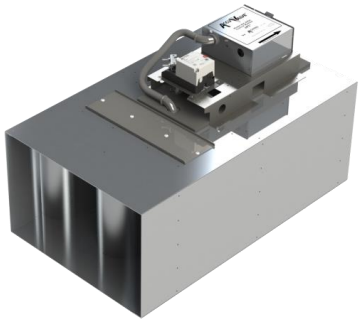
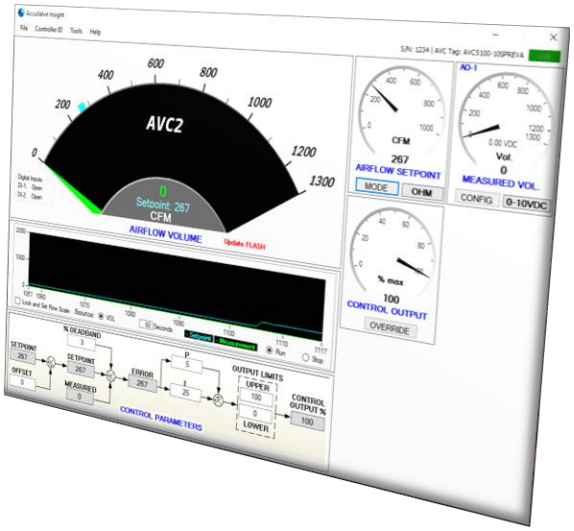
Installation & Operation Manual - Model AVC2000

Airflow Control Valve

Patented: U.S. 6,991,177 & 7,543,759



With AccuValve **Insight** Configuration Software



Manufactured by:

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CE

Accutrol Representative:

AVC2000 MANUAL REV B, 2022-03-04, ECN 2772

LIMITED WARRANTY

Accutrol LLC, having its principal place of business at 21 Commerce Drive, Danbury, CT USA ("Manufacturer") warrants its AccuValve®, Model AVC2000 product (the "Products") as follows:

1. Limited Warranty.
Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of sixty (60) months from the date of purchase. If the Products do not conform to this Limited Warranty during the warranty period (as herein above specified), Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer's satisfaction that said defects are covered by this Limited Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its own expense, furnish, replacement Products or, at Manufacturer's option, replacement parts or services for the defective Products. Shipping and installation of the replacement Products or replacement parts shall be at Buyer's expense.

2. Other Limits.
THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising out of improper or abnormal use or handling of the Products; against defects or damages arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to Buyer the warranty it received (if any) from the maker thereof of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs have been affected or attempted by persons other than Manufacturer or pursuant to written authorization by Manufacturer. This warranty also does not apply to any product provided by the Buyer and mounted by the Manufacturer to Products.

3. Exclusive Obligation.
THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, and strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages.

4. Other Statements.
Manufacturer's employees or representatives' ORAL OR OTHER WRITTEN STATEMENTS DO NOT CONSTITUTE WARRANTIES, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty.

5. Entire Obligation.
This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

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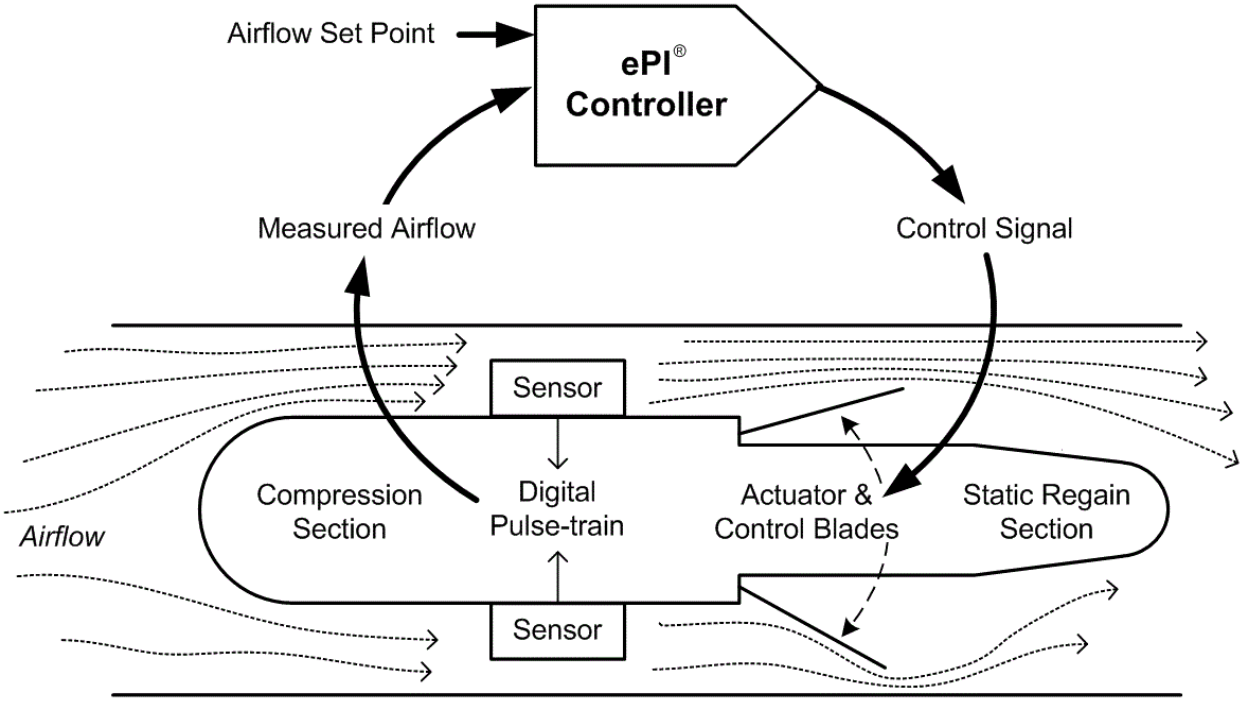
SECTION 1 - INTRODUCTION

The AVC product family integrates a high-performance controller with the revolutionary award winning AccuValve® product. The Engineers at Accutrol have used technology and innovation to make the AVC AccuValve® not only the most advanced airflow control valve in the industry, but also the most reliable and intuitive airflow control valve available.

1.1 Theory of Operation (Reference the Diagram Below)

The AccuValve® divides the airflow into two equal chambers using an airfoil shaped compression section. Each chamber is comprised of a vortex shedding airflow sensor, a modulating control blade and a static regain section. As air enters the chambers it accelerates and compresses, creating an ideal zone for measuring airflow velocity. The vortex shedding airflow sensors provide a highly repeatable digital pulse-train with a frequency that is directly proportional to the air flow velocity in each chamber of the AccuValve®.



The digital signal generated by each vortex shedding sensor provides a direct measurement of the volumetric flow rate in each chamber of the AccuValve®. The airflow measurement provides closed-loop feedback to the ePI® controller which modulates the valve actuator to maintain the desired airflow set point. The airflow set point is provided from digital inputs or AVC internal program memory. The AVC also provides an analog output signal that is software configurable.

Field programming is accomplished through AccuValve Insight, which is an intuitive user-interface software. Connection between the AVC and computer is provided through a USB port located on the AVC control module.

1.2 Model Code

A V C 2 [ ][ ][ ] - [ ][ ] - [ ][ ][ ][ ][ ]

VALVE MATERIAL

2 = 304ss, 20 Ga.
3 = 316ss, 20 Ga.
4 = Aluminum, 16 Ga.

VALVE SIZE

06 = 6" Diameter
08 = 8" Diameter
10 = 10" Diameter
12 = 12" Diameter
14 = 14" Diameter
18 = 12" h x 18" w
24 = 12" h x 24" w

ACTUATOR

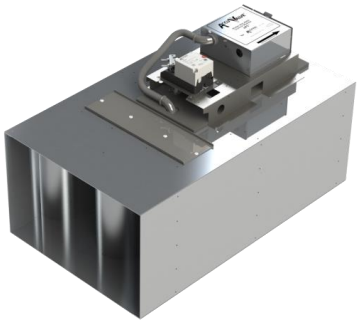
17 = Fail Last Position (FLP) 10-sec full cycle

OPTIONS

F = Flanges, Van Stone Type for Round Valves
I = Insulation
S = Tight Shut-off

1.3 Valve Types

Round AccuValve
Sizes 06, 08, 10, 12 and 14



Rectangular AccuValve
Sizes 18 and 24

SECTION 2 – SPECIFICATIONS

PERFORMANCE	
Accuracy	+/- 5% of reading or 5 CFM, whichever is greater
Speed of Response	< 1 second control signal response (full stroke cycle time is 10 seconds)
Shut-off Leakage Rate	Standard: < 1.5% FS at max operating pressure
	"S" Option: < 0.5% FS round valves, < 1% FS rectangular valves @ max operating pressure
Max Operating Pressure	3”wc Differential Pressure Across Valve
Min Operating Pressure	Reference Section 2.1
Airflow Range	Reference Section 2.1
Failure Mode	Last Position
ENVIRONMENTAL	
Temperature	Airstream: -20 to 165 deg. F for all Standard Valve Models
	Ambient: -20 to 125 deg. F Storage: -40 to 165 deg. F
Humidity	0 to 90% non-condensing
ELECTRICAL	
Power:	24VAC +/- 20% 50/60Hz. (Class 2 Power Source) 17VA
	24VDC +/- 10%, 9W
Digital Inputs:	2 dry-contact inputs
Analog Output:	**Software Selectable:** 0-20mA, 4-20mA, 0-10V, 2-10V, 0-5V or 1-5V
	V-out capable of driving 1 K-ohm load @ 10V, I-out capable of driving 1K-ohm load
Configuration Port:	USB Type C
Terminal Blocks:	**Power:** 2-Position, vertical pluggable, Wire Size range - 18-30 AWG
	IO: 5-Position terminal block, Wire size range - 16-30 AWG
Compliance:	CE, RoHS, BTL Listed
Electromagnetic Compatibility:	2014/30/EU, EMC Directive EN61236-1:2013
	2014/53/EU, Radio Equipment Directive EN301489-1, V1.9.2:2011 ETSI EN301489-1, V2.2.0:2017 ETSI EN301489-3, V1.6.1:2013/V2.1.1:2017 ETSI EN301489-17, V2.2.1:2012/V3.2.0:2017
Product Safety	2014/35/EU, Low Voltage Directive EN61010-1:2010/A1:2019/AC:2019
FC	**FCC Part 15**
	This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user’s own expense. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

SPECIFICATIONS CONTINUED

Units provided with the optional Bluetooth low energy module contain
FCC ID: XPYNINAB1
IC: 8595A-NINAB1
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two condition;

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

KCC South Korea compliance certification number MSIP-CRM-ULX-NINA-B111

Australia and New Zealand regulatory compliance. The NINA-B1 modules are compliant with AS/NZA 4268:2012?AMDT 1:2013 standard – Radio equipment and systems – Short range devices – Limits and methods of standard measurement made by the Australian Communications and Media Authority (ACMA)

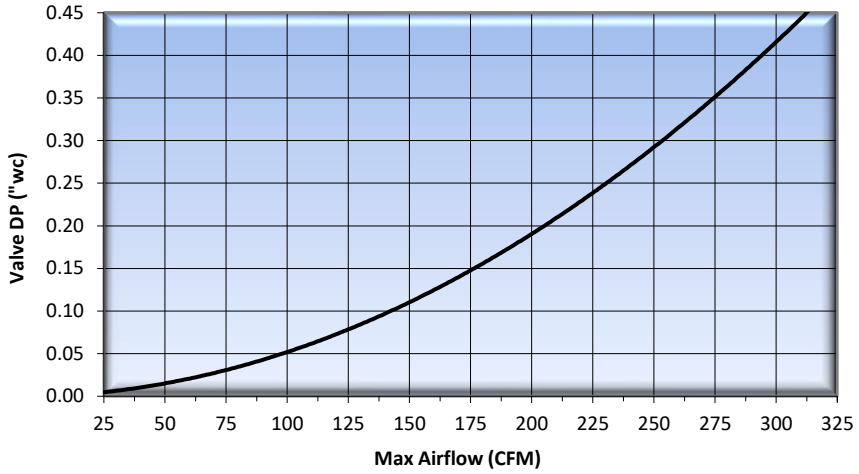
Materials of Construction

Model Material Designator	(2) 304SS	(3) 316SS	(4) Aluminum
Housing	304L SS	316L SS	Al. Alloy 5052-H32
Compression Section	304L SS	316L SS	Al. Alloy 5052-H32
Static Regain Section	304L SS	316L SS	Al. Alloy 5052-H32
End Plate	304L SS	316L SS	Galvanized Steel
Blades	304L SS	316L SS	Galvanized Steel
Shafts	316L SS	316L SS	316L SS
Shaft Bearings	Teflon	Teflon	Teflon
Vortex Sensors	Polycarbonate, UL94-V0	Polycarbonate, UL94-V0	Polycarbonate, UL94-VO
Sensor Tubing	Polyurethane, Ether-based	Polyurethane, Ether-based	Polyurethane, Ether-based
Compression Seals	Viton Rubber	Viton Rubber	EPDM Rubber
Machine Screws	304SS	316SS	304SS
Rivets	304SS	316SS	304SS
Blade Seals (optional)	Viton Rubber	Viton Rubber	EPDM Rubber
Access Cover Gasket	EPDM Blend	EPDM Blend	EPDM Blend

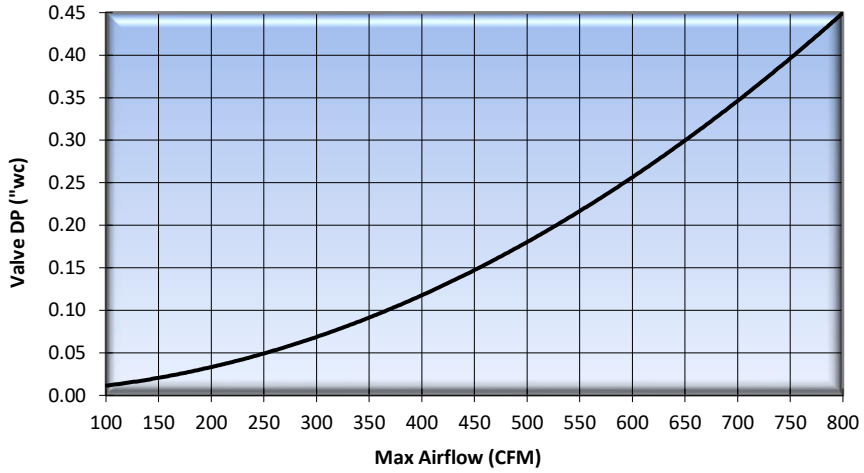
Note 1: *Above list includes only items internal to the valve which are exposed to the airstream.*

2.1 Operating Range

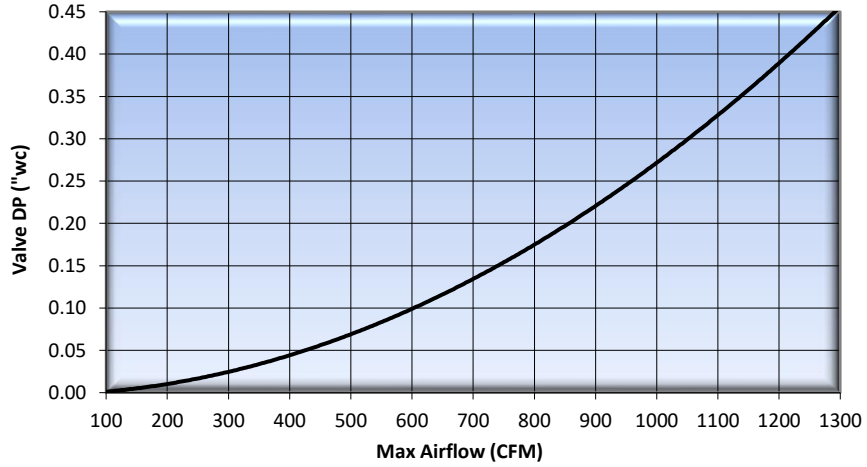
The operating range of each AccuValve is provided below along with a characteristic curve showing the relationship between the minimum operating pressure and maximum airflow volume as tested in accordance with ANSI/ASHRAE STD 130.



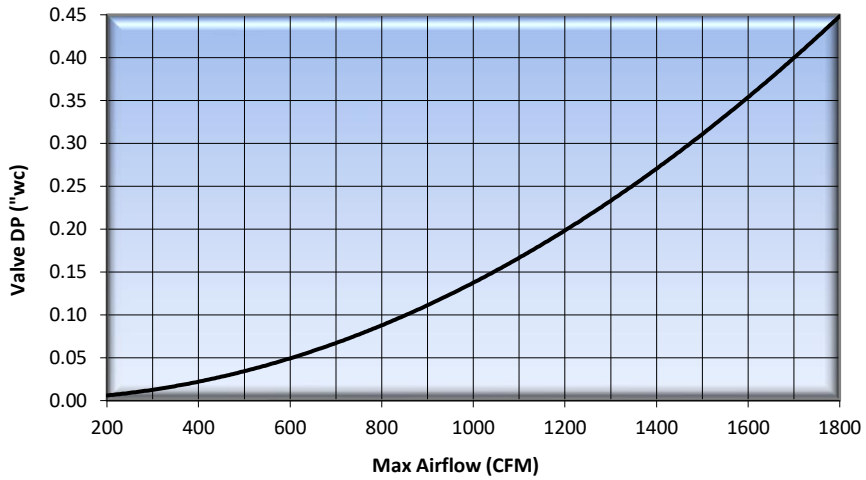
6" AccuValve
Operating Range: 0-315 CFM
Min. Measurement: 30 CFM



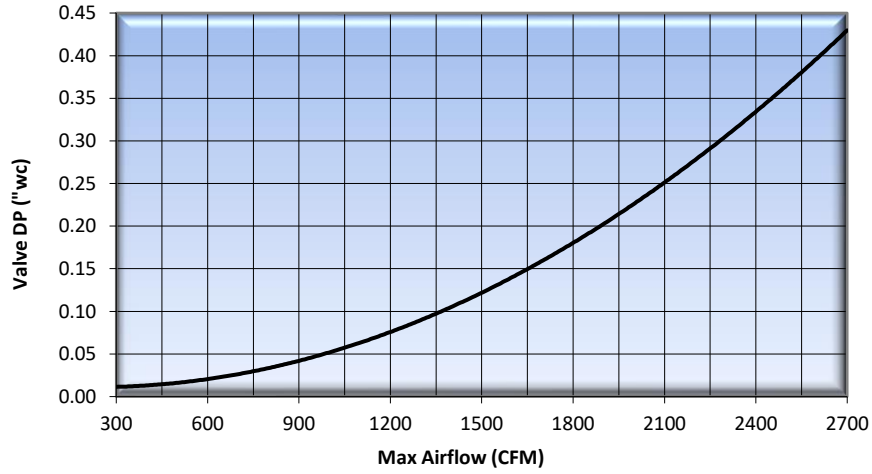
8" AccuValve
Operating Range: 0-800 CFM
Min. Measurement: 80 CFM



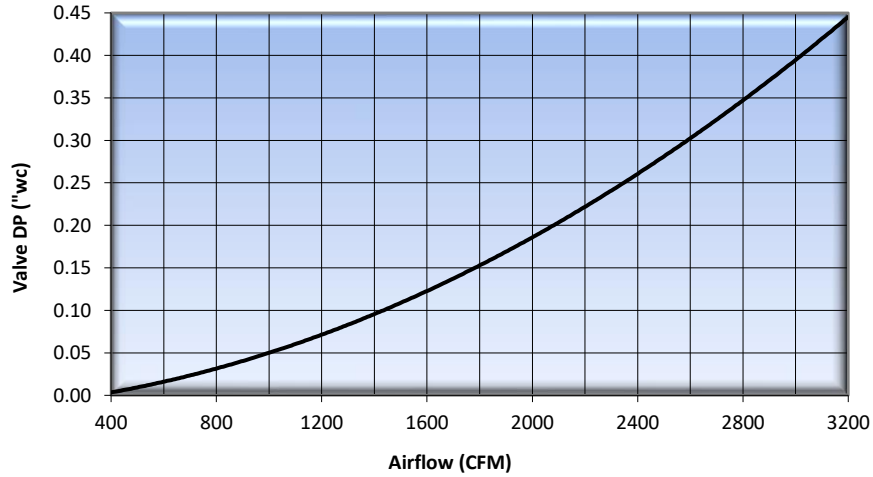
10" AccuValve
Operating Range: 0-1300 CFM
Min. Measurement: 120 CFM



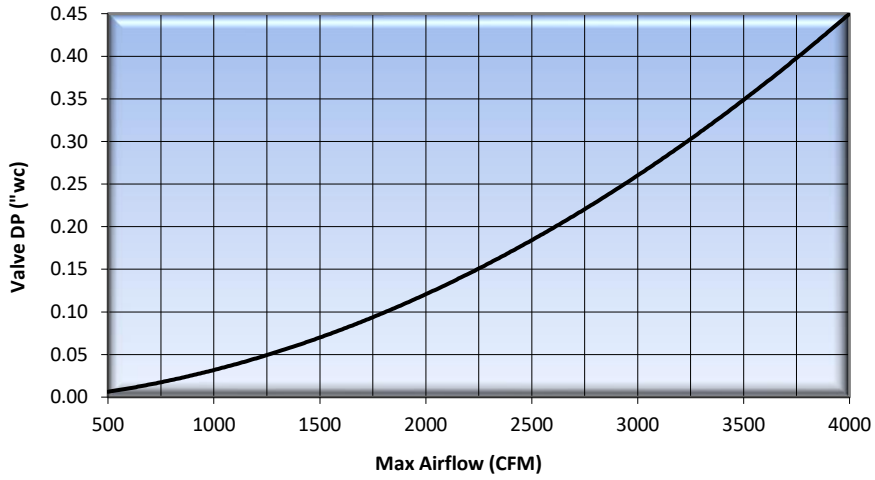
12" AccuValve
Operating Range: 0-1790 CFM
Min. Measurement: 180 CFM



14" AccuValve
Operating Range: 0-2750 CFM
Min. Measurement: 250 CFM



12x18" AccuValve
Operating Range: 0-3200 CFM
Min. Measurement: 260 CFM



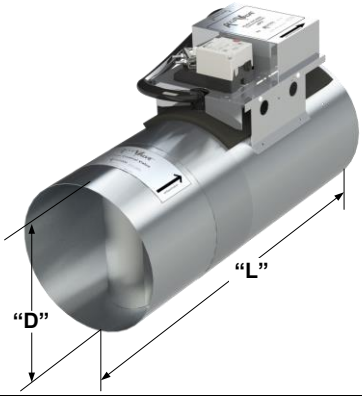
12x24" AccuValve

Operating Range: 0-4000 CFM

Min. Measurement: 350 CFM

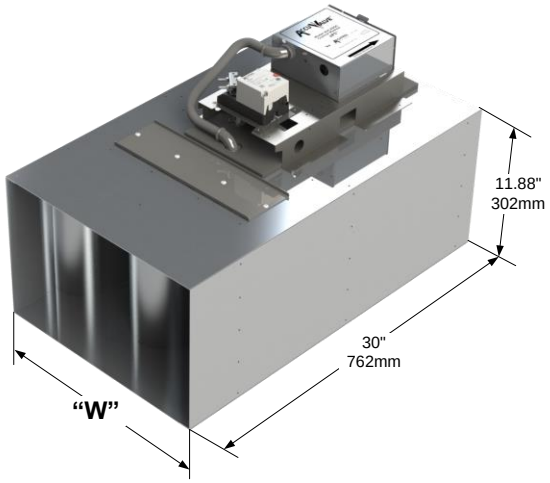
SECTION 3 – PHYSICAL DIMENSIONS & WEIGHTS

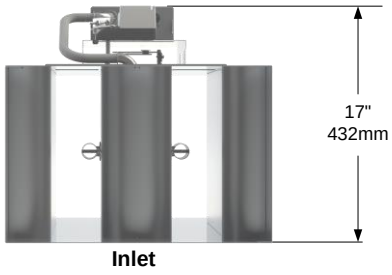
3.1 Round Valve Sizes



Valve Model Size	Dimensions						Weight					
	"D"		"L"		"H"		Stainless Steel		Aluminum		Flange Add	
	in.	mm	in.	mm	in.	mm	Lbs.	kg	Lbs.	kg	Lbs.	kg
06	5.88	149	22	559	10	254	13	5.9	9	4.1	2.0	0.9
08	7.88	200	24	610	13	330	16	7.3	12	5.4	2.6	1.2
10	9.88	250	24	610	15	381	20	9.1	14	6.4	3.2	1.5
12	11.88	300	27	686	17	432	26	11.8	16	7.3	4.5	2.0
14	13.88	350	30	762	19	483	30	13.6	20	9.1	5.2	2.4

3.2 Rectangular Valve Sizes





Valve Model Size	Valve Width "W" Ref Diagram		Weight					
			Stainless Steel		Aluminum		Flange Add	
	in.	mm	Lbs.	kg	Lbs.	kg	Lbs.	kg
18	17.88	454	43	19.5	26	11.8	5.0	2.3
24	23.88	607	49	22.2	29	13.2	5.5	2.5

Note: *All dimensions are to the "outside" and have a tolerance of +/- .062" (1.6mm).*

SECTION 4 - INSTALLATION

Read all instructions and review the installation diagrams provided on the following pages prior to beginning installation.

CAUTION: *Wear eye protection, cut-resistant gloves, and clothing suitable for working with sheet metal. Failure to do so may result in personal injury.*

1. Verify the tag number located on the valve label matches the HVAC schedule.
2. Locate the duct section which the valve is servicing and select a suitable mounting location for the valve.

NOTE: *Though the AccuValve does not require straight-run inlet conditions to operate properly, it's always best to follow HVAC Best Practices for Commercial Buildings during installation which includes locating the valve away from transitions and bends to minimize impact on system static pressure. Also, be sure to select a location that will provide a minimum clearance of 14" (356mm) unobstructed access to the control module, actuator and valve access cover.*

3. Provide an opening in the duct section sized appropriately for the valve being installed.

NOTE: *A slip-fit valve will require an opening approximately 2" smaller than the valve length and a flanged valve will require an opening the same as the valve length. For valve dimensions, reference Section 3.*

4. Install duct hangers within 12" (305mm) from each end of the valve connections. Reference Section 3 for valve weights.

WARNING**:** *Use duct hangers and hardware designed to support the total load of the valve and associated duct sections. Failure to do so may result in serious personal injury or death.*

5. Install the valve into the duct in accordance with the airflow direction label located on the valve. Position the valve for easy access to the control module side. Since the AccuValve is not position sensitive, it can be installed in any plane or rotational axis without having impact on the performance.

NOTE: *Screws, nuts, fasteners, duct sealant, hangers, companion flanges and gaskets are NOT provided by Accutrol.*

4.1 Round Valve Installation Diagrams

WARNING: *Use duct hangers and hardware designed to support the total load of valve and associated duct sections. Failure to do so may result in serious personal injury or death.*

Standard Slip-fit Valve Secured to Duct with Tek Screws.

1. Slip the inlet end of valve into the duct far enough to allow the valve to be lifted into the duct opening.
2. Slip the discharge end of the valve into the duct engaging valve into duct 1" at each end.
3. Position valve to provide unobstructed access to the control module, actuator and access panel.
4. Apply duct sealant and secure valve to duct at both ends using tek-screws.

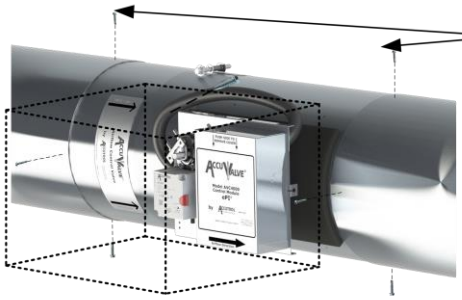


Figure 1

Standard Slip-fit Valve Secured to Duct with Draw Band Clamps

1. Slip the draw band clamps over each end of the duct.
2. Slip the inlet end of the valve into the duct far enough to allow the valve to be lifted into the duct opening.
3. Slip the discharge end of the valve into the duct engaging valve into duct 1" at each end.
4. Position valve to provide unobstructed access to the control module, actuator and access panel.
5. For clean air applications, apply UL181 compliant foil tape over the valve/duct seams.
   For corrosive exhaust applications, apply PTFE tape (available from Accutrol) over the valve/duct seams.
6. Secure both ends of valve to the duct using draw band clamps.

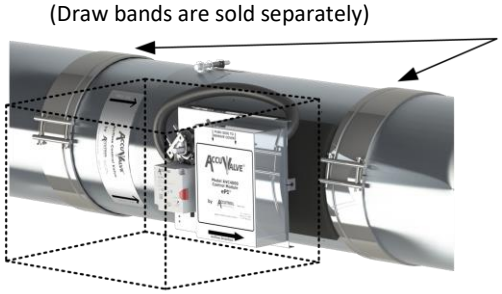


Figure 2

Flanged Valve "Option F" Secured to Duct with Companion Flanges and Hardware

1. Slip the companion flanges over each end of the duct and install to duct as required.
2. Position valve to provide unobstructed access to the control module, actuator and access panel.
3. Install gaskets and/or duct sealant between the valve flanges and companion flanges.
4. Secure valve to duct using appropriate hardware. Reference the Accutrol Van Stone Flange Detail Drawing.

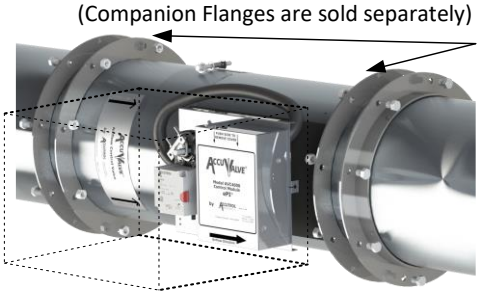


Figure 3

4.2 Rectangular Valve Installation Diagrams

Valve Sizes 18 and 24

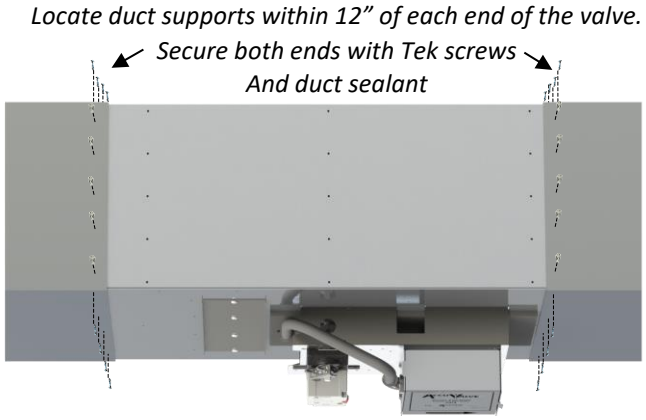
1. Verify the opening in the duct is properly sized for the valve and installation method being used. Also verify both ends of the duct where the valve is to be attached are true and square before attempting to install valve. If the duct ends are not square and true, do not attempt to install valve as it will not operate properly.

2. Lift valve into position to provide unobstructed access to the control module, actuator and access panel.

3. Slip the inlet end of valve into the duct far enough to allow the valve to be lifted into the duct opening.

4. Slip the discharge end of the valve into the duct engaging valve into duct 1" at each end.

5. Secure both ends of valve to duct using tek screws and duct sealant.



NOTE: *It's acceptable to fabricate and install flanges onto the AccuValve and ductwork on location. If flanges are fabricated on site, it's still important to verify both ends of duct are true and square prior to and after installing flanges, otherwise the valve will not operate properly.*

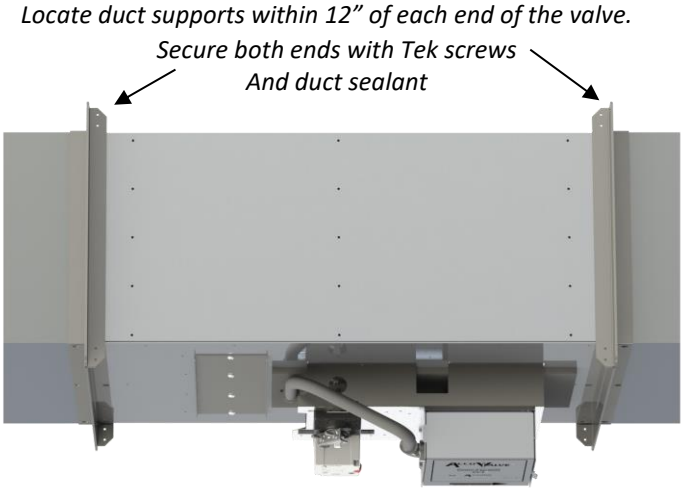
Flanged Valve "Option F"

1. Install companion flanges (provided by others) over each end of the duct.

2. Lift the valve into position to provide unobstructed access to the control module, actuator and access panel.

3. Install gaskets and/or duct sealant between the valve flanges and companion flanges.

4. Secure both ends using tek-screws.



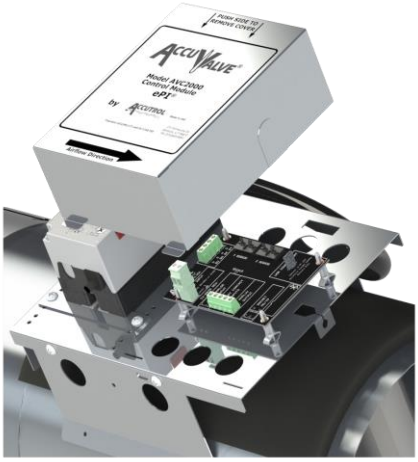
SECTION 5 – WIRING

5.1 AVC2000 Control Module

CAUTION: *Maintain polarity if power source is used for multiple devices, otherwise equipment may be damaged.*

Note*: Connections will vary based on application. For detailed wiring instructions, use this drawing in conjunction with the job specific wiring diagrams.*

Note*: If conduit connection is required, replace strain relief fitting with a .875 (22mm) conduit fitting. (Provided by others)*

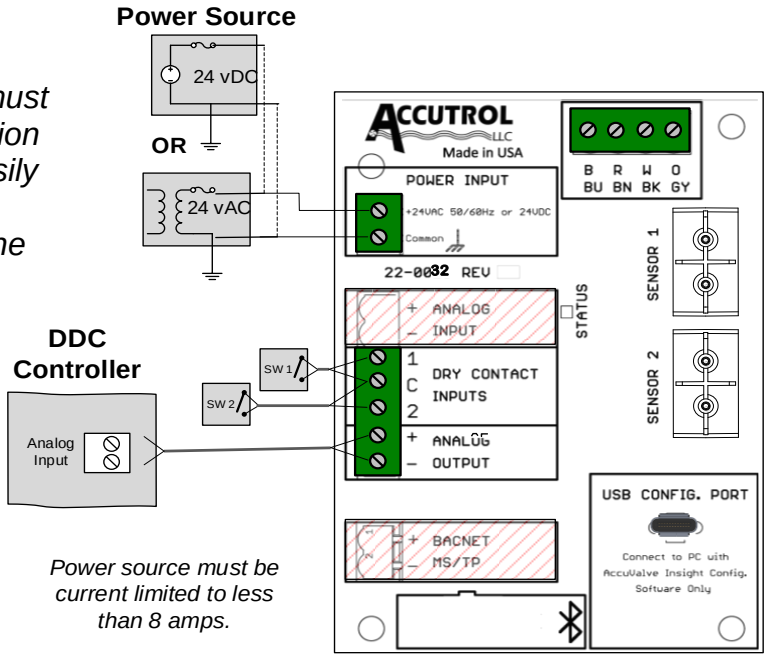


Wiring Instructions

1. Remove cover & route cables through the strain relief fitting into the enclosure.
2. Connect wires to appropriate terminals then secure terminal screws.
3. Insert the ratcheting strain relief over cable(s) and push down until snug.
4. Reinstall cover.

5.2 Control Module Wiring Diagram: Connections will vary based on application.

NOTE:
Switch or circuit breaker must be included in the installation and located where it is easily reached and marked as disconnecting device for the equipment.



Power source must be current limited to less than 8 amps.

WARNING*: During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. This work shall be performed by a licensed electrician or qualified individual who has been properly trained in handling live electrical equipment. Failure to follow all electrical safety precautions when exposed to live electrical components may result in serious injury or death.*

WARNING: *Do not use enclosure as junction box for other equipment.*

SECTION 6 – ACCUVALVE INSIGHT CONFIGURATION SOFTWARE

AccuValve Insight is a software configuration tool that provides a means to communicate directly with the AVC AccuValve. All that's required is a Windows 10 computer or tablet with a USB Port, USB cable and the AccuValve Insight Software.

6.1 Minimum Requirements for PC

- Windows 10 computer or tablet with a USB 2.0 port

6.2 Installing the AccuValve Insight Software

Before starting the install process, close any programs running on the computer.

- Download the **AccuValve Insight Software** from http://www.accutrolllc.com.
- Run setup and follow the on-screen instructions.

6.3 AccuValve Insight Software Product Registration

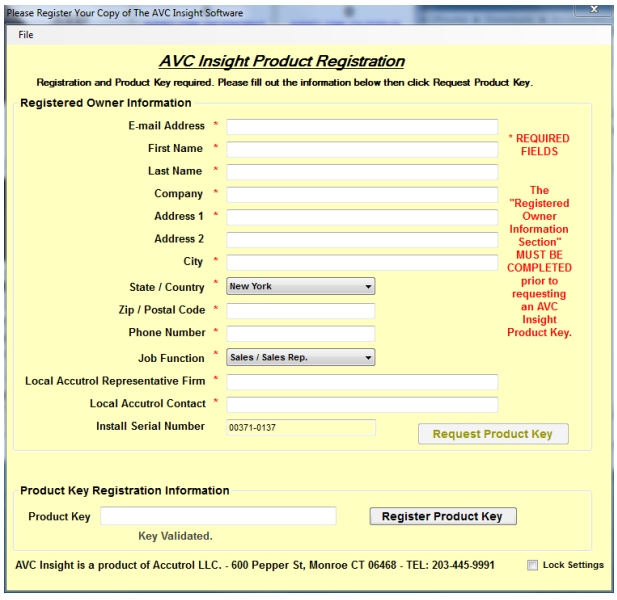
After the software has been installed on your computer, you will need to register the product and obtain a valid software key from the factory by performing the following steps.

Note: *This process will require an automatic email to be generated from your computer, therefore you will need to have internet access to generate the key request.*

a. Double click on the desktop shortcut created during installation.

b. Complete the Product Registration Form.

c. Select "Request Product Key" to generate a "key request" email to the factory.



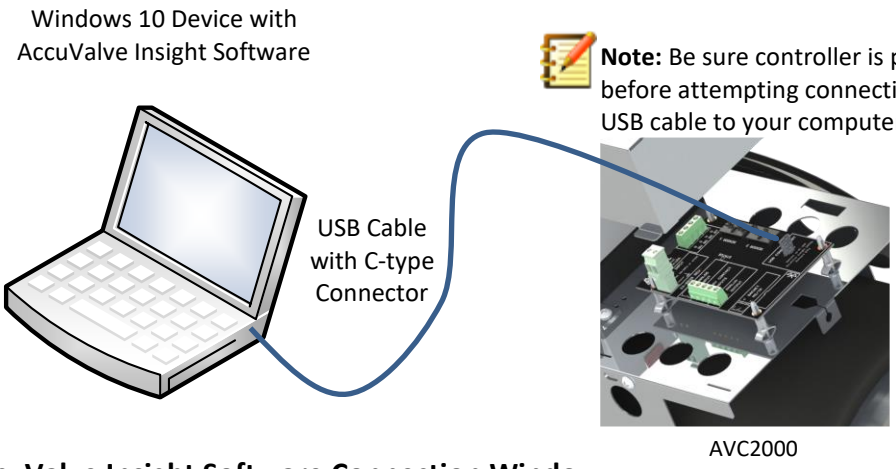
d. The factory will issue a Product Key to the email provided on the Registration Form.

e. Copy and paste the Product Key into the field provided at the bottom of the form then select "Register Product Key".

f. You will now be able to use the AccuValve Insight Software on this computer. If you have any problems, contact Accutrol LLC at 203-445-9991.

6.4 Connecting the computer to the AVC Control Module

6.4.1 Connecting to a standard AVC2000 using USB cable

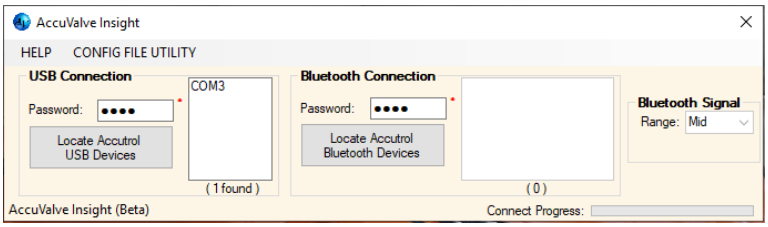


Note: Be sure controller is powered before attempting connection with the USB cable to your computer.

6.5 AccuValve Insight Software Connection Window

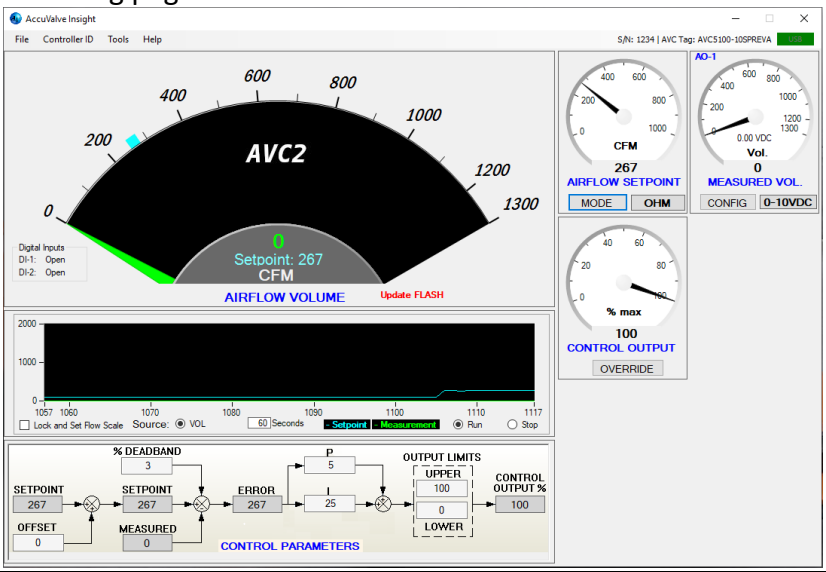
To open the AccuValve Insight application double click on the desktop shortcut or go to the Start Menu and select Programs > AccuValve Insight.

To communicate to the AVC2000 via USB connection, select “Locate Accutrol Devices” then select the com port associated with the AVC2000 that your computer is connected to.



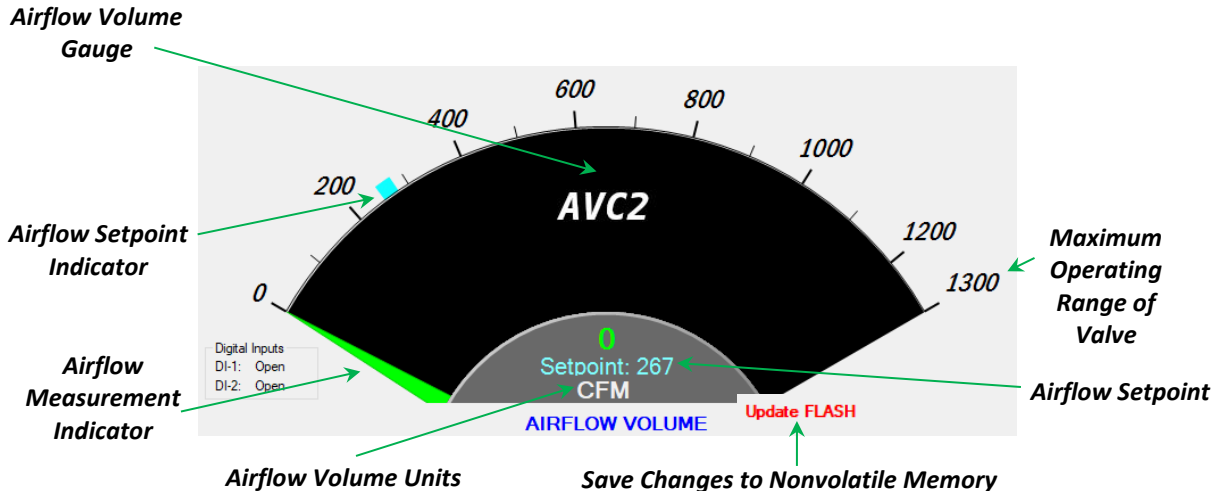
6.5.1 AccuValve Insight Dashboard

The Dashboard provides real-time performance information while also serving as an intuitive graphical user interface that is easy to understand while providing access to the most common field-configurable parameters with one click. The Dashboard that is pictured below is connected to an AVC2000 control valve. A brief description of each Dashboard object is provided on the following pages.



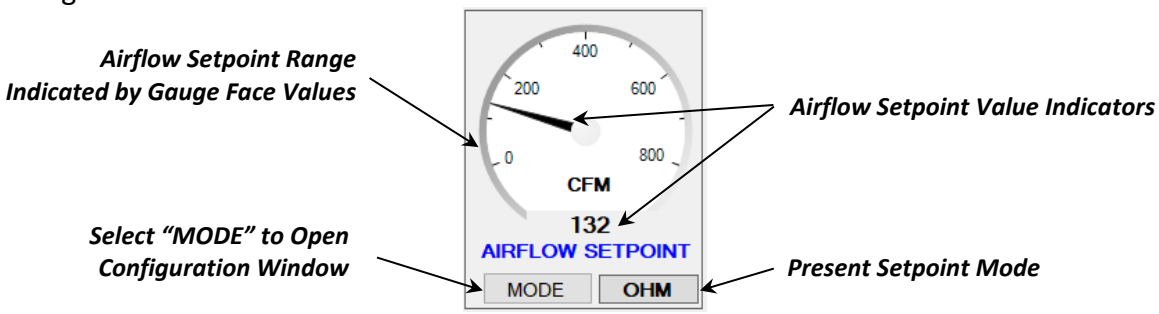
6.5.2 Airflow Volume Gauge

The Airflow Volume Gauge provides the most critical real-time operating parameters of the AVC2000. The Airflow Volume Gauge is an "information only" object; therefore, no field programming can be accessed through the Airflow Volume Gauge.



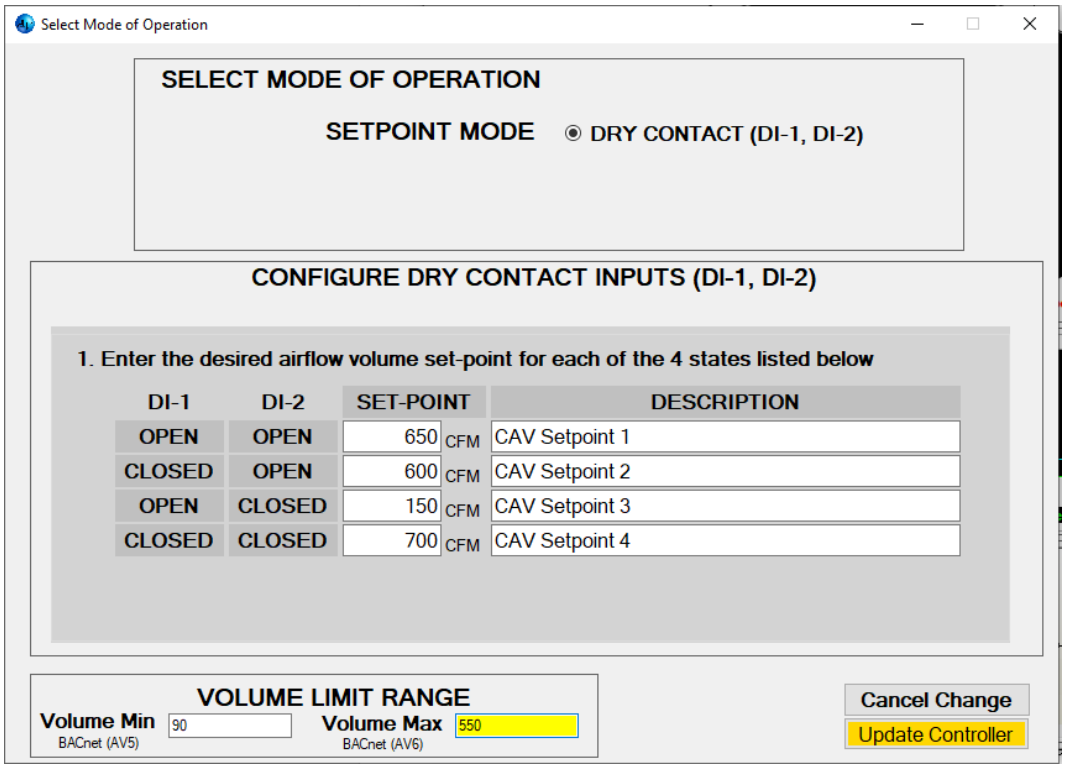
6.5.3 Airflow Setpoint Gauge

The Airflow Setpoint Gauge displays the Airflow Setpoint Value, the Airflow Setpoint Range and the Airflow Setpoint Operating Mode. Access to the Mode Configuration Menu is provided by selecting the "MODE" button.



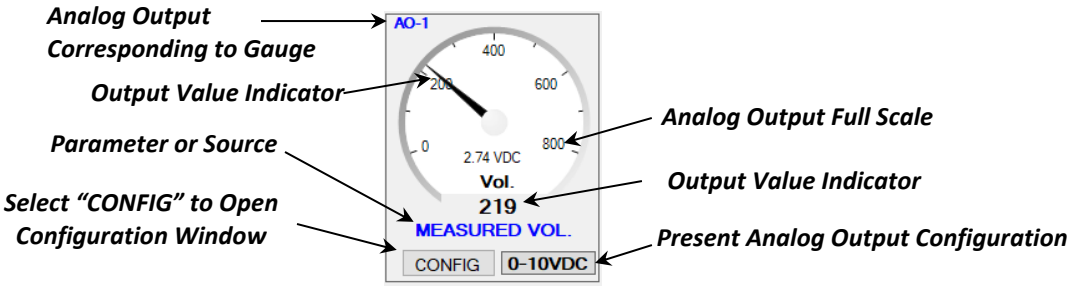
6.5.4 Configuring the AVC2000 Set Points

Setpoint Source = Dry Contact Inputs (DI-1, DI-2)
The following example shows how the controller would be configured to receive up to 4 different setpoints from the Dry Contact Inputs (DI-1 and DI-2).



6.5.5 Analog Output Gauge

The Analog Output Gauge is provided for indicating the status and configuration of the Analog Output. The Analog Output Configuration Menu is provided by selecting the "CONFIG" button.



6.5.5.1 Analog Output Configuration

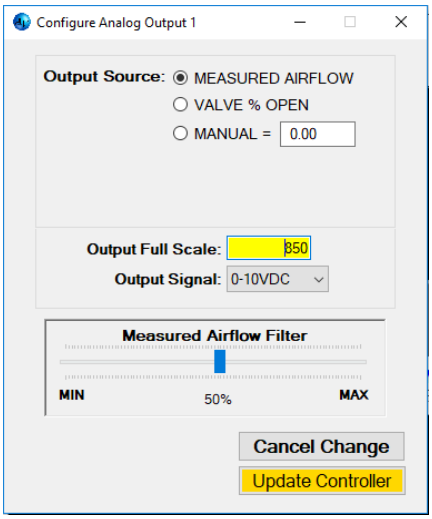
Selecting the "CONFIG" button on the Analog Output Gauge will open a window that will enable you to enter the configuration parameters available for that Analog Output. The examples provided below explain the parameters available and how to configure each.

Output Source Selected: **MEASURED AIRFLOW** sets the AO to correspond with the measured airflow volume.

Output Full Scale: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 850 cfm for this example.

Output Signal Type: Select from dropdown list. For this example, 10v corresponds to 850 cfm.

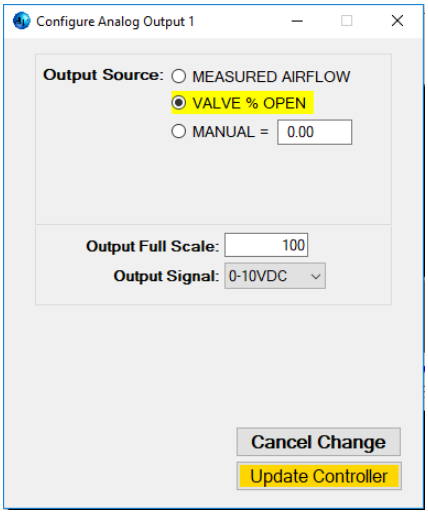
Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.



Output Source Selected: **VALVE % OPEN** sets the AO to correspond with the valve % open value.

Output Full Scale: Provides the full-scale range of the AO Signal and the corresponding AO Gauge.

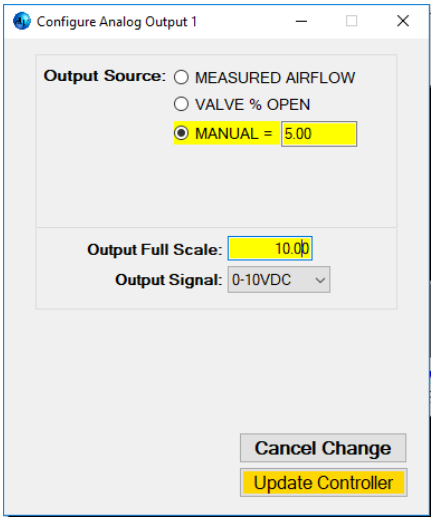
Output Signal Type: Select from dropdown list. For this example, 10v corresponds to 100 % open.



Output Source Selected: **MANUAL** sets the AO to correspond with the value entered in the box to the right of the "=" sign

Output Full Scale: Provides the full-scale range of the AO Signal and the corresponding AO Gauge. This example is set for a full scale of 10.00 units, which is based on the signal type selected.

Output Signal Type: Select from dropdown list. For this example, 10v corresponds full scale. Setting Manual = 5 with the Output Full Scale set to 10.00 will result in AO = 5v.



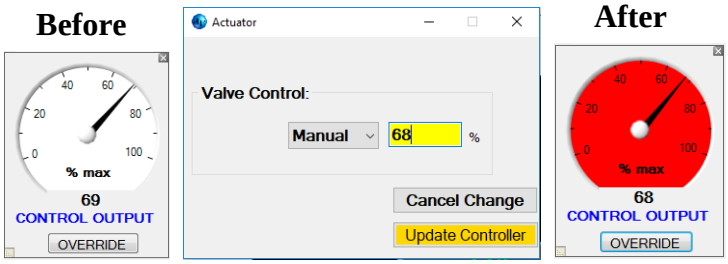
6.5.6 Control Output Gauge

The Control Output Gauge displays the Control Output % and provides a means for overriding the control-loop enabling direct command of the actuator.

6.5.6.1 Control Output Override

To override the control to Manual;

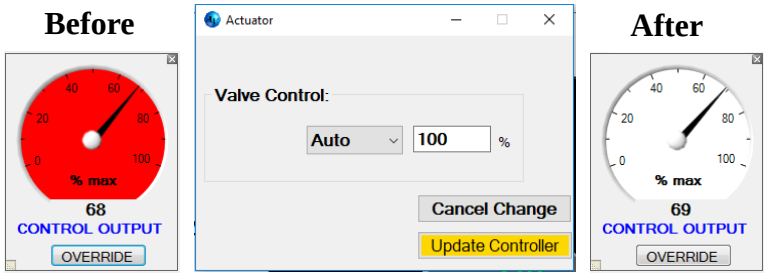
1. Select the OVERRIDE button at the bottom of the Control Output Gauge.
2. Select "Manual" and enter the desired control output % to position the actuator.
3. Select Update Controller.



NOTE: *Because the Override function is not intended to be used for extended durations the manual override value is not saved to the controller's nonvolatile memory. A power cycle will release the control to Auto.*

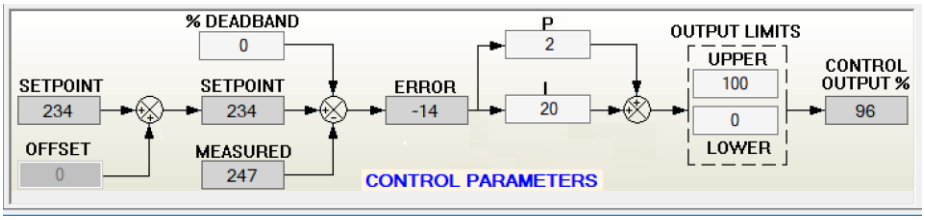
To return to Auto Control;

4. Select the OVERRIDE button at the bottom of the Control Output Gauge.
5. Select "Auto".
6. Select Update Controller.



6.5.7 Control Parameters Diagram

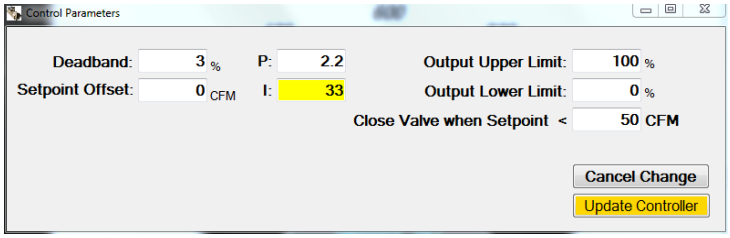
The Control Diagram provides real-time information of the parameters associated with the closed-loop control function. Configurable parameters are displayed in the white boxes and non-configurable parameters are displayed in gray. Each parameter is briefly described below.



- **SETPOINT:** The SETPOINT value is based on the controller "Operating Mode" and is not a configurable parameter in the CONTROL OBJECT. The Min and Max Volume Setpoint values can be displayed by hovering the mouse over the SETPOINT box. The SETPOINT display box will change to yellow when the calculated setpoint value is greater than the maximum or less than the minimum allowable value.
- **OFFSET**: The OFFSET value is a configurable parameter which is normally used in tracking pair applications. The sum of the OFFSET and SETPOINT make up the control loop SETPOINT value. Polarity can be either positive or negative, based on application. The offset parameter is disabled when operating in Fume Hood Mode.
- **% DEADBAND**: The % DEADBAND value is a configurable parameter which is applied as a percentage of the SETPOINT value. The purpose of the DEADBAND is to improve control loop stability by holding the control output constant until the ERROR exceeds the % DEADBAND. The DEADBAND also serves to reduce the wear and tear on the actuator.
- **MEASURED:** The MEASURED value is the airflow measurement provided by the airflow sensors and is not a configurable parameter. The airflow measurement value is the process variable which closes the feedback loop.
- **ERROR:** The control ERROR is difference between the SETPOINT and MEASURED values. The control ERROR is input to the PI algorithm which generates the control output.
- **P & I:** The AVC utilizes a parallel PI algorithm which includes two configurable parameters, "P" (Proportional Gain) and "I" (Integral). Both parameters act in parallel on the same error and are combined to generate the control output signal. Increasing the "P" term makes the control loop more sensitive and less stable. The "I" term, sometimes referred to as "automatic reset", increases the control output by the integral of the error. Increasing the "I" term makes the control loop more sensitive and less stable. Both the "P" and "I" terms can vary based on the valve size and operating parameters. The factory default values for P & I will accommodate the majority of applications.
- **OUTPUT LIMITS:** The control output limits are configurable parameters which are essentially clamps for the control output. Normally the LOWER limit is set to 0% and the UPPER limit is set to 100%. The OUTPUT LIMITS are only used for applications that would benefit from limiting the control output thereby preventing the valve from fully closing and/or fully opening.
- **CONTROL OUTPUT:** The CONTROL OUTPUT % is generated by the PI control loop and is used to modulate the valve actuator resulting in a reduced error between the setpoint and measurement.

6.5.7.1 Changing Configurable Control Parameters

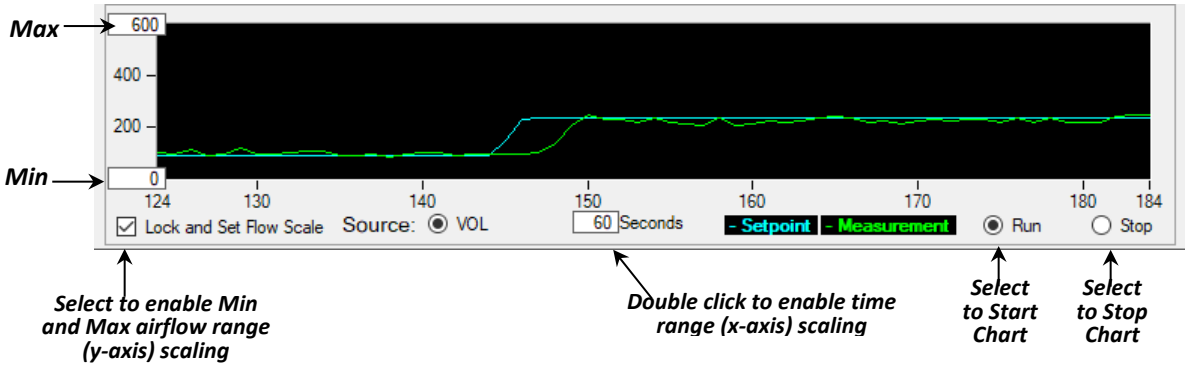
Open the Control Parameters window by double-clicking in the Control Diagram inside one of the white boxes. To modify any of the configuration parameters, enter the desired value in the appropriate box and select "Update Controller" to save the change.



In addition to the parameters described in section 6.5.8, the Control Parameters window includes a value titled "Close Valve when Setpoint < ___CFM". When the Setpoint is less than this value, the controller will drive the valve to the fully closed position.

6.5.8 Strip Chart

The Strip Chart provides a real-time x-y strip chart plot of the Airflow Setpoint and Measurement values with respect to time. The Strip Chart is a useful tool for troubleshooting and evaluating the controller performance. The time scale (x axis) is adjustable between 10 and 300 seconds and the airflow volume scale (y axis) can either be set for auto range or bounded by upper and lower limits.



6.5.9 Dashboard Menus

The area located along the top of Dashboard provides access to Menu Items in addition to displaying information about the device such as; MAC Address, Serial Number, Tag Number and USB/Bluetooth com status. Each of the menu items are described below.

6.5.9.1 File Menu Items

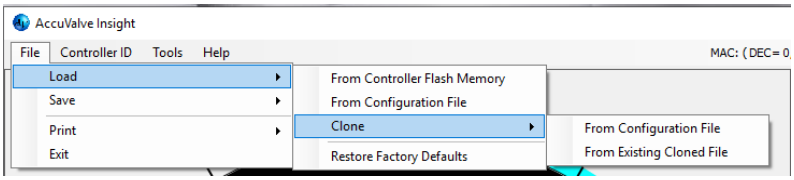
6.5.9.1.1 Load

From Controller Flash Memory loads the configuration file that resides in the AVC controller's nonvolatile memory (FLASH) into the AVC controller's volatile memory (RAM).

From File loads the configuration file that resides in a nonvolatile storage device (i.e. hard drive or USB Flash Drive) to the AVC controller's volatile memory (RAM).

***CAUTION**: This selection will load Configuration Settings and Calibration Data, which is valve size specific. When using this function, verify the configuration file is the correct valve size for the application.*

Clone loads either from a previously existing clone (.avc2c) file or loads from a standard configuration (.avc2) file and then prompts you to convert the standard file into a clone file.



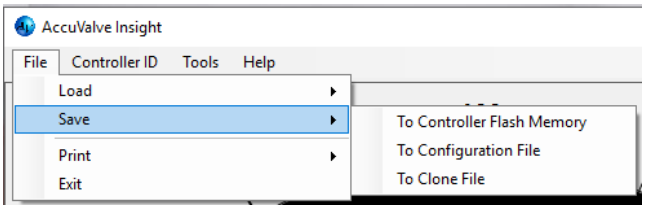
Restore Factory Defaults loads the original factory configuration file that resides in a protected portion of the AVC controller's nonvolatile memory (FLASH) to the AVC controller's volatile memory (RAM).

6.5.9.1.2 Save

To Controller Flash Memory saves the configuration file that resides in the AVC controller's volatile memory (RAM) to the AVC controller's nonvolatile memory (FLASH).

To File saves the configuration file that resides in the AVC controller's volatile memory (RAM) to a nonvolatile storage device (i.e. hard drive, USB flash drive).

To Clone File saves the configuration file that resides in the AVC controller's volatile memory along with more specific clone parameters to a nonvolatile storage device (i.e. hard drive of USB flash drive).



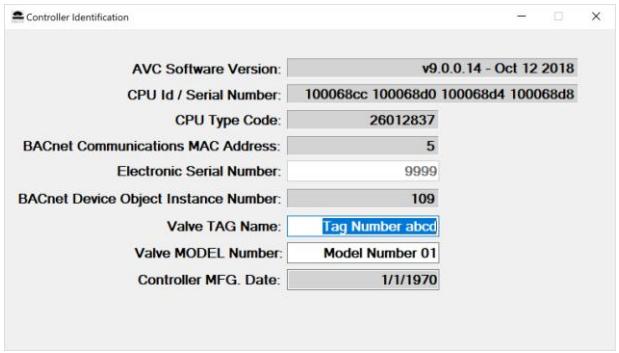
6.5.9.1.3 Print

Parameters Report prints a timestamped PDF document of the primary configuration parameters which reside in the AVC controller's nonvolatile (FLASH) memory.

6.5.9.1.4 Exit

Closes the Dashboard and disconnects the communications.

6.5.9.2 Controller ID



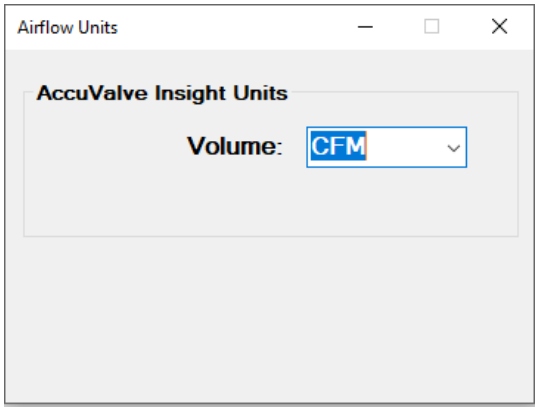
6.5.9.3 Tools

6.5.9.3.1 Close Active Window After Update

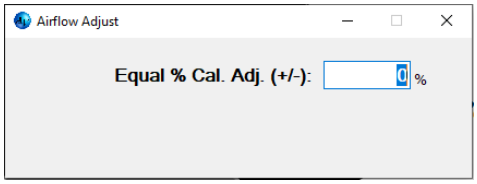
If this item is checked, the active window will automatically close after the change has been saved. If this item is not checked, the active window will remain open until the user closes the window.

6.5.9.3.2 **Airflow Measurement** provides viewing access to the AVC's real-time airflow measurement data window. In addition to providing the factory calibration constants, the Airflow Window also provides the real-time vortex shedding frequency measurement in each chamber of the AccuValve, which can be a useful troubleshooting tool. This window does not provide access for making changes to the calibration data.

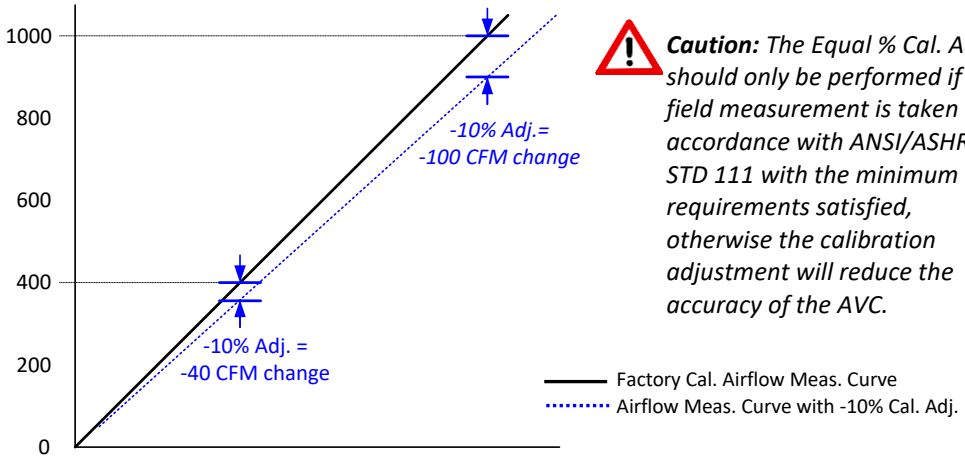
6.5.9.3.3 **Airflow Units** provides a means to set the units for Airflow Volume.



6.5.9.3.4 **Volume Measurement Adjust** is a calibration tool that can be used to correlate the airflow volume measured by the AVC2000 with a field measurement.



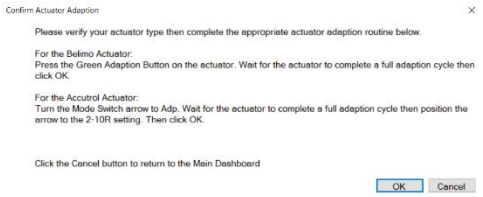
NOTE: *The* ***Equal % Cal. Adj.*** *is a single-step field calibration method which does not overwrite the factory calibration of the AVC2000. Using this function is not normally required (or advisable) and is only provided as a tool for the Airflow Balancer to correlate the AVC airflow measurement to a field airflow measurement. The graph below shows the effect the Equal % Cal Adj. has over the entire operating range.*



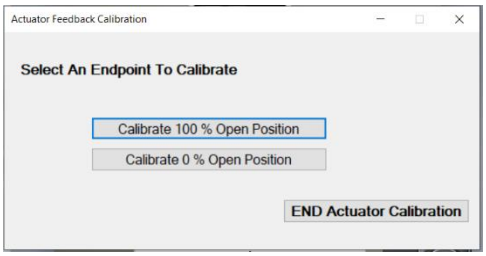
Caution: *The Equal % Cal. Adj. should only be performed if the field measurement is taken in accordance with ANSI/ASHRAE STD 111 with the minimum requirements satisfied, otherwise the calibration adjustment will reduce the accuracy of the AVC.*

6.5.9.3.5 **Actuator Feedback Calibration** provides a means to calibrate the actuator feedback signal to precisely coincide with the "valve % open" parameter. The steps required to calibrate the actuator feedback are provided below.

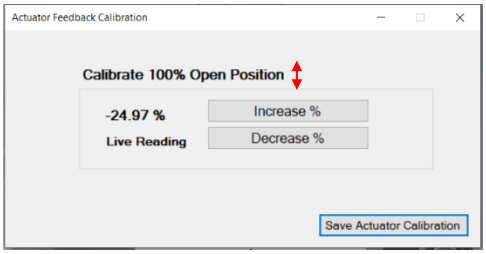
Step 1: Press the Adaption Button on the Actuator, Select **OK** after Complete.



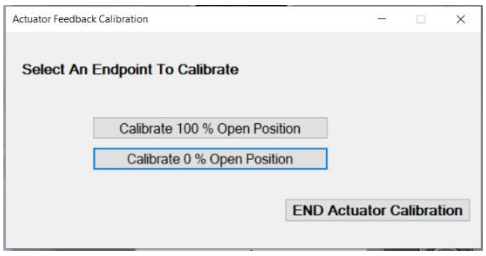
Step 2: Select **Calibrate 100% Open Position** to Drive Valve to the Full-Open Position.



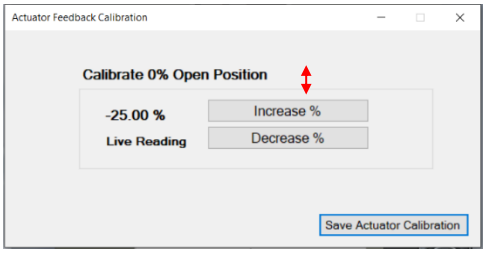
Step 3: Select **Increase %** or **Decrease %** to Adj. Live Reading to 100%. Save Actuator Calibration when done.



Step 4: Select **Calibrate 0% Open Position** to Drive Valve to the Closed Position.

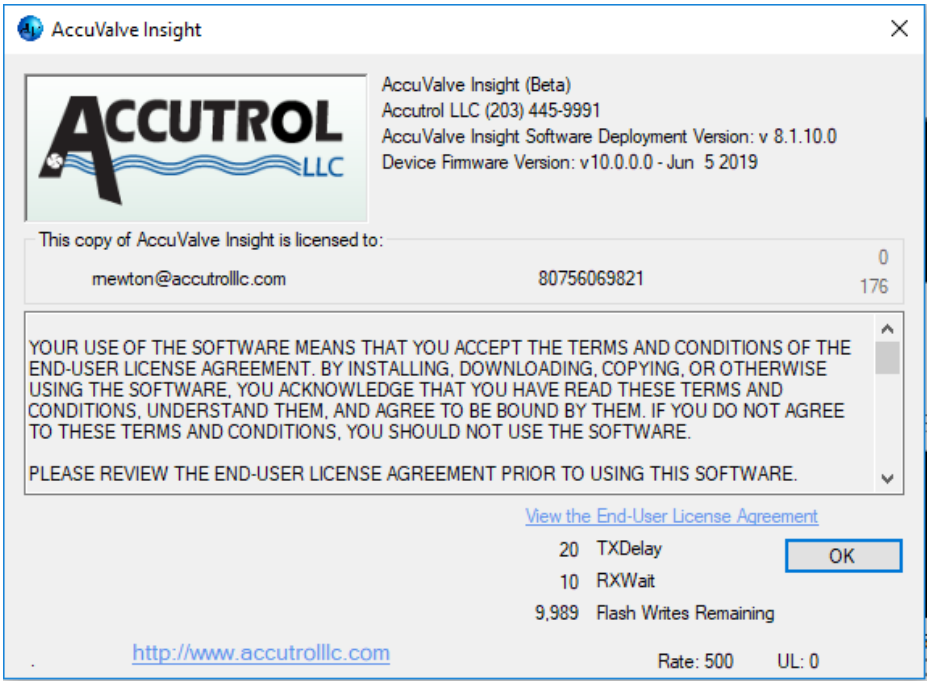


Step 5: Select **Increase %** or **Decrease %** to Adj. Live Reading to 0%. Save Actuator Calibration when done.



6.5.9.4 Help

About AccuValve Insight dialog box is shown below.

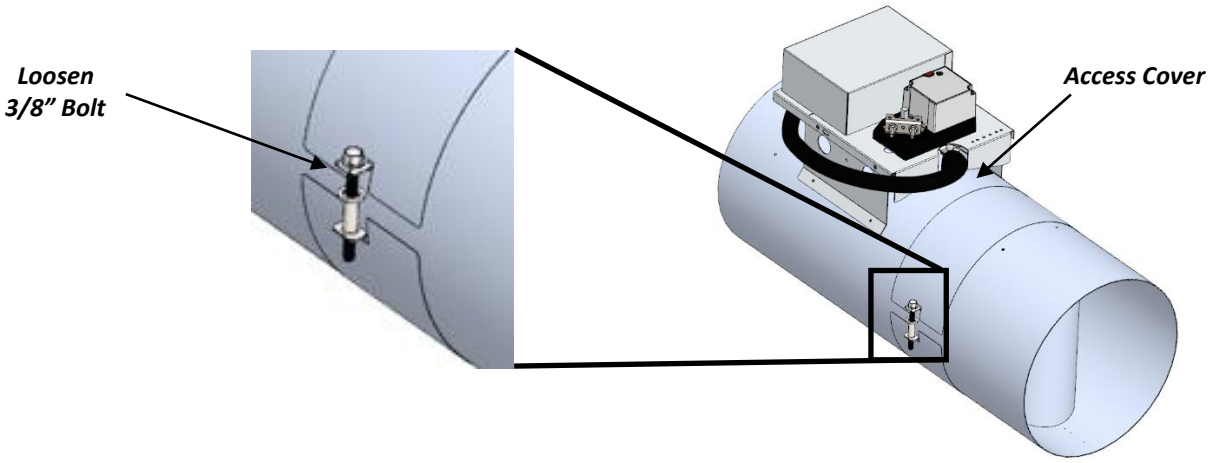


SECTION 7 – MAINTENANCE

Scheduled maintenance for the AVC is not required; however each AccuValve does include an access cover which can be removed to inspect the airflow sensors if desired.

7.1 Round Valve Access Cover

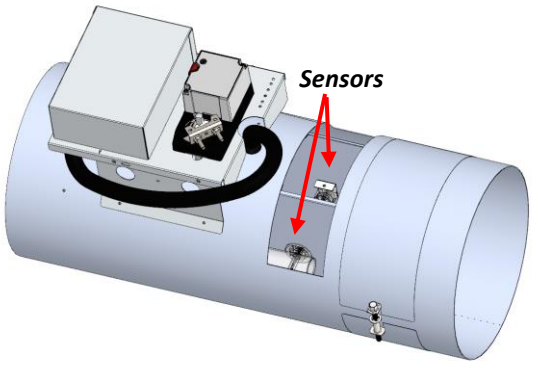
CAUTION: *Wear eye protection, cut-resistant gloves and clothing suitable for working with sheet metal. Failure to do so may result in personal injury.*



7.1.1 Loosen the 3/8" bolt enough to allow the access door to slide forward.

CAUTION: *If the bolt is removed from the captive nut, the access cover can spring open possibly causing injury.*

7.1.2 Using two hands; squeeze the access cover and slide it forward over the valve enough to uncover the access opening.



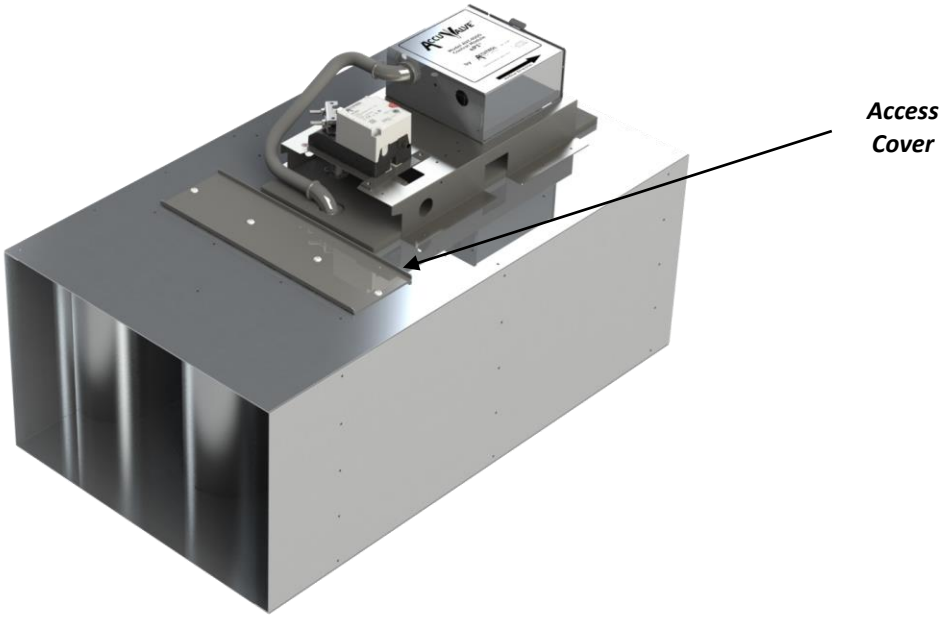
7.1.3 Once the cover is slid forward or removed, the airflow sensors can be visually inspected.

7.1.4 When inspection is complete, slide the access cover over the opening, being careful not to damage gasket in the process.

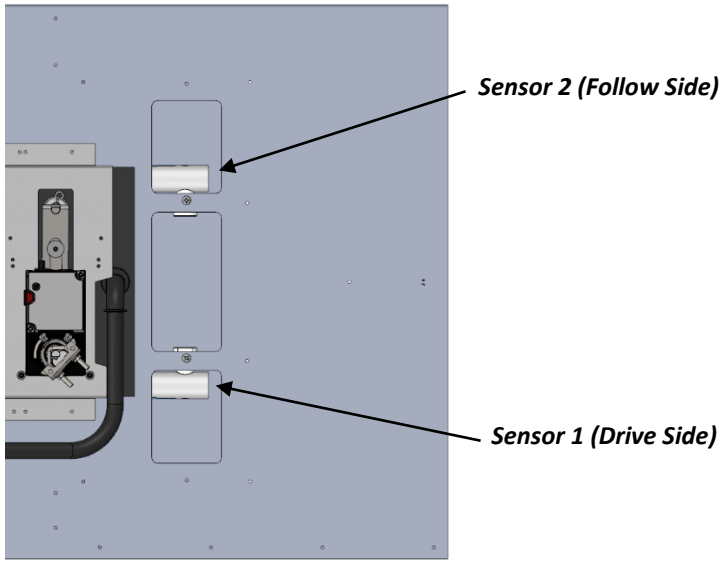
7.1.5 Verify the access cover is in position to completely cover the opening. Secure cover in place by tightening the 3/8" bolt using care not to over tighten.

7.2 Rectangular Valve Access Cover

CAUTION: *Wear eye protection, cut-resistant gloves and clothing suitable for working with sheet metal. Failure to do so may result in personal injury.*



7.2.1 The access cover is secured to the valve using (4) #2 blunt-head Phillips head screws. To inspect the sensors, remove the access cover by removing the screws using a #2 Phillips head screw driver. Put the screws aside for reinstalling the cover later.



7.2.2 Once the cover is removed the sensors are accessible for inspection.

7.2.3 When inspection is complete, place the access cover in position and secure using the same screws previously removed.