP-65, IIA, IIB CMRI certified
Process Connections	:	ASA 150, 2" Flanged
Mounting	:	Insertion type
Operating Conditions	:	Temperature 0 to 55°C / Humidity 5 to 95% non condensing

ASSEMBLY VIEW



MOUNTING DETAILS



FLOW RANGE WITH RESPECT TO LINE SIZE (for Velocity 1 m/s)

Line Size (mm)	Flow (m ³ /hr)	Flow (MLD)	Flow (ft ³ /sec)	Line Size (mm)	Flow (m ³ /hr)	Flow (MLD)	Flow (ft ³ /sec)
200	113.10	2.714	1.109	800	1809.56	43.429	17.751
250	176.71	4.241	1.734	900	2290.22	54.965	22.466
300	254.47	6.107	2.496	1000	2827.43	67.858	27.736
350	346.36	8.313	3.398	1200	4071.50	97.716	39.940
400	452.39	10.857	4.438	1400	5541.76	133.002	54.363
500	706.86	16.965	6.934	1600	7238.22	173.717	71.004
600	1017.88	24.429	9.985	1800	9160.88	219.861	89.865
700	1385.44	33.250	13.251	2000	11309.72	271.433	110.944

CODIFICATION OF ELMAG-100

CODE POWER SUPPLY
01 : 230 V AC
02 : 24 V DC

CODE RETRACTABLE ASSEMBLY MATERIAL
01 : MS
02 : SS

KUSHAL-100 - 01 - 02



TURBINE FLOW METER

SALIENT FEATURES

- 2 wire system.
- Simple & cost effective construction.
- Provides wide flow ranges.
- Local display as 8 x 1 LCD.
- Outstanding accuracy for clean & low viscosity applications.
- Operates over wide ranges of temperature & pressure.
- Easy maintenance.
- Flame-proof, IP-65, IIA, IIB CMR1 certified housing.

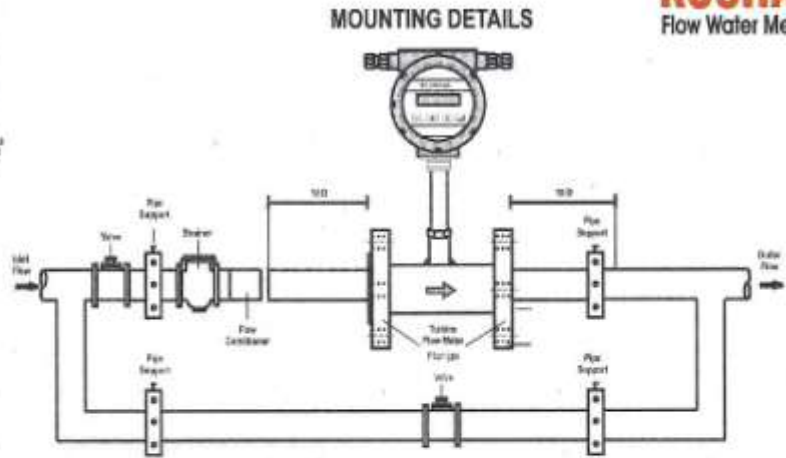
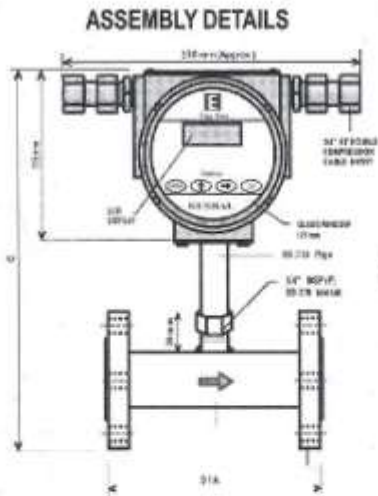


DESCRIPTION

KUSHAL-100 are 2 wire turbine flow meter specially used for various industrial applications. The flowing media engages a vaned rotor causing it to rotate at an angular velocity proportional to flow rate. The pick-up coil senses the spinning motion of the rotor inside the pipe & converts it into a pulsating electrical signal. Summation of the pulsating electrical signal is directly related to the total flow. The frequency is linearly proportional to flow rate which is converted to electrical signal 4-20 mA.

TECHNICAL SPECIFICATIONS

Media	: Liquids (Clear)
Viscosity	: 100 cp max
Pick off Type	: Magnetic sensor
Line Size	: 15 NB to 150 NB
Display	: 8 x 1 LCD
Type of Output	: 4 to 20 mA DC, 2 wire
Calibration Range	: As per requirement (Factory Calibrated)
Accuracy	: +/- 1% F. S.
Linearity	: +/- 1%
Repeatability	: +/- 1%
Pressure Drop	: Approx. 0.28 kg/cm ² at max. Flow
Turn down ratio	: 10 : 1 to 100 : 1
Process Temperature	: 150°C max
Process Pressure	: 30 kg/cm ² max
Material of construction	: Body, Bearings, Support & Flange - SS 316 / Teflon Rotor - SS 410 / SS 410 with Teflon coating Shaft - tungsten carbide
Power Supply	: Loop powered, 24 V DC excited
Power Consumption	: < 40 mW
Response Time	: < 100 mSec
Temperature Coefficient	: +/- 0.01% per °C
Transmitter Enclosure	: Flame-proof, IP-65, IIA, IIB CMR1 certified
Process Connections	: Flanged / Threaded / Tri-clover
Mounting	: In-Line (Horizontal OR Vertical)
Operating Conditions	: Temperature 0 to 55 °C / Humidity 5 to 95% non condensing



(A : In case of Flange Connection, D : In case of Thread Connection)

LINE SIZE SELECTOR CHART WITH RESPECT TO FLOW RANGE

Line Size (inch)	A (mm)	B (mm)	C (mm)	Liquid Flow Range	
				m ³ / hr	LPM
1/2	45	208	----	0.4 to 4.0	6.6 to 66.6
3/4	60	210	----	0.8 to 8.0	13.3 to 133.3
1	75	213	75	1.6 to 16.0	26.6 to 266.6
1 1/2	120	220	120	3.4 to 34.0	56.6 to 566.6
2	150	225	150	6.8 to 68.0	113 to 1133
3	225	238	225	13.5 to 135.0	225 to 2250
4	300	250	300	27.0 to 270.0	450 to 4500
6	450	275	450	55.0 to 550.0	916 to 9166

CODIFICATION OF FL-100

CODE MATERIAL OF CONSTRUCTION
 01 : SS
 02 : SS with Teflon Coating

CODE PROCESS CONNECTIONS
 01 : Flanged
 02 : Threaded
 03 : Tri-Clover

FL-100 - 01 - 02