

# Klinger DS116

*Ultrasonic Flowmeter Clamp on*

Klinger DS116 is an ultrasonic flow meter for mounting on the outside of the measuring tube. The meter uses the transit time principle and can be used for all clean liquids.

## Principle

The principle is based on the simultaneous transmission of one ultrasonic signal downstream and one countercurrent.

Since the countercurrent signal will be longer along the way, the difference in travel times will be an expression of the liquid velocity, which can be calculated purely electronically, as it turns out that measurement of the flow velocity, based on ultrasound, is:

- Independent of media density
- Independent of the viscosity of the media
- Independent of the speed of sound in the current media

These are 3 very important conclusions, as in practice this means that an ultrasonic flow meter e.g. can be calibrated with water - and then applied to other liquids without having to recalibrate!

## Limitations

The transit time principle is primarily used for clean liquids / gases, as the ultrasonic signal must be able to run unhindered between the sensors.

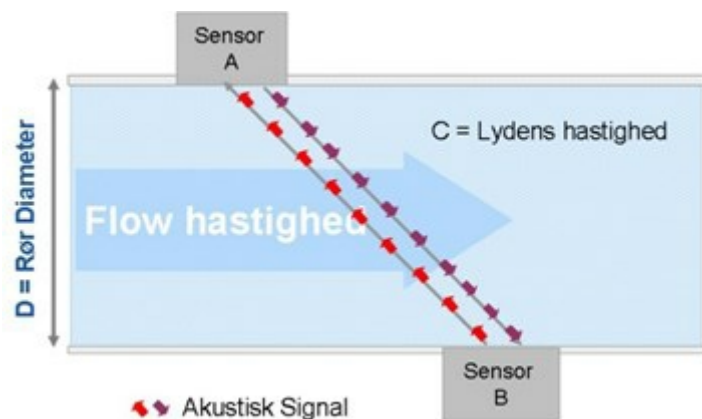
Air bubbles / moisture and particles can dampen the sound signal, in some cases it can even give false reflections. It is not possible to state exact values for how "dirty" the medium can be, it depends on what material the source of pollution is made of, but as a rule of thumb applies:

- Gas / air bubbles in liquid <1% vol
- Solid particles in the medium <5% vol

Although the principle is independent of the viscosity of the medium, there is an upper limit of 100cP / m, where the sound waves can no longer be compressed (transport the signal)

## Application

Klinger DS116 can be mounted on all pipes made of steel, stainless steel or PVC - in dimensions from DN 25mm to DN 1,200mm.



## Klinger DS116 for Liquid flow:

- Can be used for all clean liquids
- Pipe dimensions from DN 25 to DN 1,200mm
- Installed on the outside of the measuring tube
- For pipes made of steel, stainless steel and PVC
- Controlled setup assisted by Clear text menu

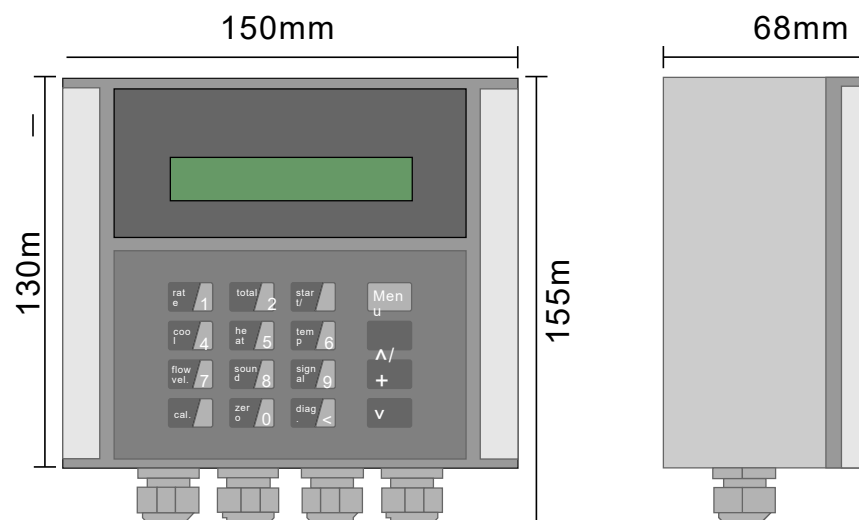
## Specifications

Specifications	
Range	$\pm 0.01\text{m/s} \sim \pm 5\text{m/s}$
Accuracy	$\pm 1.0\%$ of measured value
Pipe size	Clamp-on: DN 25mm to DN 1.200mm
Reference media	Water
Pipe material	Steel, Stainless steel or PVC.
Electrical	
Output	Pulse output: 0~5000Hz. Analogue output: 4~20mA, max load 750 $\Omega$ .
Communication	RS485
Power Supply	10~36VDC/1A
Keypad	16(4x4) Keys
Display	20x2 Ciffers/Text w. Backlite.
Temperature	Transmitter: -10to +50grC Transducer: 0 to +80 grC
Humidity	Max. 99% RH, not condensing
Physical specifications	
Transmitter	PC/ABS, IP65.
Transducer	IP68.
Transducer Cable	Standard length: 30ft (9m)
Weight	Transmitter: app. 0.7kg; Transducer: app. 0.4kg

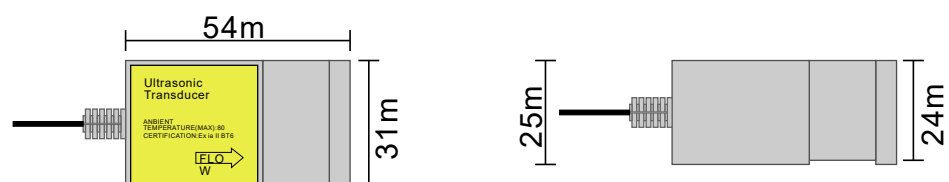


## Dimensions

### Transmitter



### Transducer



# Installation

The sensor mounting depends on the pipe dimension, so it is recommended:

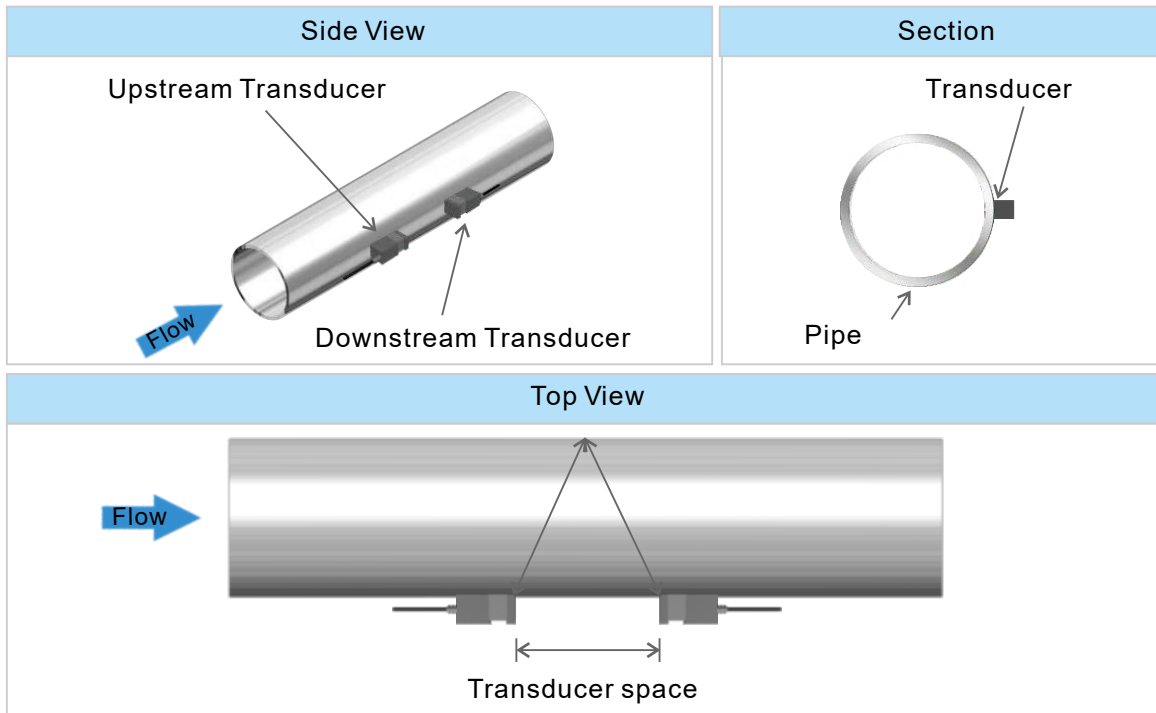
The V method for smaller pipe dimensions, where several traverses give the sound wave longer travel time.

The Z method for larger pipe dimensions

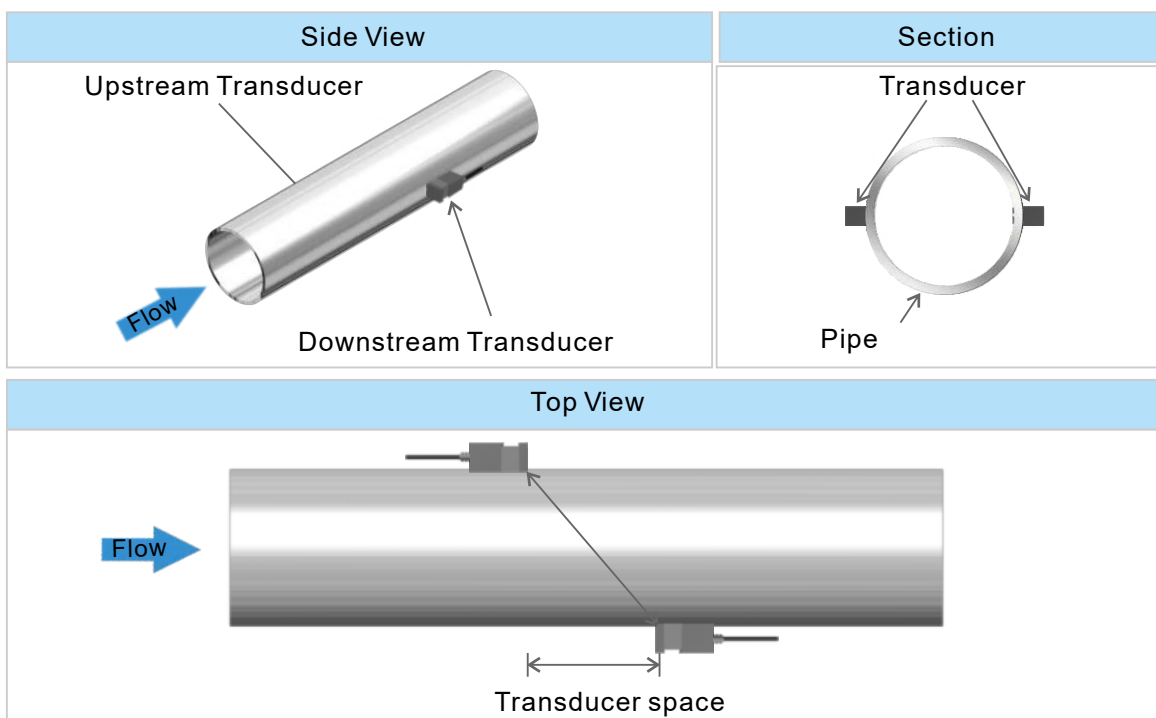
In both cases, mounting on the side of the pipe is recommended to avoid the influence of air / dirt in the top / bottom of the pipe.

If the tube is painted, this must be cleaned, and it is recommended to use an ultrasonic paste for the best possible contact between the transducer and the measuring point.

V-method for pipe size DN 25mm to 400mm



Z-method for pipe size DN 100mm til 1.200mm



## Order Code

Model	Description
DS116	<p>Digital Correlation Transit Time Flowmeter            Installation method: wall mount            Transmitter:            Flow Range: <math>\pm 0.03 \text{ ft/s} \sim \pm 16 \text{ ft/s}</math> (<math>\pm 0.01 \text{ m/s} \sim \pm 5 \text{ m/s}</math>)            Accuracy: <math>\pm 1.0\%</math> of measured value            Repeatability: 0.3%            Pipe Size Range: 1"~48" (25mm ~ 1200mm)            Keyboard: 16 (4x4) touch keys            Display: 20x2, alphanumeric, backlit LCD            Power supply: 10-36V DC@1Amax            Transmitter enclosure: IP65, ABS/PC enclosure            Temperature: <math>-20^{\circ}\text{C} \sim 50^{\circ}\text{C}</math>            Output: OCT pulse output 0-10KHz, Relay output, 4-20mA optional            Communication: RS232, Modbus Protocol            Temperature: <math>-40^{\circ}\text{F} \sim +140^{\circ}\text{F}</math> (<math>-40^{\circ}\text{C} \sim 60^{\circ}\text{C}</math>)</p>
Code	Output mode
3	OCT output, Relay output, RS232, 4-20mA output
4	OCT output, Relay output, RS485, 4-20mA output
7	OCT output, Relay output, RS232, 4-20mA output, RTD input
8	OCT output, Relay output, RS485, 4-20mA output, RTD input
Code	Type of transducers
CP035	Clamp on transducer, Operating temperature: $32^{\circ}\text{F} \sim +140^{\circ}\text{F}$ ( $0^{\circ}\text{C} \sim +60^{\circ}\text{C}$ )
W210	Insertion transducer, Operating temperature: $-40^{\circ}\text{F} \sim +176^{\circ}\text{F}$ ( $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$ )
Code	Transducer Cable Length
030	Standard 30ft (9m)
xxx	Maximum lengthen to 305m(1000ft), per 5m is a lengthen unit.
Code	Type of Temperature sensor
PT1000	PT1000 Temperature sensor
Standard Model: DS116-4-CP035-030 Description: standard flowmeter with Clamp-on transducers, OCT pulse output, Relay output, RS485, 9m cable.	



## Other Principles

Magnetic Inductive Flowmeters



VA meters



Vortex flowmeters

