



Red Eye® Hot-Tap Insertion and Retraction Technology

Weatherford's *Red Eye* hot-tap insertion and retraction technology allows insertion and retraction of a water-cut meter in a flowing pipeline. Hot-tap configurations are available for both the standard *Red Eye* 2G and MP product families. *Red Eye* meters use patented, optical-sensor technology to accurately measure the full range of water cut (0 to 100%) in a commingled stream of oil and water (and gas with the *Red Eye* MP). High accuracy across all water-cut levels and easy installation and configuration make this unique meter suitable for numerous applications. The meter can be used in stand-alone mode to measure and report instantaneous water cut or used with the net oil computer (NOC) to perform timed production well tests.

Hot-Tap System Components

A complete hot-tap system consists of the *Red Eye* hot-tap assembly, vertical spool assembly and hot-tap insertion and retraction tool.

Hot-tap, water-cut meter: The hot-tap, water-cut meter has a standard *Red Eye* head assembly, as well as a special shaft extension, which has a flange with inner holes that bolt to the vertical spool assembly after it is inserted into a pipeline. The outer holes on the flange attach to the adjustable shelf on the insertion and retraction tool, which is used to insert and retract the hot-tap, water-cut meter.

Hot-tap, vertical spool assembly: The hot-tap vertical spool assembly attaches to a 2-in. (5.08-cm) ANSI-certified, ball valve (not included) that has been installed on a flowing pipeline. The vertical spool assembly consists of a vertical spool with a pressure bleeder valve, an internal wiper, and packing material with a packing nut.

Hot-tap, insertion and retraction tool: The insertion and retraction tool is used to insert or retract the hot-tap assembly into or from the pipeline. It has a bottom shelf that is bolted to the outer holes on the bottom flange of the vertical spool assembly and an adjustable middle shelf that bolts to the outer circle of holes in the flange of the hot-tap, water-cut meter. The tool is operated with a manual hand crank located on the top end.



Weatherford's hot-tap system enables insertion and retraction of a *Red Eye* water-cut meter in a flowing pipeline. (The 2-in. ball valve is not included.)



Specifications

Hot-Tap Water-Cut Meter¹		
Operating temperature, °F (°C)	Process fluid (standard)	32 to 302 (0 to 150)
	Ambient temperature (standard)	-40 to 149 (-40 to 65)
Operating pressure at 302°F (150°C) maximum CWP, psi (bar)		1,480 (102.04)
Flange, in. (cm)	Outer diameter with 2-in. (5-cm) flange (600) ANSI bolt process connection	11.5 (29.2)
	Bolt hole diameter for mounting	0.75 (1.91)
Wetted parts		316L SS or Hastelloy C 276 with sapphire windows
Communications		Modbus® RTU (standard) RS-232 or RS-485 ports
Display (LCD available)		Two-line, 16-character vacuum florescent display
Output		4 to 20 mA water cut
Power		10 to 30 VDC
Physical dimensions (diameter x length), in. (cm)		11.5 x 38 (29.2 x 96.5)
Weight, lb. (kg)		40 (18.14)
Electrical		
Power		10 to 32 Vdc @ 1 Amp maximum
Analog input (well selection and flow rate)		4 to 20 mA
Analog output (water cut)		4 to 20 mA
High level frequency		0 to 10 kHz at TTL level or 24 Vdc
Operating temperature, °F (°C)		-40 to 159 (-40 to 65)
Certifications		FM 06 ATEX 0021 Ex d IIB T3 IP66 Ta = -4° to 185°F (-20° to 85°C)
Vertical Spool Assembly		
Packing material	Compression packing material, 4 rings, in. (cm)	0.25 (6.35)
	Outside diameter, in. (cm)	5.25 (13.3)
Pressure: maximum CWP, psi (bar)		1,480 (102.04)
Process connection, in. (cm)	600 lb. (272 kg) ANSI RF flange (top and bottom ²)	2 (5.08)
	Bolt hole diameter for mounting	0.75 (1.91)
Physical dimensions (diameter x length), in. (cm)		11.5 x 7.5 (29.2 x 19.1)
Weight, lbs (kg)		43.5 (19.7)
Wetted parts		316L SS
Hot-Tap Insertion and Retraction Tool		
Physical dimensions, in. (cm)	Overall size	15 x 18 x 39 (38.1 x 45.7 x 99.1)
	Shelf and bottom-plate hole diameter	0.75 (1.91)
Material composition		Aluminum
Weight, lb. (kg)		104 (47.17)
Maximum line pressure, psi (bar)		1,480 (102.04)

¹Red Eye MP water-cut meters are also available in hot-tap configurations.

²Bottom flange includes outer bolt pattern for attaching insertion and retraction tool.

Product requirements: The meter is designed for 6- to 12-in. (15.24- to 30.48-cm) piping that has an installed, 2-in. (5.08-cm) ball valve with a 600-lb. (272.15-kg) flange—ANSI-certified for up to 1,480 psi (102.6 bar). The distance between the top flange of the ball valve and the top of the piping must be approximately 16.25-in. (41.28-cm).

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