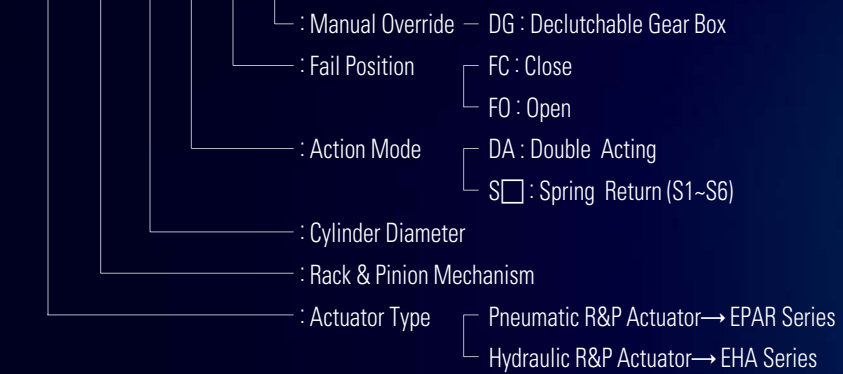


Ordering Codes

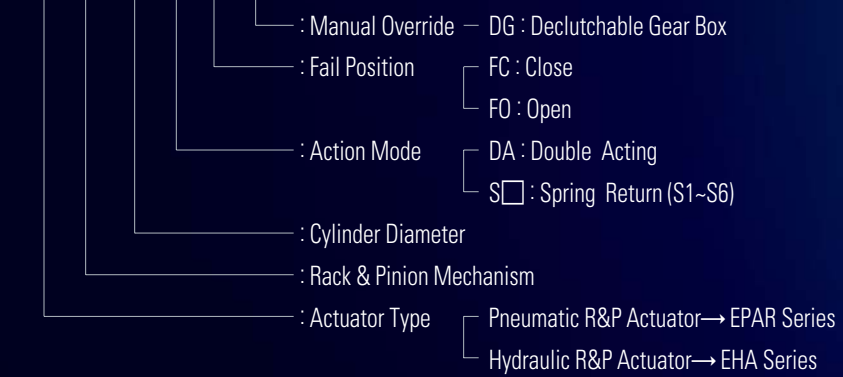
Double Acting Actuators

EPAR 042 - 150 - S1 - FC - DG



Spring Return Actuators

EHA 040 - 080 - S1 - FC - JO



FLOWBUS®

EHA, EPAR Series

Pneumatic and Hydraulic Rack & Pinion Actuators
For Quarter Turn and Multi Turn Operation



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Due to continuous development, product data is subject to change without prior notice.
Literature # P&HA.008.04.Rev.0.Aug/14



Key Advantages : EPAR Series

01 Advanced Rack & Pinion Design

A compact rack and pinion design provides simple construction and constant output torque throughout the stroke. Low friction rollers and twin rack side rails maintain correct engagement of the high strength alloy steel gearing for absolutely exceptional life cycle.

04 Corrosion Protection

Exact standards of corrosion protection makes the EPAR actuators adaptable to the most hostile environments. The actuators incorporate four stages of internal and external corrosion coating to resist environments and extend the service life. Additional protection is provided by hard chrome plated cylinders and an external sand blast process.

standard 90°. In addition, Flowbus is able to design infinite stop plates so that the rotation angles are adjustable according to the customer's request, to enhance performance and provide the perfect solution to the application requirements.

07 Rugged and Compact Design

The totally enclosed weatherproof housing, fabricated from ductile iron provides high strength for longer life and prevention of deformation due to torque forces. The EPAR actuators are compact and rugged, with dual racks and pinions guaranteeing stable torque output throughout the actuator's travel. This reduces the overall valve package envelope, providing a more compact design.

10 Easy Maintenance & Repair

Flowbus actuators are designed to prevent failure and repair costs are minimal in comparison to competitive actuators. The EPAR actuators are constructed to the highest quality standards, using engineering experience and the latest manufacturing techniques, and offers reliable performance.

11 NAMUR Standard Interface

For ancillary equipment such as positioners and switchboxes, the latest VID/VDE 3845 mounting interface is provided to allow quick and simple mounting with a direct pinion drive.

12 ISO5211 Valve Interface

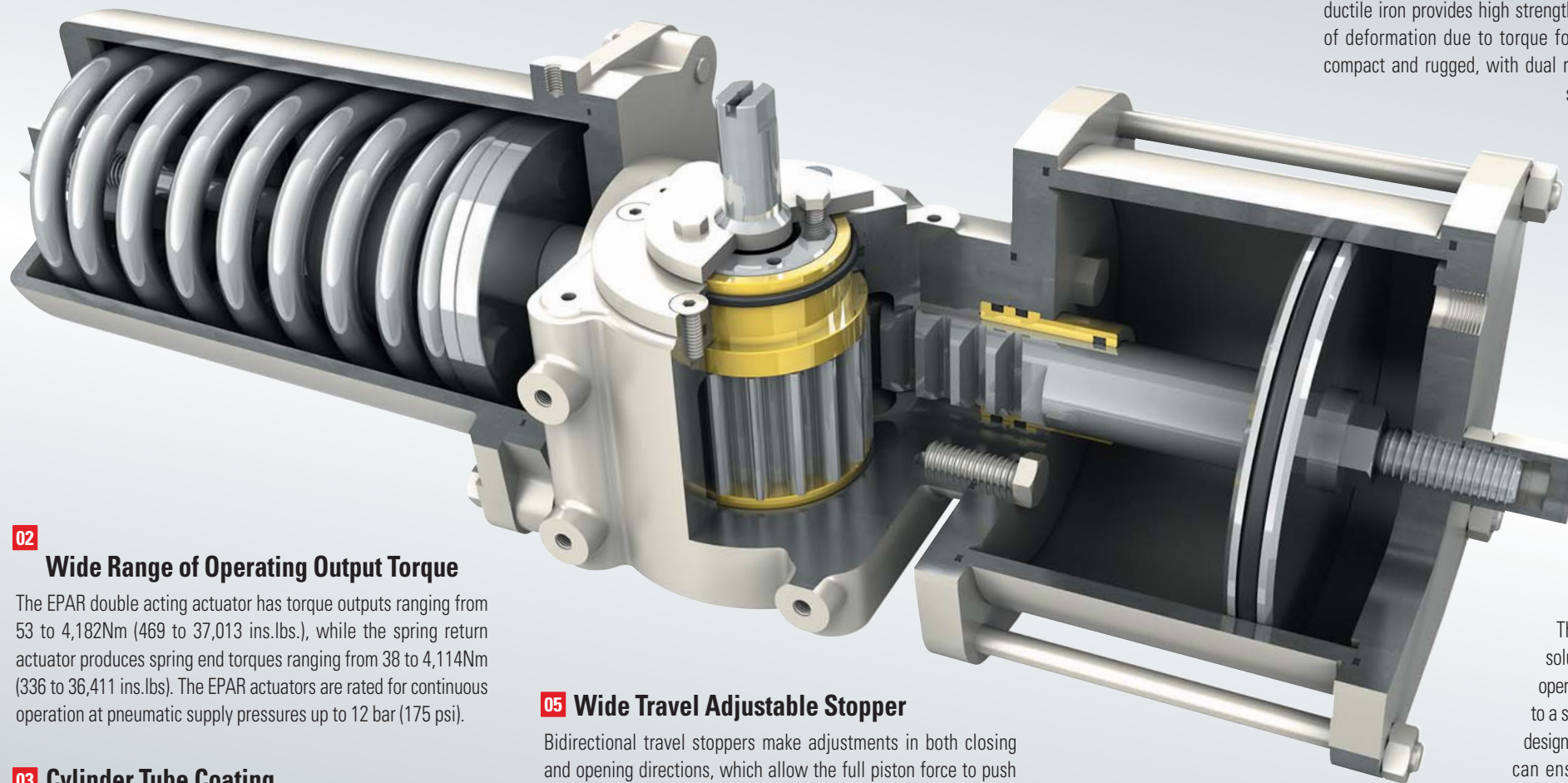
The EPAR actuators have valve mounting pads in accordance with the ISO5211 mounting pattern to provide great flexibility for valve adaptation.

13 High Visibility Position Indicator

A high visibility position indication beacon is available as an optional feature on the EPAR actuators. The indicator is impact resistant and weather-proof as per the IP66/67 standard.

14 Ambient Temperature

Standard EPAR actuators are designed for operating temperatures of -20°C to +80°C (-4°F to +176°F). Options are available for low and high temperatures of -48°C (-54.4°F) and +177°C (+350°F), respectively. Special requirements can be supplied on request. For higher and lower temperature applications, consult Flowbus.



02 Wide Range of Operating Output Torque

The EPAR double acting actuator has torque outputs ranging from 53 to 4,182Nm (469 to 37,013 ins.lbs.), while the spring return actuator produces spring end torques ranging from 38 to 4,114Nm (336 to 36,411 ins.lbs). The EPAR actuators are rated for continuous operation at pneumatic supply pressures up to 12 bar (175 psi).

03 Cylinder Tube Coating

The EPAR actuators incorporate a hard chrome internal coating to resist wear, corrosion, and thermal and physical shock while providing a low friction lubricating interior finish. The coating ensures that the cylinder tube is fully protected regardless of what corrosive elements are drawn in from the surrounding atmosphere. To ensure long life, the coating is made to bonds to the cylinder surface, eliminating the problems of cracking or flaking experienced with inferior solutions. As an option, electroless nickel and Teflon-plated cylinders are available in accordance with the industry application.

05 Wide Travel Adjustable Stopper

Bidirectional travel stoppers make adjustments in both closing and opening directions, which allow the full piston force to push the pinion into high friction contact with the actuator body. External travel stoppers allow for precise angular stroke adjustment between 80° and 100°. The travel stoppers can be modified by request to allow higher closing or opening angles.

06 Optional Multi-Turn Actuators

The EPAR actuators offer a complete range of extended body double acting actuators with rotations ranging from 120° to 180°. These actuators are ideal for multiport applications or other specialized processes that require rotation in excess of the

08 Quick Operation

The EPAR actuators are suitable solutions for achieving a very short operation time less than 1 second due to a short stroke design. Owing to their design advantages, the EPAR actuators can ensure proper operation of final control elements such as valves, actuators and controllers in emergency shutdown (ESD), or partial stroke testing (PST) on request.

09 Multiple Spring Packages

The EPAR actuators are available with various ranges of springs in comparison with other actuators offering similar torque outputs. To ensure optimal valve positioning and installation, Flowbus provide a wide variety of torque capabilities under different supply pressures and operating conditions.



Key Advantages : EHA Series

01 Guaranteed wide range torque outputs

The EHA double acting actuator has torque outputs ranging from 101Nm to 4,147Nm (893 to 36,704 ins. lbs.), while the spring return actuator produces spring end torques ranging from 62Nm to 3,517 Nm (548 to 31,128 ins. lbs.). The actuators are rated for continuous operation at hydraulic supply pressures ranging from 70 to 210 bar (1,015 to 3,045psi). Hydraulic supply pressure of 250 bar (3,625 psi) is available as an option.

02 Compact Rack & Pinion Design

A compact and rugged construction with high strength alloy steel gearing guarantees stable torque output throughout the actuator's travel. The design is also suitable for high cycle, high speed duties.

03 Inherently Safe Spring Unit

The EHA spring rod is connected to both the spring and cover and to the retainers, so that the spring is fully retained during assembly or disassembly. This ensures the safety of personnel during installation and maintenance by preventing accidental release of the spring force.

04 Advanced Sealing for Protection

The EHA actuators make use of a Teflon U-ring to offer a high standard of sealing performance and the seals are lubricated to ensure smooth operation of moving parts. These seals offer long term, trouble free performance.

05 Reliability and Compact Design

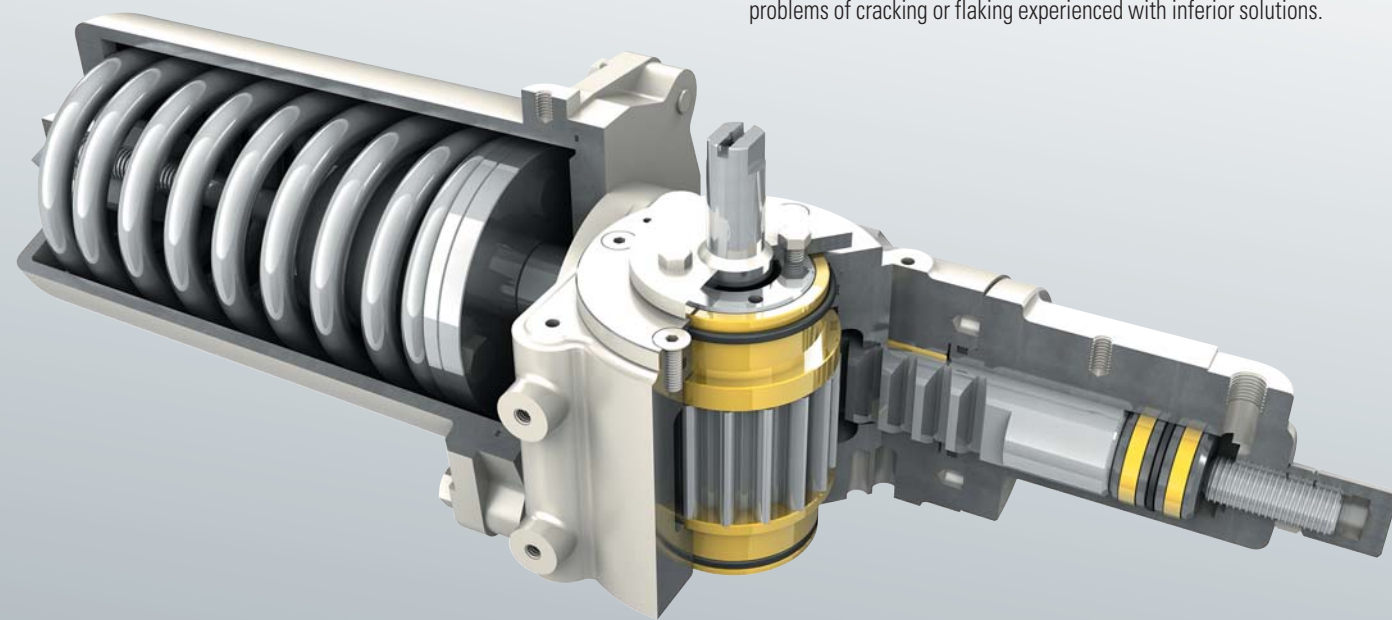
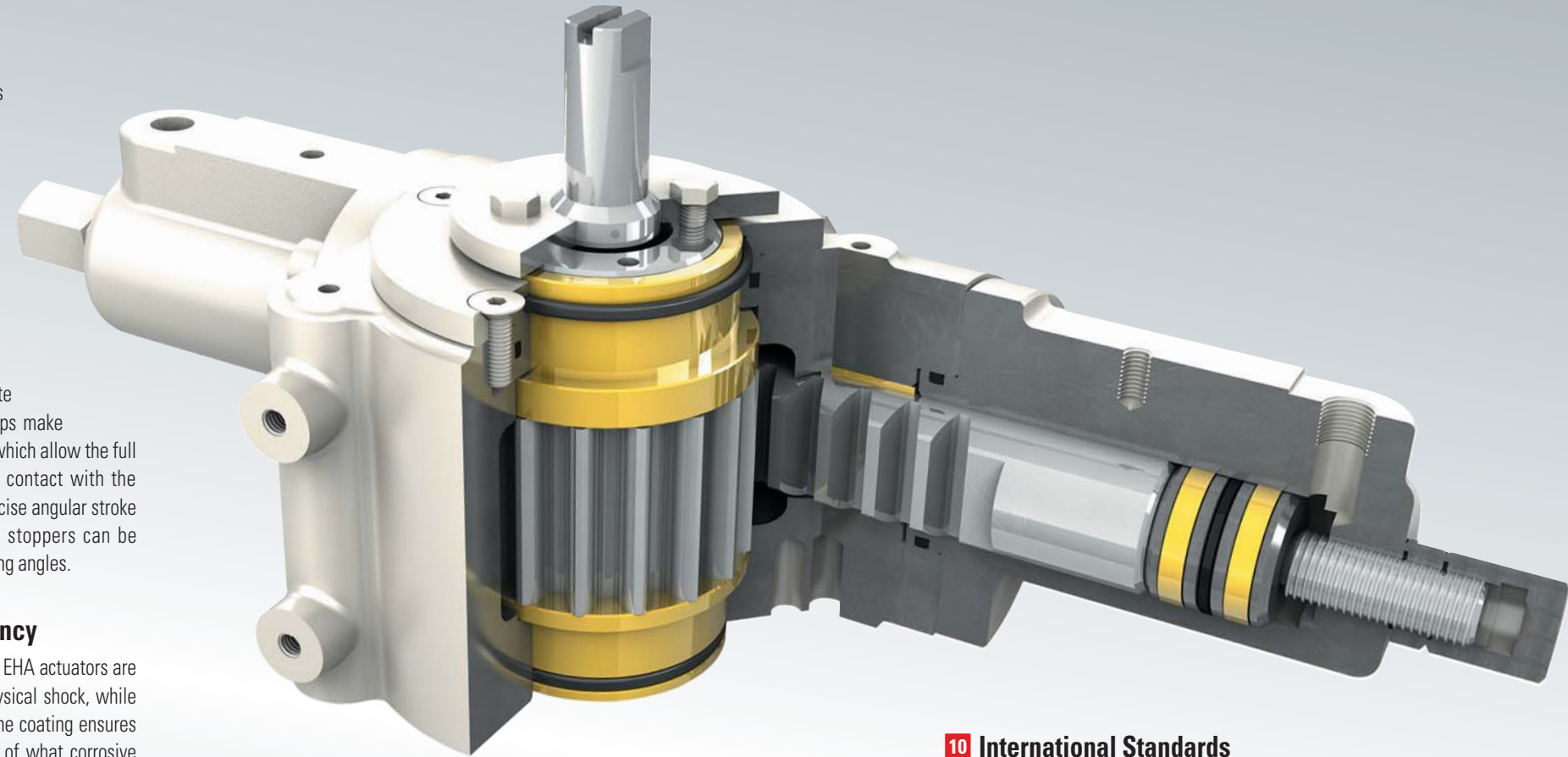
The EHA actuator is smaller than other actuators offering similar torque outputs. This reduces the overall valve package envelope, providing a more compact design. The totally enclosed weatherproof housing, fabricated from ductile iron provides high strength for longer life and prevention of deformation due to torque forces.

06 Travel Adjustment Stopper

In order to set the actuator travel to give an accurate valve open or closed point, bidirectional travel stops make adjustments in both closing and opening directions which allow the full piston force to push the pinion into high friction contact with the actuator body. External travel stoppers allow for precise angular stroke adjustment between 80° and 100°. Adjustment stoppers can be modified on request to allow higher closing or opening angles.

07 Extended Service Life and Efficiency

By incorporating a hard chrome internal coating, the EHA actuators are able to resist wear, corrosion, and thermal and physical shock, while providing a low friction lubricating interior finish. The coating ensures that the cylinder tube is fully protected regardless of what corrosive elements are drawn in from the surrounding atmosphere. To ensure long life, the coating bonds to the cylinder surface, eliminating the problems of cracking or flaking experienced with inferior solutions.



10 International Standards

The EHA actuators comply with the latest ISO5211 valve interface standards, for optimum strength, standardized dimensions, and direct mounting and accurate assembly of automated packages. Upon the customer's request, ISO 4406 is available as an option.

11 High Visibility Position Indicator

Flowbus has specially designed position indicators that locally signal valve position. The display indicates valve position through the full range of travel. As an optional feature on the EHA actuators, the indicator is impact resistant and weather-proof as per the IP66/67 standard.

12 Ambient Temperature

Standard EHA actuators are designed for operating temperatures of -20°C to +80°C (-4°F to +176°F). Options are available for low and high temperatures of -48°C (-54.4°F) and +177°C (+350°F), respectively. Special requirements can be supplied on request. For higher and lower temperature applications, consult Flowbus.

08 Variety of Spring Package Selections

The EHA actuators rack & pinion designs are available in both double acting and spring return configurations. The various springs are capable of providing the optimal selection for valve positioning to reduce installation space and increase flexibility. They are compact and light weight actuators whose design produces significant savings in the use of compressed air with less stroke volume.

09 Optional Multi Turn (120°, 135°, 180°) Actuators

Flowbus has developed devices that consist of a series of rack & pinion and pneumatic actuators for multi-turn applications to actuate multi-port valves. These devices have the same torque outputs as the standard actuators. The EHA actuators can provide 120°, 135°, and 180° angles on the double acting configuration, and additional angles are available upon the customer's request.

Specifications



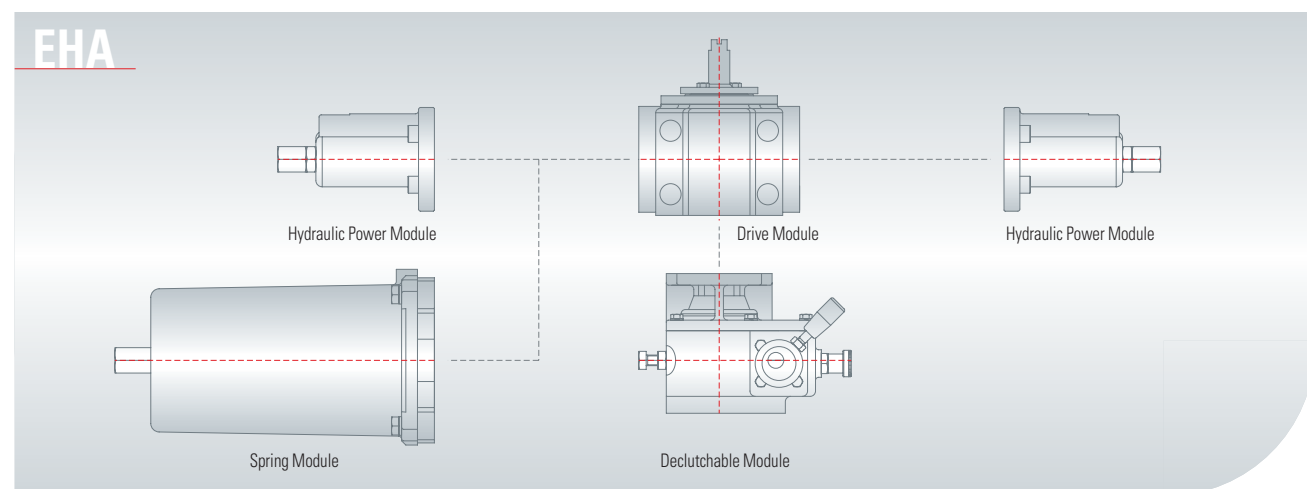
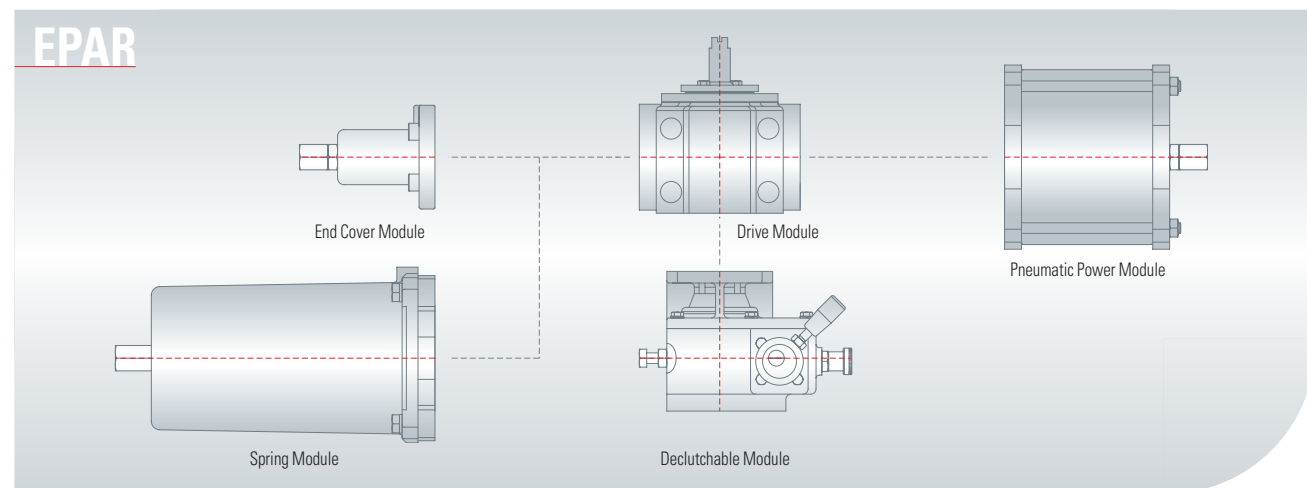
Manual Override

FB-Series : Declutchable Gear Override

The declutchable gear override can be fitted to all EPAR Series and EHA Series units in both double acting and spring return configurations. This manual override is the optimum solution for a customer requiring a compact unit of minimum weight and size.

Versatile Modular Design

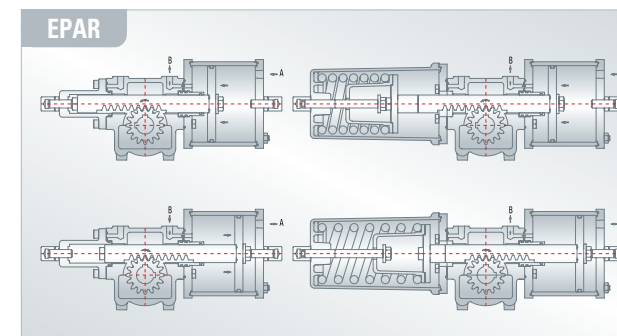
The actuator design consists of spring, power and drive modules. The modules have been designed for easy disassembly and this allows the actuator to be quickly and easily converted from double acting to single acting configuration or for the addition of ancillaries. The modular design allows these modifications to be performed without removing the actuator from the valve.



Actuator Operation

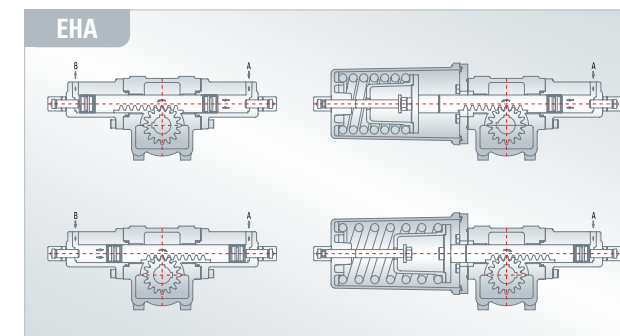
Double Acting Configuration

In the standard configuration, the actuator is set up for anti-clockwise rotation when pressure is applied to port A. This pressurizes the internal chamber driving the pistons apart. When air is applied to port B, the end chambers are pressurized driving the pistons together and causing clockwise actuator rotation. If required, the pistons can be inverted in the housing resulting in clockwise rotation when pressure is applied to port A.



Spring Return Configuration

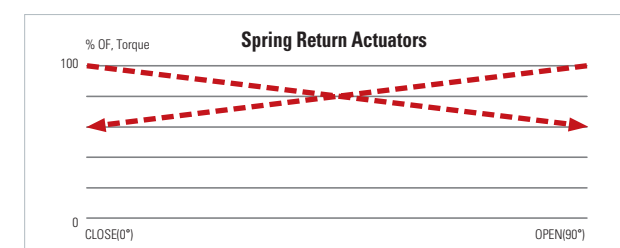
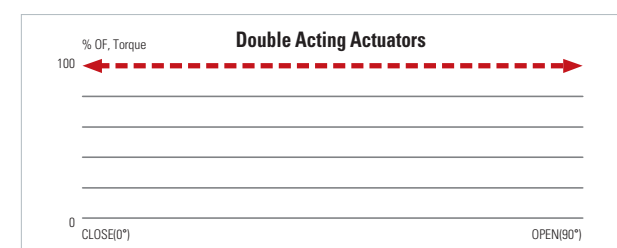
In the standard configuration, the actuator is set up for clockwise rotation in the air failure mode. When port A is vented the springs drive the pistons together, causing clockwise rotation. When pressure is applied to port A, the internal chamber is pressurized driving the pistons apart and compressing the springs which causes anti-clockwise actuator rotation. Port B is used as a breather for the spring chamber swept volume.



Torque Output

The rack and pinion actuators are designed such that torque is independent of actuator travel and is constant throughout the travel range. Spring return actuators have both spring and air torques and

each torque has a higher start figure than the end figure. The rack and pinion actuators are designed such that the spring and air start torques are equal, as are the spring and air end torques.



Complete Tailored Solutions

Flowbus can supply not only an actuator but also a complete solution to meet the customer's applications. We offer comprehensive solutions with the latest innovations in technology for project specific customer requirements. By combining our high quality product range, expertise, and process experience, we are able to solve complicated process problems with reliable, on-time packages. Our aim is to exceed the quality and operational expectations of customers, providing them with added value and service.

