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Ultrasonic Flow Meter

TYPE 1158S Datasheet

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Datasheet

Ultrasonic Flow Meter
TYPE-1158S

The wall- mounted ultrasonic flow meter is designed to measure the fluid velocity of liquid within a closed conduit. The transducers are a non- contacting, clamp- on type, which will provide benefits of non- fouling operation and easy installation.

The TYPE - 1 1 5 8 S wall- mounted ultrasonic flow meter can be applied to a wide range of pipe flow measurements. Applicable liquids include pure liquids as well as liquid with small quantity of tiny particles.

Applications

- Petrochemical
- Pharmaceutical
- Paper industry
- Metallurgy
- Electric power
- Environmental protection
- Food and beverage

Ultrasonic Flow Meter

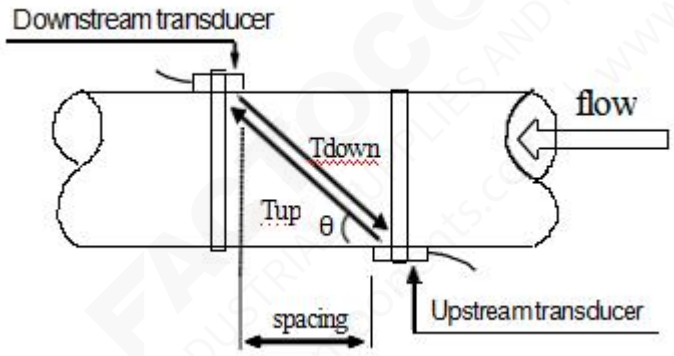
Features

- Linearity: 0.5%.
- Repeatability: 0.2%.
- Accuracy:±1%.
- Easy to operate.
- Several type transducers for selection, measuring pipe size is from DN15mm to DN6000mm.
- Adopt low voltage, multi-pulse technology to improve accuracy, useful life and reliability.
- Powerful recording function, record the totalizer data of the last 64 days/64 monthes/5 years.

Principle

The wall-mounted ultrasonic flow meter utilizes two transducers that function as both ultrasonic transmitters and receivers. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. The transducers can be mounted in V-method where the sound transverses the pipe twice, or W-method where the sound transverses the pipe four times, or in Z-method where the transducers are mounted on opposite sides of the pipe and the sound crosses the pipe once. This selection of the mounting method depends on pipe and liquid characteristics. The flow meter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two transducers and measuring the transit time that it takes for sound to travel between the two transducers. The difference in the transit time measured is directly and exactly related to the velocity of the liquid in the pipe, show as follows:

$$V = \frac{MD}{\sin 29} \times \frac{\Delta T}{T_{up} . T_{down}}$$



Where:

θ is the include angle to the flow direction

M is the travel times of the ultrasonic beam

D is the pipe diameter

Tup is the time for the beam from upstream transducer to the downstream one

Tdown is the time for the beam from downstream transducer to the upstream one

ΔT=Tup –Tdown

Parameters	
Items	Main parameters
Accuracy	Better than ± 1%
Repeatability	Better than 0.2%
Principle	Transit-time measuring principle

Measurement Period	500ms
Display	LCD with backlight, display accumulated flow/heat, instantaneous flow/heat, velocity, time etc.
Output	Analogue output: 4-20mA or 0-20mA current output OCT output: Frequency signal (1~9999HZ) Relay output: over 20 source signal (no signal, reverse flow etc.) RS485 serial port
Input	Three analogue input Three-wire PT100 resistor input (optional)
Other functions	Automatically record the totaliser data of the last 64 days / 64 months / 5 years; The power-on time and corresponding flow rate of the last 64 powe on and off events. Allow manual or automatic flow loss compensation. The instrument working status of the last 64 days.
Pipe material	Steel, stainless steel, cast iron, cement pipe, copper, PVC, aluminum, FRP etc. Liner is allowed.
Pipe size	15-6000mm
Straight pipe section	In the upstream it must be beyond 10D, in the downstream it must be beyond 5D, in the upstream the length must be beyond 30D from the access of the pump. (D stands for pipe diameter)
Liquid types	Water, sea water, industrial sewage, acid & alkali liquid, alcohol beer, all kinds of oils which can transmit ultrasonic single uniform liquid
Temperature	Standard: -30 ˚C - 90 ˚C; High-temperature: -30 ˚ C - 160 ˚C
Liquid Turbidity	Less than 10000ppm, with a little bubble
Flow Direction	Bi-directional measuring, net flow/heat measuring
Environment temperature	Main Unit: -30 ˚C - 80 ˚C Transducer: -40 C - 110 C, Temperature transducer: select on enquiry
Humidity	Main Unit: 85% RH Transducer: water-immersible, water depth less than 3m
Cable	Twisted Pair Line, standard length of 20m, can be extended to 500m (no recommended); Contact the manufacturer for longer cable requirement; RS-485 interface, transmission distance up to 1000m.
Power supply	AC220V or DC24V
Power Consumption	Less than 1.5W
Protocols	MODBUS, M-BUS, Fuji extended protocol and other factory protocol

Wiring

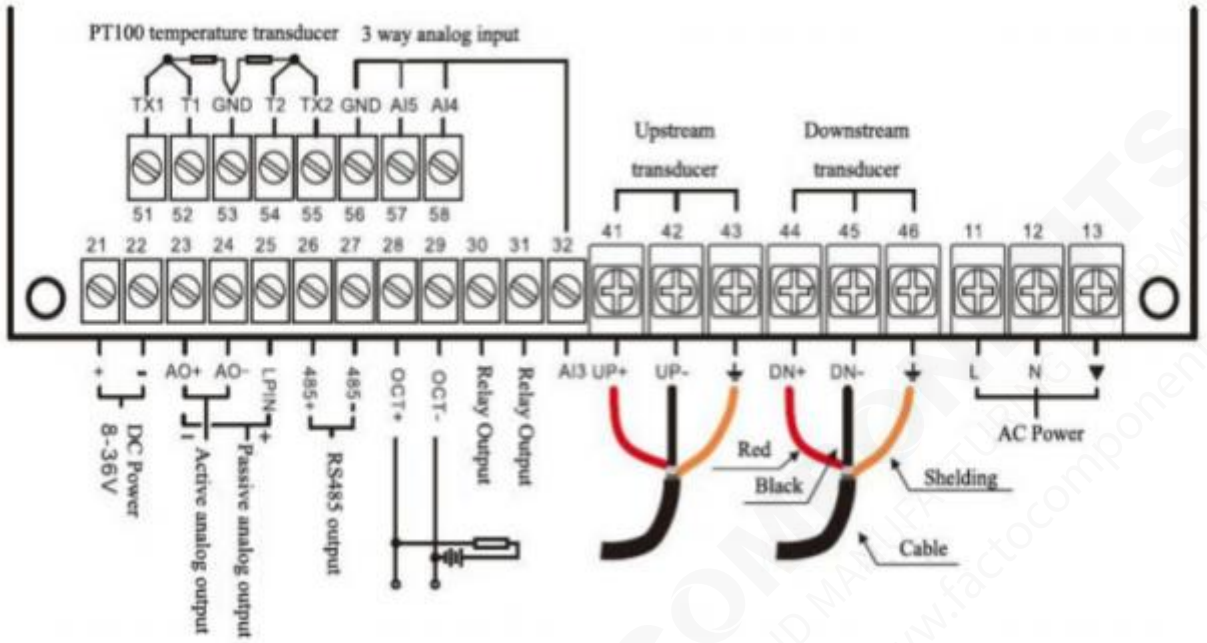


Figure 1 wiring diagram of ultrasonic flow meter

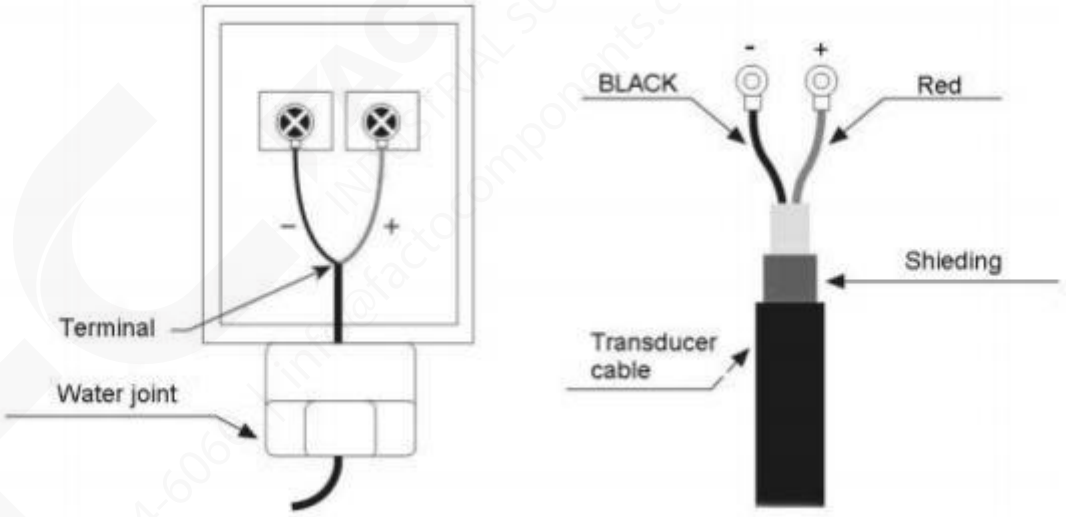


Figure 2 wiring diagram of transducer

Ordering code

TYPE-1158S-ST1-DNXX-J6-MT0-T1-V1-PQ0-CS5															Description
1158S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sensor type	ST1														Standard small external clamp type (DN15-DN100)
	ST2														Standard medium-sized external clamp type (DN50-DN700)
	ST3														Standard large external clamp type (DN300-DN6000)
	ST4														High temperature small external clamp type (DN15-DN100)
	ST5														High temperature medium-sized external clamp type (DN50-DN700)
	ST6														High temperature large external clamp type (DN300-DN6000)
	ST7														Insert standard type (DN50-DN6000)
	ST8														Insert extension type (DN50-DN6000)
	ST9														Insert parallel type (DN80-DN6000)
	ST10														Standard pipe section (DN15-DN1200)
Nominal diameter		DNXX													Standard / high-temperature clamp-on sensor range: DN15-DN6000 Plug-in/parallel sensor range: DN50-DN6000 Pipeline sensor range: DN15-DN1200
Accuracy			J6												1.0%
Storage type				MT0											No storage
				MT1											SD card storage
Temperature resistance					T1										-30° C-90° C (Standard outer clamp only)
					T2										-30℃-160℃ (Only high-temperature

								external clamp/insert type/pipe type)
Power supply	V1							24VDC
	V2							220VAC
Pipe material		PQ0						No material (non-segmented)
		PQ1						Carbon steel (segment only)
		PQ2						304 stainless steel (pipe section only)
		PQ3						316 stainless steel (pipe type only)
Cable length			CS5					5m * 2 (standard)
			CS10					10m * 2