

# Introducing the PRECISION 190F Fixed Transit Time clamp-on ultrasonic flowmeter

## Features

- A cost effective clamp-on non-invasive flowmeter.
- Analog and digital outputs.
- Data logger with local display of data. (graphically or as text)
- Bi-directional measurements, with totalization in positive and negative flow directions.
- Built in help.
- Automatic liquid speed of sound measurement and Reynolds Number flow profile correction.
- Measure flow rate within a pipe without cutting the pipe.
- Latest correlation signal detection system.
- Easy to attach clamp-on sensors.
- Zero head loss results in improved pumping efficiency.



- Clearly laid out high tactile response keypad.
- Very large flow measuring range, with no complicated upper velocity limits on sensors.
- Suitable for all commonly used sonically conductive pipe materials and liquids.

## Description

The Precision Flow 190P is a, transit time, flowmeter designed for liquid flow measurement applications, in particular where sterile conditions prevail and any invasion of the piping system could cause contamination. It is also a very economical solution to flow measurement in larger pipe applications.

Precision Flow's experience in ultrasonic technology ensures that the 190F is a high precision instrument, which can be configured and operational within minutes.

Various sensor and clamping options are available for non standard applications. Please contact us for more information.

## Principle of operation

Ultrasonic waves are transmitted in the direction of flow. These are accelerated slightly by the velocity of the liquid in the pipe. When ultrasound is transmitted in the opposite direction, the flow of the liquid causes the transmitted sound to decelerate. The subsequent time difference is directly proportional to the flow velocity in the pipe. Having measured the flow velocity and knowing the cross-sectional area, the volumetric flow can be easily calculated. Time differences are measured with a resolution of 20 Pico seconds, thus giving extremely good performance in small pipes or in large pipes with low velocity flows.

## Electronics

The Precision flow 190F is easily configured by selecting the options displayed in the main menu and following simple on screen instructions. The graphic display provides flow data in large highly visible characters, which is enhanced by the use of the back light facility, making it possible to read the flow rate from a distance under extremely poor lighting conditions. Error messages, signal quality, time and date are all continuously displayed, as well as flow information in either numerical or graph format, keeping the user fully aware of the measurement process.

## Data Logger

The built in data logger has the capacity to store 60,000 flow readings. Data can be stored in 5-second to 1 hour intervals. Data from each logging session can be saved with a unique name and is stored in the memory until it has been cleared. The stored data can be displayed on the instrument in text or graphical format. The instrument is also capable of downloading the stored data via The RS232 output port to a printer or PC onto a standard spreadsheet. A USB option is available. The unit has a removable electronics pack so the data logger can be taken away for download if required. (under screw fixed front panel)

## Specification

### Wall Electronics Enclosure

Protection Class : IP66  
Material : Painted Steel  
Weight : 4.3 Kg  
Dimensions : 235 mm x 300 mm X 80 mm (with glands)  
Display : 240 x 64 graphics LCD with backlight  
Keypad : 17 key tactile membrane (behind front panel)  
Temperature range : 0°C to +50°C (operating) -10°C to +50°C (storage)  
Power supply 100 to 240 V AC or 12V DC  
Volumetric flow units : m<sup>3</sup>, gallons (Imperial and US), Liters  
Velocity units : metres/sec, feet/sec  
Flow velocity range : 0.01 m/sec to 25 m/sec to 4 significant figures  
(option higher if required)  
Total volume : 12 digits forward and reverse  
Continuous signal quality indication  
Status messages  
Analogue 4-20mA into 750<sub>Ω</sub> : User definable scaling  
Resolution : 0.1% of full scale  
Pulse 5 Volts User definable scaling  
Serial RS232 USB  
Data Logging memory capacity 60,000 data points  
Data Logging output Via RS232 or displayed graphically/numerically

### Transducer Standard WLT type Pipe size : 25mm-500mm

Protection Class : IP66  
General service temp short term :-30 to 130 °C  
General service temp long term :-30 to 105 °C

### Transducer Standard W type Pipe size : 500mm-1200mm

Protection Class : IP66  
General service temp short term :-30 to 130 °C  
General service temp long term :-30 to 105 °C

### Transducer Standard Y type Pipe size : 1200mm-6500mm

Protection Class : IP66  
General service temp short term :-30 to 130 °C  
General service temp long term :-30 to 105 °C

Application specific transducers Contact Precision flow for details

Repeatability ±0.5% with unchanged transducer positions

Accuracy ± 1% to ± 2% or ± 0.02 m/sec whichever is the greater, depending on application.

The specification assumes turbulent flow profile.

Precision Flow Ltd reserve the right to alter any specification without notification