YouTube
Video demonstration:
https://youtu.be/hI84zgTN7J0

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FT221 Ultrasonic Flow Meter (Portable)

INTRODUCTION

FT221 is a full function transit time ultrasonic flow meter. An ideal solution to quickly verify the flow reading of another meter or to data log flow system values over an extended period. The FT221 portable meter has clamp on transducers with versatile mounting frames, meaning no tapping or cutting is required, just clamp onto the outside of the pipe. The meter can be easily moved and installed on different pipes and it's convenient to carry site to site. Its portability and powerful specifications at an economical price point makes it an excellent choice for measuring flows in many applications

FEATURES

- For measurement of clean liquids (not clear, so even oils can be measured)
- wide measurement range (velocity to 12ms)
- Easy to install, requiring no special tools
- Non-intrusive as sensors clamp on to the outside of the pipe, no need to stop the process, no moving parts, no leaks, no risk of contamination
- Inbuilt li-ion battery with fast charging
- Lightweight with rugged transport case
- Data logging – large capacity memory to log your flow measurements, retrieve and view with a PC.

APPLICATIONS

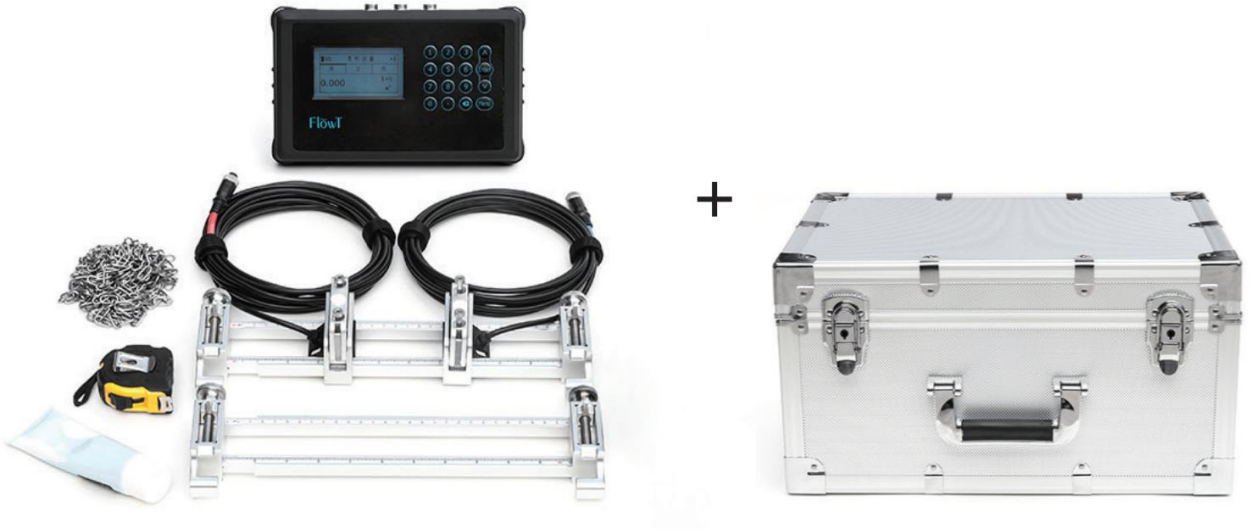
- Water (Hot water, cooling water, potable water, sea water)
- Petroleum products - Chemicals, including alcohol, acids
- Beverage, food and pharmaceutical processors
- Secondary sewage, waste treatment, etc...
- Mining industry, power plants for various processes
- Fire suppression system testing
- Pipeline leak detection and inspections
- Flow measurement surveys

- Displays current flow rate and velocity
- Displays totalised flow (NET, POS, NEG)
- Switchable units: Cubic Meter, Liters, Gallons, Cubic feet, & more

SPECIFICATIONS

Performance specifications	
Flow range	±0.03 ft/s ~ ±40 ft/s (±0.01 m/s~ ±12 m/s)
Accuracy	±1% of measured value
Pipe size	Clamp-on: 1/2"~48"(15mm~1200mm) [depending on sensor choice] *Standard model sensors best suit ~40 to 1200mm*
Fluid	Clean single medium liquids with little or no solids or bubbles *Pre-programmed liquids include:* *Water, Water 125℃, Seawater, Kerosene, Gasoline, Fuel Oil, Crude Oil, Diesel Oil, Castor Oil, Peanut Oil, Alcohol, Propane (-45℃), Butane (0℃), Other* *If 'other' then you can manually input liquid sound velocity (m/s)*
Pipe material	Sound conducting compact material pipe *Pre-programmed materials include:* *PVC, Carbon Steel, Stainless Steel, Cast Iron, Ductile Iron, Copper, Aluminium, Asbestos Cement Pipe, Fiberglass Pipe, Other* *If 'other' then you can manually input liquid sound velocity (m/s)*
Function specifications	
Outputs	Analog output: 4~20mA, Max 750 Ω. Modbus: RS485
SD card	16G
Logging Interval	1 ~ 99999 seconds
Keyboard	Membrane keys
Display	240*128 back lit LCD
Power supply	Rechargeable Lithium Battery Power, 3000mAh (Continuous operation of main battery ~16 hours). Includes 12.6v charger
Temperature	Transmitter: -20℃~60℃ Transducer: -40℃~80℃ - standard (-40℃~130℃ special order option) Humidity: Up to 99% RH, non-condensing
Physical specifications	
Transmitter	NEMA13, IP54.
Transducer	Encapsulated design, IP68
Transducer cable	Standard cable length: 5m (16ft).

STANDARD INCLUSIONS



1. Carrying Case x 1pc
2. Transmitter x 1pc
3. Transducers (Sensors) with cables 1x pair.
4. Mounting tracks and chains 1x set, DT type are standard (other options are special order)
5. Accessories: Coupling compound x1pc, Battery charger x1pc, Output cable x1pc, measuring tape x1pc
6. Documentation: User manual, factory calibration certificate

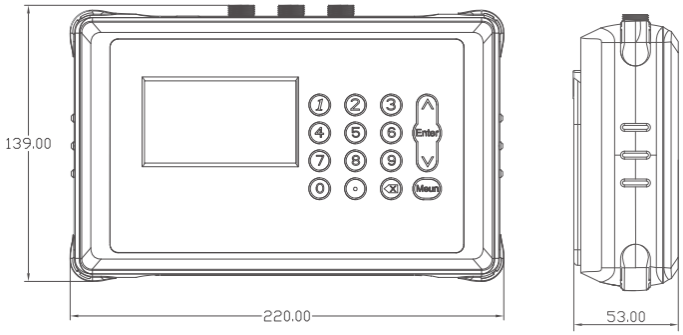
SENSORS & MOUNTS

We have standardised on the DT dual guides, but alternatives shown could be special ordered

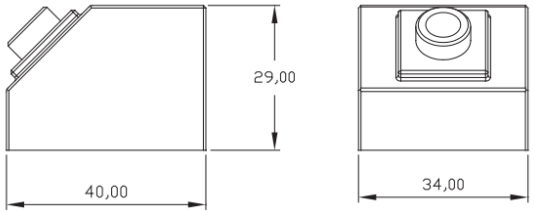
		
STANDARD Dual guides mounting type bracket (Code DT)	**Special order** Single guide mounting type bracket (Code ST)	**Special order** small pipe sensors DN15-DN40 (Code D2 + SMT)

DIMENSIONS

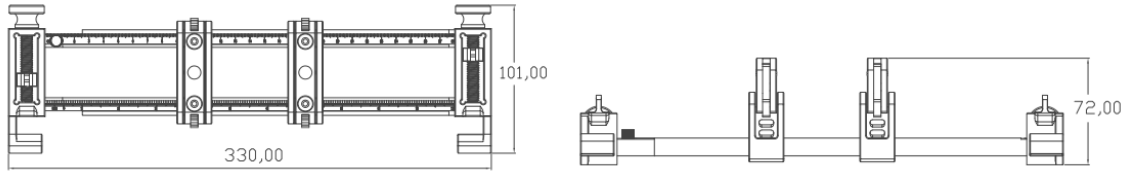
Transmitter dimensions



Standard transducers

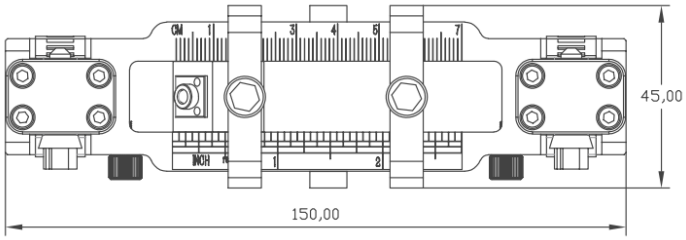


Standard DT sensor frames

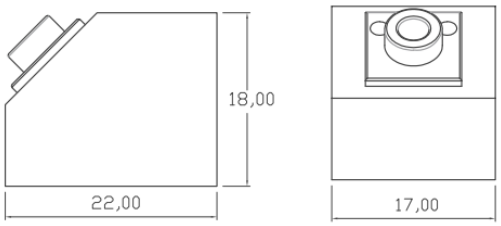


D2 small sensor dimensions (special order for very small pipes):

D2 mounting bracket size



D2 transducer size



ORDERING CODE

Our standardised model is FT221-1-D1-DT-P5, other model codes may be special ordered on request.

Code	Description
FT211	Portable Ultrasonic Flow Meter
Code	**Type of transmitter**
1	Ultrasonic flow meter
2	Ultrasonic Energy/Btu Meter function(RTD) [SPECIAL ORDER]
Code	**Type of transducers**
D1	Sensors best suited for DN40-1200, standard temp version, Clamp on, IP68 Operating temperature: -40℃ ~ +80℃ (-40℉ ~ +176℉)
D1U	Sensors best suited for DN40-1200, high temp version, Clamp on, IP68 Operating temperature: -40℃ ~ +130℃ (40℉ ~ +266℉)
D2	Sensors best suited for DN15-40, standard temp version, Clamp on, IP68 Operating temperature: 0℃ ~ 65℃ (32℉ ~ 149℉)
D2U	Sensors best suited for DN15-40, high temp version, Clamp on, IP68 0℃ ~ 115℃ (32℉ ~ 239℉)
Code	**Type of mounting track**
DT	Dual guides mounting type bracket
ST	Single guide mounting type bracket
SMT	D2 Mounting support
Code	**Transducers cable length**
P5	D1 series type of cable Standard 5m (16ft) with mounting track
P3	D2 series type of cable Standard 3m (9ft) with mounting track
PXX	XX is the length you need for cables, Maximum lengthen to 30m.
Code	**Temperature sensor**
PT1000	A pair of clamp on PT1000 sensors, 9m cables

Flow meter model (example):
FT221-1-D1-DT-P5
Portable Ultrasonic Flow Meter FT221, D1 type transducer 5m cables with dual guide mounting tracks

Energy/ Btu meter model(example):
FT221-2-D1-ST-P5-PT1000
Portable Ultrasonic Energy/Btu Meter FT221, D1 type transducer 5m cables with single guide type mounting track. A pair of PT1000 clamp on temperature sensor, 9m cables.

INFO ON SITE SELECTION AND SUITABILITY

When selecting a measurement site, it is important to select an area where the fluid flow profile is fully developed to provide an accurate measurement. Use the following guidelines to select a proper installation site

a) Choose a section of pipe that is always full of liquid, such as a vertical pipe with flow in the upward direction, or a full horizontal pipe.

b) Ensure enough straight pipe length before and after the transducers so that the flow is non turbulent inside the pipe

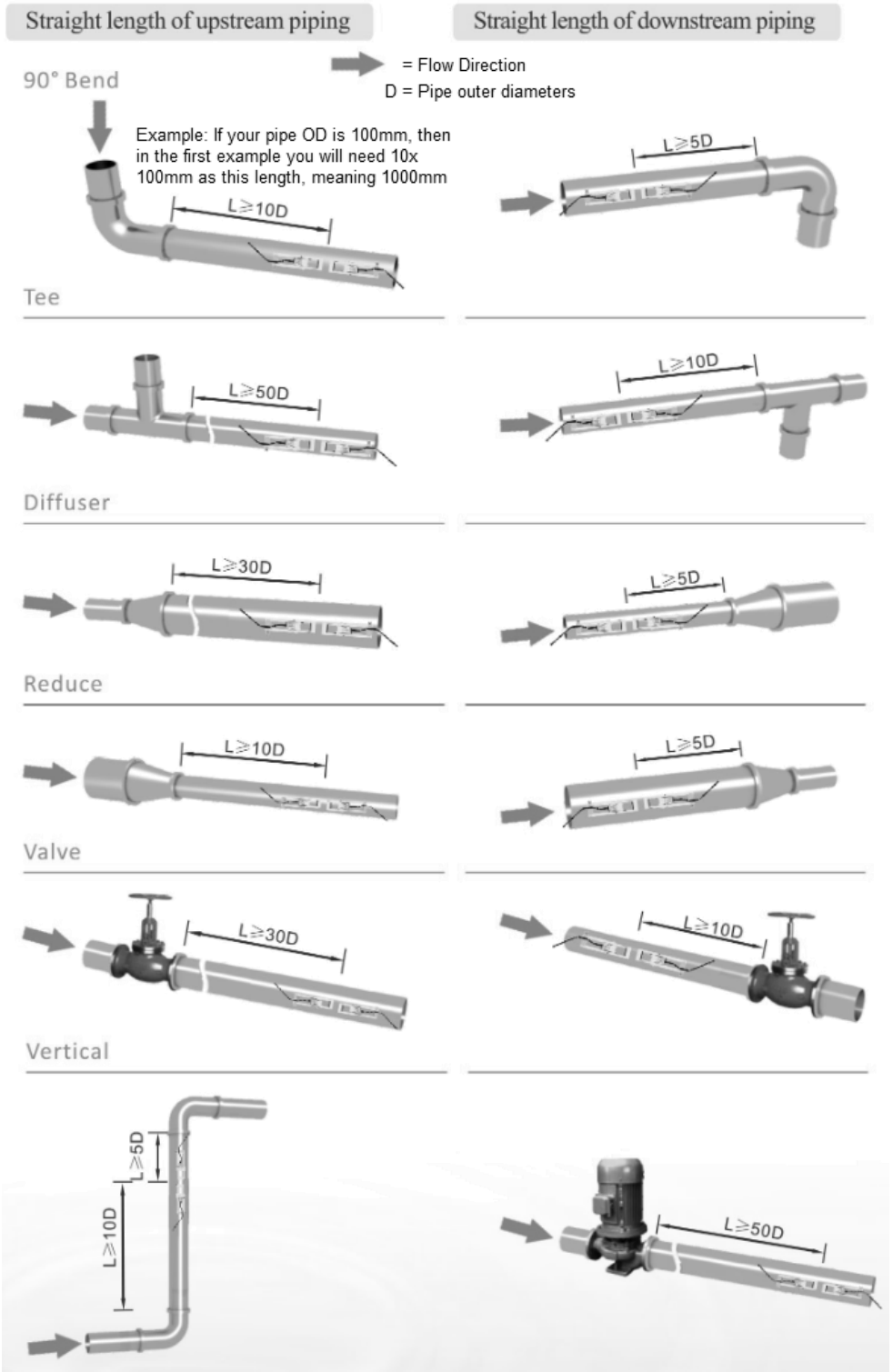
c) Transducers are best mounted on the 3 or 9 o'clock position of the pipe section (at the side of the pipe) this is to avoid sediment at the bottom of a pipe or air bubbles at the top

d) Ensure that the pipe surface temperature at the measuring point is within the transducer temperature limits

e) Consider the condition of the pipe inside and out. Select a section free of excessive corrosion or scaling

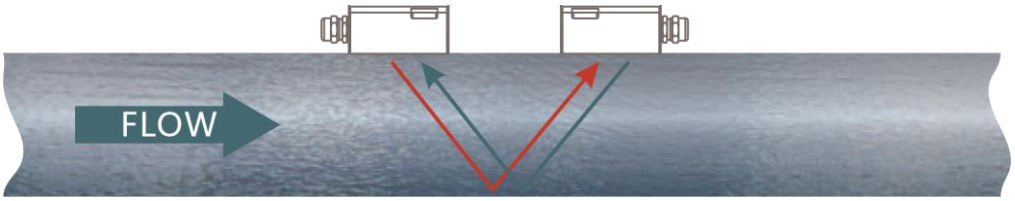
f) Consider the possibility of sedimentation at the bottom of the pipe and the presence of an air pocket at the top of the pipe. In addition, avoid flanges and welding areas and select a smooth portion of the pipe to install the transducers.

g) Ensure pipe and liquid are compatible or suitable to measured ultrasonically and install away from sources of interference or vibrations.



MEASUREMENT PRINCIPLE

A transit time 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 two transducers transmit and receive ultrasonic signals which travels firstly downstream and then upstream. Because the sound wave travels faster downstream than upstream, there will be a time difference. When the flow is still, the time difference is zero. Therefore, if the transit time of both downstream and upstream is known, the flow meter can work out the time difference, then the flow velocity and flow volume via a formula which the flow meter self calculates in real time.



OPTIONALLY this can be special ordered with a BTU function (RTD), An ultrasonic meter equipped with heat flow capabilities measures the rate and quantity of heat delivered or removed from devices such as heat exchangers. By measuring the volumetric flow rate of the heat exchanger liquid, the temperature at the inlet pipe and the temperature at the outlet pipe, the energy usage can be calculated – please contact us for information.

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