

Non-invasive Flow Monitor

KATflow 10

- **Non-invasive ultrasonic measuring principle**
- **No contact between sensor and liquid**
- **Easy and cost effective installation - sensor is simply mounted to the outside of the pipe, no holes to drill, ideal for retrofits**
- **Suitable for high pressure, corrosive, aggressive and toxic media**
- **Liquid can contain gas bubbles and solid particles**
- **Short evaluation time of signals**
- **No wear and tear on sensor**
- **Easy calibration**



Description

The **KATflow 10** device is a non-invasive ultrasonic flow indicator and switch which is able to monitor process liquids without penetrating the surface of the pipe. The sensor is simply attached to the outside of the pipe and measurements are made through the pipewall. There is no need to drill holes or to perform any welding to install the sensor. Installation time and cost are negligible as a result.

The **KATflow 10** utilises ultrasonic Doppler technology to provide cost effective and repeatable switch point outputs for high or low flow alarm. Ultrasonic pulses are transmitted and received by the unit through the pipewall and into the fluid. Signal reflections from particles and air inclusions in the liquid cause a frequency shift of the transmitted ultrasound which is proportional to the flow rate of the medium.

The **KATflow 10** is capable of operating in general purpose flow measurement applications with velocities from 0.3 m/s to 3.5 m/s on many liquids and slurries. It is possible on the majority of liquids, to indicate the flowrate and provide a repeatable switching point on higher or lower than desired flow.

Each unit has ease of installation and calibration as a key feature, having a single button set-up with status feedback during initial calibration from red and green LED's.

The **KATflow 10** has ingress protection of IP67 (equivalent to NEMA 6) and its rugged design provides a high degree of protection from bump, shock and vibration within a typical industrial environment.

Typical industries:

Chemical
Food and drink
Mineral Extraction
Pharmaceutical
Power generation
Pulp and paper
Sewage and water treatment

Typical applications:

Activated carbon slurries
Aerated liquids
Coal slurries
Cooling water circulation
De-ionised water
Filter backwash
Fly ash slurries
Limestone slurries
Oil/coal mixtures
Paint
Paper slurry/stock
Primary sewage and sludge
Raw sewage
Resin slurries
Return activated sludge
River water
Secondary effluent
Soap solutions
Spent acids
Taconite slurries
Tertiary effluent
Thickened or digested sludge

Technical data

Measuring principle	: Ultrasonic Doppler, non-invasive
Transducer mounting principle	: Outside surface of pipe with metallic straps or pipe clamps, transducers coated with acoustic coupling component
Pipe material	: Carbon steel, stainless steel, other metals, glass, plastic materials
Pipe outside diameter	: 40 mm ... 400 mm (1.5 inch ... 15 inch)
Pipewall thickness	: < 10 mm
Velocity range	: 0.3 m/s ... 3.5 m/s (0.7 m/s ... 9 m/s for high flow unit KAT10-01-1)
Accuracy/repeatability	: +/- 7.5 %, application dependent
Switch point set-up	: Via settings in electronic unit (for standard model KAT10-01 only)
Size/weight	: 118 mm L x 70 mm H x 65 mm W, 1500 g
Housing material	: Type 316 stainless steel investment casting
Switch output	: Voltfree relay contact, programmable, 1 A at 30 V DC, SPCO (for standard model KAT10-01 only)
Analogue output	: 4 mA ... 20 mA auto scaled, 0 V DC ... 10 V DC (for standard model KAT10-01); 0 V DC ... 10 V DC auto scaled (for model KAT10-02 with hazardous area approval EEx m IIC T6)
Power supply	: 22 V DC ... 36 V DC, 120 mA
Degree of protection	: IP67 (equivalent to NEMA 6)
Operating temperature	: -40 °C ... +85 °C
CE/EMC approval	: Complies with BS EN 50081-1 (1992) for emissions, BS EN 50082-2 (1995) for immunity
Accessories	: Transducer fixings, acoustic coupling component
Bump, shock & vibration	: Complies with the relevant parts of BS 60068

Ordering information

Order code	KAT 10 - 0 x - x
Standard model	1
Normal flow velocity	0
High flow velocity	1
EEx certified model	2 0

Installation recommendations

The **KATflow 10** unit should be mounted in direct contact with the outside wall of the pipe, which should be clean and free from any loose or flaking material. The sensor to pipe contact area should be coated with acoustic coupling component to provide good acoustic contact.

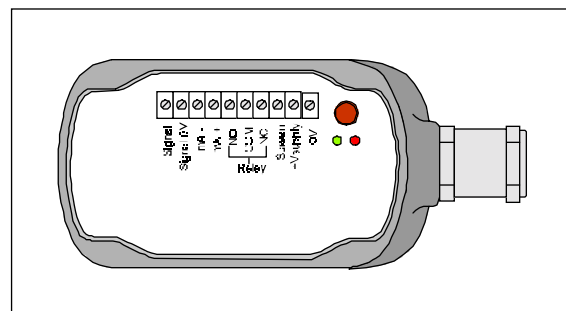
A suitable metallic strap, hose clip or plastic tie is required to firmly position and clamp the sensor in place.

The sensor must be mounted to coincide with liquid flow, for example on pipes where there may be large inclusions of air running along the top of the section of the pipe, it is recommended that the **KATflow 10** unit is mounted some degrees off vertical.

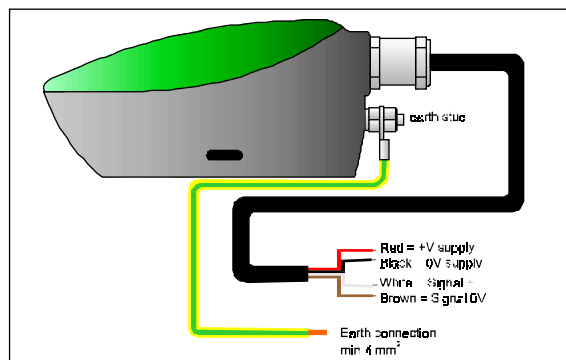
For the standard model KAT10-01, once clamped onto the pipe the unit's lid is unscrewed (the four captive screws are retained by the lid) and electrical connections made to the terminal strip. Commissioning and set-up are simple and straightforward. The set-up consists of a one button calibration routine to establish flow rate and to enable an alarm setting with an option for 'high flow' and 'low flow'.

The model KAT10-02 for use in hazardous areas Zone 1 and 2 (certified to EEx m IIC T6) is fitted with an integral cable. It is not possible to remove the lid for this unit. An auto-scaled analogue output 0 V DC ... 10 V DC is provided proportional to 0.3 m/s ... 3.5 m/s flow velocity.

Connection details



KATflow 10 standard model KAT10-01



KATflow 10 EEx certified model KAT10-02