

# rotork®

## Fluid Systems

These special multi-turn actuators, apply the reliable Planetary Torque Controls System (PTCS), fulfilling requirements in certain industries for actuators with a hydraulic or pneumatic supply in multi-turn applications with position and applied torque control.

### Features of 4P and 4H actuators

- Pneumatic or hydraulic actuators designed to meet the needs of diverse actuation applications:
  - Torque from 450 Nm (332 lbf.ft) up to 200,000 Nm (147,556 lbf.ft) when combined with an external worm gearbox
  - Multi-turn torque: 30 to 8,000 Nm (22 to 5,900 lbf.ft), combined with an external spur/bevel gearbox
  - Linear thrust: 12 to 200 kN (2,697 to 44,961 lbf)
- PTCS patented planetary gearing system controlling the applied torque with high mechanical efficiency >95%
- Intrinsic mechanical torque limit protection
- Mechanical switch mechanism with a wide range of signalling options
- Lockable manual operation: motor drive priority
- Modular design, covering actuator with standard configuration up to actuator with control panels
- IP67/IP68, optional ATEX
- Environmental sealing. Optional double-sealed terminal compartment

### Key benefits

- The 4P/4H is position control blocked: the multi-turn hydraulic actuator is self-locking (through combination with the stem nut), as compared with a hydraulic linear cylinder that is non self-locking.
- Lubricated for life gearing with reduced maintenance requirements
- Mechanically protects to prevent excessive output torque using PTCS
- Designed to work efficiently and effectively under harsh conditions (vibrations)

### Actuator-valve coupling

Meeting ISO 5210 or 5211 standards, the 4P/4H feature different coupling suitable for all types of valves.



## 4P / 4H Range

### Hydraulic and Pneumatic Actuators

#### Hydraulic motor

The reversible vane motor suitable for a wide range of supply pressures and flow rates (30 to 140 bar working pressure and 240 bar max pressure).

#### Pneumatic motor

Reversible vane motor suitable for supply pressures from 2 to 7 bar.

#### PTCS – The patented planetary gearing system

- High mechanical efficiency (>95%)
- Precise control of the applied output torque/thrust
- Silent service
- Highly compact and light weight design
- Increased Safety: PTCS provides mechanical protection against:
  - Overloading the valve
  - External pressure regulator failure or deregulated inlet pressure
  - Failure of any torque or limit switch
  - Delays in the switching control system independent from valve inertia

#### Environmental sealing and protection

- Actuators are IP67 certified (IP68 as an option)
- Paint protection coatings for highly corrosive atmospheres (ships, offshore platforms) are available
- A double-sealing ingress protection version is also available

## 4P / 4H Range

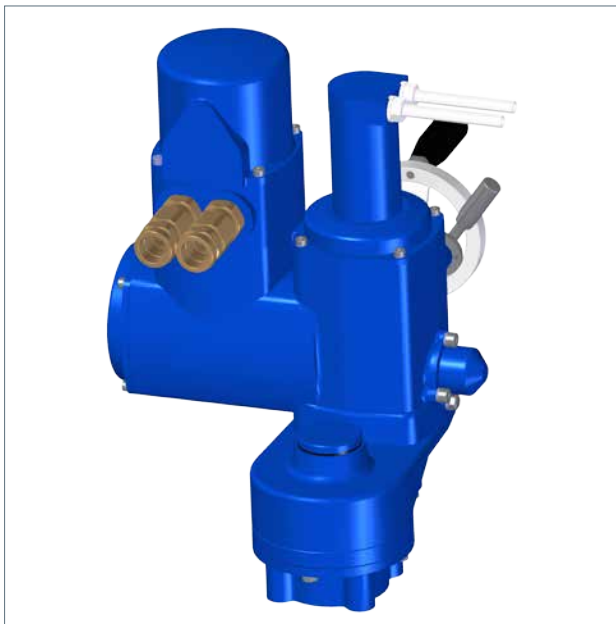
### Control options

#### Actuator switch mechanism

The purpose of the actuator switch mechanism is to sense the valve position and torque. The actuator is fitted with a mechanical switch mechanism (MSM) that provides an instantaneous position. Torque is sensed mechanically, and IP67 rated micro switches provide end of travel indication as well as torque trip indication.



*Pneumatic Actuator*



*Hydraulic Actuator*

#### Standard elements:

- Mechanical switch mechanism (MSM)  
Adjustable stroke: 2-1.500 turns  
(special version on request, up to 2-15.000 turns)  
Torque setting, adjustable 60-100% of rated torque
- DPDT torque switches
- DPDT limit switches

#### Optional elements:

- Pneumatic switches for the 4P series, for pure pneumatic control, instead of DPDT switches
- DPDT extra torque and limit switches, and intermediate position switches
- Precision potentiometer: 1, 5 and 10 kOhm.  
Other values on request
- Electronic position transmitter  
(0-20 mA, 4-20 mA, 0-10 V)
- Mechanical position indicator
- For 4H series: Hydraulic dual relief valves and flow regulators, special control block on request
- ATEX version available, according to EC-Type Examination Certificate number LOM 03ATEX2126 X
- For 4P series: Air set kits (FRL), control valves, mufflers, pneumatic or electro-pneumatic (before local control units)

#### Electrical connection

Offering electric and pneumatic/hydraulic standard connections, indicator options are also available.

Seated on terminals with tension clamp connection for control wiring, the wiring and cabling process is simple, easy and robust. The terminal housing forms part of the actuator enclosure, featuring the same protection degree benefits. It has been designed to work efficiently and effectively under harsh conditions (vibrations). Up to three conduit entries are provided to suit various gland/size requirements (metric, NPT or PG threads available). Standard version: 2xM25 and 1xM20 or 2x $\frac{3}{4}$ " and  $\frac{1}{2}$ "NPT. Other arrangements are available on request.

#### Manual operation

This provides lockable emergency manual operation. The motor drive priority is always maintained.

## 4P / 4H Range

### 4P1/4H1 for rising spindle

Hydraulic actuators model	Pneumatic actuators model	Rated torque (Nm)	Min setting torque (Nm)	Max allowable thrust (kN)	Flange ISO 5210	Max allowable stem diam (mm)	Hydraulic pressure (bar)	Air pressure (barg)
4H1.003	4P1.003	30	18	70	F10	40	Working pressure 30-140 bar Max pressure 240 bar	Working pressure 2-7 bar
4H1.006	4P1.006	60	36	70	F10	40		
4H1.012	4P1.012	120	72	70	F10	40		
4H1.025	4P1.025	250	150	160	F10	57		
4H1.050	4P1.050	500	300	160	F14	57		
4H1.100	4P1.100	1000	600	250	F16	75		
4H1.200	4P1.200	2000	1200	380	F25	86		




Actuator output speed depends on OIL/AIR flow, consult Rotork.

### 4P0/4H0 for non-rising spindle

Hydraulic actuators model	Pneumatic actuators model	Rated torque (Nm)	Min setting torque (Nm)	Shaft diam	Max allowable shaft length (mm)	Flange ISO 5210	Hydraulic pressure (bar)	Air pressure (barg)
4H0.003	4P0.003	30	18	20	50	F10	Working pressure 30-140 bar Max pressure 240 bar	Working pressure 2-7 bar
4H0.006	4P0.006	60	36	20	50	F10		
4H0.012	4P0.012	120	72	20/30	70	F10		
4H0.025	4P0.025	250	150	30	70	F14		

Actuator output speed depends on OIL/AIR flow, consult Rotork.

### General information

Valve types	Movement		Actuator
Knife valve Gate valve Globe valves Diaphragm valves Pinch valves	Multi-turn Rising spindle Non-rising spindle		4P0 / 4H0 series + bevel (IB) / spur (IS) gearbox or 4P1 / 4H1 series
	Multi-turn Linear (Lineal)		4P0 / 4H0 series + linear thrust unit LC
Plug valves Ball valves Butterfly valves	Quarter-turn (0-90°)		4P0 / 4H0 series + worm gearbox (IW, ABM)





*4H1.050 multi-turn hydraulic actuator, 500 Nm rated torque, mounted on a 12" - Class 150 globe valve on an LNG vessel.*



*4H1.100 multi-turn hydraulic actuator, 1000 Nm rated torque, mounted on a DN300 cryogenic globe valve on one of the LNG vessels where the actuators are now operating.*

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

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

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