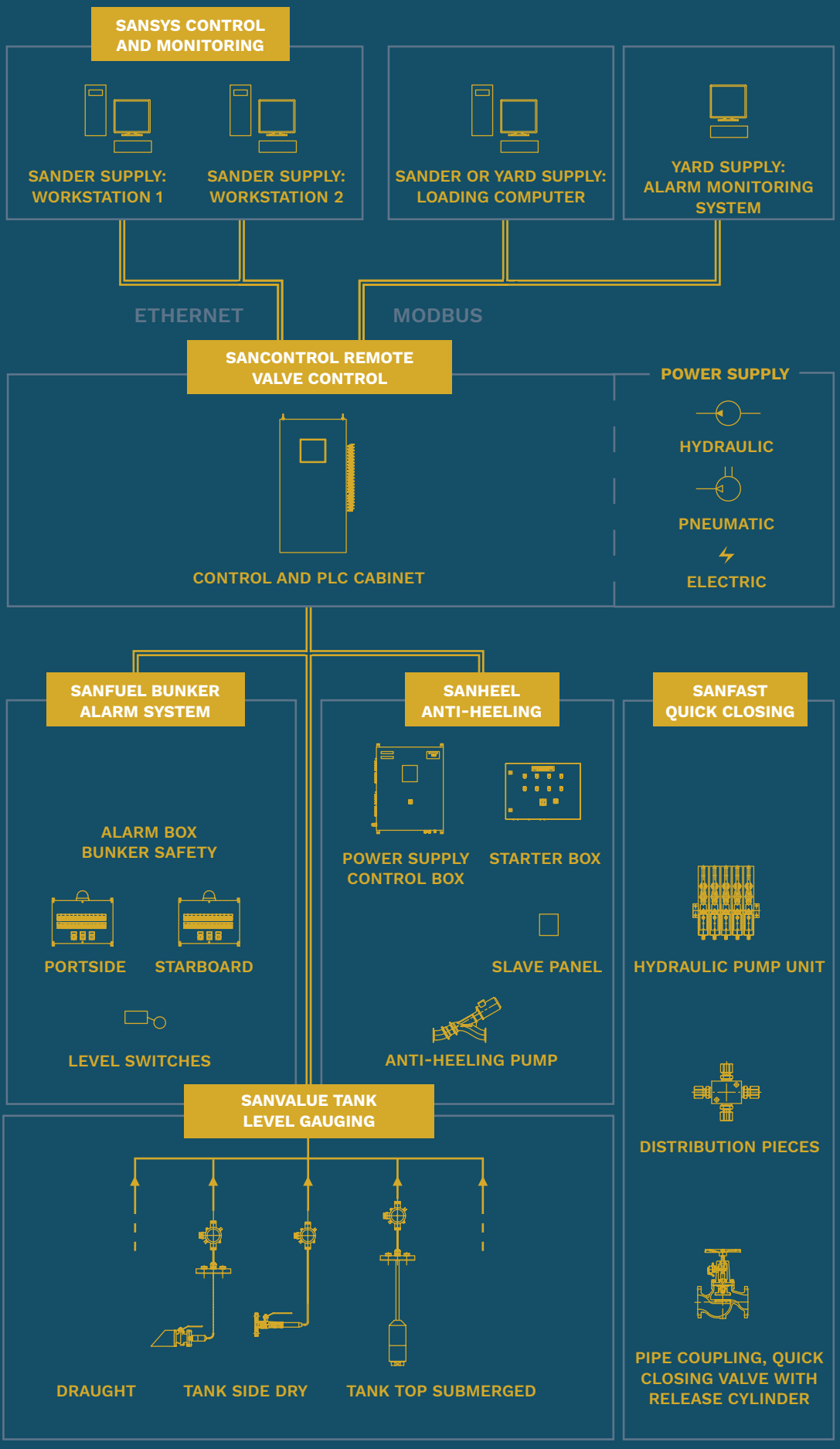
NO COMPROMISES

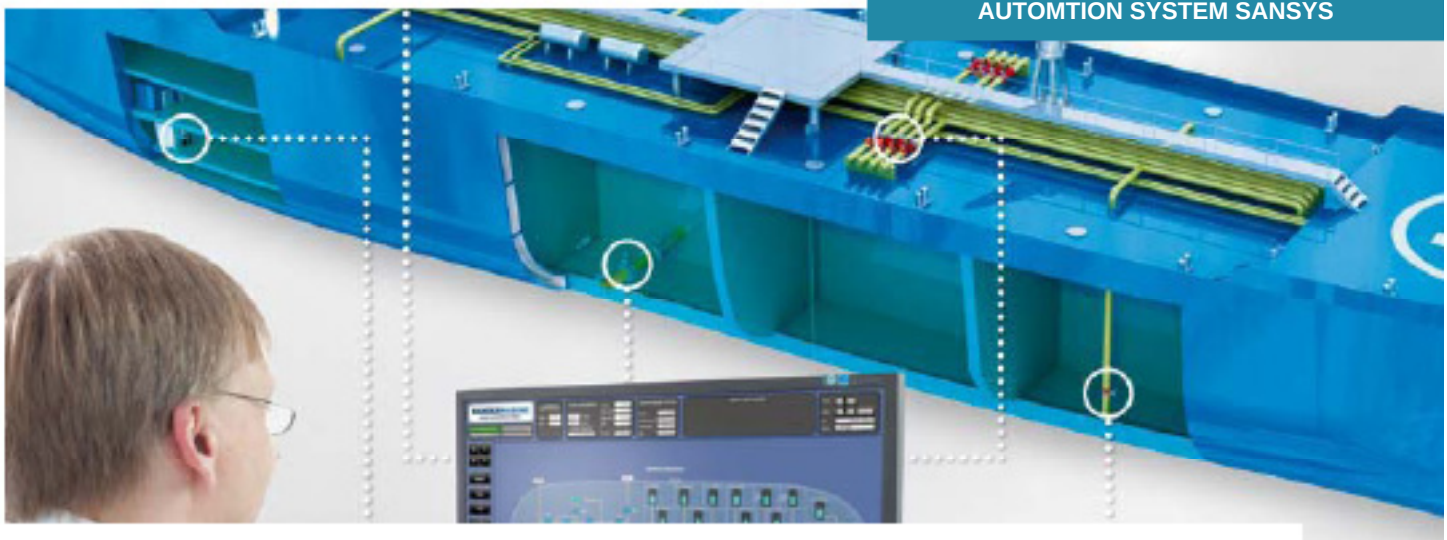
GERMAN ENGINEERING FOR THE SHIP´S INSIDE

SANDERMARINE
MARINE + OFFSHORE EQUIPMENT

SANDERNAVY
NAVAL EQUIPMENT

CONTROLLING SANDER MARINE VALVES & ACTUATORS





NO COMPROMISES: GERMAN ENGINEERING FOR THE SHIP´S INSIDE

At SANDER we consider it a science to connect our products with a system intelligence that meets our own high demands.
Due to the fact that our customers`needs can hardly ever be met by standard solutions, we decided to develop the required systems in-house which guarantees an individual and tailor-made system for each of our clients.
The results in intelligent control systems suitable for marine, navy, offshore applications and yachts - such as (besides others):

- / remote valve control systems
- / anti-heeling system
- / tank level gauging / draft measurement systems
- / quick closing
- / actuators
- / navy

FULL CONTROL AT ANY TIME

Directing the flow

A remote control valve system (RCVS) directs the transport of fluids (ballast or bilge water, fuel oil, cargo etc.) onboard a ship. Valves are opened or closed by hydraulic, electro-hydraulic, pneumatic or electric actuators. Limit switches (open/close) or positioners (0-100% open) report the valve's status back to the RCVS.

Uncompromising safety and easy operation

Depending on class requirements, valves can be equipped with emergency operation via hand wheel or hand pump and/or include a fail-safe self-closing / self-opening feature.

Besides valve operation a RCVS regularly allows the operation and monitoring of external pumps or a ballast water treatment system.

The SANSYS control and monitoring system is used to operate the RCVS from the central control cabinet or decentralized locations such as bridge, cargo control room, pump room etc. The status of the RCVS can be visualized with a tabular overview of the valves or a customized graphic display of the complete piping system.

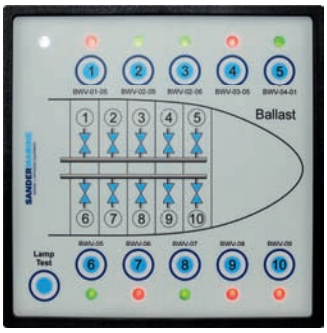
SANCONTROL may be linked to the vessel's integrated automation system (IAS) or alarm monitoring system (AMS) by wiring or bus interface.

SANCONTROL RCVS is accepted by all major class societies, such as DNV-GL, LR, BV, RMRS etc.

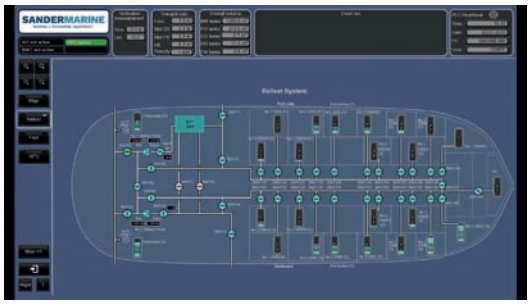
INCREASE EFFICIENCY. REDUCE RISKS.

SANCONTROL – A typical setup

- **Control cabinet**
- **Hydraulic power unit (hydraulic system only)**
- **External pressurized air supply (pneumatic system only)**
- **Valves with**
  - Actuators (hydraulic / electro-hydraulic / pneumatic / electric)
  - Local power units (electro-hydraulic system only)
  - Limit switches or position feedback
  - Optional emergency operation devices (hand wheel / hand pump)
- **Optional SANSYS Chief / SANSYS Master monitoring**
- **Optional external workstations**
- **Optional interfaces to**
  - Vessel's integrated automation system IAS / alarm monitoring system AMS
  - External pumps
  - Ballast water treatment system
  - Other SANDER fluid management systems

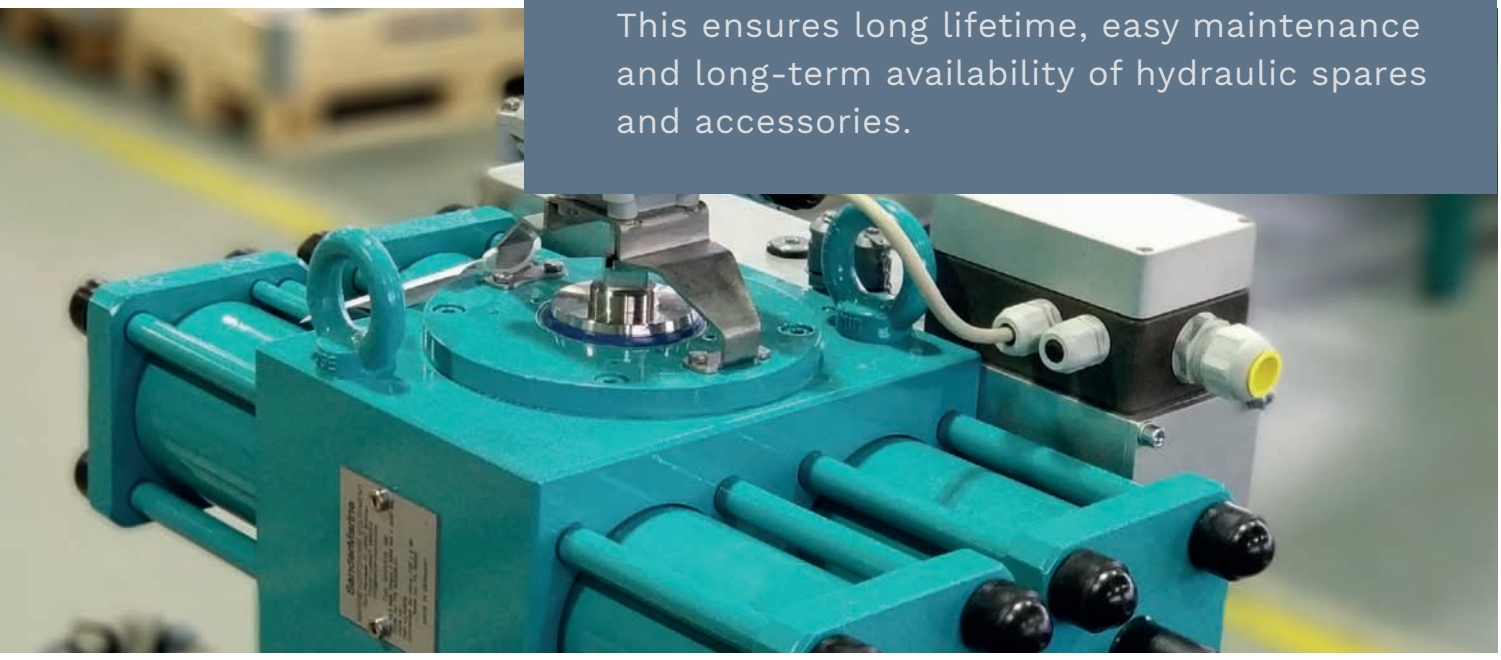


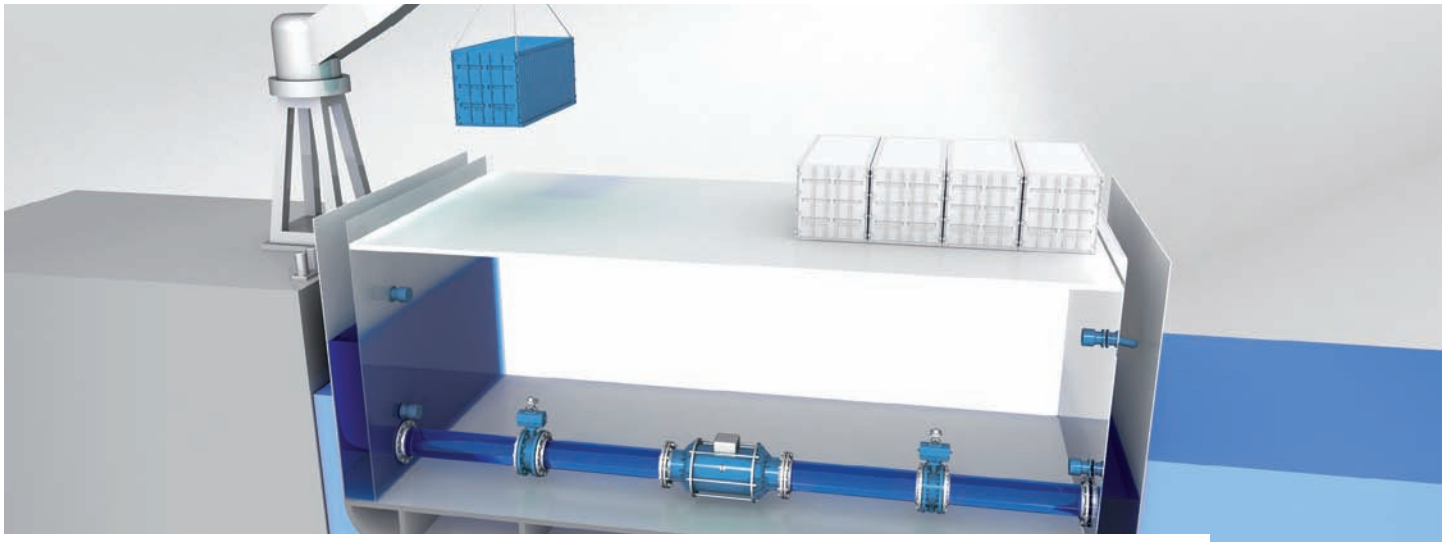
RCVS System – SANSYS Pro



RCVS System – SANSYS Master

✔ Our hydraulic equipment complies with the most recent **industry standard EN 15714-4**. This ensures long lifetime, easy maintenance and long-term availability of hydraulic spares and accessories.





ANTI-HEELING THE SANDER WAY

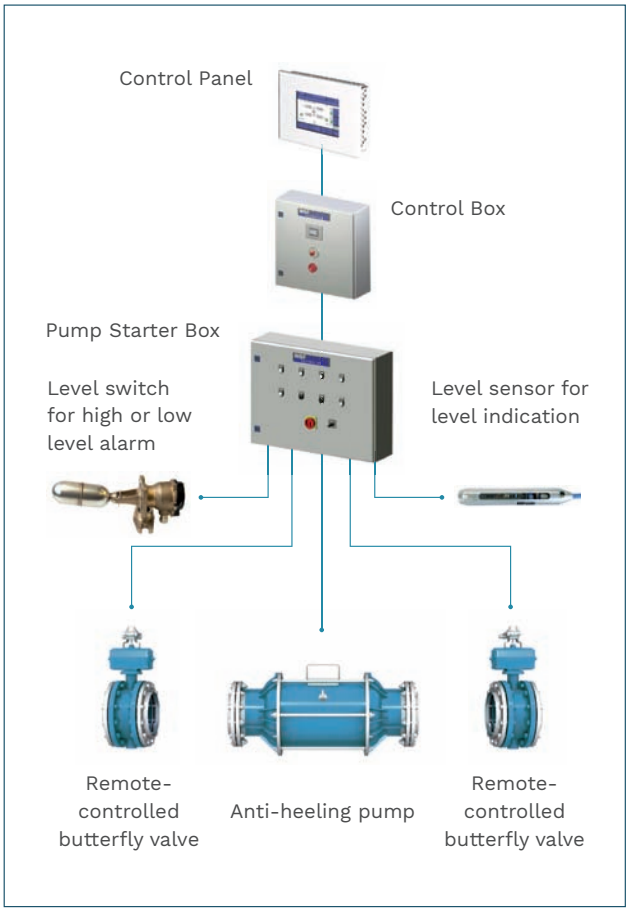
SANHEEL detects the heeling angle of the vessel and rebalances the ship automatically by pumping ballast water from starboard to portside or vice versa.

Your benefit: No compromises

Loading and unloading can be operated continuously and in reduced time while the vessel is kept safely upright. The control system evaluates the connected inclination sensor and automatically controls the mass flow through the valves and the pump to compensate the heeling by weight transfer.

A pre-heeling feature allows the crew to prepare the vessel to load or discharge single heavy pieces of cargo.

SANHEEL anti-heeling system can operate with reversible and nonreversible pumps, using remote-controlled valves to direct the ballast water flow. For safety reasons the system is provided with emergency stop equipment which can be pushed at all operating stations. Type approved by DNV-GL.



Seamless integration

The SANSYS control and monitoring system allows a seamless integration of a SANHEEL anti-heeling system with other systems such as SANCONTROL remote control valve system or SANVALUE tank level gauging system.

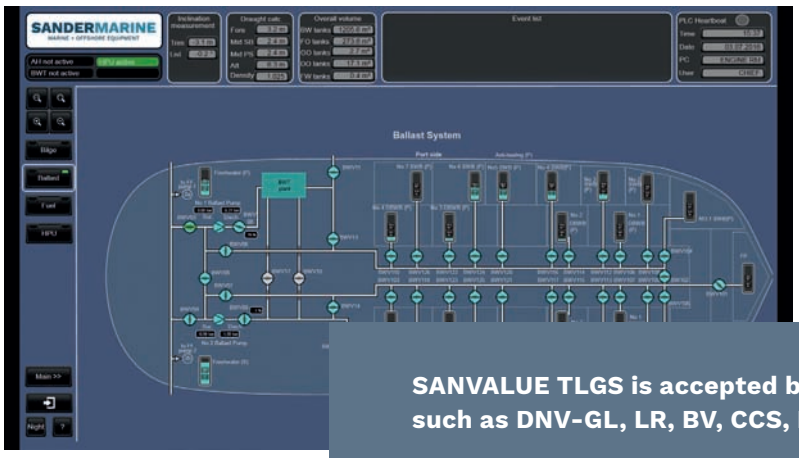
INCREASE EFFICIENCY. REDUCE RISKS.

SANVALUE – Selecting the right options

- **Control cabinet**
  - Inclination sensor
  - Tank volume and mass calculation (trim, list, density)
- **Dry or submerged tank level sensors**
- **Data recording and trend analysis**
- **SANFUEL bunker alarm system**
- **Draught measurement sensors**
- **Tank level switches for low and high level alarms**
- **SANSYS Chief / SANSYS Master visualization**
- **External workstations with interfaces to**
  - IAS – integrated automation system
  - AMS – alarm monitoring system
  - Loading computer
  - Other SANDER systems

Involve SANSYS for perfect control

The SANSYS control and monitoring system is used to monitor the TLGS from the central control cabinet or decentralized locations such as bridge, cargo control room, pump room etc. The tank levels can be visualized with a tabular overview of the tanks or a customized graphic display of the complete piping and tank system. A connection to the vessel's integrated automation system (IAS) or alarm monitoring system (AMS) is possible.



SANVALUE TLGS is accepted by all major class societies, such as DNV-GL, LR, BV, CCS, RINA, RMRS etc.

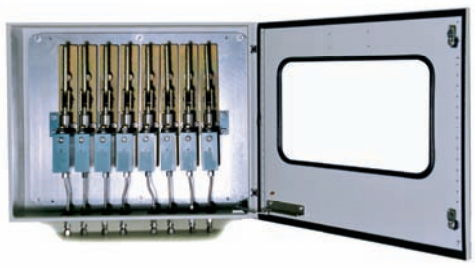
STAND-ALONE IN CASE OF EMERGENCY

That’s how it works

A SANFAST quick closing valve system (QCVS) is a stand-alone system for a safe isolation of fuel tanks in case of emergency. It has to be independent of the ship's power system. The release cabinet is located in a safe zone, outside of the engine room.

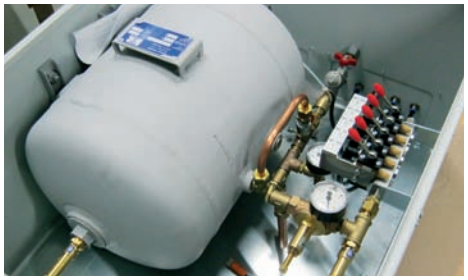
The shut-off valves of a QCVS are opened manually, tightening a spring. As soon as the release mechanism is triggered the spring tension closes the valve.

The most common release mechanisms are based on air pressure, hydraulic pressure or wire tension.

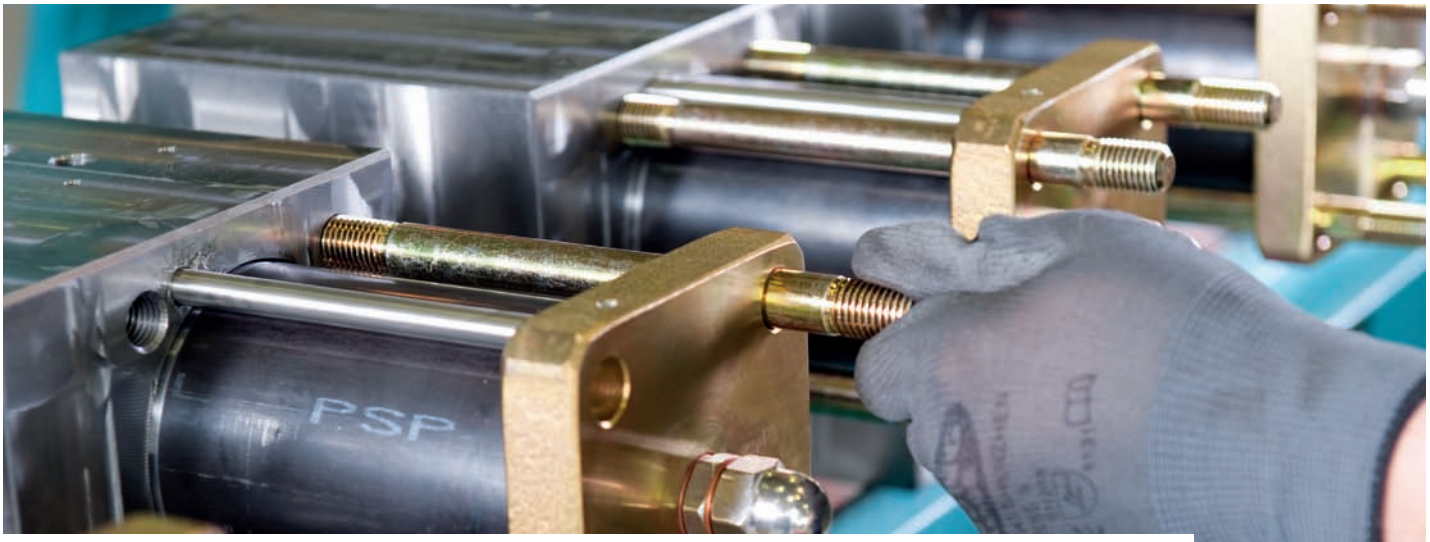


/ **Pneumatic systems:**
An air reservoir stores pressurized air sufficient to operate all valves at least twice. The crew can release it by the push of a button in the control cabinet to close single or groups of valves simultaneously.

/ **Hydraulic systems:**
The crew pulls the lever of a small hand pump inside the control cabinet to apply hydraulic pressure to single or groups of valves simultaneously.



Optional limit switches installed on the valves can confirm the safe closing of each fuel line by LED indication in the control cabinet and/or to the vessels IAS.



A RANGE OF RELIABLE OPTIONS

Hydraulic actuators

Hydraulic actuators are the most commonly used devices to operate marine valves from a distance. They convert oil pressure into a 90° rotating (ball or butterfly valves) or a linear movement (non-return or stop valves).

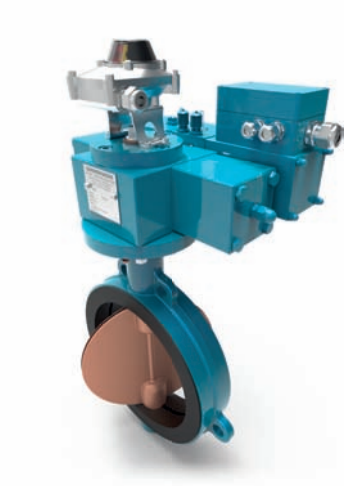
Hydraulic vs. electro-hydraulic

A hydraulic remote control valve system (RCVS) is operated by a central hydraulic power unit (HPU) and valve cabinet, while an electro-hydraulic RCVS is based on decentralized local power units (LPU) which open and close individual valves.

Double- vs. single acting actuators

Standard actuators are double-acting, opening and closing is done by hydraulic power. However, some critical applications require valves which open (or close) automatically, even in case of a complete power or pressure loss. Consequently, all SANDER hydraulic actuators are also available as single-acting version: Only one direction requires hydraulic power, while the reverse direction is powered by a spring pack or gas pressure reservoir.

HYDRAULIC ACTUATORS



Rotary actuators

/ 90° part-turn actuator for butterfly and ball valves
/ Dry and submerged service
/ Compact design
/ Flanges ISO 5211 F07 to F40
/ Square, flat or round shaft
/ Torque up to 15700 Nm
/ Body material EN-GJS-400-15

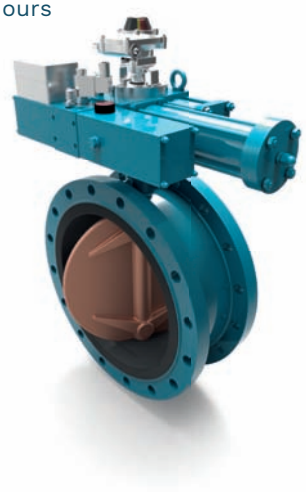
Linear actuators

/ Used for stop and non-return valves
/ Dry and submerged installation
/ Stroke 18-30 mm
/ Compact design
/ Body material EN-GJS-400-15

AUXILIARY EQUIPMENT

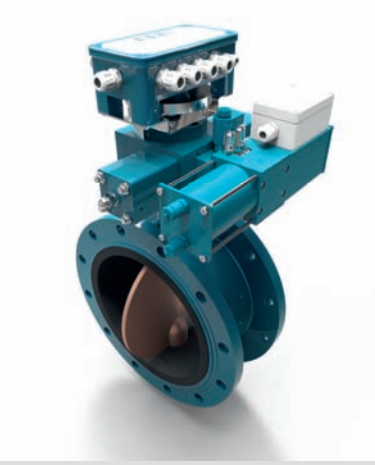
Hydraulic power unit HPU

/ Central power supply for a hydraulic remote control valve system
/ Designed for 103 bar control pressure according to EN 15714-4
/ Wide range of operating pressure adjustable
/ Two pumps for redundancy
/ Very long maintenance intervals > 20,000 operating hours



Local power unit LPU

/ Decentralized hydraulic power supply for linear or rotary actuators
/ Designed for 103 bar control pressure according to EN 15714-4
/ LPU can be installed in any direction, mounted on actuator or separately
/ Protection class IP68 for double-acting actuators



SANSWITCH 3.0 control unit

/ Local or remote operation of electro-hydraulic valves
/ Includes 0-100% position indication of valve
/ DNV-GL type approved according to DNVGL-CG-0339 (Nov. 2016)
/ Modbus RTU capable
/ Self-monitoring incl. preventive maintenance and automatic unblocking

FULL TORQUE – COMPACT DESIGN

Limit switch

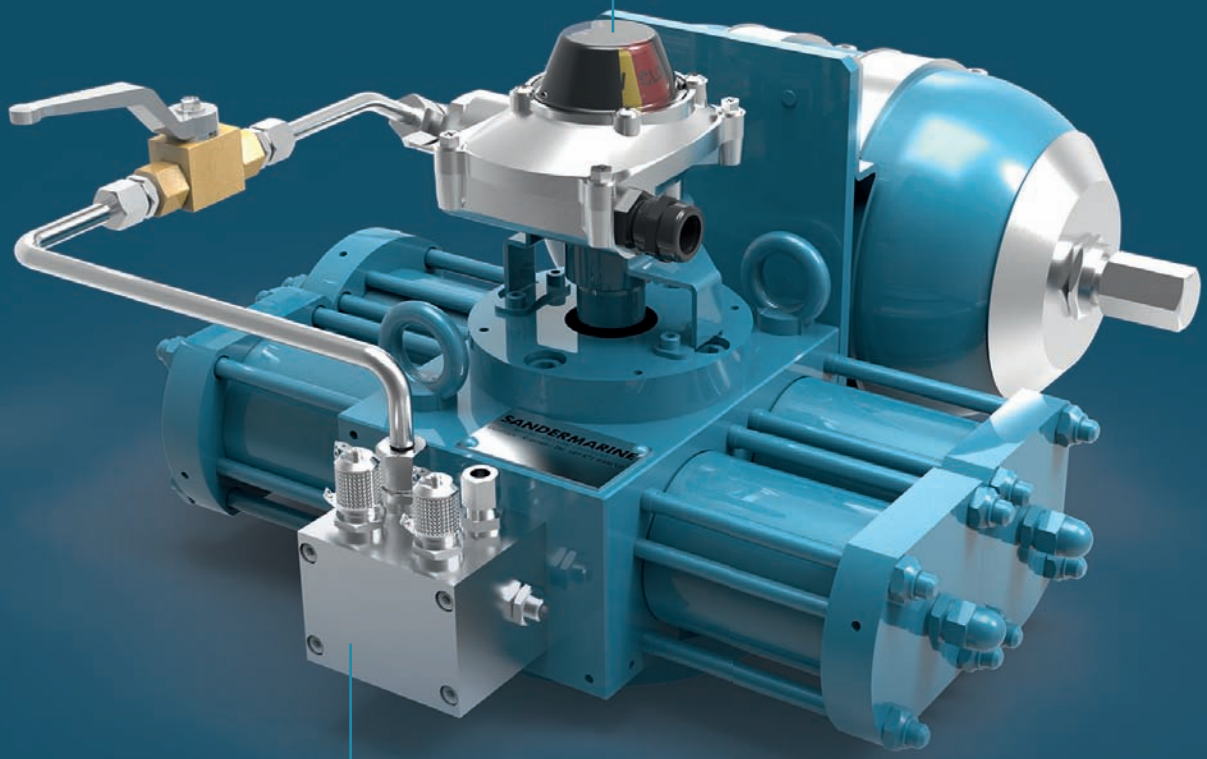
- Installed on valve
- Provides a digital signal indicating if the valve is open or closed
- Protection class IP68 (permanently submerged) possible
- Hazardous zone installation possible

Volume indicator

- Installed in hydraulic control cabinet in non-hazardous, dry environment
- Provides an analogue 4-20mA signal based on hydraulic oil volume transferred to actuator
- Remote indication of opening angle of valve

Position feedback

- Installed on valve
- Provides an analogue 4-20mA signal indicating opening angle of the valve
- Protection class IP67 possible
- Hazardous zone installation possible



Control block

- Suitable for all SANDER hydraulic actuators
- Aluminum or bronze material
- Allows various valve operating modes
- Quick & Easy connection of emergency hand pump
- Adjustable running time
- Bypass for de-aeration of hydraulic piping system

SANDERMARINE
MARINE + OFFSHORE EQUIPMENT

SANDERNAVY
NAVAL EQUIPMENT

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