

# WATER QUALITY MONITORING



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## Groundwater monitoring

To be able to show how certain activities affect the quality of the (ground) water, it is important to take reliable and frequent measurements.

### 11.11 Diver family

#### Diver

The Diver is the smallest instrument in the world for automatic measurement and registration of groundwater levels and ground water temperatures. This instrument fits in the palm of your hand and is remarkably light. With its length of only 125 mm and a diameter of 22 mm the Diver can be used in virtually any monitoring well.

The Diver is available with various measuring ranges.

#### Sound and reliable

The pressure sensor, temperature sensor, as well as the datalogger and battery are contained within a hermetically sealed stainless steel housing. This

ensures that the Diver is less sensitive to moisture or external electrical influences (Faraday cage). The Diver can be installed in the monitoring well simply suspended from a steel wire. Once installed, no part of the monitoring system is left protruding above ground level, greatly reducing the risk of vandalism. The Diver can now automatically measure the groundwater level and temperature and register these data in the internal memory. The internal memory is capable of storing 2x24.000 measurements. This means that you can execute and store a measurement every ten minutes over a six-month period before the memory is full. The built-in battery has a life of approximately 10 years.

#### Programming

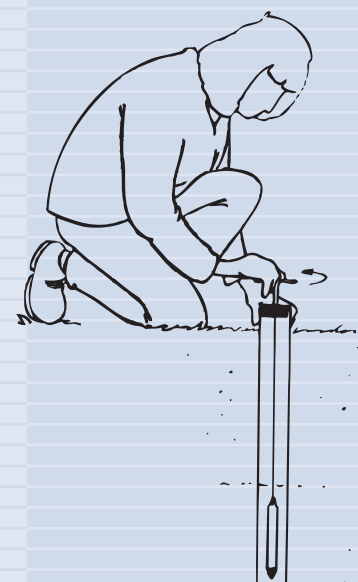
Programming the Diver, either in the field or in the office, is a matter of just a few seconds. Simply enter the location, (future) starting time, sample rate and select either a fixed measuring frequency, a fixed set-up or an event-related frequency.

**Before installation all Divers for a project are programmed at the office with a PC.**



Diver

**After installing the Diver the monitoring well is closed completely (no equipment outside the well).**



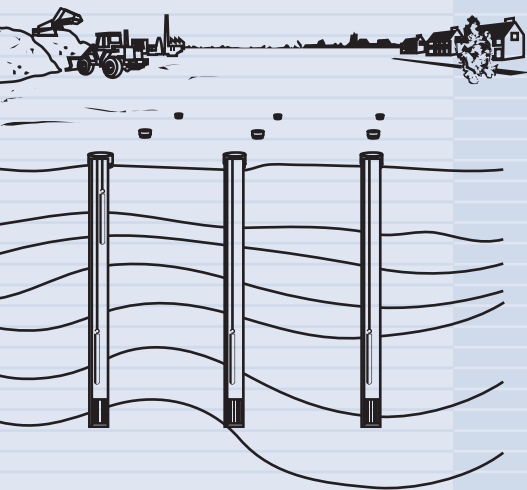


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**The Diver is placed in the optical read-out unit to gather the data with a laptop**



**The CTD-Diver is used to monitor the ground water near a rubbish dump.**



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### CTD-Diver

The CTD-Diver is a compact instrument that allows you to measure the ground water level, ground water temperature and conductivity of the ground water all in one. Where monitoring ground water, especially where it concerns decontamination of polluted soil, the monitoring of rubbish dumps and the detection of salination, once used to be a labour-intensive and troublesome job, the arrival of the CTD-Diver has changed all that.

### Reliable

The CTD-Diver is a reliable compact datalogger which measures all essential parameters as frequently as you yourself decide. These measurement values are then stored. It is even possible to store measurements only when a change occurs in the conductivity (indication of possible contamination). These measurements can likewise be viewed on a computer at any time.

### OTD-Diver

Dissolved oxygen is one of the most important and most frequently measured parameters in water. The measuring technologies to date have been particularly suitable for standalone measurements of the dissolved oxygen concentration in surface water and / or ground water of measuring temperature and water levels over longer periods of time.

### Special coating

The OTD-Diver contains an unique dissolved oxygen sensor. This sensor makes it possible for the OTD-Diver to measure and register the dissolved oxygen of surface water and/or ground water. The optical oxygen sensor has a special coating. The coating is briefly exposed to light and the dissolved oxygen concentration in the water determines the fluorescent response of the coating. By measuring the duration and intensity of the fluorescence (extinguishing time), the OTD-Diver can determine the dissolved oxygen concentration.

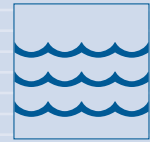


CTD-Diver



OTD-Diver

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Advantages of the optical oxygen sensor are: speedy response time and a high level of accuracy, even when the dissolved oxygen concentrations are low! The optical principle means that no oxygen is used and stirring the liquid is therefore no longer required.

The function of the Baro-Diver is to register barometric pressure. Compensation for these atmospheric pressure variations is subsequently carried out simply and easily with the use of the EnviroMon software program.

In addition to the oxygen sensor, the OTD-Diver also has two other sensors: a pressure sensor to determine the water level and a temperature sensor to measure the water temperature. The temperature sensor is also used to correct the measurement values of the other two sensors to compensate for temperature changes. Data can be read quickly and easily: the Diver is placed in a read-out unit and the data are transferred by means of an infrared system to a computer linked to the read-out unit.

## Baro-Diver

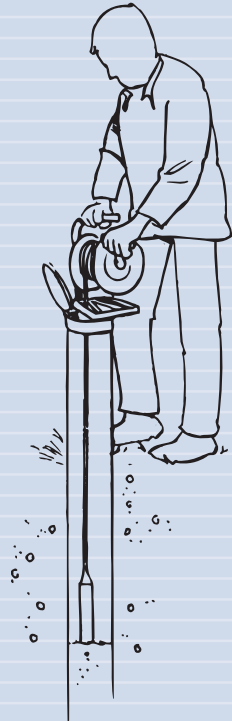
It is to chart the atmospheric pressure variations for each measuring area that the Baro-Diver is used.

## 13.38 Multiparameter probe

The water quality measuring instrument (Multiparameter probe) has been developed specifically for the instant determination of groundwater quality values in situ. Profiles in observation boreholes or monitoring wells are easily obtained as are quality measurements in lakes, rivers and oceans. The portable and compact design is based upon the proven electric contact meter, with its robust supporting frame and tape drum.

The detachable probe is made from high quality stainless steel whilst the standard white printed measuring tape enables precise depth readings to within a centimeter accuracy.

**The multiparameter probe is lowered into a monitoring well**



**The data can be processed on a PC.**



Water quality measuring instrument (Multiparameter probe)

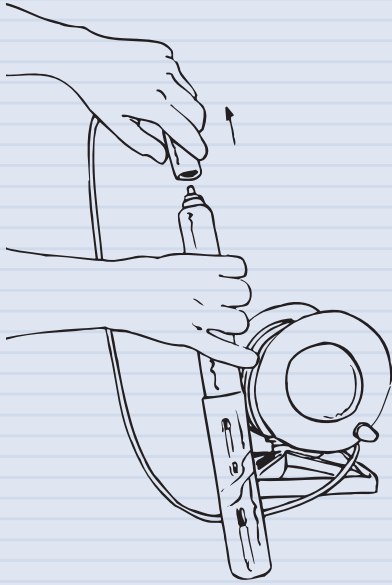


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**The sensor can be detached for cleaning or service.**



The instrument is operated via an integral key pad and liquid crystal display. The unit responds to water contact with a lamp and tone. At the touch of a button the tone is cancelled and the LCD shifts through the measured value of the quality parameters, any single channel parameter can be locked in for examination in greater detail. The whole operation and other facilities such as off sets or instructions are conveyed to the operator by the display. On the standard instrument the probe is detachable from the printed tape, enabling easy service or repair. When the probe is reconnected the micro-processor controlled unit will automatically recognize different sensors and parameters, adjusting for range (conductivity) or zero point automatically.

Special attention has been set to the energy-management - so the system shows a warning in the display, if a certain voltage level has been passed. This signalizes, that the remaining capacity is sufficient for approx. 1 hour more. After approx. 30 minutes without function the instrument switches

off automatically. The water quality measuring instrument is available as a basic and sophisticated module with various cable lengths.

The basic module is supplied with a water level and temperature sensor and a plug-in sensor for 1 extra electrode. The probe has a diameter of 40 mm (standard instrument set 13.38.SA). The sophisticated module is also supplied with a water level and temperature sensor, but it has the possibility of plugging in 7 extra electrodes. Probe diameter is 48 mm (standard instrument set 13.38.SB).

For the water quality instrument the following electrodes are available:

- pH electrode with measuring range pH 0-14.
- dissolved oxygen probe with a measuring range of 0-60 mg/l.
- redox electrode with a measuring range of +/- 2000 mV.
- water level sensors with various measuring ranges.
- turbidity sensor with measuring range 0-50 NTU or 50-1000 NTU.



Multiparameter probe