



AIRLOCK FAIL-SAFE SYSTEM

Today's systems demand ultimate performance from all components in the system. These include not only the primary instruments, but also the final control element, an integral part of the control loop. To meet these demands the actuator positioning the final control element must provide true proportional control in response to a signal regardless of the stem load and stuffing box friction. Without precise actuator positioning, the critical function of the final control element is reduced.

In many applications, spring and diaphragm actuators, due to their inherent lack of power, cannot offer precise positioning performance. Adding a positioner will improve this performance, but it is restricted by the power-absorbing spring. Conversely, a springless actuator such as Conoflow's Pneumatic Piston Actuator, which utilizes air pressures up to 100 PSI (690 kPa), can deliver thrusts in excess of 12,000 pounds, and strokes up to 10". (For stroke lengths greater than 10", consult the factory.) Positioning accuracy meets the requirements of modern day instrumentation.

The springless Piston Actuator utilizes a cushion of air under the piston whose pressure is maintained by a loading regulator. Output from an integrally mounted positioner determines the position of the piston. A differential pressure across the piston determines direction and speed of motion. Balance is achieved by an equalization of forces as determined by stem position and instrument signal pressure.

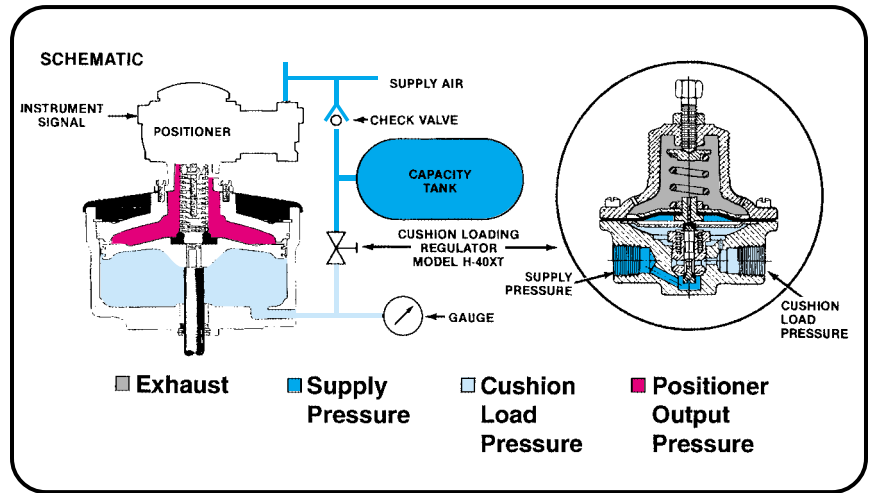
To provide a fail-safe system (extend or retract the stem in the event of air supply failure), Conoflow offers their Airlock Fail-Safe System. Integrally mounted on the actuator, this compact unit provides positive action to open or close a valve. For lock in last position feature, refer to page 159.

PRINCIPLE OF OPERATION

During operation, the supply pressure to the Actuator (up to 100 PSI) is fed through the positioner and a cushion-loading regulator. This regulator provides a constant pressure to one side of the piston regardless of its position, to give a constant force in one direction. The amount of force available is determined by the pressure setting and the effective area of the piston.

The Positioner will provide proportional positioning of the actuator stem in response to instrument signal changes by applying or relieving pressure on the piston. The air pressure required is dependent upon the cushion loading pressure and the direction of the external force to be overcome.

The high volume capacity tank, which stores air at supply pressure, acts as an auxiliary source to the cushion loading system. In the event of air supply failure, the pressure on top of the piston bleeds to atmosphere and the pressure from the capacity tank through the cushion loading regulator forces the stem to extend or retract depending on the positioner being used (refer to tables below). Since it is a completely sealed system, the stem will remain in that position until supply pressure is restored (up to 24 hours). The stem can also extend on air failure by selecting the proper positioner and applying the cushion loading system to the top of the piston (refer to the chart below).



For Piping Schematics, refer to drawings A50-4, A50-16 and A50-48

Airlock Assemblies can be purchased as individual assemblies (components shipped loose) for field replacement or for mounting to actuators other than Conoflow units.

ACTIONS AVAILABLE

POSITIONER MODEL NO.	STEM POSITION WITH INCREASING SIGNAL	STEM POSITION ON AIR FAILURE
GC31/GJ11	Extends	Retracts
GC32/GJ12	Retracts	Retracts
GC33/GJ13	Retracts	Extends
GC34/GJ14	Extends	Extends

ACTIONS AVAILABLE

MODEL	GJ2103	GJ2215 GJ2230
As Instrument Signal Increases, Actuator Stem	Extends	Retracts
Stem Position On Air Failure	Can be piped to Extend or Retract. Specify When Ordering.	

NOTE: 1. Capacity tanks are sized to provide a maximum pressure equal to 50% of the supply pressure for full extension or retraction of the actuator stem.

Throttling and On/Off - GB50 Series Units With spacer bars and lower flange (GB5_XCX) Without spacer bars and lower flange (GB5_XCAC)

AIRLOCK ASSEMBLY NUMBER	ACTUATOR MODEL - BORE SIZE	APPLICABLE STROKE LENGTHS	TANK SIZE
GB216400	GB50 Series - 3" Bore GB52 Series - 6" Bore GB53 Series - 8" Bore	8" Stroke 4" and 6" Stroke 1-1/2" Stroke	180 cubic inch
GB216401	GB53 Series - 8" Bore GB54 Series - 10" Bore	4" and 6" Stroke 2-1/2" Stroke	400 cubic inch
GB216402	GB53 Series - 8" Bore GB54 Series - 10" Bore GB55 Series - 12-1/2" Bore	8" Stroke 10" Stroke 4" Stroke	1000 cubic inch
GB216403	GB50 Series - 3" Bore GB51 Series - 4" Bore GB52 Series - 6" Bore	2" and 5" Stroke 3" and 4" Stroke 1-1/8" Stroke	57 cubic inch

NOTE: 1. Each assembly consists of capacity tank, cushion-loading regulator, check valve, draincock and mounting hardware.

Throttling and On/Off - GB52, GB53 and GB54 Series Lever Actuators (GB52S_) Yoke Style Actuators (GB52U_)

AIRLOCK ASSEMBLY NUMBER	ACTUATOR MODEL - TYPE	TANK SIZE
GB216404	GB53S(1) - Lever Actuator GB53U(1) - Yoke Style Actuator	180 cubic inch
GB216405	GB52S(1) - Lever Actuator GB52U(1) - Yoke Style Actuator	57 cubic inch
GB216406	GB54S(1) - Lever Actuator GB54U(1) - Yoke Style Actuator	400 cubic inch
GB216407	GB55U(1) - Yoke Style Actuator	1000 cubic inch

NOTES: 1. Positioner model selection, refer to chart at left.
2. Each assembly consists of capacity tank, cushion-loading regulator, check valve, draincock, mounting bracket and mounting hardware.