

Automated MPD Riser System

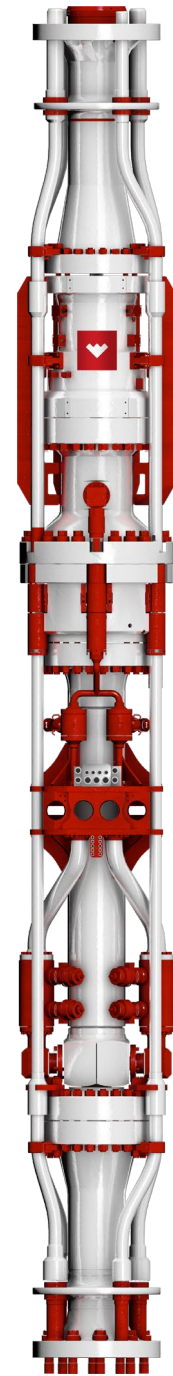
Expedites installation on offshore rigs with an integrated, compact, and smart design

Applications

- Managed pressure drilling (MPD)
- Managed pressure cementing
- Pressurized mud-cap drilling
- Underbalanced drilling
- Horizontal and vertical offshore wells

Features and Benefits

- Connection hub integrates subsea control umbilical and flowlines into one easy-to-connect component.
- Robotic arm attaches the connection hub to the hands-free flow spool in less than 20 minutes. By eliminating the need for manual work in the moonpool area, the arm enhances safety and accelerates rig up and down time by 80%.
- Robotic arm compensates up to 30° to align with the riser, which enables installation in harsh conditions. Then the arm retracts to its initial position for safe riser running.
- Smart rotating control device (RCD) technology enables predictive maintenance and early leak detection.
- Annular isolation device (AID) enables complete shut-off and offers multiple pressure equalization options.
- Hands-free flow-spool sensors monitor annular pressure and temperature.
- Subsea surveillance system enables visual confirmation of successful connection hub installation. The system also enables permanent monitoring of components during MPD operations, which reduces the need for underwater inspection using a remotely operated vehicle (ROV).
- Single subsea control umbilical provides high-performance fiber-optic cables for fast and reliable data transmission.
- Compact riser design integrates smart RCD, hands-free flow spool, AID, and all required crossovers, with no need for further assembly at the offshore rigsite.
- Reduced length, width, and weight reduces logistical complexities, associated costs, and installation time.
- Streamlined body without flowline goosenecks facilitates shipping to the rigsite and deploying through the rotary table.
- Dual-certified and approved design—according to ABS CDS* and DNV GL OS-E101**—meets the majority of deepwater rig standards.



The Weatherford automated MPD riser system uses a robotic arm that enables installation in less than 20 minutes for 80% faster rig up and down time.



* ABS CDS = American Bureau of Shipping Classification of Drilling Systems

** DNV GL = Det Norske Veritas Germanischer Lloyd

Automated MPD Riser System

Tool Description

Part of the Weatherford intelligent MPD solution, the automated MPD riser system expedites offshore installation with an integrated, compact, and smart design. The riser system consists of a smart below-tensioning marine riser (BTR-MR) RCD, an AID, and a hands-free flow spool.

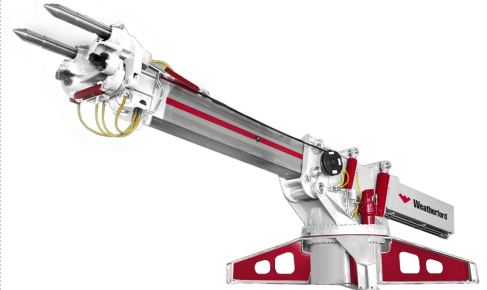
The MPD riser system also features a robotic arm that connects a connection hub, including a single subsea control umbilical and flowlines, to a hands-free flow spool. With this level of automation, the system provides safe, reliable, and efficient operations every time. In regard to efficiency, installing the connection hub to the riser takes less than 20 minutes for 80% faster rig up and down time.

The compact riser system arrives at the rigsite ready for deployment. The operator initiates installation from a control system in the moonpool. A line of sight is required to install the connection hub.

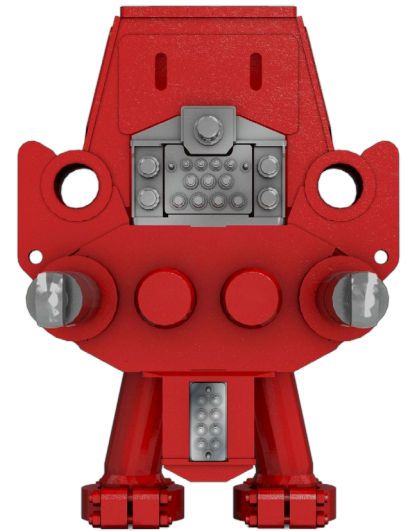
Specifications

Riser System

Length	25.7 ft (7.8 m)
Length with crossovers	42 ft (12.8 m)
Maximum OD	57 in. (1,448 mm)
Weight	65,000 lb (29,484 kg)
Weight with crossovers	88,000 lb (39,916 kg)
Bleed line connection	Integral
Mud line return connections	2
Control line umbilical connections	1
Moonpool connections	1 remote pull-in
Field serviceable packer	Yes
Temperature range	0 to 250°F (-17 to 121°C)
Third party certification	ABS and DNV GL
Auxiliary lines	
Choke and kill maximum pressure	15,000 psi (103.4 MPa)
Mud booster maximum pressure	15,000 psi (103.4 MPa)
Hydraulics maximum pressure	5,000 psi (34.5 MPa)



The robotic arm increases efficiency, improves consistency, and enhances safety by taking over manual tasks and removing people from danger zones.



The connection hub enables installing the single subsea control umbilical and flowlines in the hands-free flow spool all at once.



Automated MPD Riser System

Specifications (continued)

RCD

Length	4.4 ft (1.3 m)
Assembly weight	10,000 lb (4,536 kg)
Maximum tension rating	4,000,000 lbf (1,814,369 kg)
Minimum throughbore ID	18.75 in. (476 mm)
Bearing assembly OD	19.0 in. (483 mm)
Top flange	API 6A Type 6BX 21.25 in., 5,000 psi
Bottom flange	Modified API flange
Static pressure rating	2,000 psi (13.8 MPa)
Maximum rpm rating	200 rpm
Third party certification	ABS and DNV GL
Design codes	API Spec 16RCD, 2nd edition
Sensor ports	4

AID

Length	6.83 ft (2.1 m)
Maximum OD	57.0 in. (1.4 m)
Assembly weight	25,000 lb (11,340 kg)
Maximum tension rating	4,000,000 lbf (1,814,369 kgf)
Minimum throughbore ID	18.75 in. (476 mm)
Top flange	Modified API flange
Bottom flange	API 6A Type 6BX 18.75 in., 10,000 psi (68.9 MPa)
Static pressure rating	2,000 psi (13.8 MPa)
Minimum hydraulic operating pressure	1,850 psi (12.8 MPa)
Temperature range	40 to 150°F (4 to 66°C)*
Complete seal off	Yes
Third party certification	ABS and DNV GL
Design codes	API Spec 6A, 16A, 16F, 16C, NACE
Field serviceable	Yes
Auxiliary line integral flow path	Yes
Sensor ports	2

*Verification testing performed per API 16A 4th edition, PR1.



Automated MPD Riser System

Specifications (continued)

Flow Spool

Length	15.0 ft (4.57 m)
Maximum OD	57.0 in. (1.4 m)
Assembly weight	18,500 lb (8,391 kg)
Maximum tension rating without pressure or bending movement	4,000,000 lbf (1,814,369 kgf)
Maximum tension rating with Pressure or bending movement	3,500,000 lbf (1,587,573 kgf) @ 2,000 psi (17.2 MPa)
Minimum throughbore ID	18.75 in. (476 mm)
Top flange	API 6A Type 6BX 18.75 in., 10,000 psi (68.9 MPa)
Bottom flange	API 6A Type 6BX 18.75 in., 10,000 psi (68.9 MPa)
Maximum working pressure	2,000 psi (13.8 MPa)
Maximum hydraulic operating pressure	3,000 psi (20.7 MPa)
Temperature range	-4 to 250°F (-20 to 121°C)
Fluid type	Oil or water based
Third party certification	ABS and DNV GL
Design codes	API Spec 6A, 16A, 16F
Sensor ports	3

