



Exploration & Production

GENERAL SPECIFICATION

SUBSEA SYSTEMS

GS EP SPS 025

Subsea hydraulic spring return quarter turn actuators

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1. Scope

This Technical Specification defines the minimum requirements for the design and manufacture of hydraulic spring return actuators for operating subsea ball valves, which will be used in Emergency ShutDown service (ESD) in high pressure subsea pipelines.

This specification relates specifically to the supply of the hydraulic actuator, its mounting/interface with the subsea ball valve, which it will operate, and its interface with the control system.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ASTM A 193	Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service
ASTM A 194	Carbon and Alloy Steel Nuts for Bolts for High Pressure/High Temperature Service
BS 1133 Part 6	Temporary protection of metal surfaces against corrosion (during transport and storage)
BS 5500	Unfired Fusion Welded Pressure Vessels
BS 3382	Cadmium Plating and Threaded Fittings
BS 4882	Bolting for Flanges and Pressure Containing Purposes
BS 5750	Quality Systems
DIN 500-49	Certificates on material testing
ISO 4406	Hydraulic fluid power - Fluids - Methods for coding the level of contamination by solid particles

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
ASNT-TC-1A	Personnel Qualifications and Certification in Non Destructive Testing
ASME Section V	Boiler and Pressure Vessel Code - Non-Destructive Examination
ASME Section IX	Boiler and Pressure Vessel Code - Welding and Brazing Qualifications
ASME Section VIII Division 1	Boiler and Pressure Vessel Code - Pressure Vessels

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP PVV 142	Valves
GS EP SPS 005	Subsea Ball Valves
GS EP SPS 023	Cleaning and Flushing of Hydraulic Systems

3. Definitions

The following is a list of definitions of the terms, which apply to this specification:

- Purchaser**
Means Total or approved representative
- VENDOR**
Means the person, firm or COMPANY who has been issued with the purchase order to supply the goods

4. Actuator operational requirements

4.1 Environmental

See attached Data Sheet (Appendix 1) for project specific environmental information.

4.2 Valve

See Valve Specification and data sheets (Reference Section 3) for details on ball valves to be operated.

4.3 Mounting and installation

Provision shall be made to the actuator and its mounting on the ball valve to enable easy installation and replacement subsea by divers.

The valve will be installed such that the spindle is within 5 degrees of vertical.

The control system interfaces shall be located such that they may be easily connected by a diver or ROV.

4.4 Hydraulic system pressure

VENDOR shall recommend a working pressure for the hydraulic fluid supply to the actuator up to a maximum of 220 barg.

Proof pressure shall be 150% of working pressure.

4.5 Actuator torque requirements

The minimum actuator output torque shall be twice the maximum specified valve torque, at any point in the operation of the ball valve, when working at the recommended actuator hydraulic fluid working pressure when opening and for spring closing.

The maximum possible output torque from the actuator shall at no time exceed the maximum allowable ball valve torque.

4.6 Design life

The actuators shall be designed to operate for the design life of the Appendix 1) without maintenance.

4.7 Hydraulic fluid

The actuators shall be suitable for use with the hydraulic fluid requirements defined in the Data Sheets.

The actuators inclusive all parts of the hydraulic system shall be flushed according to **GS EP SPS 023**.

4.8 Valve closing time

It is intended that closing times of the valves will be within the range 15-30 seconds for valve sizes up to 24 inches, and about 40 seconds for valve sizes of 32 inches and above. Actuators shall be suitable to provide this speed of operation.

5. Actuator design and construction

5.1 Mechanism

VENDOR shall provide a detailed description of the actuators including a materials list.

A suitable mechanism shall be provided, as part of the actuator, to convert the linear movement of the hydraulic cylinder to a 90° rotation of the output adaptor.

The preferred mechanism will be a simple and robust design where friction and sliding surfaces should be minimised.