ELECTRO-HYDRAULIC VALVE ACTUATORS

FOR POSITIONAL, MODULATING AND STEPPING CONTROL OF:
CHOKE VALVES
GLOBE VALVES
PLUG VALVES
GATE VALVES
BALL VALVES
BUTTERFLY VALVES
FOR HAZARDOUS LOCATIONS AND SEVERE ENVIRONMENTS

ATEX
WHY CHOOSE ELECTRO-HYDRAULIC ACTUATORS?

- Alternative forms of electric and pneumatic actuators have always offered their own particular advantages, depending on the size of valve and the control required.
- Recovery of oil and gas from smaller marginal fields has forced radical changes in the design of offshore installations.
- The result being the demanding and reduction in the size of platforms and the introduction of FPSO’s.
- Equipment space and weight factors have always been at a premium but now even more so. Therefore compressed air and high electrical power consuming equipment is becoming less common on installations.
- Midland-ACS Electro-Hydraulic Actuators provide considerably more thrust, size for size compared to electric and pneumatic actuators.

RING MAIN OR SELF CONTAINED?

- Midland-ACS Electro-Hydraulic Linear Valve Actuators are the perfect solution for the control of choke and globe type control valves.
- They can provide high seat forces, fast stroking speeds, accurate positional, modulating and stepping control, plus fail safe modes.
- Midland-ACS Electro-Hydraulic Linear Valve Actuators can be connected to hydraulic RING MAIN circuits utilizing hydraulic and electrical power from wellhead control or centralised hydraulic power units.
- Alternatively if only an electrical power supply is available integral or free standing SELF-CONTAINED HYDRAULIC POWER UNITS can also be supplied.

<table>
<thead>
<tr>
<th>ACS</th>
<th>603</th>
<th>603 IR (WITH INFRARED KEYPAD FACILITY)</th>
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<tbody>
<tr>
<td>EEx</td>
<td>HAZARDOUS AREA (see below)</td>
<td>SAFE AREA (NO CODE REQ’D)</td>
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<td>In</td>
<td>ia = INTRINSICALLY SAFE (RING MAIN ONLY)</td>
<td>d = EXPLOSION PROOF</td>
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<tr>
<td>P</td>
<td>P = POSITIONING</td>
<td>M = MODULATING</td>
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<td>BORE</td>
<td>MM’s</td>
<td>BORE, ROD SIZE AND TRAVEL ARE SELECTED BY MIDLAND-ACS TO SUIT THE CLIENT’S VALVE THRUST AND TRAVEL CHARACTERISTICS.</td>
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<tr>
<td>ROD</td>
<td>MM’s</td>
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<tr>
<td>TRAVEL</td>
<td>MM’s</td>
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<tr>
<td>DA</td>
<td>DA = DOUBLE ACTING</td>
<td>SAS = SINGLE ACTING, SPRING FAIL SAFE</td>
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<tr>
<td>FSP</td>
<td>FSP = FAIL STAYPUT</td>
<td>FC = FAIL CLOSED</td>
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<td>MO</td>
<td>MO = MANUAL OVERRIDE (HYDRAULIC HAND PUMP)</td>
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<tr>
<td>RM</td>
<td>RM = RING MAIN</td>
<td>SC = SELF CONTAINED</td>
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<tr>
<td>LS1</td>
<td>LS1 = LIMIT SWITCH CLOSED</td>
<td>LS2 = SWITCH OPEN</td>
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<tr>
<td>SMART</td>
<td>SMART HART PROTOCOL POSITION TRANSMITTER FOR ACTUATOR FEEDBACK SIGNAL ONLY</td>
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<tr>
<td>WG</td>
<td>MINERAL OIL (NO CODE REQ’D)</td>
<td>WG = WATER Glycerol Fluid</td>
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1. **Electronic Positioner, Type, Analogue, Microprocessor.**
   - For positional, modulating, stepping and fail safe control.
   - Power supply: 24 VDC or single & 3 phase AC voltages.
   - Input command signal: 4-20 mA, decrease to open.
   - Output retransmission signal: 4-20 mA.
   - Positional accuracy: ± 0.1%.
   - Positional repeatability: ± 0.1%.
   - Enclosure: Tropicalised.
     - MIDLAND-ACS 603-EExd EXPLOSION PROOF Version, EExd IIC T6, ATEX II 2 GD.
     - Enclosure materials: Marine Grade Alloy with Offshore Paint finish, IP 66 rated.
     - MIDLAND-ACS 603-EExd EXPLOSION PROOF Version, EExd IIB T4/6, ATEX II 2 G/D.
     - Enclosure materials: 316 ST-ST or Cast Iron with Offshore Paint finish, IP 65 rated.
     - MIDLAND-ACS 603IR-EExd EXPLOSION PROOF Version, EExd IIC T6, ATEX II 2 GD.
     - Enclosure materials: Marine Grade Alloy with Offshore Paint finish, IP 66 rated.
     - MIDLAND-ACS 603-EExia INTRINSICALLY SAFE Version, EExia IIC T4, ATEX II 2 G.
     - Enclosure materials available: 316 ST-ST, with Offshore Paint finish, IP 66 rated.
   - Infrared option available for local calibration without the need to open the positioner enclosure in the hazardous area.

2. **Actuator Position Feedback Transmitter, Options.**
   - Linear or rotary potentiometer.
   - Linear transducer (contactless).
   - "HART" protocol digital.

3. **Actuator Options.**
   - Double Acting, Piston Type, Stayput, Fail Last Position.
   - Single Acting, Piston Type, Spring Fail Safe, Open or Closed.
   - Fail Safe Modes, on loss of power supply, 4-20 mA command signal, hydraulic supply.
   - Materials available: Carbon Steel/Stainless steel with Offshore Paint finish.
   - IP 66 rated all fasteners 316 Stainless Steel, with Offshore Paint finish.

4. **Drive Coupling,** designed to suit customers valve stem, 316 ST-ST, anti rotation, with graduated visual travel indicator.

5. **Yoke,** designed to suit customers valve topwork Carbon Steel, with Offshore Paint finish.


7. **Accumulator Storage Capacity,** optional, Carbon Steel, with Offshore Paint finish.
   - Control Panel, 316 ST-ST, IP66 rated, Offshore Paint finish contains all 316 ST-ST Manifoldered Hydraulic Control System.
   - Coil options:
     - EEx/c 2/19, ATEX Ex II, 1.5, 3.5 or 8 WATT coil options.
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   - Solenoid valves:
     - 316 ST-ST, Quick-Fit to ensure no drift of actuator position.
     - 1/2" or 3/4" NPTF, Cable gland type.
     - Pressure relief, single or dual, 5 bar, with on-line isolation, and visual pop up indicator.
     - Flow control valves, needle type, adjustable lockdown, check valves, pressure/thermal relief valves.

8. **Remote Indication Switches for Open and Closed Positions.**
   - Mechanical, Inductive Proximity or Magnetic Reed Type, EEx/c / EEx/i.
   - All available connected to 316 ST-ST Junction Box, M20 x 1.5 or 1/2" NPT.

9. **Hydraulic Connections,** supply and return, 1/2" NPT.

10. **Hosepipe Connections,** hydraulic return, 1/2" NPT.

11. **Sunshade,** optional, ST-ST Painted to protect complete actuator ass’t from direct sunlight to ensure that ambient temperatures are below + 40º C.

Additional Information:
- Hydraulic fittings, 316 ST-ST female.
- Hydraulic tubing options: 316 L or 316.
- Glands: EEx/c / EEx/i, brass, brass/nickel plated or 316 ST-ST PVC Shroud can be fitted.
- Armour braided and Halogen free.
- Location: On/offshore gasfields and severe corrosion environments.
- Hydraulic supply pressure range from ring main, standard 90 to 210 bar, ACG 345 bar.
- Hydraulic fluid cleanliness required: NAS tank class 8 / ISO 4406 19/17/14 or better.
- Ambient temperature range: -20 to 60º C, special insulated units for -50º C.

12. **Ring Main Electro-Hydraulic Actuators.**

13. **Valve Actuators 4/19/04 2:54 PM Page 4**
1. EEXD MOTORISED HYDRAULIC PUMP UNIT 24 VDC & AC VOLTAGES AVAILABLE
2. STAINLESS STEEL RESERVOIR WITH PRESSURISED FILLER CAP AND SIGHT LEVEL GAUGE
3. EEXD PRESSURE SWITCHES FOR PUMP START/STOP CONTROL
4. EEXD PRESSURE SWITCH FOR LOW OIL PRESSURE ALARM
5. HYDRAULIC CONTROL PANEL
6. MANUAL OVERRIDE HYDRAULIC HAND PUMP
7. POSITION TRANSMITTER
8. LINEAR HYDRAULIC PISTON ACTUATOR DOUBLE ACTING, STAYPUT, LAST POSITION SINGLE ACTING SPRING FAIL SAFE OPEN OR CLOSED
9. ACCUMULATOR STORAGE TO MINIMISE MOTOR STOP/STARTS AND REDUCE ELECTRICAL POWER CONSUMPTION
10. EEXD ELECTRONIC POSITIONER ENCLOSURE
11. EEXD STARTER/ISOLATOR ENCLOSURE WITH LOCAL AND REMOTE OPERATION & ALARM FACILITY.
12. EEXD LOW OIL SWITCH
13. EEXD OIL TEMPERATURE PROBE

NOTE: POWER UNIT AND INSTRUMENTATION CAN BE MOUNTED SEPARATELY TO THE ACTUATOR ON A FREE STANDING SKID OR FRAME