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eFire-Slickline Firing Head

The eFire-Slickline* electronic firing head system for slickline deployment is a programmable firing head used to detonate downhole explosives and activate specialized remedial services.

APPLICATIONS

- Perforating
- Triggering cutters
- Setting packers and plugs
- Sampling

BENEFITS

- Elimination of the traditional parameter run saves rig time.
- Exclusion of primary high explosives reduces risk.
- Multiple safety barriers and the ability to abort increase safety.

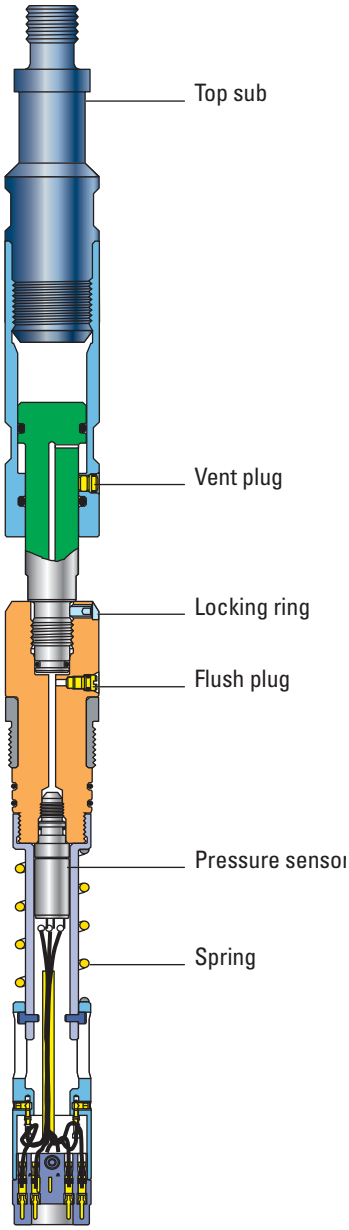
FEATURES

- Firing head is controlled from the surface.
- Radio frequency-safe detonator eliminates radio-wave interference and controls detonation.
- Independent operation of two tools allows dual tasks.
- Job log is stored in the tool for postjob evaluation.

The firing head is an electronic activation mechanism for slickline activation services that maintains total control of the sequence of operations and the timing of activation. In addition, the eFire-Slickline firing head uses two field-proven technologies: one to intelligently recognize commands sent from the surface and one to initiate the detonation chain.

Fully controlled from the surface, the eFire-Slickline firing head does not require the input of prerecorded downhole parameters to activate the firing sequence. The firing head operates with a coded sequence of tension pulses on the slickline wire, which a tension converter in the tool head converts to pressure pulses. The unique combination of these pulses creates the special signature required to communicate with the initiator module.

After a pressure transducer in the tool detects the command from the surface, two separate processors in the controller module are required to independently verify the unique command. The initiator module then converts the battery power to the high-voltage level required to initiate the S.A.F.E.* Slapper-Actuated Firing Equipment. The S.A.F.E. detonator and the eFire-Slickline firing head do not include primary explosives.



eFire-Slickline firing head system.

eFire-Slickline Firing Head

The eFire-Slickline firing head system is operated by a coded sequence of tension pulses on the slickline wire, which the hydraulic strain sensor in the tool converts to pressure pulses superimposed on the bottomhole pressure. The unique combination of the pulses creates the signature required to communicate with the firing head. Before the firing head will accept the command to fire, a preset hydrostatic pressure must enable the firing head, followed by an arming command sent from the surface. These safeguards are in addition to the safety provided by the unique pressure-pulses command signatures. The eFire-Slickline firing head is radio frequency safe and approved by Thomson-Thorn Missile Electronics Ltd. for operation during radio communication, welding, and cathodic protection.

Before the detonator is connected, a tool setup and function test is always performed through a computer interface. This interface is also used for setup and generation.

Specifications

	eFire-Slickline Head	**eFire-Slickline Head, version 3**
OD, mm [in]	43 [1.688]	43 [1.688]
Temperature rating,† degC [DegF]	160 [320] (at 400 h) 150 [302] (at 1,000 h)	At 100 h: 177 [350] At 1,000 h: 150 [302]
Pressure rating, MPa [psi]	103 [15,000]	103 [15,000]
Length, cm [in]	206 [81.2]	182 [70.71]
Tensile rating, kN [lbf]	133 [30,000]	133 [30,000]
Shock rating, g	500 (20 shocks at 0.5 ms)	500 (20 shocks at 0.5 ms)
Battery autonomy, h	240	240

† Ballistic components limit tool operation of version 3 to HMX time and temperature ratings.

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