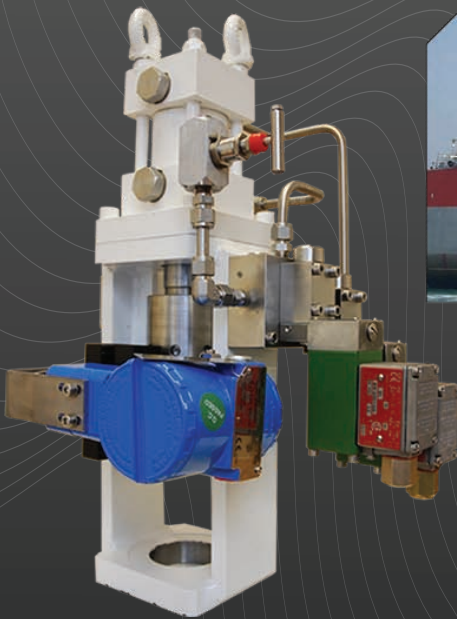


MIDLAND-ACS

Severe & Hazardous Area Experts

Electro-Hydraulic



Valve Actuation

A comprehensive range of
actuators with **positional control**



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www.midland-ac.com

Midland-ACS has been a specialist manufacturer of electro-hydraulic actuation equipment for over 50 years. Offering comprehensive purpose designed, engineered and manufactured solutions for operation of choke and control valves installed onshore and offshore.

Ring main & self contained control options incorporating special features including:

- **Double acting systems** for choke valves used for position and modulating control with a fail safe in position, fail safe closed or fail safe open options.
- **Spring return actuator systems** for positioning and modulating control incorporating a preloaded mechanical spring arrangement to provide failure position conditions in the event of electrical power/signal or hydraulic supply failure.
- **Stepping feature** - this is also available on all systems to provide positioning control with extended operating times associated with choke valves. Fail safe in position and fail safe open or closed options available.

Special purpose design Electro-hydraulic control systems available on request, including -

- Hydraulic control cabinet assemblies
- Solar power self contained systems



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ELECTRO-HYDRAULIC VALVE ACTUATION

Hydraulic Actuation

Linear Piston Type - Double or single acting

Construction - Tie Rod or Bolted Assembly

Materials

- Piston rods - Stainless Steel with hardchrome plate
- Pistons, End Caps and tubes - Carbon Steel with Stainless option
- Tie Rods & fixings - Stainless Steel
- Protective Finish - All external surfaces protected against harsh environmental conditions with 2 pack epoxy paint system to specified requirements.

Position Feedback Device

- In cylinder Potentiometric Intrinsically Safe
- In cylinder LVDT/transmitter EExd or EExia with voltage or current signal
- Independent externally mounted position transmitter EExd, EExia, HART or Foundation Fieldbus

Mechanical Position Stop

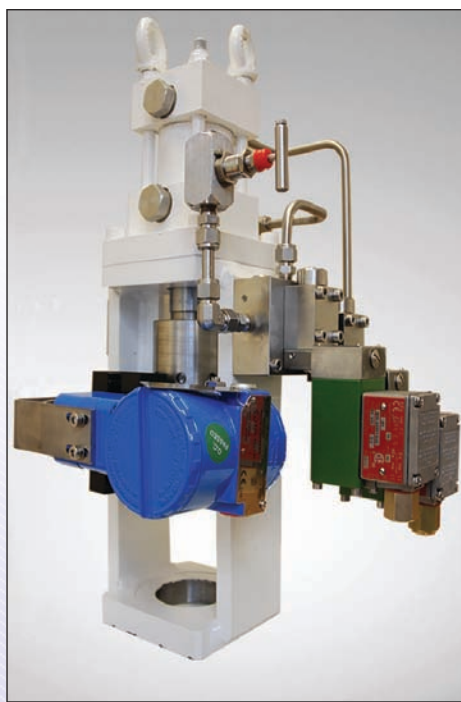
- To provide adjustment for open and closed valve position limitations

Hydraulic Control

Manifold Assembly

- In Stainless Steel comprising;
 - ~ Solenoid control valve
 - ~ Pressure Filter with pop up indicator
 - ~ Speed control valves
 - ~ Components - check valves pressure gauge & optional relief valve

Certification Options Available



Solenoid Valves

- Solenoid valve EExme, EExd & EExia intrinsically safe
- Power - 8 watts & 3.5 watt and 1 watt EExia

Operating Thrust - Up to 22,500 kg.f
(50,000 lb.f)

Control Cabinet

- 316 Stainless Steel
- Provides IP66 / Nema 4x housing protection and safety

Operating Fluids

- Mineral Oil
- Water based / Water Glycol
- Synthetic Fluids

System Pressure - Up to 350 bar

ELECTRO-HYDRAULIC VALVE ACTUATION

Positioner Controller - (Located on valve/actuator assembly)

- ACS604EX** 24vDC supply for Zone 1. Provides full range positional control in accordance with 4-20mA signal and 24vDC solenoid operated control valves.
- ACS603IR** 24vDC supply for Zone 1 & 2 with EExd enclosure. Provides full range of positional control in accordance with 4-20mA command signal and 24vDC solenoid operated control valves. Special feature infra-red hand held key pad to enable manual operation and calibration of valve without interruption of EExd housing.
- ACS604EExia** Intrinsically safe version for Zone 0 mounted in Stainless Steel enclosure. Provides full range positional control in accordance with intrinsically safe 4-20mA command signal and intrinsically safe solenoid operated control valves.
- ACS604EX HART** 24vDC supply for Zone 1 & 2 when housed in EExd enclosure. Controlled by HART, 4-20mA command signal and providing HART position feedback. Provides full range of positional control in accordance with HART protocol 4-20mA command signal and 24vDC solenoid operated control valves.

Positioner Controller Enclosure - Hazardous area classification - EExd, EExe & EExia

- Electrical Supply** EExd 24vDC standard - option for power transformer when used with alternative power supply
- Housing Materials** EExd - Cast iron (painted)
- Aluminium (low copper, marine grade aluminium alloy with offshore protective finish)
 - 316 Stainless Steel (painted)
- EExe - 316 Stainless Steel
- EExia - 316 Stainless Steel
- Cable Entries** M20 - M25
- ½" NPT - 1" NPT
- Options available to meet project specification requirements
- Certification** Standard ATEX, IP66, to meet project specification requirements

Actuator Mounting

Precision machined fabricated yoke to ensure alignment between actuator and valve top works.

Stem coupling - split type manufactured in stainless steel to provide connection of actuator and valve stem incorporating local visual indication of valve position.

Certification Options Available



ELECTRO-HYDRAULIC VALVE ACTUATION

Double Acting

- Providing high operating thrusts with fail in position control
- Double Acting Actuator Control Action to provide Fail Fix in position on loss of hydraulic & electrical supplies, or loss of Command Signal.

Single Acting - Spring Return

- Providing fail to position control by mechanical spring with installed load to provide valve seating thrust.
- Fail action - open/close
- Spring Return Actuator Control Action to provide Fail to Open or Fail to Close valve position on loss of hydraulic & electrical supplies, or loss of command signal.

Stepping Positional Control

- Providing extended opening and closing operating speeds with all optional features associated with the Double Acting and Single Acting options
- Remote switching to activate/deactivate stepping function

Self Contained Actuator Control Assemblies

For installation where existing hydraulic supply is not available. Integral hydraulic power unit and control equipment.

- To provide all operating characteristics for Double Acting, Single Acting and Stepping options

Supply voltage

- Typical voltages - 24VDC, 110v, 220v 1 Phase 400v 3 Phase 50/60Hz

General

- Certified for Zone 1, Class 1 Hazardous Areas
- ATEX 94/9/EC
- Manifold mounted solenoid and speed control valves with hydraulic supply pressure filter and pressure gauge.
- 316 Stainless Steel hydraulic control components
- Optional Stainless Steel control cabinet
- Interface designed to suit the standard valve top works.
- Wide range of positional controllers available

Options Available

- High/low temperature applications
- Open/close end position indication
- Mechanical position stop for opening & closing limitation
- Independent position transmitter with HART/F.F and EExd/I.S options

Certification Options Available



STEPPING POSITIONAL CONTROL FOR ELECTRO-HYDRAULIC ACTUATED VALVES

The Electro/Hydraulic actuator provides a cost effective alternative solution to the traditional mechanical ratchet style mechanism often used for the positioning control of choke valves.

The electro-hydraulic actuator assembly incorporates a hydraulic control system that is activated by an 'on board' electronic position controller in conjunction with a 4-20 mA command signal. The hydraulic control system is connected to a ring main pressure and return hydraulic header or may incorporate a self-contained electro / hydraulic power supply within the actuator assembly.

Standard Features

The hydraulic control system comprises manifold mounted solenoid valves and speed control valves with hydraulic supply pressure filter and pressure gauge. The components are manufactured in 316 Stainless Steel and may be housed within a Stainless Steel control cabinet to provide additional environmental protection and security. The actuator assembly is designed with an interface to suit the standard valve top works.

Operation

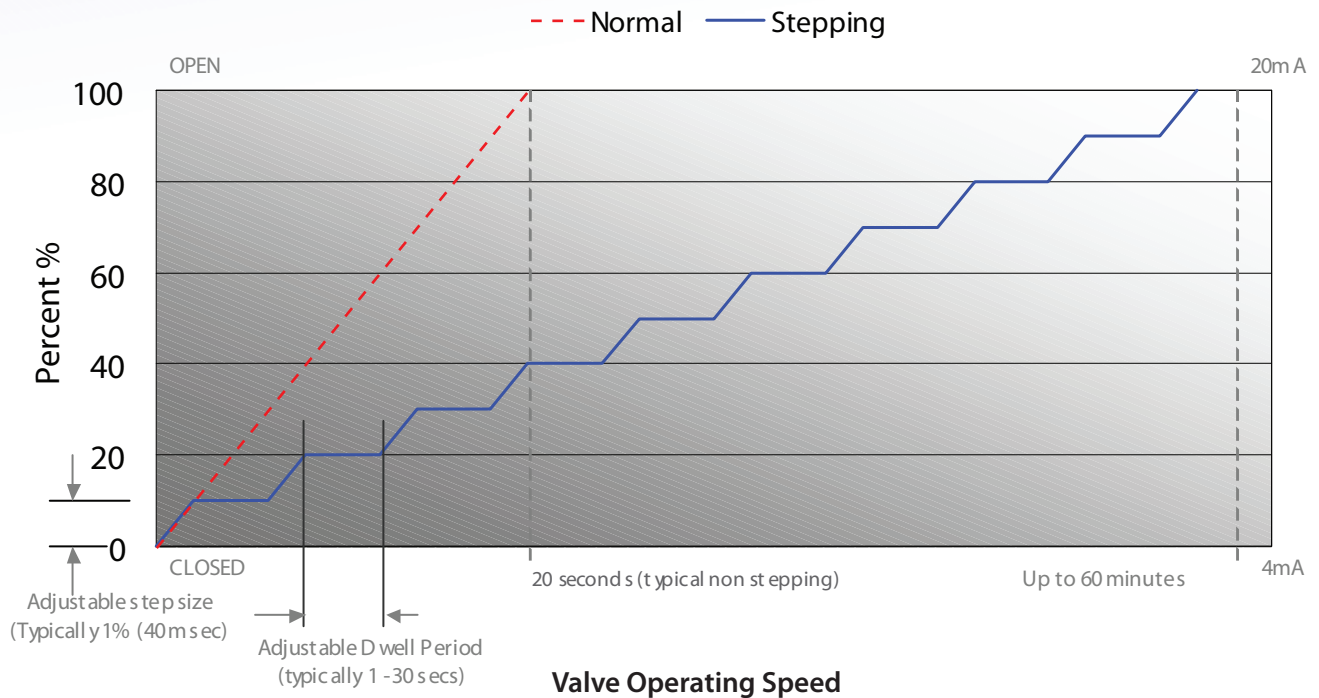
With the control system connected to the hydraulic supply, a change in command signal will cause the valve to operate by energisation of the respective solenoid operated control valves in a series of pulses until the selected position is reached.

Certification Options Available



STEPPING POSITIONAL CONTROL

Typical Illustration of Normal and Stepping Modes



Control Options Available

- Double Acting Actuator Control Action to provide Fail Fix in position loss of Hydraulic Supply, loss of Electrical Supply or loss of Command Signal.
- Spring Return Actuator Control Action to provide Fail to Open or Fail to Close valve position on loss of Hydraulic Supply, loss of Electrical Supply or loss of Command Signal.

Hydraulic Actuators

Operation – Double Acting and Single Acting

Construction – Bolted or Tie Rod

Materials – End caps and tubes - carbon steel or stainless steel

Piston Rod – Stainless Steel with hard chrome plate

Protective Finish - 2 Pack Epoxy paint System for severe offshore environment

Certification Options Available



HYDRAULIC VALVE ACTUATOR CODING SYSTEM

www.midland-accs.com

Code	Electronic Positioner
ACS604EX	Enclosed compact for current feedback
ACS604EX.V	Enclosed compact for voltage feedback
ACS604EExia	Enclosed compact for I.S. control
ACS604EXHART	Enclosed compact with HART communication
ACS603IREX	Open board with infra red remote control

Code	Positioning Mode
P	Positioning
M	Modulating
ST	Stepping

Code	Actuator Cylinder Size
xxx - xxx - xxx	Bore x Rod x Stroke (Specify size according to thrust and pressure)

Code	Actuator Operation
DA	Double Acting
SA	Single Acting

Code	Fail Action
FSP	Fail Stay-Put
SFC	Spring Fail Close
SFO	Spring Fail Open

Code	Actuator System Type
RM	Ring Main System
SC	Self Contained system

Code	Special Requirements
LS1	Limit switch open
LS2	Limit switch close
LS3	Open & close
MO	Manual override (handpump)
SMAR	Independent position transmitter
XXX	Other special features

Typical Model	ACS604EX	PM	80-36-50	DA	FSP	RM	MO	LS3
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