



Product Specification

Automax Valve Automation Systems

Product Specification

APEX 7000 Pneumatic Positioner

FCD AXENPS0125-06

Introduction:

The Apex 7000 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 7000 is available with the following options: high and low flow spool valves and multiple feedback cams



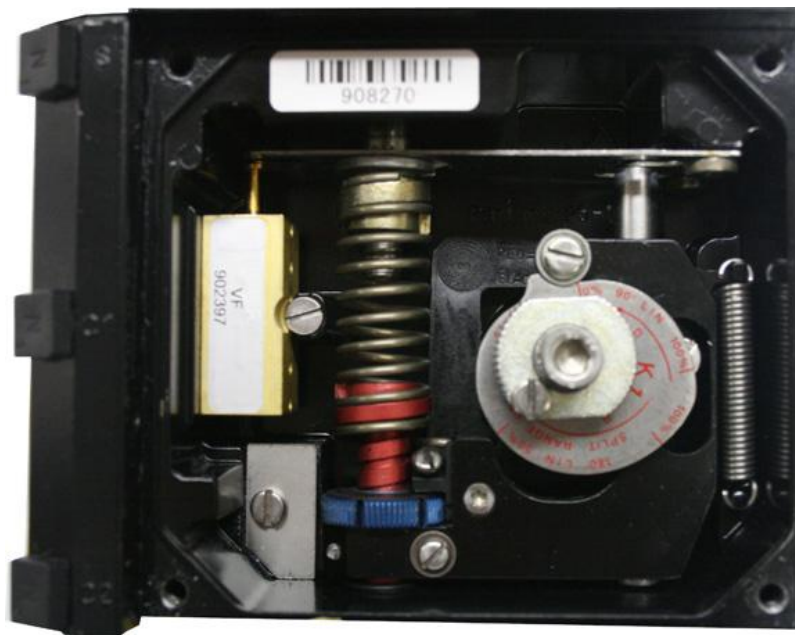
Applications:

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 7000 is equally well suited for use with pneumatic linear actuators and cylinders.

The Apex 7000 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 7000 is field upgradeable to any of the electro-pneumatic I/P options without removing the cover.
4. **Multiple Cam Options.** The standard Apex 7000 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.



Product Specification

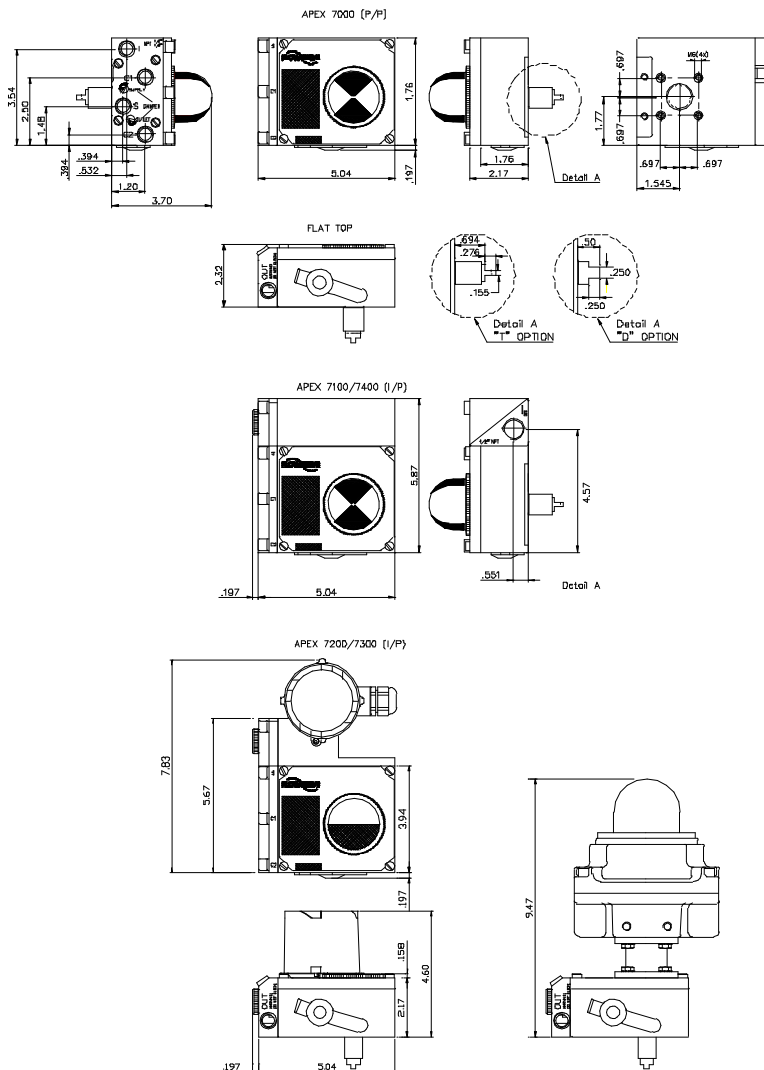
Materials of Construction

| 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 | |

Dimensions:

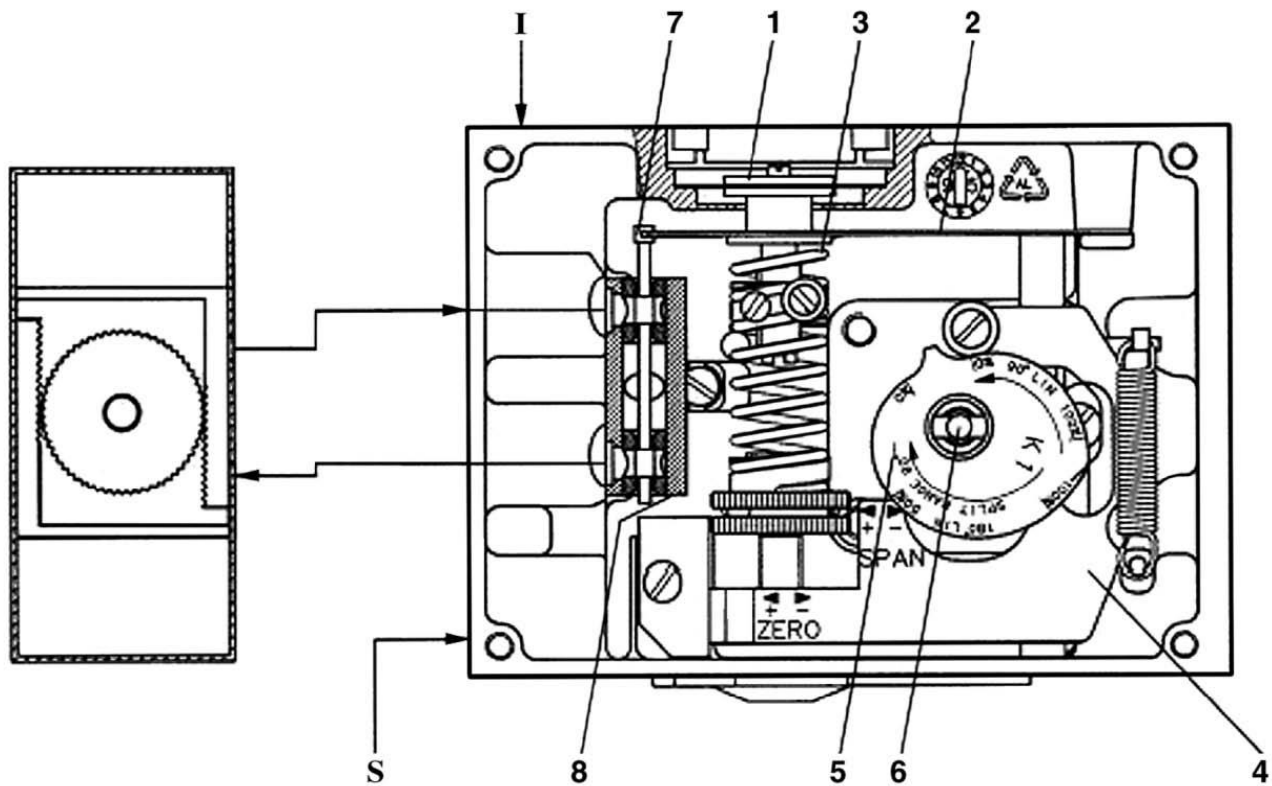


Principles of Operation:

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**
Blank - Automax 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/IECEX Explosionproof (See Note 1)
 - 73 - EP Input 4-20 mA FM/CSA/ATEX/IECEX Explosionproof (See Note 2)
 - 74 - EP Input 4-20 mA FM/CSA/ATEX/IECEX 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

Representative:

Flowserve Corporation
Springville, Utah, USA, 84663
801 489-8611

Flowserve Corporation
Cookeville, Tennessee, USA, 38501
931 432-4021

Flowserve Flow Control UK Ltd
Haywards Heath, West Sussex, Uk
44 (0)1444 314400

Flowserve Corporation
12 Tuas Avenue 20
Singapore
68798900

Flowserve Corporation
Rua Tocantins, 128
São Caetano do Sul, SP, Brazil
55 11 2169-6300

Bulletin FCD AXENPS0125-06

To find your local Flowserve representative please use the Sales Support Locator System found at www.flowserve.com

Or call toll free: 1-931-432-4021

Flowserve PMV
Korta Gatan 9
Solna, Sweden 171 54
468 555 10600

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the (INSERT OFFICIAL USER INSTRUCTION TITLE) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

For more information about Flowserve Corporation, contact www.flowserve.com or call USA 1-800-225-6989.