



EUREKA

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HART
COMMUNICATION PROTOCOL



EUMAG FLOWMETERS



**EUREKA
INDUSTRIAL
EQUIPMENTS
PVT. LTD.**

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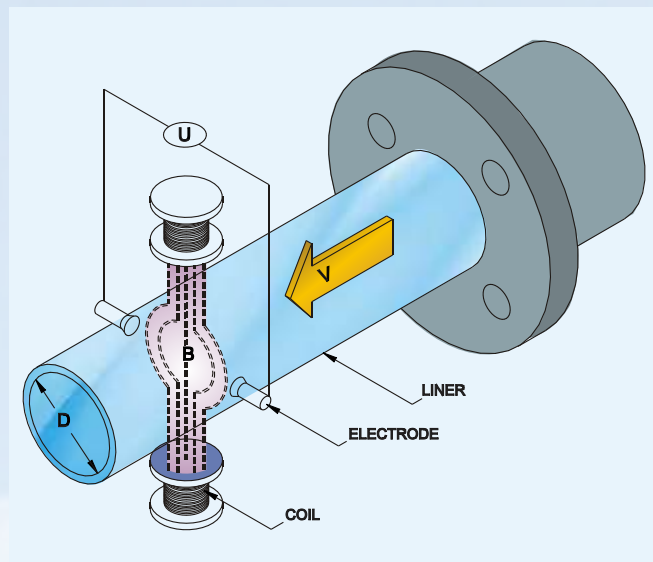
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Principle of operation of Electromagnetic flow meter

Electromagnetic flow meters commonly known as Magmeters are a type of inferential flow metering devices used to measure the flow of electrically conductive liquids in a close pipe application where the magnetic flux parameters the entire cross sectional area of the liquid flow. Magmeters measure electromotive force to determine liquid velocity using the Faraday's law of electromagnetic induction & compute the flow rate using the equation of conductivity.

The EUREKA make EUMAG flowmeters operate with electrically conductive liquids & are relatively immune to the effects of pressure, temperature, density & viscosity of the liquid medium. For Eumag flowmeters the electrically conductive liquid is defined as a liquid with a conductivity of atleast 5 micro siemens/cm.



The Principle of operation

Faraday's law states that when a conductor moves through a magnetic field of given strength, a voltage is produced in the electrode dependent on and proportional to the relative velocity between the conductor and magnetic field.

The mathematical representation is as follows

$$U=B \times V \times D \times C$$

Where U=induced voltage,

D=internal dia of flow tube

B=Magnetic strength

C=Instrument constant

V=Average velocity

Hence the flow rate equation is

$$Q=VA,$$

V =Average velocity,

a=Area occupied by flow

Advantages of Electromagnetic flow meters:

The electromagnetic (EM) flow meter is regarded by many users as the universal answer to more than 90% of all flow metering applications.

Some of the many benefits offered by the Electromagnetic flow meter include:

- Short inlet/outlet sections (5D/3D)
- Relationship is linear (not square root)
- Insensitive to flow profile changes (laminar to turbulent) including many non-Newtonian liquids
- Range ability of 30:1 or better
- Accuracy of better than $\pm 0.2\%$ of actual flow over full range
- No recalibration requirements
- Bi-directional flow measurement
- No taps or cavities
- No obstruction to flow
- Not limited to clean fluids
- High temperature capabilities
- High pressure capabilities
- Volumetric flow can be installed between flanges
- Can be made from corrosion resistance materials at low cost

General Specifications

- 1) Version: Integral/Remote
- 2) Meter size: 3 mm to 3000 MM
- 3) Process connection: Flanged ANSI 150, ANSI 300, ANSI 600, DIN 10,16,25,40, ISb 1538, Flange BS 10 table D, table E, H, /AWWA & wafer, SMS, Triclamp, BSP thread end,
- 4) Process connection material: MS/CS, SS304, SS316, SS316L
- 5) Electrode Material: SS316, SS316L, Hastalloy C, Titanium, Tantalum, Tungsten carbide, Platinum, Nickel Alloy
- 6) Lining Material: Soft rubber, Hard Rubber, Neoprene, PFA, PTFE, Polyurethane, Ceramic, Fused Al. Oxide.
- 7) Measuring tube material: SS304, SS316
- 8) Coil housing material: MS, SS304, SS316
- 9) Power supply: 230 V AC, 24 V DC, Solar Powered, Battery powered
- 10) Output: 4-20mA, Pulse, Relay
- 11) Communication interface: RS485 Modbus , GSM, GPRS.HART
- 12) The GSM/GPRS connectivity for communicating field data through SMS on mobile phones &/or control & monitoring through SCADA system.
- 13) Self diagnostic built in
- 14) Empty pipe indication built in
- 15) Bidirectional flow measurement
- 16) Protection class: IP 65/67/68
- 17) No earthing rings required because of built in earthing electrode
- 18) Grounding Rings can be provided
- 19) Flame proof & weather proof version available
- 20) Interchangeable converter
- 21) Selectable response time
- 22) Accuracy standard 0.5% optional 0.2%
- 23) Accessories: Mating flanges, gasket, nut bolt, panel, UPS, surge arrestor, printer, view software

Applications of Electromagnetic flow meters:

- Water & waste water
- Pulp & paper
- Chemical industry
- Cement Industry
- Steel Industry
- Metals & Mining
- Sugar Industries
- Food & beverage industry
- Automobile
- Infra companies
- Urban Irrigation
- OEM
- Power industry
- Nuclear Power
- HVAC
- Pharma Industry

TECHNICAL SPECIFICATIONS OF EUMAG SERIES

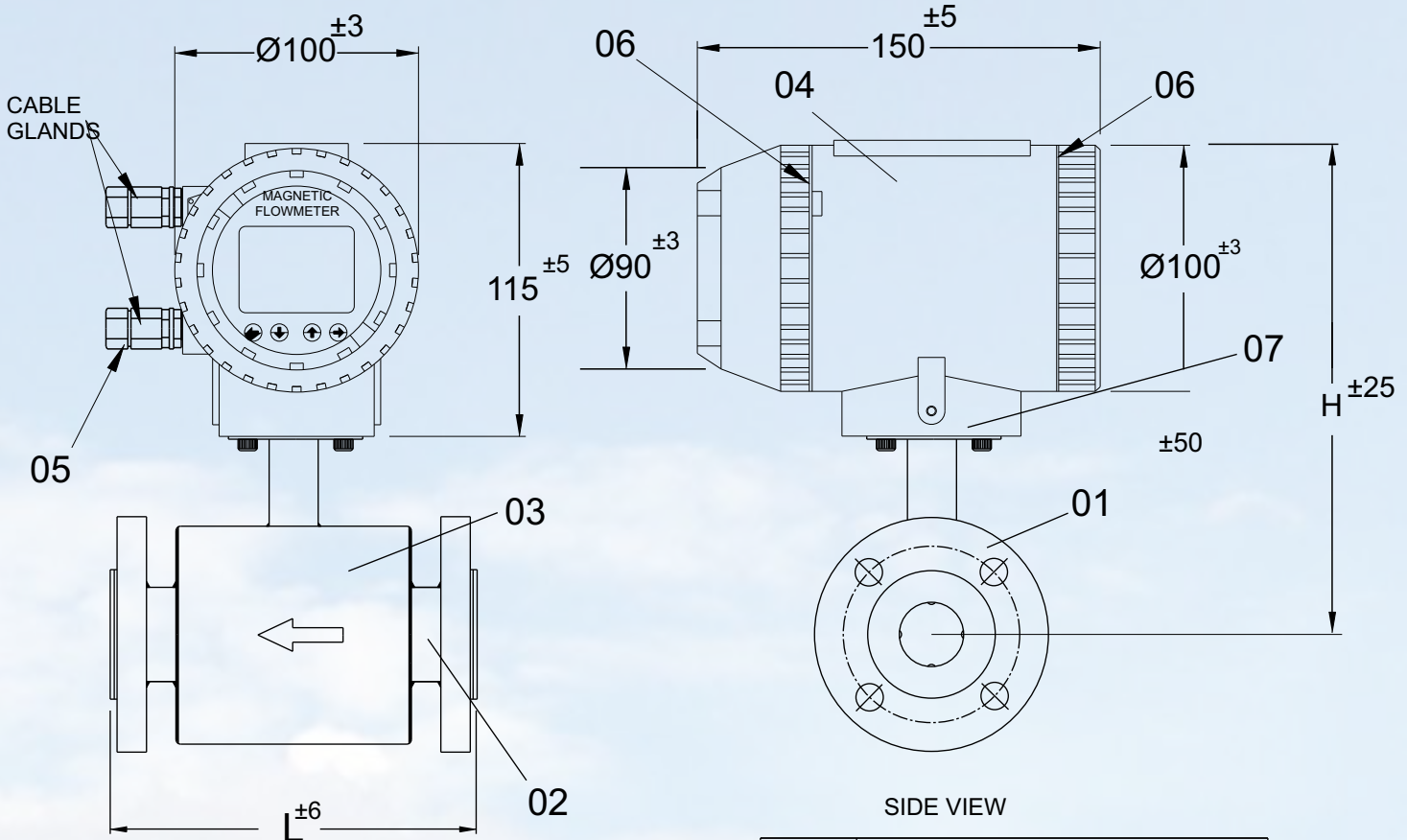
Parameters	EUMAG FULL BORE	EUMAG BATTERY OPERATED	EUMAG INSERTION
Minimum conductivity	>5 $\mu\text{s/cm}$	>5 $\mu\text{s/cm}$	>5 $\mu\text{s/cm}$
Nominal Dia in mm	10 mm to 3000 mm	10 mm to 1000mm	> 150 mm
Working pressure Kg/CM2	10,16,25,40 (Higher on request)	10,16,25,40	20
Working temp. Deg.C	Integral PTFE 120 deg C Remote PTFE 180 deg C Others 70 deg C	Up to 55 deg C	Up to 120 deg C
Electrode material	SS 316 L std*	SS 316 L std *	SS 316 L std *
Sensor lining	Neoprene/Hard Rubber/PTFE	Neoprene/Hard Rubber/PTFE	NA
Display version	Integral/Remote	Integral	Integral/Remote
Measuring tube material	SS 304 standard *	SS 304 standard *	SS 316 L std *
Sensor housing material	MS/SS304/SS316	MS/SS304/SS316	NA
End connection	Flange/wafer/Triclamp/SMS	Flange/wafer/Triclamp/SMS	NA
Measuring range	0.5 to 10 m/s	0.5 to 10 m/s	0.5 to 10 m/s
Accuracy % of measured value	(+/-) 0.5% M.V. (Better on request)	(+/-) 0.5% M.V. (Better on request)	(+/-) 1% M.V.
Repeatability	(+/-) 0.5% of span	(+/-) 0.5% of span	(+/-) 0.5% of span
Display	LCD	LCD	LCD
Display units	All standard engineering unit	All standard engineering unit	All standard engineering unit
Out put	4-20 mA Pulse, Relay	4-20 mA Passive *	-4-20 mA *
Power supply	230 VAC/24 VDC/Solar Powered	Battery powered 5 years battery life extendable	230 VAC/24 VDC/Solar Powered*
Protection class for sensor	IP 65 Std, IP 67 or IP 68 for flow tube in remote type	Std IP 65	Std IP 65
Protection class for transmitter	IP 65, IP 67	IP 65	IP 65, IP 67
Cable length for remote	10 meter *	NA	10 meter *
Installation	Inline flanged type	Inline flanged type	Insertion type with use of isolating ball valve assembly on pipe line
Communication	RS 485 MODBUS , HART , GPS/GPRS *	RS 485 MODBUS , HART GPS/GPRS *	RS 485 MODBUS , HART GPS/GPRS *

*Please refer order code for more options

Technical specification for EUMAG Mini, EUMAG Sandwich type, Wafer type

PARAMETERS	EUMAG MINI	EUMAG WAFER (SANDWICH)
Minimum conductivity	>5 $\mu\text{s/cm}$	>5 $\mu\text{s/cm}$
Line size	DN3, DN6, DN10, DN15	DN50, DN80, DN100, DN150, DN200
Velocity	0.1 M/S - 15 M/S	0.5 M/S-10 M/S
Accuracy	$\pm 0.5\%$ of reading	$\pm 0.5\%$ of reading
Lining types	F46 polymer	STD: Hard Rubber /OPTIONS: PFA
Electrode types	SS316L	STD: SS316 /OPTIONS: SS316L, Hastalloy C
Grounding Electrode		STD: SS316 /OPTIONS: SS316L, Hastalloy C
Pressure	16 Bar	10 Bar
Temperature	10-55°C	Upto 60° C
IP RATING	IP 65	IP 65
Power supply	85-250VAC , 20V-36V DC	230 VAC
Flanges	CS	
Output	4-20 mA, pulse	4-20 mA, pulse
Display	LCDisplay, 128X128mm Three lines 4 internal push button	back-lit LCD, OLED, Flow 6 digits, Tantalizer 8 digits
Communication	RS 485 MODBUS	RS 485 MODBUS , HART
Alarm	High/Low alarm	High/Low alarm
Connection	1/2 NPT, BSP	

ELECTROMAGNETIC FLOWMETER
SERIES : EUMAG---1 CONVERTOR INTEGRAL



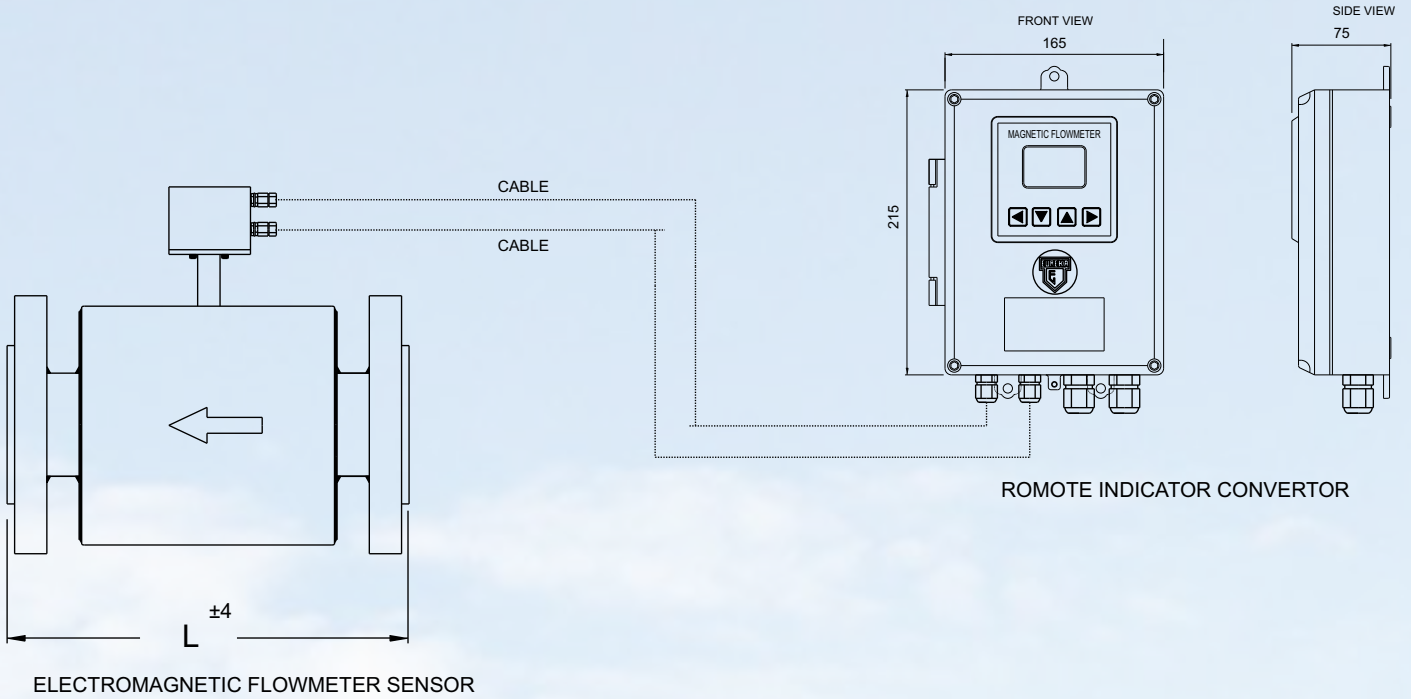
FRONT VIEW

SIDE VIEW

SR.NO.	DESCRIPTION
01	PROCESS FLANGES
02	MAIN PIPE
03	COIL HOUSING
04	INDICATOR HOUSING
05	GLANDS
06	O' RINGS-1 ENDLESS
07	O' RING-2, ID 31 X 2.5C/S

MODEL NO.	L		H	MODEL NO.	L		H
	ANSI 150 IS 6392 T5/17 DIN PN10/16	ANSI 300 DIN PN40			ANSI 150 IS 6392 T5/17 DIN PN10/16	ANSI 300 DIN PN40	
EUMAG-15---1--	200	200	205	EUMAG-600 ---1--	600		570
EUMAG-20---1--	200	200	205	EUMAG-700 ---1--	700		620
EUMAG-25---1--	200	200	210	EUMAG-800 ---1--	800		670
EUMAG-40 ---1--	200	225	235	EUMAG-900 ---1--	900		720
EUMAG-50 ---1--	200	225	235	EUMAG-1000 ---1--	1000		780
EUMAG-65 ---1--	250	275	245	EUMAG-1200 ---1--	1200		880
EUMAG-80 ---1--	250	275	250	EUMAG-1400 ---1--	1400		980
EUMAG-100 ---1--	250	275	265	EUMAG-1600 ---1--	1600		1080
EUMAG-150 ---1--	300	350	295	EUMAG-1800 ---1--	1800		1180
EUMAG-200 ---1--	350	400	325	EUMAG-2000 ---1--	2000		1280
EUMAG-250 ---1--	450	500	355	EUMAG-2200 ---1--	2200		1380
EUMAG-300 ---1--	500	550	410	EUMAG-2400 ---1--	2400		1480
EUMAG-350 ---1--	550	600	440	EUMAG-2600 ---1--	2600		1580
EUMAG-400 ---1--	600		470	EUMAG-2800 ---1--	2800		1680
EUMAG-450 ---1--	600		495	EUMAG-3000 ---1--	3000		1780
EUMAG-500 ---1--	600		520				

ELECTROMAGNETIC FLOWMETER
 SERIES : EUMAG---1 WITH REMOTE DISPLAY

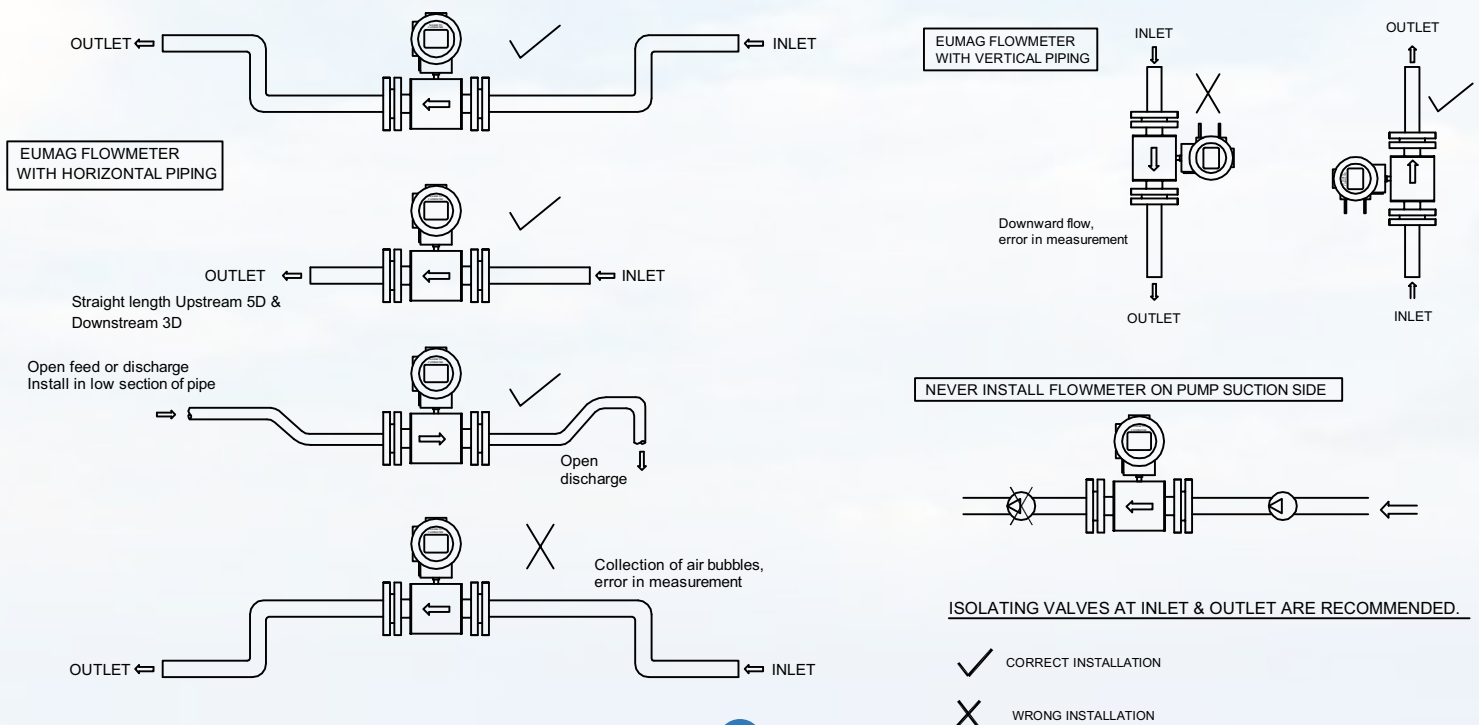


MODEL NO.	L	L	MODEL NO.	L	L
	ANSI 150 IS 6392 T5/17 DIN PN10/16	ANSI 300 DIN PN40		ANSI 150 IS 6392 T5/17 DIN PN10/16	ANSI 300 DIN PN40
EUMAG-25--- 1--	200	200	EUMAG-600 ---1--	600	
EUMAG-32 ---1--	200	225	EUMAG-700 ---1--	700	
EUMAG-40 ---1--	200	225	EUMAG-800 ---1--	800	
EUMAG-50 ---1--	200	225	EUMAG-900 ---1--	900	
EUMAG-65 ---1--	250	275	EUMAG-1000 ---1--	1000	
EUMAG-80 ---1--	250	275	EUMAG-1200 ---1--	1200	
EUMAG-100 ---1--	250	275	EUMAG-1400 ---1--	1400	
EUMAG-125 ---1--	300	350	EUMAG-1600 ---1--	1600	
EUMAG-150 ---1--	300	350	EUMAG-1800--- 1--	1800	
EUMAG-200 ---1--	350	400	EUMAG-2000 ---1--	2000	
EUMAG-250 ---1--	450	500	EUMAG-2200 ---1--	2200	
EUMAG-300 ---1--	500	550	EUMAG-2400 ---1--	2400	
EUMAG-350 ---1--	550	600	EUMAG-2600 ---1--	2600	
EUMAG-400 ---1--	600		EUMAG-2800 ---1--	2800	
EUMAG-450 ---1--	600		EUMAG-3000 ---1--	3000	
EUMAG-500 ---1--	600				

Flow Range Table

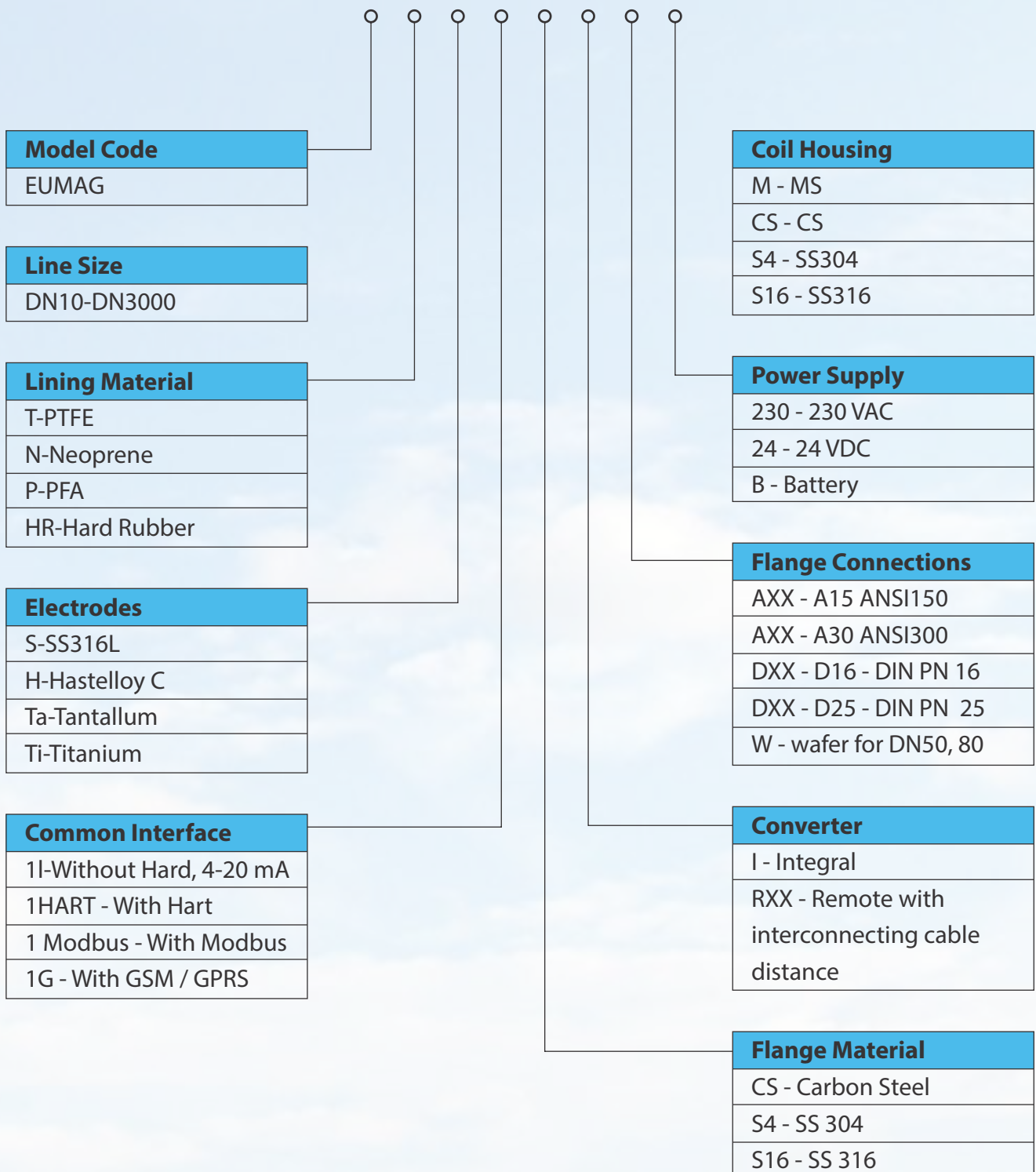
LINE SIZE	FLOW VELOCITY 0.5 M/S	FLOW VELOCITY 2 M/S	FLOW VELOCITY 5 M/S
	FLOW M3/HR	FLOW M3/HR	FLOW M3/HR
15	0.35	1.25	3.20
20	0.55	2.25	5.65
25	0.85	3.55	8.85
40	2.25	9.05	22.65
50	3.55	14.15	35.55
65	5.95	23.90	60.00
80	9.05	36.50	90.00
100	14.15	56.55	145.00
150	31.80	128.00	320.00
200	56.55	226.00	565.00
250	88.50	355.00	885.00
300	127.00	509.00	1275.00
350	175.00	695.00	1730.00
400	225.00	905.00	2260.00
450	285.00	1145.00	2865.00
500	355.00	1415.00	3535.00
600	510.00	2035.00	5085.00
700	695.00	2770.00	6925.00
800	905.00	3620.00	9045.00
900	1145.00	4580.00	11445.00
1000	1415.00	5655.00	14130.00
1200	2035.00	8140.00	20350.00
1400	2770.00	11075.00	27695.00
1600	3620.00	14470.00	36175.00
1800	4580.00	18315.00	45785.00
2000	5655.00	22610.00	56520.00
2200	6840.00	27355.00	68390.00
2400	8140.00	32555.00	81388.80
2600	9550.00	38210.00	95520.00
2800	11075.00	44315.00	110780.00
3000	12720.00	50870.00	127170.00

Installation Guidelines



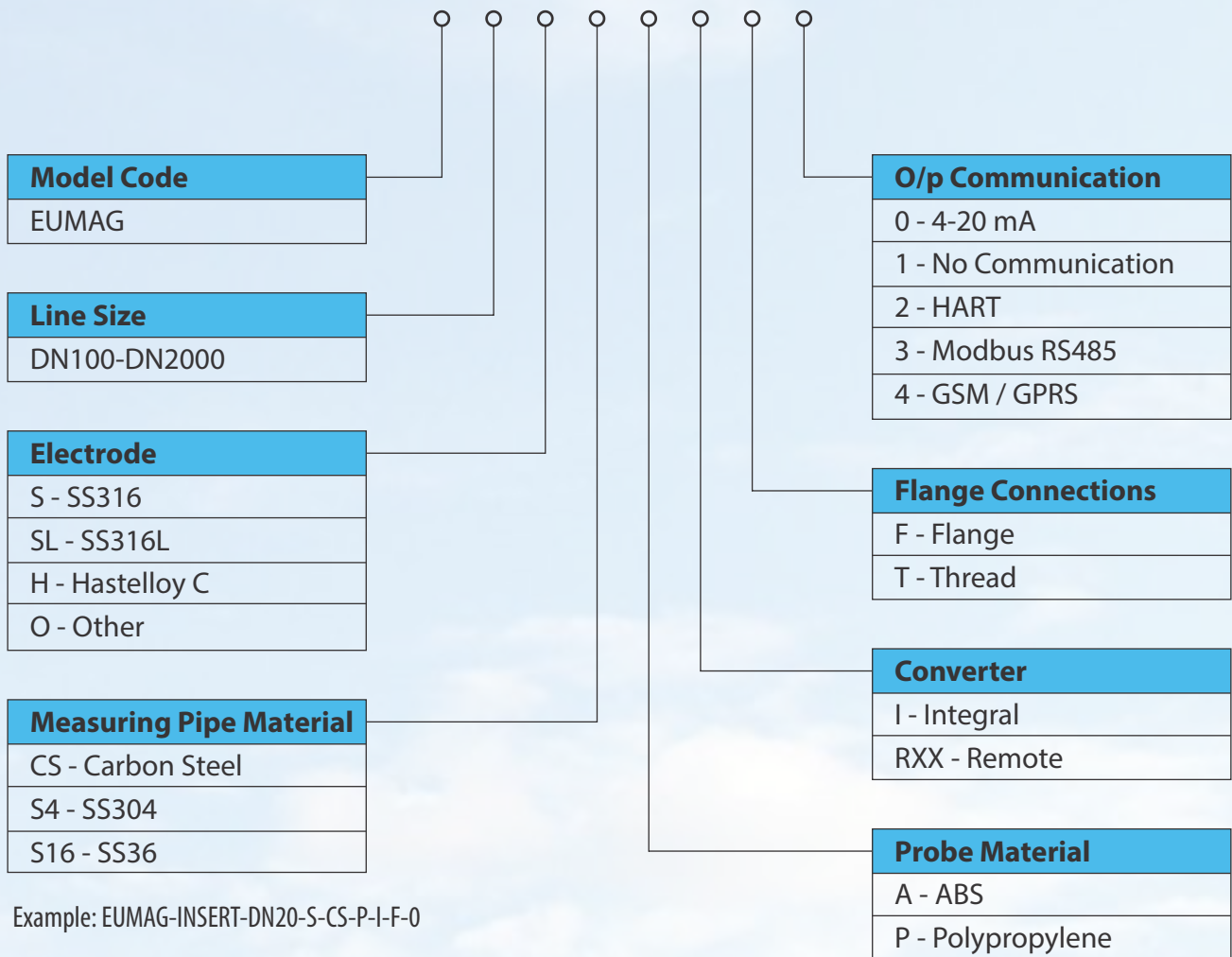
Order Code of EUMAG

EUMAG

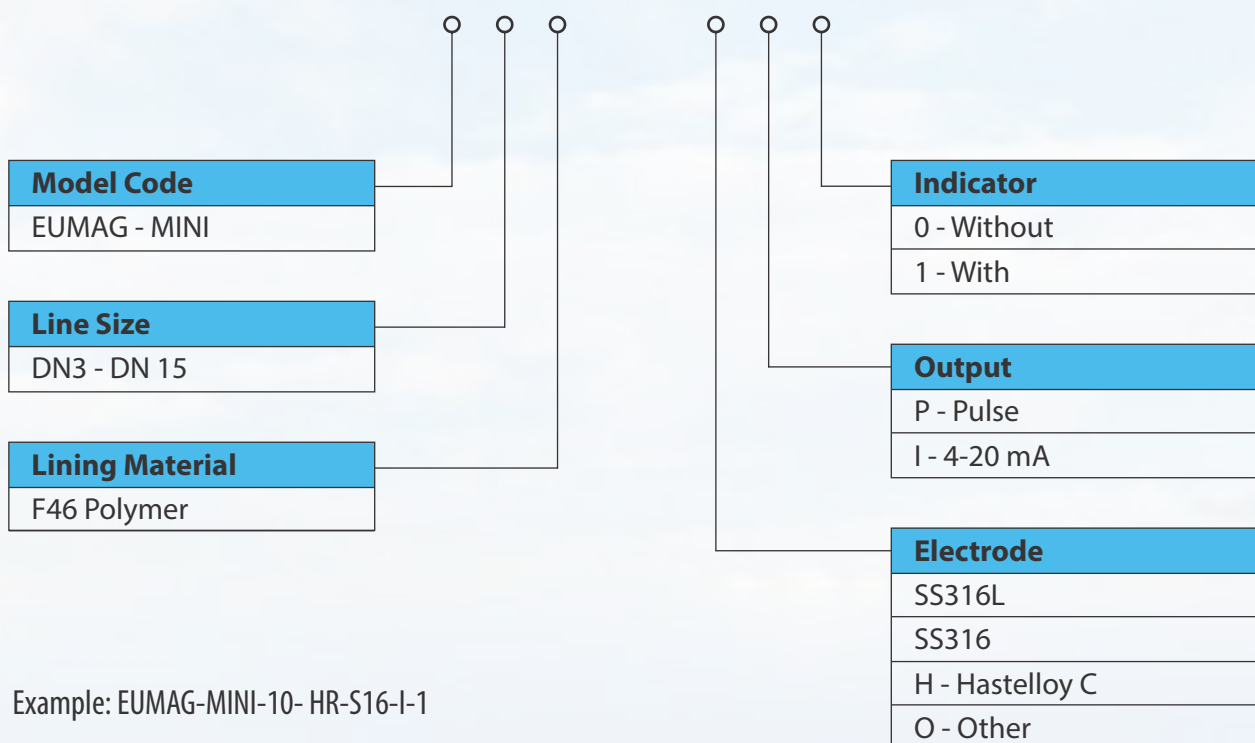


Example: EUMAG-DN50-N-S-1I-CS-I-A15-230-CS

Order Code of EUMAG INSERT



Order Code of EUMAG MINI



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- LINE TECH MAKE THERMAL MASS FLOW METER/CONTROLLER

EUREKA

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- Exports more than 10% and growing
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