

HYTORK 

AIR FAIL SAFE ACTUATOR

FOR LARGER,
HIGHER TORQUE
REQUIREMENT
VALVES -
AN ECONOMIC
SOLUTION FOR
FAIL SAFE
ACTUATOR
REQUIREMENTS



Reliability &
Flexibility in
Process
Control -
from
Hytork's
Valve
Automation
Centers
Worldwide

HYTORK 

Your Quality Assurance
in Process Control

WHY AIR FAIL SAFE?

HIGH PERFORMANCE IN THE FAIL AND POWERED STROKES

- Constant torque output during normal operation.
- A very low torque drop off on the fail stroke provides higher usable torque than spring designs.

HIGH RELIABILITY

- All components are located and protected inside the air chamber modules.
- A proven, successful track record.

COMPACT, HEAVY DUTY DESIGN

- Similar in size to spring return designs yet three times the power output.
- Central mounting over the valve prevents pipe twisting.
- Balanced design eliminates the need for support brackets.
- No side loads to wear the valve stem packing.
- Lower actuator cost.

A F S

A I R

F A I L

S A F E

The HYTORK **AFS** (Air Fail Safe) actuator is designed to provide a high fail stroke torque in a double rack and pinion actuator that cannot be achieved using springs. All the safety and performance features of double rack and pinion actuators are maintained as is the Hytork "XL" reliability.

Using the time proven air accumulator system, and modern design techniques, HYTORK produces air chamber modules with all the pneumatic circuitry safety protected within. *Protected from corrosion - protected from mechanical abuse.*

The HYTORK **AFS** maintains the highest seen air supply pressure within the chamber modules, to be released upon control demand. This design also prevents closure "creeping" when air supply pressures drop, which occurs with all spring return designs.

Torque output is constant in the powered stroke with only a small drop off on the fail stroke. The available torques are proportional to the air supply pressure.

Spring changes for various air supply pressures need not be made.

4580AFS - ACTUATOR TORQUES AT VARIOUS AIR PRESSURES

Action	Air supply pressure (psi)						
	40	50	60	70	80	90	100
Power strokes							
Torques (inch.lbs) from air supply pressure							
to open	14204	17755	21306	24857	28408	31959	35510
to close	14204	17755	21306	24857	28408	31959	35510
Fail stroke							
Torques (inch.lbs) when loss of supply pressure occurs							
at start of stroke	14204	17755	21306	24857	28408	31959	35510
at end of stroke	10653	13316	15980	18643	21306	23969	26633

Action	Air supply pressure (bar)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
Power strokes							
Torques (Nm) from air supply pressure							
to open	2043	2335	2626	2918	3210	3502	3794
to close	2043	2335	2626	2918	3210	3502	3794
Fail stroke							
Torques (Nm) when loss of supply pressure occurs							
at start of stroke	2043	2335	2626	2918	3210	3502	3794
at end of stroke	1532	1751	1970	2189	2408	2626	2845

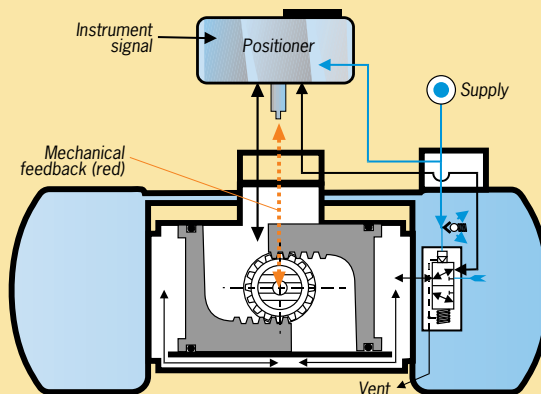
Maximum operating pressure
100psi (6.9 bar)

Minimum operating pressure
40psi (2.7 bar)

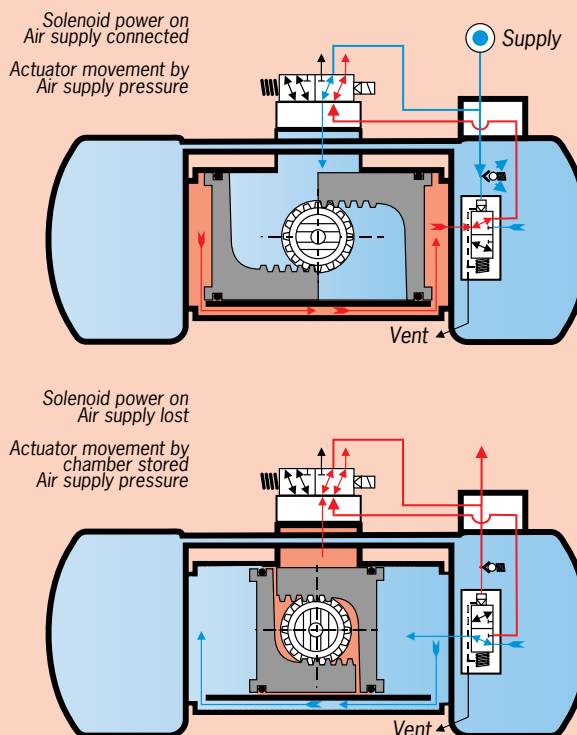
The **AFS** operates as a double acting actuator in both directions until there is a loss of supply pressure. When this loss occurs, the compressed air stored in the chambers powers the actuator to close the valve. This makes the **AFS** Series suitable for use in ON/OFF and MODULATING CONTROL situations while still providing the fail safe requirement.

The **AFS** is supplied already furnished with an installed, direct mount solenoid valve. The coil type is selected to suit your site requirements. This saves on site piping and ensures the assembly has been fully tested.

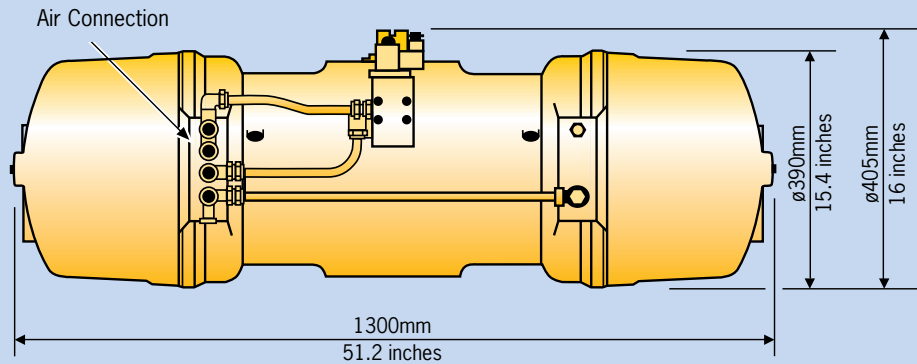
POSITIONER OPERATION



SOLENOID OPERATION

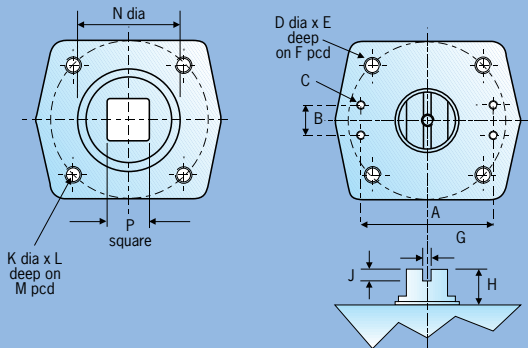


DIMENSIONAL DRAWING



ISO F16 VALVE MOUNTING FACE

NAMUR VDI/VDE ACCESSORY MOUNTING FACE



DIMENSION	VERSION	
	Metric (mm)	USA (inches)
A	130	5.12
B	30	1.18
C	M5	10-24UNC
D	M20	3/4UNC
E	25	1
F (pcd)	165	6.5
G	4.00	0.157
	4.10	0.161
H	30	1.18
J	5	0.197
K	M20	3/4UNC
L	25	1
M (pcd)	165	6.5
N (dia)	129.95	N/A
Location Ring	129.89	N/A
P	46.00	1.811
square	46.16	1.817
Weight	130kg	286lbs

MATERIALS OF CONSTRUCTION

Body, End Caps & Chambers: Aluminum, Hard Anodized, Ceramigard treated and two part epoxy coated.

Pinion & Thrust Washer: Steel, Cobalt Nickel plated

Pistons: Aluminum

Safekey: 316 Stainless Steel

Bearings: DURASTrip MoS₂ impregnated polymer

"O" Ring Seals: Nitrile (Buna N) rubber

Operating times: Operating times will vary depending on the torque of the valve being operated and the supply air volume to the actuator. As a guide the normal operating time to operate from open to close and vice versa for both the supply and fail strokes is around 10 seconds. If faster operating times are required, install quick exhaust valves at the actuator.

Fail Stroke frequency: Once the actuator has been used in the fail stroke due to loss of supply pressure, a minimum of 30 seconds must be allowed to charge the chamber with supply air before the fail action is used again.

Operating Pressures: Maximum operating pressure 100psi (6.9 bar). Minimum operating pressure 40psi (2.7 bar).

Solenoid Valve Options: (Model 8110164)

Standard coil type 0247: Weatherproof IP65, cable entry PG11 Various voltages DC, AC50Hz & 60Hz.

Explosion Proof coil type 0270: EEx m II T4 & IP65 with flying leads. Various DC voltages.

Explosion Proof coil type 0271: EEx m II T4 & IP65 with flying leads. Various AC voltages, 50Hz & 60Hz.

Explosion Proof coil type 3920: EEx em II T4/T6 & IP65, Cable entry PG13.5, Various DC voltages.

Explosion Proof coil type 3921: EEx em II T4/T6 & IP65, Cable entry PG13.5, Various voltages AC, 50Hz & 60Hz.

Explosion Proof coil type H213: UL listed for Class 1 groups C&D, Class II groups E,F&G, Type 4 (watertight) enclosure, 1/2" NPT with flying leads. voltages 24VDC and 120V60Hz.

UK Patents:

GB 2 102 887 B;
GB 2 123 517 B;
GB 2 138 505 B;
GB 2 216 229 B;

GB 2 225 079 B;
GB 2 229 254 B;
GB 2 253 459 B;
GB 2 268 574 B.

US Patents:

4,496,071;
4,651,627;
4,716,815.

Warranties:

Unauthorised modification to any **Hytork** Product totally invalidates all warranties.

Important:

We have endeavoured in this publication to make the contents as accurate as possible, but being given as general information, it is not to be taken as binding unless specifically confirmed in writing. Due to **Hytork's** continuing commitment to engineered product advancement, the product specifications and data presented in this publication are subject to change without notice.

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