EL1000 Magnetic Flow-Meter

EL1000 Series

WL300 Series
Compact Type

WL300 Series
Separate Mounting Bracket

Features

- Design with circuit lightning protection. High anti-interference circuit, apply to varieties of harsh environments.
- Provide sensors with zero-revision and back to zero with automatic function.
- With low conductivity function of measurement.
- Using electric capacitive technology with hollow and full pipe technology of detection to prevent the emergence from false alarms.
- With the consistency of exchange converter, there is no need to re-enter the parameters.
- Multiple output interface of communication could choose
  - · hart communications (option)
  - · RS485 (Modbus Option) the interface of communication.
  - · profibus (option)
- With self-diagnostic function
- Anti-covering
- Multi points calibration of correspond flowrate correspond with 4-segment velocity correspond to correction.

General

Magnetic flowmeter WILLES is a EL1000 volume flow rate meter for conductive fluids in pipelines. It allows measurement of flow rates in both directions, with high accuracy and in wide range of flow rates (0,1 – 12 m/s). The microprocessor controlled transmitter offers a wide variety of binary, analog and digital inputs and outputs suitable for all applications. Absence of moving parts and digital calibration ensures long-term accuracy and stability.

The main benefit of WILLES EL1000 type series instruments is their versitility. As a standard, the flowmeter transmitter includes a power supply and basic circuits enabling its measuring functions.

All other inputs, outputs and display units can be added as plug-in modules. Thus, the customer only pays for the function actually required. This design also permits various inputs and outputs according to the specific needs of the customer.

Versions equipped with display and keyboard provide a wide variety of displayable operating data on a readable four-line display with large characters. Also all adjustable parameters can be comfortably changed during operation, using a four-key keyboard.

Sensors are obtainable in wide range of options and designs. Manufactured dimensions are from DN8 up to DN1200, for PN10 up to PN40 (64) and temperatures for the measured liquid up to 180 °C.

According to the connection we manufacture flanged sensors, wafer or with threads. For different measured liquids we use sensors with lining from soft rubber, hard rubber, special rubber or PTFE. Measured electrodes are manufactured from stainless steel,Hastelloy, Pt or Ti.

Transmitter can be integral part of the sensor – compact version or it is connected with the sensor with a cable – separate version.

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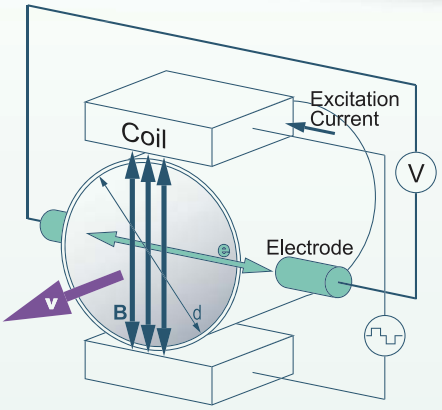
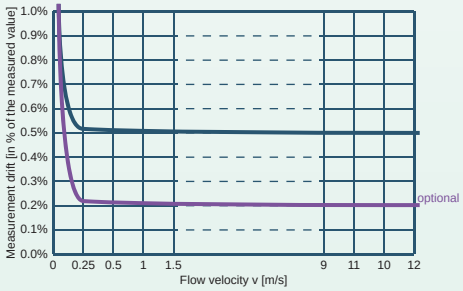


e:Electromotive Force k:Constant
v:Mean Flow Velocity d:Internal Diameter

Accuracy diagram



Summary

WILLES magnetic flow-meter is a high-tech product which amploys the microprocessor-based intellectualization technology development, it includes two types: compact type and separate type. It can measure electric liquid medium including acid, alkali, salt brine, rate of volume flow of strong corrosive medium, solid-liquid medium and so on. When the medium cross the magnetic field which is vertical of the flow direction, it will cause an electric force which is being proportional of the average flow-speed (that is volume of flow-rate), because it requires that the measured flow liquid has lowest conductivity. The induction is checked out by two electrodes which contact with the medium straightly, and that will send to amplifier via cable, then changed into an output signal. This measuring method has the following characteristic:

1. There is no resistance in the pipe, so there is no pressure loss.
2. Because the signal is formed in the magnetic field, it is an average value of the section of the pipe. The needed straight pipe between the electrode and the sensor is relativey shorter. The length is 5×DN (DN is the inner diameter of the pipe).
3. Only the pipe and the electrodes contact with the medium, so if you make reasonable choice of the material of the liner and electrodes, you can satisfy the request of anti-corrosive and wearability.
4. The signal output by the sensor is an potential which becomes linear relation with average flow rate.
5. The measuring result is not affected by the physical parameters such as pressure, viscosity, temperature, density, conductivity(more than the lowest conductivity) of the medium. So the measurement is precise, and stable.

Flow Range

Unit:M3/Hr

Normal Size		Flow Range & Velocity Table						
mm	Inch	Min. 0-0.1 M/S	1.0 M/S	2.0 M/S	3.0 M/S	5.0 M/S	10.0 M/S	Max. 0-12 M/S
8	5/16”	0 ~ 0.018	0.18	0.36	0.54	0.90	1.80	0 ~ 2.16
10	3/8”	0 ~ 0.028	0.28	0.57	0.85	1.41	2.83	0 ~ 3.39
15	1/2”	0 ~ 0.063	0.64	1.27	1.91	3.18	6.36	0 ~ 7.63
20	3/4”	0 ~ 0.112	1.13	2.26	3.39	5.65	11.3	0 ~ 13.6
25	1”	0 ~ 0.176	1.77	3.53	5.30	8.84	17.7	0 ~ 21.2
32	1-1/4”	0 ~ 0.288	2.90	5.79	8.69	14.5	29.0	0 ~ 34.7
40	1-1/2”	0 ~ 0.451	4.52	9.05	13.6	22.6	45.2	0 ~ 54.3
50	2”	0 ~ 0.705	7.07	14.1	21.2	35.3	70.7	0 ~ 84.8
65	2-1/2”	0 ~ 1.191	11.9	23.9	35.8	59.7	119	0 ~ 143
80	3”	0 ~ 1.804	18.1	36.2	54.3	90.5	181	0 ~ 217
100	4”	0 ~ 2.82	28.3	56.5	84.8	141.4	283	0 ~ 339
125	5”	0 ~ 4.40	44.2	88.4	133	220.9	442	0 ~ 530
150	6”	0 ~ 6.34	63.6	127	191	318.1	636	0 ~ 763
200	8”	0 ~ 11.28	113	226	339	565.5	1131	0 ~ 1357
250	10”	0 ~ 17.62	177	353	530	883.6	1767	0 ~ 2121
300	12”	0 ~ 25.38	254	509	763	1272	2545	0 ~ 3054
350	14”	0 ~ 34.54	346	693	1039	1732	3464	0 ~ 4156
400	16”	0 ~ 45.12	452	905	1357	2262	4524	0 ~ 5429
450	18”	0 ~ 57.10	573	1145	1718	2863	5725	0 ~ 6871
500	20”	0 ~ 70.50	707	1414	2121	3534	7068	0 ~ 8482
600	24”	0 ~ 101.5	1018	2036	3054	5089	10179	0 ~ 12214
700	28”	0 ~ 138.1	1385	2771	4156	6927	13854	0 ~ 16625
800	32”	0 ~ 180.4	1810	3619	5429	9048	18095	0 ~ 21714
900	36”	0 ~ 228.4	2290	4580	6871	11451	22902	0 ~ 27482
1000	40”	0 ~ 282.0	2827	5655	8482	14137	28274	0 ~ 33928
1200	48”	0 ~ 406.0	4071	8143	12214	20357	40714	0 ~ 48857
1400	56”	0 ~ 552.7	5542	11083	16625	27708	55417	0 ~ 66500
1600	64”	0 ~ 721.9	7238	14476	21714	36190	72381	0 ~ 86857
1800	72”	0 ~ 913.6	9161	18321	27482	45803	91607	0 ~ 109928
2000	80”	0 ~ 1128.0	11309	22619	33928	56547	113095	0 ~ 135714

EL1000 Magnetic Flow-Meter

General

The EL1000 is widely used for tap-water, waste water, food & beverage Pulp & Paper and many other applications.
EL1000 Series magmeter could be used in compact or separate model with WL Series converter of electromagnetic Flowmeter.

Features

- Various liner can be selected that satisfies most industrial applications
- Flow Velocity range: 0-12 m/s, with good results for low flow applications
- It comes any flanges such as, ANSI, DIN, JIS... etc
- It excellent for high pressure application
- Protection class: IP68 is available, and the sensor can sink into the water
- PFA Liner suitable in vacuum tube
- High accuracy of +/-0.5% of reading(or+/-0.2% of reading)
- With Forward/Reverse flowrate measure function

EL1000 Specification

Size	8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1200, 1400, 1600, 1800, 2000 mm
Measuring Rang	Velocity 0-0.1 m/s min. (+/-0.5%) 0.1-12 m/s max. (+/-0.5%)or(+/-0.2%)Option
Material Measuring Tube	Stainless Steel 304
Flange	Carbon Steel (standard), Stainless Steel304 (Option), Stainless Steel316 (Option)
Coil Housing	Carbon Steel (standard), Stainless Steel304 (Option), Stainless Steel316 (Option)
Liner	Hard Rubber (40-2000 mm) Neoprene (40-2000 mm) PFA (10-2000 mm) PTFE (10-2000 mm)
Protection	IP67, IP68
Conductivity	to be more then 5 uS/cm
Explosion Proof	Exd (ib)ibqIIBT5 (with WL300/ WL500/ WL500S-Heart Meter)
Electrode & Grounding	Stainless Steel 316L, Hastelloy B, Hastelloy C, Titanium, Tantalum, Platinum, Tungsten Carbide
Cable Entry	2 X 1/2NPT, M20 (Option)
Ambient Temperature	-25 to +60 Deg. C
Process Connection	Flange
Flanges Type	JIS 10K/ JIS 20K/ JIS 40K ANSI 150#/ ANSI 300#/ ANSI 600# DIN PN 10/ PN 16/ PN 25/ PN 40
Grounding Resistance	Must be less then 10 Ω
Accuracy	+/-0.5% of reading (Velocity >= 0.5 m/s) +/-0.001 m/s (Velocity < 0.5 m/s) +/-0.2% of reading (Option)
Temperature	-10 ~ +80℃ (Hard Rubber) -20 ~ +80 ℃ (Neoprene) -40 ~ +180℃(PFA) -40 ~ +180℃ (PTFE)
Max. Pressure	2600 Kg/cm2

EL1000 Magnetic Flow-Meter

EL1000 Series

Liner

【A】 Neoprene (40 ~ 2000 mm, 1-1/2" ~ 80")
【B】 Hard rubber (40 ~ 2000 mm, 1-1/2" ~80")
【C】 PTFE (10 ~ 2000 mm, 3/8" ~80")
【D】 PFA (10 ~ 2000 mm, 3/8" ~ 80")

Size

【8 ~ 2000】 8 ~ 2000 mm

Electrode Material

【-A】 Stainless Steel 316L
【-B】 Titanium
【-C】 Has. B
【-D】 Has. C
【-E】 Tantalum
【-F】 Platinum
【-G】 Tungsten Carbide
【-H】 Others

Connection

【A】 PN10
【B】 PN16
【C】 PN25
【D】 PN40
【E】 ANSI 150#
【F】 ANSI 300#
【G】 ANSI 600#
【H】 JIS 10K
【I】 JIS 20K
【J】 JIS 40K
【K】 Others

Grounding

【1】 None
【2】 Grounding Electrode (3 Electrode)
【3】 Grounding Ring (SS 316)
【4】 Grounding & Protection Ring (SS 316)

Protection

【A】 IP67
【B】 IP68

Flange & Housing

【1-】 Carbon Steel (standard)
【2-】 SS 304 Flange
【3-】 SS 316 Flange
【4-】 SS 304 Flange & Housing
【5-】 SS 316 Flange & Housing

Installation & Cable length

【NNN】 Compact version
【010 ~ 300】 Separate version, Cable 10M ~ 300M

Option

【-A】 None
【-B】 Explosion Proof, Exd(ib)ibqIIBT5 (with AMC3000/ AMC3100 only)
【-C】 Pressure higher then standard
【-D】 Max. Temp. higher then 180℃

EL1000-								
X	XXXX-	X	X	X	X	X-	XXX	-X

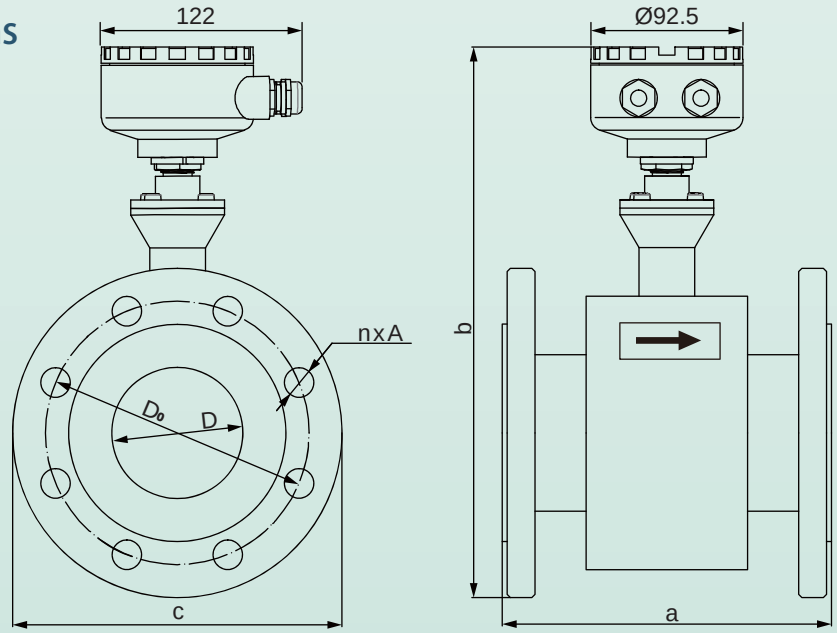
EL1000 Magnetic Flow-Meter

Separate Type Electromagnetic Flowmeter

Reference of caliber and pressure, external dimensions and weight

Caliber	Pressure	External dimension (mm)			Flange dimension (mm)		
(mm)	(MPa)	a	b	c	D	D_0	n x A
8	4.0	200	239	90	8	60	4 x 14
10	4.0	200	239	90	10	60	4 x 14
15	4.0	200	241	95	15	65	4 x 14
20	4.0	200	246	105	20	75	4 x 14
25	4.0	200	251	115	25	85	4 x 14
32	4.0	200	264	140	32	100	4 x 18
40	4.0	200	283	150	40	110	4 x 18
50	4.0	200	290	165	50	125	4 x 18
65	1.6	200	310	185	65	145	4 x 18
80	1.6	200	325	200	80	160	8 x 18
100	1.6	250	345	220	100	180	8 x 18
125	1.6	250	370	250	125	210	8 x 18
150	1.6	300	405	285	150	240	8 x 22
200	1.0	350	464	340	200	295	8 x 22
250	1.0	400	517	395	250	350	12 x 23
300	1.0	500	563	445	300	400	12 x 23
350	1.0	600	617	505	350	460	16 x 23
400	1.0	600	678	565	400	515	16 x 26
450	1.0	600	728	615	450	565	20 x 26
500	1.0	600	779	670	500	620	20 x 26
600	1.0	600	889	780	600	725	20 x 30
700	1.0	700	1001	895	700	840	24 x 30
800	1.0	800	1114	1015	800	950	24 x 35
900	1.0	900	1200	1115	900	1050	28 x 35
1000	1.0	1000	1307	1230	1000	1160	28 x 35
1200	0.6	1200	1498	1405	1200	1340	32 x 35
1400	0.6	1400	1823	1524	1400	1560	36 x 36
1600	0.6	1600	2033	1726	1600	1760	40 x 36
1800	0.6	1800	2227	1926	1800	1970	44 x 39
2000	0.6	2000	2428	2170	2000	2180	48 x 32

Dimensions



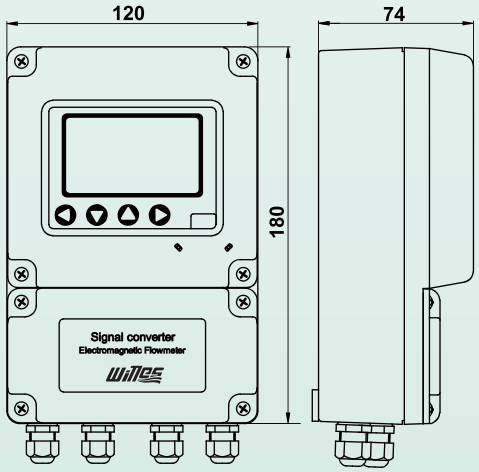
WL500 Magnetic Flow-Meter

Features

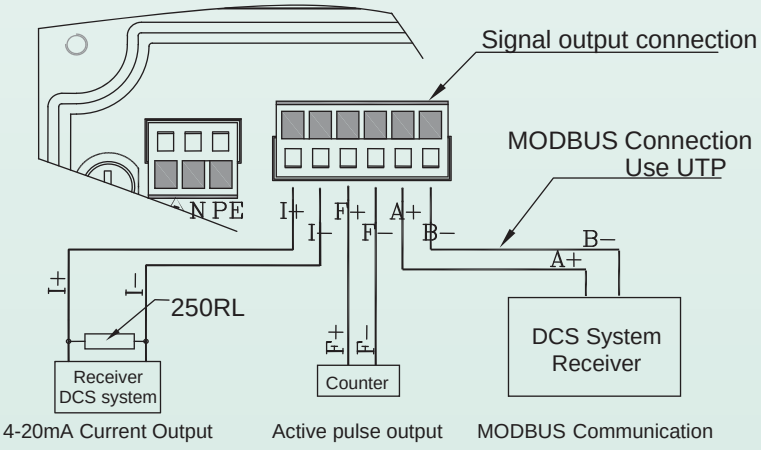
- Three line LCD display for Flow rate/Totalizer
- Accuracy of +/-0.5% of reading(or+/-0.2% of reading)
- Bi-directional flow measurement, current and pulse output
- 4-20mA auxiliary Input include 4 digit display
- MODBUS/HART communication

- Design with circuit lightning protection. High anti-interference circuit, apply to varieties of harsh environments.
- Provide sensors with zero-revision and back to zero with automatic function.
- With low conductivity function of measurement.
- Using electric capacitive technology with hollow and full pipe technology of detection to prevent the emergence from false alarms.
- With the consistency of exchange converter, there is no need to re-enter the parameters.
- Multiple output interface of communication could choose
  - · hart communications (option)
  - · RS485 (Modbus Option) the interface of communication.
  - · profibus (option)
- With self-diagnostic function
- anti-covering
- Multi points calibration of correspond flowrate correspond with 4-segment velocity correspond to correction.

Dimensions



Signal output connection



WL500 Series Model Selection Guide

Power supply		
【AC-】 90-260 Vac, 50/60 Hz		
【DC-】 24Vdc, +/-10%		
	Mounting	
	【1-】 Compact with Sensor	
	【2-】 Separate, wall mounting	
	【3-】 Separate, 2" mounting bracket	
		Communication
		【R】 RS485(MODBUS Protocol)
		【H】 HART signal

WL500 Magnetic Flow-Meter

Standard Specification

Excitation	Square wave
Display	Clear backlighted LCD display, instant, accumulation
Line1	11 digit totalizer for forward flow
	11 digit totalizer for reverse flow
	11 digit totalizer for difference
Line2	5 digit flowrate / Velocity / % / mA / Hz
Line3	Parameter / Query / Clr tot / Query LOG / Alarm / Guidance
Unit	M3/H, L/H, Kg/H, T/H, L/min, M3/min, GPH, GPM
Measuring Range	Min. 0 to 0.1 m/s (0.5%)
	Max. 0 to 12 m/s (0.5%) or (+/-0.2% of reading, option)
Accuracy	+/-0.5% of reading (Velocity >= 0.5 m/s)
	+/-0.002 m/s (Velocity < 0.5 m/s) or (+/-0.2% of reading)
Repeatability	+/-0.1% of reading
Current Output	4-20mA (Isolated)
Load	Max. 800 Ω
Pulse Output	Open collector
Rating	3 to 30 VDC, 20mA Max.
Pulse Rate	1. Scale pulse, (Pulse/M3, Pulse/L, Other)
	2. Frequency, 0-5000 Hz
Pulse Output	Transistor collector open output with photoelectric isolation; pulse equivalent: 0.0001-10 m^3/cp
Alarms	High/ Low with open collector output
Rating	3 to 30 VDC, 20mA Max.
Communication	RS485 (MODBUS Protocol) / HART signal
Data Storage	Operation parameters and totalization figures are stored by EEPROM for more then 15 years
Keyboard	4 keys from internal for programming and display control.
	4 keys from remote control for programming and display control.
Low Flow Cutoff	0 to 9.9%
Damping	0 to 99 Second
Density Setting	0.1 to 9.99 g/cm2
Self Diagnosis	The following error message is indicated when applicable
	- Coil fail / Power fail / Output overranged / Internal error / Overflow / Empty pipe
Cable Entry	4-M18 X 1.5
Protection Class	IP 67
Ambient Temperature	-25 to +65℃
Material	Aluminum Alloy
Power Supply	90-260 VAC, 45/63 Hz, 8-36 VDC, internal lighting protection
Power Consumption	< 10VA
Mounting	Wall suspension type