MEASURE **TODAY.** ENSURE **TOMORROW.**

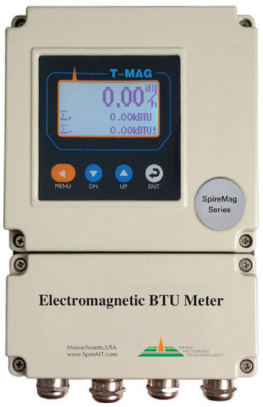
SpireMag Series T-MAG
Electromagnetic BTU Meter

Features

T-MAG BTU meter is the latest addition to the SpireMag series for accurate thermal energy measurement. It utilizes a high accuracy electromagnetic flowmeter to measure the flow volume of the chilled water, hot water or condensed water, and two matched temperature sensors to measure the supply and return temperature. T-MAG provides abundant input/output and communication options which make it easy to be integrated into any meter reading system, PLC or BMS systems.

Insertion Flow Sensor

Full Bore Flow Sensor



Main Unit

Insertion Temperature Sensor

- High accuracy, billing grade. Up to 0.5% accuracy for flow, 0.15°F (0.08°C) for temperature difference. 0.3% accuracy available upon request
- Plug and play. All parameters are pre-configured in factory
- Integrated BTU measurement system. Single source responsibility
- Two flow sensor options: full bore sensor for high accuracy, insertion sensor for easy installation
- Bi-directional
- Short straight-pipe run, thus, suitable for any desired installation location
- No moving parts to wear and tear. Save maintenance cost
- Standard output: 4-20mA, pulse, dry contact (relay)
- Optional MODBUS, HART, BACnet, LonWorks or Wireless for easy BMS or PLC integration

DSTMAGQT-1501-Rev.5

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SpireMag Series T-MAG
Electromagnetic BTU Meter

Applications

The T-MAG high-performance BTU meter accurately measures the thermal energy consumption or transportation of a heating / cooling system. It is an ideal choice for a wide range of applications in HVAC, heating/cooling energy production, energy transfer, building management, facility management, district heating and cooling, geothermal or solar hot water system monitoring, and more.

Some examples are:

- Chilled water HVAC
- Hot water HVAC
- Condensate and heating water circuits
- Boiler feed water
- Thermal storage, geothermal system, solar hot-water system
- District energy management and billing
- Commercial building tenant billing
- LEED / Green building verification, green credit application
- Energy consulting
- Power plant efficiency monitoring
- Facility management in shopping malls, campus, industrial parks, hospitals, commercial buildings, government buildings, airports and more

Introduction

Spire Metering's T-MAG electromagnetic BTU meter is designed to measure the heat or cold energy of a water heating/ cooling circuits. It consists of three parts, an electromagnetic flow sensor, a pair of temperature sensors and a main unit. The main unit is a powerful console which combines high accuracy flow measurement, temperature measurement and BTU calculation.

The flow sensor operates based on Faraday Law. It measures the volume flowrate of conductive medium in closed pipelines. With a microprocessor and exclusive integrated circuit, Spire Metering's electromagnetic flow sensor has the advantages of reliable performance, high accuracy, ease of use and more. The advanced signal processing technologies ensure a wide measuring range. The big LCD display makes the readings and parameter setting comprehensive and convenient.

The temperature sensors are high accuracy. It also comes with either 2, 3 or 4 wire RTDs which are paired and calibrated in factory to achieve better than 0.15°F (0.08°C) accuracy for temperature difference measurement.

The BTU calculation is according to the EN1434 heat meter standard. The formulas have been carefully implemented in the microprocessor to reduce computational error to a minimum.

As the latest addition to the SpireMag series, the T-MAG offers various output options, such as 4-20mA, dry contact, RS485/ Modbus, BACnet, LonWorks, wireless and more. It can be integrated into BMS building automation systems and PLC units easily.

SpireMag Series T-MAG
Electromagnetic BTU Meter

Specifications | With full bore flow sensor

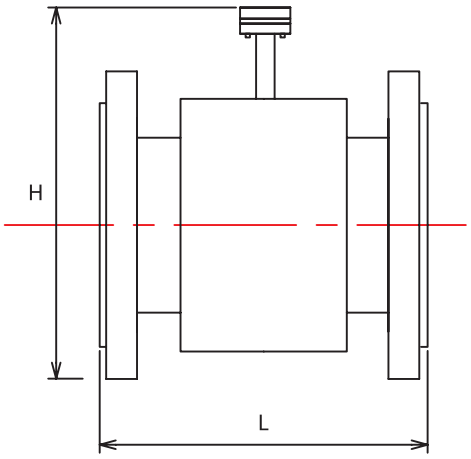
Nominal Size	½" ~ 40" (DN15 ~ DN1,000)
Flow Accuracy	±0.3% / ±0.5% of reading for 12" and smaller
	±1% of reading for sizes above 12"
Flow Measurement Range	0.3ft/s ~ 30ft/s (0.1m/s ~ 10m/s)
Flow Direction	Capable of measuring both forward and reverse flow and recognizing its direction
Temperature Range	Θ: 32°F ~ 300°F (0°C ~ 150°C)
Temperature Difference Range	ΔΘ: 4°F ~ 160°F (2°K ~ 90°K)
Temperature Difference Accuracy	±0.15°F (±0.08°C)
Medium Temperature	-10°C ~ +80°C (14°F ~ 176°F) with rubber liner
	-10°C ~ +150°C (14°F ~ 302°F) with PTFE liner
Display and Keys	Large LCD display with backlight. Visible under sunlight or in the dark
	Display instantaneous energy, flow, total energy, total flow, supply temperature, return temperature, temperature difference, alarm and more
	Display units for energy – BTU, KBTU, KJ, MH, GJ, KWh, MWh
	Four keys for local programming and information access
Totalizers	Energy totalizer, flow totalizer
Output Signals	Analog output: 4 ~ 20mA. Load resistor ≤ 500Ω
	Digital output: Open Collector Transistor (OCT) interface. Can be programmed as: • Pulse output: pulse width 0.1s ~ 99.9s • Frequency output: 1 ~ 5,000Hz
Communication	RS232 or RS485 / MODBUS
	HART Communication available upon request
	BACnet, LonWorks or others available upon request
Protection Class	For electronic box: IP65 (outdoor)
	For sensor: IP65 (outdoor)
Lining Material	Rubber or PTFE
Electrode Material	316L SS
Sensor Material	stainless steel for measuring tube, carbon steel for housing and flange
Pipe Connection	DIN or ANSI RF150# flange
Nominal Pressure	½" ~ 2" (DN15 ~ DN50): 2.5MPa (362psig) for DIN and 150lbs for ANSI RF#150 flanges
	2½" ~ 10" (DN65 ~ DN250): 1.6MPa (232psig) for DIN and 150lbs for ANSI RF#150 flanges
	12" ~ 24" (DN300 ~ DN600): 1.0MPa (145psig) for DIN and 150lbs for ANSI RF#150 flanges
	28" ~ 40" (DN700 ~ DN1,000): 1.0MPa (145psig) for DIN flange only
Ambient Temperature	-25°C ~ +50°C (-13°F ~ 122°F)
Ambient Humidity	5~95%RH (relative humidity)
Medium Electrical Conductivity	≥ 20us/cm
Power Supply	18~36VDC or 110~240VAC, <15W
Structure Type	Remote type

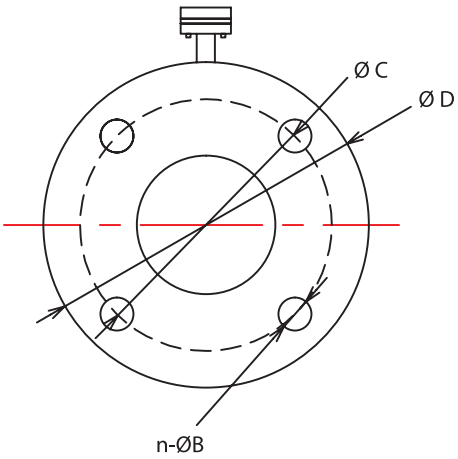
SpireMag Series T-MAG
Electromagnetic BTU Meter

Specifications | With insertion flow sensor

Nominal Size	3" ~ 40" (DN80 ~ DN1,000)
Flow Accuracy	±2% of reading
Flow Measurement Range	1.5ft/s ~ 30ft/s (0.5m/s ~ 10m/s)
Flow Direction	Capable of measuring both forward and reverse flow and recognizing its direction
Temperature Range	Θ: 32°F ~ 300°F (0°C ~ 150°C) **Note:** *the flow sensor head is made from ABS.* *Thus, the liquid temperature should be below 140°F (60°C)*
Temperature Difference Range	ΔΘ: 4°F ~ 160°F (2°K ~ 90°K)
Temperature Difference Accuracy	±0.15°F (±0.08°C)
Medium Temperature	ABS 60°C (14°F)
Display and Keys	Large LCD display with backlight. Visible under sunlight or in the dark
	Display instantaneous energy, flow, total energy, total flow, supply temperature, return temperature, temperature difference, alarm and more
	Display units for energy – BTU, KBTU, KJ, MH, GJ, KWh, MWh
	Four keys for local programming and information access
Totalizers	Energy totalizer, flow totalizer
Output Signals	Analog output: 4 ~ 20mA. Load resistor ≤ 500Ω
	Digital output: Open Collector Transistor (OCT) interface. Can be programmed as: • Pulse output: pulse width 0.1s ~ 99.9s • Frequency output: 1 ~ 5,000Hz
Communication	RS232 or RS485 / MODBUS
	HART Communication available upon request
	BACnet, LonWorks or others available upon request
Protection Class	For electronic box: IP65 (outdoor)
	For sensor: IP65 (outdoor)
Electrode Material	316 SS with polypropylene head
Sensor Material	ABS
Hot tapping	Ball valve optional
	Hot tapping tool kit available upon request
Operating Pressure	Above 200psi
Ambient Temperature	-25°C ~ +50°C (-13°F ~ 122°F)
Ambient Humidity	5~95%RH (relative humidity)
Medium Electrical Conductivity	≥ 50us/cm
Power Supply	18~36VDC or 110~240VAC, <15W
Structure Type	Remote type

SpireMag Series T-MAG
Electromagnetic BTU Meter





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")		450	17.7	495	19.5	405	15.9	70	154
300 (12")	1.0 MPa (145 psig)	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
1050 (42")	1200	47.2	1346.2	53	1350	53.1	1250	2755.8
1100 (44")	1150	45.3	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
15 (½")	200	7.9	220	8.7	95.2	3.7	8	17.6
20 (¾")	200	7.9	225	8.9	117.3	4.6	10	22.1
25 (1")	200	7.9	227	8.9	123.9	4.9	12	26.5
32 (1 ¼")	200	7.9	237	9.3	133.3	5.2	13	28.7
40 (1 ½")	200	7.9	252	9.9	155.4	6.1	14	30.9
50 (2")	200	7.9	263	10.4	165.1	6.5	15	33.1
65 (2 ½")	200	7.9	285	11.2	190.5	7.5	20	44.1
80 (3")	200	7.9	294	11.6	209.5	8.2	24	52.9
100 (4")	250	9.8	327	12.9	254	10.0	31	68.3
125 (5")	250	9.8	354	13.9	279.4	11.0	36	79.3
150 (6")	300	11.8	388	15.3	317.5	12.5	40	88.2
200 (8")	350	13.8	450	17.7	381	15.0	70	154.3
250 (10")	450	17.8	519	20.4	444.5	17.5	102	224.9
300 (12")	500	19.7	577	22.7	520.7	20.5	141	310.9
350 (14")	550	21.7	632	24.9	584.2	23.0	190	418.9
400 (16")	600	23.6	695	27.4	647.7	25.5	220	485.0
450 (18")	600	23.6	755	29.7	711.2	28.0	270	595.2
500 (20")	650	25.6	813	32.0	774.7	30.5	334	736.3
600 (24")	700	27.6	934	36.8	914.4	36.0	480	1058.2
700 (28")	700	27.6	1050	41.3	1035.1	40.8	550	1212.5
800 (32")	800	31.5	1160	45.7	1149.4	45.3	700	1543.2
900 (36")	900	35.4	1270	50.0	1270	50.0	880	1940.1
1000 (40")	1000	39.4	1230	48.4	1238.3	48.8	900	1984.2

SpireMag Series T-MAG
Electromagnetic BTU Meter

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

Nominal Size*	DIN Flange (mm)					ANSI 150lbs Flange (in)				Nominal Pipe Size (NPS)	ANSI 300lbs Flange (in)			
	Nominal Pressure	D	Ø B	n	Ø C	D	Ø B	n	Ø C		D	n	Ø B	Ø C
15 (½")	2.5 MPa (362psig)	80	12	4	55	3 ½	½	4	2 ⅜	½"	3 ¾	4	½	2 ⅝
20 (¾")		90	12	4	60	3 ⅞	½	4	2 ¾	¾"	4 ⅝	4	⅝	3 ¼
25 (1")		100	12	4	75	4 ¼	½	4	3 ⅛	1"	4 ⅞	4	⅝	3 ½
32 (1 ¼")		120	14	4	80	4 ⅝	½	4	3 ½	1 ¼"	5 ¼	4	⅝	3 ⅞
40 (1 ½")		130	14	4	100	5	½	4	3 ⅞	1 ½"	6 ⅛	4	¾	4 ½
50 (2")		140	14	4	110	6	⅝	4	4 ¾	2"	6 ½	8	⅝	5
65 (2 ½")	1.6 MPa (232psig)	180	18	4	145	7	⅝	4	5 ½	2 ½"	7 ½	8	¾	5 ⅞
80 (3")		195	18	8	160	7 ½	⅝	4	6	3"	8 ¼	8	¾	6 ⅝
100 (4")		215	18	8	180	9	⅝	8	7 ½	4"	10	8	¾	7 ⅞
125 (5")		245	18	8	210	10	¾	8	8 ½	5"	11	8	¾	9 ¼
150 (6")		280	23	8	240	11	¾	8	9 ½	6"	12 ½	12	¾	10 ⅝
200 (8")		335	23	12	295	13 ½	¾	8	11 ¾	8"	15	12	⅞	13
250 (10")		405	25	12	355	16	⅞	12	14 ¼	10"	17 ½	16	1	15 ¼
300 (12")	1.0 MPa (145psig)	440	23	12	400	19	⅞	12	17	12"	20 ½	16	1 ⅛	17 ¾
350 (14")		500	23	16	460	21	1	12	18 ¾	14"	23	20	1 ⅛	20 ¼
400 (16")		565	25	16	515	23 ½	1	16	21 ¼	16"	25 ½	20	1 ¼	22 ½
450 (18")		615	25	20	565	25	1 ⅛	16	22 ¾	18"	28	24	1 ¼	24 ¾
500 (20")		670	25	20	620	27 ½	1 ⅛	20	25	20"	30 ½	24	1 ¼	27
600 (24")		780	30	20	725	32	1 ¼	20	29 ½	24"	36	24	1 ½	32
700 (28")		895	30	24	840	36 ½	1 ¼	28	34	28"	40 ¾	28	1 ⅝	37
800 (32")		1010	34	24	950	41 ¾	1 ½	28	38 ½	32"	45 ¼	28	1 ⅞	41 ½
900 (36")		1110	34	28	1050	46	1 ½	32	42 ¾	36"	50	32	2	46
1000 (40")		1220	34	28	1160	50 ¾	1 ½	36	47 ¼	40"	48 ¾	32	1 ⅝	45 ½
1050 (42")						53	1 ½	36	49 ½	42"	50 ¾	32	1 ⅝	47 ½
1100 (44")						55 ¼	1 ⅝	40	51 ¾	44"	53 ¼	32	1 ⅞	49 ¾
1500 (60")						73	1 ⅞	52	69 ¼	60"	70 ¼	32	2 ⅜	67

Notes:

** For size above DN1500(60"), Please contact support@spiremt.com for details.*

Grounding Selection (for full-bore flow sensor only)

In general, extra grounding accessory is not needed for water flow in metal pipes which have normally been connected to Earth ground already. However, if the pipe is plastic or the pipe is not Earth grounded, you may consider the following accessories.

Type	Applications
Grounding Ring	Economical. Applicable to non-conductive pipeline such as plastic pipeline. However, it is not required for the sensor with polytetrafluoroethylene (PTFE) liner.
Grounding Flange	Higher cost but better grounding. Applicable to non-conductive pipeline such as plastic pipeline. However, it is not required for the sensor with polytetrafluoroethylene (PTFE) liner.

Nominal Diameter Selection (for full-bore flow sensor only)

1. Electromagnetic flowmeter has a high rangeability. Thus, you may select the nominal diameter of flow sensor to be the same as that of the process pipe.

2. 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 electrode and liner caused by the particles can be alleviated.

- 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.

3. 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 to increase the accuracy.

When you select a flow sensor which nominal diameter is different from the process pipe, a size adaptation pipe shouldbe 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 adaptation pipe.

To help sensor size selection, please consult the following table which shows the flow rate of each size at different flow velocity.

Comparison Table of Flow Velocity and Flowrate

Velocity m/s(ft/s) / Flowrate m³/h (gpm) / Diameter mm (inch)	0.01(0.03) (Min)	1 (3.28)	2 (6.56)	3 (9.84)	4 (13.12)	5 (16.4)	15 (49.2) (Max)
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(1 ½″)	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(2 ½″)	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)

SpireMag Series T-MAG
Electromagnetic BTU Meter

How to Order

Please select one option **(ID)** from each category.

T-MAG- □-□□□□□□-□-□-□-□-□-□-□

Flow Sensor Type	ID
Insertion, accuracy 2% (for size of DN80/3" or larger)	I
Full bore, accuracy 0.5%	F
Full bore, accuracy 0.3% (for size of DN300/12" or smaller)	FH

Unit System	ID
Metric System	DN
English System	IN

Flow Sensor Size	ID
DN15 (½")	0015 (0050)
DN20 (¾")	0020 (0075)
DN25 (1")	0025 (0100)
.....	.....
DN1000 (40")	1000 (4000)

Nominal Pressure	ID
2.5 MPa (362psig) / DN15-50 (½"-2")	1
1.6MPa (232psig) / DN65-250 (2½"-10")	2
1.0MPa (145psig) / DN300-1000 (12"-40")	3
Other, please specify	4

Liner Material	ID
None (for insertion sensor)	A
PTFE	B
Chloroprene Rubber (for size of DN100/4" or larger)	C

ID	Electrode Material
0	316 SS with polypropylene head (for insertion sensor)
1	316L SS (OCr18N112M02Ti)
2	HC (Hastelloy C)

ID	Output
0	Pulse + 4~20mA (default)
1	Pulse + 4~20mA + RS485 / Modbus

ID	Pipe Joint for Flow Sensor
A	Insertion
B	DIN Flange
C	ANSI RF150# Flange
D	Other, please specify

ID	Grounding
0	None
1	Ground ring
2	Ground flange
3	Tri-electrode

ID	Flow Sensor Cable
A	15m / 45ft (Default)
B	30m / 90ft
C	50m / 150ft

Required Accessories

Power Supply Cable	Model No.
110VAC (American Plug)	WA-PWC-1
220VAC (European Plug)	WA-PWC-2
Temperature Sensor (for details, please refer to the RTD probe datasheet)	**Model No.**
Insertion PT100 Probe for DN15~32/0.5~1.25" pipe with 5m/15ft Lead	PT100IN-A-N-5M
Insertion PT100 Probe with Thermalwell and 5m/15ft Lead	PT100IN-X-Y-5M
Insertion PT100 Probe with Thermalwell and 10m/30ft Lead	PT100IN-X-Y-10M
Insertion PT1000 Probe with Thermalwell and 5m/15ft Lead	PT1000IN-X-Y-5M
Insertion PT1000 Probe with Thermalwell and 10m/30ft Lead	PT1000IN-X-Y-10M

Note: *X=B: for pipe DN40~65/1.5~2.5"; X=C: for pipe DN80~125/3~5"; X=D: for pipe DN150~200/6~8"; X=E: for pipe DN250/10"; X=F: for pipe >DN250/10".*
The default cable of temp sensor is two-core wire. Four-core wire is available upon request.

Optional Accessories

External Adapter	Model No.
485-BACnet / MSTP Adapter (to connect to a BACnet Gateway)	WA-BACMSTP
485-LonWorks Adapter (to connect to a LonWorks network)	WA-LONW

Example

Model# T-MAG-F-DN0100-1-B-1-1-B-0-A
Stands for T-MAG BTU meter 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.

Model# PT1000IN-C-Y-5M
Stands for insertion temperature sensor PT1000 with thermal well for pipe DN80~125/3~5" and 5 meter long lead.

About Spire Metering Technology

Spire 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. Spire 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.