

## LOW PRESSURE DROP ROUND AIRFLOW CONTROL VALVE



AV3100

US Pat #6,991,177



- Low Pressure Drop
- Electric Actuation
- Fast Speed of Response
- No Straight Run Requirements
- True Flow Feedback
- High Accuracy and Turndown
- Linear Response
- Quiet Performance
- Can Be Mounted in Any Position
- No Scheduled Maintenance
- Universal Voltage and Current Input/Output



**Recipient of the 2008 AHR Expo Innovation Award,** the **AccuValve® AV3100** represents the first truly new design in airflow control valves in decades. By using Computational Fluid Dynamics (CFD) we have been able to create a valve that maximizes turndown while maintaining the lowest pressure drop of any critical environments valve in the industry.

#### APPLICATION

The **AccuValve® AV3100** incorporates high accuracy airflow sensing with a revolutionary but simple design based on proven technologies. The AV3100 is designed for use in applications where turndowns of up to 10 to 1 are required while maintaining accuracies of 5% of reading over that flow range, ensuring precise airflow control. R&D laboratories, process pharmaceutical manufacturing and vivariums are just a few applications for the **AccuValve®**.

#### DESCRIPTION

The AV3100 uses an airfoil-shaped compression section to divide the airflow into two equal chambers. This causes the air to accelerate and compress into a laminar flow, improving the accuracy of the airflow sensor, and enabling better turndown.

The laminar airflow inherent to the **AccuValve®** design improves the efficiency of the vortex shedding airflow sensors. These sensors are located in each chamber to provide a high degree of accuracy throughout the flow range. The **AccuValve®** design also allows for greater turndowns than possible in older, more conventional valves.

#### TRUE FLOW FEEDBACK

The unique design of the **AccuValve®** provides true flow feedback while avoiding the drawbacks of other valve designs. This feature provides the end user the benefit of the highest degree of safety in knowing that the critical space is accurately monitored and controlled.

#### ASHRAE STANDARD 90.1 -6.5.3.2.3



ASHRAE Standard 90.1 calls for the reset of the static pressure setpoint in VAV systems equipped with DDC controls. To meet the intent of this provision, the DDC system "polls" all VAV damper positions, and continually reduces the static pressure setpoint until one of the VAV dampers is near full open. Obviously this can only work when the DDC system "knows" the damper positions, which is the case with the **AccuValve®**. In competing technologies that use mechanical damper positioning (i.e. venturi valves), this is not possible. The **AccuValve's** combination of low pressure drop and static reset capability allows the absolute minimum possible fan energy consumption for critical airflow control systems. (For more information and energy savings examples see "Demand Based Static Pressure Reset Control for Laboratories")

#### LOW PRESSURE DROP

The AV3100 incorporates a streamlined compression section and a carefully designed static regain section. These features offer lower pressure drops, lower noise levels, and better flow measurement conditions than all other available technologies.

#### SIMPLE LAYOUT

There are no straight duct runs required before or after the valve making application of the valve very simple. The air compression in the valve provides laminar airflow throughout the airflow range providing repeatable airflow measurement regardless of the inlet or outlet conditions. The design also provides large turndown capability, thereby allowing a wide range of applications. All parts are accessible from the front of the valve simplifying installation requirements.

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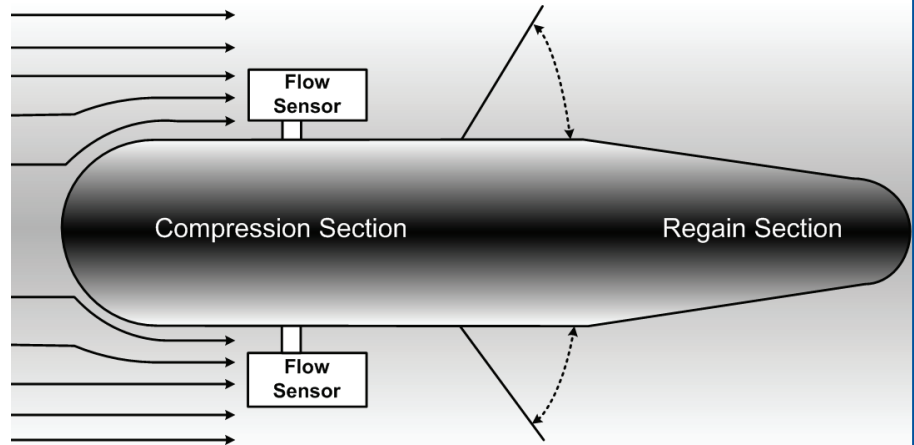
## LOW MAINTENANCE

The **AccuValve®** is designed to provide many years of maintenance free operation. Other valve designs have many critical parts such as springs, cones and linkages located in the air stream where they are not serviceable and are subjected to harsh conditions. In contrast, the **AccuValve®** was designed with very few moving parts. Nearly all of the **AccuValve®** critical parts are externally located, out of the air stream, increasing the overall reliability and lifetime of the valve. The internally mounted airflow sensors can be easily accessed for inspection through a removable access door. Because of this design, all critical parts of the **AccuValve®** can be serviced with the valve installed.

## LOW PRESSURE DROP BY DESIGN

Much like a silencer, the **AccuValve®** divides the airflow into two airstreams using an airfoil shaped compression section. By compressing the air it increases the velocity and makes the airstream more laminar. This improves the turndown of the measuring system and eliminates the need for straight runs into the valve.

The static pressure regain section located after the control blades further reduces the pressure drop of the valve making it the lowest pressure drop airflow control valve on the market. This low pressure drop offers the owner years of energy savings by reducing the required fan horsepower and thus making the laboratory building less costly to operate. (For more details see "Low Pressure Drop by Design" cut sheet.)



## SPECIFICATIONS - AV3100 ROUND ACCUVALVE

<b>Accuracy</b>	5% of reading or 5 CFM, whichever is greater
<b>Speed of Response</b>	<2.0 sec full open to full closed
<b>Temperature Limits</b>	Airstream -20 to 140°F Ambient 25 to 125°F
<b>Shutoff Leakage</b>	<1.5% of FS at 3.0" WC PD
<b>Max Operating Pressure</b>	3.0" WC across valve
<b>Actuator Electrical</b>	
Input Power	24 VAC +/- 20% 50/60 Hz, 24 VA 24 VDC +/- 10%, 12 W (1.5W)
Control Input	2-10 VDC standard, 0-10 VDC available (4-20mA using a 500 Ω ¼ W resistor)
Failure Mode	Fail Last Position or Selectable Fail Open/Closed

### Materials of Construction

Sheet Metal Parts	Galvanized Steel, 304SS or 316SS
Shafts	316SS
Airflow Sensors	Polycarbonate UL94

### Transmitter Electrical

Input Power	24 VAC +/- 20% 50/60 Hz, 2.5VA Max or 24 VDC +/- 20%, 75mA Max.
Output Signal	0-10vdc, 2-10vdc, 0-20mA or 4-20mA (jumper selectable)
Electromagnetic Compatibility	EMC Directive 2004/108/EC Low Voltage Directive 2004/108/EEC EN61326-1:2006 FCC Part 15
Product Safety	IEC/EN/UL/CSA 61010-1:2001 CAN/CSA-C22.2 No. 61010-1

## AV3100 SELECTION TABLE FOR OPERATING PRESSURE

Valve Size	Airflow Range (CFM)								Transmitter Range (CFM)
	Min	Maximum Design Airflow							
6"	30	69	99	123	143	206	254	315	0-330
8"	80	169	252	315	367	528	650	800	0-850
10"	120	304	428	524	606	860	1056	1300	0-1370
12"	180	413	591	726	840	1192	1461	1790	0-1900
14"	250	678	979	1191	1364	1884	2275	2750	0-3000
Operating Pressure*	<0.01"	0.025"	0.05"	0.075"	0.1"	0.2"	0.3"	0.45"	

\*Minimum operating pressure when tested in accordance with ANSI/ASHRAE 130-1996

Use highlighted area for optimal energy efficiency.

For more information on the use of the table please refer to "AccuValve Selection Guide for Operating Pressure"

ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

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