



Product Specification

WORCESTER CONTROLS

Product Specification

APEX W7000 Pneumatic Positioner

FCD WCENPS1057-02

Introduction:

The Apex W7000 Pneumatic Positioner provides accurate valve positioning for rotary and linear actuators in either double acting or spring return configurations. It may be used with 3-15 psi pneumatic control signals (as shown), or fitted with current-to-pressure transducers for 4-20 mA signal inputs. The modular design of the Apex 7000 allows for field retrofitting of the I/P options. The compact, lightweight positioner also conforms to NAMUR VDI/VDE 3845 mounting standards and features a UltraDome visual position indicator. The Apex W7000 is available with the following options: high and low flow spool valves and multiple feedback cams



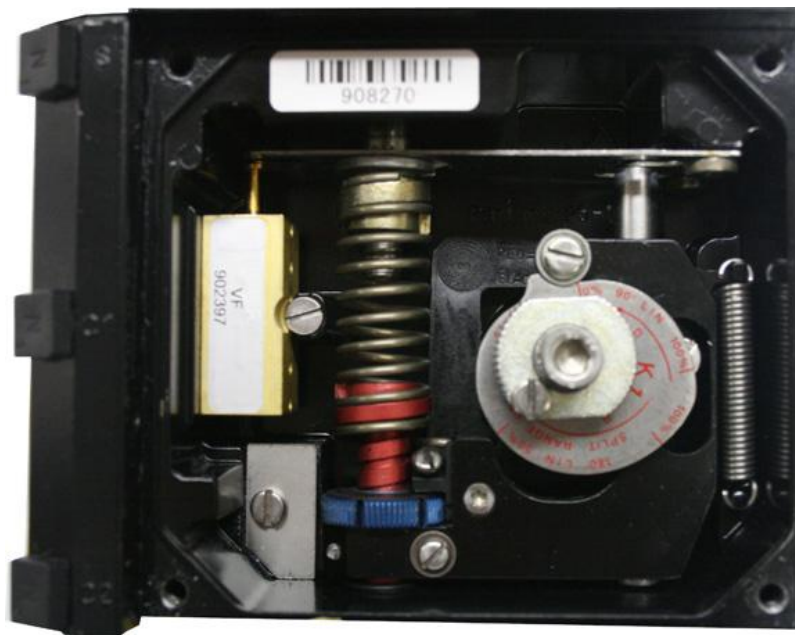
Applications:

Two spool valve options make the Apex 7000 well suited for use with all pneumatic rotary actuator types including: Rack-and-pinion, Scotch Yoke, Vane, and others. The Apex W7000 is equally well suited for use with pneumatic linear actuators and cylinders.

The Apex W7000 may be installed on any actuator conforming to the NAMUR standard for accessory mounting bolt pattern and pinion height without a coupler. This reduces deadband and is less expensive. Accord offers a full line of mounting hardware for non-NAMUR actuators.

Durable construction and corrosion resistant materials and coatings provide protection against the toughest applications in all process industries, including:

1. Chemical and Petrochemical
2. Power
3. Food and Beverage
4. Pharmaceutical
5. Municipal and Wastewater

**Features:**

1. **Corrosion Resistant Materials.** All exposed parts are either stainless steel or epoxy powder coated aluminum to permit use in corrosive environments. The gold-plated spool valve offers a high degree of protection against moisture laden and/or corrosive supply air.
2. **Captive Cover Screws** permit calibration without potential for losing screws.
3. **Field Upgradeable.** The Apex W7000 is field upgradeable to any of the electro-pneumatic I/P options without removing the cover.
4. **Multiple Cam Options.** The standard Apex W7000 linear cam allows operation for 0-90°, 0-180°, split ranging, and direct or reverse action applications. Optional characterized cams are available for a wide range of applications.
5. **Compact, Rugged Design** has few moving parts, adding to its reliability and performance.
6. **Low Profile Visual Position Indicator** provides high-contrast viewing of valve position.
7. **Quick and Simple Calibration** is done with thumbwheels, requiring only a flat head screwdriver for calibration. The span adjustment is performed internally with an external zero adjustment.



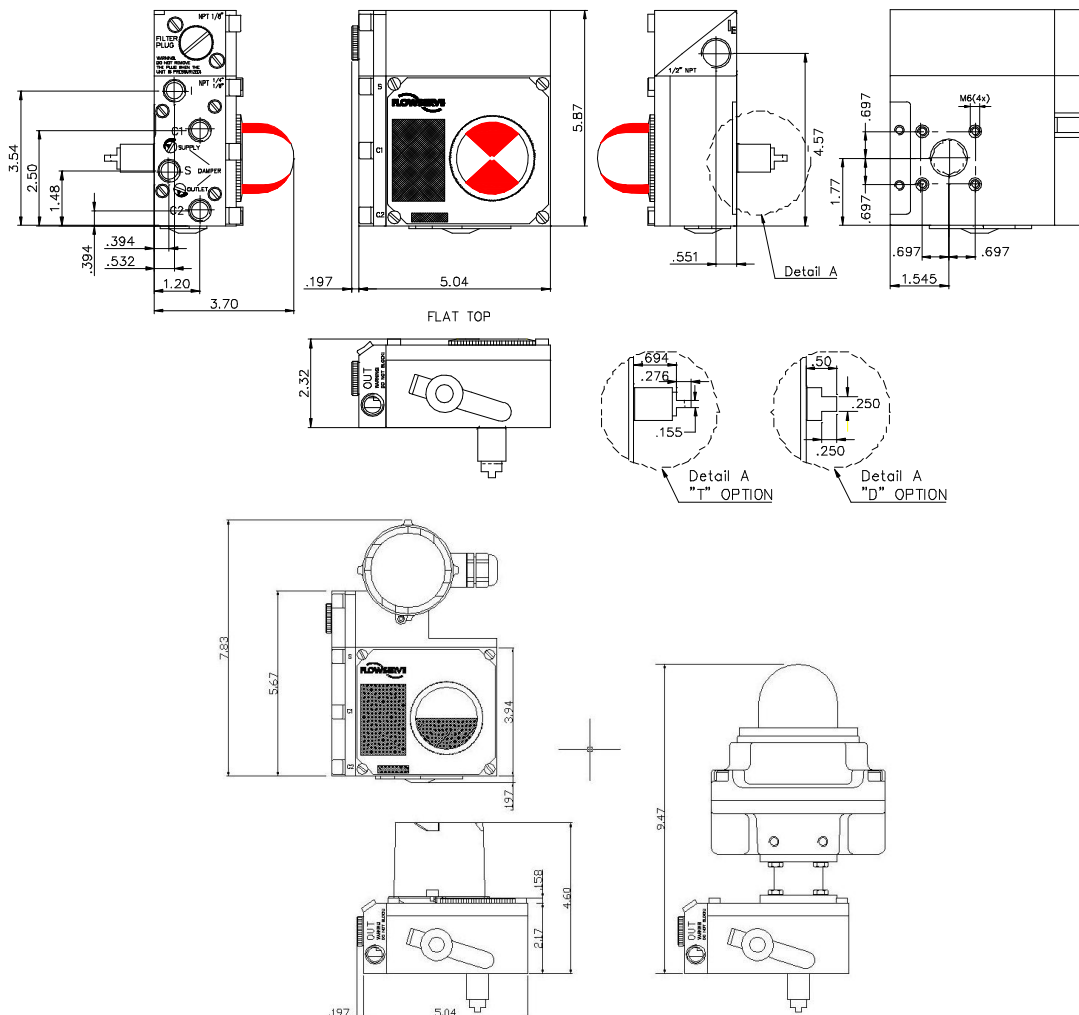
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Materials of Construction

Part of Assembly	Materials
Housing/Cover	Epoxy Coated Aluminum
Shaft	Stainless Steel
Diaphragm Cover	Epoxy Coated Aluminum
Diaphragm	Nitrile Rubber
Balance Arm	Stainless Steel
Feedback Spring	Stainless Steel
Lower Arm Assembly	Die Cast Aluminum
Rod	Stainless Steel
Spring	Stainless Steel
Twist Stop	Stainless Steel
Spool Valve	Gold-Plated Steel
Cam Locknut	Zinc-Plated Steel
Ball Bearing	Stainless Steel
Cam	Stainless Steel
Indicator	Polycarbonate
Feedback and Cam Springs	Stainless Steel
Shaft Snap Rings	Stainless Steel
Posts and E-Clips	Stainless Steel

Performance Specifications

Parameter	Value	
Repeatability	0.5% Full Scale	
Hysteresis & Deadband	0.8% Full Scale	
Linearity	0.7% Full Scale	
Air Capacity @ 60 psi	Std.	9.6 SCFM
	High	18 SCFM
Position Sensitivity	0.2% of Span	
Air Consumption	0.31 SCFM @ 87 psi	
Temperature Range	-4°F to 185°F	
Input Signal	3-15 psi	
Max. Supply Pressure	150 psi	
Weight	2 lbs	

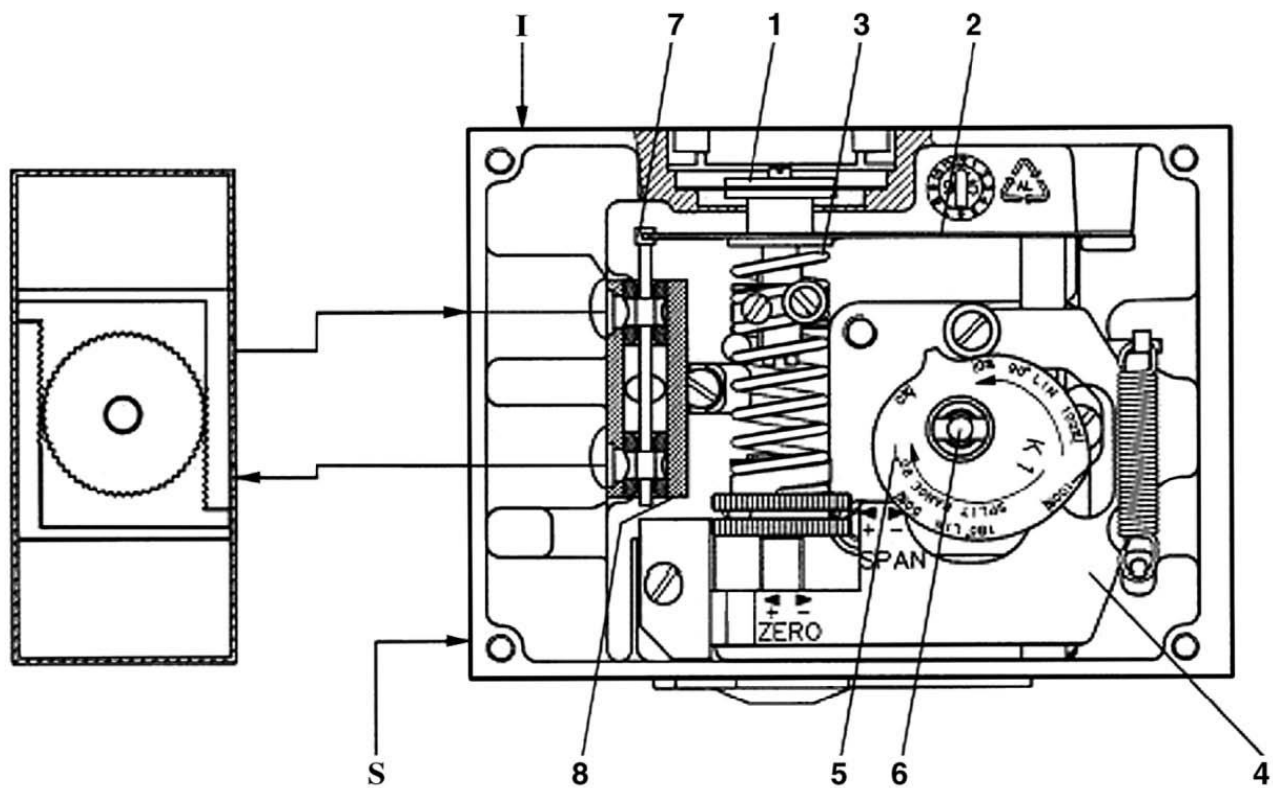


Principles of Operation:

The unit operates on a force balance principle. The opposing force is achieved through the feedback spring and is proportional to the position of the lower arm. The lower arm position is determined by the position of the cam that is secured to the spindle and connected to the actuator shaft, thus providing the feedback from the actuator/valve. When these two forces are equal, the balance arm and the spool in the pilot valve are in the neutral position, the complete unit is in a balanced position. Air is supplied to the pilot valve through Port S and controls the air flow through Ports C1 and C2.

Assume an equilibrium position.

An increased control signal will deflect the diaphragm (1) down, compressing the feedback spring (3). The balance arm (2) moves the spool (7) in the pilot valve (8) supplying air to the actuator. At the same time, air is exhausted from the actuator and is vented to atmosphere through the pilot valve and the OUT port. When the pressure imbalance exists, the actuator rotates moving the positioner shaft (6). The shaft and cam (5) rotate, forcing the lower arm (4) upwards compressing the feedback spring (3). The motion will continue until the two forces are equal and the unit is in an equilibrium position.





Product Specification

Product Nomenclature

- **PREFIX I**
 - W - Worcester Controls Black Epoxy Paint
- **MODEL**
 - 70 – PP Input 3-15 psi
 - 71 – EP Input 4-20 mA General Purpose
 - 72 – EP input 4-20 mA FM/CSA/ATEX/IECEEx Explosionproof (See Note 1)
 - 73 – EP input 4-20 mA FM/CSA/ATEX/IECEEx Explosionproof (See Note 2)
 - 74 – EP Input 4-20 mA FM/CSA/ATEX/IECEEx Intrinsically Safe (See Note 3)
 - 75 – EP Input 4-20 mA Signal Loss Fail-in-Place
 - 76 – PP Input 6-30 psi
- **INDICATION**
 - 1 – Standard Flat with Green Indicator
 - 2 – UltraDome Indicator
- **GAUGES**
 - 3 – No Gauges
 - 4 – Standard Gauges (SST casing w/ brass internals)
 - 5 – Stainless Steel Gauges
- **SPOOL VALVES**
 - 6 – Low Flow Spool Valve
 - 7 – High Flow Spool Valve
- **CAM TYPE**
 - A – Standard Linear Cam 3-15 psi, 3-9 psi, 9-15 psi, D or R, 180°
 - B – 30 or 60 Degree Linear Cam D or R
 - C – Characterized Cam, Square or Square Root, D or R
- **OPTIONS**
 - R – NAMUR Shaft – Tuftram 66 Severe Service Coating
 - T – NAMUR Shaft – Standard Epoxy Coating
 - Q – NAMUR Shaft – Silicone Seals for -40° to 185° F
 - D – Double “D” Shaft – Standard Epoxy Coating
 - U – Double “D” Shaft – Tuftram 66 Severe Service Coating
 - V – Double “D” Shaft – Silicone Seals for -40° to 185° F
- **FEEDBACK OPTIONS**
 - 0 – None
 - T – Top-Mounted UltraSwitch Cover

NOTES:

1. FM/CSA Explosionproof CI I Div 1,2 Gr BCD, CI II Div 1,2 Gr EFG, CI III Div 1,2 – Flameproof II 2 G EEx d IIB+H2
2. FM/CSA Explosionproof CI I Div 1,2 Gr BCD, CI II Div 1,2 Gr EFG, CI III Div 1,2 – Flameproof II 2 G EEx d IIC
3. FM/CSA Intrinsically Safe CI I Div 1 ABCD, ATEX II 2 GD T4-T6 Ex ia IIC



Product Specification

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