

## QL40.FTC Fluid Temperature and Conductivity probe

The QL40-FTC sub provides borehole temperature and fluid conductivity measurements. In comparison with tools from competitors, the QL40-FTC is capable of recording a wide range of conductivity from fresh to highly saturated water.

The borehole fluid temperature measurement is helpful to detect anomalies caused by events such as fluid flow into the borehole. It is also used to normalize the conductivity measurement which is temperature dependent and so allowing comparisons between boreholes.

The borehole fluid conductivity is directly proportional to the concentration of dissolved minerals. It is generally used in hydrogeology to determine the concentration of dissolved ions in the aquifers and to locate the fluid flows occurring in the borehole.

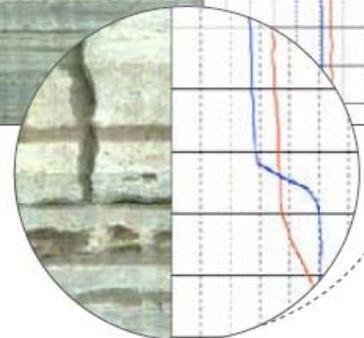
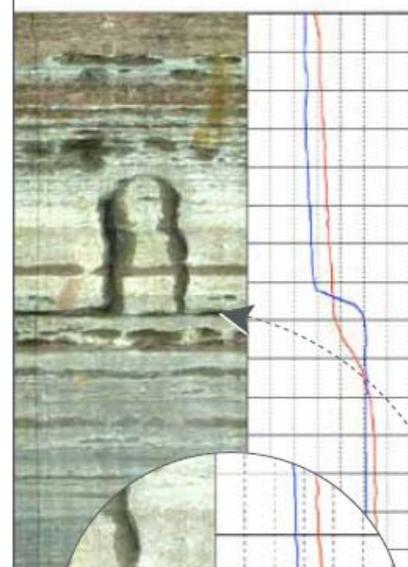
The QL40-FTC is supplied as a bottom sub. It can be combined with other logging tools of the QL (Quick Link) product line or can be operated as a standalone tool. It is compatible with Matrix acquisition system.

### Application

- Fluid conductivity – salinity
- Salt-water intrusion studies
- Identification of fluid flow in open/cased hole Localization of the water table
- Localization of water intervals of different quality
- Water-well monitoring
- Geothermal gradient logging
- Often used in the implementation of temperature compensation equations for other logs



CSI Image					Temp (QL40-FTC)		
0'	90'	180'	270'	0'	12	°C	
						ConductC (QL40-FTC)	
						1000	uS/cm



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## Principle of measurement

**Borehole temperature** is measured with a sensor based on a fast response semiconductor device whose output voltage changes linearly with temperature. The temperature sensor is located in a stinger at the top of the sensor body in the center of the three exit ports where the borehole fluid returns to the well bore.

**Borehole fluid conductivity** is measured using a seven electrode mirrored Wenner array. The conductivity array is an internal cylindrical array open at the bottom of the probe. Borehole fluid passes by the array as the probe is lowered in the hole. The array is completely shielded from the outside borehole, so that only fluid conductivity is measured.

## Measurement/Features

- Fluid temperature in °C.
- Fluid conductivity in  $\mu\text{S}/\text{cm}$  or  $\text{mS}/\text{cm}$
- Compensated conductivity at 25°C in  $\mu\text{S}/\text{cm}$  or  $\text{mS}/\text{cm}$

## Operating conditions

- Open or cased hole
- Temperature measurement: dry or water filled borehole
- Conductivity measurement: water filled borehole
- Always run downwards as the first log in order to minimize the fluid disturbance
- Compatible with Matrix system
- Can be combined with other QL subs

## Technical Specifications

### Tool

- Diameter: max 42.3mm. (1.67")
- Length : 0.78m (30.7")
- Weight : 3.35 kg (7.2 lbs)
- Operating Temperature: 0 - 70°C. (32- 158 °F)
- Maximum Pressure: 200bar (2900psi)

### Measurement point

- Temperature : 0.09m up from bottom
- Conductivity : 0.06m up from bottom

### Power

- DC voltage at probe top :  
Min 80 VDC  
Max 160 VDC  
Nominal 120 VDC
- Current : Nominal 25mA

### Temperature measurement

- Range : -20 to 80°C
- Accuracy : < 1%
- Resolution : 0.004°C

### Conductivity measurement

- Range:  $5\mu\text{S}/\text{cm}$  to  $2.5 \times 10^5 \mu\text{S}/\text{cm}$ .
- Accuracy : 1% ( $500 - 2.5 \times 10^5 \mu\text{S}/\text{cm}$ )



Specifications subject to change without notice