

QL40

Stackable Logging Tools

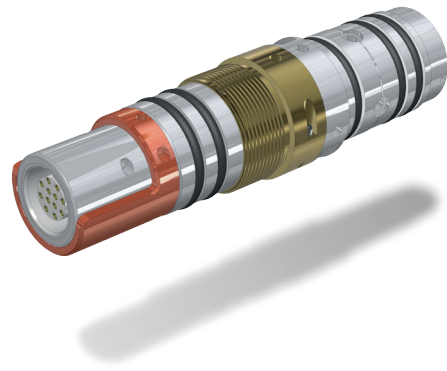


QL Stackable Logging Tools

The Quick Link (QL) series of slim-hole logging tools can be combined in custom configurations to acquire more data in a single logging pass.

Each QL tool can be used as a stand-alone probe or combined into a “string” or “stack” to yield multiple measurement parameters simultaneously.

This innovative flexibility saves time in field acquisition and allows for purchases to suit budgets and projects, as needed.



Examples of QL Logging Tool Applications in Mining, Water, Engineering and Energy

Lithology identification ▶ QL40 GR | QL40 OBI | QL40 DEN | QL40 NEU | QL40 FWS | QL40 ELOG | QL40 DLL3 | QL40 IND

Mineral detection and indication of mineralization ▶ QL40 GR | QL40 SGR | QL40 IP | QL40 MGS | QL40 IND | QL40 DEN

Stratigraphy and bed thickness ▶ QL40 GR | QL40 OBI | QL40 DEN | QL40 NEU | QL40 FWS | QL40 ELOG

Permeable zones and Porosity ▶ QL40 DEN | QL40 FWS | QL40 ELOG | QL40 DLL3 | QL40 NEU

Location of aquifers / aquitards ▶ QL40 DEN | QL40 FTC | QL40 OCEAN | QL40 SFM | QL40 IND

Density ▶ QL40 DEN

Water quality and contamination ▶ QL40 FTC | QL40 OCEAN

Fluid flow measurements ▶ QL40 SFM

Detection of weathered, fractured and permeable zones ▶ QL40 DEN | QL40 IND | QL40 FWS | QL40 ABI | QL40 OBI

Fracture identification and orientation ▶ QL40 ABI | QL40 OBI

Core orientation ▶ QL40 ABI | QL40 OBI

Local Stress (borehole breakout orientation) ▶ QL40 ABI | QL40 OBI | QL40 CAL

Rock Strength and elastic parameters ▶ QL40 DEN | QL40 FWS | QL40 ABI

Coal quality ▶ QL40 DEN | QL40 DLL3 | QL40 GR | QL40 ELOG

Cased hole integrity / cementation ▶ QL40 GR-CCL | QL40 ABI | QL40 FWS

Borehole shape, volume, integrity and orientation ▶ QL40 ABI | QL40 OBI | QL40 CAL | QL40 DEV



IMAGING TOOLS

QL40ABI Acoustic Televiewer

Sensor

Ultrasonic Transducer

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Borehole diameter

0.05 – 0.50 m (2" – 20")
depending on borehole conditions

Diameter - Length

40 mm (1.6") - 1.6 m (63")

Weight

6.7 kg (14 lbs)

Measurements/Features

- 360° orientated acoustic image (amplitude & travel time)
- Borehole azimuth and tilt
- Tool internal temperature
- Relative bearing
- Magnetic field
- Gravity

QL40OBI Optical Televiewer

Sensor

1/3" high sensitivity CMOS digital image sensor

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Borehole diameter

0.05-0.53 m (2"-21") depending on borehole conditions

Diameter - Length

40 mm (1.6") - 1.47 m (57,9")

Weight

5,3 kg (11,7 lbs)

Measurements/Features

- 360° RGB true color oriented image
- Borehole azimuth and tilt
- Relative bearing
- 3 accelerometer calibrated components
- 3 magnetometer calibrated components
- Temperature of CMOS image sensor

SONIC TOOL

QL40FWS Full Waveform Sonic

Sensor

Ceramic piezoelectric

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

50 mm (2")
{ 2.27m (89.4")
{ 1Tx-4Rx configuration

Weight

18 kg (39.7 lbs)

Measurements/Features

- Full waveform per receiver
- Real time p-wave velocity or slowness
- Real time CBL processing
- Additional post processing module available in WellCAD

● Bottom ● In line

MECHANICAL TOOL

QL40CAL 3 Arm Caliper

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

40 mm (1.6") - 1.87 m (73")

Weight

8.7 kg

Measurements/Features

- Calibrated measurement of borehole diameter in inches, centimeters or millimeters
- Easy exchangeable short and long caliper arms and wear tips

MAGNETIC TOOL

QL40MGS Magnetic Susceptibility

Sensor

Bartington : 1.36 kHz Focused Dual Coil system

W-R : Two coil system with inter coil spacing of 25 cm operating at ~ 2Khz

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

Bartington : 43 mm (1.7") - 1.4 m (56")
W-R : 45mm (1.6") - 1.1m (43")

Weight

Bartington : 6.1 kg (13 lbs)
W-R : 7 kg (15,4 lbs)

Measurements/Features

- Magnetic susceptibility in CGS unit

DEVIATION TOOL

QL40DEV Borehole Deviation

Sensor

APS544-3 axis magnetometer and accelerometer

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

40 mm (1.6") - 0.7 m (28")

Weight

5.3 kg (12 lbs)

Measurements/Features

- Angular values of azimuth, tilt and relative bearing
- Calibrated values of each accelerometer and magnetometer components

FLUID PROPERTIES TOOLS



QL40SFM

Bi-directional spinner Flowmeter

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

40 mm (1.6") excluding cage
0,9 m (35,4")

Weight

3.2 kg (7 lbs)

Measurements/Features

- 60mm diameter pitch impeller/75 mm diameter cage
- 75mm diameter pitch impeller/100mm diameter cage
- Spinner speed in cps up and down



QL40FTC & FTC-b

Fluid Temperature and Conductivity

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

40mm (1.6") – 0.8m (31.5")
bottom sub
50mm (2") – 1.01m (39.8")
in line sub

Weight

3.3kg (14lbs) – 6.6kg (28lbs)

Measurements/Features

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



QL40OCEAN 303

Water Quality Probe

Sensor

Idronaut ocean seven 303,
Pressure, Temp, Fluid Conductivity,
Oxygen, PH, Redox

Temperature - Pressure

0-70°C (32-158°F)
150 bar (2175 psi)

Diameter - Length

44 mm (1.7") - 1.4 m (55")

Weight

4.9 kg (10.8 lbs)

Measurements/Features

- Pressure : in dbar
- Temperature : in °C
- Conductivity
 - Salt water : in mS/cm
 - Fresh water : in $\mu\text{S/cm}$
- Oxygen : in ppm.
- pH
- Redox : in mV

● Bottom ● In line

ELECTRICAL TOOLS



QL40ELOG

Normal Resistivity (8", 16", 32", 64", SP & SPR)

Temperature - Pressure

0 -70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

43 mm (1.7")
1.9 m (75")

Weight

9 kg (19.8 lbs)

Measurements/Features

- 8", 16", 32" and 64"
- Normal Resistivity in [Ohm-m]
- SP in [mV]
- SPR in [Ohm]
- Current (mA)

Bridles

QL40 IS 1
QL40 IS 2
QL40 IS 4



QL40IP

Induced Polarization and Normal Resistivity (8", 16", 32", 64", SP & SPR)

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

43 mm (1.7")
1.9 m (35")

Weight

9 kg (19.8 lbs)

Measurements/Features

- Chargeability Ma in [ms] on 16" and 64" electrodes
- 2 spacing full wave data
- 8", 16", 32" and 64" Normal Resistivity in [Ohm-m]
- SP in [mV]
- SPR in [Ohm]

Bridles

QL40 IS 1
QL40 IS 2
QL40 IS 4



QL40DLL3

Dual Laterolog

Temperature - Pressure

0-70°C (32-158°F)
200 bar (2900 psi)

Diameter - Length

43 mm (1.7")
2.83 m (111.4")

Weight

15 kg (33 lbs)


Measurements/Features

- Time Multiplex dual spacing focused resistivity LL3-S & LL3-D in [Ohm.m]
- Potential value on measuring and guard electrodes in [V]
- Current value on measuring and guard electrodes in [mA]

Bridles

QL40 IS 1
QL40 IS 2
QL40 IS 4

NUCLEAR TOOLS



QL40GR
**Total Count
 Natural Gamma**


Sensor
 NaI (TI) crystal (1 x 3")

Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)

Diameter - Length
 40 mm (1.6") - 0.9 m (35")

Weight
 4.3 kg (9.5 lbs)

Measurements/Features
 · Total gamma counts in CPS
 and/or API unit



QL40GR-CCL
**Natural Gamma &
 Casing Collar Locator**


Sensor
 GR: NaI (TI) crystal (1 x 3")
 CCL: 32 x 280 mm coils &
 magnets assembly

Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)

Diameter - Length
 40 mm (1.6") - 1.16 m (46")

Weight
 5.9 kg (13 lbs)

Measurements/Features
 · Total gamma counts in CPS
 and/or API unit
 · CCL in mV



QL40SGR
**Natural
 Spectral Gamma**

Sensor
 NaI (TI) crystal (1 x 4")
 BGO crystal (1 x 4")

Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)


Diameter - Length
 40 mm (1.6") - 0.93 m (36")

Weight
 4.4 kg (9.6 lbs)

Measurements/Features
 · 256 channels spectrum
 · spectrum stabilized (software)
 · Nuclides concentrations
 · Window gamma counts
 · Total gamma counts in CPS
 and/or API unit

● Bottom ● In line

ELECTRICAL TOOL



QL40IND
Dual Induction Probe

Sensor
 Dual coil system with intercoil
 spacing : 50 & 80 cm
 Operating Frequency : 100 kHz


Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)

Diameter - Length
 45 mm (1.77")
 1.925 m (75.78")

Weight
 7 kg (15.4 lbs)

Measurements/Features
 · Medium Induction : mS/m
 · Deep Induction : mS/m

NUCLEAR TOOLS



QL40DEN
**Formation Density
 Sonde**


Sensor
 CSI (TI) crystals
 SSD (20cm) and
 LSD (35cm)

Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)

Diameter - Length
 50 mm (2") - 1.9 m (75")

Weight
 20 kg (44 lbs)

Measurements/Features
 · SSD : in CPS
 · LSD : in CPS
 · SSD density : in g/cc
 · LSD density : in g/cc
 · Compensated density : in g/cc
 · Caliper : in mm or inch
 · PE option



QL40NEU
**Neutron - Thermal
 Neutron**

Sensor
 Single He-3 thermal neutron
 detector

Temperature - Pressure
 0-70°C (32-158°F)
 200 bar (2900 psi)

Diameter - Length
 40 mm (1.6") - 1,34 m (46")

Weight
 5.5 kg (12 lbs)

Range
 0 - 100.000 CPS

Measurements/Features
 · Qualitative measurement of
 formation porosity in open and
 cased holes.
 Measures hydrogen content of
 formation.



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