

Connect wireless selective electronic firing head

Real-time reliable connection with the reservoir during Symphony live downhole reservoir testing

-  **Temperature:**
329 degF [165 degC] for 100 h
-  **Pressure:**
20,000 psi [138 MPa]
-  **Acoustic Control:**
Activation and confirmation without requiring pressure pulses

Applications

- Wells with little margin for applied pressure
- Deviated wells
- Wells with a partial cushion
- Selective or multizone perforating

How it improves wells

The Connect wireless selective electronic firing head is seamlessly integrated in the Symphony* live downhole reservoir testing toolstring to enable activating the perforating guns by using bidirectional acoustic signals. Unlike conventional technology that requires pressure pulse commands generated from high overpressure or mechanical movement to activate, the Connect firing head is activated acoustically. Not only does using acoustic signals enable achieving optimal underbalance conditions before perforating, but it also significantly increases the reliability and safety of perforating operations.

How it works

The Connect electronic firing head—combining field-proven sensors, battery power, microprocessors, and control switches—is united with the Symphony testing string via Muzic* wireless telemetry. The firing head consists of two sections. The upper section is a pressure transducer assembly mounted with the telemetry modem. The lower section is the firing head electronics cartridge and battery rated to 330 degF for 100 h and 20,000 psi.

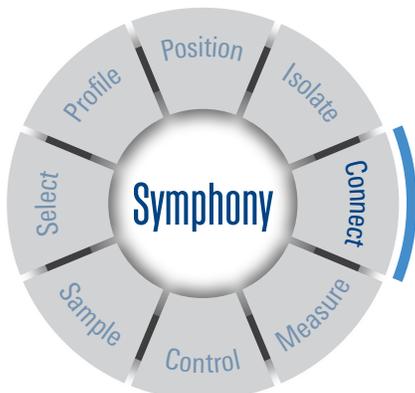
Once the wireless command is generated through the Muzic telemetry acquisition controller interface from surface, it is transmitted downhole through the repeater network to the firing head. Activation of the Connect electronic firing head by the acoustic signal is reported to surface to confirm gun initiation and can be aborted at any moment.

Additional information

For contingency operations, standard fluid pulses can also be used to initiate the gun systems. The pressure transducer provides measurements to the electronics cartridge. When a firing command is registered, the initiator module triggers the guns.

Connect Wireless Selective Electronic Firing Head Specifications	
	Connect Firing Head United by Muzic Telemetry
Temperature rating, degF [degC]	100 h: 329 [165] 1,000 h: 302 [150]
Pressure rating, psi [MPa]	20,000 [137.9]
OD, in [mm]	1.756 [44.6]
Makeup length, in [cm]	199.2 [506]
Weight, lbm [kg]	87 [39.5]
Tensile rating, lbf [N]	43,000 [191]
Shock rating ¹	6 shocks, 30-ft drop
Min. acoustic firing pressure, MPa [psi]	500 [3.5]
Battery duration, h	Lithium: 240 or 500

¹ 30-ft axial drop test performed onto a 1-in polypropylene plate and cement base.



*Symphony testing
Connect wireless selective
electronic firing head united
by Muzic telemetry.*

Connect

Fill Sub Assembly Specifications

Symphony Testing Connect Head Sub Assembly		
	3.000-6 SA	5.062-6 SA
Size, in	4.5	
Tensile yield strength, lbf [N]	359,000 [1,596,900]	
Fluid isolation	Yes	
Max. OD, in [mm]	4.51 [114.6]	7.01 [178.1]
Makeup length, ft [m]	19.5 [5.94]	19.6 [5.97]
Weight, lbm [kg]	446 [202]	489 [222]
Gun type	HSD* high shot density system	
Gun size, in [mm]	2.88-5.00 [73.15-127]	6.62-7.00 [168.15-177.8]
Max. exposure	330 degF and 20,000 psi at 100 h	
	302 degF and 20,000 psi at 500 h	
Max. operating pressure, psi [MPa]	20,000 [137.9]	
Min. operating pressure, psi [MPa]	500 [3.4]	
Max. working temperature, degF [degC]	330 [165.6]	

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