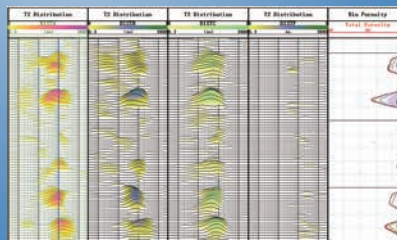
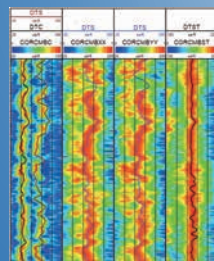
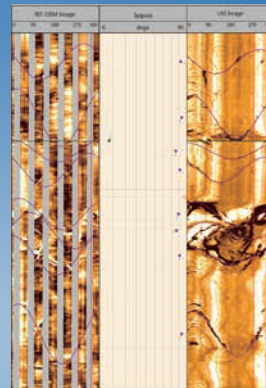
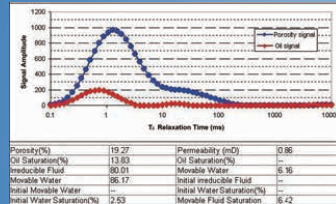




Geo-Vista

Lithology Logging Series (LithoLog) (No Radioactive Source)

- Nuclear Magnetic Resonance Tool (NMR-M)
- Multipole Array Acoustic Tool (MAA)
- Reservoir Characterization Tester-B (RCT-B)
- Reservoir Characterization Tester-Express (RCT-X)
- Formation Coring Tool-Large (FCT-L)
- Elemental Capture Tool (ECT)
- NMR Rock Sample Analyzer (NRA)



www.RenheSun.com
www.geovista.cn

Introduction

LithoLog is used to measure formation lithology and liquid characteristic which not use traditional chemical radioactive source way to get the formation information.

Downhole Tools

Nuclear Magnetic Resonance Tool (NMR-M)
Hexapod Resistivity Imaging Tool (RIT-WBM/OBM)
Ultrasonic Scan Imaging Tool (USI/USI-V/USI-G)
Multipole Array Acoustic Tool (MAA)
Reservoir Characterization Tester (RCT-B/RCT-S/RCT-C)
Formation Coring Tool (FCT/LHFCT)
Generator Compensated Neutron Tool (GCN-T)
Elemental Capture Tool (ECT)
NMR Rock Sample Analyzer (NRA)

Applications

- Reveal different properties of the formation fluid and pore size distribution
 - Effective and total porosity
 - Movable water and bound water
 - Permeability
 - Pore size, microporosity and vugs
- Hydrocarbon Typing and Quantification
 - Low-R, low-contrast pay
 - Water, gas, oil saturations or flushed zone saturations
 - Oil viscosity
 - Characterizing unconventional reservoirs such as gas shale, tar and heavy oil

Features

- Multi-frequency, multi-investigation depth measurements
- Side-looking data acquisition expands operating envelope
- Direct measurement of lithology independent effective porosity, free fluid and capillary bound porosity, bound water
- Accurate measurements utilizing fully recovered wait time

Benefits

- Improved reservoir quality estimate (permeability, pore size distribution)
- Reduction of rig time through improved logging speed and tool combinability
- Accurate reserves determination with minimal uncertainty

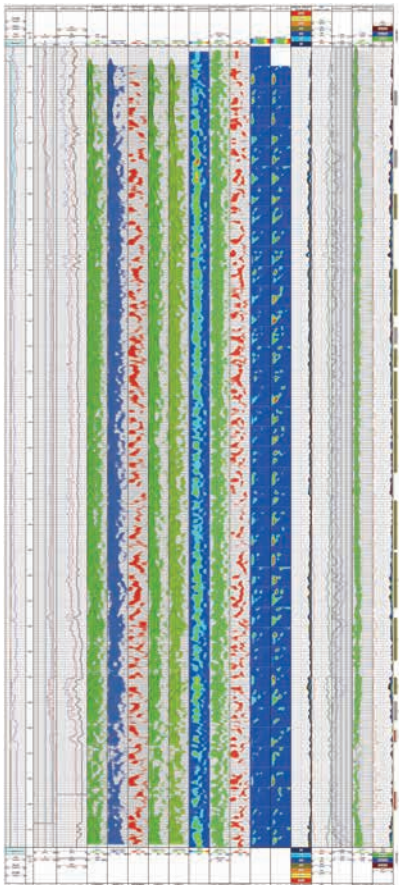
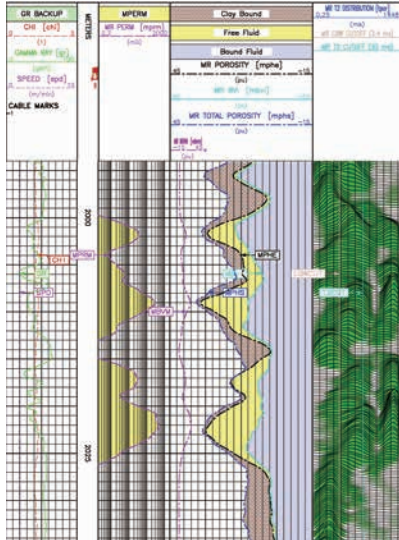
Introduction

The NMR-M tool measures hydrogen for porosity and relaxation rates of protons. This tool is primarily a digital device. NMR experiments are a measurement of time required for protons to either align with an external magnetic field or for processing protons to de-phase, or relax (T₂ measurement). It is easier to identify fluids from 2D data interpretation. NMR-M eccentric measurement makes it is less affected by mud mineralization.

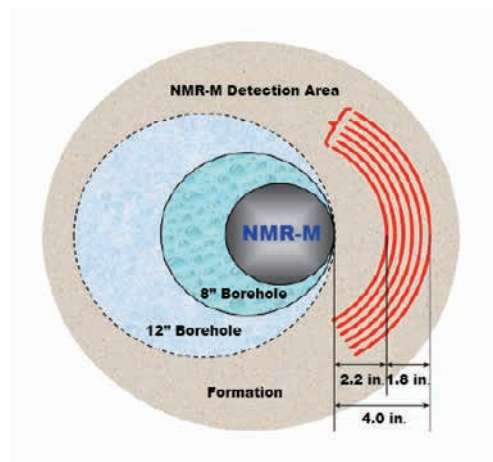
Specifications

Maximum Temperature	350°F (175°C) for 2 hours
Maximum Pressure	20,000 psi (137.9 MPa)
Make-up Length	15 ft.-6 in. (4.73 m)
Make-up Including QA cap/charger	24 ft.-5 in. (7.44 m)
Instrument Weight	
NMR-M-QA	156 lbs. (70.8 kg)
NMR-M-EC	178 lbs. (80.7 kg)
NMR-M-MB	310 lbs. (140.6 kg)
Diameter	
NMR-M-QA	3.625 in. (92 mm)
NMR-M-EC/MB	5.06 in. (127 mm)
Minimum Hole Diameter	5.875 in. (149 mm)
Maximum Hole Diameter	13.5 in. (343 mm)
Logging Speed (typical)	
BHD=8 in., BHT=150°F, R _{xo} >2 ohm.m , standard resolution 4 points/ft. (0.0762 m)	
Formation Evaluation (TW≤2.1 s)	15 ft./min (4.6 m/min) R _m >0.1 ohm.m 4.9 ft./min (1.5 m/min) R _m =0.02 ohm.m
Fluid-Typing (TW≤11 s)	10.8 ft./min (3.3 m/min) R _m >0.1 ohm.m 2.7 ft./min (0.8 m/min) R _m =0.02 ohm.m
Bound Water Logging	24 ft./min (7.3 m/min) R _m >0.1 ohm.m 8.1 ft./min (2.5 m/min) R _m =0.02 ohm.m (Stationary Measurements Possible)
Number of Frequencies	12
Number of acquisition modes	7
Vertical Resolution	Optional 6, 4, 3, 2.5, 2 ft. default 6 ft. (1.8 m)
Measure Point	4.933 ft. (12.52 cm) above matching point of bottom of NMR-M-MB
Measurement Range	0-100 pu
Minimum TE	0.3 ms
Measurement Accuracy	≤2 pu
Maximum Average Pulse Rate	≤1200 echoes/s
Maximum Data Bandwidth @1200 Echoes Per Sec	36 kbps
Depth Of Investigation Beyond Borehole Wall	2.2-4.0 in. (56-102 mm)
Sensitive Volume	
Antenna length	18 in. (457 mm)
Arc length	~120°
Shell Thickness	1.1-2.3 mm
Volume (7 freqs)	1.3 L
Static Field Gradient	14-39 gauss/cm

Specifications



Power Requirements:	
High Voltage & Current	600 Vdc, <700 mA
(High Voltage DC is provide by independent Battery Power Sub)	
Electrical/Telemetry	
Acquisition Cycle	Selectable (2-20 s typical 8 s)
Send data Cycle	Selectable (0.25-1 s typical 0.5 s)
Send Data Rate	36 kb/s
Data Block Length	Variable but ≤180 ms, with 0.5 s send data rate
Operating Position	
Hole Deviation	Decentralized
Minimum Dogleg Radius (no tool bending)	
6 in. hole	337 ft. (17°/100 ft.)
8 in. hole	112 ft. (51°/100 ft.)
12.25 in. hole	47 ft. (120°/100 ft.)
14 in. hole	37 ft. (153°/100 ft.)
Minimum Dogleg Radius (bending, with safety factor 2)	
6 in. hole	173 ft. (33°/100 ft.)
8 in. hole	85 ft. (67°/100 ft.)
12.25 in. hole	42 ft. (136°/100 ft.)
14 in. hole	33 ft. (169°/100 ft.)
Maximum Tensile Force	46,000 lbs. (205 kN)
Maximum Compressive Force	40,000 lbs. (18,144 kg)
Bending Strength Of Mandrel	2,500 ft.-lbf (3,390 N.m)





Applications

- Petrophysical evaluation
 - Porosity estimation (also in cased hole)
 - Lithology and clay identification
 - Gas identification
- Sonic imaging
- Rock mechanical properties
- Anisotropy analysis
- Thin bed analysis
- Fracture monitoring with Gyro in cased hole
- Cement Bond Log (CBL)

Features

- Acquires all waveforms simultaneously
- High power broadband dipole transmitters with superior low-frequency content
- Provides high-quality shear data that eliminates the need for dispersion correction

Introduction

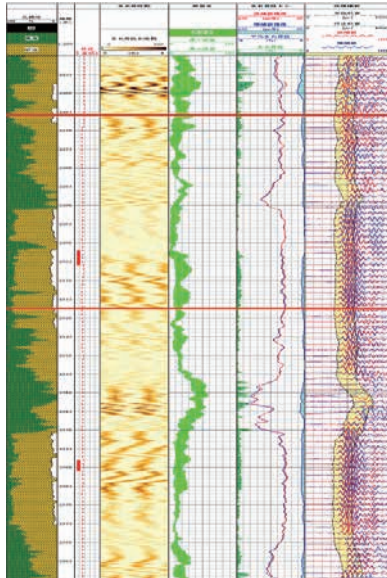
Multipole Array Acoustic Tool (MAA) is a fullwave monopole, quadrupole and cross dipole acoustic logging tool. MAA cross multipole array acoustic log service acquires full-wave acoustic data for compressional, shear and Stoneley evaluations. The significant design improvements have resulted in a broader range of capabilities. And it incorporates the simultaneous acquisition of two-directional dipole measurements aligned 90 degrees apart in the wellbore. contains five major components: ACT-EC, MAA-MB, MAA-PB, MAA-BA and MAA-FA.

Specifications

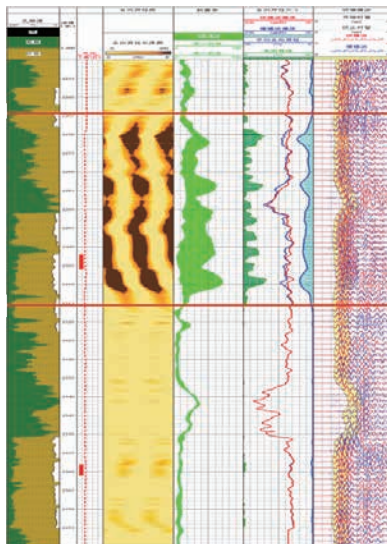
Maximum Temperature	350°F(175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Make-up Length	37 ft.-5.64 in. (11.42 m)
Total Weight	780 lbs. (354.1 kg)
Instrument Maximum Diameter	3.88 in. (98.6 mm)
Minimum Borehole Diameter	4.5 in. (114 mm)
Maximum Borehole Diameter	17.5 in. (455 mm)
Borehole Deviation	Vertical to Horizontal
Telemetry	Standard MGTS
Mode:	
Command	Mode 2
Tool Status	Mode 2
Data	Mappable: mode 7 or 5
Data Transmission Time:	
Subset 1	1.7 s (Inline & Cross dipole, fullwave mono, Mono DT-44 channel acquisition)
Subset 2	0.86 s (Inline dipole, Fullwave Monopole, Mono DT)
Sample Rate:	2 samples per foot recommended
Maximum Logging Speed (Standalone):	
Recommended Subset 1	15 ft./min (Inline & Cross dipole, fullwave mono, Mono DT-44 channel acquisition)
Recommended Subset 2	28 ft./min (Inline dipole, Fullwave Monopole, Mono DT-compressed 20 channels)
Depth Control	Relative instrument depth control to an accuracy of 12 in.
Data Recorded	Monopole-Fullwave (range 40-300 us/ft.) Dipole-Fullwave (range 80-1000 us/ft.) Quadrupole-Fullwave (range 80-TBD us/ft) Stoneley-Fullwave (range 180-600 us/ft) Mono DT-From monopole Cross Dipole-Fullwave (same depth)



Specifications



Before fracturing



After fracturing

Data Presented	
Mono DT (Methods—First break, Avan real time)	
Vertical resolution (Semblance)	3.5 ft.
Vertical Resolution (First Break)	1.0 ft.
Measurement Range:	
Compressional Slowness	40-280 usec/ft.
Shear Slowness	80-1000 usec/ft.
Stoneley Slowness	80-1000 usec/ft.
A/D conversion Rate	5 usec to 250 usec
Number of A/D Channels	8
A/D Resolution	16 bits
Record Length	3125 samples max.
Compaction/Compression	12 bit compaction & data compression
Measurement Accuracy:	
	+3% error on compressional slowness
	+5% error on shear slowness
	+5% error on Stoneley slowness
Total Power	
	MGTS Instrument Bus
	AC power (180 Vac) <300 mA
Accuracy	
	±3% error on compressional velocity
	±5% error on measured shear velocity
Vertical Resolution	
	3.5 ft. for semblance. 0.5 ft. for inner Rx first break and monoΔT.
Maximum Tensile Force	
Transmitter & Receiver	35,000 lbs.
Isolator	45,000 lbs.
Maximum Compressive Force	
Transmitter & Receiver	35,000 lbs.
Isolator	45,000 lbs.
Absolute Bending Strength of Mandrel	2000 ft./lbs.



Applications

- Formation pressure measurement and fluid contact identification
- Formation fluid sampling
- Permeability measurement
- Permeability anisotropy measurement
- Mini-Drillstem Test (DST) and productivity assessment
- In-situ stress and minifrac testing

Benefits

- Testing and sampling in low permeability, laminated, fractured, unconsolidated and heterogeneous formations
- Fast, repeatable pressure measurements
- Faster tests in low permeability-reduced seal losses and probe plugging
- Pressure, volume and temperature (PVT) formation fluid samples
- Downhole fluid differentiation
- Real-time fluid gradients, permeability and contamination assessment

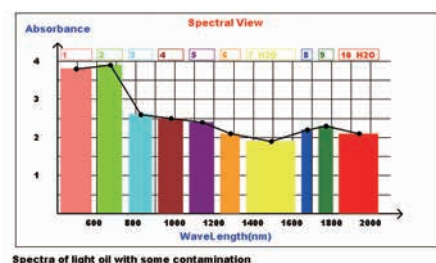
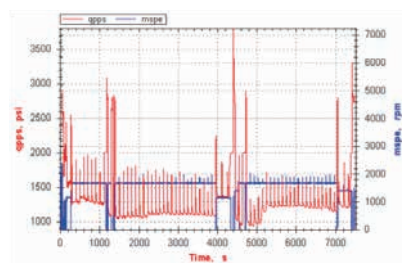
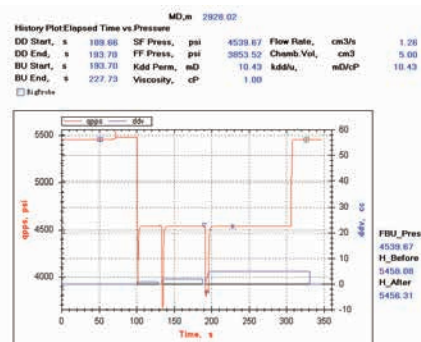
Features

- Multiple samples in one trip
- Multiprobe and inflatable dual packer module options
- Accurate pressure measurements using the fast response Crystal Quartz Gauge
- Programmable pretest pressure, rate and volume
- Filtrate pumpout prior to sampling
- Fluid resistivity and temperature measurements at the probe
- Quantitative sample contamination measurement with optical spectroscopy techniques
- Low-shock sampling
- Field-proven database for accurate pumpout time
- The RCT-B combined with Pipe Conveyed Logging Tool (PCL) is more safety in tough condition wells.

Introduction

Reservoir Characterization Tester-B (RCT-B) is designed to obtain formation pressures and formation fluid samples at different depths within a reservoir. Analyzing pressure buildup profiles and the properties of a fluid sample helps to provide a better understanding of the fluid dynamics within a reservoir.

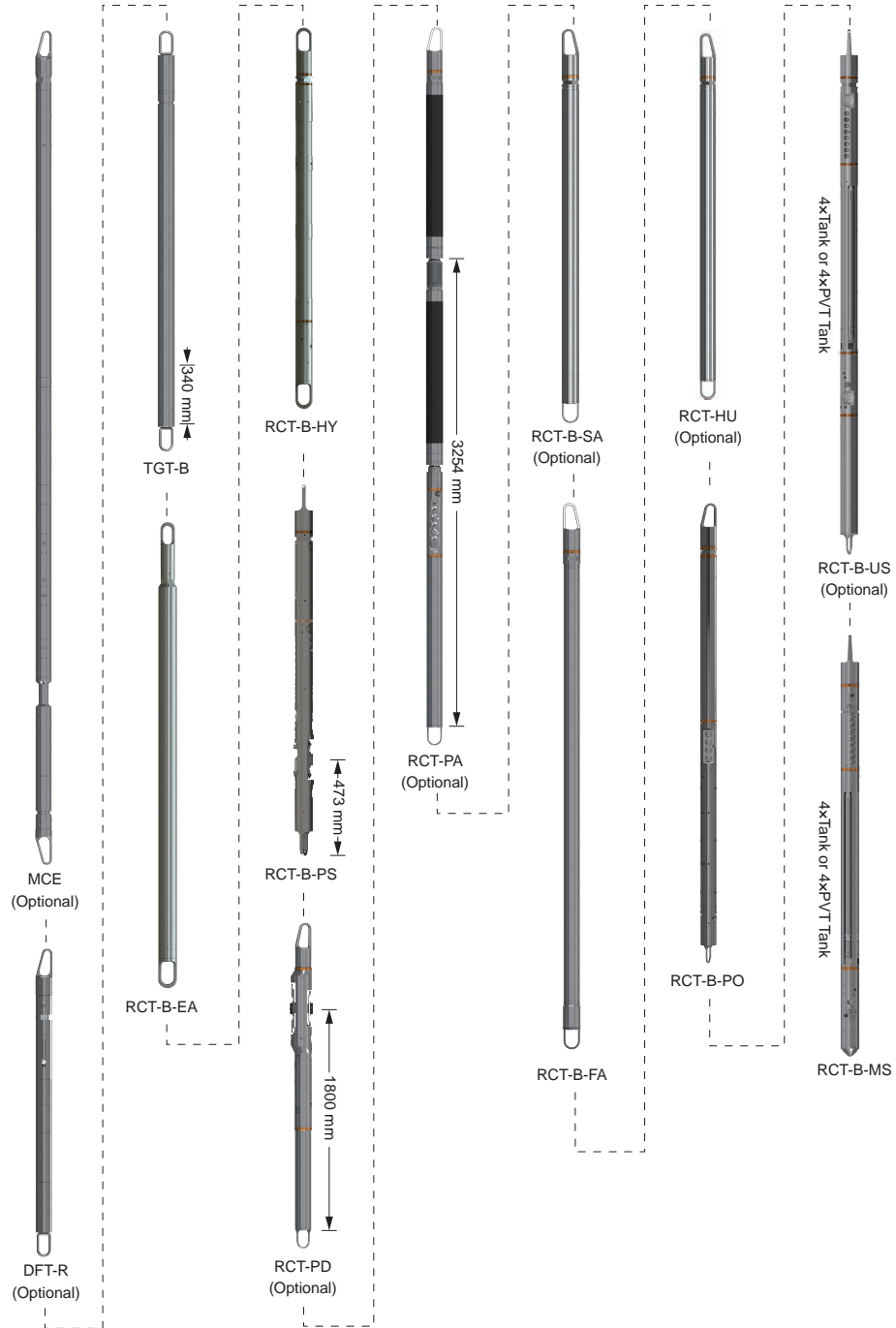
In a single trip, the RCT-B tool is able to acquire most of the data requirements needed for accurate and timely decision making.



Downhole Tool String

CHB	Cablehead-B
PCL-H	Pipe Conveyed Logging Tool-H (Optional)
MCE	Multi-Conductor Extreme Jar (Optional)
DFG-R	Downhole Force Gauge-R (Optional)
TGT-B	Telemetry & Gamma Ray-B
RCT-B-EA	RCT-B Electronic Assembly
RCT-B-HY	RCT-B Hydraulic Power
RCT-B-PS	RCT-B Probe Single
RCT-PD	RCT Probe Dual (Optional)
RCT-PA	RCT Dual-Packer (Optional)
RCT-B-SA	RCT-B Fluid Spectrum Analyzer (Optional)
RCT-B-FA	RCT-B Fluid Analyzer
RCT-HU	RCT Hydraulic Unit (Optional)
RCT-B-PO	RCT-B Pump-Out
RCT-B-US	RCT-B Upper Samples (Including Tank or PVT Tank) (Optional)
RCT-B-MS	RCT-B Multi-Sample (Including Tank or PVT Tank)

Tools:



The RCT-B tool can be customized and efficiently assembled on-site to meet exact requirements depending on the needs of a particular well evaluation.

1. Basic RCT-B configuration for pressure, permeability and sampling: RCT-B-EA↔RCT-B-HY↔RCT-B-PS↔RCT-B-FA↔RCT-B-PO↔RCT-B-MS
2. Three-probe vertical interference testing: RCT-B-EA↔RCT-B-HY↔RCT-B-PS↔RCT-PD↔RCT-B-FA↔RCT-B-PO↔RCT-B-MS
3. Vertical interference test with probe-packer: RCT-B-EA↔RCT-B-HY↔RCT-B-PS↔RCT-PA↔RCT-B-FA↔RCT-HU↔RCT-B-PO↔RCT-B-MS
4. Low shock PVT-quality sampling: RCT-B-EA↔RCT-B-HY↔RCT-B-PS↔RCT-B-SA↔RCT-B-FA↔RCT-B-PO↔RCT-B-US↔RCT-B-MS
(RCT-B-US can increase or decrease according to customer needs, with a maximum of 3 instrument strings connected)
5. The Dual-packer configuration for pressure, permeability and sampling: RCT-B-EA↔RCT-PA↔RCT-B-FA↔RCT-HU↔RCT-B-PO↔RCT-B-MS



Applications

- Formation pressure measurement and fluid contact identification
- Formation fluid sampling
- Permeability measurement
- Permeability anisotropy measurement
- Mini-Drillstem Test (DST) and productivity assessment
- In-situ stress and minifrac testing

Benefits

- Testing and sampling in low permeability, laminated, fractured, unconsolidated and heterogeneous formations
- Fast, repeatable pressure measurements
- Faster tests in low permeability-reduced seal losses and probe plugging
- Pressure, volume and temperature (PVT) formation fluid samples
- Downhole fluid differentiation
- Real-time fluid gradients, permeability and contamination assessment

Features

- Multiple samples in one trip
- Multiprobe and inflatable dual packer module options
- Accurate pressure measurements using the fast response Crystal Quartz Gauge
- Programmable pretest pressure, rate and volume
- Filtrate pumpout prior to sampling
- Fluid resistivity and temperature measurements at the probe
- Quantitative sample contamination measurement with optical spectroscopy techniques
- Low-shock sampling
- Field-proven database for accurate pumpout time
- The RCT-B combined with Pipe Conveyed Logging Tool (PCL) is more safety in tough condition wells.

Introduction

The Reservoir Characterization Tester-B (RCT-B) provides fast and accurate pressure measurements and high-quality fluid sampling. It can also measure permeability anisotropy. In a single trip, the RCT-B tool is able to acquire most of the data requirements needed for accurate and timely decision making.

Specifications

Maximum Temperature	350°F (175°C) / 400°F (204°C) Advanced
Maximum Pressure	20,000 psi (137.9 MPa) / 30,000 psi (206.9 MPa) Advanced
Make-up Length	55 ft. (16.8 m) (without optional tool)
Weight	1419 lbs. (643.6 kg) (Without optional tool)
Tool Diameter	4.75 in. (120 mm)
	Probe size 5.3 in. (135 mm)
	Dual Packer size 5 in. (127 mm) or 6.3 in. (160 mm)
Hole Size Range	5-7/8 in. to 9.7 in. (149 mm to 246 mm) Single setting
	5-7/8 in. to 13.8 in. (149 mm to 350 mm) telescopic setting
	8 in. to 13.7 in. (203 mm to 348 mm)
	Single setting with extended bumper-2 in. (50.8 mm) - thick for single setting
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)
Sample Pump	
Volume	500 cc Max.
Pump Differential Pressure	5,000 psi (34.5 MPa) Max.
Nominal System Pressure	3,600 psi @ 350°F (28.4 MPa @ 175°C)
Tank Volume	4x600 cc or 8x600 cc or 12x600 cc or 16x600 cc (PVT tank optional, and certified PED)
Motor Power	50 Vdc @ 600 W
Maximum Power Requirements	250 Vac @ 250 mA
Maximum Pretest Volume	20 ml (Adjustable)
Quartz Pressure Gauge	
Transducer	20,000 psi (137.9 MPa)
Accuracy	0.02% FS
Resolution	<0.008% psi/sec
Resistivity Sensor	
Range	0.01~20 ohm·m
Accuracy	0.01 ohm·m or ±5% of reading 20 ohm·m
Resolution	0.001 ohm·m
Capacitance Water Holdup Sensor	
Range	0 -100% (best value 0-40%)
Accuracy	±1% (water holdup40%)
Resolution	0.1%
Tuning Fork Density Sensor	
Range	Range of density measurement 0 g/cc to 1.25 g/cc in the viscosity range of 1.0 cS to 50 cS
Accuracy	±0.03 g/cc
Resolution	0.01 g/cc



Applications

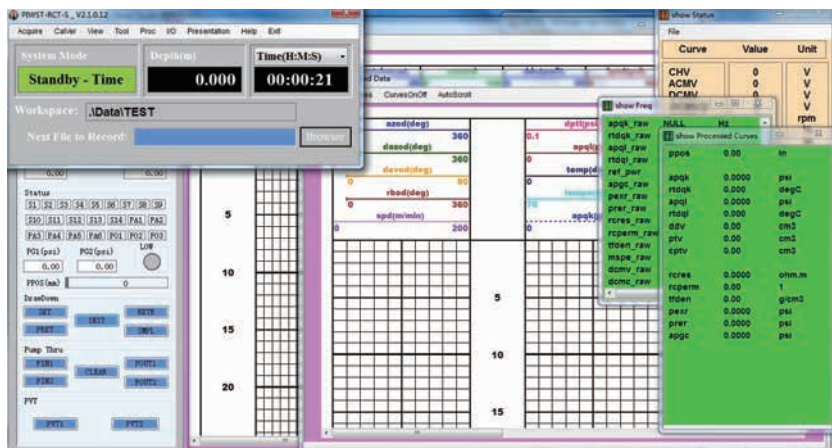
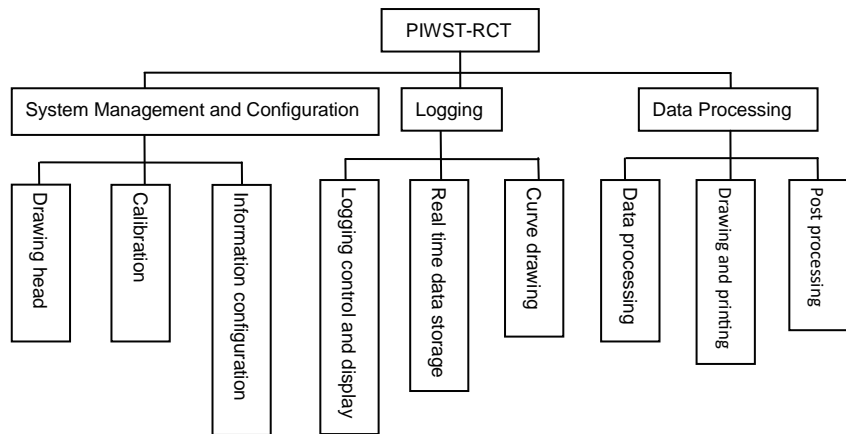
- RCT is a digital control, so the user can be based on the characteristics of the measured strata, set the speed of the motor in the logging process, predict the volume, pumping speed and so on.
- Increase the fluid analysis function, can measure resistivity, water holdup and density.
- Increased the USB and the network communication way, the Industrial Personal Computer is replaced for the notebook computer, is easy to carry and the operation.

Introduction

PI Reservoir Characterization Tester Software (PIWST-RCT) according to the software operation process from the macro is divided into three parts, namely, the system management and configuration, logging, data processing, each part is divided into corresponding sub function module according to the function.

Calibration module in system management and configuration function module is mainly used to calibrate sensor. Logging function module includes the opening and closing legs, pretest, pump out/pump in and sampling. The post processing module mainly includes data playback, image editing, data conversion, FTA data analysis, which can convert GFF files into LAS files, easy to view the contents of the data files.

Software overall structure diagram as follow:





Applications

- Communication between the acquisition system and the downhole tools.
- Adjust the depth of the tool string in relation to the depth of the formation being logged.

Introduction

The TGT-B is a 3.375" O.D. TGT-B communicates with the Surface Panel System over seven-conductor logging cables using a form of cable transmission referred to as T5 mode. The TGT-B is a passive device used for measuring the intensity of naturally occurring gamma-rays in a wellbore.

The TGT-B uses a Scintillation detector to measure the gamma-ray radiation originating in the volume of the formation near the sonde. Because the detectors are only 8-12 inches long, they are able to give good formation detail. TGT-B is only used for depth correction of downhole instruments.

Specifications

Maximum Temperature	350°F (177°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	3.375 in. (86 mm)
Make-up Length	5 ft.-2.99 in. (1.6 m)
Shipping Length	6 ft.-2.8 in.(1.9m)
Weight	59.5 lbs. (27kg)
Operating Voltage & Current	250 Vac @ 250 mA (Max.)
Wireline Requirements	7 conductor cable
Maximum Tensile Force	36,250 lbf (161,248 N)
Maximum Compressive Force	36,250 lbf (161,248 N)
Communication Rate	100 kbps
Maximum Logging Speed	30 ft./min (9m/min)
Possible Combinations	PI Reservoir Characterization Tester Software (PIWST-RCT) Tool strings
Vibration & Shock	Meets Spec. GV-WI/RD-0038-A/6





Applications

- Control action of RCT-B-HY、 RCT-B-PS and RCT-PS, realize the function of measuring pressure.
- Control action of RCT-B-HY、 RCT-B-PS and RCT-PD, realize the function of measuring resistivity.
- Power supply to the RCT-B-FA, which realize the function of RCT-B-FA.

Introduction

RCT-B Electronic Assembly (RCT-B-EA) converts AC power from the surface to provide DC power for all modules in the tool. It is an essential part of any RCT-B configuration. RCT-B-EA control motor speed and solenoid valve action, acquisition pump outlet pressure, acquisition DC motor speed, acquisition low oil switch and solenoid valve state. Acquisition resistivity data, acquisition of formation pressure, acquisition the temperature signal.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.41 in. (112mm)
Make-up Length	7 ft.- 11.28 in. (2.42 m)
Shipping Length	9 ft.- 7.75 in. (2.94 m)
Make-up Weight	124.23 lbs. (56.35 kg)
Shipping Weight	143.23 lbs. (64.97 kg)
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)
Maximum Power Requirements	250 Vac @ 250 mA
Motor Power	50 Vdc @ 600 W



Applications

- With RCT-B-PS and RCT-PD for pressure measurement and sampling

Features

- Without Electrical Section
- Include DC Motor and fixed displacement pump
- Include Accumulator for automatic retraction

Introduction

RCT-B Hydraulic Power (RCT-B-HY) is the primary hydraulic power source for the Reservoir Characterization Tester-B (RCT-B) downhole modules such as the Single Probe (RCT-B-PS) or Probe Dual (RCT-PD).

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	7 ft.-1.8 in. (2.18 m)
Shipping Length	8 ft.-10.30 in. (2.7m)
Weight	185.2 lbs (84 kg)
Motor Power	50 Vdc@100 W
Hydraulic Pump Displacement	0.0170 cu.in/rev (0.28 cm ³ /rev)
Maximum Tensile Strength	166,000 lbf (738,405 N)
Maximum Compressive Strength	50,000 lbf (222,411 N)
Vibration & Shock	Meets Spec. GV-WI/RD-0038-A/6



Applications

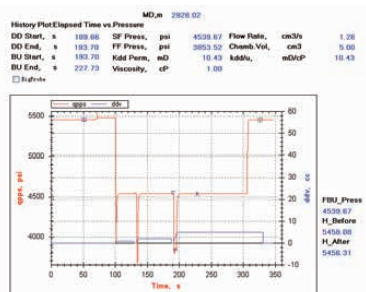
- Formation pressure measurement
- Permeability measurement

Benefits

- Testing in low permeability, laminated, fractured, unconsolidated and heterogeneous formations
- Fast, repeatable pressure measurements
- Faster tests in low permeability-reduced seal losses and probe plugging

Features

- Efficient integration with other tools
- Accurate pressure measurements using the fast response Crystal Quartz Gauge
- Programmable pretest pressure, rate and volume
- Fluid resistivity and temperature measurements at the probe base for accurate



Introduction

The RCT-B-PS provides a means to take reservoir samples and to measure reservoir pressures. In addition, the RCT-B-PS contains a pressure pretest to perform a pressure drawdown providing data used to determine the permeability of the formation. The RCT-B-PS must be operated with the RCT-B Electronic Assembly (RCT-B-EA) for sources of electrical.

The RCT-B-PS contains the probe assembly, (with packer and telescoping backup pistons), the accurate, high-resolution, quick response quartz pressure sensor, fluid resistivity and temperature sensors, and a 20cc pretest chamber. The volume, rate and drawdown of this chamber can be controlled from the surface to adjust to any test situation, especially in tight formations.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
	Probe size 5.3 in. (135 mm)
Make-up Length	6 ft.- 7.53 in. (2.02 m)
Shipping Length	8 ft.- 2.82 in. (2.51 m)
Make-up Weight	199.07 lbs. (90.3 kg)
Hole Size Range	5-7/8 in. to 9.7 in. (149 mm to 246 mm)
	Single setting
	5-7/8 in. to 13.8 in. (149 mm to 350 mm)
	telescopic setting
	8 in. to 13.7 in. (203 mm to 348 mm)
	Single setting with extended bumper-2 in. (50.8 mm) - thick for single setting
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)
Maximum Pretest Volume	20 cc (adjustable)
Quartz Pressure Sensor	
Range	0~20,000 psi (0-137.9 MPa)
Accuracy	0.02% FS
Resolution	<0.008 psi /sec
Resistivity Sensor	
Range	0.01 ~ 20 Ohm- m;
Accuracy	0.01 Ohm-m or ±5% of reading 20 Ohm-m
Resolution	0.001 Ohm-m



Applications

- Formation pressure measurement
- Permeability measurement
- Permeability anisotropy measurement

Benefits

- Testing in low permeability, laminated, fractured, unconsolidated and heterogeneous formations
- Fast, repeatable pressure measurements
- Faster tests in low permeability-reduced seal losses and probe plugging

Features

- Must be connected directly below the RCT-B-PS
- Accurate pressure measurements using a fast response Crystal Quartz Gauge
- Programmable pretest pressure, rate and volume
- Back-to-back probe/packer assemblies
- Field hydraulic and electric quick connections.

Introduction

The RCT Probe Dual (RCT-PD) contains two probes mounted back-to-back, 180° apart on the same block. It must be connected directly below the RCT-B-PS. When combined with the RCT-B-PS, it forms a three probes system capable of determining horizontal and vertical permeability. The RCT-PD, in conjunction with the pressure measured at the vertical probe from the RCT-B-PS, measures the pressure at both probes. These measurements are used to determine near-wellbore permeability anisotropy.

For a layer less than 2 ft [0.61 m] thick, the combination of the RCT-PD and RCT-B-PS can straddle the layer to determine if the layer is a pressure barrier.



Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	6 in. (152.4 mm)
Minimum Pass Diameter	6.33 in. (160.78 mm)
Make-up Length	6.9ft. (2.1 m)
Weight	250 lb. (113.4kg)
Maximum Pretest Volume	20 ml (adjustable)
Measure Point	71in. (1.8m)
Hole Size Range	7.62 in. (193.6 mm)~13.75in.(336.5 mm) (without bumper) 8.875in.(225.4mm)~15in.(381mm) (with bumper)
Quartz Pressure sensor	
Range	0~20,000psi(0-137.9Mpa)
Accuracy	0.02%FS
Resolution	<0.008 psi /sec
Resistivity Sensor	
Range	0.01 ~ 20 Ohm- m;
Accuracy	0.01 Ohm-m or ±5% of reading 20 Ohm-m
Resolution	0.001Ohm-m

*Note: Must be connected to bottom of RCT-B-PS

Applications

- For sampling low-permeability formations, the packer module often allows pumping out at lower permeabilities than the probes. Sampling can also be conducted at a lower differential pressure and can sometimes be accomplished faster.
- In unconsolidated formations, it is often difficult to provide either a pressure measurement or a sample with conventional probes.
- Packer module can overcome this by straddling zones after the hole has been cased and perforated.

Benefits

- Testing and sampling in low permeability, laminated, fractured, unconsolidated and heterogeneous formations.
- Fast, repeatable pressure measurements.
- Faster tests in low permeability-reduced seal losses and probe plugging.

Features

- The packer module with an Auto-Retract Mechanism (ARM).
- A auto-deflate valve is a fail-safe device for emergency release.
- The packed-off interval length can be adjusted.

Introduction

RCT-PA provides two inflatable packer elements of about 1 m in length that seal off a 1 m - 3 m section of the borehole. The elements are inflated with wellbore fluid or water that is brought down from the surface using the RCT-B-PO. The packer module can be used as an alternative to conventional probes. Because the assembly provides access to the entire borehole wall over its 1 m packed-off interval, the area that is open to the formation is several thousand times larger than with the conventional probes. It also seals the entire borehole circumference for a distance of several feet. This allows pressure measurements and fluid sampling in laminated, shaley, fractured, vugular, or low-permeability formations where the probes usually cannot operate.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	15.88 ft. (4.84 m)
Weight (Without packers)	169.78 lbs. (77.01 kg)
Sealing shaft length	3 ft.-3.36 in. to 10 ft. (1 m to 3 m)
Packer element specification	
Temperature	350°F (175°C) / 300°F (150°C) / 248°F (125°C)
Differential Pressure	5000 psi (34 MPa)
Packer Element Diameter	Hole Size Range
5 in. (127 mm)	5.5 in. to 7.5 in. (139.7 mm to 190.5 mm)
6.3 in. (160 mm)	8.5 in. to 10.5 in. (215.9 mm to 266.7 mm)
Quartz Pressure Sensor	
Range	0-20,000 psi (0-137.9 MPa)
Accuracy	0.02% FS
Resolution	< 0.008 psi / sec
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)



Applications

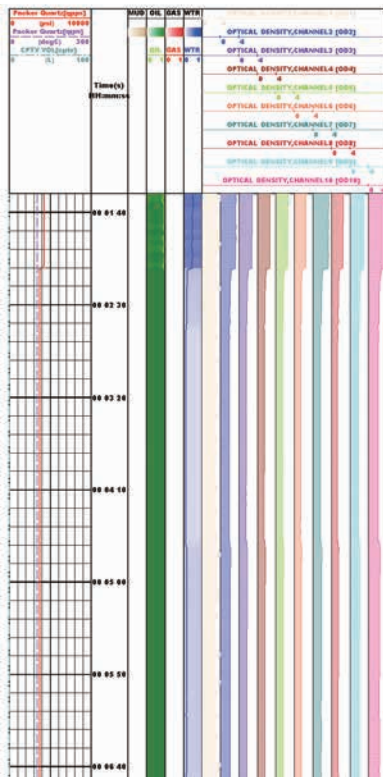
- Real Time flow analysis to ensure the reliability of samples.
- Test whether there is gas in the fluid.
- Test the oil-gas ratio.
- Test dew point and bubble point.
- Identification of oil type- heavy oil, light oil, condensate oil.

Benefits

- Provide verification for obtaining high quality samples.
- Save sample analysis cost and time.

Features

- With oil pipeline.
- Including fluorescence spectrum and absorption spectrum.



Introduction

RCT-B-SA uses spectroscopy to determine the sample composition in the RCT-B flowline. RCT-B-SA contains two sensors: absorption spectrometer and fluorescence spectrometer. It can identify the downhole fluid and samples, and analyze fluid bubble point, dew point, oil-gas ratio and oil type- heavy oil, light oil or condensate oil.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	5.09 ft. (1.55 m)
Shipping Length	6.73 ft. (2.05 m)
Make-up Weight	112.44 lbs. (51 kg)
Shipping Weight	137.55 lbs. (62.39 kg)
Spectral Channel Number	10 channels (including gas measurement channel)
Measurement Range	Optical Density for 2 mm path length 0.0 to 4.0 OD for 425-1100 nm 0.0 to 3.8 OD for 1300-2008 nm
Measurement Accuracy	10% of measured optical density or 0.1 OD, whichever is greater.
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)

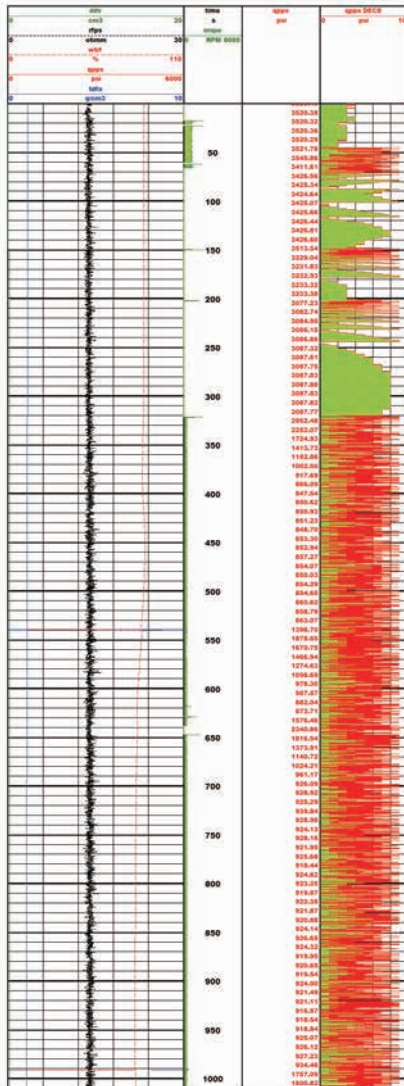


Applications

- Used to measure the water content of the formation fluid.
- Measure the density and viscosity of the fluid in the formation.
- Control the solenoid valve of RCT-B-PO and acquisition the differential pressure sensor data.
- Control RCT-B-US or RCT-B-MS of the disc motor for sampling.

Benefits

- Downhole fluid differentiation



Introduction

RCT-B-FA contains Water Holdup Sensor and Tuning Fork Density Sensor. For real-time monitoring and analysis of measured fluid content etc., and help to obtain high quality of formation fluid. In addition, the RCT-B-FA has an electronic section used to control the RCT-B-PO solenoid valve and RCT-B-US or RCT-B-MS disc motor, collecting sensor data, which realize Pump in/out of RCT-B-PO and Sampling of RCT-B-US, RCT-B-MS.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	10 ft.-7.56 in. (3.24 m)
Shipping Length	12 ft.-1.67 in. (3.7 m)
Shipping Weight	253.53 lbs. (115 kg)

Capacitance Water Holdup Sensor

Range	0 -100% (best value 0-40%)
Accuracy	±1% (water holdup<40%)
Resolution	0.1%

Tuning Fork Density Sensor

Range	Range of density measurement 0 g/cc to 1.25 g/cc in the viscosity range of 1.0 cS to 50 cS
Accuracy	±0.03 g/cc
Resolution	0.01 g/cc

Maximum Tensile Force 166,000 lbf. (738,405 N)

Maximum Compressive Force 50,000 lbf. (222,411 N)



Applications

- with RCT-PA for pressure measurement and sampling

Introduction

Due to the fact that the hydraulic power of the RCT-B-PO configured in the standard instrument string is the same as that of the RCT-B-PS, when using RCT-PA for pressure measurement and sampling, the hydraulic power of RCT-B-HY cannot be provided to RCT-B-PO, and the expansion of RCT-PA requires high flow rate and low pressure difference. Therefore, it is necessary to connect RCT-HU to the upper end of RCT-B-PO to provide adjustable displacement hydraulic power for RCT-B-PO.

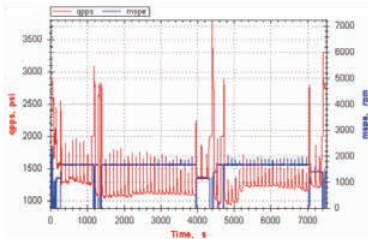
Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120.65 mm)
Make-up Length	8 ft.-0.46 in. (2.45 m)
Shipping Length	8 ft.-10.30 in. (2.7m)
Weight	277.8 lbs (126 kg)
Motor Power	50 Vdc @ 100W
Pump Displacement	0 ~ 0.067cu.in/rev (0 ~ 1.1cm ³ /rev)
Maximum Tensile Strength	50,000 lbf (222,411 N)
Maximum Compressive Strength	166,000 lbf (738,405 N)
Vibration & Shock	Meets Spec. GV-WI/RD-0038-A/6



Applications

- **Sampling:** Formation fluids can be pumped into a pressure-balanced chamber at low pressure differentials to avoid reaching the fluid's bubble point for obtain PVT samples.
- **Mini-Frac:** The RCT-B- PO can be used to pump fluids from a sample chamber to an interval isolated by an inflated dual packer at pressures up to 4500 psi performing a mini-frac on candidate formations (hydraulic fracture). Sleeve fractures can also be performed by inflating the dual-packer.



Introduction

RCT-B Pump Out (RCT-B-PO) is used to transport fluids from one part of the flowline in which it is placed to another part of the flowline, at a higher pressure than the original fluid status. As such, the RCT-B-PO will always be placed in between these two pressure extremities. Its primary applications are facilitating with sampling, advanced testing and mini-frac operations. Any operations involving a dual packer (RCT-PA) will require an RCT-B-PO to inflate the elements and operate its auto-deflate valve.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	9 ft. 6.96 in. (2.92 m)
Shipping Length	11 ft. 2.65 in. (3.42 m)
Make-up Weight	231.35 lbs. (104.94 kg)
Shipping Weight	256.99 lbs. (116.57 kg)
Sample Pump	
Volume	500 cc Max.
Pump Differential Pressure	5000 psi (34.5 MPa) Max.
Nominal System Pressure	3,600 psi @ 350°F (28.4 MPa @ 175°C)
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)



Applications

- Formation fluid sampling
- PVT high quality sample

Benefits

- Multiple RCT-B-US connected in one trip
- High quality sample
- Pressure, volume and temperature (PVT) formation fluid samples

Features

- Multiple formation-fluid samples in one trip
- Multiple separate 600cc tank samples

Introduction

The module contains a mandrel which has 4x600cc Tank mounted in banks , and connects multiple RCT-B-US in one trip. Therefore, it can retrieve up to four separate formation-fluid samples taken at different formation zones. Once at the surface, the samples can be sealed in their tanks, and the tanks removed from the tool string for shipping directly to the lab for analysis without having to transfer the sample at the wellsite. Multi-Sample Sub is to retrieve high-quality, reservoir-fluid samples for Pressure Volume Temperature (PVT) analysis.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
	30,000 psi (206.9 MPa) Advanced
Tool Diameter	4.75 in. (120 mm)
Make-up Length	10 ft. - 4.41 in. (3.16 m)
Shipping Length	11 ft. - 0.28 in. (3.66 m)
Make-up Weight	290.79 lbs. (131.9 kg)
Shipping Weight	317.69 lbs. (144.1 kg)
Tank Volume	4x600 cc
Motor Power	50 Vdc @ 100W
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)
Tank and PVT Tank	
Tank Max Working Temperature	350°F (175°C)
Tank Max Working Pressure	10,000 psi (68.9 MPa)
Tank Diameter	1.77 in. (45 mm)
Tank Length	3 ft.-11.24 in. (1.2 m)
Tank Weight	19 lbs. (8.6 kg)
Tank Volume	600 cc
Special Application (Optional)	PED-approved PVT tank Anti - H ₂ S service



Applications

- Formation fluid sampling
- PVT high quality sample

Benefits

- High quality sample
- Pressure, volume and temperature (PVT) formation fluid samples

Features

- Multiple formation-fluid samples in one trip
- Four separate 600cc tank samples

Introduction

The module contains a mandrel which has 4x600cc tank mounted in banks. Therefore, it can retrieve up to four separate formation-fluid samples taken at different formation zones. Once at the surface, the samples can be sealed in their tanks, and the tanks removed from the tool string for shipping directly to the lab for analysis without having to transfer the sample at the wellsite. Multi-Sample Sub is to retrieve high-quality, reservoir-fluid samples for Pressure Volume Temperature (PVT) analysis.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	4.75 in. (120 mm)
Make-up Length	8 ft.-0.85 in. (2.46 m)
Shipping Length	9 ft.-8.54 in. (2.96 m)
Make-up Weight	240.74 lbs. (109.2 kg)
Shipping Weight	267.64 lbs. (121.4 kg)
Tank Volume	4x600 cc
Motor Power	50 Vdc @ 100W
Maximum Tensile Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	50,000 lbf. (222,411 N)
Tank and PVT Tank	
Tank Max Working Temperature	350°F (177°C)
Tank Max Working Pressure	10,000 psi (68.9 MPa)
Tank Diameter	1.77 in. (45 mm)
Tank Length	3 ft.-11.24 in. (1.2 m)
Tank Weight	19 lbs. (8.6 kg)
Tank Volume	600 cc
Special Application (Optional)	PED-approved PVT tank Anti - H ₂ S service

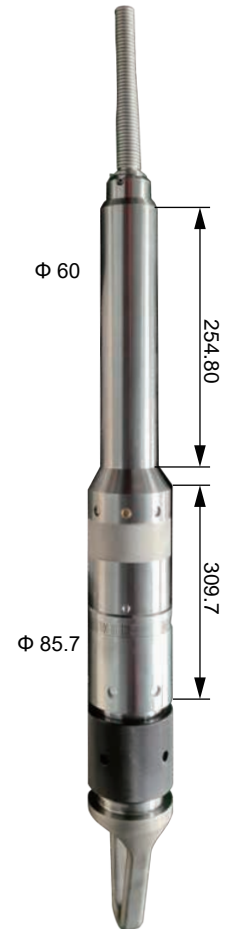


Introduction

Cablehead-B (CHB) connect 7-conductor logging cable and logging tool for open-hole and cased-hole.

Specifications

Maximum Temp	400°F (204°C)
Maximum Pressure	23,000 psi (160 MPa)
Maximum OD	3.625 in. (85.7 mm)
Minimum Hole	4.5 in. (114 mm)
Shipping Length	3.36 ft. (1.04 m)
Makeup Length	2.83 ft. (0.86 m)
Bottom Connector	28-pin Male Plug (Use only 10 banana plugs)
Cable OD	15/32 in. (11.91 mm)
	17/32 in. (13.49 mm)
	0.474 in. (12.04 mm)
Weakpoint	6,000 lbs. (2700 kg) (Optional: 3,000 lbs. (1350 kg), 4,000 lbs. (1800 kg), 5,000 lbs. (2250 kg), 7,000 lbs. (3150 kg), 8,000 lbs. (3600 kg) and 9,000 lbs. (4050 kg)
Maximum Tensile Force	130,000 lbs. (59,000 kg)
Maximum Compression Force	130,000 lbs. (59,000 kg)
Torque	600 lb-ft (815 N·m)



28-pin Male Plug
(Use only 10 banana plugs)



Applications

- Conveyed downhole tools in high deviated, horizontal or hostile well by tubing or drilling pipe.
- High temperature, high pressure, high conductivity mud and high voltage.
- Simply structure and design for easy operation at wellsite.
- No need vacuum pump and circulation system.



Introduction

Pipe Conveyed Logging Tool is used to convey logging tools under deviation and horizontal well conditions, such as high temperature, high pressure, high conductivity mud of downhole to achieve the docking cable and instruments. PCL-H can remain unchanged in the conventional logging projects. The premise and guarantee the quality of measurement tasks to complete, it can be coring, repeat formation test, dip logging, perforating and so on. Using this system can not only measured by conventional logging the best information, but can also be micro-resistivity scanning operations. During the logging operation, can measure all standard measurements, with significant economic benefits.

Specifications

Maximum Temperature 400°F (200°C)
 Maximum Pressure 25000 psi (172.4 MPa)
 Plug Diameter 1.5 in. (38 mm)
 Contact Resistance <0.1 ohm
 Insulation Resistance >200 M ohm
 Max. Latch Deviation 90°
 Docking Locking Power 1000 lbs.-1200 lbs.



7-conductor Quick Change Assembly (PCL-H-QC)
 Tool Diameter 3.54 in. (90 mm)
 Shipping Length 3 ft.-7.44 in. (1.1 m)
 Weight 46.2 lbs. (21 kg)

7-conductor Socket Assembly (PCL-H-SA)
 Tool Diameter 1.57 in. (40 mm)
 Shipping Length 6.12 in. (0.15 m)
 Weight 1.1 lbs. (0.5 kg)

Pump-down Head Assembly (PCL-H-PH)
 Tool Diameter 2.01 in. (51 mm)
 Shipping Length 3 ft.-10.56 in. (1.18 m)
 Weight 16.06 lbs. (7.3 kg)

Support Sleeve (PCL-H-SS)	2.875 in. TBG	5 in. (NC 50)
Tool Diameter	3.95 in. (101 mm)	6.5 in. (165 mm)
Shipping Length	4 ft.-10.68 in. (1.49 m)	5 ft.-3.24 in. (1.61 m)
Weight	149.6 lbs. (68 kg)	182.6 lbs. (83 kg)

Side Entry Sub (PCL-H-SE)	3.5 in. (NC 38)	5 in. (NC 50)
Tool Diameter	5 in. (127 mm)	6.5 in. (165 mm)
Shipping Length	4 ft.-2.4 in. (1.28 m)	4 ft.-5.28 in. (1.35 m)
Weight	195.8 lbs. (89 kg)	321.2 lbs. (146 kg)

Offset Sub (PCL-H-OS)
 Tool Diameter 4.41 in. (112 mm)
 Shipping Length 3 ft.-2.28 in. (0.97 m)
 Weight 63.8 lbs. (29 kg)

Cross Offset Sub (Cross Decentralizer) (PCL-H-XO)
 Tool Diameter 5.51 in. (140 mm)
 Shipping Length 5 ft.-1.08 in. (1.55 m)
 Weight 129.8 lbs. (59 kg)

Sinker Bar (PCL-H-SB)
 Tool Diameter 1.69 in. (43 mm)
 Shipping Length 5 ft.-6.96 in. (1.70 m)
 Weight 26.4 lbs. (12 kg)

Cross Offset Sub (For Slimhole) (PCL-H-XS)
 Tool Diameter 4.69 in. (119 mm)
 Shipping Length 5 ft.-1.08 in. (1.55 m)
 Weight 121.25 lbs. (55 kg)

Applications

- Prevents stuck or lost tool string.
- Provides a short, compact design and doesn't require additional tools to enhance its operation.
- Allows electrical "pass through" to the logging companies' wireline tool string.
- Provides multiple run and activation capability.
- Uses mechanical operation. No time delay issues, or concerns with pressure and temperature.
- Accommodates instant relatching.

Introduction

The Multi-Conductor Extreme (MCE) is a field-proven, cost-effective way to help prevent stuck tool strings and expensive fishing jobs during wireline logging operations. Precision engineered to operate reliably, the MCE provides instant, unlimited activations, with no waiting periods or time delays. Once line tension exceeds the setting of the jar (indicating a stuck condition), the MCE activates and frees the stuck tool string.

Specifications

Maximum Temperature	400°F (204°C)
Maximum Pressure	25,000 psi (172.4 MPa)
Tool Diameter	3.375 in. (86 mm)
Make-up Length (Open)	13 ft.-5.42 in. (4.1 m)
Make-up Length (Closed)	12 ft.-9.54 in. (3.9 m)
Shipping Length	15 ft.-1.10 in. (4.6 m)
Weight	275.6 lbs. (125 kg)
Maximum Tensile	210,000 lb. (95,254.4 kg)
Minimum Setting	4,409 lb. (2,000 kg)
Maximum Setting	10,000 lb. (4,535.9 kg)
Voltage Rating	1,000 V



Applications

- Detect and measure external cablehead tension and compression forces at the top of the tool string

Introduction

The DFG-R Downhole Force Gauge is a 3.375" O.D., instrument with Formation Tester tools. The DFG-R must be connected to the top of the instrument string. The functions of the DFG-R are to detect and measure external tension and compression loads at the top of the tool string and send this information to the telemetry unit in digital form. The device has the capability to measure from -12,000 pounds (compression) to +12,000 pounds (tension). The DFG-R is designed for the Formation Multi-Tester.

Specifications

Maximum Temperature	350°F (177°C) for 8 hours
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	3.375 in. (86 mm)
Make-up Length	3 ft.-8.76 in. (1.14 m)
Shipping Length	5 ft.-1.76 in. (1.57 m)
Weight	80 lbs. (36.29 kg)
Measurement Range	0 -12,000 lbs. Tension 0 -12,000 lbs. Compression
Absolute Accuracy	± 1000 lbs. Tension/Compression ± 100 lbs. Differential Tension ± 100 lbs. Differential Compression
Repeatability	± 100 lbs. Tension ± 100 lbs. Compression
Power Requirements	
Operating Voltage & Current	250 Vac @ 250 mA (Max.)
Wireline Requirements	7 conductor cable
Detector or Sensor Type	Strain Guage
Maximum Tensile Force	36,250 lbf. (161,248 N)
Maximum Compressive Force	36,250 lbf. (161,248 N)
Possible Combinations	PI Reservoir Characterization Tester Software (PIWST-RCT) Tool strings
Vibration & Shock	Meets Spec. GV-WI/RD-0038-A/6





Applications

- Formation pressure measurement
- Real Time flow analysis.
- Fluid sampling

Benefits

- Slim size holes operations
- Provides accurate pressure measurements for interpretation
- Reduces filtrate contamination of final sample
- Provides safe transport for sample bottles
- Saves rig time through safe and efficient operations

Features

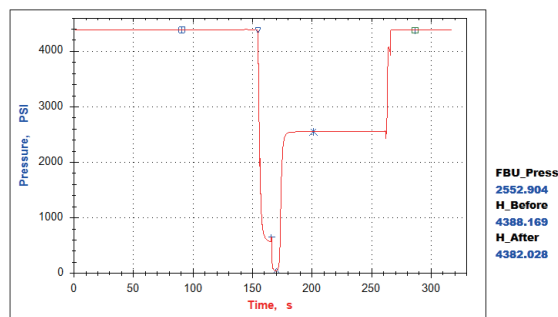
- Operates in holes up to 15.25 in.
- Small tool OD of 4.5 in.
- Improved Quartz Pressure Gauge
- Max sample pump volume is 56.7 cc
- Tank Volume is 2x600 cc
- Certified sample bottle
- Optional backup shoes
- Combinable with other tools

Introduction

The Reservoir Characterization Tester-Slim with a 3.625 in. (92 mm) outer diameter (O.D.)-brings wire line formation tester services to small-diameter boreholes. It can also be run in wells where conventional tools cannot operate because of abrupt changes in angle, swelling formations, hole restrictions, and other drilling problems.

The pressure measuring curve are as follows:

MED Depth,m		2540.177		TVD Depth,m		2540.177	
History Plot:Elapsed Time vs.Pressure							
DD Start, s	154.440	SF Press, psi	2552.904	Flow Rate, cm3/s	1.295337		
DD End, s	169.960	FF Press, psi	42.547	Chamb.Vol, cm3	10.000		
BU Start, s	169.960	Kdd Perm, mD	4.032578				
BU End, s	201.080	kdd/u,	mD/cP	4.032578			



Downhole Tool String

MCE	Multi-Conductor Extreme Jar (Optional)
DFG-R	Downhole Force Gauge-R (Optional)
TGT-B	Telemetry & Gamma Ray-B
RCT-S-FC	RCT-S Cartridge
RCT-S-HU	RCT-S Hydraulic Unit
RCT-S-PS	RCT-S Probe Single Sub
RCT-S-SU	RCT-S Sample Unit
RCT-S-FA	RCT-S Fluid Analyzer
RCT-S-PO	RCT-S Pump Out Sub
RCT-PA	RCT Dual-Packer (Optional)

* RCT-S connects with RCT-PA for 6 in. and 8.5 in. bit size as optional.

** RCT-S-DP (Dual Packer) as special order for 4.5 in. bit size.



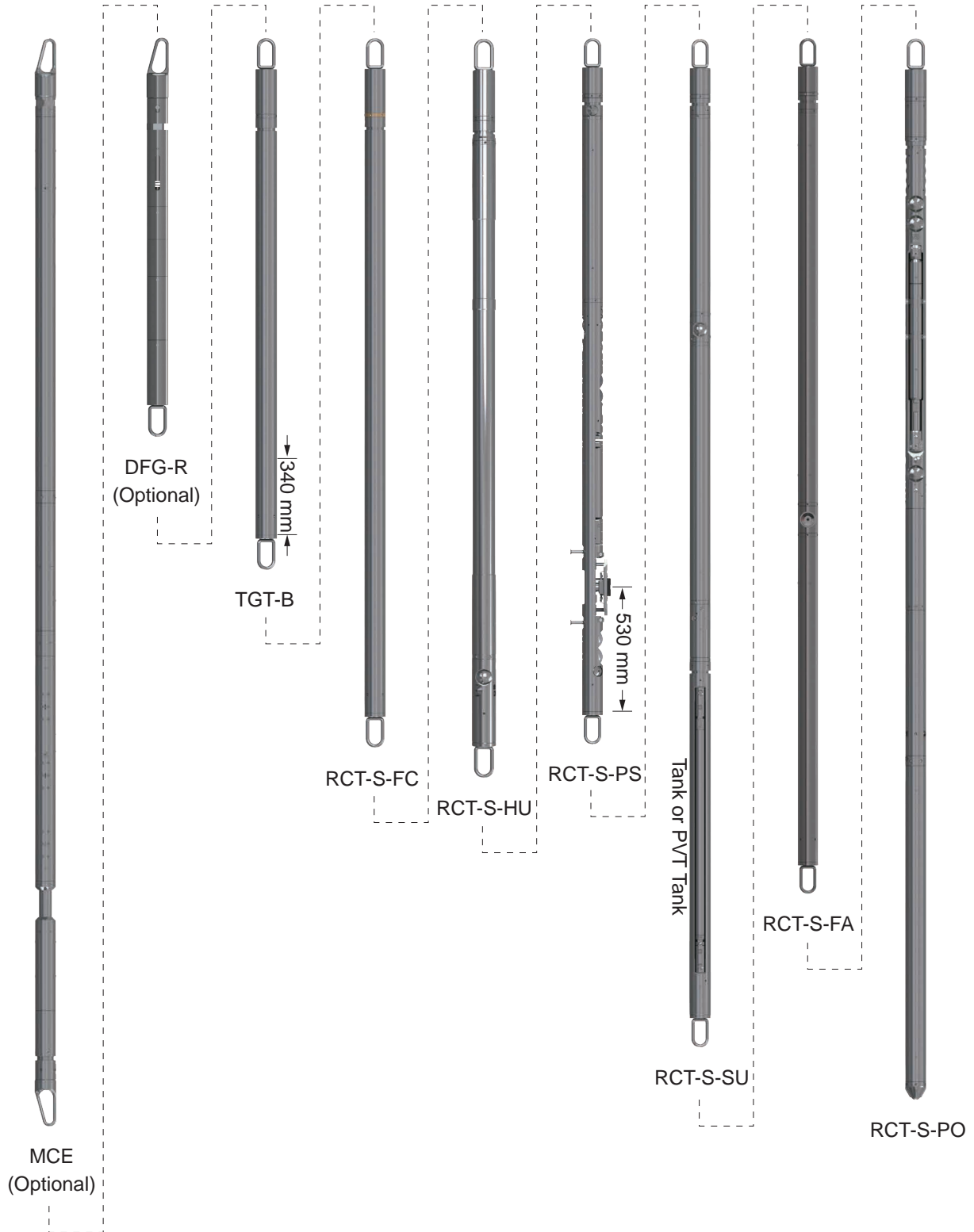
RCT-PA (Optional)



Reservoir Characterization Tester-Slim (RCT-S)

Geo-Vista

Tools:





Applications

- Formation pressure measurement
- Real Time flow analysis.
- Fluid sampling

Benefits

- Slim size holes operations
- Provides accurate pressure measurements for interpretation
- Reduces filtrate contamination of final sample
- Provides safe transport for sample bottles
- Saves rig time through safe and efficient operations

Features

- Operates in holes up to 15.25 in.
- Small tool OD of 4.5 in.
- Improved Quartz Pressure Gauge
- Max sample pump volume is 56.7 cc
- Tank Volume is 2x600 cc
- Certified sample bottle
- Optional backup shoes
- Combinable with other tools

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Tool Diameter	3.625 in. (92 mm)
Probe Section Diameter	Hole Size Range
3.625 in. (92 mm)	4.5 in. to 9 in. (114.3 mm to 228.6 mm)
5 in. (127 mm)	6 in. to 11.75 in. (152.4 mm to 298.5 mm)
6.75 in. (171 mm)	10.75 in. to 15.25 in. (273.1 mm to 387.4 mm)
Make-up Length	67 ft. (20.4 m) (Without MCE\DFG-R)
Weight	1201 lbs. (544.8 kg) (Without MCE\DFG-R)
Pretest Volume	5 cc & 10 cc or 5 cc & 5 cc (Unadjustable)
Setting Force	5127 lbf. (22,806 N)
Maximum Tensile Force	100,000 lbf.
Maximum Compressive Force	25,000 lbf.
Sample Pump	
Volume	56.7 cc (Max.)
Pump Differential Pressure	4,320 psi (29.8 MPa) Max.
Nominal System Pressure	3,600 psi @ 350°F (24.8 MPa @ 175°C)
Tank Volume	2x600 cc (PVT Optional)
AC Motor Power	400 Vac @ 1.1 A (Max.)
DC Motor Power	600 Vdc @ 2 A
Power Requirements	250 Vac @ 250 mA (Max.)
Quartz Pressure Gauge	
Transducer	20,000 psi (137.9 MPa)
Accuracy	0.02% FS
Resolution	<0.008% psi/sec
Strain Pressure Gauge	
Transducer	10,000/20,000 psi (68.9 MPa/137.9 MPa)
Accuracy	±0.15% FS
Resolution	0.1 psi /0.2 psi
Resistivity Sensor	
Range	0.01-20 ohm-m
Accuracy	0.01 ohm-m or ±5% of reading 20 ohm-m
Resolution	0.001 ohm-m
Capacitance Water Holdup Sensor	
Range	0-100% (best value 0-40%)
Accuracy	±1% (water holdup 40%)
Resolution	0.1%
Tuning Fork Density Sensor	
Range	Range of density measurement 0 g/cc to 1.25 g/cc In the viscosity range of 1.0 cS to 50 cS
Accuracy	±0.03 g/cc
Resolution	0.01 g/cc
Relative Bearing (Optional)	
Measurement Range	0°-359°
Accuracy	±1° (DEV 90°) ±1.5° (DEV10°) ±2° (DEV 3°-5°) ±5° (DEV 1°-2°)



Applications

- Fast pressure & mobility measurements on the first logging run
- Pressure profiles & mobility measurements to combine with petrophysical, seismic, and conventional logging data to develop a static reservoir model
- Fracture stimulation design in formations targeted for multilevel or stage fracturing operations
- Depleted zones identification in a wider mobility range
- Uneconomic zones delineation to avoid during fracturing
- Reservoir fluid density measurements with gradients

Benefits

- Pressure measurements and fluid mobilities in a fraction of the time required by multifunction formation testers
- Increased survey efficiency with minimized setting and retracting times
- Saved time and cost with the elimination of additional wireline runs solely for acquiring pressure measurement data
- Reduced risk of sticking
- Reduced overall expenditure for pressure testing

Features

- Faster stabilization times after sudden pressure and temperature changes by fast response sensor.
- Combinable with openhole wireline services
- Optimized pressure test quality and reduced time on station
- Enhanced pretest system for more accurate and precise control of pretest volume and rate than conventional hydraulic pretest systems
- Rapid confirmation of all measurements, if desired, without retracting the tool

Introduction

The RCT-X service brings new efficiency to the formation pressure testing process by significantly reducing both the time and risk involved with multifunction formation testers. Unlike conventional formation pressure test tools that take formation fluid samples, the tool obtains only pressure and fluid mobility measurements during the first logging run. And it makes reservoir pressure and mobility measurements while stationary for less than a minute.

Specifications

Tool Nominal Diameter	3.5 in. (89 mm)
Tool Length	26.8 ft. (8.18 m)
Weight	605 lbs. (275 kg)
Probe Section Diameter	Hole Size Range
3.625 in. (92 mm)	4.5 in. to 9 in. (114.3 mm to 228.6 mm)
5 in. (127 mm)	6 in. to 11.75 in. (152.4 mm to 298.5 mm)
6.75 in. (171 mm)	10.75 in. to 15.25 in. (273.1 mm to 387.4 mm)
Maximum Pressure	20,000 psi (140 MPa)
Maximum Temperature	350°F (175°C)
Pretest Volume	0.1 ml-35 ml (Adjustable)
Pretest Rate Range	3 ml/min to 120 ml/min
Maximum Drawdown	6,500 psi (44.8 MPa)
Setting Force	5512 lbf. (24,528 N)
Maximum Tensile Force	50,000 lbf. (222,411 N)
Maximum Compressive Force	22,000 lbf. (97,861 N)
Quartz Pressure Gauge	
Transducer	20,000 psi (140 MPa)
Accuracy	0.02% FS
Resolution	<0.008% psi/sec





Applications

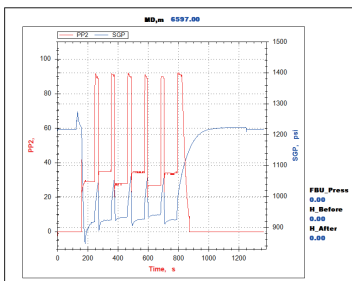
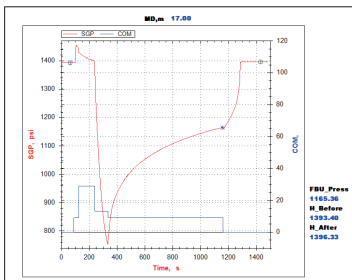
- Formation pressure measurement
- Formation fluid sampling
- Mini-Drillstem Test (DST) and productivity assessment
- In-situ stress and minifrac testing

Benefit

- Testing and sampling in Casing hole
- Fast, repeatable pressure measurements
- Real-time fluid gradients, permeability and contamination assessment

Features

- Two samples in one trip
- Inflatable dual packers is hydraulic
- Accurate pressure measurements using a fast response Crystal Quartz Gauge
- Programmable pretest pressure, rate and volume
- Field-proven database for accurate pumpout time



Introduction

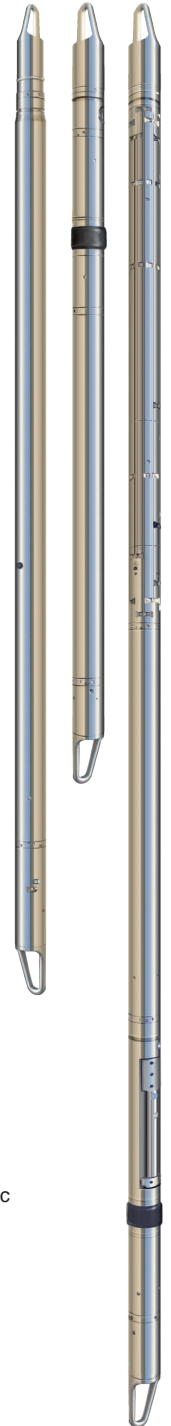
Reservoir Characterization Tester-Casing confirm depth by natural gamma Pack the target formation by packer, and then pump out formation fluid. Besides conventional formation test, it can be also used to obtain reservoir fluid in controllable volume, and identify properties of the fluid sample by water holdup sensor, Density Sensor, resistivity sensor, pressure and temperature sensor at the same time. The RCT-C only used in casing hole.

Downhole Tool String

MCE	Multi-Conductor Extreme Jar (Optional)
DFG-R	Downhole Force Gauge (Optional)
TGT-B	Telemetry & Gamma Ray-B
RCT-S-FC	FT Cartridge
RCT-C-HU	Hydraulic Unit Sub
RCT-C-DP	Double Packer (Include Pump out Sub)
RCT-S-FA	Fluid Analyzer Sub
RCT-S-SU	Sample Unit 2*600 cc

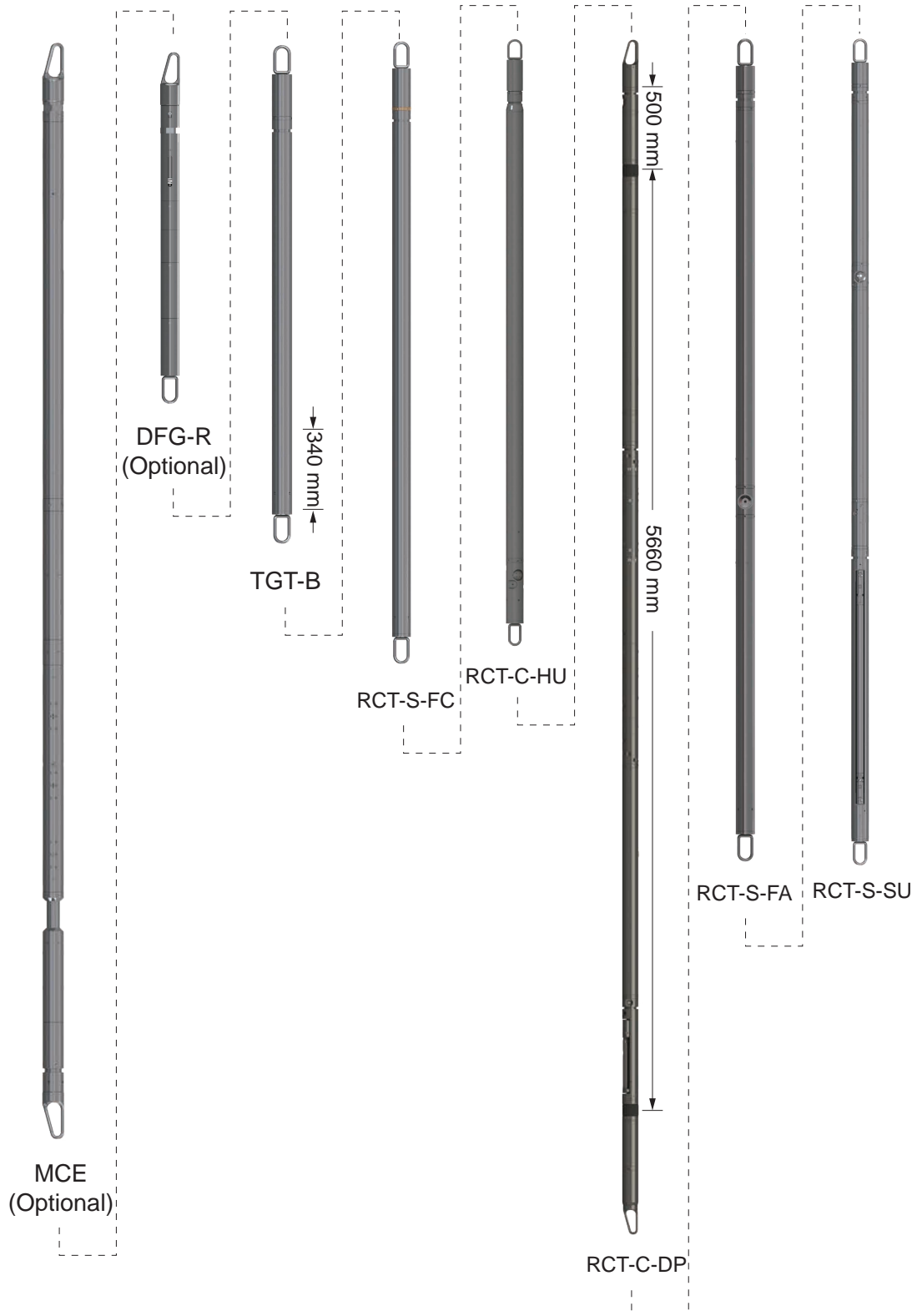
Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Make-up Length	63 ft.-4.44 in. (19.32 m) (without Entrench Sub)
Weight	1300.7 lbs. (590 kg)
Tool Diameter	3.875 in. (98 mm)
Minimum Hole Diameter	5.5 in. (139.7 mm)
Maximum Hole Diameter	7 in. (177.8 mm)
Sealing shaft length-Min	18.57 ft. (5.66 m)
Sealing shaft length-Max	68.57 ft. (20.9 m)
Maximum Sample Volume	2×600 cc
Maximum Tension Force	166,000 lbf. (738,405 N)
Maximum Compressive Force	100,000 lbf. (444,822 N)
Strain Pressure Gauge	
Scale	10,000/20,000 psi (68.9 MPa/137.9 MPa)
Accuracy	±0.15% of Full Scale
Resolution	0.1 psi/0.2 psi
Quartz Pressure Gauge	
Transducer	20,000 psi (137.9 MPa)
Accuracy	0.02% of Full Scale
Resolution	<0.008% psi sec
Resistivity Sensor	
Range	0.01-20 ohm-m
Accuracy	±5% (full range)
Resolution	0.001 ohm-m
Capacitance WaterHoldup Sensor	
Range	0 -100% (best value 0-40%)
Accuracy	±1% (water holdup 40%)
Resolution	0.1%
Tuning Fork Density Sensor	
Range	Range of density measurement 0 g/cc to 1.25 g/cc
In the viscosity range of	1.0 cS to 50 cS
Accuracy	±0.03 g/cc
Resolution	0.01 g/cc
Power Requirements	400 Vac/1.2 A
Relative Bearing (Optional)	
Measurement Range	0°~359°
Accuracy	±1° (DEV 90°) ±1.5° (DEV 10°) ±2° (DEV 3°-5°) ±5° (DEV 1°-2°)





Tools:





Formation Coring Tool (FCT) Formation Coring Tool-Large (FCT-L)

Geo-Vista

Applications

- Lithology and Secondary porosity analysis
- Porosity and permeability determination
- Confirmation of hydrocarbon shows
- Determination of clay content
- Determination of grain density
- Detection of fracture occurrence



Introduction

This coring service enables collecting sidewall-core samples equivalent to standard laboratory core plugs in high-angle and horizontal wells. FCT-L is a new version of FCT series to take large cores, which is 1.5 inches in diameter and 2.5 inches in length. The core's volume is 3 times as much as that of FCT. 25 cores can be obtained in one trip. With optional tools, the number of cores is up to 50. The FCT/FCT-L tool is combined with Downhole Force Gauge (DFG-F) to measure downhole cable tension to make safe PCL operation. For wireline sidewall coring, Multi-Conductor Extreme Jar (MCE) and Cablehead Releasable (CHR) is suitable for safety operation.

FCT/FCT-L also includes gamma ray sensor and orientation sensor inside. GR make sure sidewall coring operation in any depth. GR curve helps compare with openhole logging curves. Orientation indicates the core direction.

Compared with drilling pipe coring, sidewall coring is quickly, large range, position accuracy, reduce cost and save operation time. Compared with explosive sidewall coring, FCT samples are not broken, that represent the original downhole formation better.

Specifications

Surface Power Supply	380 Vac/50 Hz
Maximum Temperature	275°F (135°C)/350°F (175°C)
Maximum Pressure	20000 psi (138 MPa)
Make-up Length	25.3 ft. (7.7 m) (FCT) 24.6 ft. (7.5 m) (FCT-L)
Weight	436.5 lbs. (198 kg) (FCT) 507.1 lbs. (230 kg) (FCT-L)
Tool Maximum Diameter	5 in. (127 mm) (FCT) 5.83 in. (148 mm) (FCT-L)
Minimum Hole Diameter	6 in. (152.4 mm) (FCT) 6.875 in. (174.6 mm) (FCT-L)
Maximum Hole Diameter	13 in. (330.2 mm) (FCT) 17 in. (431.8 mm) (FCT-L)
Core Diameter	1 in. (25.4 mm) (FCT) 1.5 in. (38.1 mm) (FCT-L)
Maximum Core Length	1.75 in. (44.5 mm) (FCT) 2.375 in. (60.325 mm) (FCT-L)
Vertical Resolution	0.2 m
Hole Deviation	Vertical to Horizontal (in highly-deviated hole needs proper tools)
Maximum Coring Number (One Trip)	25 (Optional 50) (FCT) 25 (Optional 50) (FCT-L)
Relative Bearing (Optional)	
Measurement Range	0°~359°
Accuracy	±1° (DEV 90°) ±1.5° (DEV 10°) ±2° (DEV 3°-5°) ±5° (DEV 1°-2°)



Formation Coring Tool (FCT) Formation Coring Tool-Large (FCT-L)

Geo-Vista

Applications

- Lithology and Secondary porosity analysis
- Porosity and permeability determination
- Confirmation of hydrocarbon shows
- Determination of clay content
- Determination of grain density
- Detection of fracture occurrence



Optional

DFG-F (Downhole Force Gauge)

Tool Diameter	3.386 in. (86 mm)
Make-up Length	3 ft.-8.76 in. (1.14 m)
Weight	58 lbs. (26.5 kg)
Measurement Range	0-12,000 lbs Tension 0-12,000 lbs Compression
Absolute Accuracy	± 110 lbs. ± 220 lbs. @ 175°C

MCE (Multi-Conductor Extreme Jar)

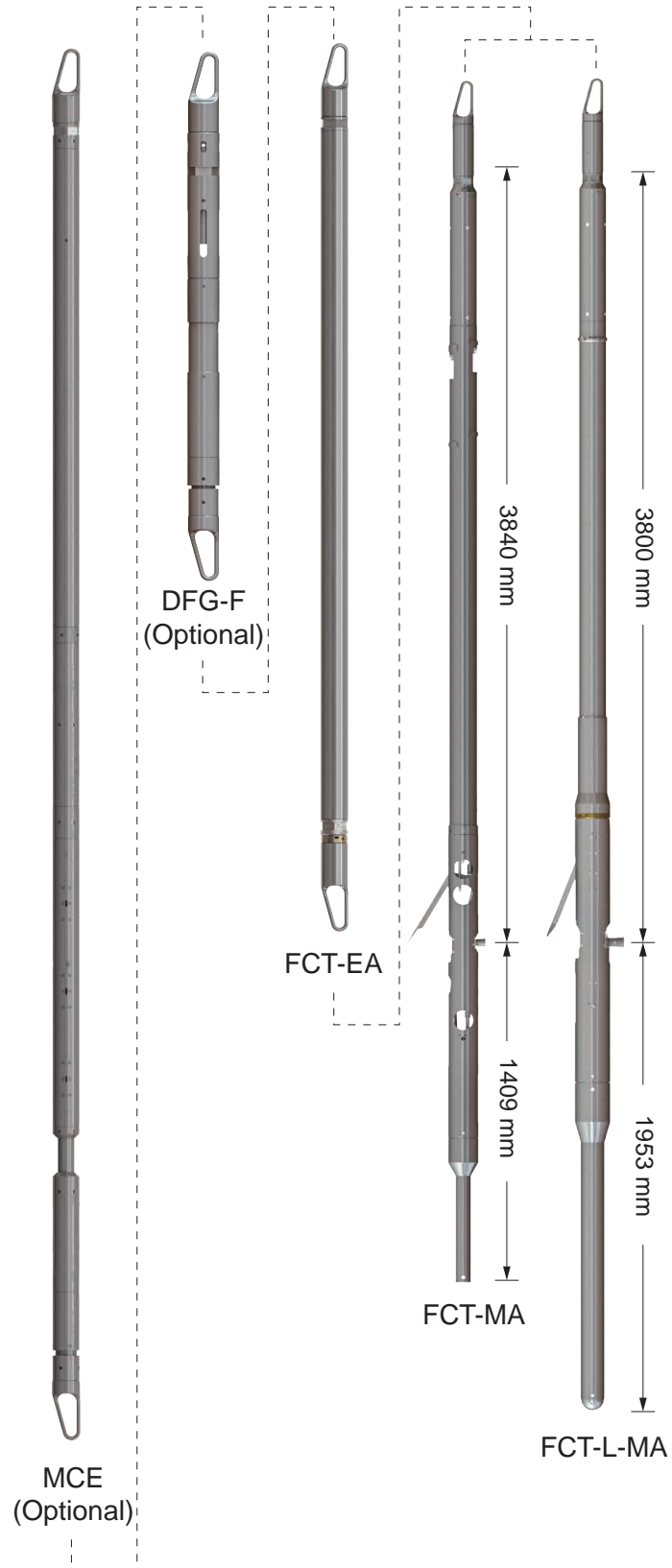
Tool Diameter	3.375 in. (86 mm)
Make-up Length (Open)	13 ft.-1.7 in. (4 m)
Make-up Length (Closed)	12 ft.-6.7 in. (3.83 m)
Weight	260 lb. (118 kg)
Maximum Tensile	210,000 lb. (95,254.4 kg)
Minimum Setting	1,000 lbs. (453.6 kgf)
Maximum Setting	8,000 lbs. (3628.7 kgf)
Voltage Rating	1,000 V



Formation Coring Tool (FCT)
Formation Coring Tool-Large (FCT-L)

Geo-Vista

Tools:





Applications

- Indicate formation porosity in open or cased boreholes.
- Dividing reservoir.
- Distinguish gas reservoir.

Introduction

The GCN-T utilizes the neutron generator rather than the chemical source. The high energy neutron is thermalized by the formation and captured the He3 detectors.

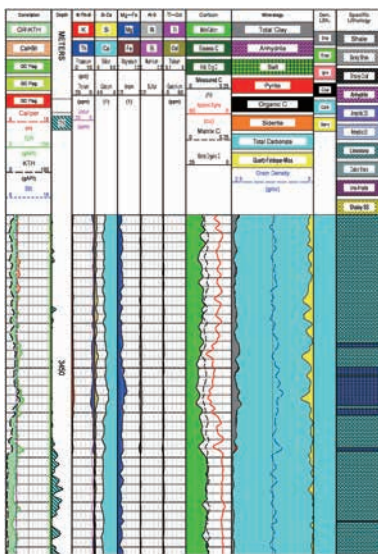
Specifications

Maximum Temperature	350 °F (175 °C) 430 °F (220 °C) 8 hours Advanced
Maximum Pressure	20,000 psi (137.9 MPa) 25,000 psi (172.4 MPa) Advanced
Tool Diameter	2-1/4 in. (57 mm)
Minimum Hole Diameter	3-1/2 in. (89 mm)
Maximum Hole Diameter	16 in. (406 mm)
Make-up Length	9 ft.-10.11 in. (3 m)
Shipping Length	11 ft.-1.07 in. (3.38 m)
Weight	70 lbs. (32 kg)
Maximum Logging Speed	60 ft./min (18 m/min)
Typical Logging Speed	30 ft./min (9 m/min)
Measuring Range	-3 to 70 Limestone Porosity Units (p.u.)
* Accuracy	± 0.5 p.u. below 7 p.u. porosity ± 7% of recorded value above 7 p.u. porosity
* Repeatability	±1.5 p.u. @ 15% Limestone porosity
Depth of Investigation	12 in. (304.8 mm), estimated for a 7.88-in. (200.0 mm) water-filled borehole with nominal 15% porosity formation
Vertical Resolution	28 in. (711.2 mm) given proper formation contrast above and below zone of interest
Tension	72,000 lbf.
Compression	44,500 lbf.
*Applies to a decentralized tool in a smooth 7.88 in. (200.0 mm) water-filled borehole.	
Operating Voltage and Current	36 Vdc (Cablehead)
Detector or Sensor Type	He-3 tube
Source Type	Neutron generator
Source life	1000 hours



Applications

- Carbonate, gypsum or anhydrite, QFM, pyrite, siderite, coal, and salt fractions for complex reservoir analysis
- Matrix density and matrix neutron values for more accurate porosity calculation
- Mineralogy-based permeability estimates
- Coalbed methane bed delineation, producibility, and in-situ reserves estimation



Introduction

The Elemental Capture Tool (ECT) incorporates an electronic pulsed-neutron source in order to generate gamma rays from capture and inelastic nuclear interactions with energies indicative of the parent elements. The ECT service incorporates both the ECT and the Gamma Ray instruments in order to provide lithological and quantitative mineralogical information about the subsurface formations that surround the borehole. This is achieved by first identifying the individual elements in the formation using the principles of gamma ray spectroscopy for both natural and neutron-induced gamma ray spectroscopy.

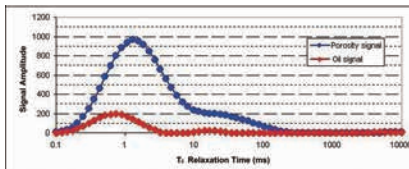
Specifications

Maximum Temperature Ratings	350°F (175°C)
Maximum Pressure	20,000 psi (137.9 Mpa)
Length	15.6 ft. (4.75 m) with QA
Weight	267 lbs. (121 kg) with QA
Diameter	4.87 in. (124 mm)
Minimum Hole Diameter	6 in. (152 mm)
Maximum Hole Diameter	22.0 in. (558.8 mm)
Recommended Logging Speed	10 ft./min. (3 m/min.)
Maximum Logging Speed	15 ft./min. (4.6 m/min.)
Gamma Ray Energy Range	0.5 to 10 MeV
Accuracy	Element Uncertainty Al 0.90% C 1.3% Ca 1.0% Fe 0.22% Gd 1.3 ppm Mg 1.2% S 0.37% Si 1.4% Ti 0.05%
Vertical Bed Resolution	18 in. to 24 in. (457 mm to 610 mm)
Measure Point	5.6 ft. (1.71 m) from bottom sub
Maximum Compressive Force	6-in. hole: 125,000 lbs. (56,699 kg) 8.5-in. hole: 76,500 lbs. (34,700 kg) 12.25 in. hole: 42,000 lbs. (19,051 kg)
Maximum Tensile Force	38,000 lbs. (17,292 kg)
Combinability	MGTS telemetry instruments
Depth of Investigation	8.5 in. (216 mm) for Inelastic 21 in. (533 mm) for Capture for Solid Rock Matrix
Detector	3-in. x 6-in. BGO scintillation
Source Type	Pulsed Neutron (14 MeV)
Number of Energy Channels	256
Repeatability	± (0.2 to 1.4)% of weight, depending upon the specific element.



Applications

- No sample shape requirement
- Without sample broken
- Various results from one sample
- Fast report



Porosity(%)	19.27	Permeability (mD)	0.86
Oil Saturation(%)	13.83	Oil Saturation(%)	--
Irreducible Fluid	80.01	Movable Water	6.16
Movable Water	86.17	Initial Irreducible Fluid	--
Initial Movable Water	--	Initial Water Saturation(%)	--
Initial Water Saturation(%)	2.53	Movable Fluid Saturation	6.22



Introduction

NMR technology have lots of excellences: detecting more parameters, advanced technology, no requirement on shape, getting many parameters in one sample and so on. The instrument shape could be smaller and the weight could be lighter by upgrade in digital way. So that, it is adapt to build up a mini-laboratory for geological service.

Specifications

System Frequency	2 MHz-5 MHz series, tunable
Magnetic Field Strength	1200 Gauss
Availability Sample Metering Zone	Diameter 1.5 in. Height 2.5 in.
Frequency Precision	0.01 Hz
Radio Frequency Emission Power	25 W
Radio Frequency Phase Variation Ability	4
Signal Receive-send Method	Digital perpendicularity
Max Echo Wave Number	8000
Least Echo Wave Time	150 ms
Probe Switching Time	No more than 0.5 s
System Control Method	USB port control
Operating System	Microsoft Windows XP
Weight	55 kg
Volume	240 mm x 400 mm x 210 mm x 3

Features

- The system records the data including the original signal of the instrument, calibrated engineering value and the processed data. Because the original signal of the instrument is recorded, the logging data could be reprocessed by different parameters if required.
- All of the calibration value and verification value could be displayed by the operator, therefore, it is easy to confirm: the value of the super-value will flash, causing the operator's attention.
- Repeated curves can be real-time displayed on the main logging curves to verify the repeatability of the curves.
- Real-time plotting of cross-plot graphs allows the operator to verify the correctness of the logging response which is based on the expected model.
- Real-time environmental correction eliminates the subjective assessment of the operator's quality control process.
- Real-time similarity correction verifies the integrity of the acoustic waveform data.
- Using personnel safety and data protection systems.
- Reduces wellsite operating time and ensure system reliability by using advanced computer technology and redundant design simplify data acquisition and processing.

* Telemetry :




MGTS
SGTS
RGTS

Wireline Perforating Panel (WPP)

Features

- Wide voltage input (100 Vac-240 Vac)
- With safety switch
- PFC power supply is up to 150 V, and perforating and coring power supply adopts the mode of external DC power supply
- The polarity of perforating and coring voltage is adjustable

Introduction

The  PI Data Acquisition System ( PIDAS) is designed for data acquisition and processing in combination with Open-hole and Cased Hole tool. This  PIDAS is based on portable notebook as a host and remote transmission system with high-speed data communication.



Specifications

Physical Dimensions & Weights

Height	29.13 in. (740 mm)
Depth	29.33 in. (745 mm)
Width	27.56 in. (700 mm)
Shipping Weight	160.9 lbs. (73 kg)

Environmental Characteristics

Operating Temperature	0°C~+50°C
Storage Temperature	-20°C~+75°C
Relative Humidity	< 95%
Vibration (3D)	3 g 10-60 Hz (When not working)
Shock (3D)	3 g 10-60 Hz (When not working)
System Power Supply	85-265 Vac, 43 Hz-70 Hz
Downhole Instrument Power Supply	
AC Power	0-720 Vac, 2 A, 1440 W
	0-1440 Vac, 1 A, 1440 W
DC Power	0-1000 Vdc, 2 A, 2000 W

System Composition

Portable surface logging system is divided into: data acquisition system, power supply system and other major parts. The functions of each part is as follows:


1. Surface Data Acquisition System: the computer is the core, controlled by several loaded software, to complete a variety of logging operations. Such as the processing, recording, display, quality control and fast processing and interpretation of logging data on the wellsite. Including: PC, Wireline Acquisition Panel (WAP).
2. Power Supply System provides power to the surface system and downhole equipment. Currently, logging power supply system usually use vehicle generators or wellsite power.
3. Hoist Display Unit (HDU) is the display unit for the Surface System. Equipped with a color LCD touch screen display, the unit provides a continuous display of depth information. In addition, HDU also displays other variables monitored and provides a visual and audible alarm when any of these variables are outside a preset range.

Features

- Used for a variety of downhole instruments for openhole and cased hole with different modules.
 - PI Data Acquisition System (PIDAS)
 - Post-processing & presentation management (FileView)
 - PI Wireline Formation Sampling and Testing System (PIWST)
 - PI Formation Coring Software (PIWST-FCT)
 - PI Mechanical Sidewall Coring Software (PIWST-MSD)
 - PI Reservoir Characterization Tester Software (PIWST-RCT)
 - PI Formation Test, Fluid Analysis, Pump-Thru Software (PIWST-FFP)
 - PI Production and Engineering Logging System (PIPES)
 - PI Down Hole Camera Software (PIPES-DHC)
 - PI Free Point Indicator Software (PIPES-FPI)
 - PI Mechanical Downhole Cutter (PIPES-MDC)
 - PI Rotary Magnet Ranging Software (PIPES-RMR)
 - PI Gyroscope Orientation Software (PIPES-GOT)
 - PI Downhole Casing & Tubing Tractor Software (PIPES-CTT)
 - PI Downhole Hydraulic Tractor Software (PIPES-DHT)
 - PI MFI Logging System (PIPES-MFI)
 - PI Memory Acquisition and Processing Software (PIPES-MAP)
 - PI Vertical Seismic Profile System (PIVSP)
 - Microseismic monitoring data processing and interpretation software (MMDPI)
 - PI Logging While Drilling System (PILWD)
 - PI Rotary Steerable Software
 - PI LWD Data Presentation Software
 - PI LWD Remote Monitoring Software
- Using multi-window to display nuclear logging equipment which is obtained by the spectrum, acoustic and imaging instruments. These windows can be controlled by the user, in order to display the original data or the processed data, so that, the operator can control the quality of the real-time logging data.
- Provides Multi-tasking and distributed processing at the wellsite, improving log data integrity and wellsite efficiency.

PIDAS Software Introduction

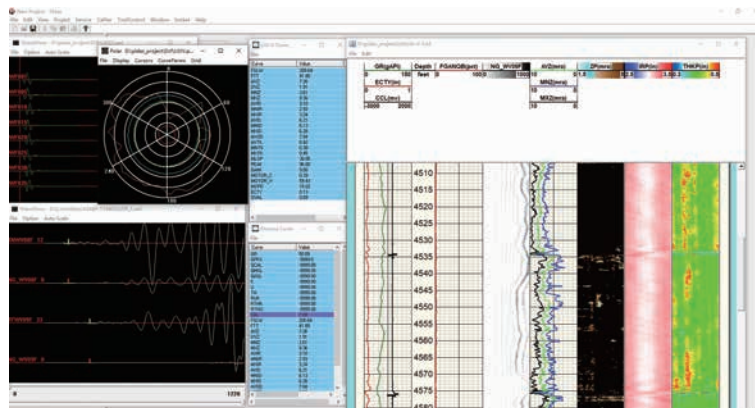
The PIDASView software contains two parts: PIDAS software and FileView software. Each part can run independently.

The  PIDAS software is a control acquisition processing system based on WINDOWS with multi-task & multi-user, and using a large number of modern image processing technology.

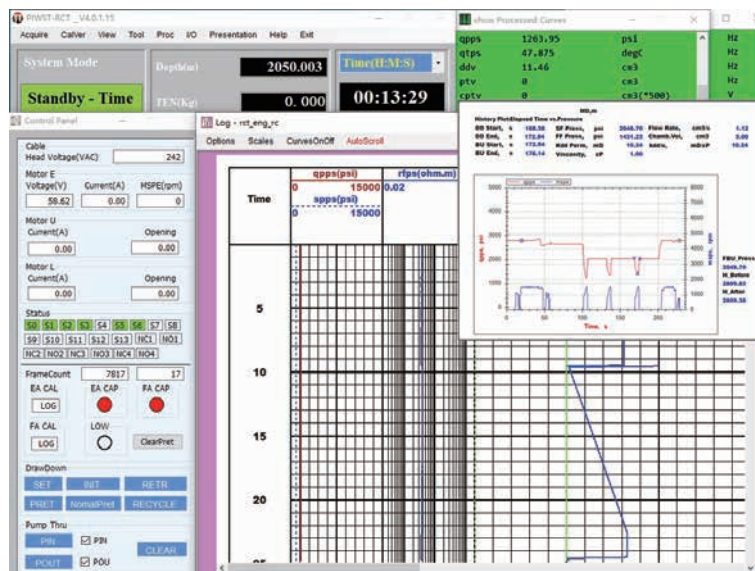
The control acquisition processing system is used to acquire and process various signals of the downhole logging instrument detector and to control other functions of the downhole instrument and converts the acquired signals to engineering values and provides the logging data required by the user.

By equipment array, imaging and large information, real-time logging data acquisition, control and processing achieve multi-parameter acquisition and multi-task time-sharing processing. PIDAS software can be used for a variety of downhole instruments for openhole and cased hole with different modules.

The FileView is a post-processing and presentation software. It can support the basic functions, such as the heading, toolstring, well sketch, calibration, parameters, log plot, data convert, etc. Also, it can provide the data analysis and processing, 2D, 3D, cross plot, compose plot, etc. advanced functions.



USI-G/CBL/VDL service by PI Data Acquisition System module



Pressure Test and Sampling service by PI Reservoir Characterization Tester Software PIWST-RCT module

Features

- Equipped with a safety switch to ensure safe operation.
- Power supply to GR and CCL instruments, the voltage is up to 160 Vdc.
- Adjust the polarity of the power supply
- Both hands must be used simultaneously for perforation and coring to ensure the safety of the operation.
- Using an external DC power supply, the perforation voltage and current no limited by this panel.
- With BYPASS mode, connected with any system.
- Perforation and coring functions, no more panels required.
- Provide a powerless CCL visual indication and signal conditioning

Introduction

Wireline Perforating Panel (WPP) is used for Perforating Control, Coring Control, PFC (Perforating Formation Correlation) power supply for Gamma Ray and CCL, Powerless CCL. It is the first panel connected to the cable drums, and suitable for 7-Conductor and Mono-conductor cable.



Specifications

Physical Specifications

Length	17.7.00 in. (45 cm)
Width	19 in. (48.26 cm)
Height	5.3 in. (13.35 cm)
Weight	22.05 lbs. (10 kg)

Electrical Parameters

AC Input	100-265 Vac / 47-63 Hz
PFC Output Voltage	0-160 Vdc

Environmental Specifications

Operating Temperature Range	32°F (0°C) to 104°F (+40°C)
Storage Temperature Range	-4°F (-20°C) to 158°F (+70°C)
Maximum Humidity	95%



Marketing Manager
Xujie Zhang
Mobile: (+86) 13521254100
Email: zhangxj@renhesun.com

International Sales Manager
Sharry Liu
Mobile: (+86) 13911317865
Email: sharry@renhesun.com

Sales Manager
Dr. Hong Mei
Contact: +1 8323585168
Email: meihong@renhesun.com
Address: 910 Chinquapin Place,
Houston, Texas, USA 77094

Product Manager
Hongai Zhang
Mobile: (+86) 18911632096
Email: zhangha@renhesun.com

International Sales Director
Chen Gang
Mobile: (+86) 13817367599
Email: chengang@renhesun.com

Sales Manager
Chen Hua
Contact: +971 524515130
Email: chenhua@renhesun.com
Address: View 18 Office No. 2102,
Downtown Jabel Ali, Dubai, UAE