

Subsea Valve Actuators



Shafer™


EMERSON™
Process Management

APPLICATIONS



Shafer's experience in providing subsea valve control systems spans 30 years. We have hundreds of subsea actuators currently in service around the world.

- Subsea valve control at depths up to 1000 meters.
- Subsea ESD valves - Double acting or spring return.
- Platform ESD valves - Subsea, riser or topside.
- Tanker mooring system applications - PLEM shutdown.
- Subsea manifold valves.

CAPABILITIES

Complete valve actuation systems

Our turn-key expertise enables us to design and provide the complete subsea "valve operating system".

- Double acting actuators.
Torque outputs to 5 million in-lbs (564,922 N-m).
- Spring return actuators.
Spring ending torque outputs to 400,000 in-lbs (45,194 N-m).
- Hydraulic power units.
- Power storage accumulators for fail-safe valve operation.
- Umbilicals and umbilical termination assemblies which provide all hydraulic and electrical requirements for the subsea actuators.
- ROV compatible actuator controls and control panels.
- Valve position indication accessories.

SUBSEA ACTUATORS

*The smallest,
most efficient
actuator available.*

The rotary vane type actuator is ideal for double acting (open/close) valve control. The rotary vane can also be utilized in fail-safe applications where a hydraulic accumulator is used to provide power for the fail-safe valve stroke. Accumulators can be mounted with the subsea actuator or positioned topside with the hydraulic power unit.

The rotary vane has several distinct advantages for subsea use including:

- The rotary vane is the most compact actuator available.
- The actuator is mounted concentrically over the valve stem, making the system exceptionally stable.
- The double vane actuator produces pure balanced torque and, by design, will not generate any side loading on the valve stem or actuator bearings.
- Pressure compensation devices are not required, even at depths up to 1,000 meters.



SUBSEA ACTUATORS

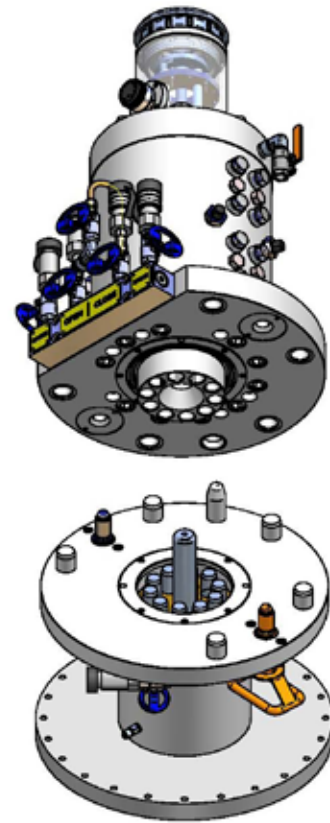
Quick connect/disconnect mounting adaptors.

ACTUATOR MOUNTING

Mounting systems include conventional permanent actuator to valve mounting, along with ROV or diver activated quick connect/disconnect styles of mounting adaptors.

The quick connect/disconnect mounting system allows for easy removal of the actuator, from the valve, while submerged. A sealed cover is available to protect the valve stem from corrosion and sea growth after the actuator is removed.

For re-installation, tapered pins are used to simplify mounting the actuator, in the correct position, while in the subsea environment. All Shafer actuators provide complete purging and by-pass valving for initial commissioning or remounting subsea.



CAPABILITIES

Shafer manufactures a complete line of hydraulic power units and accumulators specifically designed to supply the proper pressure, volume and flow rates for the subsea actuators. Other power systems include diesel powered hydraulic pumping units for barges or buoys along with nitrogen powered or manual hand pump type units.



MATERIALS OF CONSTRUCTION

RV-Series

Body	HRS-1020/ASTM A-36 Plate
Head	HRS-1020/ASTM A-36 Plate

Mounting Adapter

Upper Spool	HRS-1020/ASTM A-36 Plate
Lower Spool	HRS-1020/ASTM A-36 Plate

AUXILIARY EQUIPMENT

Pipes & Fittings	316 Stainless Steel
Valving	316 Stainless Steel
Junction Block	316 Stainless Steel
Bolting	316 Stainless Steel or ASTM A-193 GR.B-7 with Zylan 1070 coating

PROTECTIVE COATING SYSTEM

Shafer utilizes a coating system produced by Ameron Protective Coatings Division. The experts at Ameron have verified and approved our application processes and coating thicknesses to give us the best coating system possible for this type of equipment.

- The initial coating applied to all carbon steel surfaces is an abrasion resistant inorganic-zinc coating which provides long lasting cathodic protection. The coating has excellent resistance to weathering, splash and spill of petroleum products or solvents.
- Intermediate and topcoats are polyamide-cured epoxy coatings which provide excellent durability in the marine environment; withstands solvents, petroleum products, seawater, salt solutions, and sour crude.

NOTE: Alternate coating systems may also be specified by the customer.

TESTING



Hyperbaric testing of actuators and control systems takes place in Shafer's test chamber, which currently is rated to 457 meters simulated depths.

Other test facilities are available through associated companies in the U.S.A., providing testing capabilities in depths exceeding 1500 meters.

In addition, certified torque testing of actuators can be provided on Shafer's patented torque measurement machine. The unique torque tester was designed by Battelle Research Institute and is capable of measuring torque to 10,000,000 inch-pounds (1,129,845 N-m) to the Institute of Standards and Technology.

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