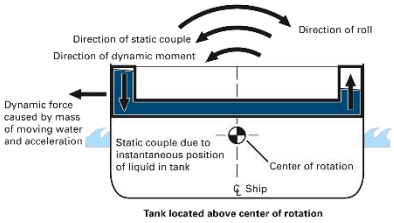
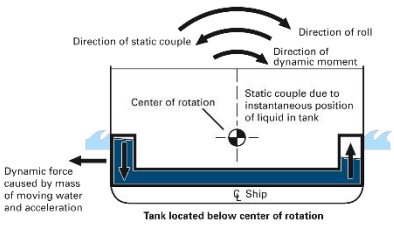
SYSTEM

The Hoppe U-Tank Roll Damping System is designed for passive U-shape roll damping tanks. Passive tanks are featured by taking energy from the ship's roll motion for creation of a stabilizing moment. Tank dimensions and filling level cause a fluid oscillation opposite to the ships roll direction. The moving mass creates a stabilizing / damping moment opposing the wave moment causing ship roll.

An average roll damping efficiency between 40% and 55% can be achieved with such passive roll damping tank. The efficiency is influenced by several parameter, such as tank type, dimensions, location in relation to ship roll center as well as density of tank fluid – typically sea- or freshwater.

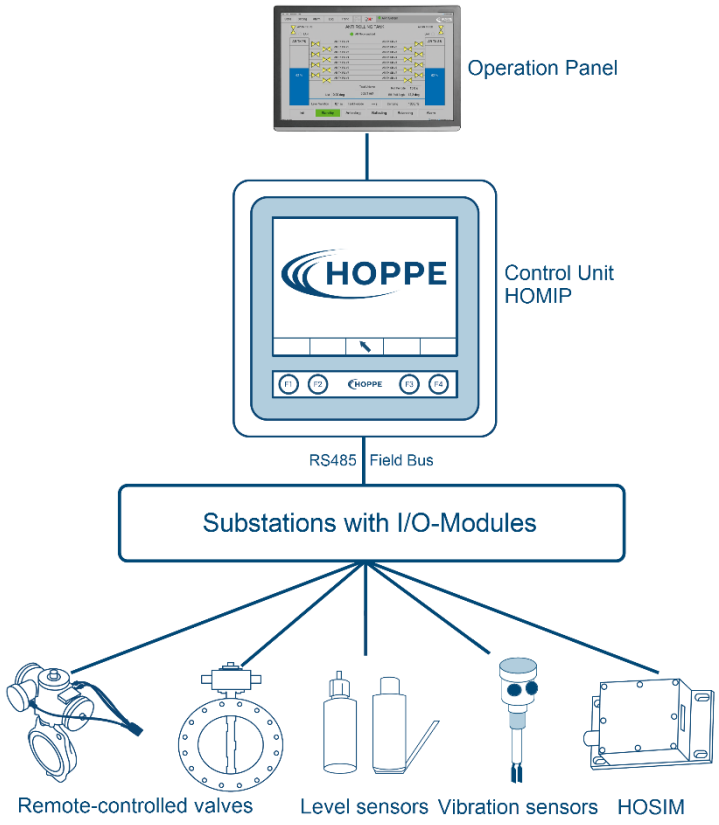
U-Tanks are integrated in the ship structure – side tanks connected by a water duct – located typically below the ship's roll center and equipped with an active valve control system in air- and water duct system, to tune the natural tank period to the actual ship roll period.





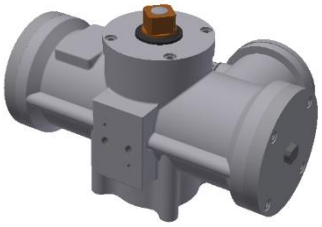
FACTS, FEATURES & DIMENSIONS

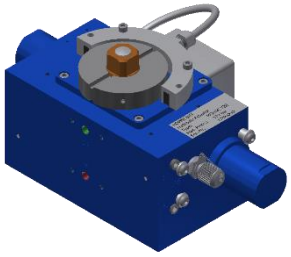
- system works over full ship speed range --- even at zero speed
- tank caused none additional ship resistance and investment cost are much lower compared with active system fin stabilizer
- systems are nearly maintenance free and works reliable
- sensors, valves, control- and other measuring components are approved for marine application
- simple operation by means of clearly visualization on display of HOMIP and PC-screens
- combination of U-Tank & FLUME Tank-stabilizer on same ship for optimum efficiency at minimum space consumption
- roll-damping tanks helps to extend ship operation window and safety on working deck
- cargo safety and crew comfort are increased



TECHNICAL DATA REMOTE-CONTROLLED VALVES

Working type	Double-acting, single-acting (various types, pneumatic, hydraulic, electro-hydraulic)
Working locations	Dry, temporarily submerged
Valve range	DN50-DN500
Material	Aluminum (max. weight 18kg)
Emergency functions	Close function avail. for single-acting



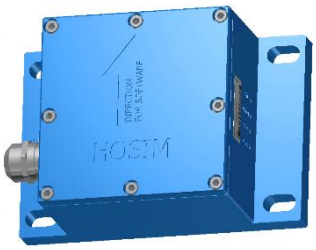


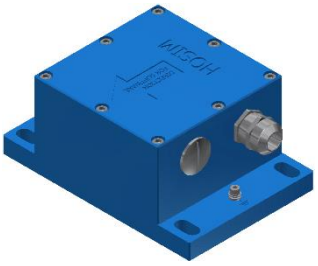
TECHNICAL DATA VIBRATION SENSOR & LEVEL SENSOR

Materials	Stainless Steel, Titanium
Vibration sensor	Featuring an energized tuning fork to vibrate at its resonance frequency. When medium-covered, the frequency decreases and is further processed.
Level sensor measuring range	0mbar – 4000mbar
Level sensor output signal	Analog 4…20mA, Bus signal RS485 half-duplex
Level sensor degree of protection	IP 68; submersible up to 10 bar

TECHNICAL DATA HOSIM 2

Measuring principle	Acceleration- and temperature-compensated position measurement
Roll/Pitch angle accuracy (static)	0.07° RMS
List/Trim angle accuracy (5 min. average)	0.09° RMS
Linear temperature influence (angles)	± 0.02°/°C
Interfaces	RS422, RS485, Ethernet
Housing and protection class	Aluminum, IP68





TECHNICAL DATA VALVES (BUTTERFLY / WAFER / FLANGE)

Materials	GGG40, Aluminum, Bronze, Stainless Steel
Sealing	IVBR, EPDM
Operation	pneumatic, electro-hydraulic, electric
Application	Air Flow Control / Damping
Features	Dump valve / rapid discharge system for GM increase / stability and safety