

# ORAKEL

SYSTEM

## TIME OF FLIGHT ULTRASONIC FLOW METER

The ORAKEL Time of Flight Sensor is a non-invasive liquid flow measurement tool that uses ultrasonic technology to calculate flow without the need to cut into existing pipe work.



### HOW IT WORKS

Transit time ultrasonic flow meters send and receive ultrasonic waves between transducers, in both the upstream and downstream directions, in the pipe.

At 'no flow' conditions, it takes the same time to travel upstream and downstream between the transducers. Under flowing conditions, the upstream wave will travel slower and take more time than the (faster) downstream wave. When the fluid moves faster, the difference between the upstream and downstream times increases. The transmitter processes upstream and downstream times to determine the flow rate.

### APPLICATIONS

Designed to measure liquids, the **ORAKEL Time of Flight Sensor** can measure almost any fluid that contains < 10% solids or gas; including water, oils, petrochemicals, alcohol and more.

The **ORAKEL Time of Flight Sensor** is suitable for:

- Liquid flows needing precision measuring
- High and low temperature flows
- Pipeline leak detection
- Management of liquid transfer

### KEY FEATURES

#### Intuitive Menu

Driven by HMI, the intuitive menu makes installation easy.

#### Diagnostics

Includes a full set of instrument and measurement diagnostics.

#### Precision Positioning

An integrated signal oscilloscope optimises sensor positioning and diagnostics.

#### Data Analysis

An optional GSM data-logger can be added and data sent to an online portal for detailed analysis.



[www.detectronic.org/orakel](http://www.detectronic.org/orakel)

## KEY FEATURES (CONTINUED)

### Easy Configuration

Includes an internal database of pipe, lining and fluid materials.

**Lining:** none, cement, epoxy, glass, PP, PVDF, rubber, other.

**Pipe:** carbon steel, stainless steel, cast iron, ductile iron, copper, PVC, aluminium, asbestos, fibre glass, epoxy, other.

**Fluid:** water, sea water, kerosene, gasoline, fuel oil, crude oil, Freon R134a, Freon R22, diesel oil, castor oil, peanut oil, ethylene glycol, glycol/water 50%, alcohol, other.

### Flexible Measurement

Liquid can be measured in l, m<sup>3</sup>, USgal, mg, cf, bbl and Imp bbl. All measured values can be selected as flow rate per second, minute, hour or day and are automatically totalised.

### Built-in Parameters

Built-in fluid parameters allow calculations to compensate for speed of sound, density, viscosity, specific heat capacity and temperature (if temperature is known from optional temperature probe).

## TECHNICAL SPECIFICATION

### Dimensions

Control unit: 230 x 309 x 103mm.

Transducers: 60 x 30 x 35mm.

### Environmental Protection Standards

Enclosures and glands: IP 68.

Transducers: IP 66.

### Flow Velocity Range

0-25m/s (bi-directional).

### Velocity Resolution

0.25mm/s.

### Accuracy

+/-0.5% of measured value under ideal conditions (gas/solids < 10% of volume).

### Communications

Modbus RS485 slave serial communications.

### Operating Temperature

Control unit: -10°C to +65°C.

Transducers: -20°C to +150°C.

### Material

Control unit: ABS flame retardant IP65N, Nema 4X.

Transducers: 316 stainless steel.

### Repeatability

0.15% of measured value.

### Pipe Size

6-2000mm.

### Power

12Vdc PSU at 10W.

3m cable is supplied as standard.

### Output

Transducers operating at 1MHz.

## THE ORAKEL SYSTEM



The **ORAKEL System** is the ultimate fluid measurement product range.

Created as a modular system with a wide range of sensors that can be added to measure various characteristics for a truly bespoke and cost effective solution.

- Two types of high specification control units available
- On-screen graphing
- 9 buttons for easy navigation
- Secure website viewing option available
- 4-20mA and Modbus outputs available
- Multilingual options
- Connects up to 2 sensors as standard; expandable up to 16 sensors

To learn more about the **Detectronic ORAKEL System** and how it can help your business, get in touch:

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Visit: **www.detectronic.org**

