

# COMP<sup>4</sup>ACT II



The Actuator that Delivers **Maximum** Torque for Minimum with Consumption

## Proven Advantage

The **COMPACT II** is a quarter turn rack & pinion pneumatic actuator that is **patented** worldwide.

The superiority of the **COMPACT II** actuator over single and double rack & pinion actuator designs, results from the four pistons which generate torque around a centrally located pinion, thereby giving more than double the torque achieved by these other designs.

The increased number of pistons in the actuator allows their diameter to be reduced while maintaining its high torque. This also allows the overall size of the actuator to be reduced and become more compact.



## Space Saving, Fast Acting

The **COMPACT II** has four small cylinders, each located on one of the four sides of a cube. At a given air pressure, the **COMPACT II** can produce the same torque output as double piston actuators, using smaller diameter piston and a narrower pinion. A narrower pinion results in a shorter piston travel, which permits a compact space saving mechanism and fast acting travel from one position to the next.



## Superior Corrosion Resistance

The body and covers are anodized internally and externally, providing protection against ingress of corrosive atmosphere.

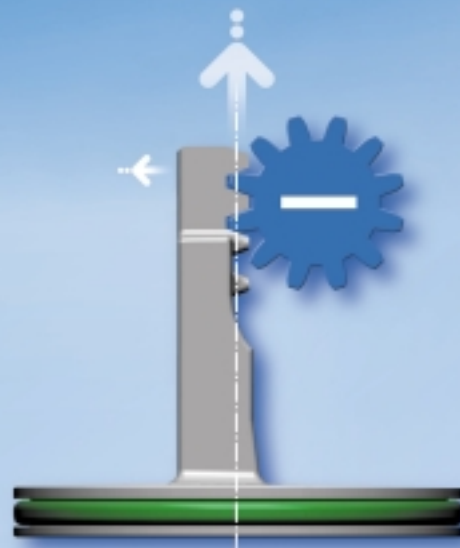
An external epoxy base layer and a second polyurethane paint provides additional protection against aggressive environments.



## Less Air Consumption

The **COMPACT II** gives maximum torque for minimum air consumption. It is both compact in size and energy efficient, creating a fast-responding, trouble-free, high cycle lifespan.

The cube shape of the **COMPACT II** and the short piston travel minimizes excess space. Excess space is space not swept by piston travel that must be pressurized before piston motion begins; therefore, reducing the pressurization of excess space results in reducing energy requirements.

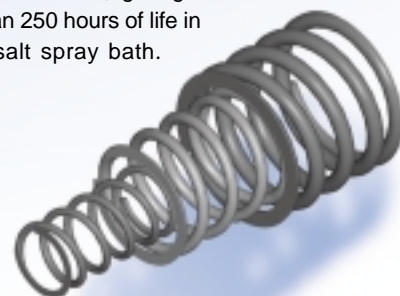


## Balanced Forces

The cube-shaped configuration of the **COMPACT II** positions the pistons so that each piston develops thrust along its own axis, rather than the off-axis thrust, that results from the geometry of most other actuator configurations. Piston side loading, caused by off-axis thrust, does not occur, thus resulting in less stress on the seals.

## Nested Springs

The **COMPACT II** four-spring chambers can use up to three different spring sizes, which are nested between the covers and pistons and are aligned by centering rings. Each spring is wound in the opposite direction to its neighbor to avoid entanglement. As there are four cylinders there are many more spring combination possibilities than with double piston actuators. This results in better solutions for any air supply pressure required. Special painting of the springs provides higher corrosion resistance to the environment, giving more than 250 hours of life in a salt spray bath.



## Less Wear

With its unique 4-piston design, the Compact II achieves a more uniform load distribution than do single and double piston actuators, therefore greatly reducing gear wear at the points of contact between rack and pinion.

The force-balanced piston with its shorter stroke prevents uneven wear of O-rings, gear and pistons. This eliminates the need for bearings and reduces the number of soft parts, thereby resulting in longer maintenance schedules and low cost of repair kits. The high surface finish of the four cylinder is protected from wear due to the hardened surface created by the anodizing treatment.

## Indicator & Puck



A highly visible indicator with flow direction arrows is snapped to the pinion providing easy identification of valve position. The indicator snap-on arrows allow true positioning of any type of ball porting. A puck with two position signaling inserts and a highly visible indicator with flow direction arrows is bolted to the pinion to provide a cost effective option for valve monitoring.

## Pinion

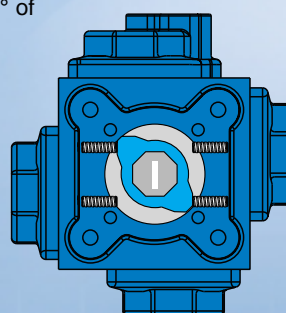
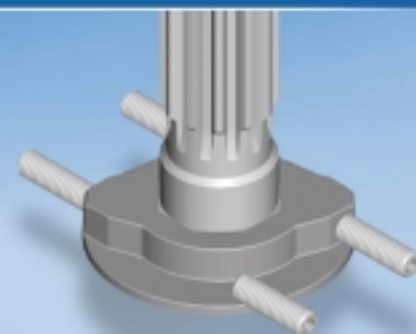
The pinion has a double-square female drive on its bottom plane for accepting the ISO 5211 or DIN 3337 coupling options. The top plane has the Namur slot for attachment to switches or positioners. There is a machined flat below the Namur interface to provide for manual operation of the actuator by use of a wrench. The pinion is made from carbon steel with EN plating which gives a hard wearing surface with added protection against corrosive environments.

## Limit Stop

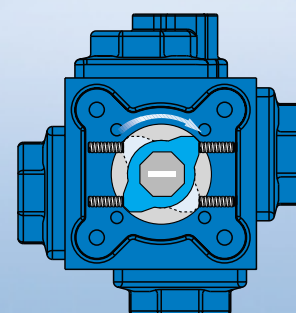
The pinion and stop rotation can be adjusted by four large diameter adjustable set screws diametrically opposed and threaded into the actuator body. Each opposing pair of screws exerts simultaneous and equal forces on opposite sides of the stop when the rotation limit is reached, thus, no off-center forces are generated.

The stop design allows for  $\pm 5^\circ$  of rotational adjustment in both directions of travel.

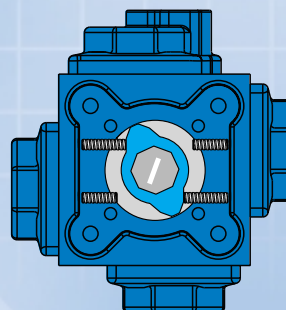
Any intermediate position can be achieved with a longer set of stop screws. This feature is built into the actuator stop mechanism and eliminates the need for additional plates and screws. The stop material is St.St. for better wear and corrosion resistance.



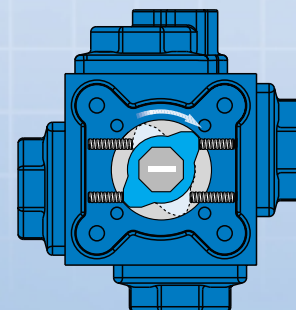
Close



Open

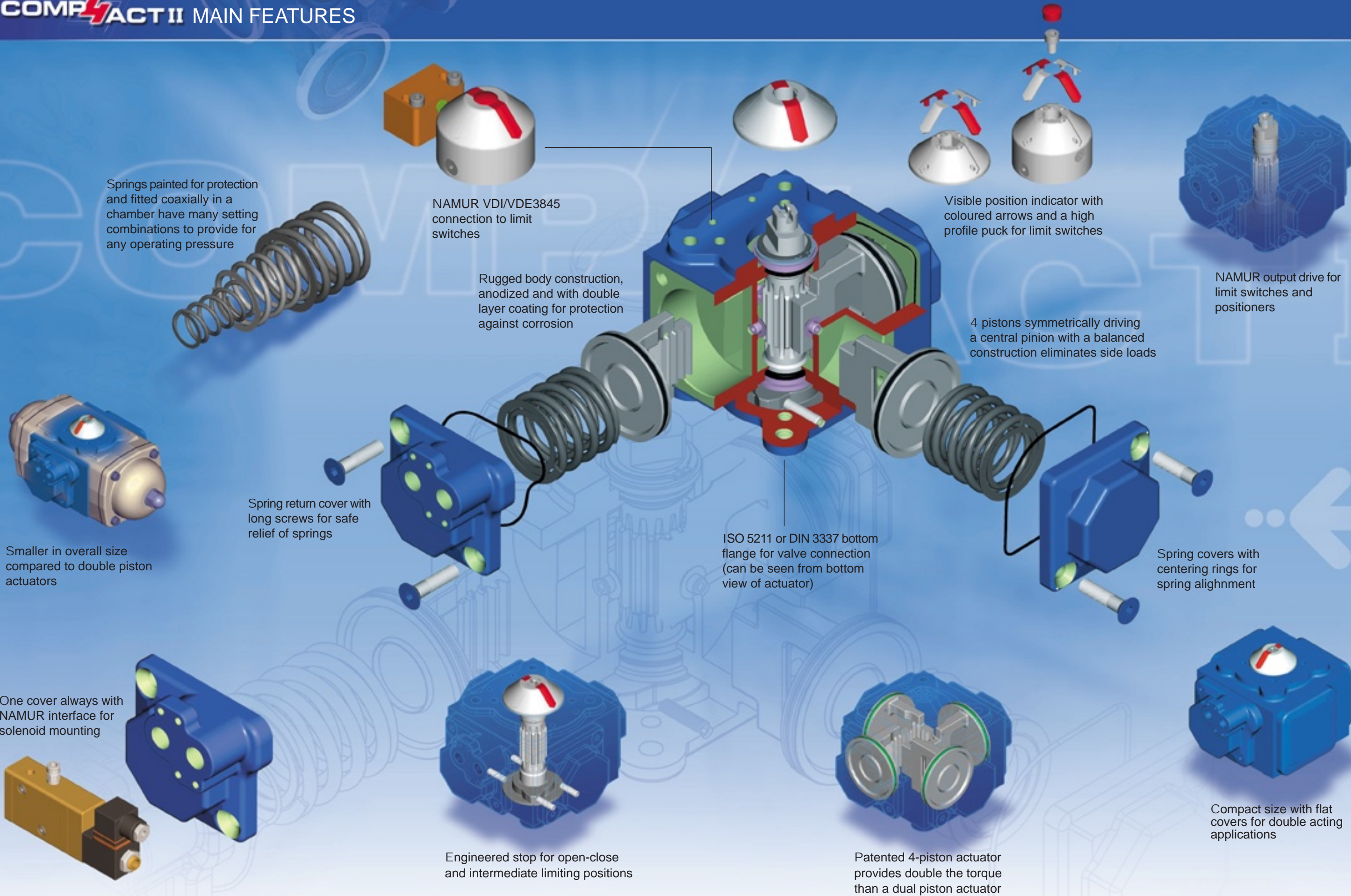


Limit



Open

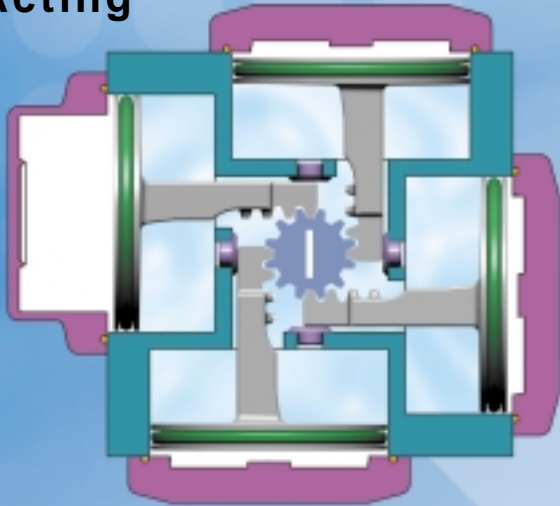






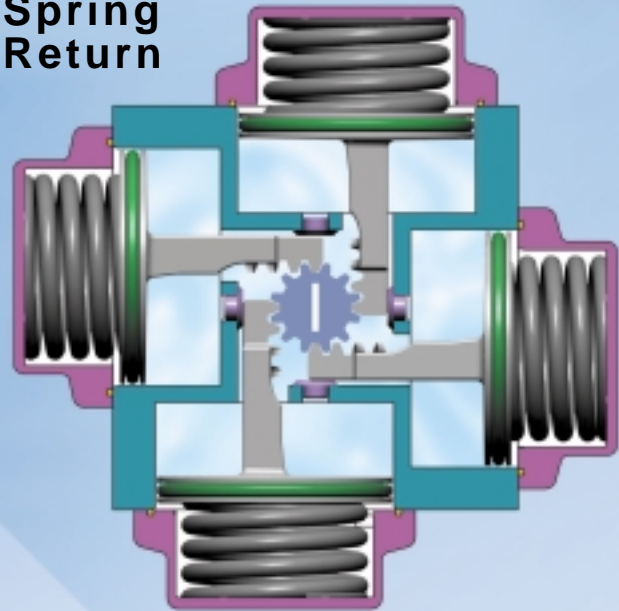
The **COMPACT II** actuator transforms the linear motion of its pneumatic pistons into rotary motion via 4 gear racks that drive the central pinion. Air Supply, to drive the pistons, flows into port **A** of the NAMUR cover: Port **A** is connected to the center chamber and port **B** is connected to the four outside chambers.

## Double Acting

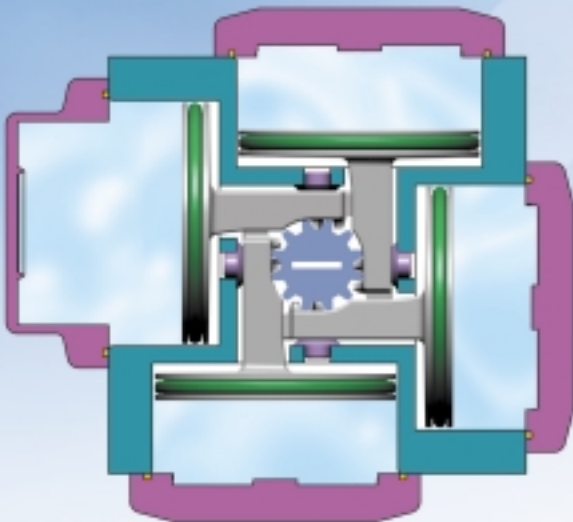


**Pressure entering Port A to open:**  
Center chamber pressurized. Pistons move outward. Pinion rotates counter clockwise.

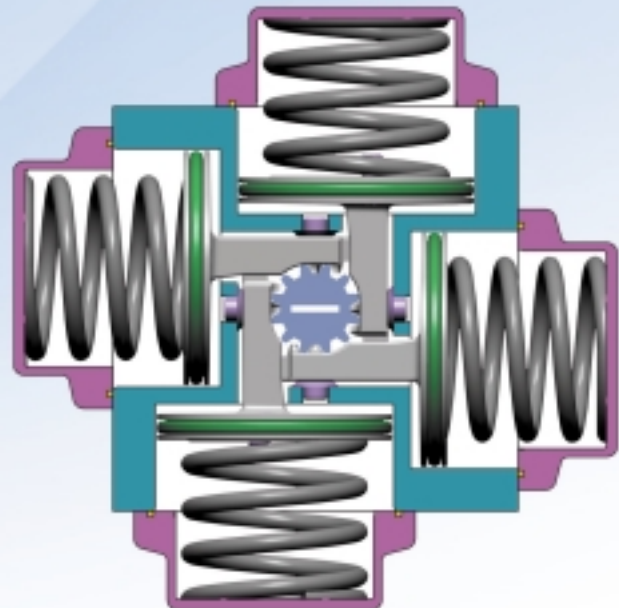
## Spring Return



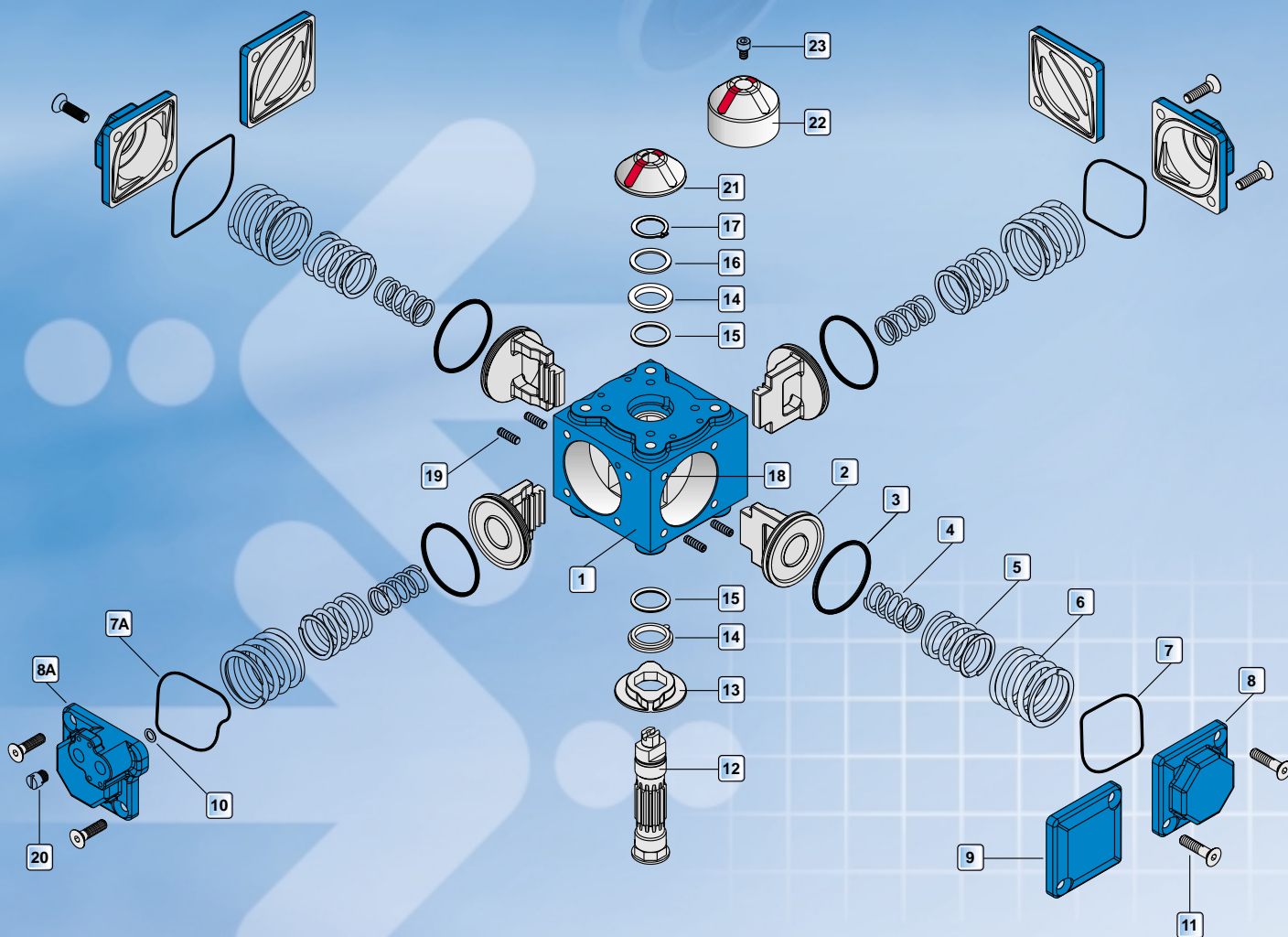
**Pressure entering Port A to open:**  
Center chamber pressurized. Pistons move outward. Springs are compressed. Pinion rotates counter clockwise.



**Pressure entering Port B to close:**  
Outside chambers pressurized. Pistons move inward. Pinion rotates clockwise.



**Pressure exiting Port A to close:**  
Air released from center chamber. Springs drive pistons inward. Pinion rotates clockwise.



## Parts List

Description	Qty	Material
1 Body	1	AL 356-T6
2 Piston	4	AL 356/380
3 Piston O-Ring	4	Buna N, Viton, EPDM
4 Inner Spring	4	Spring steel, Painted
5 Middle Spring	4	Spring steel, Painted
6 Outer Spring	4	Spring steel, Painted
7 Cover O-Ring	3	Buna N, Viton, EPDM
7a Namur Cover O-Ring	1	Buna N, Viton, EPDM
8 Spring Return Cover	3	AL 356/380
8a Namur Cover	1	AL 356/380
9 Double Acting Cover	3	AL 356/380
10 Air Supply O-Ring	1	Buna N, Viton, EPDM
11 Cover Screw	8-16	ST. ST.

Description	Qty	Material
12 Pinion	1	Steel E.N.Coated
13 Stop	1	ST.ST 316
14 Thrust Washer	2	Delrin, NRG, UHMWPE
15 Pinion O-Ring	2	Buna N, Viton, EPDM
16 Disc Bearing	1	ST.ST
17 Circlip	1	ST.ST
18 Pad	4	Delrin, NRG, UHMWPE
19 Stroke Adjustment Screw	4	ST. ST.
20 Exhaust Plug (Silencer)	1	Delrin, (Brass)
21 Indicator	1	Plastic (ABS), Red & White
22 Puck	1	Plastic (ABS), Red & White
23 Indicaor Screw	1	ST.ST
24 Tag	4	ST.ST

## NAMUR & ISO Interface

Solenoid valves, limit switches and positioners interface directly with the **Compact II** according to the latest international standards of ISO 5211, NAMUR and VDI/VDE 3845.

### NAMUR VDI/VDE 3845

This standard provides for a range of accessories such as mounting kits, limit switches, pucks, indicators and positioners which have VDI/VDE interface and therefore can be easily mounted onto the actuator.

### NAMUR Solenoid Mounting

One of the four covers of the actuator incorporates a pad for solenoid mounting according to the NAMUR international standard. Any solenoid of a different brand, conforming to the NAMUR interface can be directly mounted for spring return or double acting actuators.

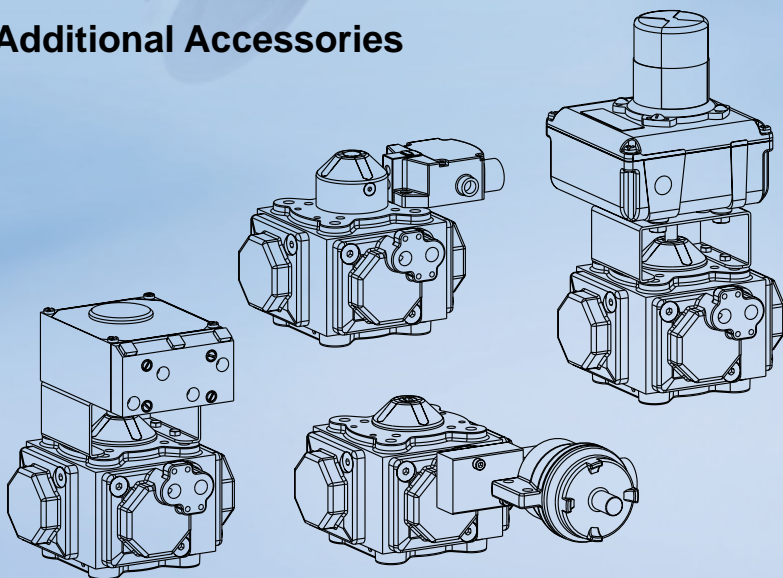
This simplifies the installation of solenoids and eliminates additional piping. It also allows quick actuation response as pressurized air supply is available at the port entrance.

The air ports are marked for correct assembly of the solenoid.

### ISO 5211 or DIN 3337

The actuator bottom flange is in accordance with ISO 5211 (or DIN 3337) international standard and incorporates a star shaped female drive for flexibility to fit various valve output shafts. The valve can be attached by a bracket or mounted directly onto the actuator, using one of the various ISO hole patterns.

## Additional Accessories



The international NAMUR and ISO standards for modular mounting of accessories to actuators simplify the attachment of solenoid valves, limit switches and positioners to the **COMPACT II** actuator.

Any accessory that conforms to these standards will connect directly or indirectly by a variety of mountings. This includes accessories ranging from general use to explosion proof, on-off signaling to digitally controlled positioners.

For control applications the **COMPACT II** actuator features accurate, quick response positioning with minimum hysteresis.



## Safety Features

The longer cover bolts for spring return actuators relieve the spring load before they disengage from their threads. Also, before the pistons can be removed, the stop screw must be released and the pinion removed, thus ensuring that any trapped pressure in the body will escape and will not become a hazard. Because these safety features are built in, they ensure a secure and safe operation whereby assembly and dismantling of the actuator becomes a simple task.

## Quality

The **Compact II** is manufactured under ISO 9001 certification and is **ATEX 94-9-EC** approved for use in potentially explosive areas. All body and cover castings are identified by a stamped heat code.