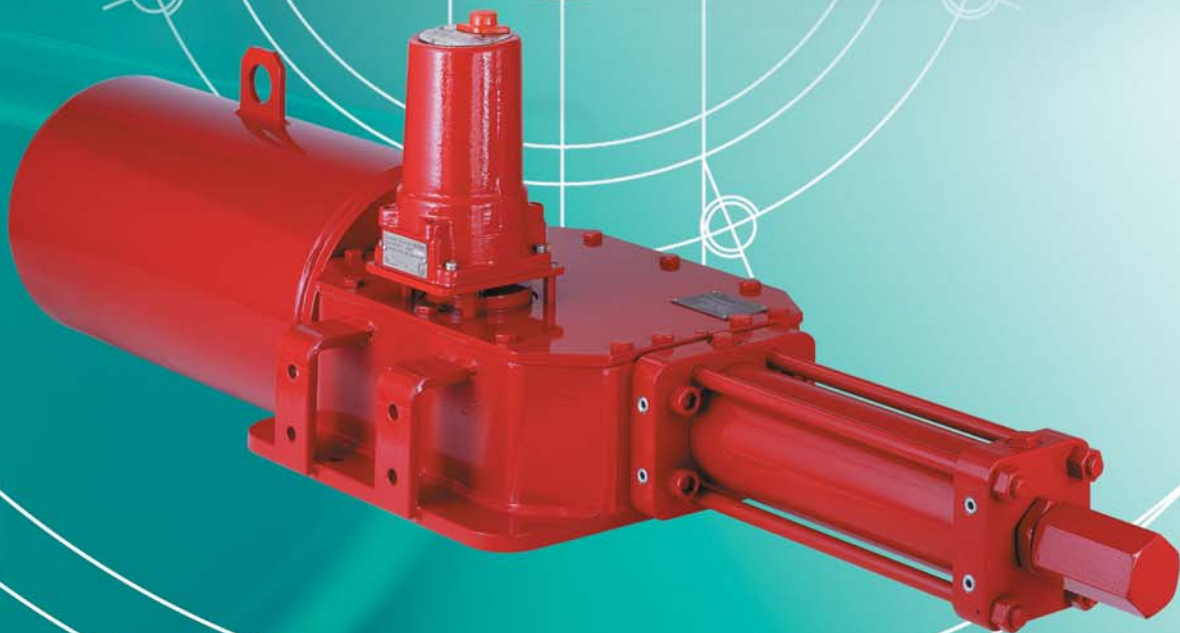


GP AND GH RANGE

PNEUMATIC AND HYDRAULIC ACTUATORS  
FOR QUARTER-TURN VALVES

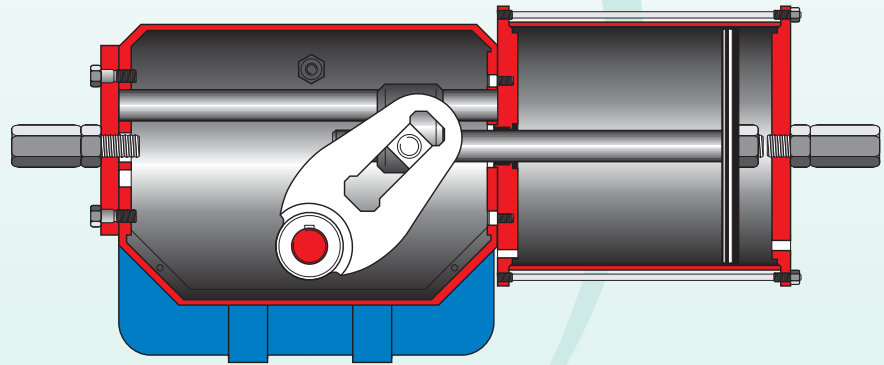
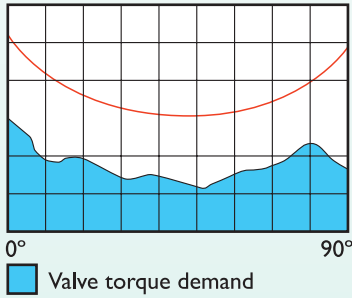


# GP and GH SCOTCH YOKE QUARTER-TURN ACTUATORS

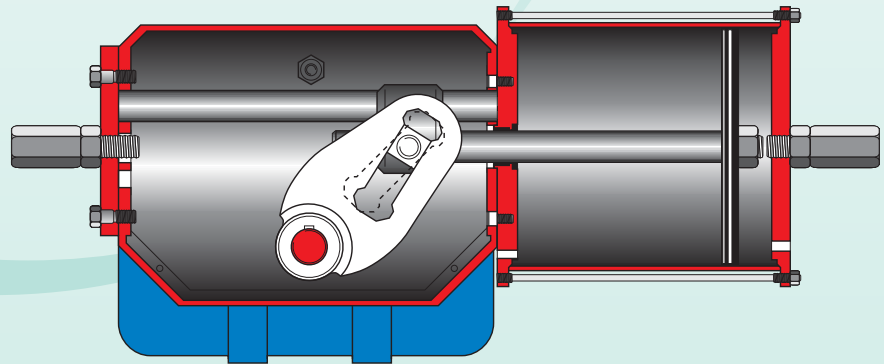
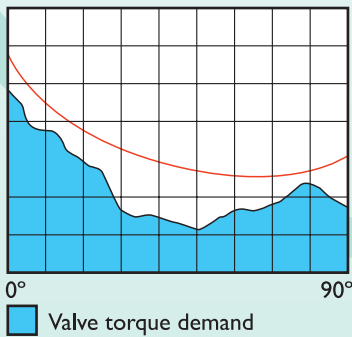
GP and GH Range scotch yoke actuators are designed to operate ball, butterfly and plug valves requiring a rotary, quarter-turn movement for either on/off or modulating duty. The rugged yet compact design is available with two different yoke designs. The classic symmetrical yoke delivers peak torque at both ends of

stroke. Alternatively, GP and GH Range actuators can be supplied with canted torque arms designed to deliver peak torque at only one end of stroke. Use of canted arms can often reduce actuator size, weight and cost for valves with appropriate torque demand characteristics.

Symmetrical Scotch Yoke



Canted Scotch Yoke

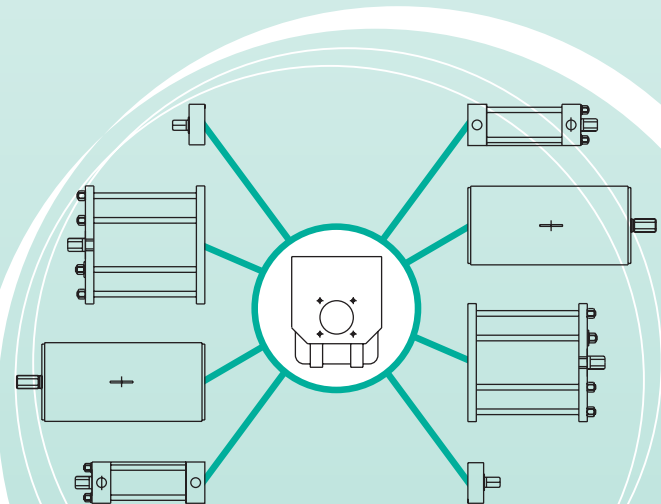


## ROTORC ACTUATORS - MODULAR CONSTRUCTION

Rotork GP and GH Range actuators share a modular construction design. The centre body is available in nine sizes. A pneumatic cylinder can be attached to either or both sides. A spring can cylinder can also be fitted to either side for Emergency Shut Down (ESD) applications. Modular construction and stocking of components by Rotork Fluid System Centres and a worldwide network of distributors facilitates quick delivery times.

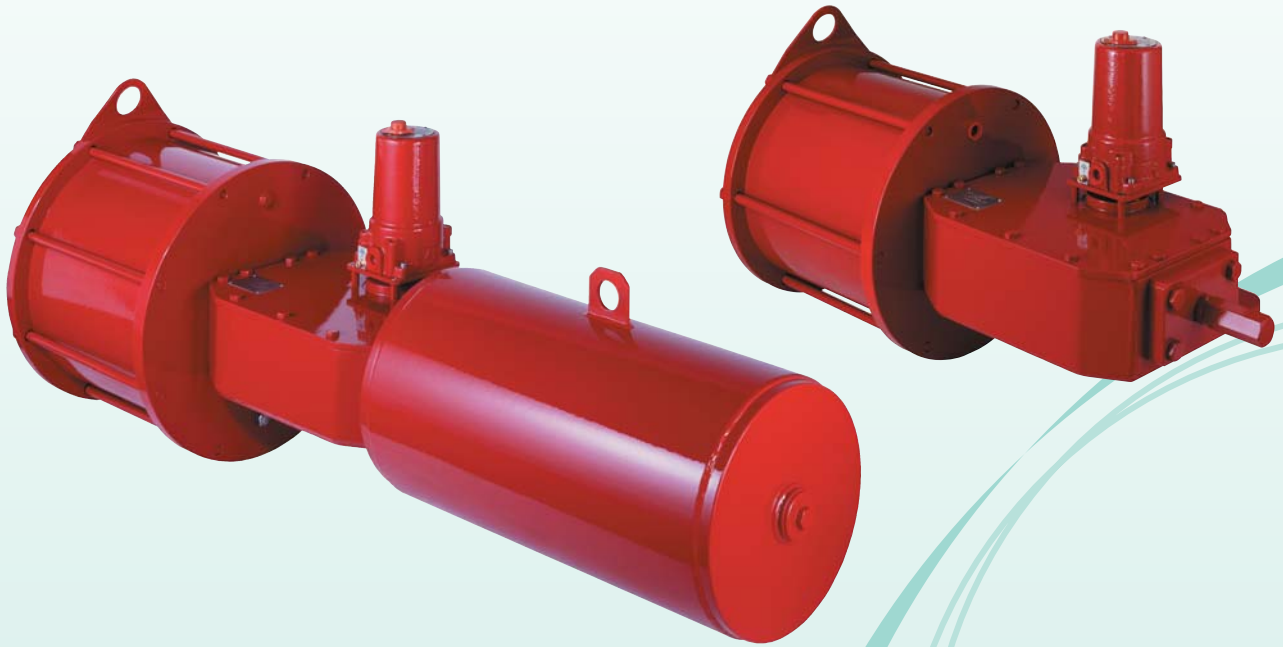
### SAFE AND VERSATILE

Spring return units can be assembled to provide spring return operation in either direction. The spring return module is inherently safe since it can only be removed from the centre body after all spring forces have been released.

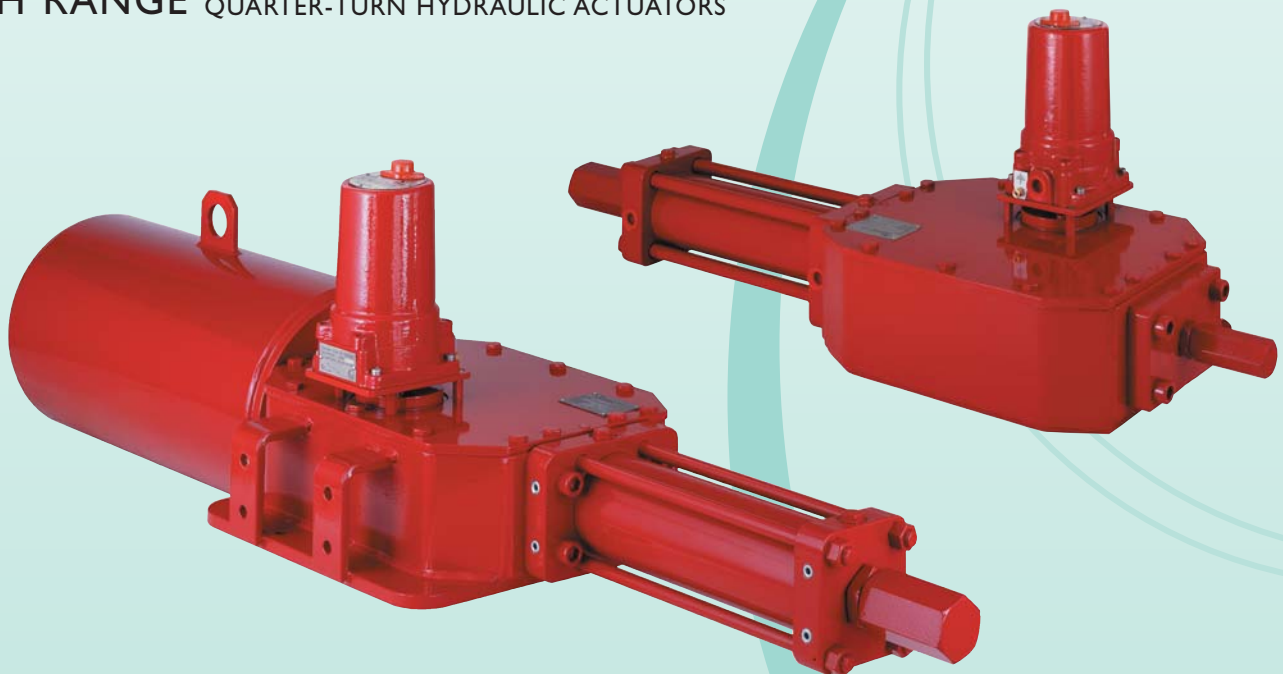


GP and GH modular construction allows multiple configurations of components on either side of the centre body.

## GP RANGE QUARTER-TURN PNEUMATIC ACTUATORS



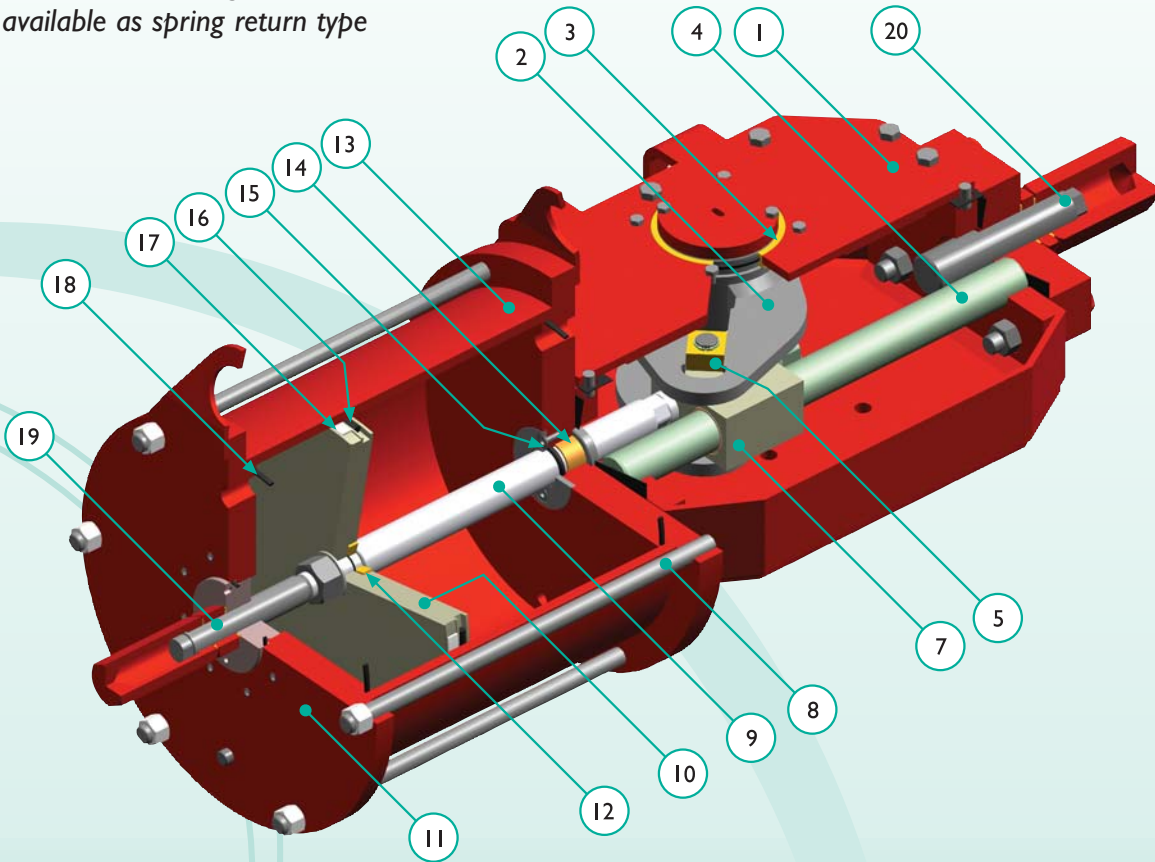
## GH RANGE QUARTER-TURN HYDRAULIC ACTUATORS



	GP RANGE ACTUATORS for pneumatic operation	GH RANGE ACTUATORS for hydraulic operation
<b>Torques available</b>	Up to 600,000 Nm 5.3 Million inch pounds	Up to 600,000 Nm 5.3 Million inch pounds
<b>Operating pressures</b>	Up to 12 bar (175 psi) HPG Range for high pressure gas also available	Up to 210 bar (3,000 psi)

# INSIDE THE GP RANGE ACTUATOR

Pneumatic double acting actuator illustrated, also available as spring return type



ITEM	DESCRIPTION	MATERIAL	U.S. STANDARD EQUIVALENT
1	Centre Body †	Carbon Steel Ductile Iron	ASTM A 283 gr.D ASTM A 536 GR 60.40.18
2	Yoke †	Carbon Steel Ductile Iron	API 5LX gr.X 52 + ASTM A537 CLI ASTM A 536 GR 60.40.18
3	Yoke Bushing	Bronze	ASTM B427 ALLOY UNS N. C90800
4	Thrust Bar	Alloy Steel (Chromium plated)	AISI SAE 9840
5	Sliding Block	Bronze	ASTM B427 ALLOY UNS N. C90800
6	Vent Valve (not shown)	Stainless Steel	AISI 304
7	Guide Block	Carbon Steel	ASTM A 283 gr.D
8	Tie Rod	Alloy Steel	AISI SAE 9840
9	Piston Rod	Alloy Steel (Chromium plated)	AISI SAE 9840
10	Piston	Carbon Steel	ASTM A 283 gr.D
11	End Flange	Carbon Steel	ASTM A 283 gr.D
12	O-Ring*	NBR	
13	Cylinder Tube	Carbon Steel (ENP)	API 5LX gr.X 52
14	Rod Bushing	Steel + Bronze + PTFE	
15	Seal*	NBR + PTFE + Graphite	
16	O-Ring*	NBR	
17	Sliding Ring	PTFE + Graphite	
18	O-Ring*	NBR	
19	Stop Setting Screw	Alloy Steel	AISI SAE 9840
20	Stop Setting Screw	Alloy Steel	AISI SAE 9840

† Typical fabricated carbon steel centre body and yoke illustrated. Some models have cast ductile iron centre body and yoke.

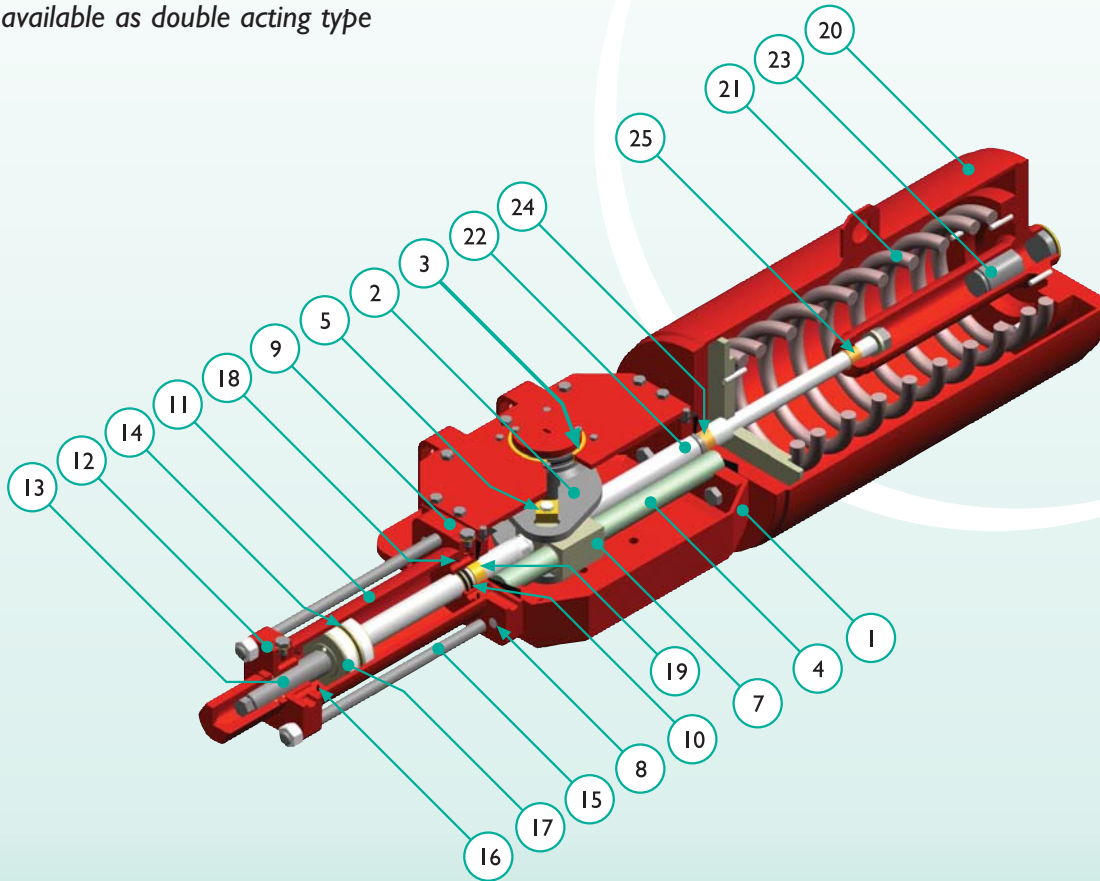
**\* Actuator Seals**

Standard	NBR	-30°C to 100°C (-22°F to 212°F)
High Temp	Viton	-20°C to 160°C (-4°F to 320°F)
Low Temp	Fluorosilicone	-60°C to 160°C (-76°F to 320°F)

# INSIDE THE GH RANGE ACTUATOR

**rotork**<sup>®</sup>  
fluid system

*Hydraulic spring return actuator illustrated,  
also available as double acting type*



ITEM	DESCRIPTION	MATERIAL	U.S. STANDARD EQUIVALENT
1	Centre Body †	Carbon Steel	ASTM A 283 gr.D
		Ductile Iron	ASTM A 536 GR 60.40.18
2	Yoke †	Carbon Steel	API 5LX gr.X 52 + ASTM A537 CL1
		Ductile Iron	ASTM A 536 GR 60.40.18
3	Yoke Bushing	Bronze	ASTM B427 Alloy UNS N. C90800
4	Thrust Bar	Alloy Steel (Chromium plated)	AISI SAE 9840
5	Sliding Block	Bronze	ASTM B427 Alloy UNS N. C 90800
6	Vent Valve (not shown)	Stainless Steel	AISI 304
7	Guide Block	Carbon Steel	ASTM A 283 gr.D
8	Screw	Alloy Steel	AISI SAE 9840
9	Head Flange	Carbon Steel	ASTM A 283 gr.D
10	O-Ring*	NBR	
11	Cylinder	Carbon Steel (ENP)	ASTM A 283 gr.D
12	Bottom Flange	Carbon Steel	ASTM A 283 gr.D
13	Stop Setting Screw	Alloy Steel	AISI SAE 9840
14	Seal*	NBR + PTFE	
15	Tie Rod	Alloy Steel	AISI SAE 9840
16	O-Ring*	NBR	
17	Piston	Carbon Steel	ASTM A283 gr.D
18	Seal*	NBR + PTFE + Bronze	
19	Rod Bushing	Steel + Bronze + PTFE	
20	Spring Cartridge	Carbon Steel	ASTM A 283 gr.D
21	Spring	Alloy Steel	ASTM A 29 gr.9254
22	Spring Cartridge Stem	Alloy Steel (Chromium Plated)	AISI SAE 9840
23	Stop Setting Screw	Alloy Steel	AISI SAE 9840
24	Bushing	Steel + Bronze + PTFE	
25	Bushing	Steel + Bronze + PTFE	

## KEY DESIGN FEATURES

Every Rotork Fluid System actuator is built to provide long and efficient service with minimum maintenance. The design, engineering and materials used in construction ensure optimum performance even in the harshest environments. Listed here are some of the most important features that enable Rotork GP and GH actuators to achieve and maintain this high level of service.

The GP and GH actuators are of a rugged, efficient and compact design incorporating an internal chromium plated guide bar to absorb side loads during operation of the scotch yoke mechanism.

### GP/GH Range

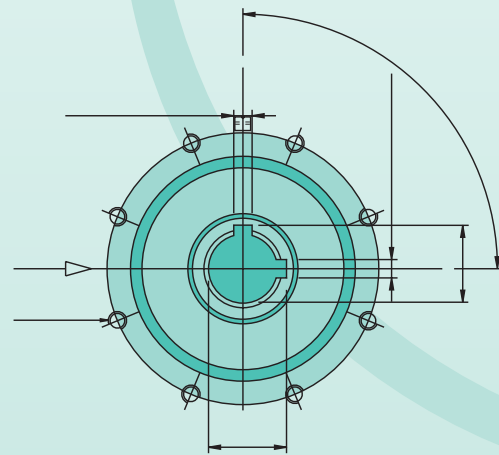
Quarter-turn operation:

- Standard range covers torque requirements up to 600,000 Nm (5.3 million inch pounds) - higher output torques are available on request.
- Double acting and single acting (spring return) versions are available.
- Carbon steel or ductile iron (depending upon size) scotch yoke mechanism available in either symmetric or canted form to follow application specific valve requirements with minimum cost and weight.
- Totally enclosed weatherproof housing in fabricated carbon steel or cast ductile iron (depending upon size) complete with bottom relief valve to avoid over-pressurisation.
- Bronze sliding blocks on the torque arm to ensure minimum friction and long service life.
- Alloy steel chromium plated thrust bar to support the transverse loads of the scotch yoke.
- Carbon steel, electroless nickel-plated cylinders fitted with mechanical end stop to ensure accurate angular stroke adjustment  $\pm 5^\circ$
- Carbon steel piston with dynamic floating seal to reduce friction and avoid stick-slip effect even after prolonged periods without operation.
- Chromium plated piston rod.
- For single acting versions, a welded steel canister totally encloses the spring for safety.
- The spring cartridge can only be removed in the fully relaxed state, thus avoiding the possibility of injury during disassembly.
- Standard valve position indicator.
- Double acting actuators can be supplied with emergency tanks to allow operation during supply failure.

### Paint Specification

The standard specification is suitable for offshore service applications to protect against severe weathering, chemical atmospheres, salt spray and petroleum products. Other specifications are available upon request.

<b>Surface preparation:</b>	Sandblast to grade SA 2.1/2
<b>Prime coat:</b>	Inorganic zinc 75 microns DFT
<b>Intermediate coat:</b>	Epoxy 110 microns DFT
<b>Final coat:</b>	Polyurethane 40 microns DFT
<b>Colour:</b>	RAL3011 Dark Red 225 microns total DFT

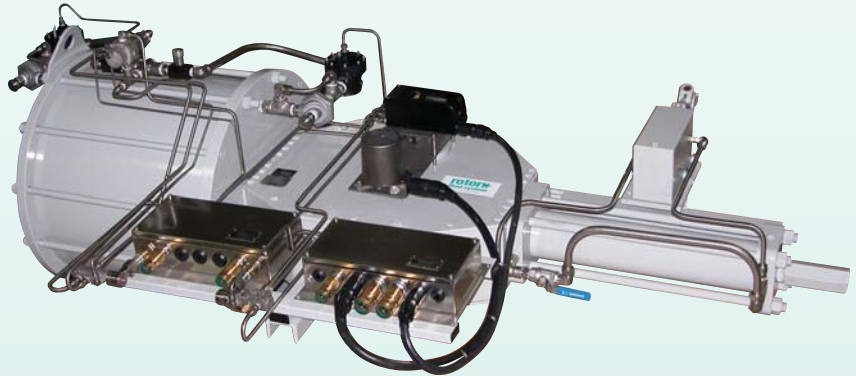


## Controls

Control component packages are a part of any actuator/valve installation. Rotork has extensive experience in the design and assembly of all types of fluid power control systems to satisfy any customer requirement for on/off, modulating or ESD service. Packages can be mounted on a panel or in a cabinet; and located either on the actuator or at a remote location.

## Emergency and Manual Override

GP and GH Range actuators have many simple yet safe manual override options available to meet your requirements. Options include: simple jackscrew, de-clutchable manual handwheel, and hydraulic manual overrides.



## Approvals and Industry Standards

- Actuators certified in accordance with PED.
- Actuators certified in accordance with ATEX 94/9/CE.
- Actuators certified to IP66M/67M.
- Actuators designed and manufactured under a third party accredited ISO 9001:2000 quality assurance program.
- Certification for critical components to EN 102043.1.D 31b is available upon request.
- Actuator and controls in accordance with UK health and safety requirements for pipeline safety regulations SI 825 (1996).
- Actuator design calculation procedure approval by Lloyds (report no. 094/5152).

## Fire Protection Solutions

Rotork Fluid System actuators and control systems can be customized to withstand exposure both to fire and very high environmental temperatures. Several protection solutions are available to meet a variety of application requirements - some providing protection in temperatures in excess of 1200°C.

Solutions include: compact, fire retardant blankets; intumescent coatings; and rigid enclosures consisting of high thermal performance materials encapsulated within a stainless steel skin.

<b>rotork</b> fluid system LUCCA ITALY	
SERIAL No.:	_____
TAG No.:	_____
MODEL:	_____
ACT. MIN/MAX OP. PRES.:	_____
P.O.:	Month/year: _____
	II 2 GD c IIC T5 - IP 66M / 67M Dossier tech. TR 219-X Kept by B.V. ITA on behalf of LCIE Notified body "N° 0081" Receipt n°: ATEX/ITA/04/032



## GP AND GH RANGE

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All Rotork Fluid System actuators are manufactured under a third party accredited ISO9001:2000 quality assurance program

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