

# rotork® Fluid Systems

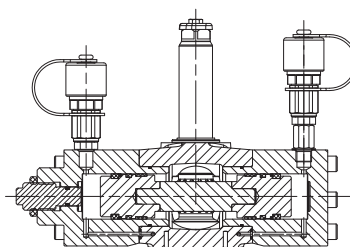
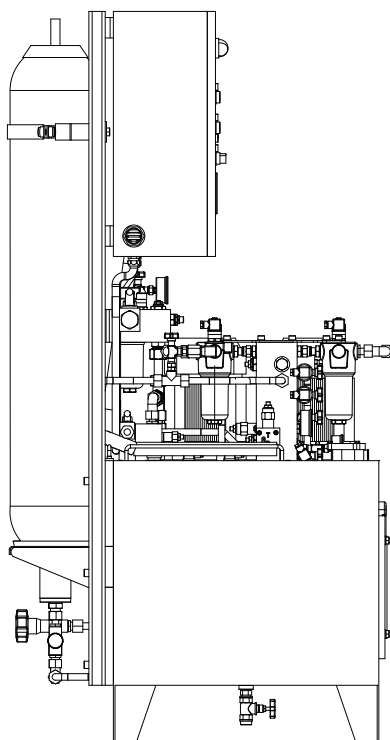
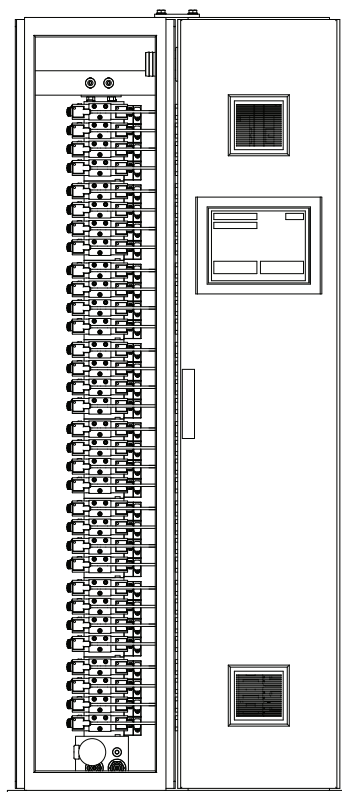
The **Valve Remote Control System (VRCS)** is considered by the "International Convention for the Safety of the Life at Sea" (SOLAS) to be critical for the safety of passengers, crew and transported cargo on any type of ship, whether on commercial ships, cruise vessels, chemical carriers, LNG, LPG, and even FPSOs.

Rotork's leading solution for the marine and offshore industries is the Masso range of Valve Remote Control Systems. With more than 80 years of experience in specialist design, fabrication and installation of actuators and VRCS, the Masso range provides safety critical hydraulic and electro-hydraulic solutions.

CRCS – The Masso range hydraulic VRCS combines traditional hydraulic systems with advanced communication technologies.

ADCS – The Masso range electro-hydraulic system provides a flexible control solution, while bringing several advantages to shipyards and ship-owners worldwide.

Both systems are compatible with most Integrated Automation Systems (IAS).

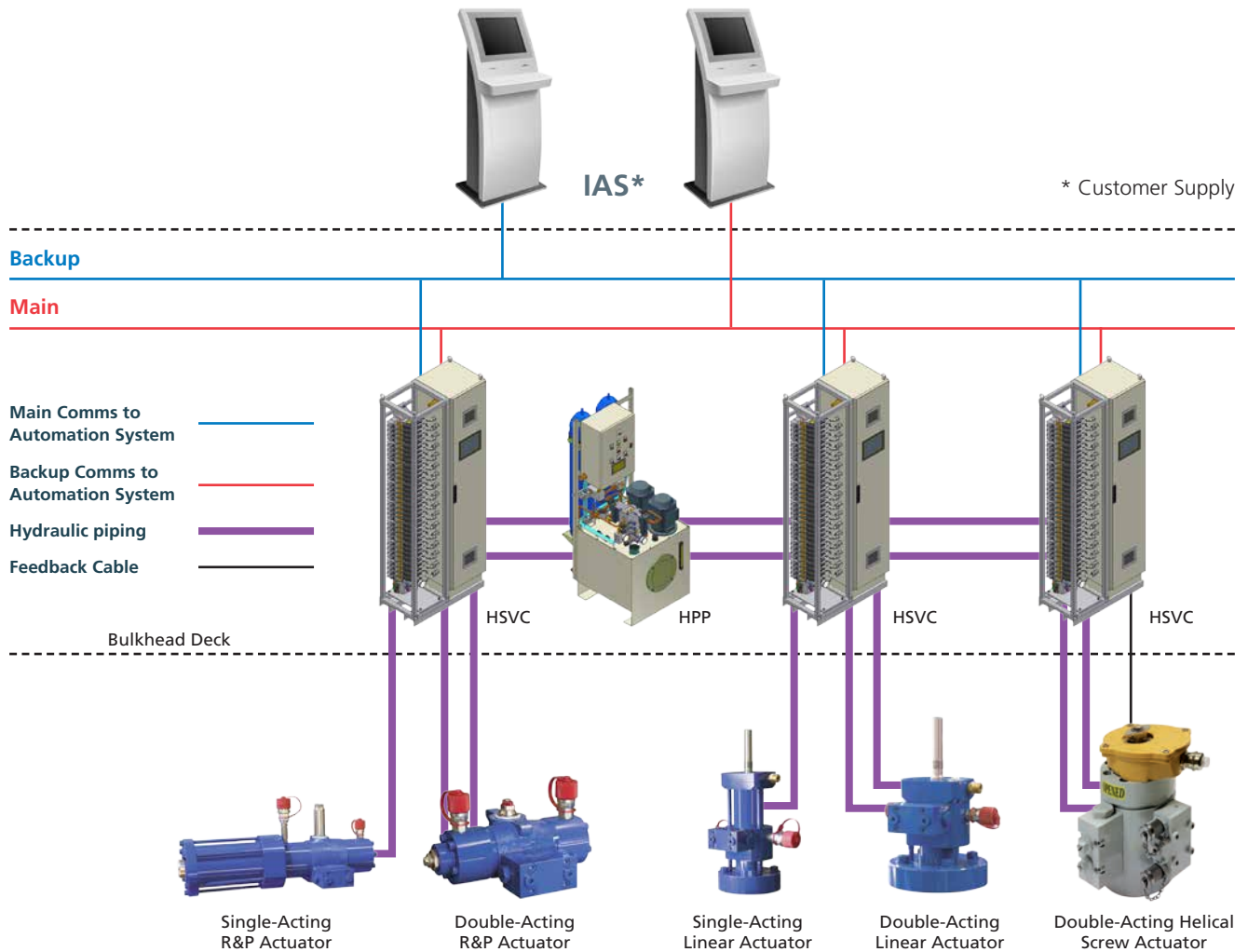


## Masso Range Valve Remote Control Systems for marine applications



Redefining Flow Control

## CRCS – Hydraulic Valve Remote Control System



### Features

The Rotork CRCS Hydraulic Valve Remote Control System is designed with redundancy of all the main hydraulic and electrical components of the HPP and HSVC, such as the HPP pumping units, filters, relief valves, accumulators, volumetric oil indicators, power supply and digital communications.

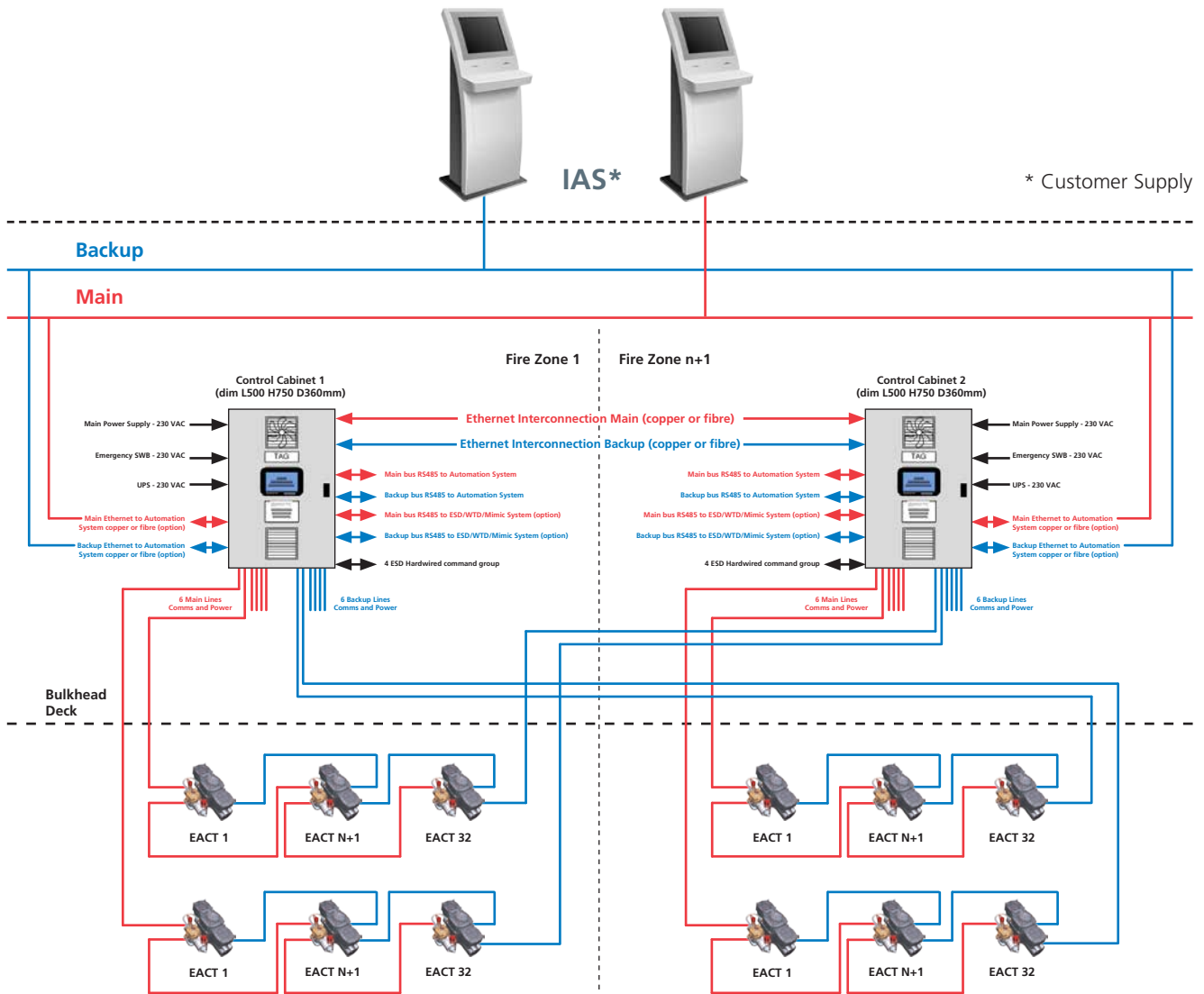
The **HPP** and **HSVC** fulfill the requirements of all major classification societies and are complete with all installation accessories and emergency operation fittings.

The system is integrated with any type of IAS (Integrated Automation System) by means of redundant digital communication RS485 serial lines through Modbus standard protocol interface.

The system is also available in a shock tolerant version, with all components including HPP tested to up to 250 G shocks.

On request, turnkey installation may be supplied.

## ADCS – Electro-Hydraulic Remote Control System



### Features

The Rotork ADCS Valve Remote Control System starts with the self-contained micro power pack E-ACT-C type (electro-hydraulic actuator with integral electronic control unit), and goes up to the "I/O Control Cabinet" which contains main and backup communication cards, power distribution, serial interface and a touch-screen panel for local control.

The system has been designed with full redundancy in mind – both from power and communications. If one of the two lines of each group is cut, the other one will remain connected and operative. If an E-ACT-C micro power pack is damaged or totally lost, the others will be still connected and operative.

Main features and benefits of the Rotork ADCS system include:

- Removal of hydraulic tubing
- Less bulkhead penetrations
- Replacement of HPP and HSVC for smaller control cabinets
- Lower overall system cost
- Reduction of installation and maintenance costs
- Full diagnostic capabilities
- Low maintenance costs
- Full system redundancy.

On request, turnkey installation may be supplied.

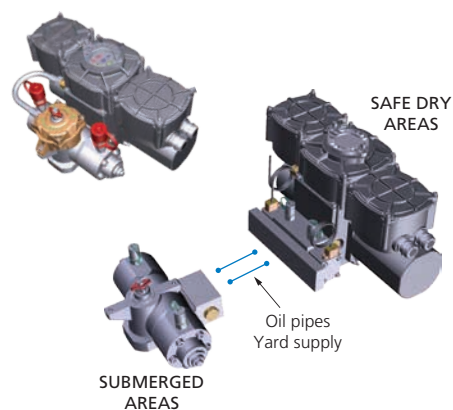
### CC – Control Cabinet

- Redundancy of all critical components
- Redundant power supply
- 2 accumulators as standard
- Compact design for confined spaces
- Very low drainage of hydraulic components
- Low maintenance costs
- Full diagnostic capabilities
- Cross network connection, reducing installation costs compared to STAR systems



### EACT – Electro-hydraulic Actuators

- Stand-alone electro-hydraulic actuator
- Linear and quarter-turn configurations
- Single- and double-acting configurations
- Operable from two control cabinets in different fire zones
- Local LED position indicator
- Local control
- Redundant wire connection (Power and BUS)
- IP68 30 m / 72 hr
- Separable power pack for submerged applications



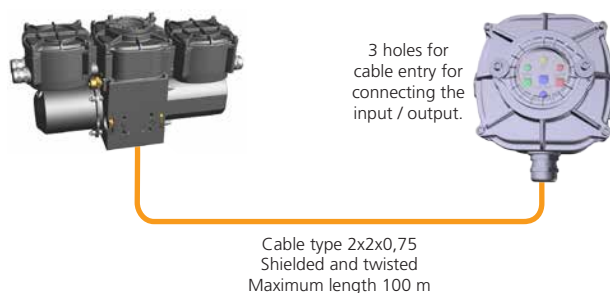
### FOX Touch Screen Interface

- Redundant supervised 230 VAC power supply
- 1 Ethernet port 10/100 Mbit/s TP cable RJ45 CAT 5
- 1 USB 2.0 port
- 2x RS485 serial ports (max 115.200 baud), protocol MODBUS RTU standard
- Real-time operating system
- Compact dimensions for confined spaces
- Fan-less design for quiet operation
- Stand-alone version with 16 digital inputs, 16 digital outputs, 4 analogue inputs and 2 analogue outputs



### Extended Local Interfaces

- Compact design made in nodular cast iron
- Stem made in AISI 316
- Extended stem available for feedback unit coupling
- Stainless steel quick coupling
- Suitable for submerged applications
- Double-acting thrusts up to 12,350 N
- Single-acting thrusts up to 2,080 N



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### HPP – Hydraulic Power Pack

- Redundancy of all critical components
- Redundant power supply
- 2 accumulators as standard
- Compact design for confined spaces
- Very low drainage of hydraulic components
- Low maintenance costs
- Full diagnostic capabilities



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### HSVC – Hydraulic Solenoid Valve Cabinet

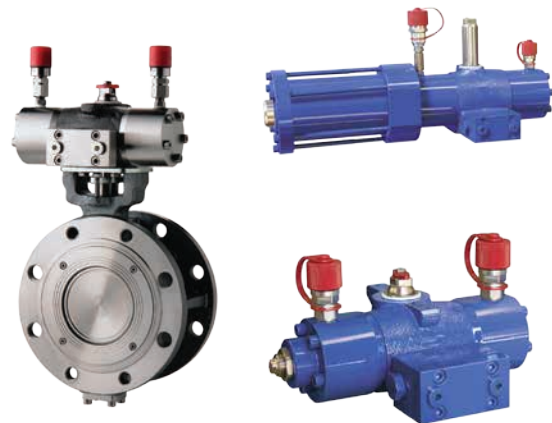
- Cabinets available in 32 or 64 valves
- Two volumetric meters for each valve
- Redundant power supply
- Redundant bus communication lines to automation system
- Reduced Pressure Consumption (RPC) function
- Compact design for confined spaces
- Very low drainage of hydraulic components
- Low maintenance costs
- Full diagnostic capabilities



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### RPD & RPS Quarter-Turn Actuators

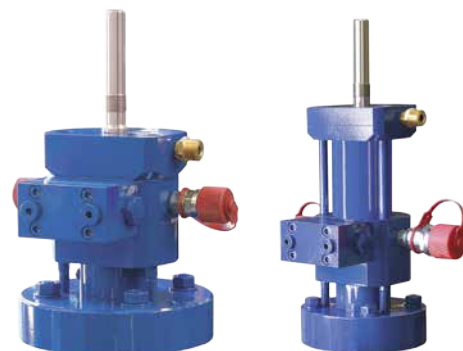
- Compact design made in nodular cast iron
- Rack made in steel, pinion made in AISI 316
- Local position indicator
- Modular interconnecting brackets to ISO 5211
- End stroke setting screws
- Suitable for submerged applications
- Special executions available in SS AISI 316
- Double-acting torques up to 22,950 Nm
- Single-acting torques up to 655 Nm
- Larger sizes available upon request



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### LPD & LPS Linear Actuators

- Compact design made in nodular cast iron
- Stem made in AISI 316
- Local position indicator
- Extended stem available for feedback unit coupling
- Stainless steel quick coupling
- Suitable for submerged applications
- Double-acting thrusts up to 12,350 N
- Single-acting thrusts up to 2,080 N
- Larger sizes available upon request



### Accessories

#### FBKS – Direct Position Feedback Sensor

- Available for quarter-turn and linear valves
- Hard wired interface
- No contact or mechanical drag between the valve stem and the feedback unit
- Maintenance free
- Immune to vibrations
- Immune to dirt ingress
- Immune to humidity and salt corrosion
- Easy to use, foolproof calibration
- Polarity reversal and overload-protected
- Output protected with current limiters



#### VOLOIL – Indirect Position Feedback Sensor

- Available for quarter-turn and linear valves
- For use where actuators will be submerged
- Measures hydraulic volume, speed and direction
- No seal, therefore not subject to wear
- High volumetric performance
- Extreme precision with very low flow rates
- Maintenance free



#### Handpumps

- For use in emergency manual operation of the valves
- Lightweight and easy to transport
- Available for CRCS and ADCS systems
- Available for single- and double-acting actuators
- Stationary hand pumps available



A full listing of our worldwide sales and service network is available on our website.

[www.rotork.com](http://www.rotork.com)

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