

WATER DISCHARGE MEASUREMENTS

Water discharge measurements are important for the determination of a hydrologic balance in a certain area.

For the determination of the current velocity in water ways, measuring discharges from drainage systems and/or the registration of water movement in open irrigation channels, various kinds of measuring equipment have been developed.

An efficient and accurate hydrological research dictates strict requirements for the equipment to be used.

Both current velocity meters, the flumes and the self-recording drain discharge recorder meet these requirements.

13.12 Current meter with synthetic propeller

The instrument is used for the accurate determination of the current velocity in water ways, channels, rivers and the sea. The meter can also be applied in polluted water currents.

The measurements are executed with the propeller mounted on the rod(s) or connected to a cable.

The current velocity meter has a measuring range of 0.025 to 10 m/sec.

The complete set contains: a streamlined current velocity meter with a synthetic propeller, an electro mechanical counter, extension rods with graduation, cable, accessories and case.

The meter with the extension rods is usually applied for measurements in shallow creeks or rivers with low current velocities.

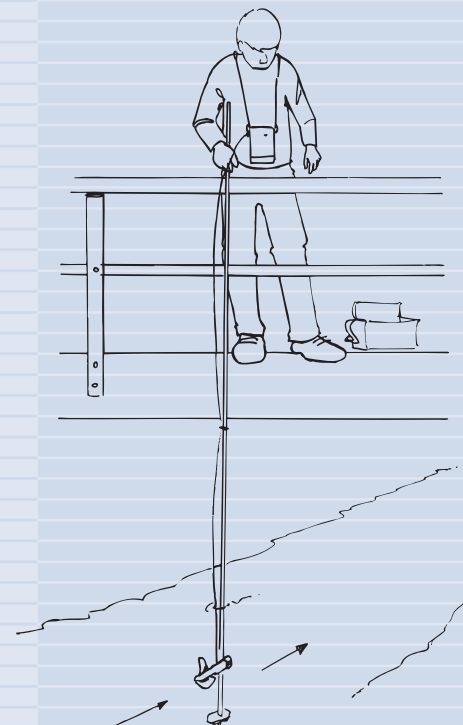
The synthetic propeller is fiberglass reinforced. The mechanical counter, fitted with a carrier belt, registers up to 10 pulses per seconds.

In large water ways with higher water levels and current velocities the current velocity meter can be connected to a cable with single drum winch (optional) which can be mounted either to the railing of a bridge or a boat.

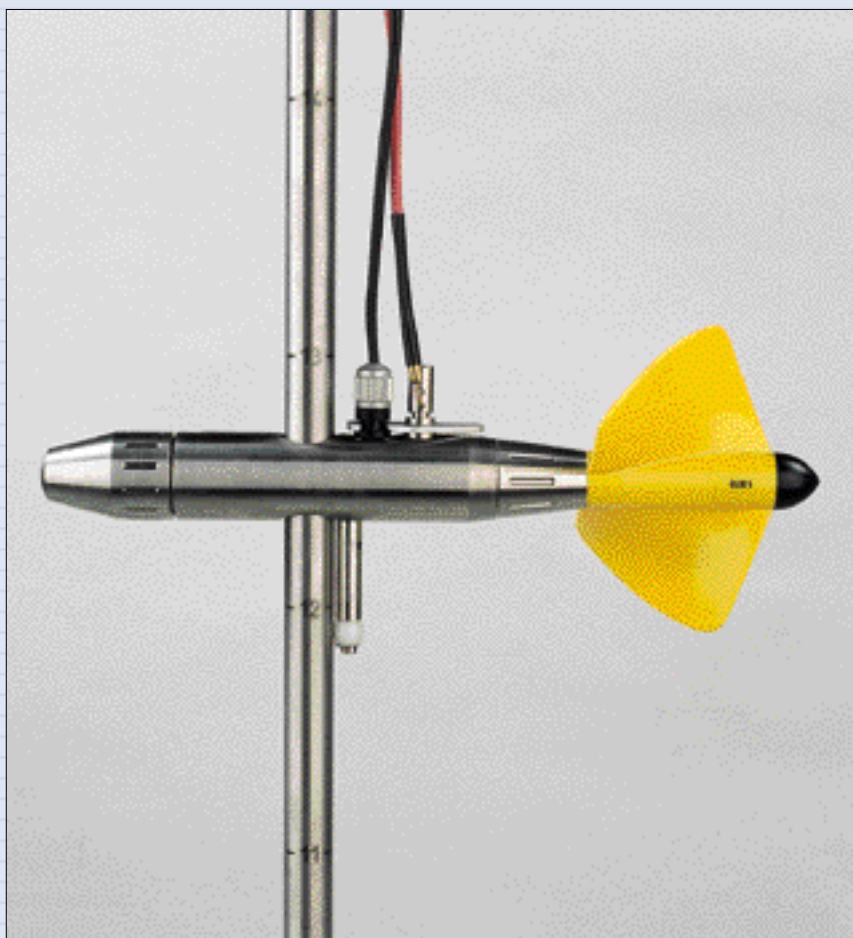
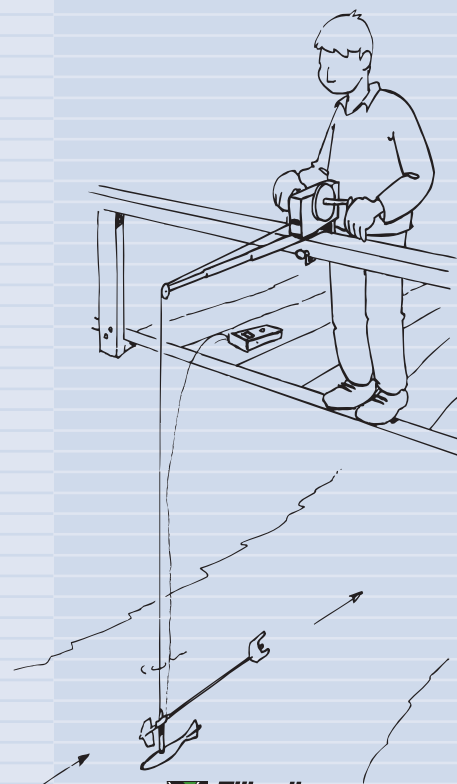


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Measuring the current velocity with the meter mounted to the rods.



Lowering the current velocity meter using a winch and an arm fastened to the railing of the bridge.



Current meter with propellor

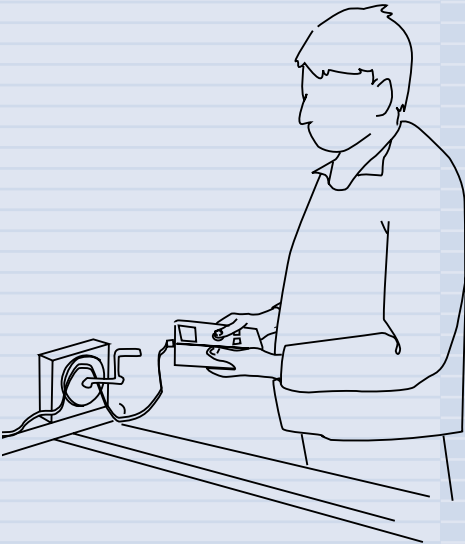


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Reading the electro mechanical counter.



Advantages

- Exclusive application of anticorrosive materials.
- Low starting speed.
- Almost frictionless contact transmission increases the precision of the instrument.
- Simple control and maintenance.
- Rod and wire operation possible.
- Very complete set.

13.13 Mini current meter with aluminium propeller

The mini current meter with aluminium propeller is used in small ditches, with low water levels. Measuring range 0.03 to 2.5 m/sec. The instrument is included in a complete set.

13.14 Mechanical current meter with propeller

This small, lightweight mechanical current velocity meter has a measuring range of approximately 0.1 m/sec. to 7.9 m/sec. The meter is used for current velocity measurements in rivers, channels,

sewage systems, pipes, etc. Suspended from a wire the meter can be applied at great depth. The meter is balanced in such a way that it will remain in a horizontal position even if the meter for instance is pulled at speed by a line. The propeller is linked directly to a six digit counter that registers and visualizes every single rotation of the propeller, similar to the mileage counter in a car.

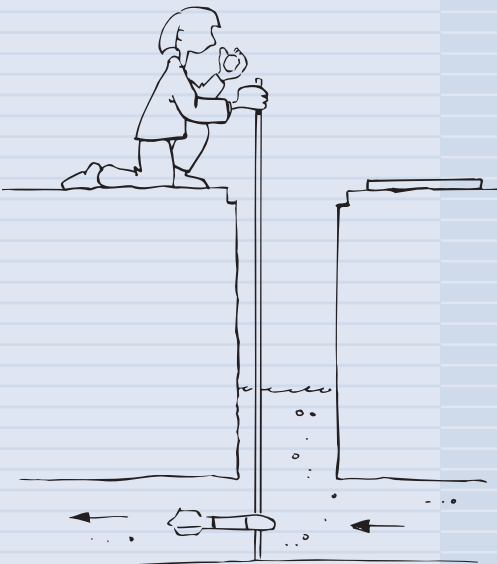
The counter is placed within the instrument. After retrieval it is possible to read the overall number of rotations of the propeller on the counter through a clear synthetic window.

The meter can be mounted to a wire as well as to a telescopic rod (with an extended length of 2.4 meter).

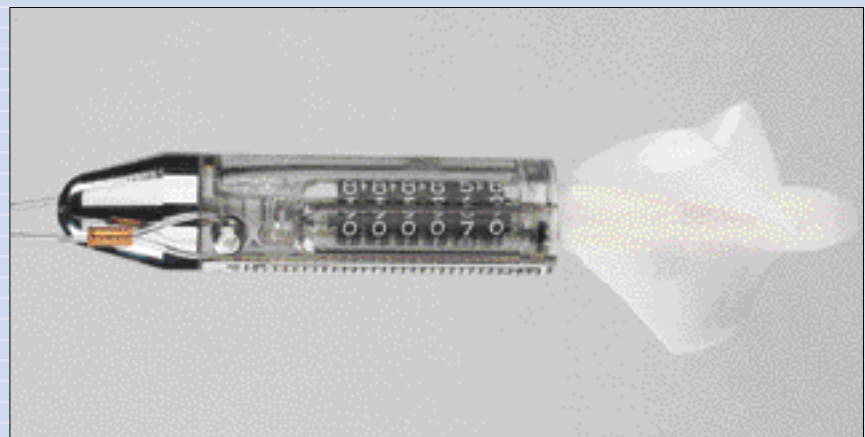
Advantages

- Small and lightweight.
- Corrosion proof.
- Can be applied at great depth.
- Balanced for dynamic stability.

Measuring the current velocity in a sewage outfall.

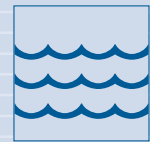


Current meter with synthetic propellor, complete set



Mechanical current meter

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13.17 RBC flumes

RBC flumes are used to measure the quantity of water that, for instance, flows through an irrigation channel. By comparison to 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.

The standard program contains flumes with various measuring ranges, varying from 0.1-8.7 l/sec to 2.0-145 l/sec. On special order larger measuring ranges are possible as well.

In order to obtain correct measurements it is essential that the flume is placed in such a way that the water can flow from the flume without obstruction.

After the flume has been placed in a horizontal position the measuring can begin by reading the

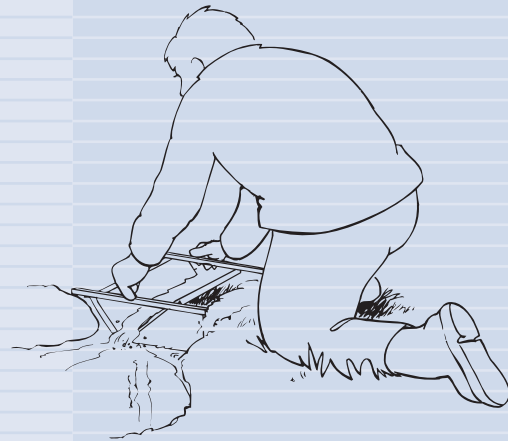
measure of water surge near the threshold. The measure of water surge can be read in the stilling well at the end of the flume. Using standard formulas the flow through quantity (the discharge) is calculated.

Instead of reading the stilling well it is possible to install a pressure transducer connected to a datalogger.

Advantages

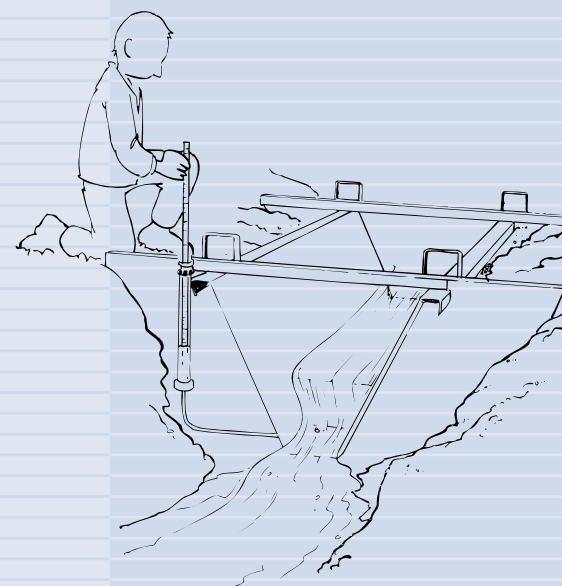
- Due to the small weight and the limited dimensions the flumes can be easily used and transported. This is particularly advantageous in the event of multiple temporary measurements.
- The measuring range of the large flume can be substantial (also in shallow water).
- Easy to install.
- User friendly.
- Measuring results can be read easily.
- Information regarding discharge velocity available fast.

A small flume is placed in an irrigation channel.



Small RBC flume for manual read-out

Measuring the water level in the stilling well manually.



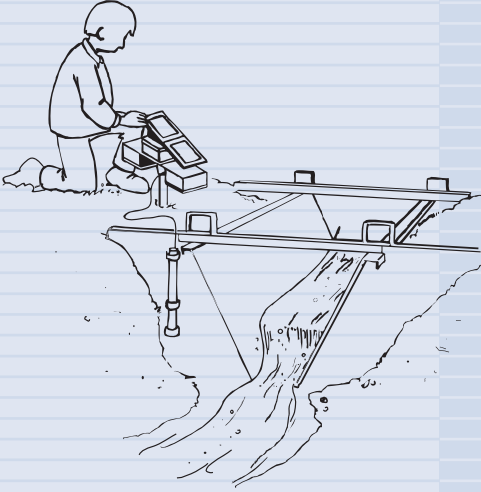


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Measuring the water level in the stilling well of a big flume with an accurate pressure transducer connected to a datalogger.



Automatic measurement

Instead of reading the stilling well it is possible to install a pressure transducer connected to a datalogger. This allows for automatic measuring (or activation), storage and reading.

In case of an automated flume, the sill-referenced water level is recorded using a very accurate pressure sensor connected to a datalogger.

Advantages

Advantages of automatic registration over a manual determination of the flow rate are:

- Maximum and minimum values are recorded in relation to time, from which the response rate of the discharge can be deduced.
- Average discharge rates as well as the cumulative discharge are accurately determined by continuous recording.

- Automatically recording flow rates is less time consuming and is very convenient in remote areas.
- High flow rates during rain periods can selectively be recorded.

The software enables you to configure and to read out the data directly. The data can be used in spread-sheet programs.

The user friendly, PC-software has the following functions:

- Program the datalogger clock.
- Read data stored in the datalogger.
- Set interval time and logging parameters.
- Show current data of the sensor.
- Automatic data storage in 2 different data formats.
- Selection of language.
- Password protected functions

The data can be processed on a PC.



Small RBC flume with pressure transducer, logger and solar panel