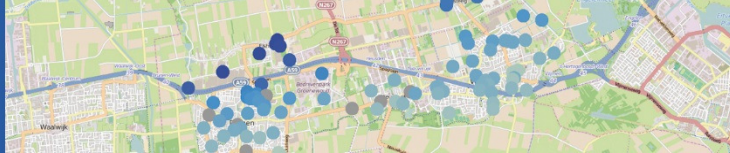GROUNDWATER
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PRODUCT MANUAL

Diver Smart Interface Cable – AS346

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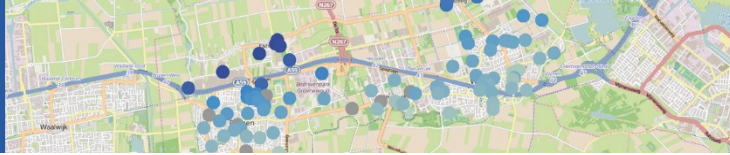
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CE COMPLIANCE STATEMENT (EUROPE)

We hereby declare that the device(s) described below are in conformity with the directives listed. In the event of unauthorized modification of any devices listed below, this declaration becomes invalid.

Type: Diver cable interface
Product Model: Diver Smart Interface Cable (AS346)

Relevant EC Directives and Harmonized Standards:

1999/5/EC R&TTE Directive for Radio and Telecommunications Terminal Equipment in accordance to annex III to which this directive conform to the following standards:

> **Low Voltage Directive per EN60950-1 (2006)+A11 (2011)** for Product Safety testing standard for "Information Technology Equipment"

> **EMC Directive EN 301 489-1 V1.8.1 / EN 301 489-17 V1.3.2** Electromagnetic emission and immunity for "Information Technology Equipment"

2004/108/EC   Electromagnetic Compatibility directive, as amended by EN61326-1:2013

The product(s) to which this declaration relates is in conformity with the essential protection requirements of 2004/108/EC Electromagnetic Compatibility directive. The products are in conformity with the following standards and/or other normative documents:

> **EMC: Harmonized Standards: EN 61326-1:2013 Lab Equipment, EMC**

> IEC61000-6-3:2007 Emission standard for residential, commercial and light-industrial environments
> IEC61000-4-2:2009 Electrostatic discharge immunity test
> IEC61000-4-3:2006 Radiated, radio-frequency, electromagnetic field immunity test
> IEC61000-4-4:2012 Electrical fast transient/burst immunity test
> IEC61000-4-5:2006 Surge immunity test
> IEC61000-4-6: 2014 Immunity to conducted disturbances, induced by radio-frequency fields
> IEC61000-4-11:2004 Voltage dips, short interruptions and voltage variations immunity tests
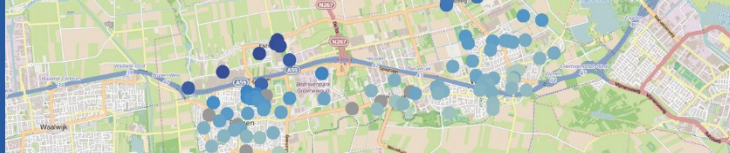
I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The items comply with all applicable Essential Requirements of the Directives.

Contents

1 Introduction

The Diver Smart Interface Cable™, shown in Figure 1, is a communication device to link the Divers deployed on a DXT or DDC cable to a PC, laptop and/or tablet. Simply plug the Smart Interface Cable in an available USB port of the computer and connect the other end to the communication cable, and the deployed Diver can be accessed using the free Diver-Office software. Once connected, the Diver® can be programmed, settings read, or data downloaded.

A Suspension Plate (part no MB43191) to facilitate data downloading is included with every Smart Interface Cable. The DDC-DXT Adapter (part no AS348) is used to read data from Diver deployed on a DDC Cable (part no AS6xxx) and is optional.

Figure 1   The Diver Smart Interface Cable (part no. AS346) including the DDC-DXT Adapter (AS348) and Suspension Plate (MB43191).

The Smart Interface Cable features a barometric pressure sensor that allows for real-time comparison of Diver readings and manual measurements. The Smart Interface Cable also features indicators for sensing if a cable is connected, a Diver is connected to the cable or if the communication cable is malfunctioning.

The Smart Interface Cable can be used for Diver communication cables from 1 meter up to 500 meters in length. The Smart Interface Cable is designed be used in the field and supports all Divers.

Diver-Office 2017.2 or later must be installed to be able to communicate with the Smart Interface cable.

The connectors of the Smart Interface Cable are shown in Figure 2. The USB connector must be plugged in the USB port of a computer. The other end of the cable is an M12 connector that is connected to the top connector of a DXT-Cable or to the DDC-DXT Adapter to connect to a DDC cable.

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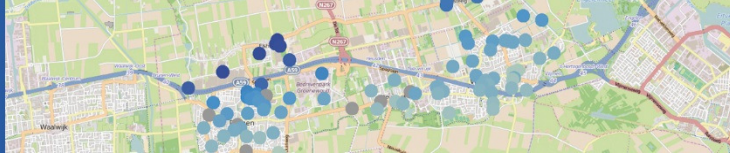
Figure 2   *The connectors of the Smart Interface Cable.*

1.1   Features

The Smart Interface Cable features:

- Real-time atmospheric pressure measurement.
- Informational indicators: ready, sending data, receiving data
- Warning indicators: Diver not connected/communicating, cable malfunctioning.

This manual outlines all the features and operating principles of the Smart Interface Cable. The next chapter gives an overview of the supported equipment, installation procedures and configuration.

1.2   Specifications

The specifications of the Smart Interface Cable are given in appendix A.

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1.3 System Overview

The two configurations for the Smart Interface Cable are shown in in Figure 3. On the left, the Smart Interface Cable is connected to a computer and a DXT-Cable (part no AS2xxx). On the right the Smart Interface Cable is connected to a Diver Data Cable (part no AS6xxx) through the DDC-DXT Adapter (part no AS348).
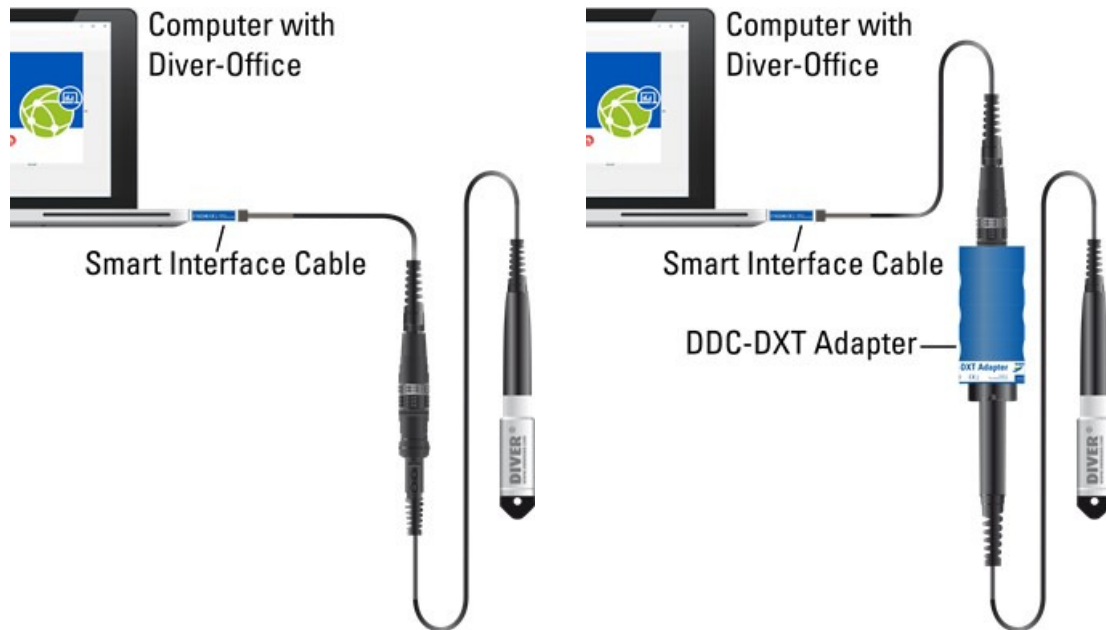
Figure 3   Smart Interface Cable connected to (left) a DXT-cable and (right) a Diver Data Cable through the DDC-DXT Adapter (AS348).

2 Getting Started

2.1 Supported Equipment

The following Divers can be used in combination with the Smart Interface Cable:

- TD and Baro-Diver (model DI8xx),
- Mini and Baro-Diver (model DI5xx),
- Micro-Diver (model DI6xx),
- Cera-Diver (model DI7xx),
- CTD-Diver (model DI27x), and
- MTD-Diver (model DI24x)

The following cables can be used in combination with the Smart Interface Cable:

- DXT-Cable (AS2xxx)
- DDC cable (AS6xxx); DDC-DXT Adapter required

See appendix B for more details of these products.

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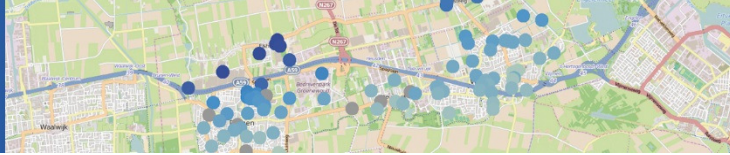
2.2 Software

Install Diver-Office 2017.2 or higher before connecting the Smart Interface Cable to a computer. This ensures that the proper drivers are installed.

2.3 Connecting the Smart Interface Cable

Plug the USB connector of the Smart Interface Cable in the USB port of the computer. When reading data from a Diver deployed on a DXT-Cable, clip the Suspension Plate (part no MB43191) on the M12 connector of the Smart Interface Cable, then connect it to the DXT-Cable. This ensures that the Diver returns to the same position in the well while connected to the Smart Interface Cable.

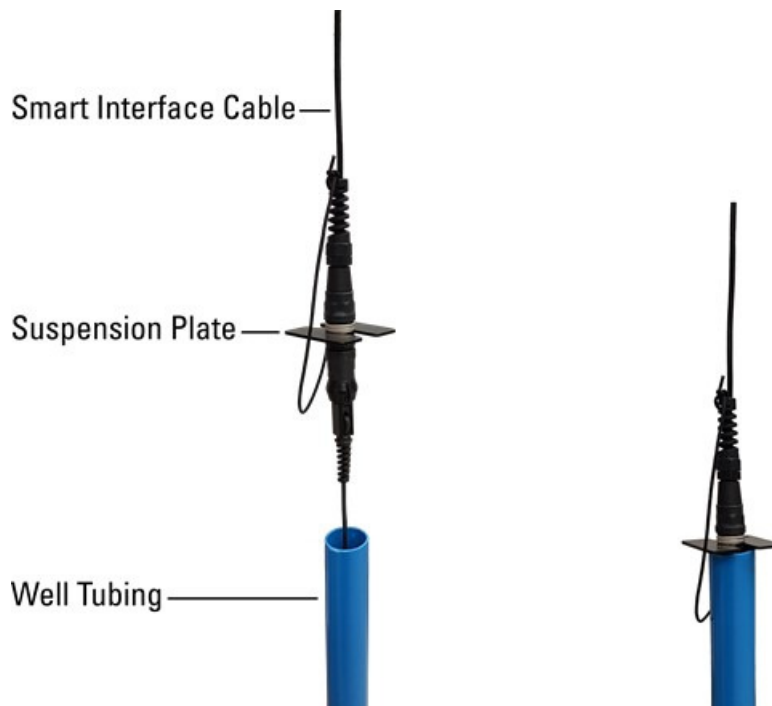*Figure 4   The Smart Interface Cable, with the Suspension Plate snapped on, connected to a DXT-Cable (left) before deployment and (right) in position to read real-time Diver data.*

2.4 LED Indicators

There are three LED indicators located on the Smart Interface Cable as shown in Figure 5. These indicators monitor the communication with the Diver and provide information for troubleshooting.
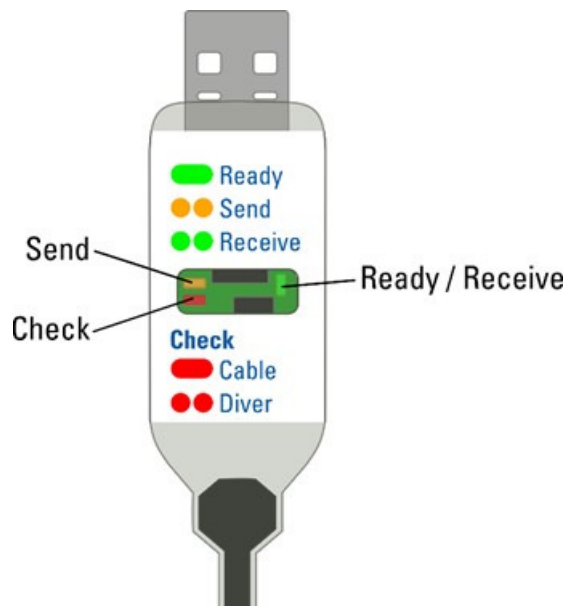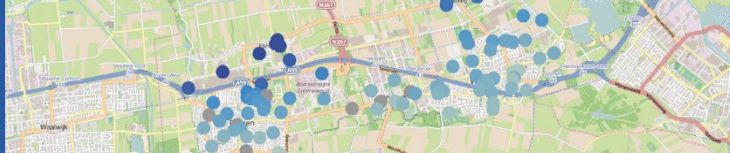
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Figure 5   Position of LED indicators of the Smart Interface Cable.

The three LED indicators are:

- Green: OK / receiving data from Diver,
- Yellow: sending data to Diver and
- Red: check indicator.

When the Smart Interface Cable is connected to a DXT or Diver Data Cable with a Diver connected the green OK indicator will turn on.

As soon as communication is initiated, for example reading settings or data from the Diver, the yellow LED will start blinking, indicating that data is send to the Diver. In return, the Diver will respond by sending data back to the Smart Interface Cable and the green LED starts blinking. When the communication is finished the green LED will remain off for approximately 5 seconds, before being turned on again.

The red LED indicates when an issue arises. There are two modes:

- The red LED is continuously on:
  - o   No communication cable is connected.
  - o   There is an issue with the communication cable, for example the communication cable is broken.
- The red LED is blinking: The Diver could not be detected.

2.5   Reading Atmospheric Pressure

The Smart Interface Cable includes a pressure sensor for measuring the atmospheric pressure. Its value can be read using Diver-Office 2017.2 or higher. Connect the Smart Interface Cable to the computer and a communication cable with a Diver. In the main window of Diver-Office click on the **Diver** button and the settings from the Diver will be read. In the **Actual Data** section, the atmospheric pressure will be listed as shown in Figure 6.
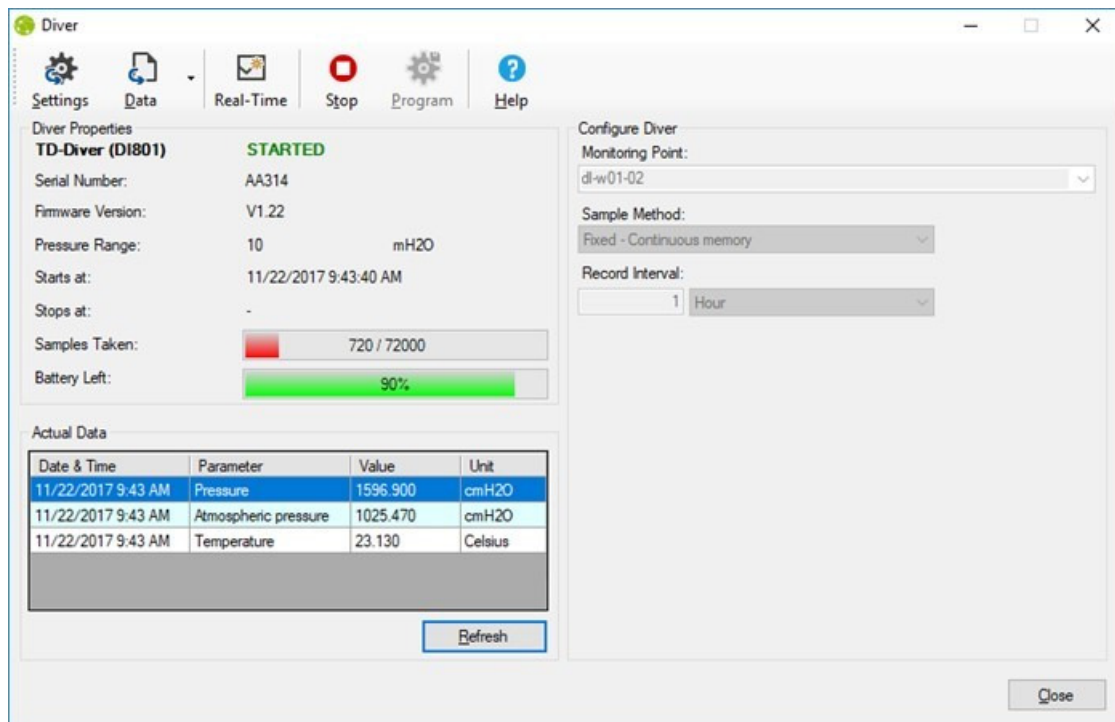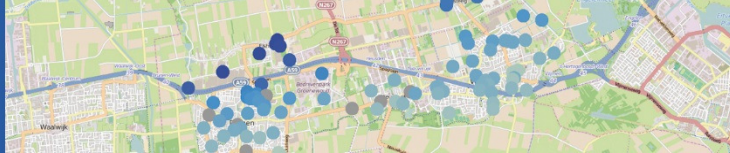
Figure 6   Diver window with the atmospheric pressure reading from the Smart Interface Cable.

Click the **Real-Time** button in the Diver window and the window as shown in Figure 7 will appear. The **Barometric Pressure** value is automatically populated. The (**Calculated**) **Cable Length** value is automatically retrieved from the database if present or can be entered manually. Enter a **Manual Measurement** to calculate the **Difference between Diver and Manual Measurement** or if the cable length is unknown click the **Recalculate** button to determine the **Calculated Cable Length**.

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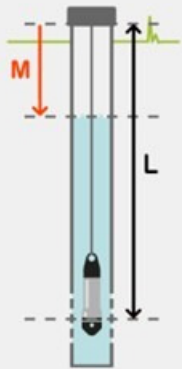*Figure 7   Real-Time Data window with the atmospheric pressure reading from the Smart Interface Cable.*

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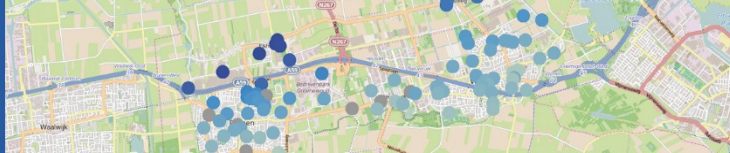
3 Appendix A – Specifications

3.1.1 General

Power supply   USB
Length USB cable   ~1.80 m
Temperature range   -20 °C to 60 °C

3.1.2 Connections

Computer   USB

DXT-Cable (AS2xxx)   M12 connector

DDC Cable (AS6xxx)   through DDC-DXT Adapter AS348

Supported DXT/DDC cable length   1 to 500 m

Compatible Diver models   TD-Diver (DI8xx), Micro-Diver (DI6xx), Cera-Diver
                                      (DI7xx), CTD-Diver (DI27x), MTD-Diver (DI24x), Mini-
                                      Diver (DI5xx)

3.1.3 Software

Diver-Office 2017.2 or later must be installed to be able to communicate with the Smart Interface
cable.

3.1.4 Barometric Pressure Sensor

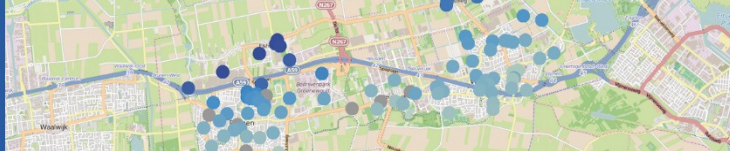Range   400 to 1100 cmH_2O

Accuracy[+]   ±2.0 cmH_2O

Resolution   0.06 cmH_2O

[+] over temperature range -20 to 60 °C

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4 Appendix B – Diver Equipment

4.1 Diver-Office software

Program Diver dataloggers and download measurements onto your PC. Export the data to a spreadsheet or modeling program. Diver-Office is a flexible "project-based" measurement software package designed for exchanging Diver data. Diver-Office is easy-to-use and has an intuitive user interface.

- Barometric compensation
- Units: Metric and U.S.
- 7 languages: Dutch, English, French, German, Polish, Portuguese and Spanish

Free download from www.vanessen.com

4.2 USB Reading Unit

The Diver USB Reader can be used for programming or reading the Diver. Connect the USB Reader to the USB port of your PC or Laptop. Simply insert the Diver into the base of the USB Reading Unit and you are ready to communicate with your Diver.

The USB Reading Unit can be used in the field or the office.

Part no: AS330

## 4.3 Communication Cable

Deploying a Diver on a Diver communication cable saves time on downloading and provides real time data from a Diver. Connect your laptop equipped with Diver-Office to the communication cable using the Smart Interface Cable to program and read data from the Diver.

Available in lengths from 1 meter to 500 meter.

Part no: AS2xxx
xxx = length in meter, e.g 10 meter cable is AS2010
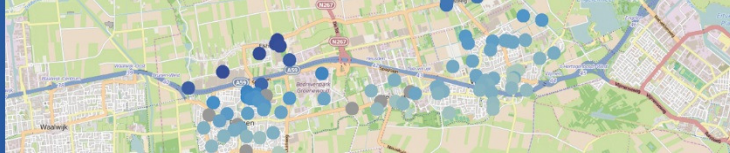
4.4   TD-Diver

This Diver is manufactured using a stainless steel (316 L) casing with a 22 mm diameter. The TD-Diver can store a maximum of 72,000 measurements (date/time, pressure and temperature) in its working memory and 72,000 measurements in its backup memory.

The TD-Diver samples pressure and temperature at fixed length intervals and stores these values in fixed length or continuous memory.

The TD-Diver is available in the following pressure ranges: 10 m, 20 m, 50 m and 100 m.

Part no: DI8xx

4.5   Baro-Diver

The Baro-Diver is manufactured using a stainless steel (316 L) casing with a 22 mm diameter. The Baro-Diver can store a maximum of 72,000 measurements (date/time, pressure and temperature) in its working memory and 72,000 measurements in its backup memory.
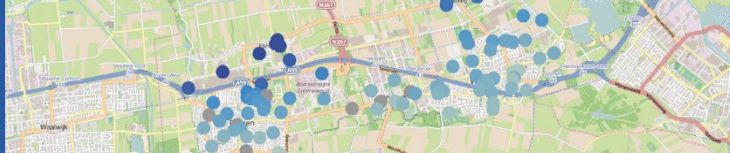
The Baro-Diver measures atmospheric pressure and is used to compensate for the variations in atmospheric pressure measured by the other Divers. The Baro-Diver can also be used for measuring shallow water levels up to 1 meter.

The Baro-Diver samples pressure and temperature at fixed length intervals and stores these values in fixed length or continuous memory.

Part no: DI800

4.6   Cera-Diver

The ceramic-shelled Cera-Diver is specifically designed for monitoring water levels under potentially corrosive conditions, such as brackish water and seawater.

The Cera-Diver has a 22 mm diameter ceramic (zirconium-oxide) casing and can store 48,000 measurements (date/time, pressure and temperature).

The Cera-Diver has the following sample methods: fixed length intervals, event dependent, averaging and pumping test.

The Cera-Diver is available in the following pressure ranges: 10 m, 20 m, 50 m and 100 m.

Part no: DI7xx

4.7   Micro-Diver

The Micro-Diver is the smallest Diver measuring only 18 mm in diameter. It is specifically designed for monitoring wells or drive-points too small to accommodate larger dataloggers. This Diver is suitable for pipes with a diameter of at least 20 mm.
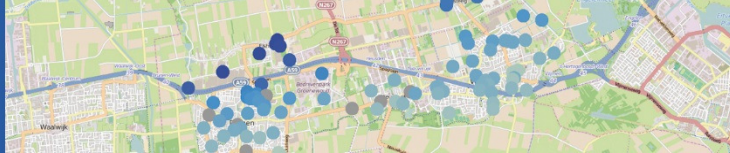
The Micro-Diver has a stainless steel (316 L) casing and can store 48,000 measurements (date/time, pressure and temperature).

The Micro-Diver has the following sample methods: fixed length intervals, event dependent, averaging and pumping test.

The Micro-Diver is available in the following pressure ranges: 10 m, 20 m, 50 m and 100 m.

Part no: DI6xx

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4.8 CTD-Diver

Where there is a need to monitor groundwater levels and salt water intrusion, injected waste water, or contamination from chemical discharges and landfill sites, the CTD-Diver with its 22 mm diameter rugged, corrosion proof ceramic (zirconium-oxide) housing, is the instrument of choice.

The CTD-Diver is equipped with a four-electrode conductivity sensor that measures electrical conductivity from 0 to 120 mS/cm. There are two options for measuring conductivity: true or specific conductivity at 25 °C.

The CTD-Diver can store 48,000 measurements (date/time, pressure, temperature and conductivity).

The CTD-Diver has the following sample methods: fixed, event dependent, averaging and pumping test.

The CTD-Diver is available in the following pressure ranges: 10 m, 50 m and 100 m.

Part no: DI27x

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