



(I) Common Coiled Tubing Drilling System (ComCTD)

3-1/8 in. Common Coiled Tubing Drilling System (ComCTD-3RSS)

3-1/8 in. Common Coiled Tubing Drilling System (ComCTD-3) (Mud Pulse)

3-1/8 in. Common Coiled Tubing Drilling System-Wireline (ComCTD-3W)

2-1/4 in. Common Coiled Tubing Drilling System-Wireline (ComCTD-2W)





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(1) 3-1/8 in. Common Coiled Tubing Drilling Geo-Vista System (ComCTD-3RSS)



Features

- Flexible setup the integrated CTD system
- Data transmission & communication via mud pulse
- Selectable directional system with reliable and automated closed-loop steering
- Azimuth GR service
- Depth control and circulation capability by specific BHA services

Benefits

- On-location BHA adjustments based on customer requirements
- Precise directional control for maximized reservoir contact, optimized wellbore placement and reduced drilling time
- Increased section length in horizontal reservoir section by adjustable steering control and flexibility for high dogleg requirements in build sections
- Optimized formation evaluation and geosteering capability for increased production and improved well placement
- Drilling parameter optimization improved ROP and drilling efficiency

Introduction

The 3.125 in. tool use coiled tubing and rotary steering unit to drill 4.5 -5.5 in. borehole. It has downlink function for steering unit.

Components

Quick Connector Sub (QCS)

Bi-directional Communication & Power system While Drilling (BCP-3)

Battery Management Unit (BAT)

Measurement While Drilling (MWD-B-3)

Rotary Steering Unit (RSU-3)

Bit

Specifications

Tool Size OD 3.125 in. (79.38 mm)

4-1/2 in. to 5-1/2 in. (114 to 140 mm) Borehole Size

688.98 ft. (17.5 m) System length

Power Source Alternator Mud pulse Communication & telemetry

Maximum Flow Rate 130 gpm (490 lpm) Maximum Build Up Rate 13°/100 ft. (13°/30 m)

Tool Specifications

Tool Name	Length	Weight
QCS	1.64 ft. (0.5 m)	66 lbs. (30 kg)
Motor	29.3 ft. (9 m)	220 lbs. (100 kg)
BCP-3	18.04 ft. (5.5 m)	331 lbs. (150 kg)
BAT	13.5 ft. (4.11 m)	1984 lbs. (900 kg)
MWD-B-3	15.75 ft. (4.8 m)	265 lbs. (120 kg)
RSU-3	11.39 ft. (3.47 m)	269 lbs. (122 kg)

SSS BAT RSU





Features

- Flexible setup the integrated CTD system
- Data transmission & communication via mud pulse
- Selectable directional system with reliable and automated closed-loop steering
- Resistivity & GR LWD service
- Real-time WOB, bore & annular pressure, and vibration data
- Depth control and circulation capability by specific BHA services

Introduction

The 3.125 in. tool size has been designed to cover hole sizes from 3.5 inches up to 4.75 inches. This system provides flexibility in configuration to allow tailoring the level of service at the rigsite for Coiled Tubing Drilling (CTD) operations in standard and thru-tubing re-entry slimhole applications to meet customer service needs.

Components

Quick Connnect Sub (QCS)

Agitator (Optional)

Mechnical Circulating Sub (MCS)

Bi-directional Communication & Power system While Drilling (BCP-3)

Measurement While Drilling (MWD-B-3)

Drilling Performance Tool (DPT) (Optional)

Electromagnetic Propagation Resistivity Tool (EPR-3) (Optional)

Inclination and Gamma Ray (IGR)

Electrical Orienting Tool (EOT)

Mechanical Release Joint (MRJ)

Float Value Sub (FVS)

Downhole Thruster (Optional)

2-7/8 in. / 3-1/8 in. Motor

Specifications

Tool Size OD 3.125 in. (80 mm) Borehole Size 3.5 in. to 4.75 in.

(89 mm to 121 mm)

79.82 ft. (24.33 m) System Length System Weight 2001 lbs. (912 kg) 2.375 in. PAC box / pin System Connection top / bottom

Power Source Alternator

Communication & Telemetry Positive Mud Pulse

GR

EOT

Æ

FVS





Benefits

- On-location BHA adjustments based on customer requirements
- Precise directional control for maximized reservoir contact, optimized wellbore placement and reduced drilling time
- Increased section length in horizontal reservoir section by adjustable steering control and flexibility for high dogleg requirements in build sections
- Optimized formation evaluation and geosteering capability for increased production and improved well placement
- parameter optimization improved ROP and drilling efficiency
- Precise and reliable ECD control and management for risk reduction
- Hole cleaning and precise depth correlation improvements while tripping

Operating Specifications & Limits (Sliding operation only)

Max. Flow Rate 130 gpm (490 lpm) 45°/100 ft. (45°/30 m) Max. Build Up Rate

Pressure Drop with Water (w/o PDM) 350 psi at 132 gpm (2.4 MPa at 500 lpm)

Max. Operating WOB 25 klb (111 kN) Max. WOB to Failure 35 klb (155 kN) Max. Operating Overpull 25 klb (111 kN) Max. overpull to Failure 35 klb (155 kN) Max. Hydrostatic Pressure 15,000 psi (103 MPa)

Max. Differential Pressure

With Circulation Ports (EDC) 1,500 psi (10.3 MPa) Without Circulation Ports (ED) 4,500 psi (31 MPa)

Operating temperature limits

300°F (150°C) Max. 40°F (4°C) Min. Sand Content <1%

Solid Content (Max.) 7%

LCM 10 ppb = 28 kg/m³, fine nutplug

Tool Specifications

Tool Name	Length	Weight
QCS	1.64 ft. (0.5 m)	66 lbs. (30 kg)
Agitator	6.89 ft. (2.10 m)	132 lbs. (60 kg)
MCS	3.94 ft. (1.20 m)	18 lbs. (8 kg)
BCP-3	18.04 ft. (5.5 m)	331 lbs. (150 kg)
MWD-B-3	15.75 ft. (4.8 m)	265 lbs. (120 kg)
DPT	3.64 ft. (1.11 m)	119 lbs. (54 kg)
EPR-3 (Optional)	11.39 ft. (3.47 m)	269 lbs. (122 kg)
IGR	5.58 ft. (1.70 m)	113 lbs. (51 kg)
EOT	8.20 ft. (2.50 m)	139 lbs. (63 kg)
MRJ	1.64 ft. (0.5 m)	88 lbs. (40 kg)
FVS	1.67 ft. (0.51 m)	44 lbs. (20 kg)
Thruster	16.50 ft. (4.94 m)	308 lbs. (140 kg)
2-7/8 in. / 3-1/8 in. Motor	9.84 ft. (3.00 m)	220 lbs. (100 kg)





Features

- Flexible setup the integrated CTD system
- Data transmission & communication via mono conductor CT e-line
- Selectable directional system with reliable and automated closed-loop steering
- Resistivity & GR LWD service
- Real-time WOB, bore & annular pressure, and vibration data
- Depth control and circulation capability by specific BHA services

Introduction

The 3.125 in. tool size has been designed to cover hole sizes from 3.5 inches up to 4.75 inches. This system provides flexibility in configuration to allow tailoring the level of service at the rigsite for Coiled Tubing Drilling (CTD) operations in standard and thru-tubing re-entry slimhole applications to meet customer service needs.

Components

Quick Connnect Sub (QCS)

Agitator (Optional)

Power and Communication Tool (PCT)

Vibration& Shock Digital Attitude Sensor (VDS-3)

Drilling Performance Tool (DPT) (Optional)

Electromagnetic Propagation Resistivity Tool (EPR-3) (Optional)

Inclination and Gamma Ray (IGR)

Gyroscope Orientation Tool-Drilling (GOT-D) (Optional)

Electrical Orienting Tool (EOT)

Mechanical Release Joint (MRJ)

Float Value Sub (FVS)

Downhole Thruster (Optional)

2-7/8 in. / 3-1/8 in. Motor

Wireline

Wireline	Wires	OD [in.]	Specified Length
Camesa 1N 32 PTZ	Mono	5/16	23,000 ft. (7,000 m)
Camesa 1N 22 PTZ (ETFE)	Mono	7/32	18,000 ft. (5,500 m)
Camesa 1K 22 PTZ (ETFE)	Mono	7/32	18,000 ft. (5,500 m)
Camesa 7H 42RP (Optional)	Seven	7/16	23,000 ft. (7,000 m)

Specifications

Tool Size OD 3.125 in. (80 mm) Borehole Size 3.5 in. to 4.75 in.

(89 mm to 121 mm)

78.24 ft. (23.85 m) System Length System Weight 1470 lbs. (667 kg) System Connection top / bottom 2.375 in. PAC box / pin

Power Source Via CT e-line Communication & Telemetry Via CT e-line















Benefits

- On-location BHA adjustments based on customer requirements
- High real-time data density for operating safety & efficiency improvements
- Precise directional control for maximized reservoir contact, optimized wellbore placement and reduced drilling time
- Increased section length in horizontal reservoir section by adjustable steering control and flexibility for high dogleg requirements in build sections
- Optimized formation evaluation and geosteering capability for increased production and improved well placement
- parameter optimization for improved ROP and drilling efficiency
- Precise and reliable ECD control and management for risk reduction
- Hole cleaning and precise depth correlation improvements while tripping

Operating Specifications & Limits (Sliding operation only)

Max. Flow Rate 130 gpm (490 lpm) Max. Build Up Rate 45°/100 ft. (45°/30 m)

Pressure Drop with Water (w/o PDM) 350 psi at 132 gpm (2.4 MPa at 500 lpm)

Max. Operating WOB 25 klb (111 kN) Max. WOB to Failure 35 klb (155 kN) Max. Operating Overpull 25 klb (111 kN) Max. overpull to Failure 35 klb (155 kN) 15,000 psi (103 MPa) Max. Hydrostatic Pressure

Max. Differential Pressure

With Circulation Ports (EDC) 1,500 psi (10.3 MPa) Without Circulation Ports (ED) 4,500 psi (31 MPa)

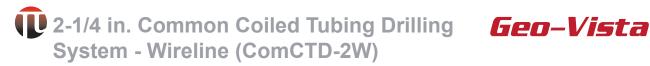
Operating temperature limits

Max. 300°F (150°C) Min. 40°F (4°C) Sand Content <1% Solid Content (Max)

10 ppb = 28 kg/m³, fine nutplug LCM

Tool Specifications

Tool Name	Length	Weight
QCS	1.64 ft. (0.5m)	33 lbs. (30 kg)
Agitator	6.89 ft. (2.10 m)	132 lbs. (60 kg)
PCT	7.94 ft. (2.42 m)	132 lbs. (60 kg)
DPT	3.64 ft. (1.11 m)	119 lbs. (54 kg)
VDS-3	5.91 ft. (1.80 m)	117 lbs. (53 kg)
EPR-3 (Optional)	11.38 ft. (3.47 m)	269 lbs. (122 kg)
IGR	5.58 ft. (1.70 m)	113 lbs. (51 kg)
GOT-D (Optional)	12.63 ft. (3.85 m)	196 lbs. (89 kg)
EOT	5.35 ft. (1.63 m)	90 lbs. (41 kg)
MRJ	1.64 ft. (0.5 m)	88 lbs. (40 kg)
FVS	1.67 ft. (0.51 m)	44 lbs. (20 kg)
Thruster	16.50 ft. (4.94 m)	308 lbs. (140 kg)
2-7/8 in. / 3-1/8 in. Motor	9.84 ft. (3.00 m)	220 lbs. (100 kg)





Features

- Flexible setup the integrated CTD system
- Data transmission & communication via mono conductor CT e-line
- Selectable directional system with reliable and automated closed-loop steering
- Resistivity & GR LWD service
- Real-time WOB, bore & annular pressure, and vibration data
- Depth control and circulation capability by specific BHA services

Introduction

The 2-1/4 in. tool size has been designed to cover hole sizes from 2.75 inches up to 3.5 inches. This system provides flexibility in configuration to allow tailoring the level of service at the rigsite for Coiled Tubing Drilling (CTD) operations in standard and thru-tubing re-entry slimhole applications to meet customer service needs.

Components

Quick Connnect Sub (QCS)

Agitator (Optional)

Power and Communication Tool (PCT)

Vibration& Shock Digital Attitude Sensor (VDS-2)

Drilling Performance Tool (DPT) (Optional)

Electromagnetic Propagation Resistivity Tool (EPR-2)

Inclination and Gamma Ray (IGR)

Gyroscope Orientation Tool-Drilling (GOT-D) (Optional)

Electrical Orienting Tool (EOT)

Mechanical Release Joint (MRJ)

Float Value Sub (FVS)

Downhole Thruster

2-1/8 in. Motor

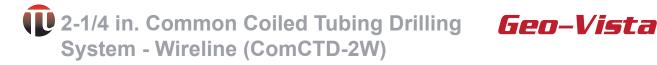
Wireline

Wireline	Wires	OD [in.]	Specified Length
Camesa 1N 32 PTZ	Mono	5/16	23,000 ft. (7,000 m)
Camesa 1N 22 PTZ (ETFE)	Mono	7/32	18,000 ft. (5,500 m)
Camesa 1K 22 PTZ (ETFE)	Mono	7/32	18,000 ft. (5,500 m)
Camesa 7H 42RP (Optional)	Seven	7/16	23,000 ft. (7,000 m)

Tool Specifications

Tool Size OD	2.25 in. (57.2 mm)
Borehole Size	2.75 in. to 3.5 in.
	(69.85 mm to 89 mm)
System Length	83.52 ft. (25.46 m)
System Weight	924 lbs. (420 kg)
System Connection top / bottom	1.5 in. AMMT box / pin
Power Source	Via CT e-line
Communication & Telemetry	Via CT e-line

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Benefits

- On-location BHA adjustments based on operational needs
- High real-time data density for operating efficiency improvements
- Precise directional control for additional reservoir access, optimized wellbore placement and reduced drilling time
- Increased section length in horizontal reservoir section by adjustable steering control and coverage of high dogleg requirements in build sections
- Geo-steering capability for increased production and improved reservoir contact
- Drilling parameter optimization for improved ROP and drilling efficiency
- Precise and reliable ECD control and management for risk reduction
- Hole cleaning and precise depth correlation improvements while tripping

Operating Specifications & Limits (Sliding operation only)

Max. Flow Rate 80 gpm (300 lpm) 50°/100 ft. (50°/30 m) Max. Build Up Rate

Pressure Drop with Water (w/o PDM) 650 psi at 80 gpm (4.5 MPa at 300 lpm)

Max. Operating WOB 15 klb (67 kN) Max. WOB to Failure 20 klb (88 kN) Max. Operating Overpull 15 klb (67 kN) Max. Overpull to Failure 20 klb (88 kN)

Max. Hydrostatic Pressure 15,000 psi (103 MPa)

Max. Differential Pressure

With Circulation Ports (EDC) 1,500 psi (10.3 MPa) Without Circulation Ports (ED) 4,500 psi (31 MPa)

Operating temperature limits

300°F (150°C) Max. Min. 40°F (4°C) <1% Sand Content

Solid Content (Max.) 7%

LCM 10 ppb = 28 kg/m³, fine nutplug

Specifications

Tool Name	Length	Weight
QCS	1.64 ft. (0.5 m)	22 lbs. (10 kg)
Agitator	6.89 ft. (2.10 m)	64 lbs. (29 kg)
PCT	7.94 ft. (2.42 m)	55 lbs. (25 kg)
DPT	3.64 ft. (1.11 m)	22 lbs. (10 kg)
VDS-2	5.91 ft. (1.80 m)	88 lbs. (40 kg)
EPR-2 (Optional)	11.38 ft. (3.47 m)	176 lbs. (80 kg)
IGR	5.58 ft. (1.70 m)	66 lbs. (30 kg)
GOT-D (Optional)	12.63 ft. (3.85 m)	132 lbs. (60 kg)
EOT	5.35 ft. (1.63 m)	64 lbs. (29 kg)
MRJ	1.64 ft. (0.5 m)	33 lbs. (15 kg)
FVS	1.67 ft. (0.5 m)	22 lbs. (10 kg)
Thruster	15.50 ft. (4.94 m)	242 lbs. (110 kg)
2-1/8 in. Motor	9.84 ft. (3.00 m)	140 lbs. (56 kg)



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