

Measuring and recording open channel flow with the vanwaltCONNECT telemetry system and RBC flume.

Measuring water flow in a river.

Council bodies measure river flow by mapping riverbed cross sections and recording the water level at these cross sections. Careful correlation of this data with time stamps allows a calculation of water flow that can be fine-tuned with manual flow gauging. When measuring water flow to the nearest cubic meter per second this method will suffice but with smaller bodies of water it becomes woefully inaccurate. A calibrated flume is required to calculate water flow to the nearest Litre per second.

What is a flume.

Flumes are specially shaped, engineered structures that are used to measure the flow of water in open channels. Flumes have no moving parts. They rely on restricting the flow of water in such a way so as to develop a relationship between the water level in the flume at the point of measurement and the flow rate.

Flumes can use a change in elevation, a contraction of the sidewalls or a combination of the two to accelerate flow. This acceleration creates upstream conditions where the flow rate can be determined by measuring the water level at a single point.

The water level is measured in a stilling well that is connected to the main body of water by a small capillary. This ensures that the measurement is unaffected by surface distortion (waves, current)



The relationship between the water level at the point of measurement and the flow rate can be obtained by a derived formula.

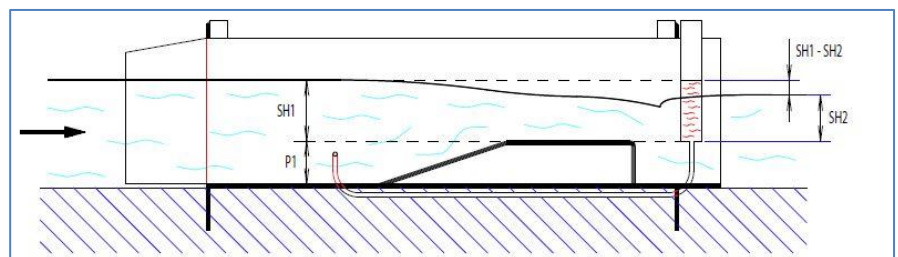
There are a number of typical flume designs each with advantage and disadvantage. For a comprehensive guide and description of each of these please visit:

<https://www.openchannelflow.com/flumes>

The RBC flume.

RBC flumes are used to measure the quantity of water that, for instance, flows through an irrigation channel. By comparison to other known flumes, such as the WSC- and the Parshall flume, the RBC flume is the most accurate. The RBC flume has been specially

designed for use in smaller water ways or earthen channels (irrigation channels, in- outlets, furrow, ditches, etc.). The RBC flume is a simple and reliable instrument for the measurement of the quantity of irrigation water that flows towards a field. Using standard formulae the flow through quantity (the discharge) is calculated. Instead of reading the stilling well it is possible to install a pressure transducer connected to a datalogger



Pressure transducers

The PT2X pressure transducer records pressure and temperature. A versatile sensor for many applications it has an integrated datalogger that will collect up to 520,000 records, Aqua4Plus control software, is easily connected to other sensors and is thermally compensated for volatile conditions – making it ideal for observing flow patterns, testing pumps, monitoring groundwater, well, tank and tidal levels or any application where 'mm' accuracy is important.

Full details and specs on PT2X here:

<https://www.vanwalt.com/aquiStar-smart-sensors.html>



vanwaltCONNECT telemetry.



vanwaltCONNECT records data from the PT2X level sensor and sends the data to your Van Walt Dashboard accessible through the internet.

A calculated field function displays the water flow. This flow data can then be send on to third parties such as consultants and council bodies.

vanwaltCONNECT systems operate around the world sending data such as water quality, level, flow and hydrocarbon sensors to dashboards of dozens of clients. One such client in New Zealand is Cardrona Ski field. They have a number of installations for water flow in pipes and open channels. Three of these are of the RBC flume type.

