

Low-Profile Vertical Tree Instrumentation Electrical Feedthrough System

Diamould electrical connectors

APPLICATIONS

Electrical feedthrough for subsea vertical trees

ADVANTAGES

- Low-profile design ideal for use with hardware with <1-in outside diameter
- Protected male pin for corrosion protection when demated
- Electron-beam-welded electrical pressure barriers that eliminate requirement for O-rings
- Crimp termination technology that eliminates soldering
- Lower tubing hanger connections rated to 350 degF [177 degC]
- Design based on proven vertical electrical feedthrough system (EFS) technology used in more than 1,000 installed subsea trees
- Barriers qualified to API Spec 6A Product Specification Level (PSL) 3G

The low-profile vertical tree EFS in the portfolio of Diamould* electrical connectors has been developed to address specific applications where real estate is limited, providing a unique nonorientated solution for vertical tree applications.

Based on patented and field-proven wet-mateable technology and cable termination methods, the low-profile vertical tree EFS provides all the functionality expected from an industry standard plus differentiating features that improve reliability and long-term performance

Protected male pins and dielectric-filled wipers

Male pins are protected in dielectric-filled wipers, increasing the electric tracking distance to earth as well as improving integrity and reliability. This feature provides mechanical and corrosion protection to the demated male contact pin.

Crimp termination technology

Unique and reliable crimp and latch boot technology provides a clean, repeatable means of cable termination, eliminating the requirement for soldered terminations and potential quality issues.

Electron-beam-welded pressure barrier

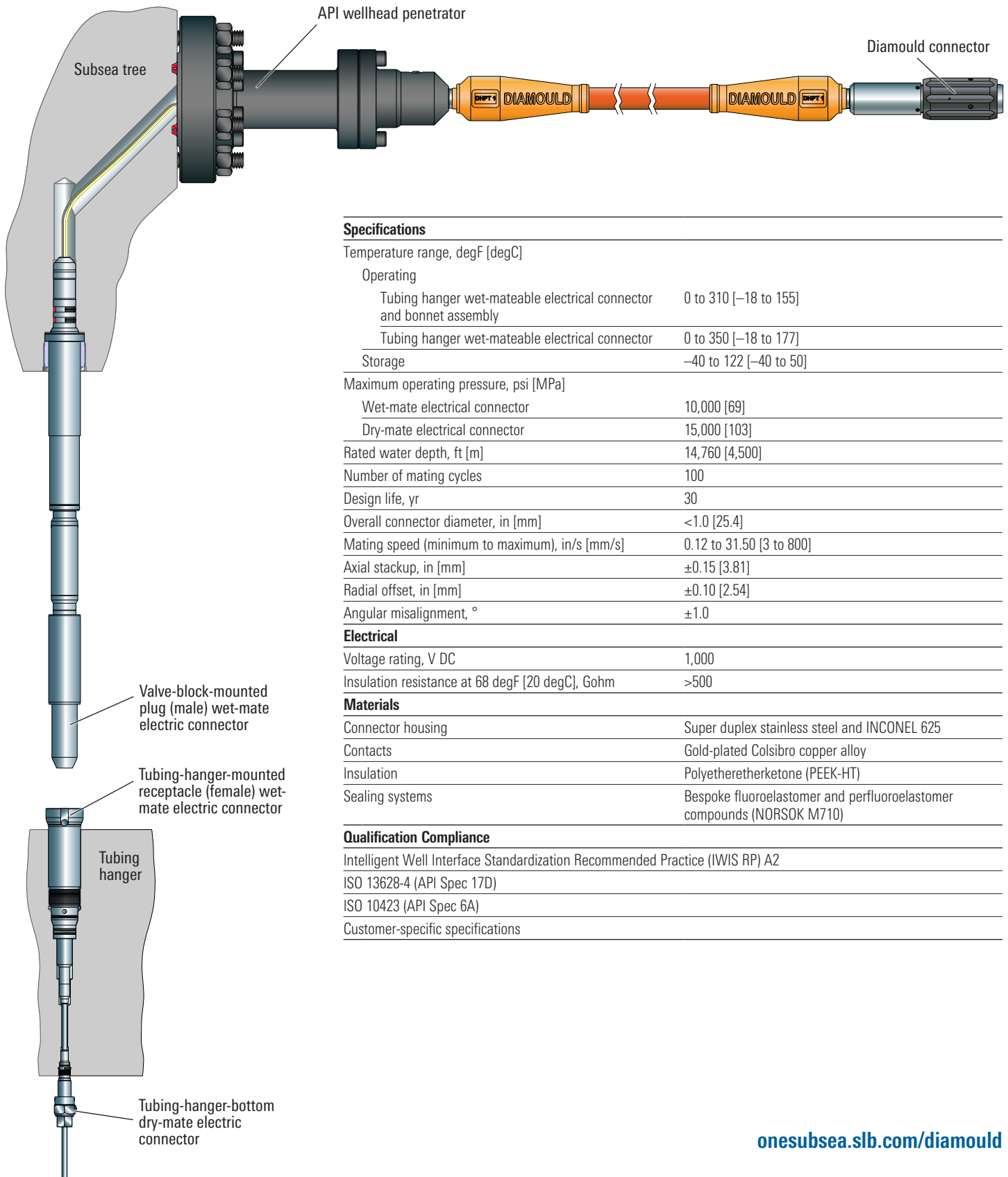
When used for long-term sealing, O-rings are subject to compression set and decompression damage. Electrical pressure barriers are configured with an electron beam weld for well integrity, eliminating the need for O-rings and elastomers as a long-term seal solution in critical wellhead applications.

High-temperature tubing hanger connectivity

The dry-mate connection system at the bottom of the tubing hanger feedthrough is developed and qualified for 350-degF operation scenarios with high-temperature production flow.



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Specifications

Temperature range, degF [degC]

Operating

Tubing hanger wet-mateable electrical connector and bonnet assembly 0 to 310 [-18 to 155]

Tubing hanger wet-mateable electrical connector 0 to 350 [-18 to 177]

Storage -40 to 122 [-40 to 50]

Maximum operating pressure, psi [MPa]

Wet-mate electrical connector 10,000 [69]

Dry-mate electrical connector 15,000 [103]

Rated water depth, ft [m] 14,760 [4,500]

Number of mating cycles 100

Design life, yr 30

Overall connector diameter, in [mm] <1.0 [25.4]

Mating speed (minimum to maximum), in/s [mm/s] 0.12 to 31.50 [3 to 800]

Axial stackup, in [mm] ±0.15 [3.81]

Radial offset, in [mm] ±0.10 [2.54]

Angular misalignment, ° ±1.0

Electrical

Voltage rating, V DC 1,000

Insulation resistance at 68 degF [20 degC], Gohm >500

Materials

Connector housing Super duplex stainless steel and INCONEL 625

Contacts Gold-plated Colsibro copper alloy

Insulation Polyetheretherketone (PEEK-HT)

Sealing systems Bespoke fluoroelastomer and perfluoroelastomer compounds (NORSOK M710)

Qualification Compliance

Intelligent Well Interface Standardization Recommended Practice (IWIS RP) A2

ISO 13628-4 (API Spec 17D)

ISO 10423 (API Spec 6A)

Customer-specific specifications

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