



Completion & workover riser & connector system

Product application:

- Landing strings inside and outside marine riser
- Light well intervention vessel, semi-submersible, jack-ups and drillships
- Shallow water: surface HP & LP drilling riser systems & surface systems
- Open water subsea riser systems

Key features:

- Designed, qualified and manufactured in accordance with ISO 13628-7
- Eliminates the need for tubular running services and equipment
- 5,000, 10,000 and 15,000 PSI rated
- 4.52" through to 14" Nom Bore
- Designed for multiple make and breaks - reducing spare and replacement costs versus a threaded and coupled connector, as well as eliminating back-off risk
- Cost-effective and expertly engineered
- Suitable for intervention work
- Single or dual bore
- TRT (Tree Running Tool) crossovers to OEM and API connections
- Wellhead and subsea tree stinger systems

Our completion and workover riser systems are lightweight, high-strength and high-fatigue resistant. All systems are designed to be efficient, with no wasted materials and use our proprietary AQC-CW connectors to reduce operational time, whilst still ensuring complete system integrity.

Our completion and workover riser systems can be deployed from a jack-up, semi-sub, drillship or light-well intervention vessel. It can be used as an open water subsea riser system, surface riser, or inside a riser system, as a landing string. Also offered as a standard forged and welded solution or ultra light weight hybrid pipe design for deeper water applications.

Our AQC-CW connector has been specifically designed for high-fatigue, multiple make-up and

break-out riser applications while maintaining a gas tight, metal-to-metal seal. The AQC-CW connector reduces cost and back off risk versus a traditional threaded and coupled connector while ensuring safety and reliability. Our technology facilitates simple installation to minimise cost and rig time and crucially a means of reliable and repeatable make/break gas tight connection with back-up sealing.

Our AQC-CW has been intelligently engineered and manufactured in strict accordance with ISO 13628-7 2006 with a qualification process involving fatigue resonance testing, drive-bolt back-off, combined loading to destruction and vibration resistance testing.



Completions and workover riser system

Our completion and workover riser expands the scope that can be completed:

- From a light-well intervention vessel, removing a need for mobile offshore drilling unit
- From a semi-sub without a need to deploy marine riser and BOP (reduces cost)



For an expanded scope of operations

Especially where our 7 3/8" ID 10,000 PSI rated system is deployed:

- Completions
- Tubing running / pulling
- Pressure testing
- Electric line slickline
- Bull heading
- Workover
- Extended well test
- Early production
- Suspension
- Coil tubing



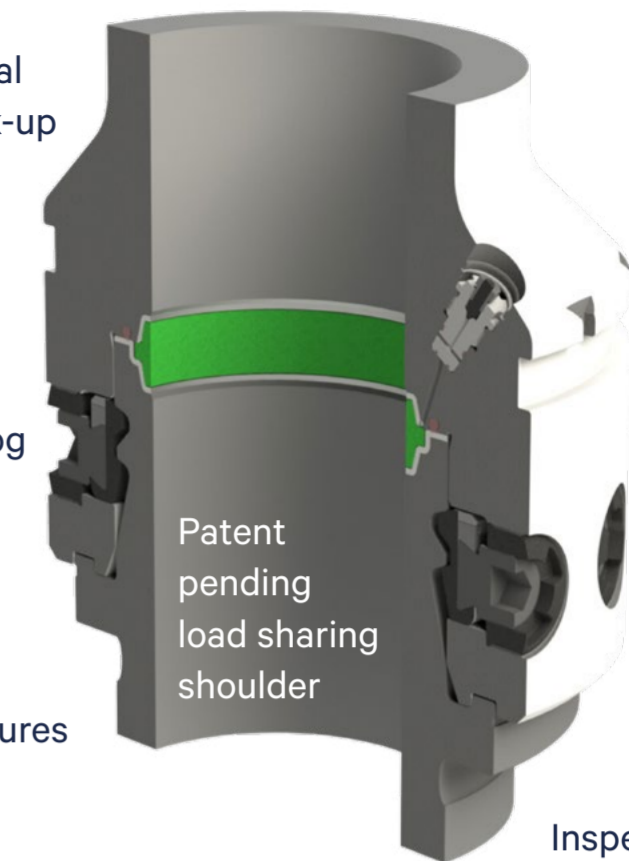
Make-up index grooves to support robotic make up

Upper shoulder: side-door elevator running
Lower shoulder: riser spider land-out, removes the need for bowl and slips

Gas tight metal-to-metal seal with qualified back-up elastomeric seal

Anti-vibration dog drive screw lock

Fatigue enhanced features



Patented back seat pressure test port to confirm makeup

Marinised seals and coating

Preloaded static connection designed and qualified for dynamic combined loading

Inspectable, measurable, repairable and replaceable components for long life and repeat makeup reliability

Technical specifications

AE Part Number:	02517
Primary Design Code:	BS EN ISO 13628-7 2006 DNVGL-OS-E101 Latest Edition Offshore Standard For Drilling Plant
Qualification:	BS EN ISO 13628-7 2006 CTOD testing in accordance with BSI BS 7448 PART 1 Combined loading, Fatigue tested and multiple make/break cycle Hydro and gas qualified Vibration back-off qualification
Pressure Rating:	5,000, 10,000 and 15,000 PSI rated
Temperature Rating:	-18°C to +121°C
Connector Type:	AQC-CW Completion & Workover Riser Connector
CWOR Connector To Pipe Manufacture:	Permanent factory installed to Tenaris Pipe via Tenaris Blue Riser Connector (no welding). Forumlok™ in place providing min 6x make-up torque to break-out
Outside Diameter:	8-5/8" (pipe) 13.78" (box) for the 7 3/8" bore system
Intermediate Joint Length	12m Effective Length (can be made-up as doubles, with Tenaris Coupler in centre) Various Pup Joint Lengths
Inside Diameter:	7-3/8" Drift (other sizes available)
Pounds Per Foot:	Approx. 50 PPF for the 7 3/8" bore system
Service:	NACE MR0175/ISO 15156 region 3
Number and type of seals:	Metal-to-metal gas tight seal areas within gasket and 1 off elastomeric seal (mainly for make-up test)
Est. No. of Makes & Breaks:	>500
Repair Method:	Cold weld repair seal face, replaceable dogs, regional service centres available
Coating:	Thermally Sprayed Aluminium (TSA) OD Corrosion resistant seal face (CRA) TK34-P Coating to AQC-CW Internals and pipe ID to improve service life

AQC-CW Connector

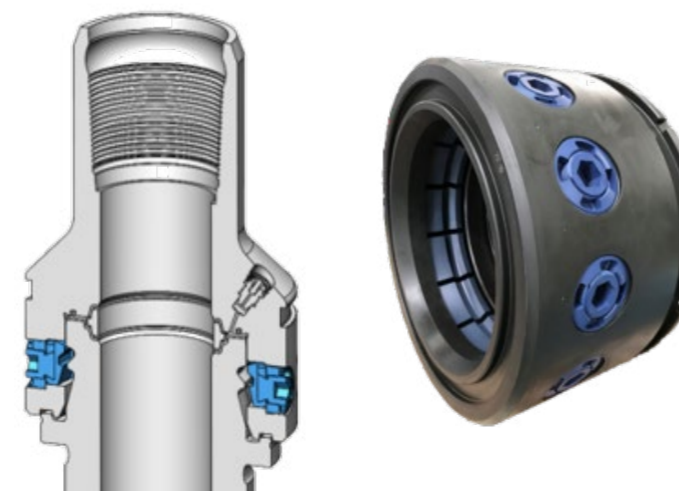
Heavyweight

- Fully forged heavy weight single piece joints
- Can be machined onto 3rd party specialist joints under licence
- Pin and box can be welded onto pipe, useful where weight is not a concern



Lightweight

- Permanently threaded and coupled (forum lock) joints. These utilise 100PSI + pipe to ensure that the assembled joints are lightweight and comply to NACE
- Factory make-up, with forum lock to provide around 6 x torque resistance against back off
- Useful for deep water applications as it lowers weight requirements, thereby reducing requirements for buoyancy



Visit our Youtube channel for more information on our riser and connector systems, and more.



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Completions and workover riser system

Safe, cost-efficient and reliable system




The system is available on a stand-alone or packaged basis. Packages include fully automatic riser spider, umbilical handling and connector make-up equipment.

Aquaterra Energy brings to bear the industry's best engineering, project and offshore teams to make your project a success, maximising safety and efficiency while minimising cost and rig-time.

A cost-saving drilling campaign example using the AQC-CW connector:

 <p>Drilling scenario</p> <ul style="list-style-type: none"> • 10 wells planned • Two wellheads/tree elevations • 2 risers installed and retrieved on two occasions for each well 	 <p>Considerations</p> <p>A typical DSA between the riser system and rig BOP equals approximately 5 hours per make-up and break-out. 5 hours x by 40 make-ups and break-outs equates to 200 hours of online rig time.</p>	 <p>Potential cost saving</p> <ul style="list-style-type: none"> • 15 minutes x 40 make-ups and break-outs = 10 hours of online rig time. • Assuming a spread rate cost of \$300K/day, this means that the saving of 30 hours over the project will result in: <p>\$ Saving \$2.4m over the campaign </p>
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Frontline gains with every use:

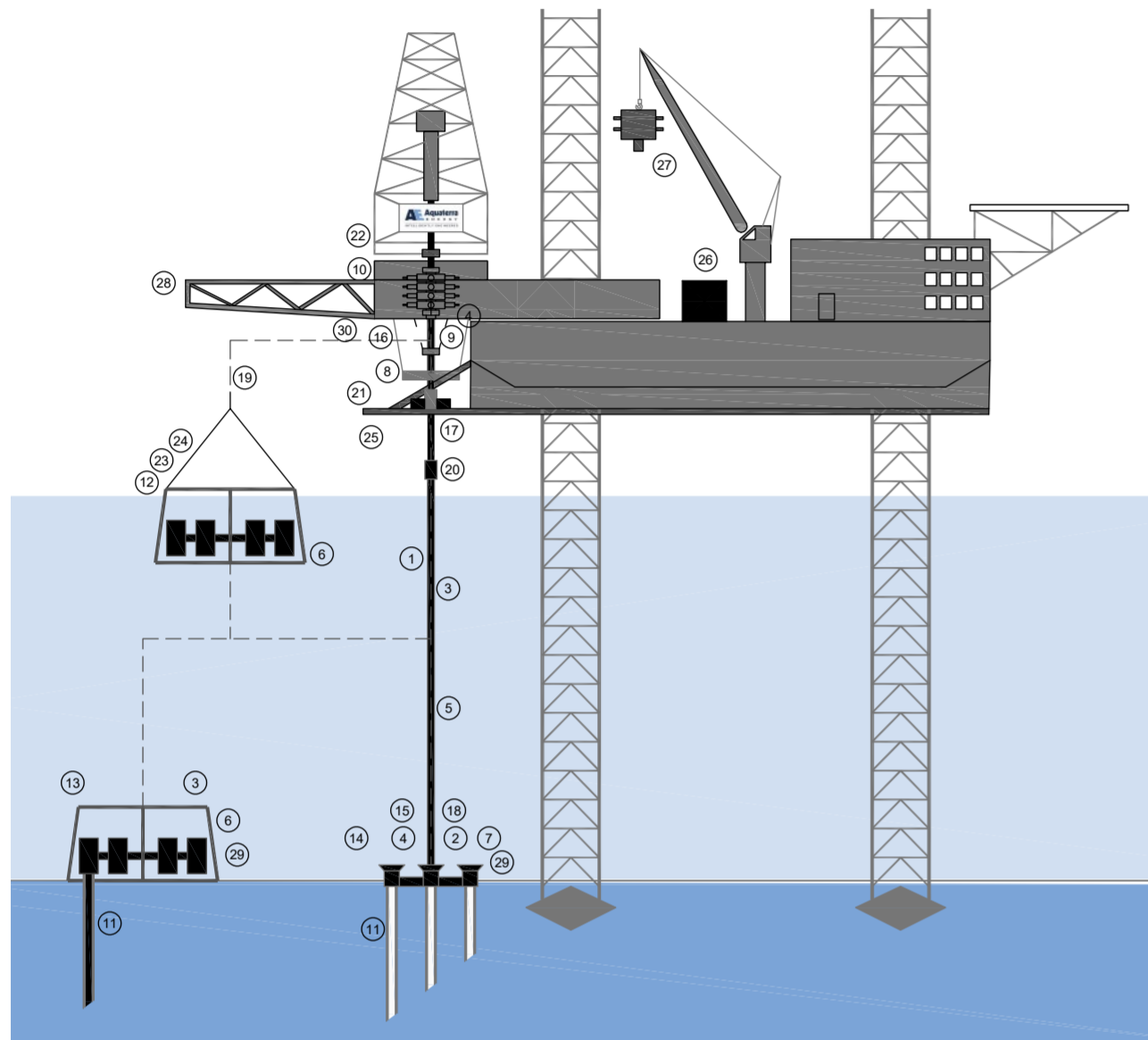
<p>Using an API flange: \$63k per use</p> 	<p>Using an AQC-CW connector \$3k per use</p> 	<p>Cost savings For every make-up or break-out</p> 
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Handling and Make-Up

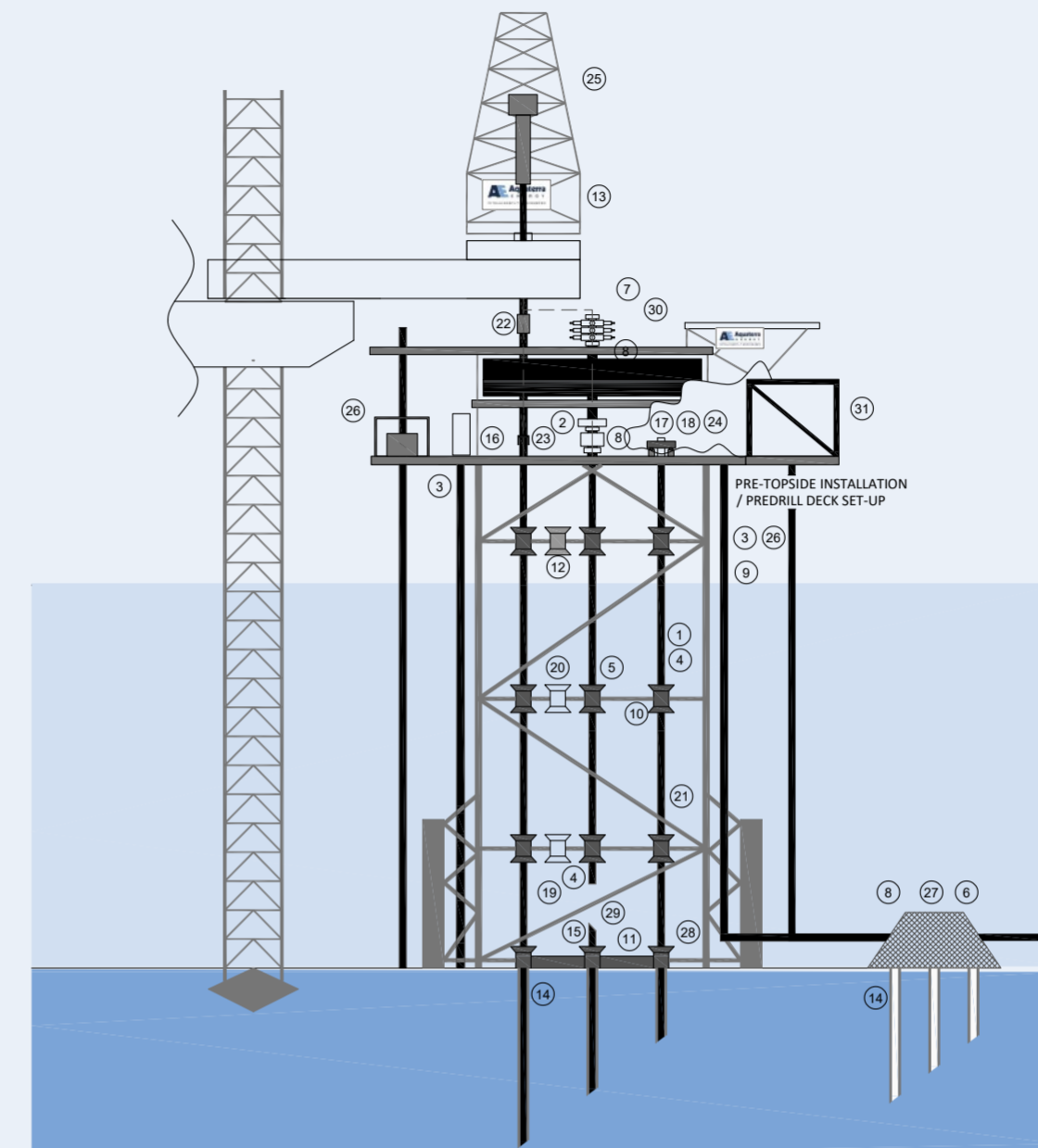
The AQC-CW riser is a lightweight, high-strength and high-fatigue resistant completion and workover riser system. Designed to withstand repeat make and breaks while maintaining a gas tight seal. Our technology facilitates simple installation to minimise cost and rig time.



Related Products and Services



Item No	Description
1	Riser & Conductor Analysis
2	Tieback Engineering & Tooling
3	Subsea HP Drilling Riser Systems
4	Subsea & Surface Connectors - NT2 , H4 & AQC
5	VIV Suppression Systems
6	Subsea Drill Centre templates
7	Subsea pre-drilling templates
8	Tension decks
9	Suregrip Tension ring
10	Rig floor Tension system
11	Cement top-up systems
12	Disposable camera systems
13	Conductor Whipstocks
14	Trash caps
15	Gyroscopes
16	Proten Riser tension system -Pull
17	Proten Riser tension system -Push
18	Aquascope Subsea Camera system
19	Heavy Lift equipment
20	Rig & Riser monitoring systems
21	Low pressure overshot systems
22	Piling analysis
23	Structural Engineering
24	Bespoke offshore structures
25	Conductor Tension Decks
26	3rd party interfaces/deck layout/grillages & sea fastening
27	Tree handling & Heavy lift assessment
28	Flareboom handling, installation & load testing
29	Mudline centraliser & drill bushing
30	BOP & topside quick connectors & Test stumps



Item No	Description
1	Riser & Conductor Analysis
2	Surface Riser Systems (LP/HP)
3	Platform Import/Export riser systems
4	Tieback Engineering & Tooling
5	Tieback Analysis
6	Subsea HP Drilling Riser Systems
7	Completion & Workover Risers
8	Subsea & Surface Connectors - NT2 , H4 & AQC
9	VIV Suppression Systems
10	Platform Guide Centralisers
11	Subsea pre-drilling templates
12	Conductor Slot addition
13	Rig floor Tension system
14	Cement top-up systems
15	Conductor Whipstocks
16	Surecut Conductor/Casing cold cutter
17	Proten Riser tension system -Pull
18	Proten Riser tension system -Push
19	Aquascope Subsea Camera system
20	Conductor Recovery
21	Conductor systems
22	Rig & Riser monitoring systems
23	Low pressure overshot systems
24	Proten Hang off tool
25	Piling analysis
26	Subsea Heavy lift equipment
27	Bespoke offshore structures
28	Mudline Centralisers & Drill Bushings
28	Tieback Clean-up & Inspection Tooling
30	BOP & Topside Quick Connectors & Test Stumps
31	Wellbay Extension Modules
32	Rig-less Conductor Recovery System



Supporting the full offshore energy ecosystem