

## Balanced hydraulic actuators for demanding applications

RHQ actuators are designed for some of the most challenging valve actuation applications on earth. They are an excellent choice for the demanding requirements and adverse conditions found in applications for mining and offshore. The range has several features that set it apart from competing designs.

### Balanced, Compact Design

RHQs provide a tremendous output torque for their size and are suitable for heavy duty applications. The range's robust double-acting hydraulic design with provision of four power cylinders results in very compact footprint – in some cases even smaller than that of the valve. The design is balanced to facilitate installation and removal and, unlike most actuators, the RHQ's lifting lugs are designed to support the weight of both the actuator and the valve.

Furthermore, when used in high-torque applications, the piston design has been proven to have a lower swept volume than vane type actuators. The reduced size, weight and power consumption of associated power units provides the end user benefits of lower cost of installation and ownership.

### Serviceability

The trouble-free rack & pinion design provides for ease of service and low maintenance cost. Unlike vane type actuators, the actuator can be field serviced. Our conventional cylinder-based design has redundant off-the-shelf seals and provides virtually zero leakage. Only the cylinder being serviced need be disturbed so actuator removal from the valve is not necessary. But, due to the balanced design, removal is easily accomplished if desired to facilitate access. And like all our actuators, the RHQ has the unparalleled support of Rotork's vast global sales, field service and maintenance network.

## RHQ Range

### Extreme-duty Rack and Pinion Hydraulic Actuators

#### Features:

- Standard rotation 90° (+/-5°)
- Totally enclosed weatherproof housing (IP68) in nodular cast iron or carbon steel
- Extremely robust housing with lifting lugs designed for the weight of the entire valve/actuator assembly
- Electroless nickel-plated cylinders with redundant piston seals
- Precision machined alloy steel rack & pinion mechanism whose large pitch diameter design limits angular backlash
- Female input shaft allows direct mounting to valve topworks



# Extreme-duty Rack and Pinion Hydraulic Actuators

## Torque Output

Up to 700,000 Nm (6,200,000 lbf.in) – see table below.

Units with output torque higher than 700,000 Nm (6,200,000 lbf.in) and up to 5,650,000 Nm (50,000,000 lbf.in) are available upon request.

## Operating Pressure

Double pressure rating values are available to optimize the output torque:

Low pressure cylinders : Maximum Operating Pressure 120 barg

High pressure cylinders: Maximum Operating Pressure 207 barg

## Temperature Range

Standard: -30 to 100 °C (-22 to 212 °F)

High: -20 to 160 °C (-4 to 320 °F)

Low: -40 to 160 °C (-40 to 320 °F)



## Approvals

ATEX

ABS (upon request)

## Performance Table

| Model Number | MOP* (barg) | Torque Factor** Nm/barg | Displacement*** Litres | Max Stall Torque Nm |
|--------------|-------------|-------------------------|------------------------|---------------------|
| RH-Q-090-    | 145/D4      | 120                     | 216.39                 | 28,000              |
|              | 110/D4      | 207                     | 124.53                 |                     |
| RH-Q-105-    | 165/D4      | 120                     | 342.46                 | 45,000              |
|              | 125/D4      | 207                     | 196.54                 |                     |
| RH-Q-120-    | 190/D4      | 120                     | 516.02                 | 68,000              |
|              | 145/D4      | 207                     | 300.54                 |                     |
| RH-Q-145-    | 225/D4      | 120                     | 868.38                 | 113,000             |
|              | 170/D4      | 207                     | 495.73                 |                     |
| RH-Q-155-    | 260/D4      | 120                     | 1,289.52               | 170,000             |
|              | 200/D4      | 207                     | 763.03                 |                     |
| RH-Q-185-    | 300/D4      | 120                     | 2,002.96               | 270,000             |
|              | 230/D4      | 207                     | 1,177.29               |                     |
| RH-Q-225-    | 340/D4      | 120                     | 3,207.50               | 425,000             |
|              | 260/D4      | 207                     | 1,875.67               |                     |
| RH-Q-250-    | 400/D4      | 120                     | 4,994.38               | 635,000             |
|              | 300/D4      | 207                     | 2,809.34               |                     |
| RH-Q-280-    | 450/D4      | 120                     | 7,023.34               | 960,000             |
|              | 350/D4      | 207                     | 4,248.69               |                     |

## Notes:

\* Low pressure cylinder MOP is based upon a design safety factor of 1.5. High pressure cylinder MOP is based upon design safety factor per ASME VIII Div. 1. Alternative safety factors are available upon request.

\*\* Actuator output torque generated per barg, i.e., output torque (Nm) = torque factor x supply pressure (barg).

\*\*\* For 90° rotation. Other angular rotational strokes are available upon request.

## Hydraulic Power Units

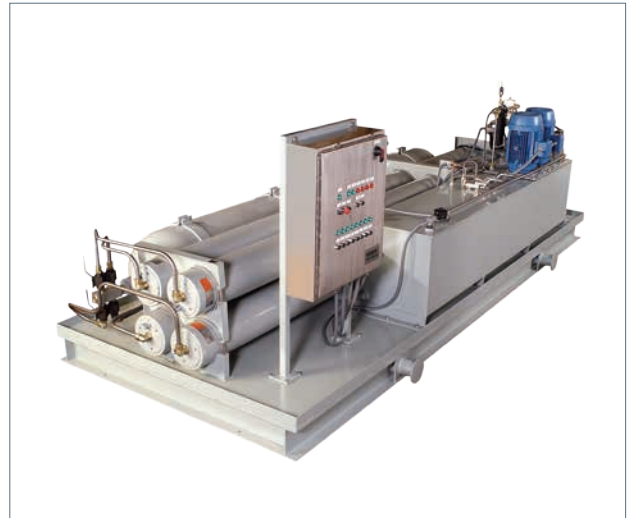
HPU's complement our hydraulic actuator offering. We have over three decades of experience in their manufacture with units in service in a variety of plant and pipeline locations spanning the globe.

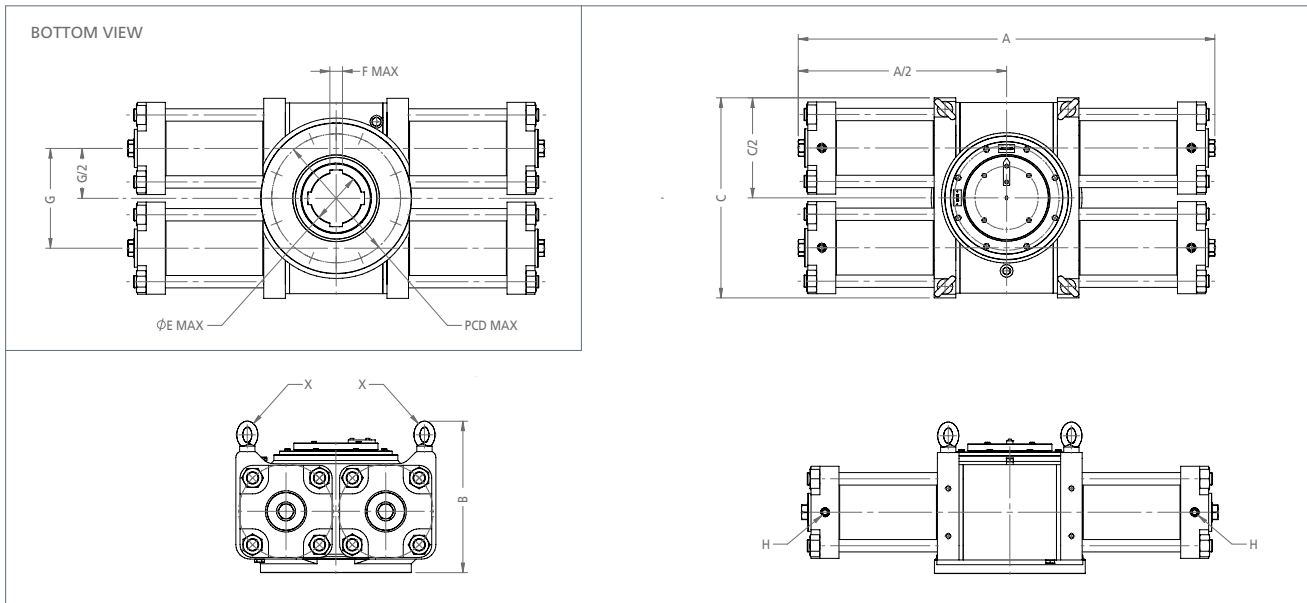
Rotork HPU's can be produced to meet any global engineering or manufacturing standards including FM, NEC, ATEX, CSA, ANSI, ASME and CE. Materials and construction can be optimised for hazardous, corrosive, or environmentally sensitive areas. Ratings are available for extreme temperatures, and food-grade approved hydraulic fluid is an option.

Our HPU's can also incorporate stored energy accumulators, redundant pumps or controls and even multiple prime movers such as solar powered or gas powered pumps to back up traditional A/C electric drives.

### Rotork HPU Capabilities:

- Hydraulic fluid capacity from 19 to 7,570 litres (5 to 2,000 U.S. gal)
- Operating pressures up to 345 bar (5,000 psi)
- Flow rates up to 3,785 lpm (1,000 U.S. gpm)
- Electrical classifications: NEMA 4, 4x, 7 or comparable
- CSA or ATEX ratings
- Corrosion resistant materials and finishes suitable for offshore and other demanding environments
- PLC or relay based control logic
- Petroleum based, biodegradable, food grade or fire resistant hydraulic fluids
- Bus network communication systems via common industry protocols
- Roofed and/or enclosed units
- Low temperature construction down to -46 °C (-50 °F)
- Portable HPU's for transportation to multiple valve sites
- Multiple-stroke accumulator storage
- Multiple redundancy
- ASME or CE PED rated accumulators
- Wide array of alarm and indication options
- Configurable to suit any space constraints
- Filtration to suit any environment
- Control multiple valves from one HPU
- Multiple power source options:
  - Commercial AC
  - External DC
  - Pneumatic pressure from a site supply
  - Solar power generated at site
  - Gasoline or diesel fuel engines
  - Natural gas
  - Wind generators





#### Dimensions

| Dimensions and Weight |       |     |      |         |        |       |       |      |     |             |
|-----------------------|-------|-----|------|---------|--------|-------|-------|------|-----|-------------|
| Model                 | A     | B   | C    | PCD MAX | ØE MAX | F MAX | G     | H    | X   | Weight (kg) |
| RH-Q-090-110/D4       | 841   | 286 | 390  | 254     | 82.5   | 22    | 178   | 1/2" | M16 | 220         |
| RH-Q-105-125/D4       | 972   | 332 | 450  | 356     | 100    | 28    | 210   | 1/2" | M16 | 300         |
| RH-Q-120-145/D4       | 1,064 | 385 | 510  | 406     | 117    | 32    | 243   | 1/2" | M20 | 490         |
| RH-Q-145-170/D4       | 1,223 | 445 | 580  | 406     | 140    | 36    | 285   | 3/4" | M24 | 700         |
| RH-Q-155-200/D4       | 1,312 | 477 | 630  | 406     | 155    | 40    | 314   | 3/4" | M24 | 1,020       |
| RH-Q-185-230/D4       | 1,483 | 545 | 720  | 483     | 185    | 45    | 366.4 | 3/4" | M30 | 1,500       |
| RH-Q-225-260/D4       | 1,774 | 660 | 870  | 603     | 230    | 50    | 446   | 3/4" | M36 | 2,170       |
| RH-Q-250-300/D4       | 1,948 | 706 | 970  | 603     | 270    | 63    | 501   | 3/4" | M36 | 2,830       |
| RH-Q-280-350/D4       | 2,110 | 805 | 1080 | 813     | 304    | 70    | 558   | 1"   | M42 | 3,780       |

X = Lifting Points

H = Close / Open Hydraulic Connections: NPTF Threaded

**NOTE: Different valve interface dimensions on request**

All dimensions are in mm

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

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