Control Equipment, HPU's, Hydraulic Actuators, Integrated Electro-Hydraulic Actuator System

PIANO TYPE OR PANEL TYPE

Control Console

Hydraulic Power Unit

Sol. v/v Cabinet or Deck Control Box

Actuator/Valve

COMPUTERIZED CONTROL TYPE

Workstation

PLC

Integrated Electro-Hydraulic Actuator System
The system is designed for electro-hydraulic remote control of cargo and ballast system valves with valve position indication such as open/shut, intermediate position and memory lamps. The valves are executed with our hydraulic actuators.

We can deliver manual remote control systems and computerized control systems.

1) Manual remote control type
This system is designed to control the valves with a mimic board on the control console. The control console is executed with control switches, position indicators etc.

2) Computerized remote control type
This system is designed to control the valves using a computerized operating system that consists of a workstation, PLC and related accessories. The various parts communicate through communication lines.
Control console
All valves included in the system can be controlled and monitored on the control console. The control console is available with piano type or panel type in depending on the available space.

- Mimic board
- Pressure gauges
- Start panel for HPU
- Selector switch, if any
- Monitor for valve control, if any
- Keyboard for valve control, if any
- Zener safety barrier
- Other necessary gauges upon request

Workstation
The workstation is not only to control and monitor valves installed on the cargo oil or water ballast line through the mimic diagram on monitoring system but also to operate motors and check the alarm status of pressure, level and temperature sensors.

- Computer
- LCD monitor
- Mimic
- Key board
- Mouse
- Operating program

Solenoid valve cabinet
The solenoid valve cabinet distributes pressurized oil from the hydraulic power unit to actuators to open or close valves by the signal from control console. The solenoid cabinet is installed in a Ex safe area.

- Solenoid valves 4/3 way
- Flow switches for open/shut position indication
- Throttle valves
- Manifold blocks
- Pressure relief valves
- High pressure filter on main "P"line
- Stop valves
- Emergency quick connectors
- Other accessories

Deck control box
The deck control box containing switches to locally operate valve and other equipment is water tight and located on the upper deck.

PLC
PLC (programmable logic controller) is an intermediator that sends and receives signals between the workstation and sensors through various communication method.

- CPU
- Input / Output card
- Power source
- Memory card
Hydraulic Power Unit (HPU)

The hydraulic power unit contains two hydraulic oil pumps and motors as stand-by back up, with Accumulator:

- Hydraulic pumps & Electric motors
- Accumulators
- Pressure switches
- Pressure gauges
- Pressure transmitter
- Temperature transmitter
- Sight glass
- Level switch
- Return oil filter
- Pressure relief valves
- Non-return valves
- Starter box
- Other necessary valves & fitting

<table>
<thead>
<tr>
<th>Standard specification</th>
<th></th>
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<tbody>
<tr>
<td>Oil tank volume</td>
<td>As necessary capacity</td>
</tr>
<tr>
<td>Electric motor</td>
<td>Voltage - 3φ 380V 60Hz x 2ea or 440V</td>
</tr>
<tr>
<td>Relief valve setting</td>
<td>140kgf/cm²</td>
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<tr>
<td>Alarm</td>
<td>Low level, high temperature, low &amp; high pressure</td>
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</tbody>
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Butterfly Valve with Hydraulic Actuator
Hydraulic Actuator

Available in both double and single acting action, covering a torque range up to 25,344Nm.

Scotch Yoke Type

<table>
<thead>
<tr>
<th>Actuator Model</th>
<th>HA20</th>
<th>HA28</th>
<th>HA36</th>
<th>HA45</th>
<th>HA56</th>
<th>HA63</th>
<th>HA70</th>
<th>HA80</th>
<th>HA90</th>
<th>HA100</th>
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<tbody>
<tr>
<td>Output Torque</td>
<td>18.6 kgf.m (183 N.m)</td>
<td>48.7 kgf.m (478 N.m)</td>
<td>102 kgf.m (1008 N.m)</td>
<td>192 kgf.m (1889 N.m)</td>
<td>373 kgf.m (3657 N.m)</td>
<td>503 kgf.m (4937 N.m)</td>
<td>699 kgf.m (6858 N.m)</td>
<td>1015 kgf.m (9952 N.m)</td>
<td>1413 kgf.m (13855 N.m)</td>
<td>1983 kgf.m (19438 N.m)</td>
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<tr>
<td>Max. Working Pressure</td>
<td>210 kgf/cm²</td>
<td>315 kgf/cm²</td>
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<td>315 kgf/cm²</td>
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<tr>
<td>Spindle Dimensions</td>
<td>As standard with key dimension according to ISO 773</td>
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Rack & Pinion Type

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<th>RA28</th>
<th>RA36</th>
<th>RA45</th>
<th>RA56</th>
<th>RA70</th>
<th>RA9</th>
<th>RA110</th>
<th>RA140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Torque</td>
<td>21.5 kgf.m (211 N.m)</td>
<td>42.7 kgf.m (419 N.m)</td>
<td>89 kgf.m (873 N.m)</td>
<td>172 kgf.m (1689 N.m)</td>
<td>323 kgf.m (3168 N.m)</td>
<td>712 kgf.m (6982 N.m)</td>
<td>1330 kgf.m (13038 N.m)</td>
<td>2586 kgf.m (25344 N.m)</td>
</tr>
<tr>
<td>Max. Working Pressure</td>
<td>140 kgf/cm²</td>
<td>210 kgf/cm²</td>
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Our Hydraulic Actuators offers the following advantages

- Available in rack & pinion and Scotch Yoke design.
- Simple, robust and compact design. Strong and light weight.
- No outside piping.
- High reliability.
- Specifically designed for use with all type quarter turn valves. ISO 5211 mounting flange.
- Adjustable open and close position.
- Long life performance.
- Suitable for submerged service.
- Easy repair and maintenance without dismounting from the valve.
- Visual position indicator
- Many options possible, switchbox, position transmitter etc.
Innovative application of advanced technology makes possible many new features of the MHPU (Micro Hydraulic Power pack Unit) in addition to easy installation and maintenance, the system offers economical communication and control method between actuators throughout the power line communication technology.

There is an advantage to eliminate the solenoid valve and hydraulic oil pipe from centralized hydraulic power unit to the hydraulic actuator.

**POWER LINE ACTUATOR MODELS**

**AV-RA28/36/45/56/70/90 available type**

- Double Acting Standard
- Double Acting Explosion Proof

The position control type, open/close or full position, can be selected manually via a membrane switch mounted on the control board of the PROV-VAC.

- **PROV - VAC**: Power line remote operated valve control system - valve actuator controller
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