

TEKSENS

UFM2012-F *SERIES*

ULTRASONIC FLOWMETER / HEATMETER

IP68



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OVER 20 YEARS' EXPERIENCES

SPECIALIZED IN ULTRASONIC FLOW METERS

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UFM2012-F series Ultrasonic Flow/Heat Meter is the new product of Teksens Proses Ölçüm Ekipmanları Ltd. Şti. it is designed strictly according to JJG1030-2007 standard to develop the reliability of protection class. Ultrasound transmit time principle makes the measurement range from DN25 to DN6000.

The advantages include high accuracy, strong anti-interference, reliability and stability, multiple interface. Each parts can achieve to IP68, enable the meter work in any severe environment.

CHARACTERISTICS



- ▲ **IP68 PROTECTION CLASS**
Whole machine waterproof: whole machine is sealed completely reaching IP68 protection level.
Parts waterproof : Each part is waterproof, operating normally in the event of water inside .
- ▲ **WATERPROOF KEYBOARD**
4-key board design, support setting operation password .
- ▲ **MULTIPLE INTERFACE**
Communication interface: RS485 interface
Output: 4-20mA analog/OCT pulse/Relay signal
Heat measurement: achieve heat measurement by connecting 3-wired PT100 temperature transducers
Input: 3 way 4-20mA analog input, acquisition signals of temperature, press, liquid level, etc.
- ▲ **TEMPERATURE AND PRESSURE**
Temperature range: -30°C ~ 160°C
P/N : 0~2.5Mpa (Optional)
- ▲ **HIGH ACCURACY MEASUREMENT**
Accuracy: 0.5%、 1% .
- ▲ **ULTRASOUND MEASUREMENT**
No rotation, no moving parts , Long term measurement with high accuracy.
Applicable to variety of water quality, including the water gravel and weeds.

IN-LINE ULTRASONIC FLOW METER / HEAT METER

Typical Application



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IN-LINE ULTRASONIC FLOW METER / HEAT METER

1. π Type Inline Ultrasonic Flow Meter(DN15mm~DN32mm)

The measuring range of π type inline ultrasonic flow meter is DN15mm~DN32mm,by flange connection or thread connection. IP68 protection level. measuring temperature range -30°C ~ 160°C , P/N 0~4.0Mpa, high accuracy within $\pm 0.5\%$. (Please refer to page14 for detailed parameters) .

Measuring Diagram

THREAD CONNECTION

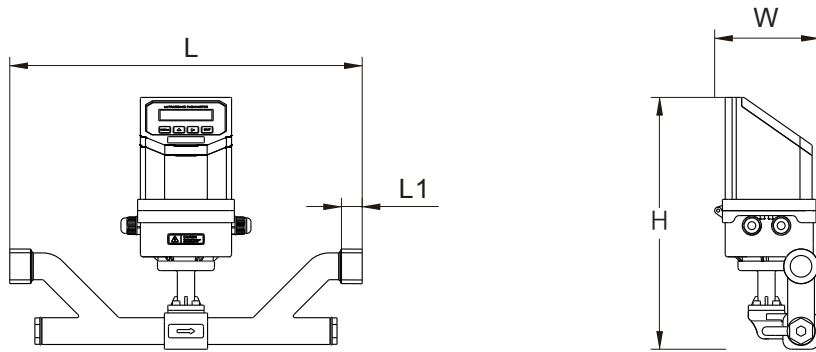


FLANGE CONNECTION



Dimension

Thread Connection

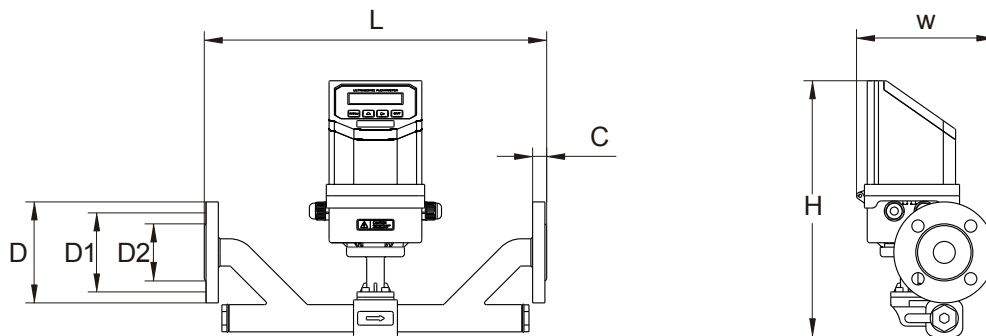


Unit: mm

Standard of Thread: GB/T7307-2001

Nominal Diameter (DN)	Pressure Level P	Length L	Width W	Height H	Thread Length L1	Thread Standard
DN15	2.5	320	121	285	13	G3/4B
DN20	2.5	360	121	285	15	G 1B
DN25	2.5	390	121	292	16	G1 1/4B
DN32	2.5	450	121	292	22.5	G 1 1/2B

Flange Connection



Unit: mm

Standard of Flange: GB/T 9119-2000

Nominal Diameter (DN)	Pressure Level P	Length L	Width W	Height H	Flange Dimension						
					Normal Size D	Bolt Hole Centers D1	Bolt Hole X Quantity $\phi \times n$	Sealing Surface Diameter D2	Flange Thickness		Bolts Dimension
									C	f	
DN15	2.5	320	148	285	95	65	14x4	46	14	2	M12x50
DN20	2.5	360	153	285	105	75	14x4	56	16	2	M12x50
DN25	2.5	390	158	292	115	85	14x4	65	16	2	M12x50
DN32	2.5	450	170	292	140	100	18x4	76	18	2	M16x60

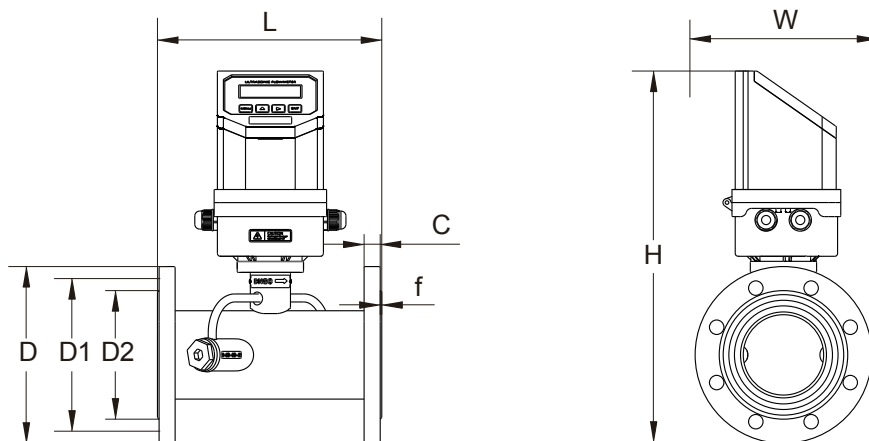
● 2、 Standard Inline Ultrasonic Flow Meter(DN40mm~DN1000mm)

The measuring range of Standard inline type ultrasonic flow meter is DN40mm~DN1000mm, with high protection class of IP68, measuring fluid temperature of $-30^{\circ}\text{C}\sim 160^{\circ}\text{C}$, pressure range of $0\sim 2.5\text{Mpa}$, high accuracy within $\pm 0.5\%$. (Please refer to page14 for detailed parameters)

Measuring Diagram



Dimension



Unit: mm

Nominal Diameter (DN)	P/N P	Length L	Width W	Height H	Flange Dimension						
					Outer Diameter D	Bolt Hole Centers D1	Bolt Hole X Quantity $\phi \times n$	Sealing Surface Diameter D2	Flange Thickness		Bolt Specification
									c	f	
40	1.6	300	150	336	150	110	18x4	84	18	2	M16x60
50	1.6	300	165	349	165	125	18x4	99	20	2	M16x70
65	1.6	300	185	366	185	145	18x4	118	22	2	M16x70
80	1.6	225	200	381	200	160	18x8	132	20	2	M16x80
100	1.6	250	220	401	220	180	18x8	156	22	2	M16x80
125	1.6	275	250	428	250	210	18x8	184	22	2	M20x80
150	1.6	300	285	459	285	240	22x12	211	24	2	M20x90
200	1.6	350	340	511	340	295	26x12	266	26	2	M22x90
250	1.6	450	405	569	405	355	26x12	319	28	2	M22x90
300	1.6	500	460	621	460	410	23x16	370	32	2	M22x90
350	1.0	550	500	666	500	460	25x16	428	28	4	M20x80
400	1.0	600	565	697	565	515	25x20	482	30	4	M22x90
450	1.0	700	615	774	615	565	25x20	532	30	4	M22x90
500	1.0	800	670	826	670	620	30x20	585	32	4	M22x90
600	1.0	1000	780	931	780	725	25x24	685	36	5	M27x110
700	0.6	1100	860	1021	860	810	30x24	775	32	5	M22x90
800	0.6	1200	975	1129	975	920	30x24	880	32	5	M27x100
900	0.6	1300	1075	1229	1075	1020	30x24	980	34	5	M27x100
1000	0.6	1400	1175	1329	1175	1120	30x28	1080	36	5	M27x110

Standard Of Flange: GB/T 9119-2000 (DN40~300)
JB/T81-94 (DN350~1000)





• 3、 Inline Ultrasonic Heat Meter

It can achieve to heat measurement by connecting 3 way PT100 transducer. Accuracy:±1.0%, Heat meter's dimension is the same as In-line ultrasonic flow meter, except that the height increased 70mm.

Measuring Diagram



Optional Temperature Transducers(3-wired PT100)

Picture	Specification	Model	Meas. Range	Temperature	Cut off water	Accuracy
	Clamp on temperature Transducer Pt100	CT-1	≥DN50	-40~160℃	No	100℃ ±0.8℃
	Insertion temperature Transducer Pt100	TCT-1	≥DN50	-40~160℃	Yes	
	Insertion Pt100 Installation with pressure	PCT-1	≥DN50	-40~160℃	No	
	Insertion Pt100 Small size pipe diameter	SCT-1	<DN50	-40~160℃	Yes	

FIXED MOUNTED CLAMO ON ULTRASONIC FLOW METER/HEAT METER



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Fixed Mounted Clamp On Ultrasonic Flow Meter/Heat Meter

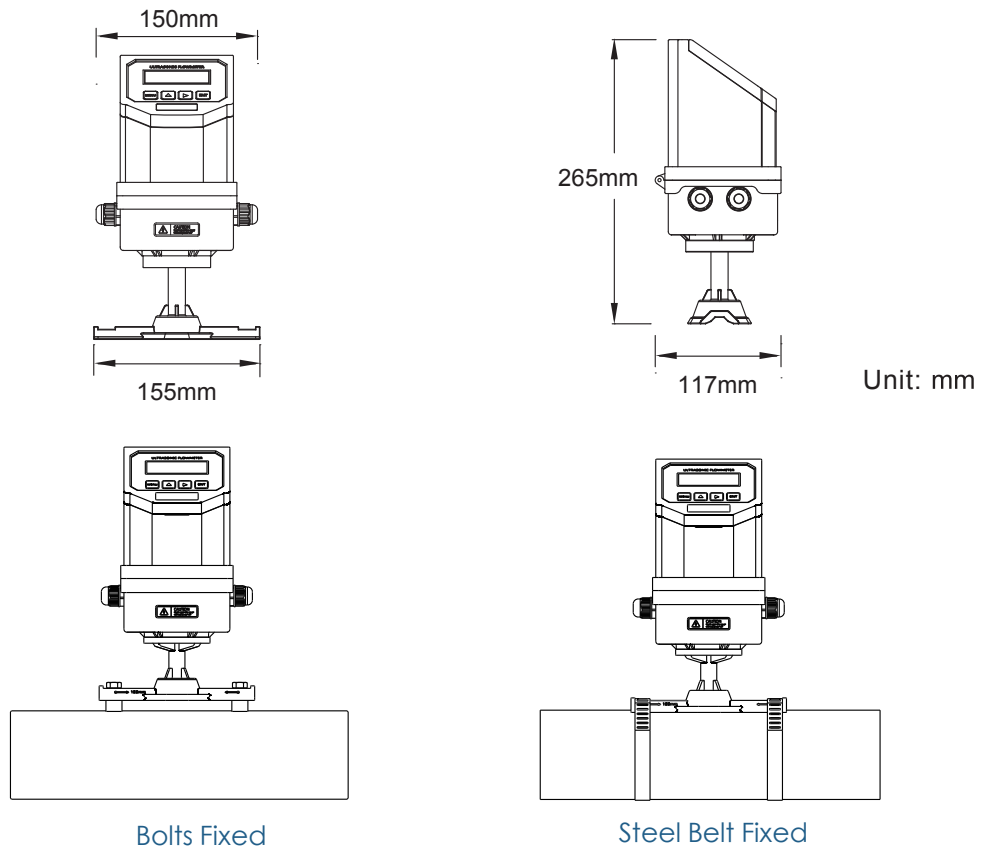
1. Fixed Mounted Clamp On Ultrasonic Flow Meter

Both converter and transducer are fixed on the pipeline, no need to cut off the pipeline, simplifying installation process. Wide measuring range of DN25mm~DN6000mm, IP68 protection class, measuring fluid temperature of $-30^{\circ}\text{C} \sim 160^{\circ}\text{C}$, no limit for pressure, high accuracy within $\pm 1\%$. (Please refer to page 14 for detailed parameters)

Measuring Diagram



Dimension & Installation



Optional Clamp On Transducers

● Standard Clamp On Transducers



- Built-in magnet, attached to pipe surface Easily.
- IP68 if be sealed with Gel.
- Complete specifications , wide measuring range of DN25mm~DN6000mm.
- Fluid temperature :-30°C~160°C.

Description	Model	Measuring Range	Fluid Temperature	Dimension
Small Size	TS-2	DN25~DN100	-30~90 C	45×25×28mm
Medium Size	TM-1	DN50~DN700	-30~90 C	64×39×44mm
Large Size	TL-1	DN300~DN6000	-30~90 C	97×54×53mm

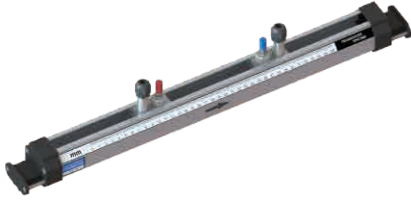
● High Temperature Clamp On Transducers



- Built-in magnet, attached to pipe surface directly.
- IP68 if be sealed with Gel.
- Complete specifications , wide measuring range of DN25mm~DN6000mm.
- Fluid temperature :-30°C~160°C.

Description	Model	Measuring Range	Fluid Temperature	Dimension
Small Size	TS-2-HT	DN25~DN100	-30~160 C	45×25×28mm
Medium Size	TM-1-HT	DN50~DN700	-30~160 C	64×39×44mm
Large Size	TL-1-HT	DN300~DN6000	-30~160 C	97×54×53mm

● Mounting Bracket Clamp On Transducers



- Improve installation efficiency and installation accuracy
- IP68 protection class.
- Measuring range: DN25mm~DN700mm.
- Fluid temperature :-30~160 °C

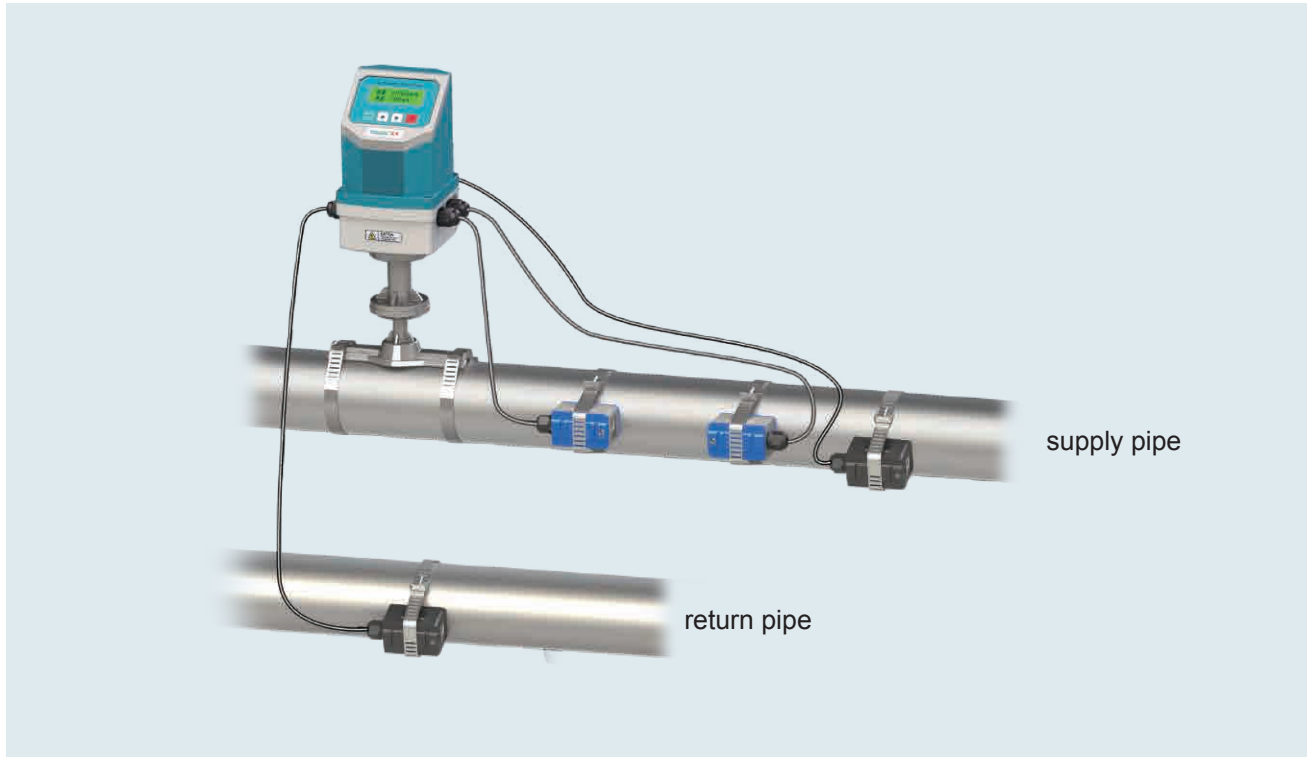
Description	Model	Measuring Range	Fluid Temperature	Dimension
Small Size	HS	DN25~DN100	-40~90 °C	318×59×85mm
Medium Size	HM	DN50~DN300	-40~90 °C	568×59×85mm
Large Size	EB-1	DN300~DN700	-40~90 °C	88×59×49mm
High Temperature Small Size	HS-HT	DN25~DN100	-40~160 °C	318×59×145mm
High Temperature Medium Size	HM-HT	DN50~DN300	-40~160 °C	568×59×145mm
High Temperature Extended	EB-1-HT	DN300~DN700	-40~160 °C	88×59×49mm

• 2、 Fixed Mounted Clamp On Ultrasonic Heat Meter





It can achieve to heat measurement by connecting 3 way PT100 transducer. No need to cut off the water supply for installation. Protection class: IP68. Accuracy:±2.0%.

Wide measuring range of DN25mm~DN6000mm by selecting different transducers.

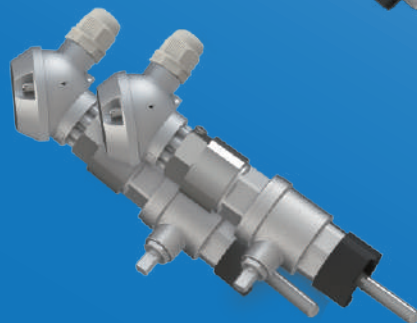
Measuring Diagram



Optional Temperature Transducers(3-wired PT100)

Picture	Specification	Model	Meas. Range	Temperature	Cut off water	Accuracy
	Clamp on temperature Transducer Pt100	CT-1	≥DN50	-40~160℃	No	100℃ ± 0.8℃
	Insertion temperature Transducer Pt100	TCT-1	≥DN50	-40~160℃	Yes	
	Insertion Pt100 Installation with pressure	PCT-1	≥DN50	-40~160℃	No	
	Insertion Pt100 Small size pipe diameter	SCT-1	<DN50	-40~160℃	Yes	

FIXED MOUNTED INSERTION TYPE ULTRASONIC FLOW METER/HEAT METER



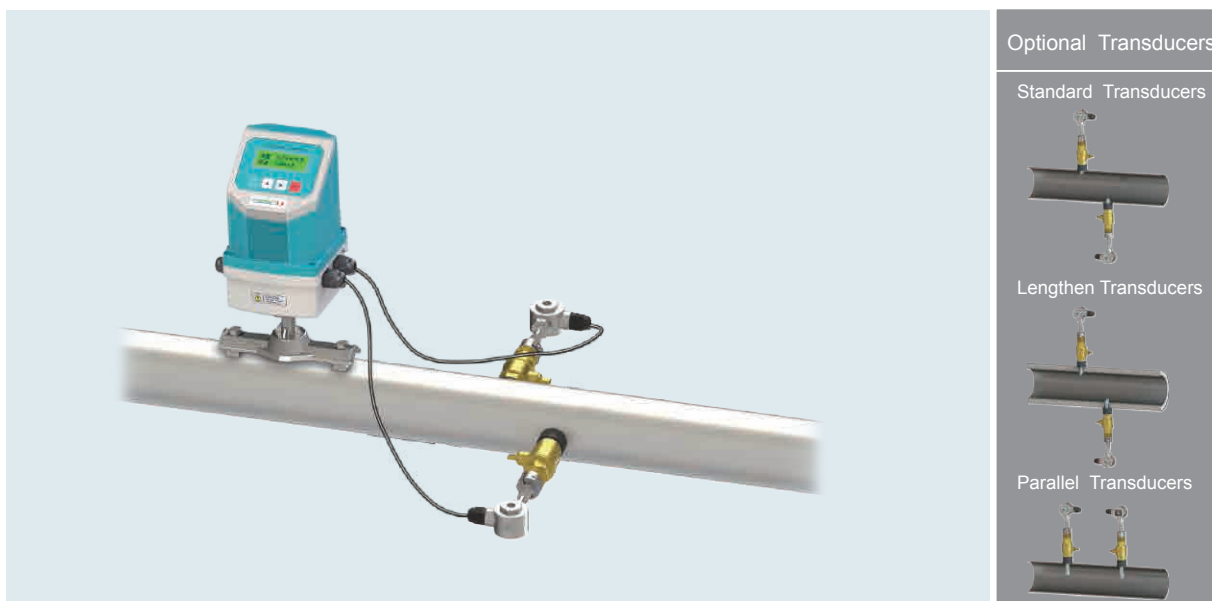
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Fixed Mounted Insertion Ultrasonic Flow Meter/Heat Meter

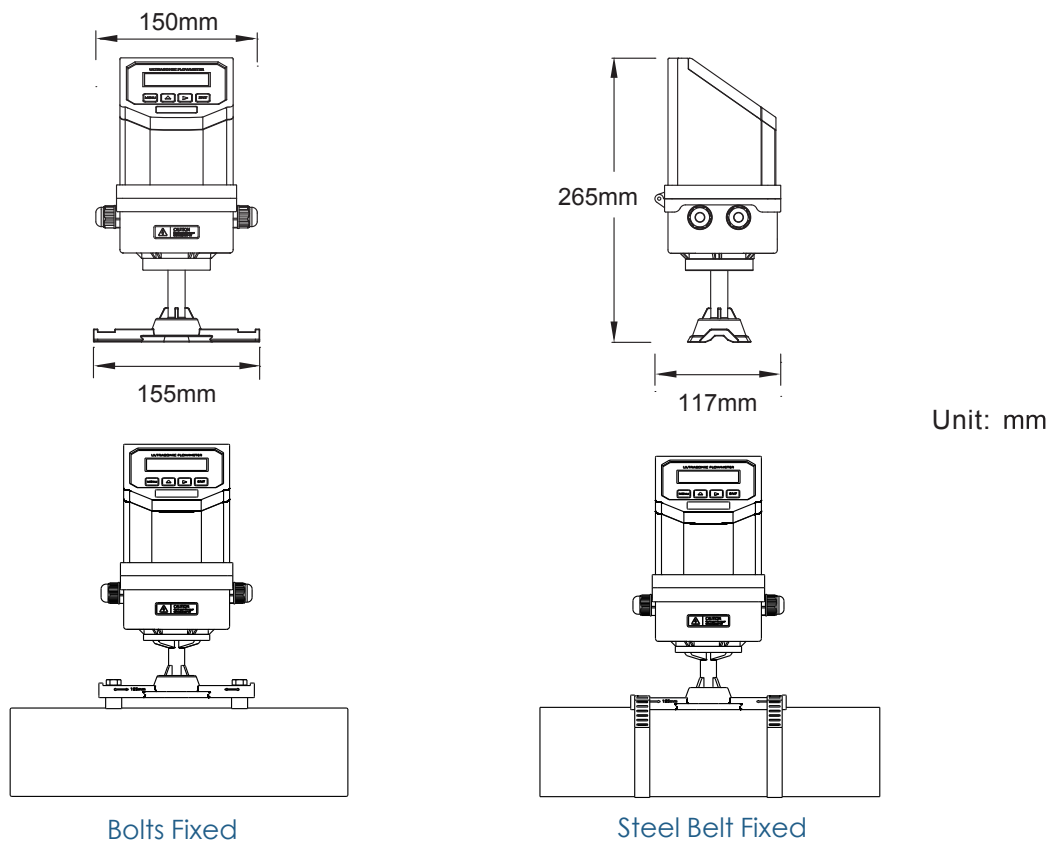
1. Fixed Mounted Insertion Ultrasonic Flow Meter

Both converter and transducers are fixed on the pipeline, no need to cut off water, reliable and stable in operation. Wide measuring range of DN50mm~DN6000mm, IP68 protection class, measuring fluid temperature of $-30^{\circ}\text{C}\sim 160^{\circ}\text{C}$, no limit for pressure, high accuracy within $\pm 1.0\%$. (Please refer to page 14 for detailed parameters)

Measuring Diagram

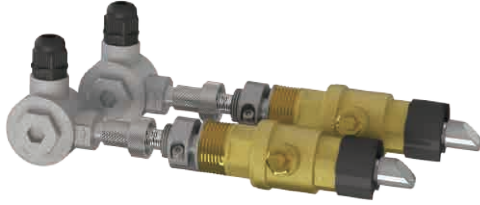


Dimension & Installation



Optional Insertion Type Transducers

● Standard Insertion Transducers



- Applicable for the pipeline can be directly welded, like carbon steel and stainless ,etc.
- Pipe wall thickness \leq 20mm
- Measuring range:DN50mm~DN6000mm
- Fluid temperature: -30~160 °C

● Lengthen Insertion Transducers



- Applicable for the pipeline can not be directly welded, like cement ,PVC ,cast iron,steel,composite material,etc.
- Pipe wall thickness \leq 70mm
- Measuring range:DN50mm~DN6000mm
- Fluid temperature: -30~160 °C

● Parallel Insertion Transducers



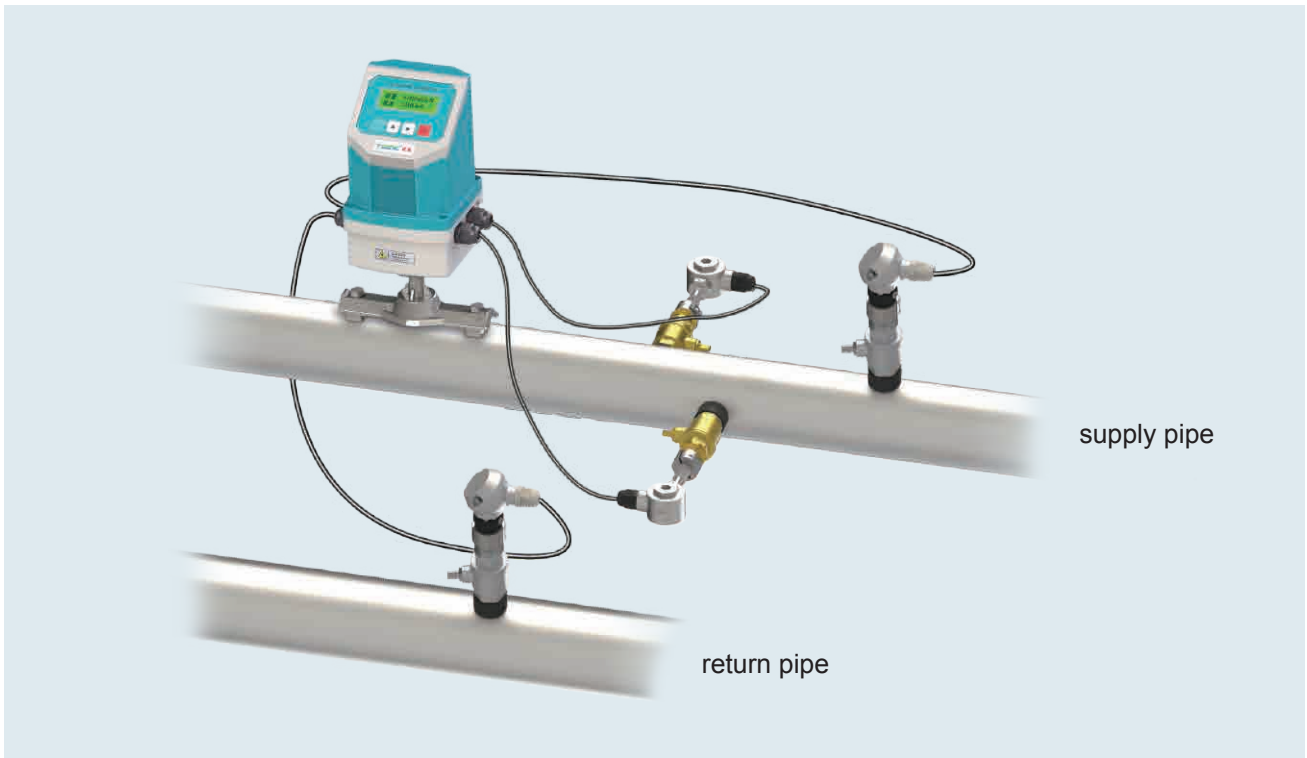
- Applicable for the pipeline then there is not enough installation space
- Pipe material is unlimited
- Wall thickness is unlimited and Insertion depth should be 1/3 of pipe inner diameter
- Measuring range: DN80mm~DN6000mm
- Fluid temperature: -30~160 °C

• 2、 Fixed Mounted InsertionType Ultrasonic Heat Meter





It can achieve to heat measurement by connecting 3 way PT100 transducer. No need to cut off the water supply for installation with a high accuracy of $\pm 2.0\%$. Long term operation with high stability and reliability IP68 protection class.

Wide measuring range of DN50mm~DN6000mm by selecting different insertion transducers.

Measuring Diagram



Optional Temperature Transducers(3-wired PT100)

Picture	Specification	Model	Meas. Range	Temperature	Cut off water	Accuracy
	Clamp on temperature Transducer Pt100	CT-1	\geq DN50	-40~160℃	No	100℃ \pm 0.8℃
	Insertion temperature Transducer Pt100	TCT-1	\geq DN50	-40~160℃	Yes	
	Insertion Pt100 Installation with pressure	PCT-1	\geq DN50	-40~160℃	No	
	Insertion Pt100 Small size pipe diameter	SCT-1	<DN50	-40~160℃	Yes	

Data Sheet & Model Selection

Item		Principle & Parameters
Converter	Principle	Transit-time, 4 byte floating-point operation in accordance with IEEE754
	Accuracy	Inline type: flow meter: $\pm 0.5\%$; heat meter: $\pm 1.0\%$ Clamp on type: flow meter: $\pm 1.0\%$; heat meter: $\pm 2.0\%$ Insertion type: flow meter: $\pm 1.0\%$; heat meter: $\pm 2.0\%$
	Operation	4-key manipulation with magnetic bar touch or finger touch; simulation keyboard software
	Output	One way 4~20mA analog output, electric resistance: 0~1k, accuracy: 0.1%
		One way OCT pulse signal output
		One way Relay output
	Input	3 way 4~20mA analog input, accuracy: 0.1%; Acquisition signal of temperature, pressure and liquid level
Achieve heat measurement by connecting 3-wired PT100 temperature transducers		
Data Interface	RS485 serial interface, upgraded by computer, support MODBUS communication protocol	
Special cable	Twisted-pair shielded cable and cable length should be no more than 50 m. Transmission distance can achieve 1 km if select the RS 485 interface	
Pipeline	Pipe Material	Steel, stainless, cast iron, copper, cement, PVC, aluminum, glass steel, etc.
	Pipe Diameter	DN15mm~DN6000mm
	Straight Pipeline	Transducers installation points should be: 10 diameters' straight pipeline from upstream transducer; 5 diameters' straight pipeline from the downstream transducer; 30 diameters' straight pipeline from the pump
Measuring Medium	Liquid Type	Single liquid that can conduct sound wave, such as water, seawater, sewage.
	Fluid Temperature	-30°C~160°C
	Turbidity	≤ 10000 ppm, with little bubble
	Fluid velocity	0m/s~7m/s
Working Environment	Temperature	Converter: -20°C~60°C; Transducer: -30°C~160°C
	Humidity	Both of the converter and transducers can work under water, depth underwater ≤ 2 m. (After completely sealing)
Power Supply	DC8~36v; AC85~264V(optional)	
Power Consumption	1.5W	

Model Selection

Flow Measurement Transducers Pipe Diameter Pipe Material P/N Cable length Temperature transducer
 UFM2012-F - -DN mm - - Mpa - m --

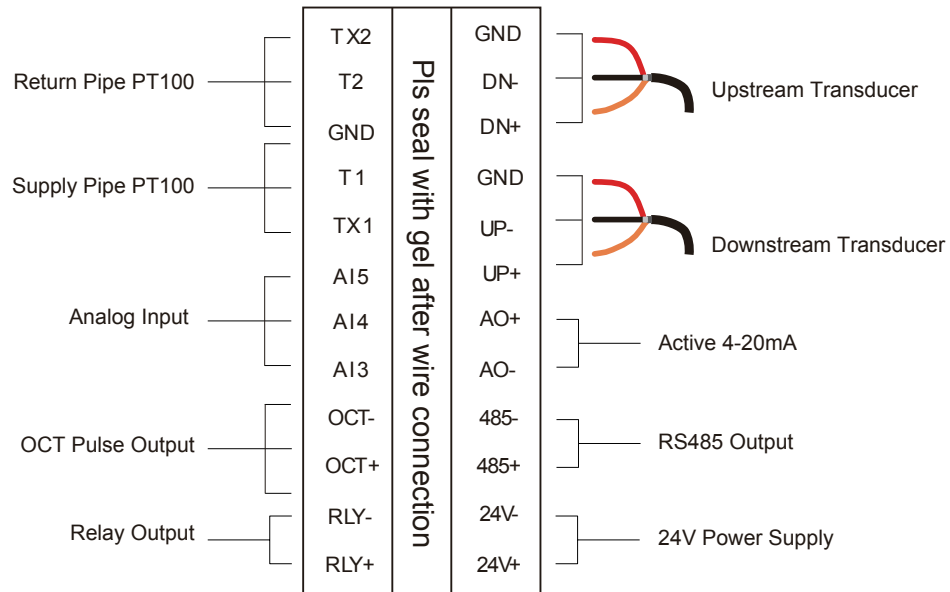
TS- 2	0 Carbon steel	None
TM- 1	1 Stainless steel	CT- 1
TL- 1	2 Cast iron	TCT- 1
TS- 2- HT	3 Glass Fiber	PCT- 1
TM- 1- HT	4 PVC	SCT- 1
TL- 1- HT	5 Cement pipe	
TC- 1	6 Others	
TC- 2		
G (inline type)		

Example: UFM2012-F - TM-1 - DN300 - 0 - 1.6MPa - 10m - PCT-1

PS: Fixed mounted ultrasonic flow meter UFM2012-F, clamp on transducers TM- 1, measuring pipe diameter: DN300mm, pipe material: carbon steel, pressure: 1.6Mpa, signal cable length: 10m, insertion type heat transducers with pressure PCT-1 for heat measurement.

Converter Wiring And Waterproof

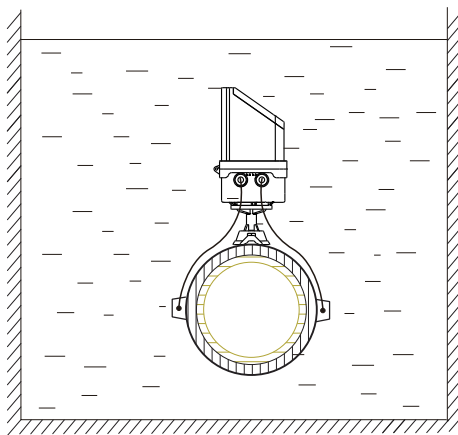
1、Wiring Diagram



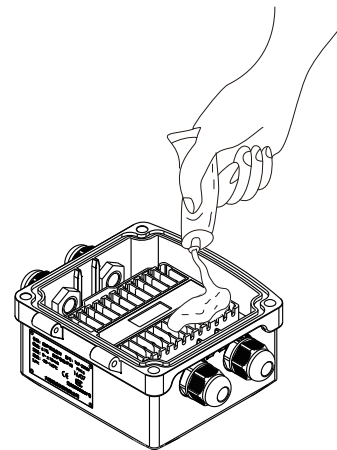
2、Water Proof

Whole machine waterproof: UFM2012-F ultrasonic flow meter reach IP68 protection class, can work underwater within 2m.

Parts waterproof: all parts are water proof except circuit board and junction box, please seal completely with gel after wiring so that the circuit board and junction box are waterproof, working normally in case of water inside.



Whole Machine Waterproof



Circuit board is waterproof after sealing with gel