Datasheet

BTU Meter

LDGR-SUP

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Supmea®

Datasheet

Electromagnetic flow meter for energy-saving measurement

Supmea's BTU meter is only suitable for measuring the instantaneous flow of conductive liquid or liquid-solid two-phase fluid, and has a flow accumulation function.The hot water (cold water) supplied by the heat source flows into the heat exchange system at a higher (low) temperature and flows out at a lower (high) temperature. During this process, heat is released or absorbed to the user through heat exchange. When the water flows through the heat exchange system, according to the flow rate given by the flow sensor and the temperature of the supply and return water given by the paired temperature sensor, as well as the elapsed time of the water flow, the calculator calculates and displays the heat released or absorbed by the system.

Application

- Sewage treatment
- Printing and dyeing
- Chemical industry
- Environmental protection
- Food
- Paper making
- Tap water supply

Features

- Excellent measurement repeatability and linearity
- Excellent stability and anti-interference function
- Excellent pressure-resistant design
- Self-diagnosis of empty pipe detection
- Prevent pressure loss measuring tube
- Simple menu operation
- High accuracy



BTU meter

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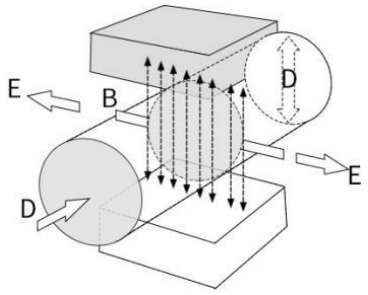
Principle of electromagnetic flow meter

The measurement principle of magnetic flowmeters can be described as follows: when the liquid goes through the pipe at the flow rate of v with a diameter D, within which a magnetic flux density of B is created by an exciting coil, the following electromotive E is generated in proportion to flow speed v:

$$E=K\times B\times V\times D$$

Where:

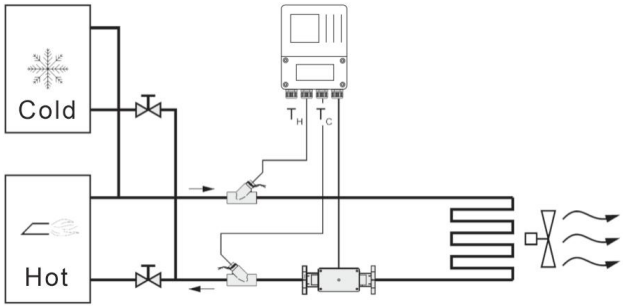
E—Induced electromotive force
K—Meter constant
B—Magnetic induction density
V—Average flow speed in cross-section of measuring tube
D—Inner diameter of measuring tube



The induced voltage signal is detected by two electrodes and transmitted to the converter through a cable. After a series of analog and digital signal processing, the cumulative flow and instantaneous flow are displayed on the display of the converter. Then, according to the return temperature difference at the inlet and outlet of the liquid flowing through the electromagnetic heat meter, it is processed by the secondary instrument to calculate the total heat value.

Principle of BTU meter

The working principle of the electromagnetic heat meter: the hot water (cold water) supplied by the heat source flows into the heat exchange system at a higher (low) temperature and flows out at a lower (higher) temperature. release or absorb heat. When the water flows through the heat exchange system, according to the flow rate given by the flow sensor and the temperature of the supply and return water given by the paired temperature sensor, as well as the elapsed time of the water flow, the calculator calculates and displays the heat released or absorbed by the system.



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Parameters

Execution Standard	JB/T9248-2015	
Measuring principle	Faraday's law of electromagnetic induction	
Function	Real-time flow rate, flow velocity, mass flow (when the density is constant), real-time measurement and flow accumulation	
Module configuration	Measurement system is made up of signal converter and measurement sensor	
Converter		
Compact Type	IP65	
Remote Type	IP65 for transmitter (IP65/IP68 for sensor)	
Measurement sensor		
Nominal Diameter	DN10-DN2000	
Flange	In line with GB/T9119-2000 standard carbon steel (Optional stainless steel flanges), other standard flange can be customized	
Pressure rating (High pressure can be customized)	DN15 - DN250, PN≤1.6MPa	
	DN300~DN1000, PN≤1.0MPa	
	DN1200~DN2000, PN≤0.6MPa	
Lining Material	Neoprene (CR), Polyurethane (PU) PTFE (F4), PFEP (F46), PFA	
Electrode Material	316L Stainless Steel, Hastelloy C, Hastelloy B, Ti, Ta, Pt	
IP Rate	IP65 for converter IP68 for sensor	IP65
Medium temperature	Neoprene: -10…+60℃ Polyurethane: -10…+60℃ PTFE/FEP: -10…+120℃ PFA: -10…+180℃	Neoprene: -10…+60℃ Polyurethane: -10…+60℃ PTFE/FEP: -10…+120℃ PFA: -10…+120℃
Buried depth	Not deeper than 5 meters (only for remote type sensors with IP68 protection)	
Immersion depth	Not deeper than 3 meters (only for remote type sensors with IP68 protection)	
Sensor cable	Suitable only for remote type instruments. The standard cable length is 10 m; flowmeters can be equipped with a cable of optional length up to 100 m.	
Temperature sensor	PT1000	

Serial communications	RS-485, HART,RS-232
Output	Current (4-20 mA) , pulse , frequency , state switch
Function	Empty pipe recognition, electrode contamination

Graphic display	Monochrome LCD, white backlight; Size: 128*64 pixels
Display function	2 measurement value pictures (measurements, condition, etc)
Language	Chinese/ English/Spanish (Spanish version can be customizable)
Unit	You can configure the menu to select the unit Refer to "6.5 Configuration details" --- "flow units 1-1"
Operating unit	4 Mechanical keys (Compact Type) or 4 touch key (Remote Type)

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Temperature sensor measuring range	-20℃~120℃	
Medium temperature	Remote type	Compact type
	Neoprene: -10…+60℃ Polyurethane: -10…+60℃ PTFE/FEP: -10…+120℃ PFA: -10…+180℃	Neoprene: -10…+60℃ Polyurethane: -10…+60℃ PTFE/FEP: -10…+120℃ PFA: -10…+120℃
Maximum measurement error	±0.1℃(Within the measuring range of temperature sensor)	

Temperature	
Environment	-10℃ - 55℃ for Compact-Type Flowmeter -10℃ - 60℃ for Converter of Remote-Type Flowmeter -10℃ – 55℃ for Converter of Remote-Type Flowmeter
Storage	-40℃ - 65℃

Water	Min. 20μS/cm (Actual electric conductivity should be greater than 50μS/cm)
Other	Min. 5μS/cm (Actual electric conductivity should be greater than 50μS/cm)

Material

Sensor housing	Carbon steel,stainless steel 304, stainless steel 316L
Converter	Standard painted die cast aluminum
Cable gland	(M20*1.5) Polyamide
Cable material	Polyurethane

Electrical Connections

Power supply	85-245 VAC，50/60 Hz，22-26 VDC
Power consumption	Max 15W
Insulation resistance	≥20MΩ
Signal cable	Apply only to remote type
Shielded cable	Signal section，wire: 0.5mm2 Cu /AWG20

Output

Current output		
Function	Measurement of volume and quality (in the case of constant density)	
Setting	Scope	4-20mA
	Max	20mA
	Min	4mA
Internal voltage	24VDC	
Loading	≤750Ω	
Pulse and frequency output		
Function	Set up Pulse and frequency output	
Pulse output	Basis	Output pulse width: 0.25ms ~100ms Duty cycle: 50% (Pulse frequency ≥5Hz) Fmax ≤ 5000 cp/s

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	Setting	0.001L – $1m^3$
Frequency	Max	Fmax ≤ 5000Hz
	Setting	0-5000Hz
Passive	U_{Outer} ≤ 36VDC	
Active	$U_{internal}$ ≤ 24VDC	
	I≤ 4.52 mA	
Status output		
Function	Output as alarm	
Passive	U_{Outer}≤ 36VDC	
Active	$U_{External}$ ≤ 24VDC	
	I≤ 4.52mA	

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Electrode selection

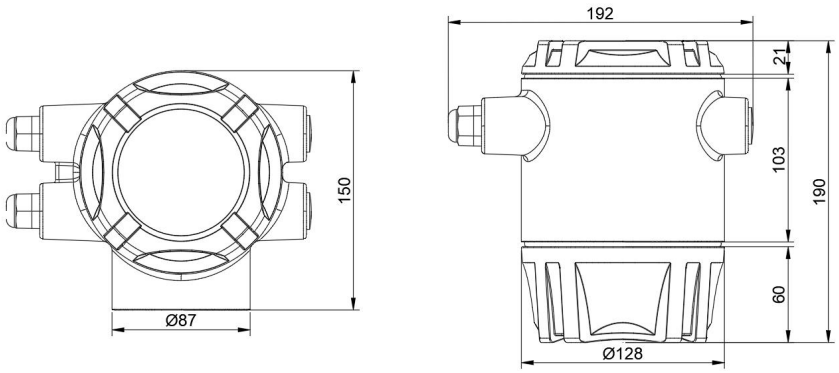
Material	Corrosion Resistance
Molybdenum-containing stainless steel (0Cr18N12Mo2Ti)	Applicable: domestic water, industrial water, sewage, weak acid-base salt solutions, normal temperature concentrated nitric acid Not applicable: hydrofluoric acid, hydrochloric acid, chlorine, bromine, iodine and other media.
Hastelloy B	Applicable: non-oxidizing acids, such as hydrochloric acid and hydrofluoric acid of certain concentration, alkaline solutions with a concentration of no less than 70% sodium hydroxide. Not applicable: nitric acid and other oxidizing acids.
Hastelloy C	Applicable: oxidizing acids, such as nitric acid, mixed acid, or sulfuric acid mixed corrosive media, corrosive environments with oxidizing salts or other oxidizing agents such as hypochlorite solution above room temperature, seawater. Not applicable: reducing acids such as hydrochloric acid and chlorides.
Ti	Applicable: chloride, hypochlorite, seawater, oxidizing acid. Not applicable: reducing acids such as hydrochloric acid, sulfuric acid, etc.
Ta	Applicable: most acids, such as concentrated hydrochloric acid, nitric acid and sulfuric acid, including hydrochloric acid with boiling point, nitric acid and sulfuric acid below 175℃. Not applicable: alkalis, hydrofluoric acid, sulfur trioxide.
Pt	Applicable: various acids (excluding aqua regia), alkalis and salts.

Lining Selection

Lining material	Symbol	Properties	Max operating temperature	Applicable medium	Nominal diameter
Neoprene	CR	Average abrasiveness, good for acidic, alkali, and salts solutions.	<60℃	Water, sea water,industrial water	≥DN50
Polyurethane	PU	With very good antiabrasiveness; No good for acid, alkali solutions	<60℃	Slury like mine slury, paper slurry	DN25~500
Teflon	PTFE	Stable chemical property, proof against the corrosion of boiling hydrochloric acid, sulphuric acid, nitric acid and aqua regia, concentrated alkali	<100℃	Strong corrosive acid, alkali solution	≥DN10
FEP(F46)	FEP(F46)	Same chemical properties as F4, but with better tensile strength and pressure resistance.	<120℃	Corrosive acidic,alkali, and salts solutions	DN10~200
PFA	PFA	Same chemical properties asF46, but with better tensile strength and pressure resistance.	<120℃ (Compact） <180℃ (Remote)	Corrosive acidic,alkali, and salts solutions	DN10~300

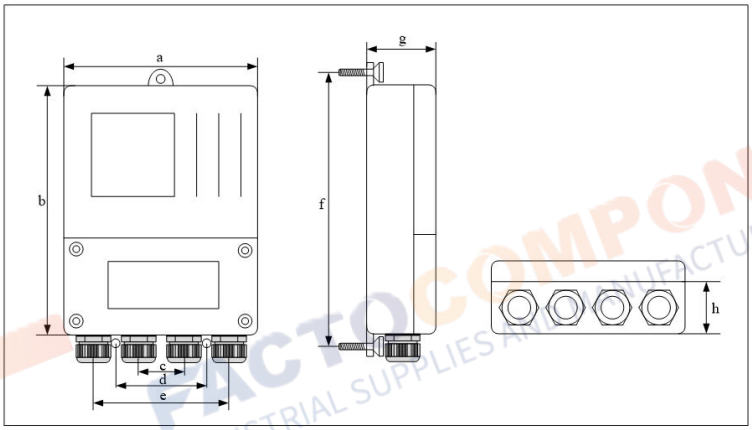
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Dimensions



Unit:mm

Compact type



Remote type

Dimension[mm]								Weight[Kg]
a	b	c	d	e	f	g	h	
164	214.5	34	70	102	233.5	69.7	45.7	0.6

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Flow and Velocity

Nominal Diameter (mm)	Flow range (m^3/h)		
	The optional lower range value can be selected from the following array	Standard	The optional upper range value can be selected from the following array
15	0.0636-0.6	0.8-3.0	4.0-7.632
20	0.131-1.0	1.2-5.0	6.0-13.6
25	0.176-1.6	2.0-8.0	10-21
32	0.2895-2.5	3.0-12	16-35
40	0.4524-4.0	5.0-20	25-45
50	0.707-6.0	8.0-40	50-85
65	1.195-10	12-60	80-143
80	1.81-16	20-120	160-217
100	2.83-25	30-160	200-339
125	4.42-40	50-250	300-530
150	6.36-60	80-400	500-763
200	11.3-100	120-600	800-1357
250	17.7-160	200-800	1000-2120
300	25.45-250	300-1200	1600-3054
350	34.6-300	400-1600	2000-4157
400	45.2-400	500-2000	2500-5429
450	57.3-500	600-2500	3000-6871
500	70.7-600	800-3000	4000-8482
600	102-800	1000-4000	5000-12216
700	139-1200	1600-5000	6000-16620
800	181-1600	2000-6000	8000-21720
900	229-1600	2000-8000	10000-27480
1000	283-2000	2500-10000	12000-33924
1200	407-2500	3000-12000	16000-48833

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Ordering code

LDGR-SUP -M1-DN50-J8-PWM1-D1--I2-V1-P3-E1-L2-G2-CS10-B1-IP1	Description
LDGR-SUP - - - - - - - - - - - - - - -	
Type M1	Compact type
Type M2	Remote type
Pipe size DNXX	DN10 - DN2000
Accuracy J8	2.00%
Output O1	4-20mA output
Frequency output PWM1	Frequency (pulse) output
Communication D1	RS232
Communication D2	RS485(Standard)
Communication D3	HART
Installation I1	Thread installation
Installation I2	Flange installation
Installation I3	Wafer connection
Installation I4	Clamp installation
Power supply V1	24VAC
Power supply V2	220VDC
Pressure rating P1	0.6MPa
Pressure rating P2	1.0MPa
Pressure rating P3	1.6MPa
Pressure rating P4	2.5MPa
Pressure rating P5	4.0MPa
Pressure rating P6	6.0MPa
Pressure rating PZ	Others
Electrode material E1	316L stainless steel
Electrode material E2	Titanium
Electrode material E3	Tantalum
Electrode material E4	Hastelloy B
Electrode material E5	Hastelloy C
Electrode material E6	Platinum
Electrode material E7	Tungsten carbide
Electrode material E8	Others
Lining material L1	Neoprene（CR）
Lining material L2	Polyurethane（PU）
Lining material L3	F4/PTFE
Lining material L4	Teflon（F46/FEP）
Lining material L5	PFA
Grounding G1	Grounding electrode
Grounding G2	Grounding ring

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Cable length	CS10		10m
	CSXX		XXm Cable length <100m
Body material		B1	Carbon steel
		B2	304 stainless steel
		B3	316 stainless steel
Ingress protection		IP1	IP65
		IP3	IP68

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