



## DATA LOGGER WITH MEASUREMENT OF CONDUCTIVITY

MAINTENANCE-FREE / AUTONOMOUS / DIAMETER 22 MM

## DCX-22 AA CTD DCX-22 (SG/VG) CTD

The CTD versions of the DCX-22 range are autonomous battery-operated data collectors made of stainless steel. Requiring little maintenance, they record the water level (pressure), temperature and conductivity over long periods. CTD stands for Conductivity, Temperature and Depth.

This data sheet specifies the additional conductivity measurement function which distinguishes the CTD version from the standard DCX-22. The pressure and temperature specifications are set out in detail in the data sheets for the DCX-22 AA and DCX-22 (SG/VG).

Conductivity is increasingly being monitored in conjunction with depth measurements, in which changes in water quality and depth are required to be detected simultaneously. Thus it is possible to detect contamination caused by salt water infiltration, waterborne particles or general pollutants when measuring groundwater levels.

KELLER's Logger 5 programming and readout software is used to select a conductivity range (0...0.2 mS/cm, 0...2 mS/cm, 0...20 mS/cm or 0...200 mS/cm) and set the temperature coefficient for the medium. This process produces compensated conductivity measured values standardised at 25 °C.

### DCX-22 AA CTD

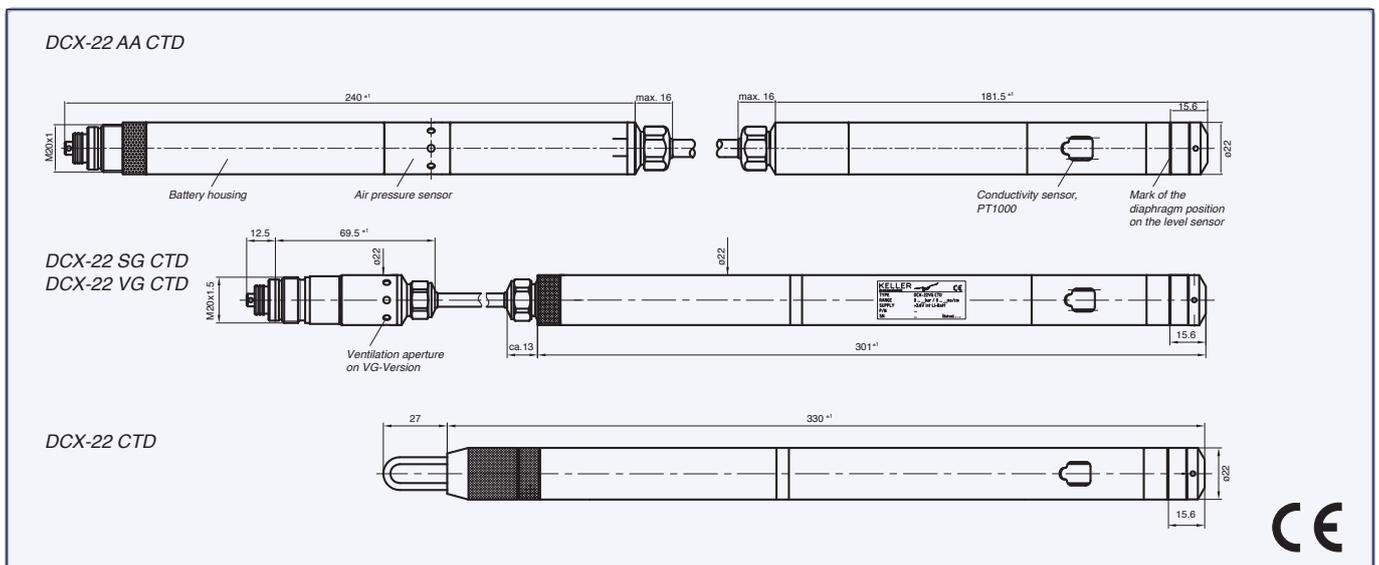
The DCX-22 AA CTD data collector records groundwater levels using the AA (absolute-absolute) measurement method, whereby fluctuations in atmospheric pressure are measured and compensated for by the watertight atmospheric pressure sensor with its stainless steel diaphragm. The advantage of this measurement method is that no humidity-sensitive capillary tube is required. As well, it is not required that the DCX-22 AA CTD be removed from the immersion tube in order to extract the data.

### DCX-22 CTD

In the DCX-22 CTD, the sensor, electronics and battery are contained within the same housing. The data collector needs to be withdrawn from the immersion tube in order to extract the data. The DCX-22 CTD uses an absolute pressure sensor. In shallow water, where the impact of atmospheric pressure fluctuations also needs to be taken into account, a second DCX, acting as a barometer, is placed at the surface to record changes in atmospheric pressure. The pressure difference or, as appropriate, the water level is then calculated in the computer by subtracting both measured values.

### DCX-22 (SG/VG) CTD

The DCX-22 SG/VG CTD versions have a cable outlet, negating the need to withdraw the instrument from the immersion tube in order to read out the data. A locking disc is used to secure the interface connector at the surface. In the VG version (reference pressure measurement), the reference equalisation capillary tube in the cable is inserted into the upper housing (read-out connector), where the reference opening protected by a Gore-Tex® diaphragm is located.



**SPECIFICATIONS**

|                                                           |                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Logger                                               | 114'000 measured values based on a storage interval $\leq 15$ s, otherwise 56'000 (with time always specified), selected from immersion probe pressure, barometric pressure, associated temperatures, difference between the two pressures, conductivity, temperature-compensated conductivity (@25 °C), temperature of the conductivity sensor |
| Power Supply                                              | Lithium battery 3,6 V (type AA)                                                                                                                                                                                                                                                                                                                 |
| Battery Life                                              | 8 years based on 1 measurement per hour (external influences may reduce service life)                                                                                                                                                                                                                                                           |
| Shortest Measurement Rate                                 | 1x per second                                                                                                                                                                                                                                                                                                                                   |
| Output                                                    | RS 485 digital                                                                                                                                                                                                                                                                                                                                  |
| Electrical Connector                                      | Fischer DEE 103A054                                                                                                                                                                                                                                                                                                                             |
| Housing Material                                          | Stainless steel 316L (DIN 1.4435), O-ring: Viton®                                                                                                                                                                                                                                                                                               |
| Cable Material                                            | Polyethylene (PE)                                                                                                                                                                                                                                                                                                                               |
| Conductivity Sensor Material                              | Housing: polyether ether ketone (PEEK), measurement electrodes: titanium                                                                                                                                                                                                                                                                        |
| Standard System Lengths                                   | As per the data sheet for the DCX-22 AA, DCX-22 SG and DCX-22 VG                                                                                                                                                                                                                                                                                |
| Measurement/Pressure Ranges                               | As per the data sheet for the DCX-22 AA and DCX-22 (SG/VG)                                                                                                                                                                                                                                                                                      |
| Operating Temperature Range                               | -5...55 °C (Conductivity sensor, icing not permitted)<br>-20...80 °C (Barometer)                                                                                                                                                                                                                                                                |
| <b>Pressure Sensors</b>                                   |                                                                                                                                                                                                                                                                                                                                                 |
| Accuracy <sup>1)</sup>                                    | $\pm 0,02$ %FS max.                                                                                                                                                                                                                                                                                                                             |
| Resolution                                                | $\leq 0,0025$ %FS                                                                                                                                                                                                                                                                                                                               |
| Compensated Temperature Range                             | -10...+40 °C                                                                                                                                                                                                                                                                                                                                    |
| Total Error Band (-10...+40°C) <sup>2)</sup>              | $\pm 0,05$ %FS typically / $\pm 0,1$ %FS max. (optional $\pm 0,05\%$ FS max.)                                                                                                                                                                                                                                                                   |
| Longterm Stability                                        | $\pm 1$ mbar max.                                                                                                                                                                                                                                                                                                                               |
| <b>Conductivity sensor</b>                                |                                                                                                                                                                                                                                                                                                                                                 |
| Measurement Ranges                                        | 0...200 mS/cm <sup>3)</sup>                                                                                                                                                                                                                                                                                                                     |
| Measurement Range Selection                               | Choice of 4 ranges: 0...0.2 mS/cm, 0...2 mS/cm, 0...20 mS/cm or 0...200 mS/cm*                                                                                                                                                                                                                                                                  |
| Resolution                                                | $\leq 0,01\%$ max. of the selected range                                                                                                                                                                                                                                                                                                        |
| Accuracy                                                  | $\pm 2,5\%$ max. of the selected range                                                                                                                                                                                                                                                                                                          |
| Measurement Method                                        | 6-electrode conductivity measurement cell                                                                                                                                                                                                                                                                                                       |
| Method of Temperature Compensation                        | Linear of 0 to 8 %/K standardised to 25 °C (according to DIN/EN27888)*                                                                                                                                                                                                                                                                          |
| <b>Temperature sensors</b>                                |                                                                                                                                                                                                                                                                                                                                                 |
| PT 1000 (in the conductivity sensor)                      | Measurement range 0...50 °C, accuracy 0,1 °C, resolution 0,01 °C                                                                                                                                                                                                                                                                                |
| TOB Temperature <sup>4)</sup> (immersion probe/barometer) | Measurement range -10...+40 °C, typical accuracy $\pm 0,5$ °C                                                                                                                                                                                                                                                                                   |

<sup>1)</sup> Linearity (BFSL), hysteresis and repeatability

<sup>2)</sup> Accuracy and temperature errors

<sup>3)</sup> mS/cm = milliSiemens per centimeter

<sup>4)</sup> Temperature information for the measuring bridge of the pressure sensor (TOB: top of bridge)

\* Standard settings, 0...200 mS/cm linear compensation with 2,25 %/K, other presets on request. Can subsequently be reconfigured by the customer via software.

**Logger 5**

The Logger 5 software can be used to configure and read out data from KELLER autonomous data loggers. The software helps the user take measurements in the field, prepare the data and forward it on to partners or end customers. Measurement data can be displayed graphically, exported, adjusted to compensate for atmospheric pressure or converted into other units. The online function shows the current values for the device.

The software comes with the interface converter or can alternatively be downloaded for free from [www.keller-druck.com](http://www.keller-druck.com).

It requires a Windows operating system (WinXP or higher).

**Accessories**

Interface converter to connect the data logger with a computer, mounting adapter, spare batteries and other accessories can be found in the correspondent operating manual.

