

APEX 5000 Pneumatic Positioner

Introduction:

The Apex 5000 Pneumatic Positioner provides accurate valve positioning with advanced features. It may be used with 3-15 psi pneumatic control signals (as shown), or fitted with one of three current-to-pressure transducers for 4-20 mA signal inputs. The Apex is available with many options including: limit switches, position feedback transmitter, speed controls, and our Pharos™ visual position indicator.



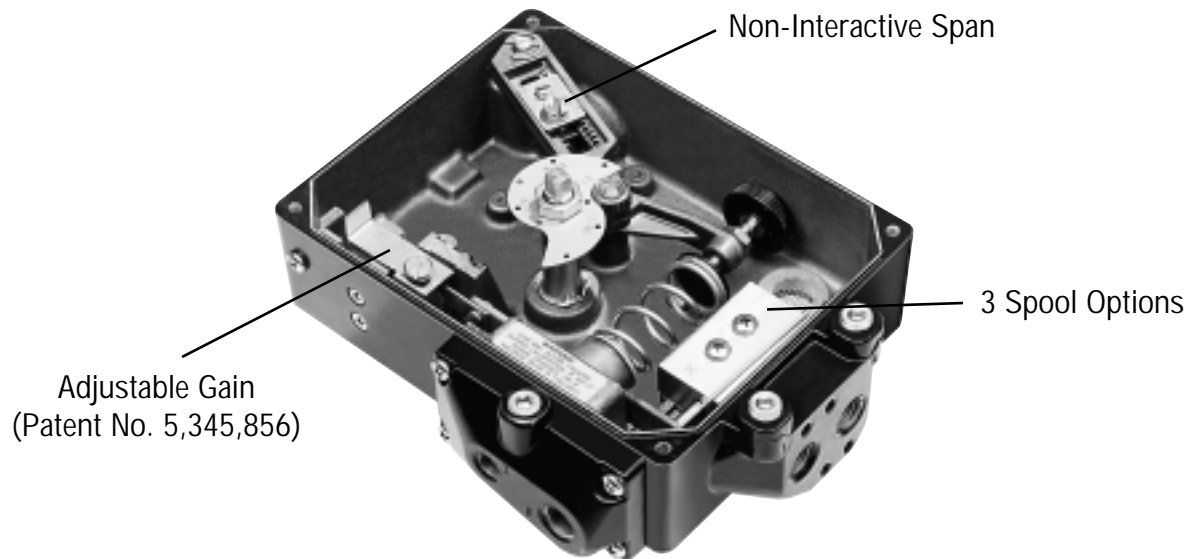
Applications:

Three spool valve options plus a patented adjustable gain system (U.S. Patent # 5,345,856) make the Apex well suited for use with all pneumatic rotary actuator types including: Rack-and-Pinion, Heavy Duty, Vane, and others. The Apex is equally well-suited for use with pneumatic linear actuators and cylinders.

The Apex may be installed on any actuator conforming to the NAMUR standard for accessory mounting bolt pattern and pinion height without a coupler (see bulletin PS0010). This reduces deadband and is less expensive. Accord also offers a full line of mounting hardware for non-NAMUR actuators.

The Apex housing is constructed from durable die-cast aluminum and treated with a dichromate undercoat and polyester powder top coat for protection against the toughest applications in all process industries including:

1. Chemical and petro-chemical
2. Power
3. Food and Beverage
4. Pharmaceutical
5. Municipal
6. Wastewater treatment

**Features:**

1. **Non-Interactive Span Adjustment** reduces calibration time.
2. Patented **Adjustable Gain** allows positioner sensitivity adjustment without removing or replacing components.
3. **Corrosion Resistant Materials.** All exposed parts are either stainless steel, anodized aluminum, or aluminum treated with chromate undercoat and polyester electrostatic powder top coat to permit use in corrosive environments.
4. **Captive Cover Screws** permit calibration without potential for losing screws.
5. Optional **Pharos™ Visual Position Indicator** provides fully adjustable, high-contrast, full-angle viewing of valve position.
6. **Field Upgradeable.** The Apex 5000 is field-upgradeable to any of three electro-pneumatic options without removing the cover. Switches or a position transmitter are field installable by replacing the shaft and adding modular "cards."
7. **Vibration Resistant.** Low spool mass, outboard spool bearings, and locking calibration adjustments provide reliable operation under high vibration.

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Materials of Construction:

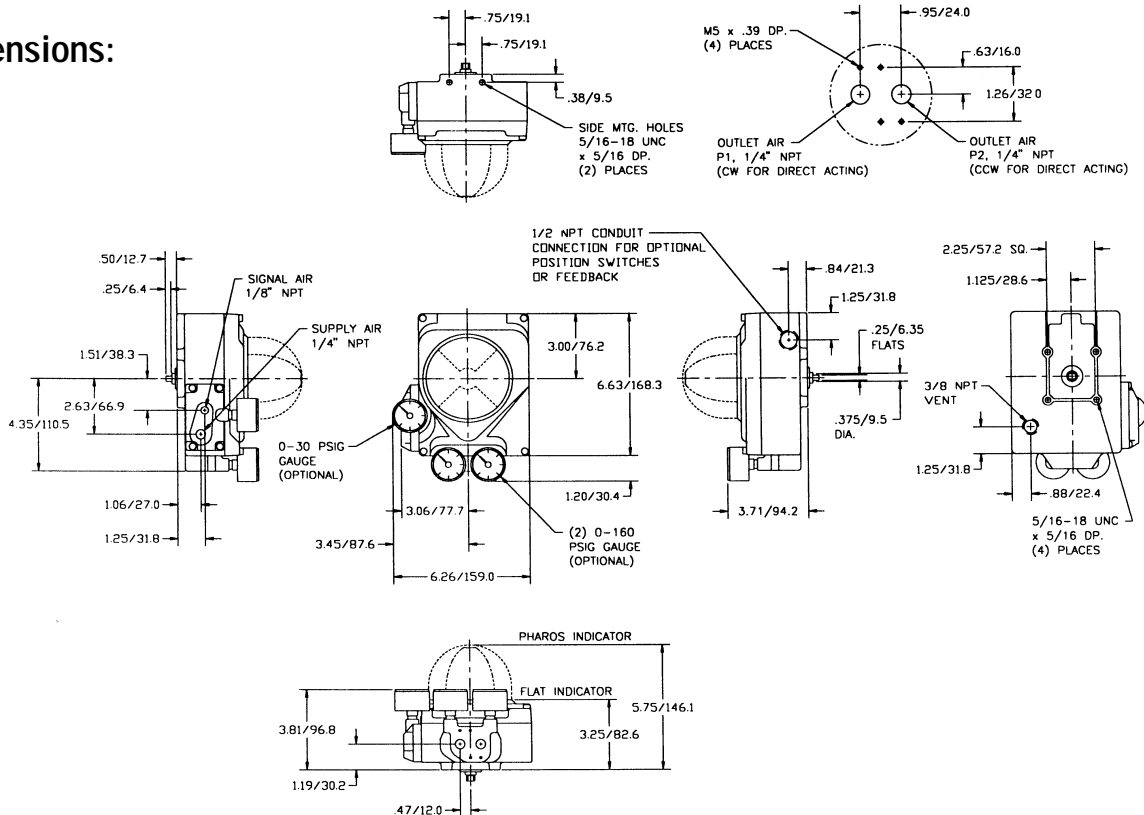
Part (*Recommended Spares)	Materials
Housing/Cover	Aluminum w/Dichromate/Powdercoat
Shaft	Stainless Steel
Cam	Stainless Steel
Cam Follower Bearing	Hardened Steel
Follower/Feedback Arms	Hard Anodized Aluminum
Span Adj. Slide/Lockscrew	Stainless Steel
Span Adj. Pinion	Plated Steel
Zero Adj. Screw	Stainless Steel/Phenolic
Pivot Pins/Snap Rings	Stainless Steel
Feedback Spring	Stainless Steel
Balance Beam	Hard Anodized Aluminum
Hinge Spring	Plated Steel
Spool Valve*	Stainless Steel
Gain Adj. Assembly	Plated Steel
Diaphragm*	Nitrile Rubber
Diaphragm Cover	Hard Anodized Aluminum
Manifold	Aluminum w/Dichromate/Powdercoat
All Fasteners	Stainless Steel
All O-ring Seals & Gaskets*	Nitrile Rubber

Performance Specs:

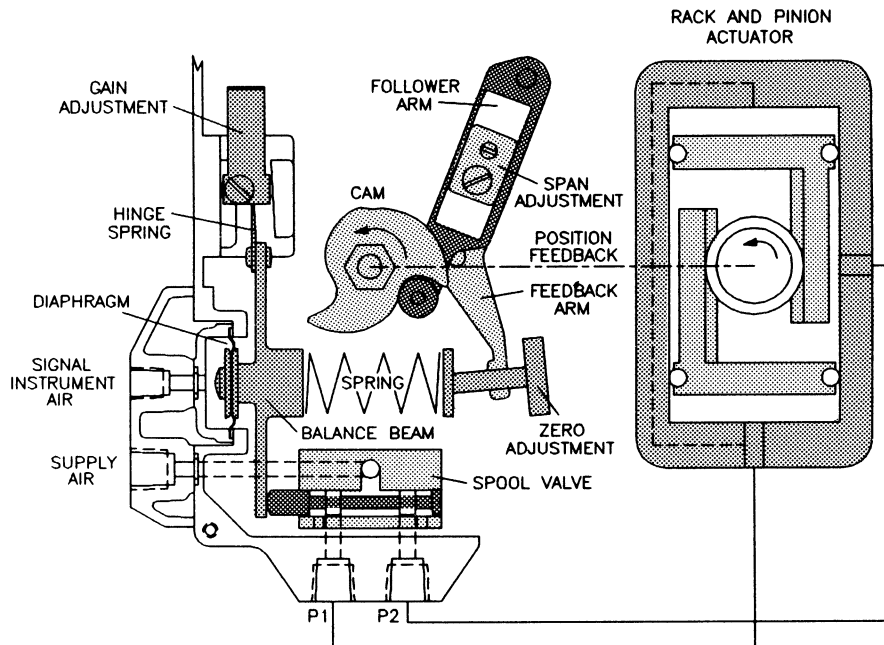
Parameter	Units	Value
Resolution	% Full Scale	0.5
Deadband	% Full Scale	0.5
Repeatability	% Full Scale	0.5
Hysteresis	% Full Scale	0.5
Linearity	% Full Scale	1
Gain - Low Flow	% / %	15-50
High Flow	% / %	30-110
Max Flow	% / %	50-150
Supply Pressure Effect	% / 1 PSIG	0.05
Supply Pressure Range	PSIG	30-120
Air Consumption	SCFM	0.3
Ambient Temp. Range	Degrees F	-40 to 180*
Temperature Effect	% / 1 Deg. F	0.5
Input Signal	PSIG	3-15

*Specify Viton Seals for 180 to 300 degree applications.

Dimensions:



Principles of Operation:



The Apex 5000 positioner causes rotation (or linear movement) of a valve actuator in proportion to input signal. This signal is in the form of pneumatic pressure. Supply pressure is directed to the actuator through a precision spool valve. As input pressure is varied, the balance beam moves away from its neutral position. The spool also shifts and a differential pressure is created across the actuator causing rotation (or linear movement). Rotation is fed back through the positioner shaft and cam. Cam rotation causes rotation of both follower arm and feedback arm about their respective pivot pins. Rotation of feedback arm changes compression in the feedback spring which forces to balance beam and spool back to their neutral positions. This shuts off the flow of air to the actuator.

Zero adjustment is made by varying spring compression via a screw in the feedback arm. Span adjustment is made by moving the point of contact between follower arm and feedback arm via a carriage assembly featuring rack and pinion adjustment. Since both arms are parallel at zero, span adjustment does not effect zero setting.

Gain adjustment is made by varying hinge spring stiffness via an adjustment assembly. This assembly slides along and clamps the hinge spring thereby changing the spring stiffness.

Representative: