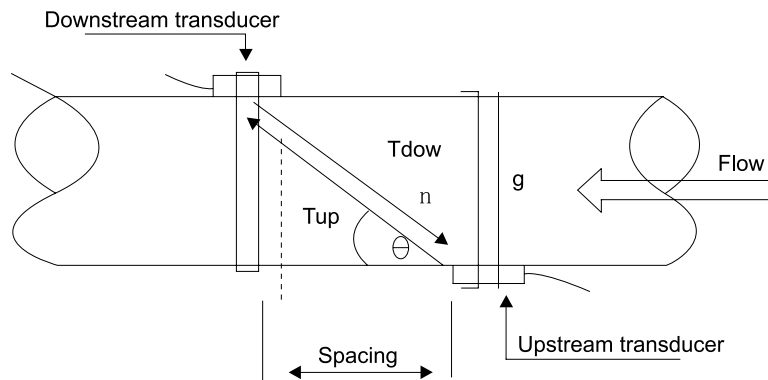


FUF ULTRASONIC FLOWMETER

Flow Measurement Principle

Ultrasonic flow meter is designed to measure the velocity of liquid within a closed conduit. It uses the well-known transit-time measurement principle, plus our proprietary signal processing and ultrasonic transceiving technologies.

As shown in Figure 1, a pair of ultrasonic transducers which are mounted on the pipe upstream and down stream respectively. Each transducer serves as both ultrasonic transmitter and receiver. The main unit operates by alternately transmitting and receiving a coded burst of sound energy between the two transducers. The transit-times in the upstream direction as well as in the downstream direction are measured. The difference of the two transit times is directly and exactly related to the velocity and the liquid in the pipe.



$$V = \frac{MD}{\sin 2\theta} \times \frac{\Delta T}{T_{up} \cdot T_{down}}$$

Where

θ is the angle between the sound path and flow direction

M is the number of times the sound traverses the flow

D is the pipe diameter

T_{up} is the time for the beam travelling from upstream the transducer to the downstream transducer

T_{down} is the time for beam traveling from the downstream transducer to the upstream transducer

$$\Delta T = T_{up} - T_{down}$$

Product Details

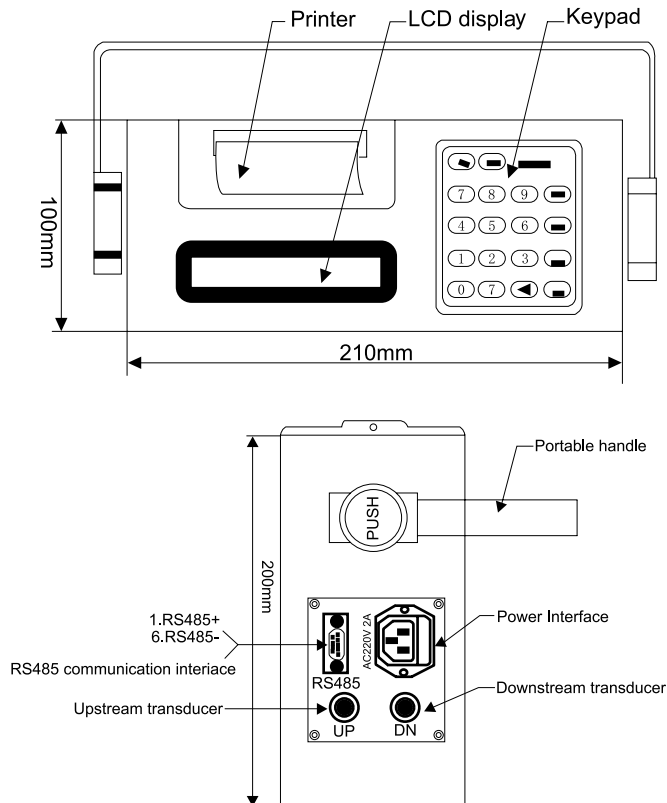
1. Portable ultrasonic flow meter

① Features:

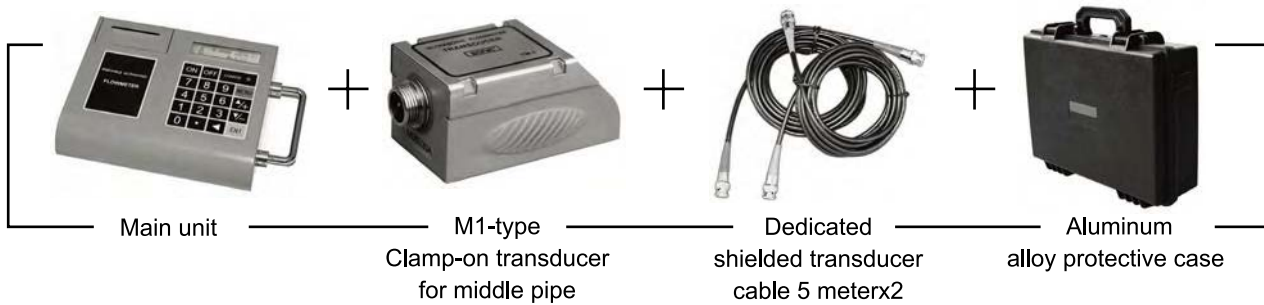
1. Non contact measuring instruments, compact packing and easy to carry;
2. Suitable for various sizes of pipes and the medium which is sound conductive;
3. Built-in Ni-MH battery, continually working up for more than 20 hours;
4. Flexible user interface and easy to use;
5. Print output: built-in thermal printer, achieve to print online or at a scheduled time;
6. Aluminum alloy protective case, can be used in harsh environment;

② Technical data:

Medium	Water, industrial sewage, acid-base liquid, all kinds of oil which can conduct sound wave;
Flow range:	0~±30 m/s
Accuracy:	Better than 1%
Power supplier	Built-in Ni-MH battery , continually working up for more than 20 hours;
Power consumption	2W
Charge:	Smart charging way, connect to 220VAC directly and stop charging and show green light after finishing.



③ Standard configuration:



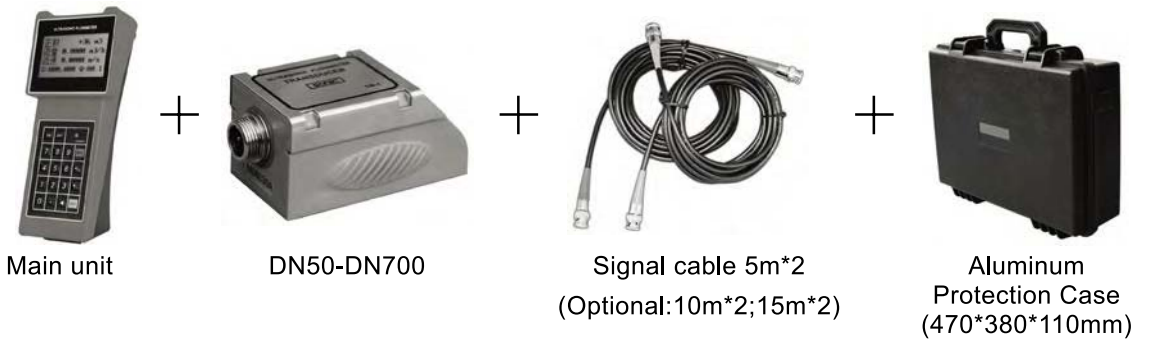
2. Handheld ultrasonic flow meter

Small size, light weight, portability, flexible operation, automatic date storage.

① Features:

Main unit	Indicating instant flow, flow velocity, flow totaliser, signal condition, etc.
	In-built data logger, recording date, flow totaliser, signal condition, etc.
	RS-232 interface, complete commutation protocol for instrument networking;
	OCT output positive/negative/net flow totaliser; pulse signal and frequency signal(1~9999HZ)
Accuracy	Better than 1%
Flow range	0.01~±32m/s
Medium	Water, sea water, industrial sewage, alcohol, acid-base liquid, all kinds of oil or uniform, single and stable liquid.
Pipe material	Steel, stainless steel, cast iron, copper, PVC, aluminum, glass reinforced plastics or other compact pipe, lining is allowable;
Pipe straight run	At least 10D for upstream & 5D for downstream, 30D if a pump is near upstream , where D is pipe diameter.
Power supply	Built-in Ni-MH battery , continually working up for more than 10 hours;
Size	200×92×32mm
Weight	525g
Note	Aluminum alloy protective case ,can be used in harsh environment;

② Standard configuration:



3. Separate fixed ultrasonic flow meter

① Features:

1. compact , firm, international advanced cast aluminum shell,
2. 4~20mA ,OCT (cumulative pulse, frequency) , electric relay output,
3. RS232 or RS485 interface;
4. Can input 2 channels 4~20 mA signal (temperature\Pressure\level....)
5. Protected by coded lock from non operators;



Wall Mounted



Panel Mounted



Ex-proof

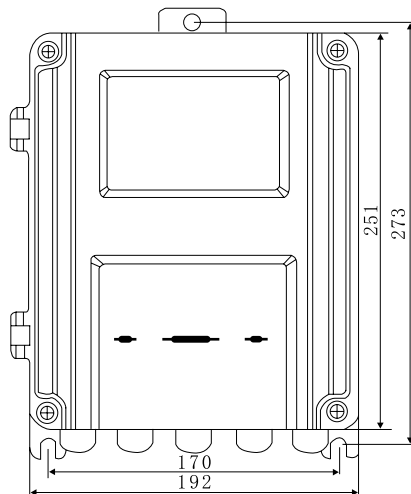
② Technical data:

Main unit	LCD with backlight, indicating instant flow, flow velocity, flow totaliser, time, thermal power ,etc.	
Signal output		4~20 mA
		OCT output: positive/negative/net totaliser flow and thermal power totaliser pulse signal or instant flow frequency signal.
		Electric relay: input nearly 20 kinds of source signals(such as no signal, counter current. etc.)
		Audible alarm: buzzer will send programmable alarm(such as excessive large or small flow)
	Input five ways current signal(such as temperature, pressure, level, etc.), can realize thermal power measurement.	
	Signal input	
	Automatically record the totaliser flow of last 64 days,64 months, 5 years ;	

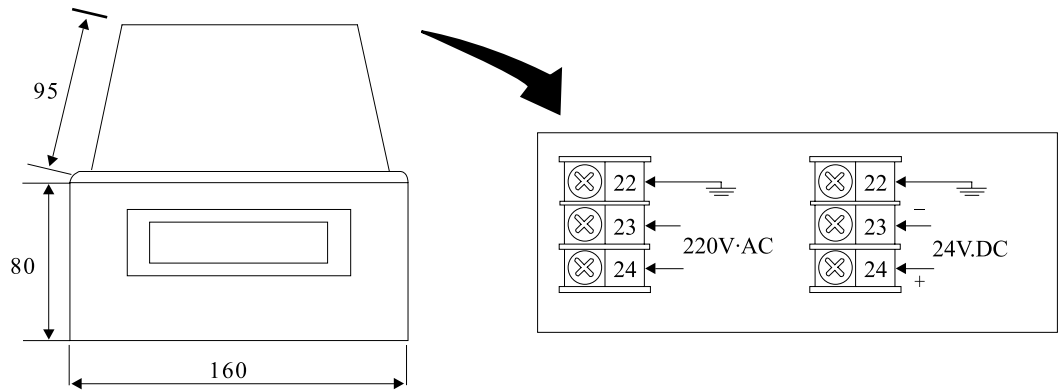
	Automatically record the power-on time and corresponding flow rate of the last 64 power on and off events, allow annual or automatic flow loss compensation.	
	Automatically record the instrument working status of the last 64 days.	
	The flow meter is equipped with a RS232 standard serial interface; you may use an external RS232-to-RS485 converter to the flow meter to RS485.	
	Programmable batch controllers	
Length of cable	Special cables of the ultrasonic flow meter are the shorter, the better in principle to decrease the interface. However it can be lengthened to 300m. If user wants still longer, thick cables should be used and at the same time , the cables should not be paralleled with high voltage cables, and should be avoided the frequency converters.	
Pipe	Material	Steel, stainless steel, cast iron, concrete pipes, copper , PVC, aluminum, glass reinforced plastics ,hard metal plastics, etc, lining is allowable;
	Pipe straight run	More than 10D for upstream, more than 5D for downstream, 30D if a pump is near up stream, where D is pipe diameter.
Medium	Water, sea water, industrial sewage, alcohol, acid-base liquid, all kinds of oil or uniform, single and liquid.	
Flow range	0~±30m/s	
Accuracy	Better than ±1%	
Power supplier	AC220V or DC8~36V or AC7~30V	
Power consumption	2W	
Weight	2.5KG	

III Dimension

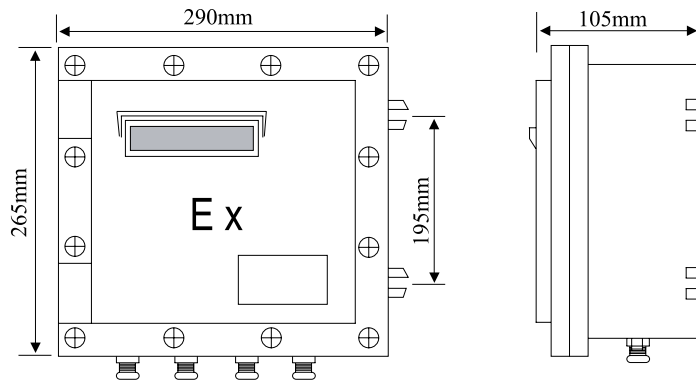
1.Wall-mounted ultrasonic flow meter:



2. Panel—mounted ultrasonic flow meter



3. EX—proof type ultrasonic flow meter



IV Transducers

1. Clamp-on transducers:

These kinds of transducers are suitable for portable and fixed ultrasonic flow meter:

	<p>Standard S type transducers (magnetic) Pipe size: DN15~DN100 mm Medium temperature: ≤ 110 °C</p>
	<p>Standard M type transducers (magnetic) Pipe size: DN50~DN700 mm Medium temperature: ≤ 110 °C</p>
	<p>Standard L type transducers (magnetic) Pipe size: DN300~DN6000 mm Medium temperature: ≤ 110 °C</p>

2. Insertion wetted transducer:



3. In line type transducer



V Model Selection

Model	Product				
FUF	Ultrasonic flow meter				
	Code	Diameter			
	15~6000mm	DN15~DN6000			
		Code	Main Unit		
		P	Portable type		
		Ep	Panel mounted type		
		Fb	Wall mounted type		
		Ex	Ex-proof type		
		K	Handheld type		
			Code	Transducer type	
			S	Clamp-on transducers: for DN15~DN100	
			M	Clamp-on transducers: for DN50~DN700	
			L	Clamp-on transducers: for DN300~ DN6000	
			C	Insertion type	
			G	In-line type	
				Code	Output signal
				F1	4~20mA
				F2	RS232
			F3	Relay output	
				Code	Power supply
			D1	DC24V	
			D2	AC220V	
FUF	500	Fb	C	F1	D2