Fluid Power Actuators and Control Systems

rotork®
Fluid Systems

Established Leaders in Valve Actuation

GP & GH Range

Pneumatic and Hydraulic Actuators for Quarter-Turn Valves

Publication F100E Issue 02/08

Rotork Actuators – Quality Controlled

In the 50 years since the company was founded, Rotork has become the standard for excellence in the field of valve and damper automation for the oil, gas, power, water and waste treatment industries around the world.

As established leaders in actuation technology, we owe our success to a commitment to quality at every stage, and at every level, of Rotork's operations.

At the heart of the company is an exceptional workforce – the highly trained, forward thinking engineers, technicians, and sales support staff who each play a crucial role in maintaining Rotork's unrivaled reputation for innovation, reliability and first class after sale support.

With several fluid power manufacturing facilities in Europe and the United States, and additional *Centres of Excellence* strategically located around the globe, we are able to offer solutions and design systems for virtually any application — from subsea hydraulics to the most sophisticated yet simple control system.

Contact Rotork for your operational or safety application requirements. We will work with you from conception, to design, to manufacture, to installation, and finally to maintenance and service support.

GP Range Pneumatic & GH Range Hydraulic Actuators

Proven, dependable design

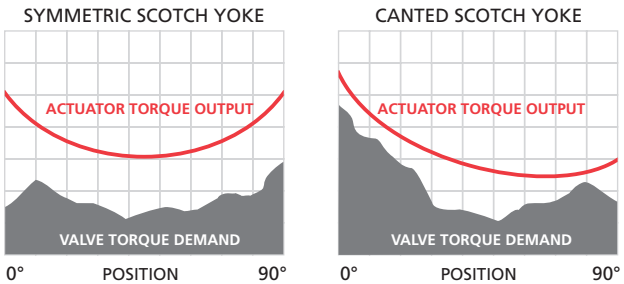
GP and GH range scotch yoke actuators are designed to operate ball, butterfly and plug valves requiring a rotary, quarter-turn movement for either on/off or modulating duty. The robust design has been proven in thousands of diverse applications the world over.

Safety by design

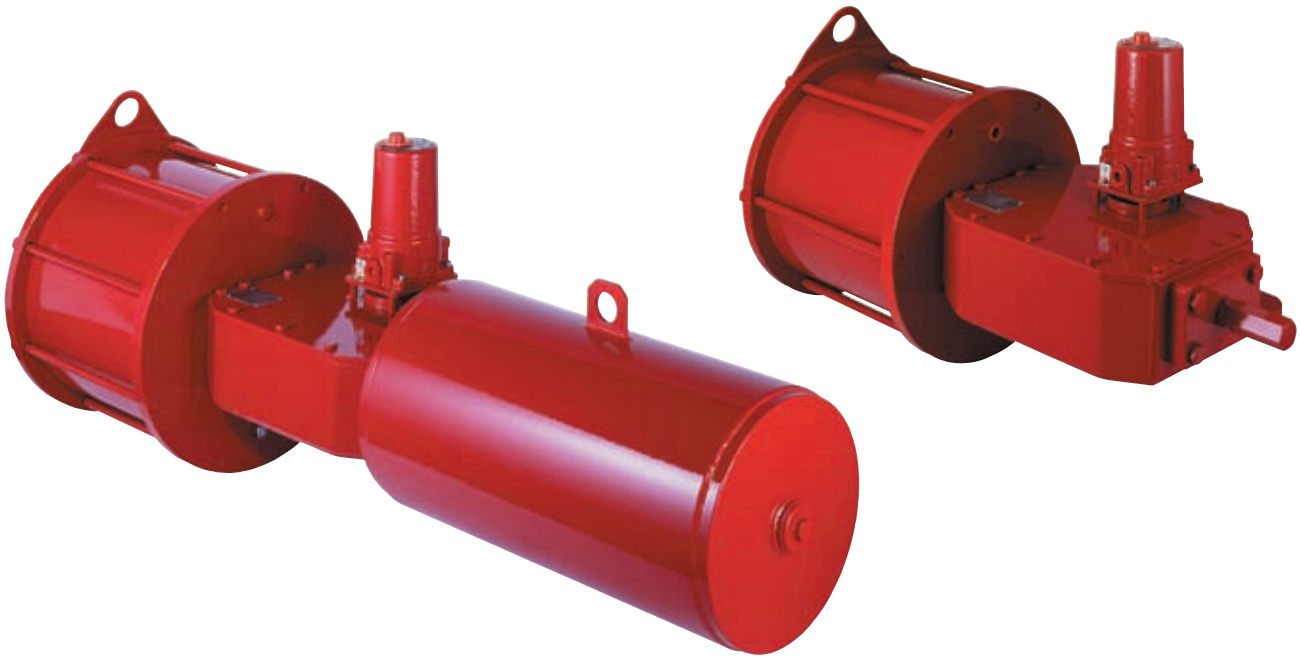
Spring-return units can be assembled to provide failsafe operation in either direction. The spring-return module is inherently safe since it can only be removed from the centrebody after all spring forces have been released. Centrebodies incorporate a pressure relief valve.

Two torque output profiles

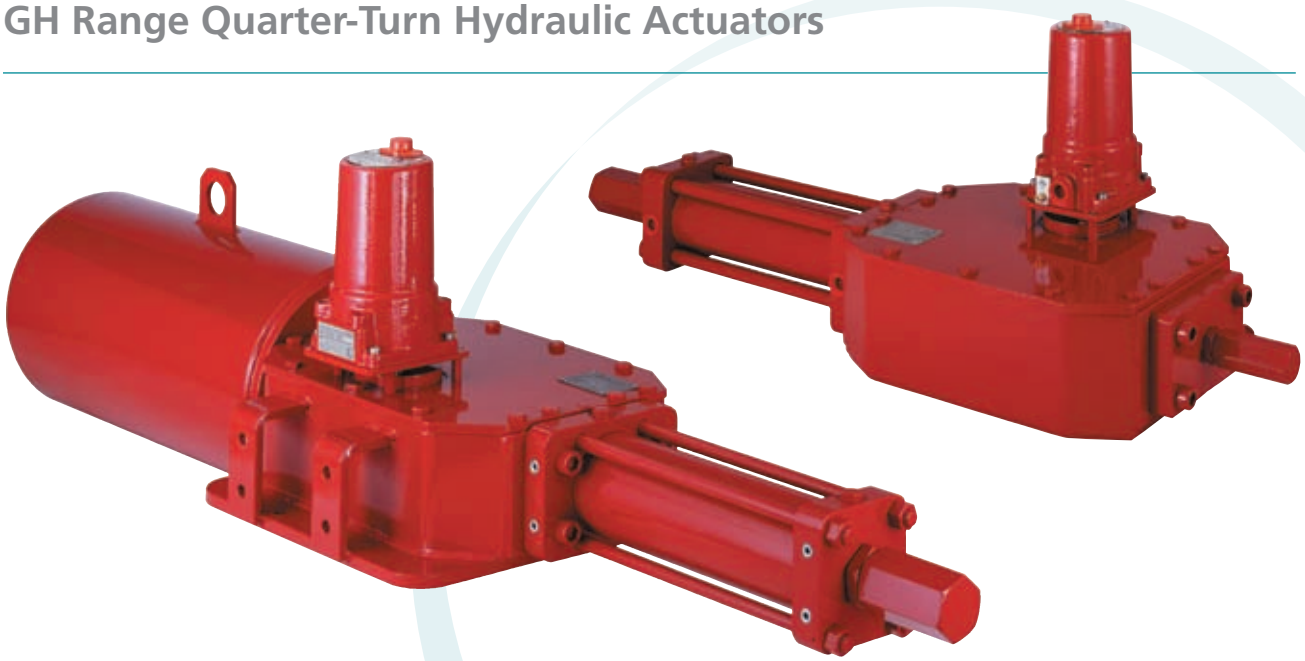
GP and GH range actuators can be supplied with either symmetrical or canted torque arms. The classic symmetric yoke delivers peak torque at both ends of stroke. The canted yoke is a Rotork design innovation that delivers peak torque at only one end of stroke. Use of canted arms can often reduce actuator size, weight and cost for valves with appropriate torque demand characteristics.



GP Range Quarter-Turn Pneumatic Actuators

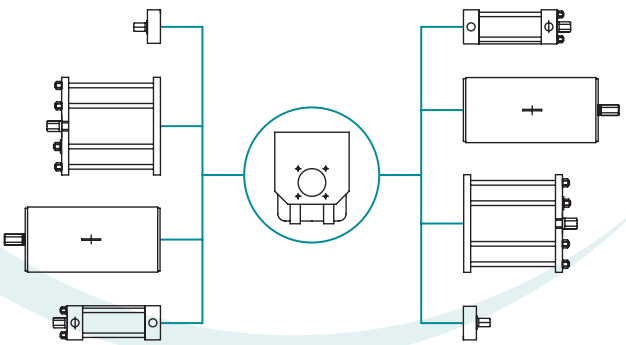


GH Range Quarter-Turn Hydraulic Actuators



Versatility

Rotork GP and GH range actuators share a modular construction design. The centre body is available in nine sizes. A pneumatic or hydraulic cylinder can be attached to either or both sides. A spring cartridge can also be fitted to either side for ESD (emergency shutdown) applications. Modular construction and stocking of components by Rotork Fluid Systems' *Centres of Excellence* and a worldwide network of distributors facilitates quick delivery times.



Inside the GP/GH Range Actuator

Every Rotork Fluid Systems actuator is built to provide long and efficient service with minimum maintenance. The design, engineering and materials used in their construction ensure optimum performance even in the harshest of environments.

Operating Pressure: Pneumatic up to 12 bar (175 psi)
Hydraulic up to 210 bar (3,000 psi)

Torque Output: Up to 600,000 Nm (5.3 million lbf-in)

Temperature Ranges:

Standard:	-30°C to 100°C	(-22°F to 212°F)
High:	-20°C to 160°C	(-4°F to 320°F)
Low:	-40°C to 160°C	(-40°F to 320°F)
Extreme Low:	-60°C to 160°C	(-76°F to 320°F)

Efficiency And Long Life

Minimum friction is ensured by electroless nickel-plated cylinders and bronze sliding blocks on the torque arm. A dynamic floating piston seal further reduces friction and avoids stick-slip effect, even after prolonged periods without operation.

Environmental Protection

O-ring sealing provides protection certified to IEC IP66M, IP67M.

Corrosion Resistance

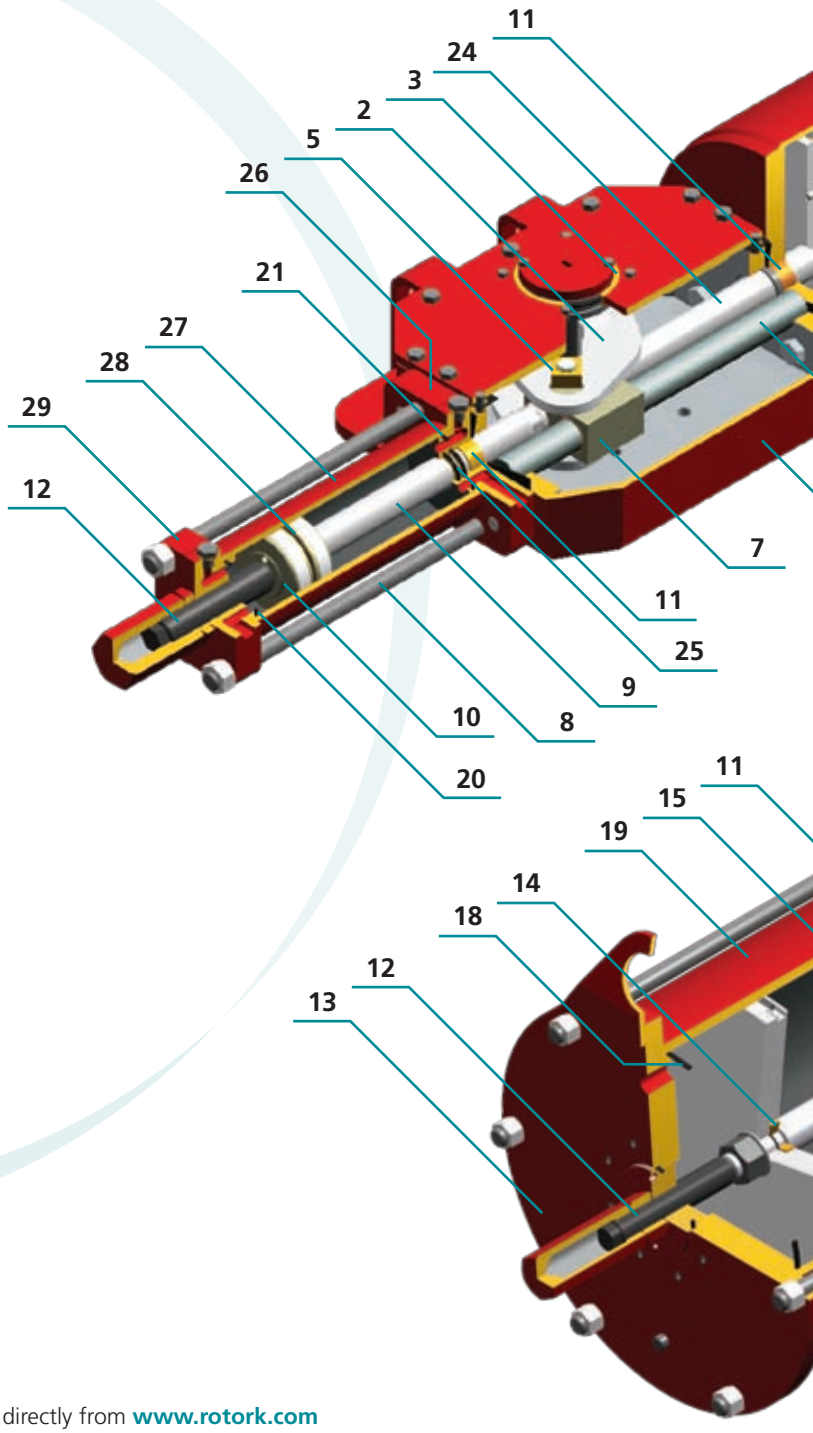
Extended service life provided by carbon steel, electroless nickel-plated cylinders and chromium plated piston rod.

Robust Yet Lightweight Design

Totally enclosed weatherproof centrebody fabricated in carbon steel or ductile iron (depending upon size) provide an excellent strength to weight ratio. The scotch yoke mechanism is available in either symmetric or canted design to meet application specific valve torque demand requirements with minimum cost and weight. The design incorporates a chromium plated alloy steel thrust bar to support the transverse loads of the scotch yoke.

Available Options

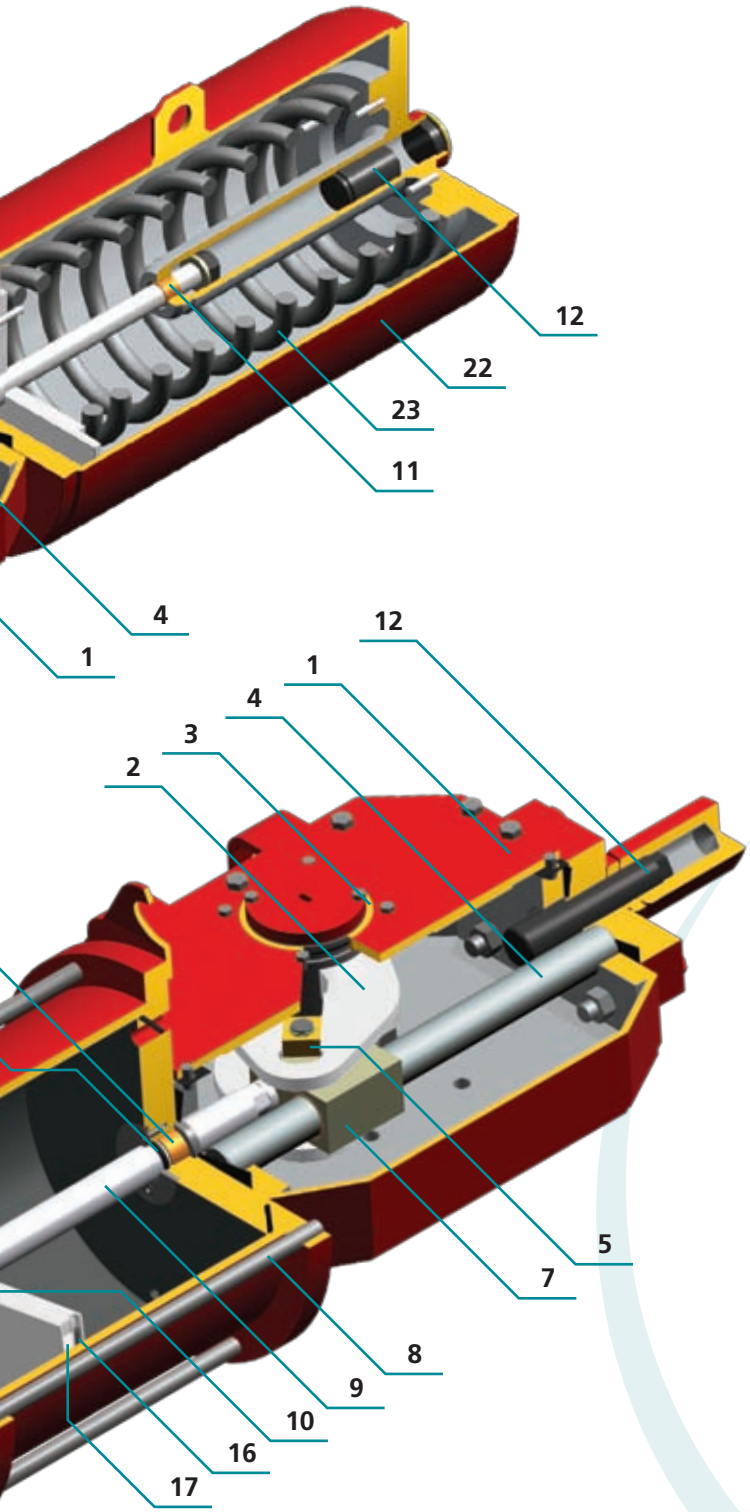
Manual override solutions. Stainless steel cylinders and tie rods. Custom paint specifications. Fibreglide® yoke bushing for modulating duty applications.



GP and GH range torque output and dimensional data are available directly from **www.rotork.com**

For quarter-turn pneumatic applications with torque requirements below that of the GP range, Rotork Fluid Systems offers a smaller series of scotch yoke actuators with outputs up to 4,500 Nm (39,828 lbf-in). Consult CP range brochure F200.

For quarter-turn hydraulic applications with torque requirements below that of the GH range, we offer a robust range of ductile iron bodied rack and pinion actuators with outputs up to 3,700 Nm (29,900 lbf-in). Consult RH range brochure F402.



ITEM	DESCRIPTION	MATERIAL
1	Centrebody	Carbon Steel or Ductile Iron
2	Yoke	Carbon Steel or Ductile Iron
3	Yoke Bushing	Bronze
4	Thrust Bar	Alloy Steel (chromium-plated)
5	Sliding Block	Bronze
6	Pressure Relief Valve	Stainless Steel (not shown)
7	Guide Block	Carbon Steel
8	Tie Rod	Alloy Steel
9	Piston Rod	Carbon Steel (chromium-plated)
10	Piston	Carbon Steel
11	Rod Bushing	Steel / Bronze / PTFE
12	Stop Screw	Alloy Steel
13	End Flange	Carbon Steel
14	O-ring	NBR
15	Seal	NBR / PTFE / Graphite
16	O-ring	NBR
17	Sliding Ring	PTFE / Graphite
18	O-ring	NBR
19	Pneumatic Cylinder	Carbon Steel (electroless nickel-plated)
20	O-ring	NBR
21	Seal	NBR / PTFE / Bronze
22	Spring Cartridge	Carbon Steel
23	Spring	Alloy Steel
24	Connecting Rod	Alloy Steel (chromium-plated)
25	Seal	NBR
26	Head Flange	Carbon Steel
27	Hydraulic Cylinder	Carbon Steel (electroless nickel-plated)
28	Seal	NBR / PTFE
29	Bottom Flange	Carbon Steel

For a complete list of parts and materials, refer to the GP/GH range Installation and Maintenance Manual F130.

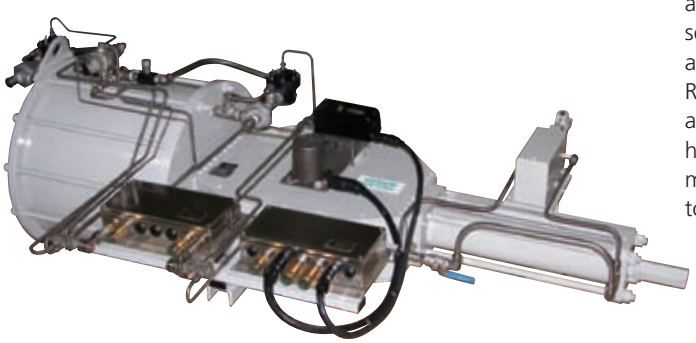
Approvals and Industry Standards

- Actuators certified in accordance with PED 97/23/EC.
- Actuators certified in accordance with ATEX94/9/EC.
- Actuators certified to IEC IP66M/67M for environmental protection.
- Suitable for use in SIL2 & SIL3 rated safety systems.
- ISO 9001-2000 certified design and manufacturing process. Design life tested in accordance with CEN/TC69/WG1/SG 10.
- Actuator design life calculation procedure approval by Lloyds (report no. 094/5152).
- Actuators and controls in accordance with UK health and safety requirements for pipeline safety (SI 825 1996).
- Hydraulic actuators can be flushed to NAS 1638 class 6.
- EN 102043.1.D 3.1B certification for critical components is available upon request.

Manual Override Options

A dependable manual override facility is an important part many valve/actuator applications. Rotork has a variety of override options available to meet virtually any requirement. Available options include open or enclosed jackscrews in both gear reducer and declutchable versions, as well as a number of hydraulic override solutions.

Complete Control Solutions



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 mounted either on the actuator or at a remote location. Rotork offers components from all leading industry suppliers as well as those of our own design including limit switch housings, quick exhaust valves, pneumatic and hydraulic manifolds, shuttle valves, linebreak safety systems and a torque limiting device.

Fire Protection Solutions

Rotork Fluid Systems actuators and control systems can be customized to withstand exposure both to fire and very high environmental temperatures. A range of fire-proof systems is available that include flexible protective jackets, intumescent coatings and rigid enclosure systems.

For further information on Rotork's fire protection solutions, consult publication S310.

Model Number Designation

Example Model Number **G P / 085 S - 100 A / D1 - MH**

ACTUATOR TYPE
G = Scotch Yoke

SUPPLY TYPE
P = Pneumatic
H = Hydraulic

CENTRE BODY SIZE Nominal movement arm (mm)
085, 130, 160, 161, 200, 201, 270, 271, 350

YOKE TYPE
C = Canted
S = Symmetric

CYLINDER SIZE

TEMPERATURE
GP Range (Pneumatic)
A = Standard
B = High
C = Low
E = Extreme low

GH Range (Hydraulic)
F = Standard
G = High
H = Low
L = Extreme low

CYLINDER / SPRING CANISTER CONFIGURATION
C0 - C9 = Spring-Return Fail Close - Spring Set # (0-9)
O0 - O9 = Spring-Return Fail Open - Spring Set # (0-9)
D1 = Double-Acting - Single Cylinder
D2 = Double-Acting - Two Cylinders

MANUAL OVERRIDE TYPE
M, MH, MHR, MHD, MHRD, MD, HPB, HPA, HPC, HP1, HP2, HPE, HZ

Extensive Product Range

Rotork Fluid Systems offers the world's most extensive line of fluid power valve actuators. Products include low- and high-pressure pneumatic, hydraulic and electro-hydraulic actuators. Scotch yoke, linear and rack and pinion designs are available in both double-acting and spring-return configurations. We also manufacture special build actuators for subsea and nuclear power applications and specialty products including a hydraulic damper for swing check valves and a manual/hydraulic power handwheel. Through other divisions, Rotork also offers complete lines of electric actuators and gearboxes.

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Fluid Systems

All Rotork Fluid Systems actuators are manufactured under a third party accredited ISO9001:2000 quality assurance programme.

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Rotork recognises all registered trademarks. As we are continually developing our products, their design is subject to change without notice.

POWTG0809

Latest product information and a full listing of our worldwide sales and service network are available on our website.

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