5120e	Product Information	thermokon asia pacific
FPC2 - Series	Ultrasonic Energy Meter	

FPC2 Ultrasonic Energy Meter uses the latest digital technology and low-voltage broadband pulse transmission. With distinctive features such as high accuracy, high reliability, the energy meter provides long-term and no-drift measurements and sorts operating software to adjust parameters according to changing conditions.

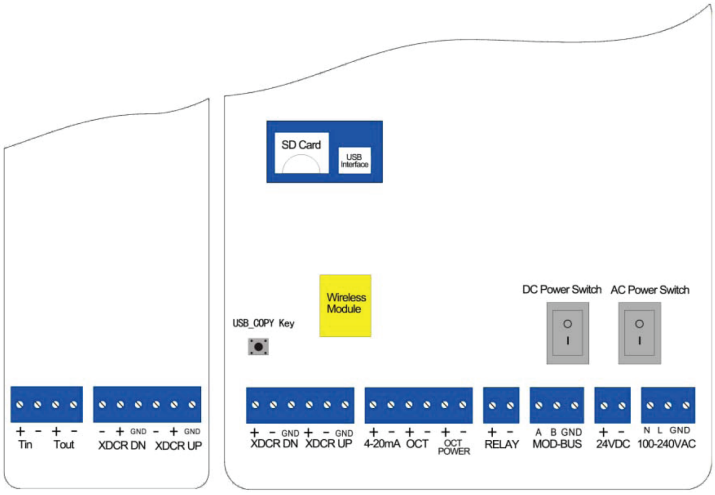
Pipe Material

Carbon Steel
Stainless Steel
PVC
Copper

Applications

Building Monitoring System (BMS)
HVAC
Building industry
Energy monitoring and auditing
Data centre

Wiring Diagram



Measuring Principle

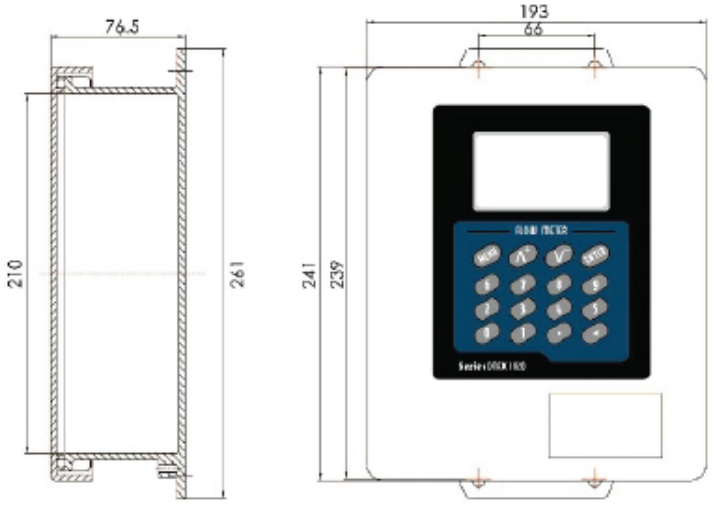
Both transducers are ultrasonic transmitter and receivers, which are clamped on outside of pipe at specific distance. Different pipe and liquid medium have different mounting method (V, Z or W method).
As ultrasonic wave travels faster downstream than upstream, by comparing the time difference, we can calculate the velocity of liquid flow in the pipe.

Model Selection Guide

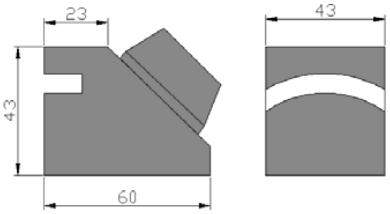
Model	Description	
FPC2	Name	Transient Time Ultrasonic Energy Meter
	Installation	Wall Mount, fixed installation
	Range	-12...+12m/s (-40...+40ft/s) bi-directional
	Accuracy	±1% of reading
	Repeatability	0.2% of reading
	Sensitivity	0.0003m/s (0.001ft/s)
	Power Supply	90...240V AC 50/60 Hz, 5A max. / 10...28V DC, 2.5A max.
	Output	4...20mA, Frequency, Relay, RS485 (MODBUS), USB, built-in data logging function
	Optional Output	HART+ (4...20mA), ZigBee, GPRS
	Transducer	DN40...DN1000, other size on request
	Media Temp.	-40ºC...+121ºC
	Cable Length	6m, other length on request

Ordering Code Description	
FPC2-S-U-S / PC-M-N-S-S-xxxx-6m-PT1000	
FPC2-S-U-S	
FPC2	Time Transient Ultrasonic Energy Meter
S	Standard Housing (Ex, explosion proof housing on request)
U	Univeral Power Supply (90...240V AC 50/60 Hz, 5A max. / 10...28V DC, 2.5A max.)
S	Standard output (4...20mA, Frequency, Relay, RS485 (MODBUS), USB, built-in data logging function)
PC-M-S-N-S-xxxx-6m	
PC	Pipe Clamp parameters
M	Medium size clamp, for DN40...DN1000
S	Standard temperature range, -40ºC...+121ºC
N	Standard clamp, no magnet on transducer
xxxx	Pipe size, e.g. 0100 for DN100, 0250 for DN250 etc.
6m	Cable Length, standard 6m (other cable length on request)
PT1000	PT1000 Class B duct insertion type temperature sensor

Dimensions



Meter Housing

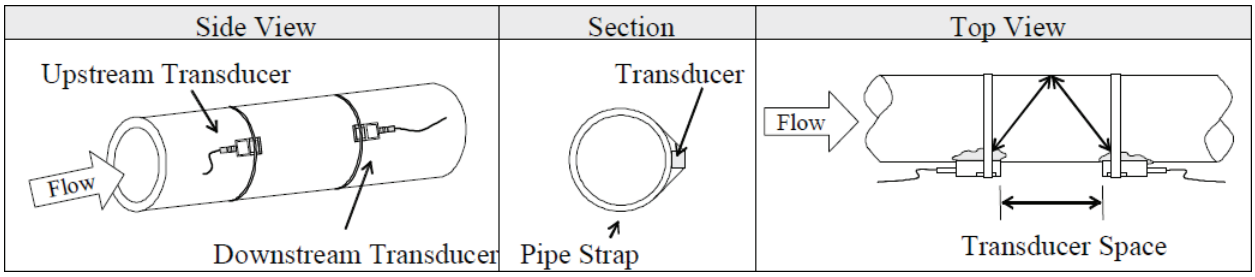


Standard Transducer

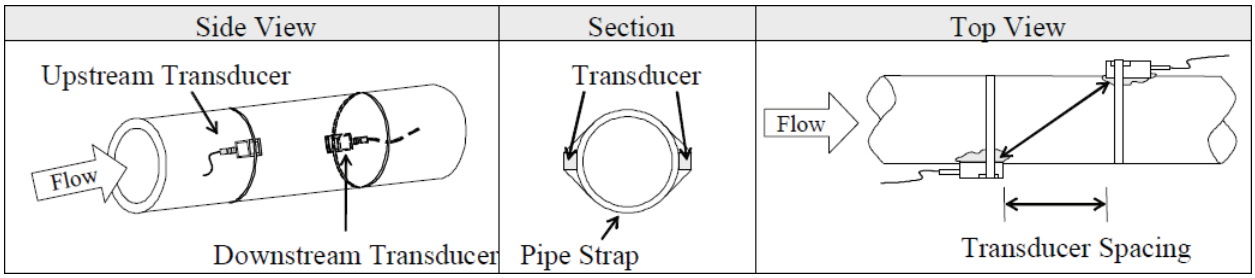
Clamp On Transducer Installation

Clamp-on Ultrasonic Flow meters are installed simply by applying coupling compound on the bottom of transducer and fixing them on the pipe.

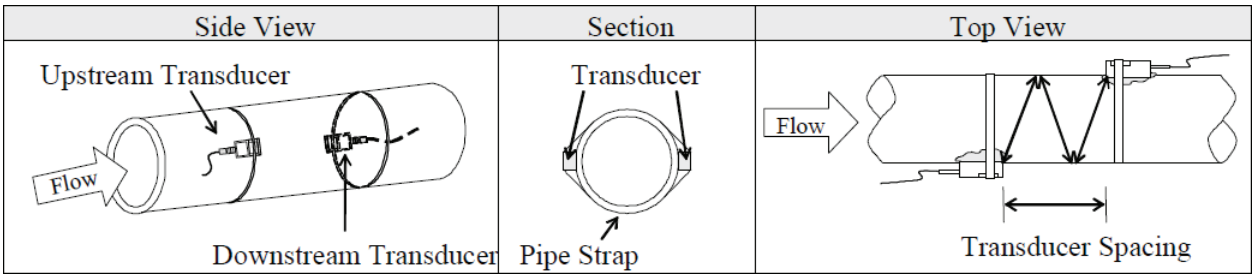
V method installation on pipe size: 25mm to 400mm



Z method installation on pipe size: 100mm to 3000mm

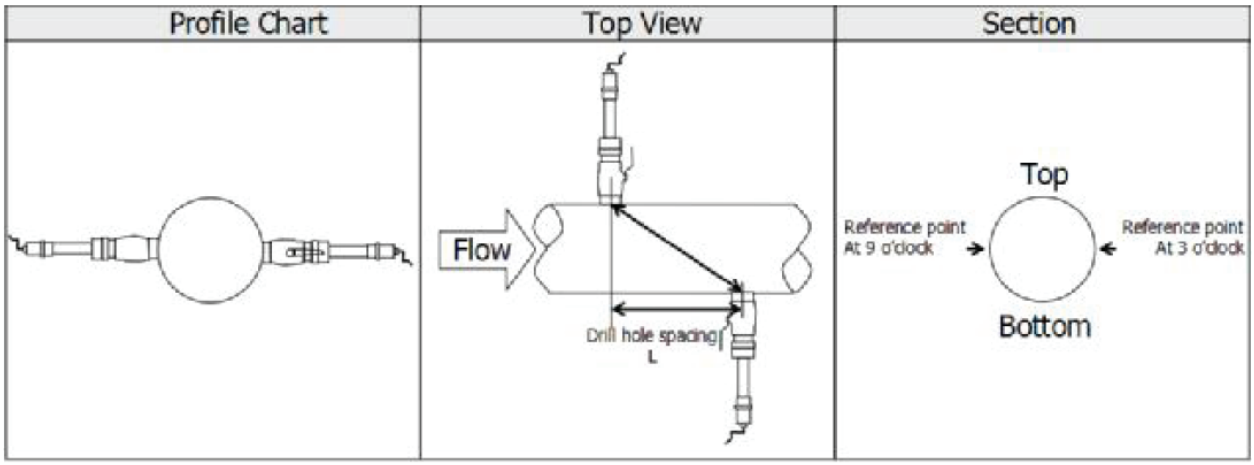


N method installation on pipe size: <50mm (Not recommended for most applications)



Insertion Type Transducer Installation

Insertion type transducer can be installed under flow conditions and pressure by hot-tapping them into pipe via isolation ball valve.
Insertion type transducer are used mainly on large size pipe (>3000mm), concrete pipe, heavily corroded pipe and aged pipes which need direct contact with liquid to be measured.
The interference of pipe material is eliminated from calculation of spacing between transducer.

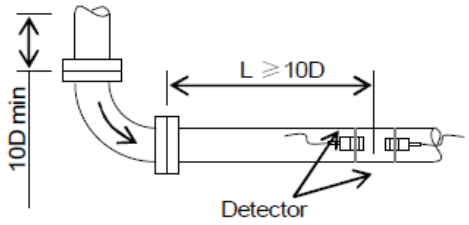
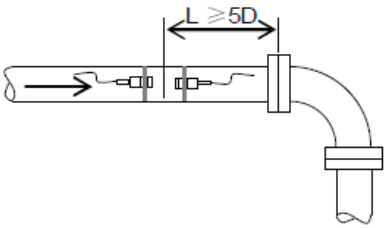
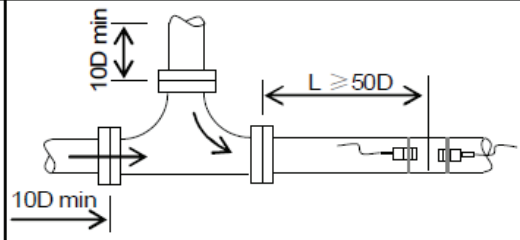
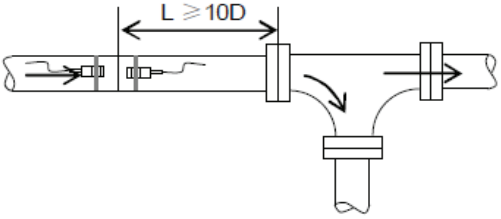
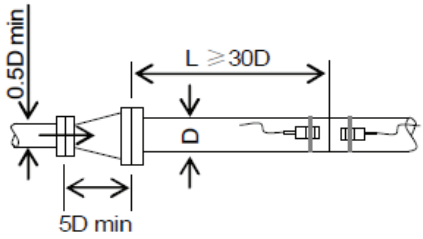
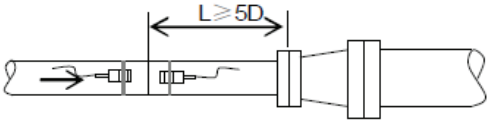
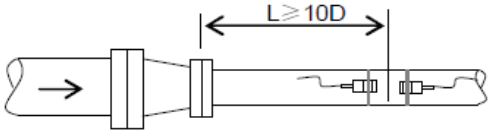
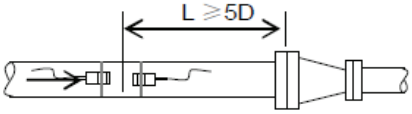
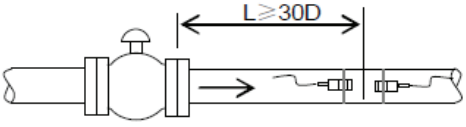
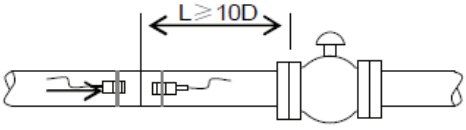
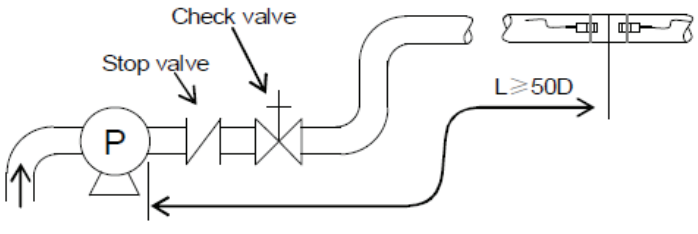


Transducer	Spacing	Installation Method and Pipe Size
W Style	T + 34mm	50mm...5000mm

When selecting a measurement location, it is important to select an area where fluid flow profile is fully developed in order to guarantee a high accuracy measurement. Use following guidelines to select a suitable installation location:

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

Ensure enough straight pipe length at least equal to the figure shown below for upstream and downstream transducer installation:

Name	Straight length of upstream piping	Straight length of downstream piping
90° bend		
Tee		
Diffuser		
Reduce		
Valve	 Flow controlled upstream	 Flow controlled downstream
Pump		

Ensure that the pipe surface temperature at the measuring location is within transducer temperature limits.
Consider surface condition of pipe carefully. Please, if possible, select a section of pipe where the pipe inside is free of excessive corrosion or scaling.