

NEWTON SYSTEM

Extended-reach tool with downhole sensors enhances coiled-tubing performance

The NEWTON SYSTEM incorporates downhole sensors that continuously record tubing pressure, annulus pressure, weight-on-bit, temperature, gravity toolface, vibration and inclination. The downhole tool can be programmed to transmit measurement data from any or all the sensors at specified intervals. Pulse signals can be reliably transmitted and decoded in coiled-tubing strings longer than 25,000 ft. All data are stored in the tool's memory for post-well analysis.

The system's pulser performs the dual functions of developing force to advance the coiled tubing and creating coded pressure pulses to transmit sensor readings to the surface. The rapid operation of the system's pulser generates pressure signals and delivers axial thrust, advancing the BHA in the horizontal section of the well while simultaneously propagating a pressure wave to surface, significantly increasing reach.

Real-time measurement and surface display of downhole weight-on-bit improves the ability to time-drill plugs and generate smaller cuttings that are easier to circulate out of the hole.

In annular frac applications, the NEWTON SYSTEM provides reverse circulation capability in the event of a screenout. The downhole tool is compliant with the use of hydrochloric (HCl) and hydrofluoric (HF) acids and allows for sand-jet perforating.

NEWTON SYSTEM data gives operators and service companies the ability to reduce risks and improve operating efficiencies by making informed decisions. Downhole weight-on-bit and differential pressure measurements eliminate costly actions based on the inference and guesswork inherent with using surface measurements without downhole data. Pulling out of hole only when needed and avoiding unnecessary trips to change out downhole tools can save tens of thousands of dollars in completion costs.

The NEWTON SYSTEM is made up in the bottomhole assembly directly above the downhole motor during plug millout operations so measurements are taken as close to the bit as possible. Ball drop-activated tools may be operated in the normal fashion.

DOWNHOLE SENSORS

- Annular pressure
- Tubing pressure
- Inclination
- Temperature
- Gravity toolface
- Vibration
- Weight-on-bit

APPLICATIONS

- Milling
- Annular frac
- Fishing
- Cleanout

FEATURES

- Real-time and recorded data
- Surface data display
- Toggle pulser on/off from surface
- Programmable data transmission
- Real-time, adjustable thrusting force
- Reverse circulate
- Low pressure drop
- Post-well analysis

BENEFITS

- Better decisions
- Lower-risk extended-reach operations
- Superior hole cleaning
- Reduced operating cost



With unique knowledge in downhole sensor and pressure pulse technology, Teledrill, Inc., develops and deploys innovative solutions to extend the reach and enhance the efficiency of coiled-tubing operations.

Tool specifications

Outside diameter	2 ⁷ / ₈ in.
Tool joints	2 ³ / ₈ in. PAC box up, pin down 2 ³ / ₈ in. REG box up, pin down ¹
Internal connections	2 ¹ / ₂ -in. 12-TPI Stub ACME
Length	111.5 in. (9.3 ft)
Weight	105 lbm
Min. flow rate	1 BPM
Max. flow rate	5 BPM
Max. temperature	347°F [175°C]
Max. pressure	16,000 psi
Min. battery life ²	100 hr

Tool pressure drop

1 bbl/min	<50 psi
2 bbl/min	50 psi
3 bbl/min	150 psi
4 bbl/min	250 psi
5 bbl/min	400 psi

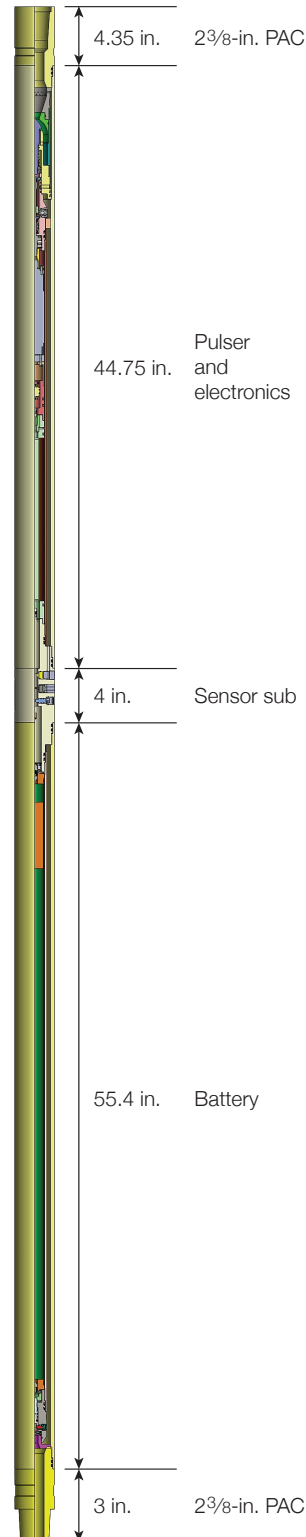
Sensor specifications

Tubing pressure (P_b) ³	0–15,000 psi
Annular pressure (P_α) ³	0–15,000 psi
Compression/tension	–10,000 to 10,000 lbf
Inclination	0–180°
Temperature	–40°F to 347°F [–40°C to 175°C]
Gravity toolface	–180° to +180°
Vibration	±55 g, 2 axis (X, Z) ±6 g, 3 axis

¹3¹/₈-in. BHA configuration

²Under normal operating conditions

³Differential pressure: $\Delta P = P_b - P_\alpha$



Running the
NEWTON SYSTEM
on every descent
delivers data that
wellsite teams can
use to reduce the total
cost of completion
operations.

Why risk the
completion by
deploying coil blind?