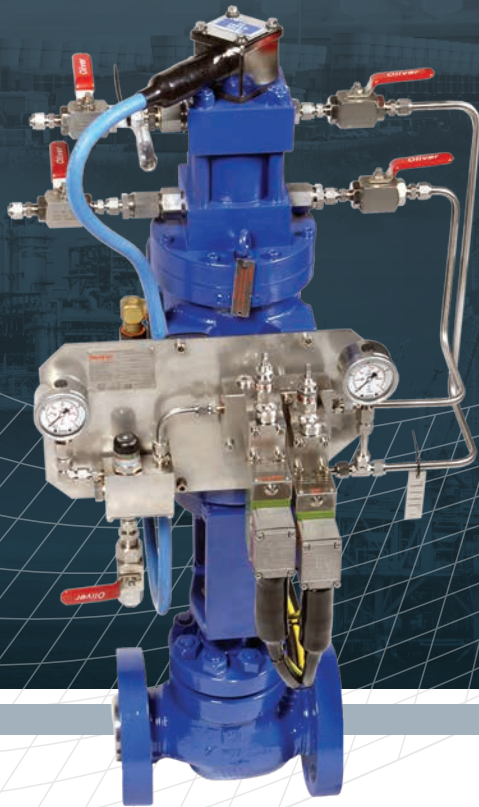


rotork[®]
Fluid Systems

Hydraulic & Electro-Hydraulic Modulating Control



ACS Range

Keeping the World Flowing

rotork®

Keeping the World Flowing



**RELIABILITY
IN FLOW CONTROL
CRITICAL
APPLICATIONS**



RELIABLE OPERATION WHEN IT MATTERS

Assured reliability for critical applications and environments. Whether used 24/7 or very infrequently, Rotork products will operate reliably and efficiently when called upon.

QUALITY-DRIVEN GLOBAL MANUFACTURING

Rotork products are designed with 60 years of industry and application knowledge.

Research and development across all our facilities ensures cutting edge products are available for every application.

CUSTOMER-FOCUSED SERVICE WORLDWIDE SUPPORT

Rotork focus on solving customer challenges and developing new solutions, from initial enquiry through to product installation, long-term after-sales care and client support programmes.

LOW COST OF OWNERSHIP

Long-term reliability prolongs service life, reducing long term cost of ownership and providing greater efficiency to process and plant.

Hydraulic & Electro-Hydraulic Modulating Control

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COMPREHENSIVE PRODUCT RANGE SERVING MULTIPLE INDUSTRIES

Rotork products and services are used in the Power, Oil & Gas, Water & Waste Water, HVAC, Marine, Mining, Food & Beverage, Pharmaceutical and Chemical industries around the world to improve efficiency, assure safety and protect the environment.

GLOBAL PRESENCE LOCAL SERVICE

Global company with local support. Manufacturing sites, offices and *Centres of Excellence* throughout the world provide unrivalled customer services and fast delivery.

MARKET LEADER TECHNICAL INNOVATOR

The recognised market leader for sixty years. Our customers have relied upon Rotork for innovative solutions to safely manage the flow of liquids, gases and powders.

CORPORATE SOCIAL RESPONSIBILITY

Rotork believes that being a responsible business leads to being the best business. We are socially, ethically, environmentally responsible and committed to embedding CSR across all our processes and ways of working.

Introduction

rotork[®]

MIDLAND

As specialist manufacturers of electro-hydraulic actuation and control equipment we offer comprehensive, purpose designed, engineered and manufactured solutions for the operation of choke and control valves for on-shore and off-shore installations.

The Actuator Control Systems range of hydraulic Modulating Control Systems has been manufactured and supplied into the oil & gas and associated industries for over 35 years.

The range of products is designed, engineered and manufactured to meet the stringent specifications and reliability demanded for application in world-wide locations.



Certification Options Available



*Industry Leading
Safety and Reliability*

*Established in the Oil &
Gas Industry with Proven
Safety and Reliability*

Global Sales and Support

*Ease of Setup and
Operation*

*Asset Management
and Datalogging*

*Hazardous Area
Operation in Harsh
Environmental Conditions*



Expertise and knowledge of every aspect of flow control.

Predictive maintenance programmes and comprehensive customer services.

Health checks and performance analysis for optimum plant performance.

Position Control Options - Ring Main Systems



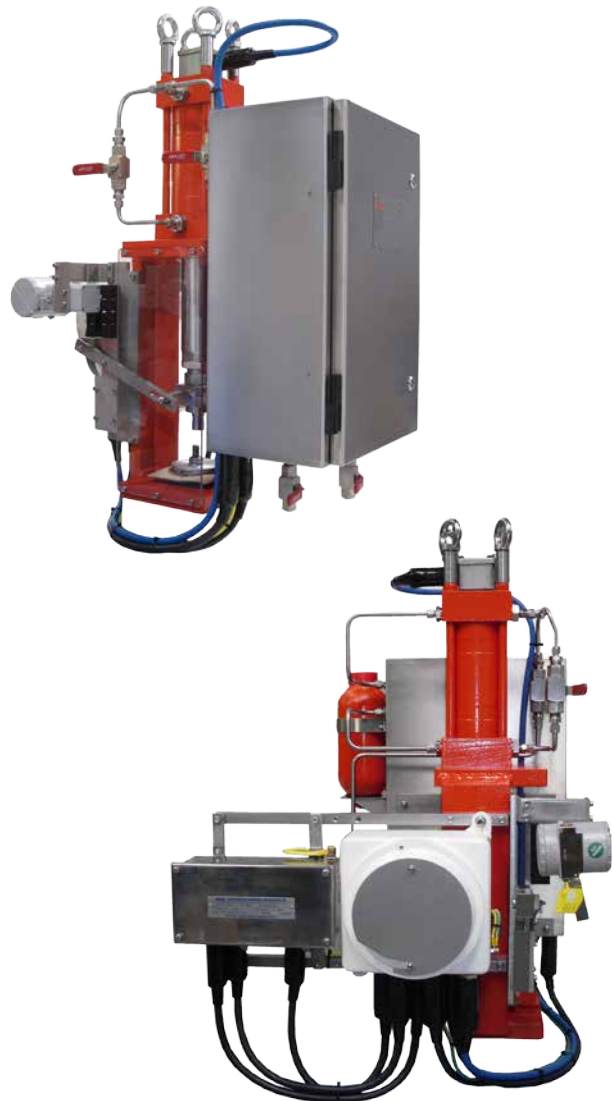
These systems offer a solution for off-shore installations and applications where an hydraulic ring main is available. Actuators are sized to meet with specific hydraulic pressures and types of hydraulic fluid and provide fail-safe stayput fixed position in the event of power failure.

Features

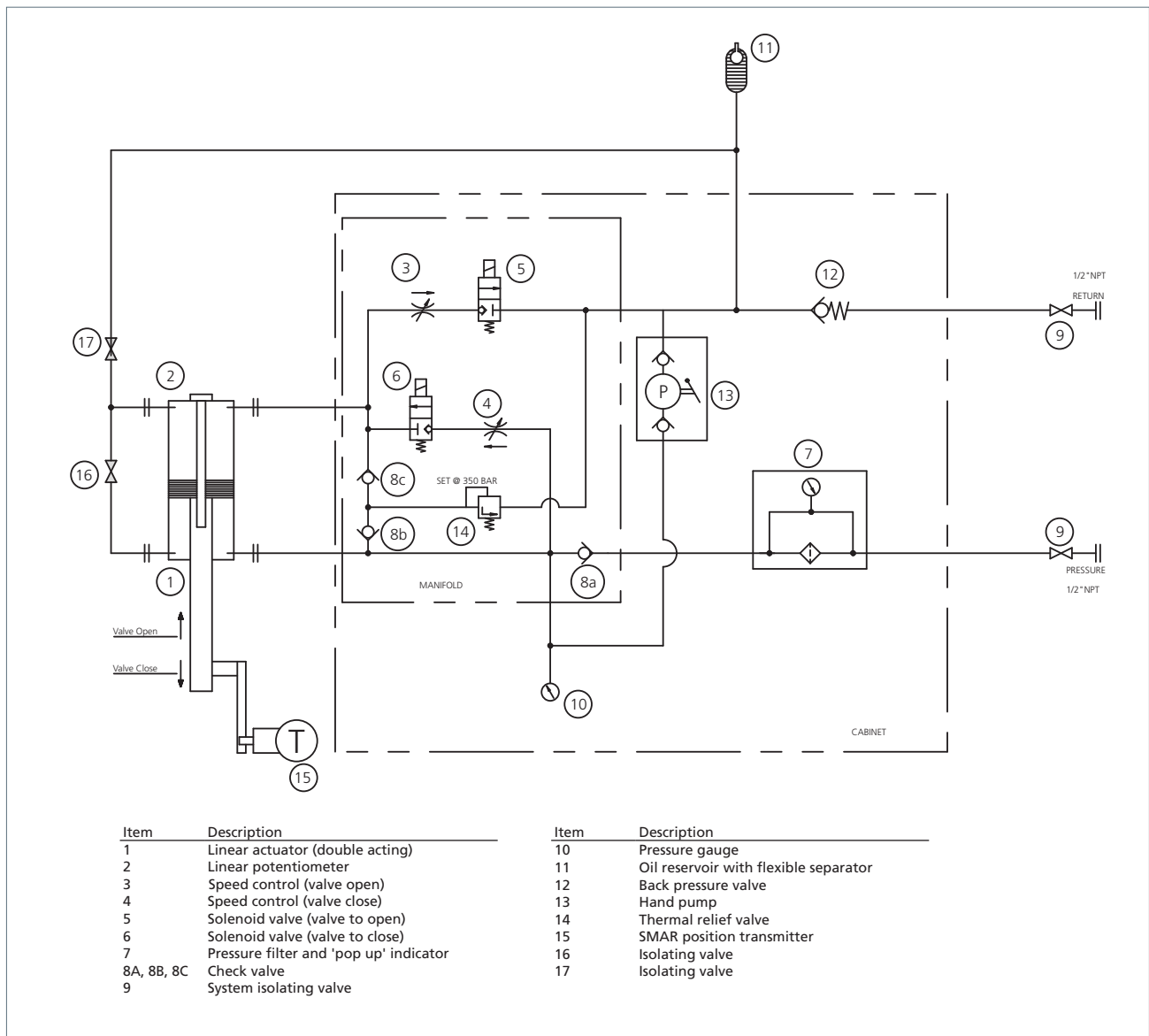
- Centralised hydraulic supply
- Pressure range 50-350 bar
- Hydraulic fluids: Mineral oils, water based and glycols or synthetic types
- Leak tight hydraulic controls with zero leakage/consumption when valve in position
- Positive control for opening, closing and positioning
- Interface to suit valve top works arrangement
- Local manual operation to position valve in event of system failure

Double-acting Fail Fixed Position

- Modulating position control
- Adjustable opening and closing speeds (also refer to stepping option)
- Fail position - Fail last 'Stayput' on
 - Loss of hydraulic supply
 - Loss of electrical supply
 - Loss of command signal



Position Control Options - Ring Main Systems



Fail 'Stayput' control system complete with manual override and thermal relief

Single-acting Fail Closed / Fail Open Position



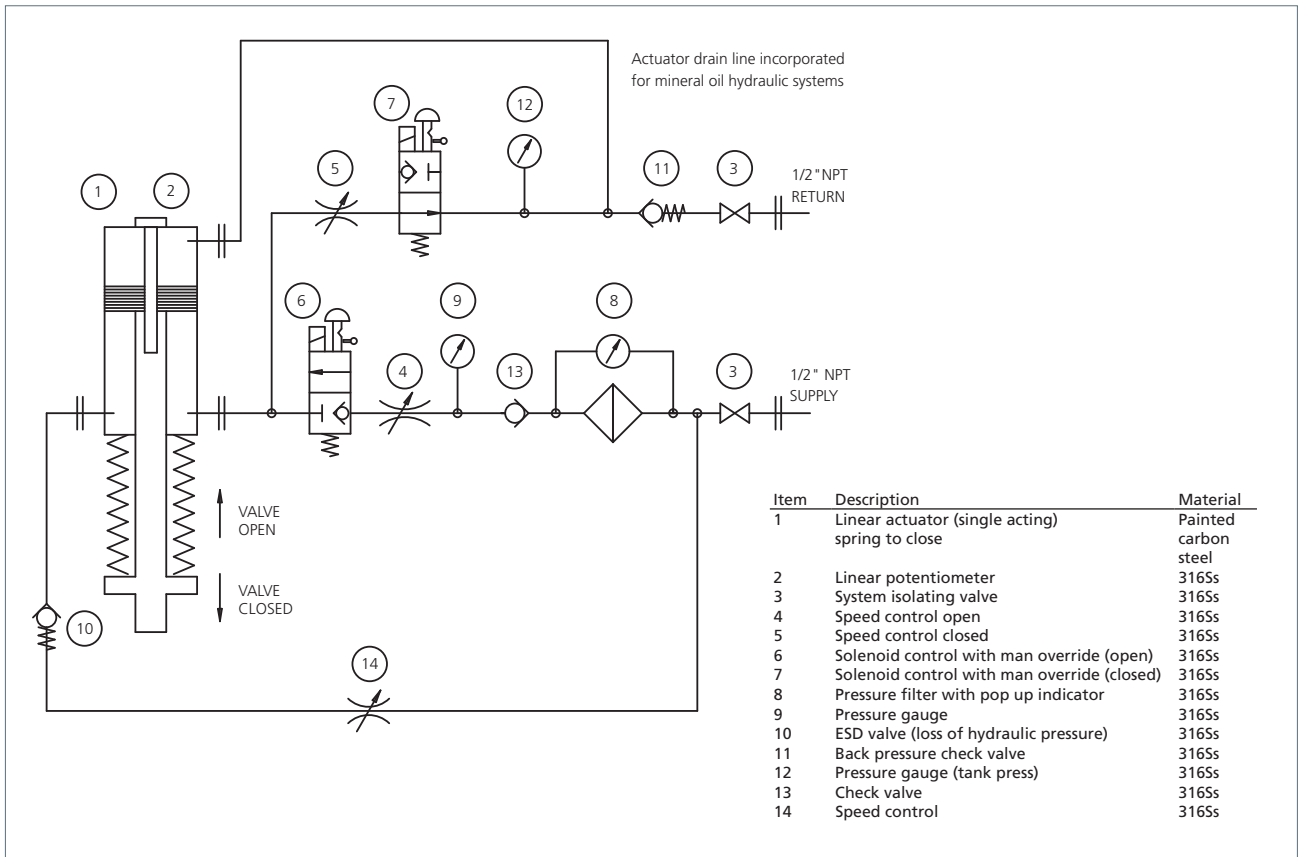
These systems offer a solution for off-shore installations and applications where an hydraulic ring main is available. Actuators are sized to meet with specific hydraulic pressures and types of hydraulic fluid and to provide fail-safe action for closing or opening the valve by a mechanical spring in the event of power failure.

Features

- Modulating positional control
- Adjustable opening and closing speeds (also refer to stepping option)
- Fail position - Fail closed, Fail open or Fail last
- Fail position achieved by integral mechanical spring with installed load to provide fail condition on -
 - Loss of hydraulic supply
 - Loss of electrical supply
 - Loss of command signal



Single-acting Fail Closed / Fail Open Position



Spring fail (to close) control system



Positional Control Options – Self Contained



These systems offer a solution for on-shore pipelines and applications where no hydraulic ring main is available. They require an electrical supply and a control command signal 4-20 mA. All features that are offered with ring main systems are available with these self-contained units.

Available in double-acting control and single-acting spring to fail-safe control options with stepping action if required.

Generally all system components are mounted to the actuator assembly to form a compact solution for mounting directly on to the control valve.

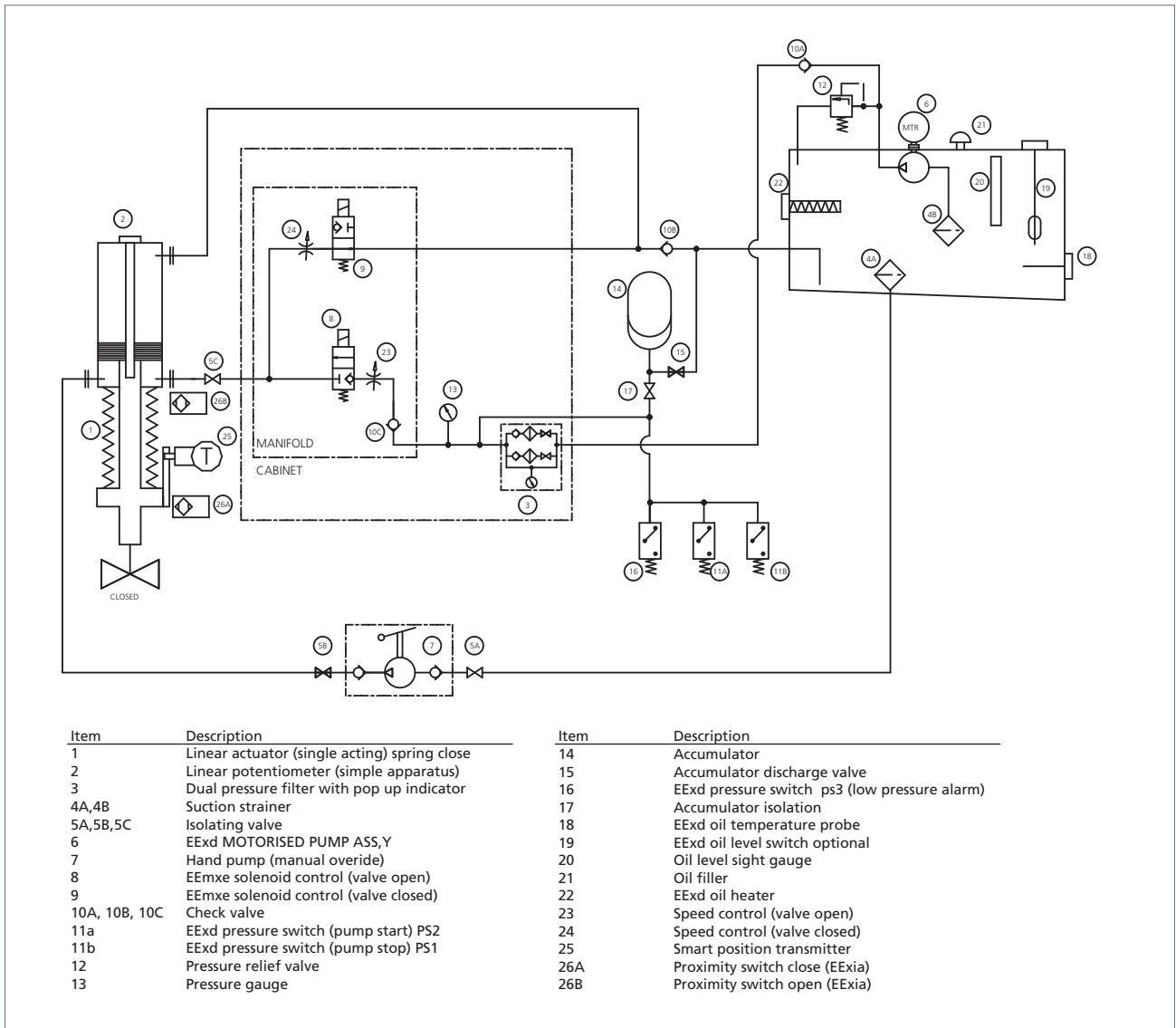
Where valves are of smaller sizes and the mounting arrangement not practical, it is possible to supply a free-standing control assembly for mounting locally to the valve with minimum interconnecting hydraulic pipework and wiring.

Typical self-contained control assemblies comprise:

- Hydraulic actuator
- Spring module (for fail to position options)
- Hydraulic power unit
- Hydraulic control module
- Electronic positioner controller / motor starter enclosure
- Pressure control switching
- Hydraulic control switching
- Hydraulic storage accumulator for back-up operation
- Hydraulic hand pump for emergency operation



Positional Control Options – Self Contained



Self Contained - Spring Close System - Linear Actuator (shown in close position)

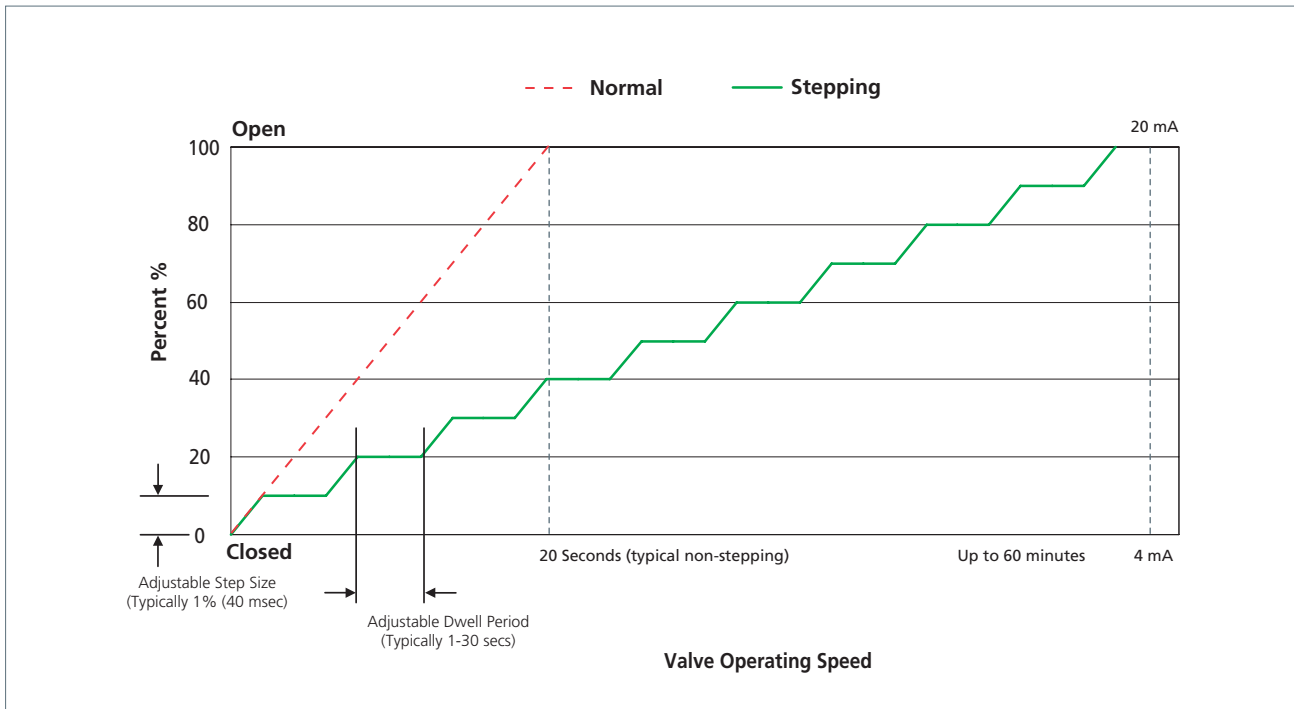
Stepping Positional Control

The electro-hydraulic stepping actuator provides a low-cost effective alternative solution to the mechanical ratchet style mechanisms that are occasionally used for choke control.

This feature may be incorporated in all versions of hydraulic and electro-hydraulic modulating control options.

The positioner controller may be set in the stepping mode either locally or remotely and causes the valve position to change in a series of steps in accordance with command signal change and achieve the desired position for the process.

The size of the steps and the dwell time between steps are adjustable to meet the operational control requirements.



Typical stepping actuator assembly with fail spring close action.



Typical stepping actuator assembly with double acting fail stayput action.

Standard Design Features

Hydraulic Actuators

- **Type** – Double-acting and single-acting - self contained
- **Construction** – Bolted style or tie rod
- **Materials of Construction** – End caps and tubes - carbon steel with protective plated or painted finish
- **Piston Rod** – Stainless steel with hard chrome plate
- **Tie Rods** – Stainless steel
- **External Protective Finish** – 2-pack epoxy paint system for severe off-shore environment in accordance with project specification



The hydraulic control system comprises manifold mounted control components manufactured in 316 stainless steel. Solenoid valves, speed control valves, hydraulic supply filtration and pressure gauge.

The control manifold assembly may be housed within a 316 stainless steel cabinet to provide additional environmental protection and security.

Suitable for operation with all types of hydraulic fluids -

- Mineral oils
- Synthetic oils
- Biodegradable and water glycol
- Fire resistant types

Hydraulic supply pressure range 50-350 bar.

The actuator assembly includes the valve mounting yoke that is designed to suit individual valve manufacturers standard interface top works.

Electronic Positioners

Generally these are mounted on the actuator assembly requiring a 24 V DC power supply and provide positioning control by a 4-20 mA command signal and providing a 4-20 mA re-transmitted output signal.

EHPC210 Universal Controller

For installation in zone 1 or 2 hazardous areas.

This unit is housed within an Exd enclosure available in 316 stainless steel or coated aluminium and closed coupled to an Exe 316 stainless steel enclosure to facilitate interconnection wiring components on site installation wiring.

The EHPC210 Universal Controller incorporates an LED graphic display with local control setting switch.

- Manual mode for actuator test
- Stepping mode selection
- Fail safe mode selection on loss of power or signal
- HART protocol data on command or retransmitted actual signal
- Configuration by *Bluetooth*[®] communication including response tuning, valve position calibration, valve position feedback setting, fault viewing and pump control
- Positional accuracy of control valve from 0.25% with a resolution of 0.1% from the 4-20 mA externally powered command signal

Options Available

- Intrinsically safe galvanic signal isolation command and retransmission
- Integral valve position feedback measurement with direct mounting to actuator
- Alternative power supplies
- Compact positioner EX200 for DIN rail mount into standard Exd enclosure
- Compact positioner IS 200 for DIN rail mount into IP rated enclosure for use in zone 0 hazardous areas

Electro-Hydraulic Actuation – Coding System

Example Model Number

EHPC210 P 80-36-50 DA FSP SC LS3 MO XXX

ELECTRONIC POSITIONER

EHPC210 = Universal positioner controller
EX200 = Compact positioner controller Exd
IS200 = Compact positioner controller Exia

POSITIONING MODE

P = Positioning
M = Modulating
S = Stepping

ACTUATOR CYLINDER SIZE

xxx - xxx - xxx = Bore x rod x stroke
 (Specify size according
 to thrust and pressure)

ACTUATOR OPERATION

DA = Double-acting
SA = Single-acting

FAIL ACTION

FSP = Fail stayput
SFC = Spring fail close
SFO = Spring fail open

ACTUATOR SYSTEM TYPE

RM = Ring main system
SC = Self contained system

SPECIAL REQUIREMENTS

LS1 = Limit switch open
LS2 = Limit switch close
LS3 = Limit switch open and close
MO = Manual override (hand pump)
SMAR = Independent position transmitter
XXX = Other special features

rotork® Site Services

Rotork actuators are recognised as the best in the world for reliability and safety in the most demanding applications. To maintain this hard-earned leadership position, Rotork Site Services is committed to helping clients to maximise the continuous, fault-free operation and working life of all their actuators.

With established operations and worldwide service centres we are able to offer same-day or next-day service to all our customers. Our Rotork factory trained engineers have skills in both multi-purpose and industry specific applications and carry with them spare parts and specialist test equipment. Our operations utilise a documented Quality Management system established in accordance with ISO9001.

Rotork Site Services aims to be your number one choice for taking care of fault diagnosis, service repairs, scheduled maintenance and system integration needs.

Visit www.rotork.com to identify your nearest Rotork Site Services centre.



Global Service and Support

Rotork understand the value of prompt and punctual customer site services and aim to supply our customers with superior flow control solutions, by providing high quality, innovative products and superior service – **on time, every time.**

Whether you have an actuator requiring on-site servicing, a custom design service requirement or a new actuator installation, we can deliver the fastest turnaround with the least plant disruption.

Accreditation and Assurance

Rotork Site Services is accredited with all major safety authorities around the world, providing our clients with reassurance and peace of mind.

Rotork's engineering teams are experts in the design and implementation of actuation solutions for all circumstances and environments. Our knowledge base draws upon previous installations and environmental situations from all around the world.

Our track record of undertaken engineering projects is second to none. Rotork is trusted by major utility and industrial companies throughout the world to design, install and maintain their actuation stock. We keep their plants operating at peak efficiency, helping them to be more profitable and at the same time meet ever tightening industry watchdog requirements.

We have the knowledge and expertise to design, build and install any standard or custom installation for you, anywhere throughout the world.

Asset Management

Rotork is a corporate member of the Institute of Asset Management, the professional body for whole life management of physical assets.



***Giving You Peace of Mind,
Guaranteed Quality and
Improving Your Site Efficiency***

rotork®

Keeping the World Flowing

www.rotork.com

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

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Rotork is a corporate member of the Institute of Asset Management



PUB025-004-00
Issue 05/16

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