

QUANTUM MAX Service Tool

High-performance gravel and frac packing in sandface completions

SYSTEM APPLICATIONS

- Stand-alone screens, gravel packs, and frac packs
- Land and offshore environments, including deepwater
- Open and cased holes
- Single-zone and multizone sand control completions

SYSTEM BENEFITS

- Field-proven design and improved performance parameters increase reliability and reduce risks

SERVICE TOOL FEATURES

- Compatibility with QUANTUM* and QUANTUM MAX* systems
- Simplified squeeze, circulate, and reverse positions
- Full-bore setdown and check valve setdown versions
- Optional crossover port bodies for gravel packing and frac packing
- Rotationally locked position while being run in the hole
- Hydraulic release with rotation release backup
- Erosion tolerance
- Setting and releasing pressures that reference hydrostatic, not reservoir, pressure

The simple, versatile QUANTUM MAX gravel-pack system service tool is designed for high-performance gravel- and frac-packing applications in high-pressure, high-temperature sandface completions. The QUANTUM MAX gravel- and frac-pack service tool is compatible with both the QUANTUM and the QUANTUM MAX gravel-packing systems.

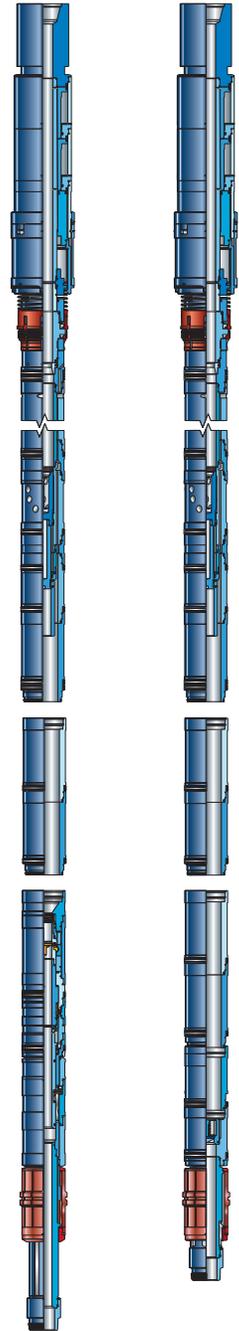
The QUANTUM MAX service tool is coupled to the QUANTUM MAX packer, allowing rotation of the bottomhole assembly, if required. The QUANTUM MAX service tool is used to hydraulically set the QUANTUM MAX packer with applied tubing pressure against a setting ball. Setting pressure is referenced against the hydrostatic pressure in the wellbore, not reservoir pressure. The service tool is released hydraulically through applied tubing pressure. Backup releasing can be accomplished through right-hand workstring rotation.

The QUANTUM MAX service tool supports weight-down circulating, weight-down squeeze, and reverse-out operations.

The QUANTUM MAX service tools is available in full-bore setdown and check valve setdown configurations. The full-bore setdown version incorporates a ball valve into the lower portion of the service tool, permitting a weight-down circulating position for gravel packing as well as a weight-down live annulus position for frac packing. The ball valve can also be cycled to a closed position, allowing a weight-down squeeze position, if necessary. The fullbore setdown ball is always closed in the reverse position, allowing for bidirectional flow control. This feature permits reverse-out operations without concern for fluid losses to the formation or well control concerns.

The check valve setdown version uses a simple check module in the lower portion of the service tool, permitting circulation with weight down during gravel-packing operations. The setdown collet on both versions engages within the setdown collar on the QUANTUM MAX circulating housing and is also used to open and close the port closure sleeve in the circulating housing.

The QUANTUM MAX service tool can be fitted with a variety of crossover port bodies and tailored to the appropriate pumping treatment. For circulating gravel packs, the triport crossover port body is configured with a large return flow area to minimize circulating pressures. For STIMPAC* frac-packing operations, for which higher rates and proppant volumes are required, the multiport crossover body is used. Both the triport and the multiport crossover port body types use a primary setting ball that is retained within the service tool, eliminating the rig time associated with reversing out the setting ball. For extremely high-rate frac packing, a uniport crossover port body is available.



QUANTUM MAX service tool
(left: fullbore setdown;
right: check valve setdown).

QUANTUM MAX Service Tool

The QUANTUM MAX gravel- and frac-pack service tool is also available in the QUANTUM PERFPAC* configuration for single-trip perforating and frac packing, as well as the QUANTUM antiswab service tool for openhole gravel packing.

QUANTUM MAX Service Tool Specifications

Size, in [mm]	2.688 [68.3]	3.000 [76.2]	4.000 [101.6]	4.750 [120.7]	5.650 [143.5]	6.000 [152.4]
Major OD, in [mm]	3.974 [100.9]	4.510 [114.6]	5.812 [147.6]	8.250 [209.6]	8.265 [219.0]	8.250 [209.6]
Minor ID, in [mm]	0.876 [22.3]	1.000 [25.4]	1.640 [41.7]	1.760 [44.7]	1.925 [48.8]	1.760 [44.7]
Setting ball OD (primary), in [mm]	0.875 [22.2]	1.000 [25.4]	1.375 [34.9]	1.625 [41.3]	1.625 [41.2]	1.625 [41.3]
Setting ball OD (secondary), in [mm]	1.250 [31.8]	1.438 [36.5]	1.750 [44.5]	2.125 [54.0]	2.125 [54.0]	2.125 [54.0]
Upper connection (workstring), in	2.375 API IF box	2.875 API IF box	3.500 API IF box	3.500 API IF box	4.500 API IF box	3.500 API IF box
Lower connection (washpipe), in	1.900 EUE 10 RD pin	1.900 EUE 10 RD pin	2.375 EU 8 RD pin	2.875 EU 8 RD box	3.375 8 SA box	3.625 8 SA box
Tensile Rating, lbf [kg]	90,000 [40,823]	122,000 [55,338]	250,000 [113,379]	400,000 [181,406]	400,000 [181,406]	400,000 [181,406]
Max. setdown weight, lbf [kg]	62,000 [28,123]	80,000 [36,287]	125,000 [56,689]	150,000 [68,027]	150,000 [68,027]	150,000 [68,027]
Makeup Length, ft [m]	27.3 [8.32]	28.0 [8.53]	31.8 [9.69]	32.2 [9.81]	34.1 [10.39]	33.1 [10.08]
Torque Through Rating, ft-lbf [N-m]	2,000 [2,712]	2,000 [2,712]	7,000 [9,491]	15,000 [20,337]	10,000 [13,558]	10,000 [13,558]
Differential Pressure, psi [kPa]	10,000 [68,948]	10,000 [68,948]	12,500 [86,184]	10,000 [68,948]	15,000 [106,868]	10,000 [68,948]
Max working temperature, degF [degC]	350 [176]	350 [176]	350 [176]	350 [176]	350 [176]	350 [176]

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