

Applications

The manual and automatic measurement of water flow volume in open channels, including:

- Drainage systems in dams and tunnels.
- Springs and collects from artesian wells.

Operating Principle

The V-notch weir uses the principle of gravitational discharge of water over a triangular or rectangular notched weir plate. For a given profile size and shape, discharge is a function of the head of water at the weir.

Experimentally determined coefficients relate the head of water to the rate of discharge. The head of water may be measured manually or automatically and remotely.

A V-notch weir system comprises a stainless steel plate with chosen notch profile to suit expected flow rates and a means of measuring the head on the weir plate. The weir plate is mounted at the exit of an approach channel or stilling basin through which the flow to be measured is channelled.

The measuring point for the head of water is located upstream of the weir plate within the channel or basin and comprises a stainless steel scale fixed to the basin wall, from where manual readings for head above the vortex of the notch may be read.

Alternatively, a Precision Water Level Sensor (PWLS), employing a vibrating wire force transducer may be used to monitor head level. A cylindrical weight suspended from the transducer hangs partially submerged in the head of water. As the water level changes, the changing buoyancy on the cylinder acts on the transducer, changing its output frequency.

V-Notch Weir System

Frequency readings may be taken manually with a portable Soil Instruments Model 1030 vibrating wire logger or automatically and remotely. Measured frequency readings are unaffected by cable length.

Additionally, recorded data may be imported automatically into I-Site software and used to control audible or visual alarms, triggered by breaching of user determined alarm thresholds.

Advantages and Limitations

- Simple in principle, a low cost and robust instrument.
- Accurate and sensitive water level monitoring.
- Low maintenance system.
- Easy to automate via data acquisition and I-Site software.
- Accuracy dependent on the design and care of complete installation.



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**DATA SHEET
W10**

Specification

V-notch weir Components

Weir Plate

Precision, laser cut stainless steel construction, c/w all stainless steel expandable anchor fixings.

Available in standard 12, 50 or 100 litre/second ranges.

Non-standard ranges available to request.

Baffle Plate

Removable zinc plated carbon steel baffle plate, with bottom, side guides and expandable anchor fixings.

Provides damping to head water, giving more stable and reliable readings.

Manual Measurement

Stainless steel measure drilled for screw fixing, graduated in centimetres and millimetres.

Precision Water Level Sensor (PWLS)

Vibrating wire force transducer and stainless steel cylindrical hanging weight, housed within a PVC damping chamber. Complete with 2 PVC, screw fixed, wall-mounting brackets. Comes with 5m of cable attached to transducer.

Available in 300 or 600mm head ranges.

Force transducer equipped with replaceable silica gel desiccant capsules, vent tube and thermistor, providing automatic atmospheric pressure compensation and manual temperature compensation.

Portable VW Loggers

See Datasheet RO1-VW.

Terminal Boxes

See Datasheet RO-TB.

Dataloggers

See Datasheet D1.

Software

See Datasheet D2.

Cable

See Datasheet CA1.

System Performance

Weir Plate

Designed in accordance with BS3680: Part 4A: 1981. Supplied with a conversion table of head against flow.

PWLS

Vibrating Wire force transducer, supplied with calibration certificate containing factors for both Portable logger and CR10 datalogger reading.

Range

Weir plate: 15, 30 or 65 l/s. Other ranges available on request.

PWLS: 300 or 600mm head.

System Resolution:

Dependant on measuring method and weir range.

Manual: 1mm, equating to up to 0.5l/s at high flows, 0.02 l/s at low flow.

PWLS: 0.02%FS (min) or 0.1mm, equating to, equating to 0.05l/s at worst.

Repeatability:

Manual: ± 1 mm - Dependant on user. PWLS: $\pm 0.02\%$ FS.

Accuracy:

Overall dependant on quality of complete installation.

Manual: ± 1 mm.

PWLS: $\pm 0.5\%$ FS.

Practical accuracy: $\pm 1.3\%$ FS.

Temperature:

PWLS: 4°C to 30°C.

Ordering Information

W 10-1 Weir Plate

W10-1.1 Plate, 15l/s range
W10-1.2 Plate, 30l/s range
W10-1.3 Plate, 60l/s range
complete with all fixings.

W10-2 Baffle Plate

W10-2.1 Baffle plate, one size, complete with frame and fixings for adaption on site. Max channel size 980x1063mm.

W10-3 Manual Reading Scale

W10-3.1 Scale 300mm range
W10-3.2 Scale 600mm range

W10-4 Water Level Sensor

W10-4.1 Sensor 300mm range
W10-4.2 Sensor 600mm range

W10-5 Replacement Parts

W10-5.1 Replacement desiccant Tablets.

CA1 Cable and Fittings

CA-3.1-4-IC 4 core screened
CA1-4.1 Joint sealing kit

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