**PETROLVALVES** offers a complete single-source integrated solution for manual or actuated high integrity ball, check, slab gate, double expanding gate and axial flow valves, in both Subsea and Topside environments.

**Subsea actuators** are suitable for installation at any water depth, in both deep and shallow water.

**Topside actuators** are manufactured for special applications such as very reliable ESD & HIPPS Systems, quick-closing operations, high-torque requirements and compact platform installations. Both Subsea and Special Topside actuated valves employ advanced technology to guarantee high performance, reliability, availability and safety over a long-term operational life.

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**visual index**

**ball and check valves**

**HYDRAULIC ACTUATORS**

- [Helical Spline® Spring Return](#)
- [Rack&Pinion Spring Return](#)
- [Helical Spline® Double Acting](#)
- [Rack&Pinion Double Acting](#)
gearboxes

- Worm Screw
- Parallel Axis
- Planetary Gear
- Normal Axis
- Diver Hand Wheel Interface
- Direct ROV Interface
- Manual Torque Tool
- Hydraulic Damper

Gate and Axial Flow Valves

- Linear Hydraulic Actuator
- Linear Gearbox
- Worm MultiTurn Gearbox
subsea actuators

GENERAL FEATURES

- Tailor made sizing according to customer requirements related to safety factors, operating pressures and operating curves.
- Fully customized material selection in accordance with Client requirements and applications.
- High strength materials for internals and torque transmitting parts.
- Seawater resistant materials for all exposed parts.
- Fully compensated design for installation at any water depth.
- Designed for extended operational life.
- Fail-safe or Fail-as-is solutions according to plant design.
- Redundant dynamic sealing on piston and external moving parts.
- Clearly visible local position indicator.
- Compact design available for PLEM and manifold installation.
- Special features to allow fast valve operation (less than 2 sec.).
- Fully designed and qualified according to API 6A, API 17D, API 6D, API 6DSS, ISO 13628, ISO 10423, ISO 14723.
- API 17D, ISO 13628-8 or tailor made diver/ROV interfaces.

subsea actuators

OPTIONAL FEATURES

- Hydraulic and electric connectors according to customer requirements.
- Umbilical system including SUTU and TUTU terminations and Hydraulic Power Units.
- Full diver/ROV retrievability of actuators and mechanical operators.
- Self-clutching system or diver/ROV retrievable actuators designed to match Client specifications.
- Guiding systems to ease subsea removal and installation operations of retrievable operators.
- Remote position indication to Control Room by means of limit switches or position transmitters.
- Stem and spool extensions to meet Client requirements in terms of distance from valve center line and field structure layout.
- Protection or pressure retaining caps engineered to protect valve stem and prevent any leakage to the environment after operator removal.
- Docking tools for removal and installation of operators and stem cap (ROV or diver operation).
- Tailor made position indicators according to Client requirements.
hydraulic spring return helical spline actuators

MAIN FEATURES

- Compact ergonomic design for manifold application.
- Piston with linear movement only instead of rotary to guarantee a linear output torque.
- High spline profile contact surface with low specific stress values preventing wear and deformation.
- Suitable and reliable for high number of strokes and fast operation.
- Factory set end stops for perfect valve stroke and alignment.

hydraulic double acting helical spline actuators

MAIN FEATURES

- Compact ergonomic design for side by side and manifold application.
- Piston with linear movement only instead of rotary to guarantee a linear output torque.
- High spline profile contact surface with low specific stress values preventing wear and deformation.
- Suitable and reliable for high number of strokes and fast operation.
- Factory set end stops for perfect valve stroke and alignment.
hydraulic spring return rack and pinion actuators

**MAIN FEATURES**

- Simple and reliable design for minimum vertical dimensions.
- Modular execution.
- Easily externally adjustable stops for perfect valve stroke and alignment.
- Weight balanced design.

hydraulic double acting rack and pinion actuators

**MAIN FEATURES**

- Simple and reliable design for minimum vertical dimensions.
- Modular execution.
- Easily externally adjustable stops for perfect valve stroke and alignment.
- Weight balanced design.
worm screw gearboxes

MAIN FEATURES

- High output torque, suitable for any ball and check valve operation.
- Factory set end stops for perfect valve stroke and alignment.
- Non-reversible mechanism to lock the valve in position during pigging operation.
- Horizontal or vertical diver/ROV interface as per customer requirements.
- Suitable for lifting the check valve clapper without in-line pressure.
- Designed to allow normal check valve functionality if not operated by diver/ROV.

parallel axis gearboxes

MAIN FEATURES

- Simple and compact design for minimum overall dimensions.
- Factory set end stops for perfect valve stroke and alignment.
planetary gearboxes

Main Features

- Integrated valve and operator design, compact size and reduced weight.
- Long term reliable service life.
- Factory set end stops for perfect valve stroke and alignment.

normal axis gearboxes

Main Features

- Integrated valve and operator design, compact size and reduced weight.
- Long term reliable service life.
- Factory set end stops for perfect valve stroke and alignment.
**direct rov interfaces**

**MAIN FEATURES**

- Integrated valve and operator design, compact size and reduced weight.
- Long term reliable service life.
- Factory set end stops for perfect valve stroke and alignment.

**diver handwheel interfaces**

**MAIN FEATURES**

- Integrated valve and operator design, compact size and reduced weight.
- High torque multiplication for an easy diver operation (diver max torque 75 Nm).
- Handwheel diameter 500 mm (other diameters available upon request).
- Long term reliable service life.
- Factory set end stops for perfect valve stroke and alignment.
hydraulic dampers  
**MAIN FEATURES**

- Reduced impact of swing check valves closure member.
- Flow regulator to set operating time.

actuators and gearboxes  
**FOR LINEAR VALVES**

hydraulic spring return and double acting linear actuators  
**MAIN FEATURES**

- Spring Return and Double Acting execution available.
- Compact size and reduced weight.
**linear gearboxes**  
**MAIN FEATURES**

- Compact size and reduced weight.
- High output thrust.

**worm multturn gearboxes**  
**MAIN FEATURES**

- High output torque, suitable for non-rising stem gate and axial flow valve operation.
- Compact size and reduced weight.
subsea actuation

actuators and gearboxes
REMOVAL SYSTEMS

rov clamp retrieval system
CLAMP MAIN FEATURES

- Coupling between spool piece and operator guaranteed by a clamp system.
- Clamp arms operated from unlocked to locked position and vice versa by ROV override.
- Misalignment prevention between operator and spool piece guaranteed by a reference key or clamp system.
- Automatic clutch for removal and reinstallation on the valve apart from valve position.
- Clutch spool equipped with relief valve acting as overpressure venting device and accumulator acting as pressure compensation device.
- Seawater resistant materials for all exposed parts.

rov clamp retrieval system
PERMANENT SPOOL MAIN FEATURES

- Easily externally adjustable stops for perfect valve bore alignment.
- Misalignment prevention guaranteed by reference groove.
- Centering pin for easy alignment with clamp clutch.
- Stem teeth design including lateral slope angle to ease smoothly the disengagement operation.
- Seawater resistant materials for all exposed parts.
- Additional port for spool cavity flushing and filling with compensation oil.
fast bolting diver retrieval system

CLAMP MAIN FEATURES

- Coupling between spool piece and operator guaranteed by diver operated fast bolts.
- Actuator locked and kept in position on the valve by easily rotating two levers placed on valve/actuator interface.
- Fast bolting operated from unlocked to locked position and vice versa by diver.
- Misalignment prevention between operator and spool piece guaranteed by a system of asymmetric dowels and anti-rotation pins.
- Automatic clutch for removal and reinstallation on the valve independently from valve position.
- Seawater resistant materials for all exposed parts.

fast bolting diver retrieval system

PERMANENT SPOOL MAIN FEATURES

- Easily externally adjustable stops for perfect valve bore alignment.
- Centering pin for easy alignment with operator clutch.
- Stem teeth design including lateral slope angle to ease smoothly the disengagement operation.
- Equipped with relief valve acting as overpressure venting device and accumulator acting as pressure compensation design.
- Seawater resistant materials for all exposed parts.
- Additional port for spool cavity flushing and filling with compensation oil.
Clamp Main Features

- Engagement/disengagement between operator and intermediate spool performed by means of diver removable enclosed nuts.

- Design limiting bolt and nut threads corrosion, permitting an easy unscrewing activity after long subsea installation periods.

- Separation of actuator and spool cavity by means of additional seals on actuator stem.

- Additional bearing on output stem to avoid any possible damage due to eventual impacts during installation.

- Additional adapter flange on valve top mounting to increase the diameter of location of the bolting.

- Additional port for spool cavity filling, outlet and inlet safety valves for seawater draining after installation.

- Seawater resistant material for exposed enclosed nuts.
actuators and gearboxes
ACCESSORIES

closed type
COMPENSATION SYSTEM

- Independent pressure balancing device connected to the operator main casing in order to avoid any spring chamber/casing over pressurization.
- Internal rubber diaphragm to avoid seawater and compensation oil direct contact.
- Safety relief to avoid pressurization of compensated cavity in case of stem leakage.
- Copper washer to avoid marine growth.
- PTFE nipple to protect copper pipe from cathodic corrosion protection system.

open type
COMPENSATION SYSTEM

- Independent pressure balancing device connected to the operator main casing in order to avoid any spring chamber/casing over pressurization.
- Compensation fluid is heavier than seawater and immiscible with it, both for actuators and gearboxes.
- Super Duplex tank in order to prevent any compensation system corrosion.
- Copper pipe to avoid marine growth.
- PTFE nipple to protect copper pipe from cathodic corrosion protection system.
**self supporting spool**

**EXTENSIONS**

- Self supporting intermediate spool extensions.
- Capable of being installed between valves’ bonnet and operator housing or below override interface in order to extend operating interfaces to the required height.
- Fixing to an external structure not needed.

**non self supporting**

**EXTENSIONS**

- Telescopic extensions available for both ROV interface and local position indicator.
- Adjustable final length of +/- 100 mm. Tailor made design for increase of adjustability.
- Available with universal joint to allow lateral misalignment of the ROV bucket.
- Seawater resistant material.
remote position

INDICATORS AND TRANSMITTERS

- Proximity switches for open, close and intermediate remote position indicator.
- 4-20 mA position transducer for continuous remote position indication; other communication protocol available upon request to meet Client requirements.
- Available up to triple redundant configuration.
- Both for linear and rotary equipment.
- Optional multiple pins subsea electric connectors, complete with protection caps.
- Optional diver removable limit switches and position transmitter assembly.

torque tool

MULTIPLIER

- Light portable tool for diver intervention.
- Suitable for ISO 13628-8 ROV buckets or other types of buckets upon request.
- Diver torque multiplier up to 20 times.
- Max diver torque 75 Nm or 100 Nm.
- Handwheel diameter 500 mm (other diameters available upon request).
**protection and pressure**

**CAPS**

- Caps to protect valve stem after actuator removal.
- Clamp, fast bolting or enclosed nuts removal and installation system.
- Pressure containing design to contain any potential valve stem leakage.
- Relief valves for cap integrity protection in case of non pressure containing design.
- Valves and tools to enable flushing after installation.
- Tailor made caps to meet Client and field requirements.

**hydraulic**

**CONNECTORS**

- Female thread port on actuators’ cylinders as standard connection; tailor made hydraulic connections provided upon request.
- Anti-vibration fittings feature.
- Hot stabs complete with protection caps.
- Both for ROV and diver intervention.
storage and transportation structures

- High strength materials.
- Tailor made structures on purchased actuators and gearboxes equipped with removal system.
- Suitable for operators’ parking and transportation activities.

guiding system

- High strength pins to ease subsea removal and reinstallation activities by ART tool.
- Available for all type of removal systems.
- Tailor made in accordance with Client and field requirements.
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