Ballast Systems

STABILISING YOUR CARGO, **SAFETY FOR PERSONNEL**

For applications in a maritime environment where stability is of great importance, e.g. on ships or semi-submersible drilling rigs, we have designed (submersible) pneumatic and hydraulic ballast control systems.

In cargo ships and semi-submersible drilling rigs, the safety of personnel and cargo depend on stability. This stability is created by a special installation on-board that organises the amount of seawater in several ballast tanks: the Ballast system. Typically, a Ballast system consists of 2 components: a control panel which is needed to operate the system and valves & actuators to control the amount of water going in or out of the ballast tanks.

PNEUMATIC **BALLAST SYSTEMS**

Traditionally, hydraulic operated actuators are used in Ballast systems. The risk of hydraulic oil leakage into the ballast water and overall system cost savings, have encouraged our engineers to design and develop pneumatic actuators. These actuators can be mounted directly into ballast tanks and be submerged up to a depth of 30 meters. We offer complete custom built pneumatic Ballast systems comprising valves, actuators, control cabinets or panels and all accessories necessary. If the use of hydraulic Ballast systems is preferred, we can also provide a suitable hydraulic solution. If needed, we can provide a complete Ballast system solution, including control systems, a touchscreen display and Hydraulic Power units. All can be customized to your specific needs.

engineering your ambitions

Implementation & technical details

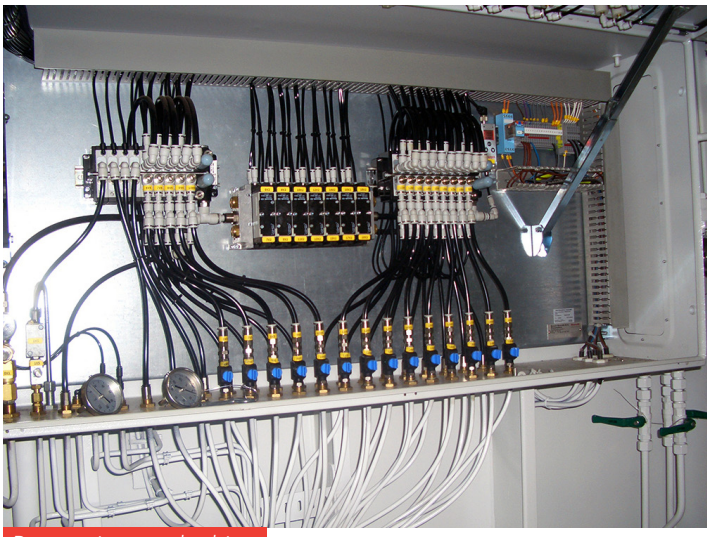
- Installation on valves throughout the ship's Ballast system
- Direct operation from the control cabinet in the engine room or remote locations elsewhere on board the ship
- Stand-alone operation or by interaction with the cargo management system of the vessel
- Installation of touch screens or integration of all control and signal elements in a pneumatic mimic panel, giving a clear graphic overview of the complete ballast system
- Connection of each actuator to the control cabinet by only 2 air connections:
  - one for opening & closing the valve
  - one for positive & active position indication
- Quality guarantee of supplied air by the use of an absorption desiccant air dryer unit:
  - prevents moisture settlement in the system
  - guarantees optimal functionality at extreme low temperatures, even far below -20 °C

SUBMERSIBLE **ACTUATORS**

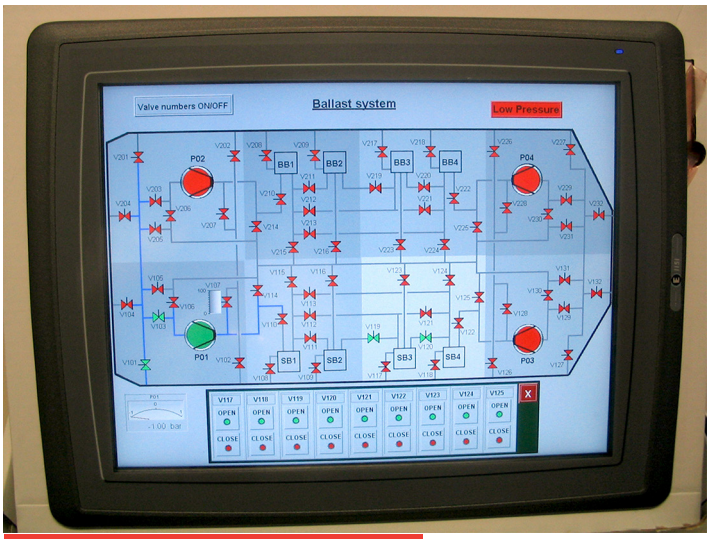
Mostly, ballast valve actuators are placed inside the engine room, pump chamber, bow thruster room or pipe duct where they can be accessed for maintenance or direct control. In an effort to save valuable space on board, engineers and ship builders choose to mount actuators inside the ballast tanks. Reliability here is of the utmost importance. For this special purpose we have developed our own line of submersible actuators.

Modern ships are designed to be operated by smaller crews which consequently resulted in a greater need for automated Ballast systems. It is of utmost importance a Ballast system can be controlled with a minimum chance of failures.

Submersible ballast valve with actuator mounted in tank



Pneumatic control cabinet

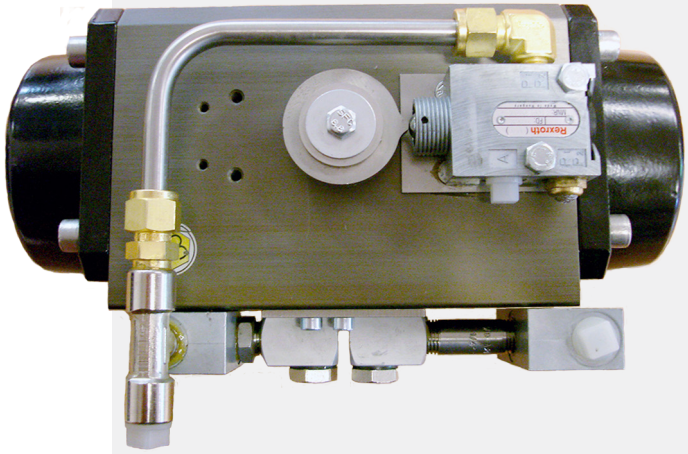


Touchscreen display

ADVANTAGES **PNEUMATIC BALLAST SYSTEMS**

- Positive & active valve position indication generated by the valve stem
- Fail-safe spring return actuators
- No electrical connections or power supply required
- Actuators submersible up to 30 meters
- Interaction with digital control systems is easily established by interface modules
- Low maintenance cost
- No special Hydraulic Power units required: a simple air compressor is sufficient
- Emergency control consists of a simple foot-pump located near the control cabinet: valves and position indication will function as normal
- Cost of installation is relatively low thanks to simple two-line control: each actuator is controlled by only two (low pressure) PU lines, instead of expensive steel or copper tubing
- Actuators are air to open, spring to close (fail-safe): guaranteeing positive closing of valves in the event of an emergency
- No risk of oil leakage (pollution) in the in- or outboard water
- After mounting pneumatic lines, there is no need to flush the entire system
- Simple check for air leakage by air consumption and/or pressure drop

Coasters, possible application for a Ballast system



Actuator for pneumatic Ballast system

EXAMPLES OF **SPECIAL BALLAST SYSTEMS**

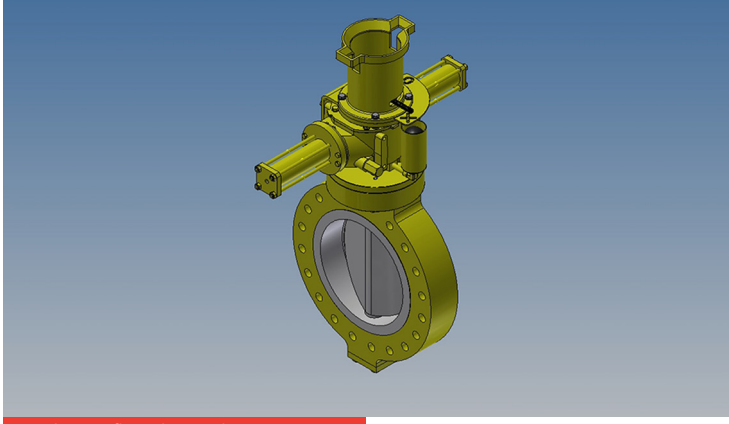
Shallow water subsea actuators

A large number of shallow water subsea actuators for flooding systems with ROV override access are being produced in 2013 and 2014. The actuators we will supply for this project are required for temporary use during structure flooding or ballasting operation at water depths of 250 meters.

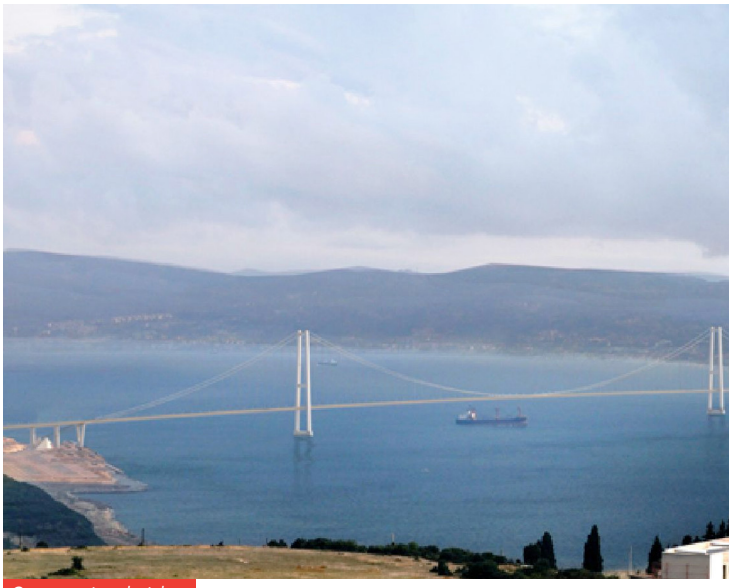
Ballast system for sinking caissons

In 2013, we provided a complete ballast system for a bridge project. The ballast system is used for sinking the caissons (concrete pontoons). The caissons serve as the foundation of a suspension bridge. The caissons are sunk on the seafloor, about 40 meters deep. After positioning them in the right place, the Ballast system ensures a straight sinking to the seabed by evenly filling the compartments in the caisson with seawater.

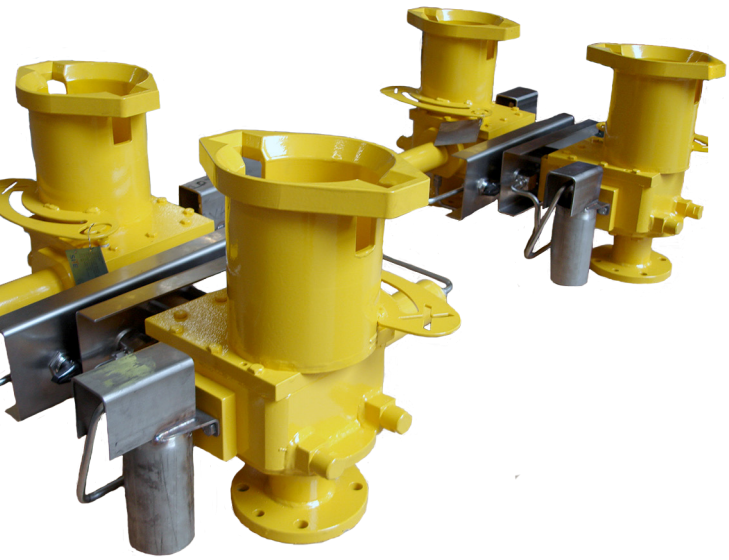
For this project, we not only supplied a complete Ballast system, we also delivered a number of Hydraulic Power units and Manifolds. With the delivery of these Hydraulic Power units and Manifolds we provided an added value for this project, we provided our customer with an entirely tailor-made solution.



14" butterfly valve with actuator



Suspension bridge



ROV operated submersible actuator

Valve actuator for a suspension bridge