

## High-Performance Magnetic Flowmeter

No Moving Parts! Plug & Play! Minimal Straight Pipe Required!

USonic Metering high-performance Electromagnetic flowmeter accurately measures the flow volume of any conductive liquids, such as water, salt water, sewage, pulps, slurry, acid, alkali, or, any mixtures of liquids and solids which have a specific minimum of electric conductivity. USONIC METERING E-MAG3x series has been widely used in municipal, wastewater treatment, irrigation, chemicals, as well as industrial liquid processes.



Remote Type

Compared with other measurement methods, E-MAG3x electromagnetic flowmeters offer the following particular advantages:

- No moving parts to wear and tear
- Short straight-pipe run required, thus, suitable for any desired installation location
- Plug and play. All parameters are pre-configured in factory
- High accuracy.  $\pm 0.5\%$  accuracy as standard offer  $\pm 0.3\%$  accuracy available for DN25-300 sizes upon request
- Large operable flow range, 1200:1. Reliable and accurate measurement over the widely varying flow rates, including minimal night flows, which occur in typical water distribution network
- Wide size selection, from DN15 up to DN2000 (1/2"~80")
- No pressure loss
- Standard output: 4-20mA, pulse, RS232, or RS485/MODBUS
- Optional HART or PROFIBUS communication interface
- Self-diagnosing capability to minimize operational downtime



## Introduction



*Integral Type*

in closed pipelines. With a microprocessor and exclusive integrated circuit, USonic Metering's electromagnetic flowmeter has the advantages of reliable performance, high-accuracy, and is exceptionally easy to use. The high speed CPU and advanced signal processing technology ensure a wide measuring range (0.01m/s to 12m/s or 0.03ft/s to 36ft/s). The two-line LCD display makes the readings and parameter setting comprehensive and convenient.

An Electromagnetic flowmeter is an induction type flow instrument often used to measure, based on Faraday Law, the volume flowrate of conductive medium

USonic Metering's electromagnetic flowmeter can be widely used in industries such as chemical, power supply, metallurgical mine, water supply and drainage, paper plants, pharmaceutical, food, and more.

## Specifications

<b>Accuracy*</b>	±0.5% of reading for DN600/32" and smaller size and ±1% for DN700/28" and larger size. ±0.3% accuracy available for DN15/1/2"-DN300/12" size upon request.
<b>Damping Time</b>	0.2~100s selectable
<b>Display and Buttons</b>	Large LCD display with backlight. Display the instantaneous flow, total flow, and alarm
<b>Totalizers</b>	Three built-in totalizers: forward flow totalizer, reverse flow totalizer and net totalizer
<b>Security</b>	Keypad can be locked with password
<b>Outputs Signals</b>	
• Analog Output	Bi-directional, isolated 0~10mA/4~20mA. Load resistor: 0~1.5KΩ for 0~10mA, 0~750Ω for 4~20mA
• Frequency Output	Forward & reverse flow output with the frequency range of 1~5000Hz. The external voltage must be lower than 35V and the max output current must be 250mA when the transistor is turned on.
• Alarm Output	Alarm output: Two isolated Open Collector Transistor (OCT) outputs for alarm signals. The external voltage must be lower than 35V and the max output current must be 250mA when the transistor is turned on. Alarm will be activated when the pipe is empty, the excitation circuits are broken or the volume of flow rate exceeds the value of designed limits.

• Pulse Alarm	The OCT circuit is used for forward or reverse flowrate output. The upper frequency of the output can be up to 5000cp/s. The relevant value of pulse is from 0.1L/p to 1000m <sup>3</sup> /p. Pulse width can be set in intervals of 10ms up to 400ms, or, 50% occupancy. The external voltage must be lower than 35V and maximum output current must be 250mA when the transistor is on.		
<b>Flow Direction Indication</b>	The converter (main unit) is capable of measuring both forward and reverse flow and recognizing its direction. The converter outputs 0V low level for forward flow, while +12V high level for reverse flow.		
<b>Communication</b>	RS232, RS485/MODBUS, PROFIBUS or HART Communication selectable.		
<b>Protection Class</b>			
• For electronic box	IP65 (outdoor) or IP 67 (optional)		
• For sensor	IP65 (outdoor) or IP 68 (submersible, only for remote type)		
<b>Nominal Pressure</b>	DN15-DN100 (1/2"~4"): 2.5MPa (362psig)		
	DN125-DN250 (5"~10"): 1.6MPa (232psig)		
	DN300-DN1000 (12"~40"): 1.0MPa (145psig)		
	DN1200-DN2000 (48"~80"): 0.6MPa (87psig)		
	Higher pressure rating is available upon request		
<b>Lining Material</b>	Rubber, PTFE, Polyurethane, PFA		
<b>Electrode Type</b>	General type, scraper type or replaceable type		
<b>Electrode Material</b>	316L SS, Hastelloy B, Hastelloy C, Titanium, Tantalum		
<b>Sensor Material</b>			
• Measuring tube	Stainless steel		
• Housing	Carbon steel as standard offer. Stainless steel available upon request		
• Flange	Carbon steel as standard offer. Stainless steel available upon request		
<b>Pipe Connection</b>	DIN flange as standard offer	ASME ANSI flange	
	Clamped type	Flange Wafer type	
<b>Medium Temperature</b>			
• Integral type	-10°C~+80°C (14°F~176°F)		
• Remote type	Neoprene & Polyurethane Liner	PTFE Liner	PFA Liner
	-10°C ~+80°C (14°F~176°F)	-10°C~+150°C (14°F~302°F)	-10°C~204°C (14°F~400°F)
<b>Ambient Temperature</b>	-25°C~+60°C (-13°F~140°F)		
<b>Ambient Humidity</b>	5~95%RH (relative humidity)		
<b>Medium Electrical Conductivity</b>	≥ 5us/cm		
<b>Measuring Range</b>	1200:1, flow rate ≤12m/s (39ft/s)		
<b>Power Supply</b>	16~36VDC or 85~250VAC, <20W		
<b>Structure Type</b>	Integral type, remote type, submersible type		

The Electromagnetic flowmeter consists of a converter (main unit) and a flow sensor. The flow sensor is composed of a stainless steel measuring tube, carbon steel housing, flange, copper wire, liner and electrode. The housing and flanges can also be stainless steel for durability. The flanges are welded on the measuring tube.

The measured fluid must be conductive liquid or slurry with conductivity no less than 5 $\mu$ s/cm. It is recommended to avoid using this technology for fluid with too much ferromagnetic substance. The pressure rating, liner material, electrode material and instrument structure should be chosen based on the characteristics of the fluid.

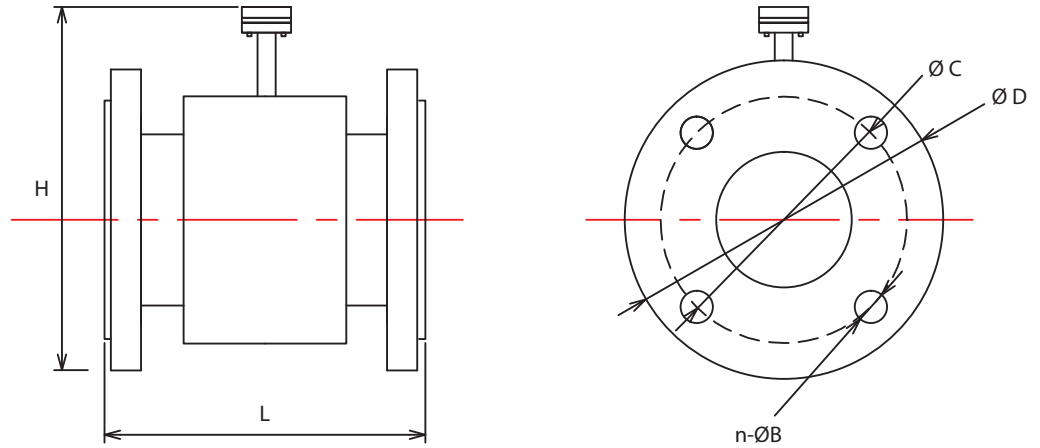
Range of application: Conductive liquid or solid-liquid phase medium, such as drinking water, beverages, sewage, as well as strongly corrosive medium like sulfuric acid to slurry.

### \* Accuracy Table

Size mm (inch)	Velocity m/s	0.3% Grade Accuracy	0.5% Grade Accuracy	1.0% Grade Accuracy
15~20 (1/2-3/4)	<0.3	Accuracy	$\pm 1$ mm/s	$\pm 1.2$ mm/s
	0.3~1		$\pm 0.5\%$ R	$\pm 1.0\%$ R
	1~15		$\pm 0.5\%$ R	$\pm 1.0\%$ R
25~300 (1-12)	<0.3	$\pm 0.75$ mm/s	$\pm 1$ mm/s	$\pm 1.2$ mm/s
	0.3~0.5	$\pm 1.5$ mm/s	$\pm 0.5\%$ R	$\pm 1.0\%$ R
	0.5~1	$\pm 0.3\%$ R	$\pm 0.5\%$ R	$\pm 1.0\%$ R
	1~15	$\pm 0.3\%$ R	$\pm 0.5\%$ R	$\pm 1.0\%$ R
350~600 (14-24)	<0.3		$\pm 1$ mm/s	$\pm 1.2$ mm/s
	0.3~1		$\pm 0.5\%$ R	$\pm 1.0\%$ R
	1~15		$\pm 0.5\%$ R	$\pm 1.0\%$ R
700~2000 (28-80)	<0.3			$\pm 1.5$ mm/s
	0.3~1			$\pm 1.0\%$ R
	1~15			$\pm 1.0\%$ R

%R: relative to reading

# USONIC METERING



## Dimensions and Pressure Rating of Flow Sensor (full bore only)

Nominal Size*	Nominal Pressure	Dimension						Weight	
		L		H		D			
		mm	in	mm	in	mm	in	kg	lbs
15 (½")	2.5 MPa (362psig)	200	7.9	220	8.7	80	3.1	8	17.6
20 (¾")		200	7.9	220	8.7	90	3.5	10	22
25 (1")		200	7.9	223	8.8	100	3.9	12	26.4
32 (1 ¼")		200	7.9	240	9.4	120	4.7	13	28.7
40 (1 ½")		200	7.9	250	9.8	130	5.1	14	30.9
50 (2")		200	7.9	263	10.4	140	5.5	15	33.1
65 (2 ½")	1.6 MPa (232psig)	200	7.9	283	11.1	180	7.1	18	39.7
80 (3")		200	7.9	290	11.4	195	7.7	20	44.1
100 (4")		250	9.8	318	12.5	215	8.5	25	55
125 (5")		250	9.8	350	13.8	245	9.6	28	61.7
150 (6")		300	11.8	380	15.0	280	11.0	30	66.1
200 (8")		350	13.8	430	16.9	335	13.2	50	110
250 (10")	1.0 MPa (145 psig)	450	17.7	495	19.5	405	15.9	70	154
300 (12")		500	19.7	547	21.5	440	17.3	95	209
350 (14")		550	21.7	602	23.7	500	19.7	120	264
400 (16")		600	23.6	665	26.2	565	22.2	140	308
450 (18")		600	23.6	720	28.3	615	24.2	160	352
500 (20")		600	23.6	783	30.8	670	26.4	200	440
600 (24")		600	23.6	897	35.3	780	30.7	280	616
700 (28")		700	27.6	982	38.7	895	35.2	350	770
800 (32")		800	31.5	1092	43.0	1010	39.8	400	880
900 (36")		900	35.4	1192	46.9	1110	43.7	480	1056
1000 (40")	1000	39.4	1299	51.1	1220	48.0	550	1210	

## Dimensions of Flow Cell

*ANSI B16.5 150lb for DN sizes ≤ 24"*

*ANSI B16.47 150lb Series A for DN sizes > 24"*

Nominal Size	Dimension						Weight	
	L		D		H		Remote**	
	mm	in	mm	in	mm	in	kg	lbs
15 (½")	200	7.9	88.9	3.5	220	8.7	8	17.6
20 (¾")	200	7.9	98.6	3.9	220	8.7	10	22
25 (1")	200	7.9	108	4.3	220	8.7	12	26.4
32 (1 ¼")	200	7.9	117.3	4.6	230	9.1	13	28.7
40 (1 ½")	200	7.9	127	5	240	9.4	14	30.9
50 (2")	200	7.9	152.4	6	260	10.2	15	33.1
65 (2 ½")	200	7.9	177.8	7	280	11	18	39.7
80 (3")	200	7.9	190.5	7.5	285	11.2	20	44.1
100 (4")	250	9.8	228.6	9	315	12.4	26	57.3
125 (5")	250	9.8	254	10	345	13.6	28	61.7
150 (6")	300	11.8	279.4	11	370	14.6	30	66.1
200 (8")	350	13.8	342.9	13.5	430	16.9	55	121.3
250 (10")	450	17.7	406.4	16	495	19.5	72	158.7
300 (12")	500	19.7	482.6	19	557	21.9	110	242.5
350 (14")	550	21.7	533.4	21	608	23.9	142	313.1
400 (16")	600	23.6	596.9	23.5	670	26.4	166	366
450 (18")	600	23.6	635	25	720	28.3	175	385.9
500 (20")	600	23.6	689.5	27.1	775	30.5	212	467.4
600 (24")	600	23.6	812.8	32	885	34.8	295	650.4
700 (28")	750	29.5	927.1	36.5	998	39.3	700	1543.3
800 (32")	850	33.5	1060.5	41.8	1115	43.9	750	1653.5
900 (36")	950	37.4	1168.4	46	1215	47.8	960	2116.4
1000 (40")	1050	41.3	1289.1	50.7	1325	52.2	1100	2425.1
1100 (44")	1200	47.2	1346.2	53	1350	53.1	1250	2755.8
1200 (48")	1300	51.3	1405	55.3	1488	58.6	1500	3306.9
1500 (60")	1600	62.9	1855	73	1930	75.9	2500	5511.6

## Dimensions of Flow Cell

*ANSI B16.5 300lb for DN sizes ≤ 24"*

*ANSI B16.47 300lb Series A for DN sizes > 24"*

Nominal Size	Dimension						Weight	
	L		D		H		Remote**	
	mm	in	mm	in	mm	in	kg	lbs
400 (16")	650	25.6	647.7	25.5	700	27.6	300	661
500 (20")	650	25.6	774.7	30.5	810	31.8	410	904
600 (24")	700	27.6	914.4	36	934	36.8	600	1323
1000 (40")	1050	41.3	1289.1	50.7	1325	52.2	1100	2425.1
1500 (60")	1600	62.9	1810	71.2	1910	75.2	2700	3747.9

## Dimensions and Pressure Rating of Flanges (full bore flow sensor only)

Nominal Size*	DIN Flange (mm)					ANSI RF#150 Flange (in)				Nominal Pipe Size (NPS)	Class 300 (in)			
	Nominal Pressure	D	Ø B	n	Ø C	D	Ø B	n	Ø C		D	n	Ø B	Ø C
15 (1/2")	2.5 MPa (362psig)	80	12	4	55	3 1/2	1/2	4	2 3/8	1/2"	3 3/4	4	1/2	2 5/8
20 (3/4")		90	12	4	60	3 7/8	1/2	4	2 3/4	3/4"	4 5/8	4	5/8	3 1/4
25 (1")		100	12	4	75	4 1/4	1/2	4	3 1/8	1"	4 7/8	4	5/8	3 1/2
32 (1 1/4")		120	14	4	80	4 5/8	1/2	4	3 1/2	1 1/4"	5 1/4	4	5/8	3 7/8
40 (1 1/2")		130	14	4	100	5	1/2	4	3 7/8	1 1/2"	6 1/8	4	3/4	4 1/2
50 (2")		140	14	4	110	6	5/8	4	4 3/4	2"	6 1/2	8	5/8	5
65 (2 1/2")	1.6 MPa (232psig)	180	18	4	145	7	5/8	4	5 1/2	2 1/2"	7 1/2	8	3/4	5 7/8
80 (3")		195	18	8	160	7 1/2	5/8	4	6	3"	8 1/4	8	3/4	6 5/8
100 (4")		215	18	8	180	9	5/8	8	7 1/2	4"	10	8	3/4	7 7/8
125 (5")		245	18	8	210	10	3/4	8	8 1/2	5"	11	8	3/4	9 1/4
150 (6")		280	23	8	240	11	3/4	8	9 1/2	6"	12 1/2	12	3/4	10 5/8
200 (8")		335	23	12	295	13 1/2	3/4	8	11 3/4	8"	15	12	7/8	13
250 (10")	405	25	12	355	16	7/8	12	14 1/4	10"	17 1/2	16	1	15 1/4	
300 (12")	1.0 MPa (145psig)	440	23	12	400	19	7/8	12	17	12"	20 1/2	16	1 1/8	17 3/4
350 (14")		500	23	16	460	21	1	12	18 3/4	14"	23	20	1 1/8	20 1/4
400 (16")		565	25	16	515	23 1/2	1	16	21 1/4	16"	25 1/2	20	1 1/4	22 1/2
450 (18")		615	25	20	565	25	1 1/8	16	22 3/4	18"	28	24	1 1/4	24 3/4
500 (20")		670	25	20	620	27 1/2	1 1/8	20	25	20"	30 1/2	24	1 1/4	27
600 (24")		780	30	20	725	32	1 1/4	20	29 1/2	24"	36	24	1 1/2	32
700 (28")		895	30	24	840	36 1/2	1 1/4	28	34	28"	40 3/4	28	1 5/8	37
800 (32")		1010	34	24	950	41 3/4	1 1/2	28	38 1/2	32"	45 1/4	28	1 7/8	41 1/2
900 (36")		1110	34	28	1050	46	1 1/2	32	42 3/4	36"	50	32	2	46
1000 (40")		1220	34	28	1160	50 3/4	1 1/2	36	47 1/4	40"	48 3/4	32	1 5/8	45 1/2
1100(44")						53	1 1/2	36	49 1/2	42"	50 3/4	32	1 5/8	47 1/2
1200 (48")						55 1/4	1 5/8	40	51 3/4	44"	53 1/4	32	1 7/8	49 3/4
1500 (60")					73	1 7/8	52	69 1/4	60"	70 1/4	32	2 3/8	67	

**Notes:**

\* For size above DN1500(60"), Please contact sales@USONICmetering.com for details.



## Flow Sensor Selection

### Selection of Liner Material

Liner material	Main performance	Applications
Polytetrafluoroethylene (PTFE)	<ol style="list-style-type: none"> <li>1. A plastic material with the most stable chemical properties, able to resist the corrosion of boiling hydrochloric acid, sulfuric acid, nitric acid, aqua regia, concentrated alkali and many kinds of organic solvents.</li> <li>2. Unable to resist the corrosion of chlorine trifluoride, high temperature vanadyltrifluoride, high flow-rate liquid fluorine, liquid oxygen and ozone.</li> <li>3. Poor abrasion resistance.</li> <li>4. Poor ability of anti-negative pressure.</li> </ol>	<ol style="list-style-type: none"> <li>1. 100°C (212°F)</li> <li>2. Strong corrosive medium like concentrated acid, alkali, and more.</li> <li>3. Sanitary medium.</li> </ol>
Chloroprene rubber (Neoprene rubber)	<ol style="list-style-type: none"> <li>1. Excellent elasticity, retractility and abrasion resistance. High degree of tensile strength, good wear resistance.</li> <li>2. Able to resist the corrosion of low concentration acid, alkali and salt, but unable to resist that of the oxidative medium.</li> </ol>	<ol style="list-style-type: none"> <li>1. &lt;80°C (176°F)</li> <li>2. Water, sewage and slurry, polluted water, mineral serosity of low abrasion.</li> </ol>
Polyurethane rubber	<ol style="list-style-type: none"> <li>1. Excellent wear resistance (ten times higher than that of the natural rubber).</li> <li>2. Not suitable in acid and alkali resistance.</li> <li>3. Unable to work with water mixed with organic solvent.</li> </ol>	<ol style="list-style-type: none"> <li>1. &lt;80°C (176°F)</li> <li>2. Middle and strong wear ability for ore pulp, coal pulp, mud, and more.</li> <li>3. High abrasion liquids such as mineral rich liquids, slurry and coal slurry.</li> </ol>
PFA Liner	<ol style="list-style-type: none"> <li>1. Outstanding chemical and solvent resistance</li> <li>2. High temperature stability</li> </ol>	<ol style="list-style-type: none"> <li>1. &lt;204°C (400°F)</li> <li>2. Often used in various grades of purity and cleanliness.</li> </ol>

Materials of Electrode	Applications
Mo-containing stainless steel (0Cr18Ni12Mo2Ti)	Liquids with weak corrosivity, such as industrial water, sewage, living water, polluted water, are widely used in industries like oil, chemical, petrochemical, urea, vinylon, carbamide, etc.
Hastelloy B (HB)	Good corrosion resistance of different concentration of hydrochloric acid under boiling point, resist the corrosion of non-oxidizing acid, alkali, non-oxidizing salt solution, such as sulfuric acid, phosphoric acid, organic acid, etc.
Hastelloy C (HC)	Able to resist the corrosion of oxidizing acid, such as nitric acid, mixed acid, the mixture of chromic acid and sulfuric acid, oxidizing salt like Fe <sup>+++</sup> , Cu <sup>++</sup> or other oxidants such as hypochlorite solution above ordinary temperature and seawater.



Titanium (Ti)	Seawater; chloride, hypochlorite salt, oxidable acid, organic acid, alkali, etc. Unable to resist the corrosion of purer reducing acid like sulfuric acid and hydrochloric acid. The corrosivity of alpha hydroxy acids will be substantially decreased if there are oxidants such as nitric acid, Fe <sup>+++</sup> , Cu <sup>++</sup> , etc. in it.
Tantalum (Ta)	The corrosion resistance of tantalum is as good as glass. Except hydrofluoric acid, fuming nitric acid and alkali, it is able to resist the corrosion of almost any other chemical media.

As there is a great variety of medium and the corrosiveness of each medium could significantly depend on temperature, concentration, flow rate and more, the above two tables can only be used as references.

Users should make a choice according to the actual situation of their applications. If necessary, corrosion resistance experiments such as a hanging sheet experiment using similar material should be performed.

### Selection of Liner Protection Flange and Grounding Flange

Type of Flange	Applications
Grounding Flange	Applicable to non-conductive pipeline such as plastic pipeline. However, it is not required for the sensor with polytetrafluoroethylene (PTFE) liner.
Inlet Protection Flange	Applied when the medium has strong wear ability, often used with polyurethane liner. However, it is not applicable to the sensor with polytetrafluoroethylene (PTFE) liner.

### Selection of the Nominal Diameter

- EMFM31 electromagnetic flowmeter has a high rangeability of 1200:1. For best results, it is recommended to select the nominal diameter of flow sensor to be the same as that of the process pipe.
  - If the actual flow velocity is below this range yet inconvenient to increase, it is recommended to select a nominal diameter smaller than that of the process pipe. As such, the flow velocity in the measuring tube of the sensor can be properly increased in order to avoid particle deposition and related accuracy degradation.
- If there are solid particles in the measured medium, a flow velocity range of 1~3m/s (3~10ft/s) is recommended.
  - If the actual flow velocity is over this range yet inconvenient to reduce, it is recommended to select a nominal diameter larger than that of the process pipe. As such, the flow velocity in the measuring tube of the sensor can be properly decreased and the abrasion of the electrode and liner caused by the particles can be alleviated.
- If the flow rate is too small yet a high accuracy measurement is required, you may select a sensor nominal diameter smaller than that of the process pipe. This is to increase the velocity thus will increase the accuracy.

When you select a flow sensor which nominal diameter is different from the process pipe, a size adaption pipe should be jointed to both the upstream and downstream of the flow sensor. The center taper angle should be no more than 150° and there should be a straight pipe at least 5 times of the process pipe diameter jointed to the adaption pipe.

### Comparison Table of Velocity and Flowrate

Velocity <small>m/s(ft/s)</small> Flowrate <small>m<sup>3</sup>/h (gpm)</small> Diameter <small>mm (inch)</small>	<b>0.01(0.03) (Min)</b>	<b>1 (3.28)</b>	<b>2 (6.56)</b>	<b>3 (9.84)</b>	<b>4 (13.12)</b>	<b>5 (16.4)</b>	<b>15 (49.2) (Max)</b>
15(½")	0.006(0.026)	0.64(2.82)	1.27(5.60)	1.9(8.40)	2.5(11.20)	3.2(14.00)	9.5(41.99)
20(¾")	0.011(0.048)	1.13(4.97)	2.26(9.95)	3.4(14.93)	4.5(19.91)	5.6(24.88)	16.9(74.64)
25(1")	0.018(0.079)	1.77(7.79)	3.53(15.55)	5.3(23.33)	7.1(31.10)	8.8(38.88)	26.5(116.63)
40(1½")	0.45(1.98)	4.52(19.89)	9.04(39.81)	13.5(59.72)	18.1(79.62)	22.6(99.53)	67.8(298.58)
50(2")	0.07(0.31)	7.07(31.11)	14.13(62.20)	21.2(93.31)	28.2(124.41)	35.3(155.51)	106.0(466.53)
65(2½")	0.12(0.53)	11.95(52.58)	23.89(105.12)	35.8(157.69)	47.7(210.25)	59.7(262.81)	179.2(788.43)
80(3")	0.18(0.79)	18.1(79.64)	36.19(159.24)	54.3(238.86)	72.3(318.48)	90.4(398.10)	271.4(1194.31)
100(4")	0.28(1.23)	28.27(124.41)	56.5(248.81)	84.8(373.22)	113.1(497.63)	141.3(622.04)	424.1(1866.11)
150(6")	0.63(2.80)	63.61(279.92)	127.2(559.83)	190.8(839.75)	254.4(1119.66)	318.1(1399.58)	954.2(4198.74)
200(8")	1.13(4.98)	113.1(497.63)	226.1(995.26)	339.3(1492.88)	452.3(1990.51)	565.4(2488.14)	1696.4(7464.42)
250(10")	1.76(7.78)	176.7(777.54)	353.4(1555.09)	530.1(2332.63)	706.8(3110.18)	883.5(3887.72)	2650.7(11663.16)
300(12")	2.54(11.2)	254.4(1119.66)	508.9(2239.33)	763.4(3358.99)	1017.8(4478.65)	1272.3(5598.32)	3817.0(16794.95)
350(14")	3.46(15.2)	346.3(1990.51)	692.7(3047.97)	1039.1(4571.96)	1385.4(6095.95)	1731.8(7619.93)	5195.4(22859.80)
400(16")	4.52(19.91)	452.3(4478.65)	904.7(3981.03)	1357.1(5971.54)	1809.5(7962.05)	2261.9(9952.57)	6785.8(29857.70)
450(18")	5.72(25.19)	572.5(2519.24)	1145.1(5038.49)	1717.6(7557.73)	2290.2(10076.97)	2962.7(13036.22)	8588.3(37788.65)
500(20")	7.06(31.10)	706.8(3110.18)	1413.7(6220.35)	2120.5(9330.53)	2827.4(12440.71)	3534.3(15550.88)	10602.8(46652.65)
600(24")	10.17(44.79)	1017.8(4478.65)	2035.7(8957.31)	3053.6(13435.96)	4071.5(17914.62)	5089.3(22393.27)	15268.1(67179.82)
700(28")	13.85(60.96)	1017.8(4478.65)	2770.8(12191.89)	4156.3(18287.84)	5541.7(24383.79)	6927.2(30479.73)	20781.6(91439.20)
800(32")	18.09(79.62)	1385.4(6095.95)	3619.1(15924.11)	5428.6(23886.16)	7238.2(31848.21)	9047.7(39810.26)	27143.3(119430.79)
900(36")	22.9(100.77)	1809.5(7962.05)	4580.4(20153.95)	6870.6(30230.92)	9160.8(40307.89)	11451.1(50384.86)	34353.3(151154.59)
1000(40")	28.27(124.41)	2290.2(10076.97)	5654.8(24881.41)	8482.3(37322.12)	11309.7(49762.83)	14137.1(62203.53)	42411.5(186610.60)
1200(48")	40.7(179.15)	2827.4(12440.71)	8143.0(35829.24)	12214.5(53743.85)	16286.0(71658.47)	20357.5(89573.09)	61072.5(268719.27)
1400(56")	55.4(243.84)	4071.5(17914.62)	11083.5(48767.57)	16625.3(73151.36)	22167.1(97535.14)	27708.8(121918.93)	83126.5(365756.78)
1600(64")	72.4(318.48)	5541.7(24383.79)	14476.4(63696.42)	21714.6(95544.63)	28952.9(127392.84)	36191.1(159241.05)	108573.4(477723.15)
1800(72")	91.6(403.08)	7238.2(31848.21)	18321.7(80615.78)	27482.6(120923.67)	36643.5(161231.56)	45804.4(201539.45)	137413.2(604618.36)
2000(80")	113.1(497.63)	9160.8(40307.89)	22619.4(99525.66)	33929.2(149288.48)	45238.9(199051.31)	56548.6(248814.14)	169646.0(746442.14)



### Required Accessories

Power Supply Cable	Model No.
110VAC (American Plug)	WA-PWC-1
220VAC (European Plug)	WA-PWC-2

### Optional Accessories

External Adapter	Model No.
485-Ethernet Adapter (to connect to an Ethernet network)	WA-485Ether

### Example

**Model# E-MAG3-DN0100-2-A-1-A-2-B-2-A-1-A**

Stands for E-MAG3 magmeter of size DN100 with 2.5MPa pressure rating DIN flange, PTFE lining and 316SS electrode. 4~20mA and RS485/Modbus outputs.

**Model# WA-PWC-2**

Stands for 220VAC power supply with European style power plug.

## About USONIC Metering:

USONIC metering is a global leader in flow and energy management solutions. Through continuous innovation, we transform cutting-edge technologies into affordable, reliable solutions for accurate flow and energy measurement. USONIC Metering offers water, heat, electricity and gas meters as well as AMR/AMI solutions. To find out how we can help today, please tell us about your application.