

Venturi Air Valve for Critical Environments

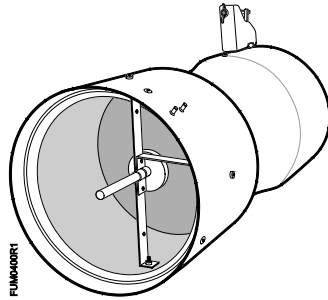


Figure 1: Venturi Air Valve.

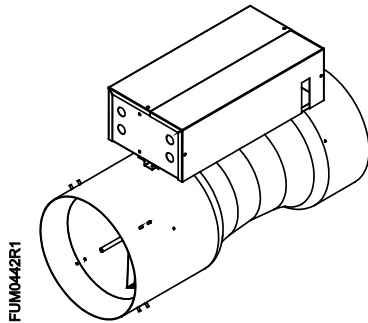


Figure 2: Venturi Air Valve with Enclosure.

Product Description

The Siemens Venturi Air Valve is a pre-packaged, easy to install airflow measurement and control solution. It provides stable and precise airflow control of room supply, room general exhaust or fume hood exhaust.

Options

- Sizes 6 in, 8 in, 10 in, 12 in, 2 x 10 in, 2 x 12 in, 3 x 12 in
- Aluminum or Heresite coated construction
- Laboratory Room Controller (LRC) in an enclosure with or without Fume hoods
- Constant Air Volume Controller (CAV)
- Variable Air Volume Controller (VAV)
- Hot water reheat coils (one or two row)

Electronic Actuation

Control packages including fast-acting or basic electronic actuation (optional) and a differential pressure transmitter (optional). These parts are included in an enclosure that is factory-mounted to the outside of the valve.

Expected Installation Time

30 minutes

Required Tools and Materials

- Small flat blade screwdriver
- 3/8-inch open end wrench
- Needle nose pliers
- Sealant
- 1/4-inch poly tubing

Prerequisites

- Valve ductwork free of debris
- Construction filters in place
- Supply/Exhaust ductwork installed
- Water lines installed (if reheat coils are used)



NOTE:

Valves should be located so that they do not come in contact with rigid conduit, sprinkler piping, Greenfield metal covering, or rigid pneumatic tubing. Do not install valves tight against concrete slabs or columns because vibrations are amplified through these structures. Also, allow clearance for service access to controls.

Instructions

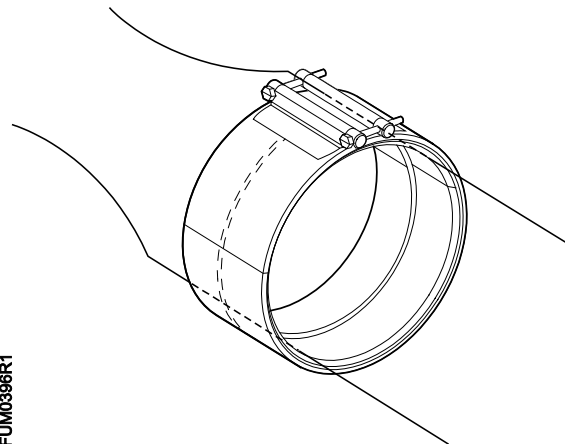
Installation instructions for the Venturi Air Valves are presented for various actuator types. These instructions consist of the following:

- Section 1 — mounting the valve.
- Section 2 — adjusting AVC airflow.
- Section 3 — actuation and sensors.

Section 1: Mounting

1. Move the valve to the installation area. Remove the valve from the shipping package. Do not carry the valve by the flow sensor, valve extension rod or any controls. See Table 1 for single-body and Table 3 for multi-body valve measurements.
NOTE: Take care not to break or bend the airflow sensor taps during installation.
2. Verify the correct airflow direction and orientation of the valve in the ductwork (for example, Horizontal).
NOTE: Before installing the valve, hold in the intended position and push on the cone inside the valve to ensure that it moves freely.
NOTE: Valves that are not mounted in a true horizontal or vertical position as determined by a level may have performance issues. If a controls enclosure is attached to the valve, the controls enclosure must be mounted vertically.

3. Support the ductwork within 12 inches of the valve.
NOTE: For single bodied air valves, do not crimp or otherwise deform the ends of round air valves.
4. Connect the ductwork to the valve's inlet collar using drawband, bolting or other accepted trade practice.



FUM0396R1

Drawband connection for ductwork and valve.

5. Connect the ductwork to the valve's outlet collar using drawband, bolting or other accepted trade practice.
6. Seal all ductwork and check that the duct connections are airtight.

Table 1. Single-body Venturi Air Valve Dimensions.

Air Valve Size	Length (L)		Inlet/Outlet Outside Dia. (OD)		Overall Height (H _o)		Overall Height with Enclosure (H _E)		Overall Width with Enclosure (W _E)	
106	21 3/4	552	5 15/16	151	13 15/16	354	13 7/8	352	9 1/4	235
108	24 3/4	629	7 7/8	200	15 7/8	403	14 7/8	378	9 1/4	235
110	26 1/2	673	9 7/8	251	17 7/8	454	15 7/8	403	10	254
112	29 1/2	749	11 7/8	302	19 7/8	505	17 7/8	454	12	305

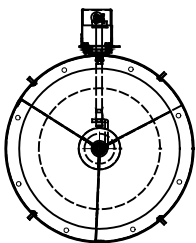
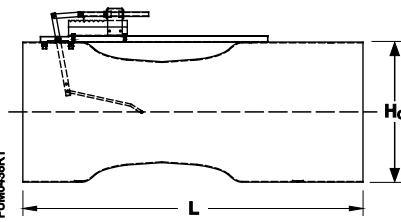
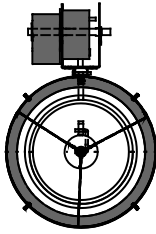
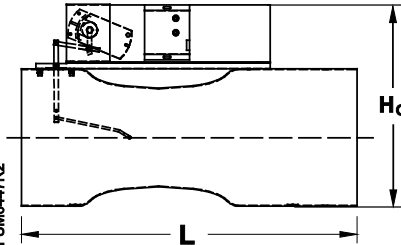
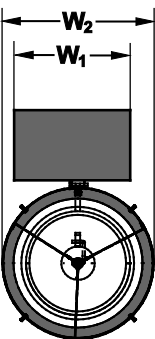
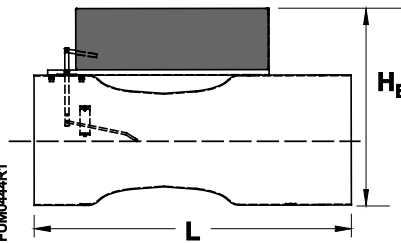
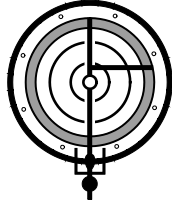
Inlet	Side/Bottom (Inlet on Right)	Description
 FUM0437R1	 FUM0438R1	AVC Constant Volume No actuator H _o = OD + 4"
 FUM0446R1	 FUM0447R2	AVV Variable Volume with Actuator Bracket H _o = OD + 8"
 FUM0494R1	 FUM0444R1	AVV Variable Volume with Enclosure W _E = Max [W ₁ or W ₂] Allow 12" spacing around enclosure for access.
 FUM0429R1	Flanged ends are available for single-body Air Valves, without bolt holes.	
		Flange End 1.5" wide.

Table 2. Multi-Body Venturi Air Valve Dimensions.							
Slip configuration (S & I)							
Size	Matching Duct Minimum Inside		Matching Duct Outside Dimension		Face-to-face Length ^{a)} (L ₁)	Slip Tab Length	Overall Height with Enclosure
	Height	Width	Height (H)	Width (W)			
2x10	10	21	11	22	29 1/2	1.5	19
2x12	12	25	13	26	32 1/2	1.5	21
3x12	12	38	13	39	32 1/2	1.5	21
Flange Configuration (F & J)							
Size	Matching Duct Minimum Inside		Matching Duct Outside Dimension		Face-to-face Length ^{a)} (L ₁₋₃)	Flat flange No Holes	Overall Height with Enclosure
	Height	Width	Height (H)	Width (W)			
2x10	10	21	12	23	26 1/2		19
2x12	12	25	14	27	29 1/2		21
3x12	12	38	14	40	29 1/2		21

a) Slip end Air Valves need an extra 3 inches of clearance during installation.

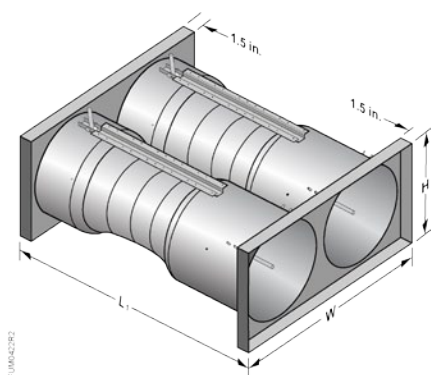


Figure 3: Dual Air Valve — Slip End.

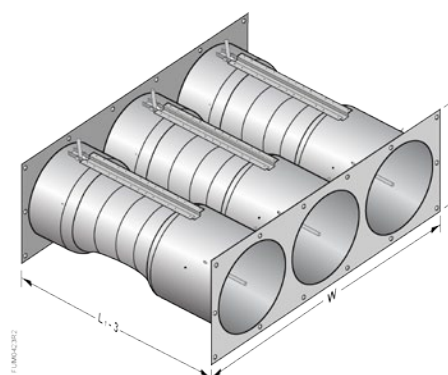


Figure 4: Triple Air Valve — Flange End.

Section 2: Adjusting AVC Valve Airflow

The control arm is held in place by a threaded rod with two nuts on opposite sides of the flange on the indicator gauge. To change the flow setting:

1. Locate the nut on the upstream side of the indicator gauge flange (side towards the inlet of the air valve, where the flow sensor is located). This is the calibration locking nut. Loosen this nut and back it off to provide sufficient distance to adjust the flow.
2. Locate the nut on the downstream side to move the control arm. This is the flow adjustment nut. Turning this nut clockwise reduces the airflow. To increase the airflow rate, turn the flow adjustment nut counter-clockwise.
3. Once the required airflow has been achieved, tighten the calibration locking nut.

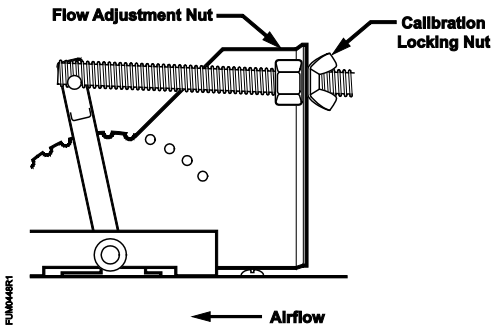


Figure 5: Style1 AVC.

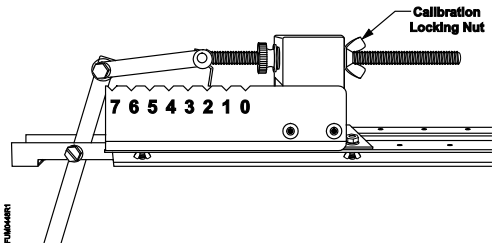


Figure 6: Style 2 AVC.

Section 3: Controls, Sensors and Actuation

Differential Pressure Transmitter

Connect a two-conductor 20 AWG cable to the controller's 4 to 20 mA input. Connect the wire to the differential pressure transmitter or through the wiring bushing/knockout to the differential pressure transmitter inside the enclosure. Connect the cable to the differential pressure transmitter.

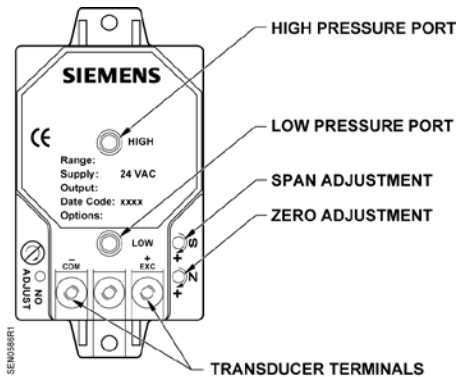


Figure 7: Differential Pressure Transmitter Wiring Connections.

GMA 121 Actuation

2-position control, 24 Vac/dc.

Table 4. 2-position Control 24 Vac.				
Standard Symbol	Function	Terminal Designation	Color	Color Symbol
1	Supply (SP)	G	Red	RD
2	System Neutral	G0	Black	BK

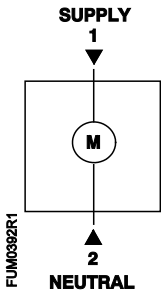


Figure 8: 2-position GMA 121 Actuators.

GDE/GLB 131 Actuation

Wiring

- All wiring must conform to NEC and local codes and regulations.
- Use earth ground isolating step-down Class 2 transformers. Do not use auto transformers.
- Determine the supply transformer rating by summing total VA of all actuators used.

Three-position control (24 Vac), 24 Vac power supply.

Table 5. 3-position Control 24 Vac.				
Standard Symbol	Function	Terminal Designation	Color	
			Standard	Plenum
1	Supply (SP)	G	Red	Red
6	Control signal clockwise	Y1	Violet	Violet
7	Control signal counter-clockwise	Y2	Orange	Orange

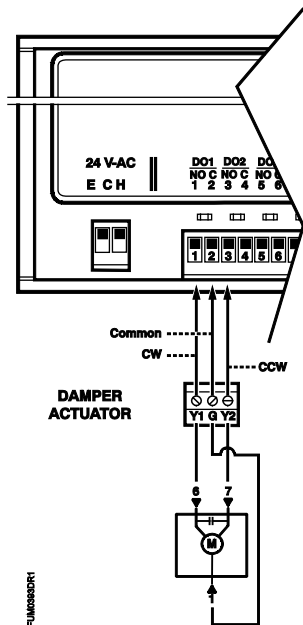


Figure 9: Actuator wiring for VAV/CV TECs.

GLB/GDE/GMA 161 Actuation

Modulating control (0-10V), 24 Vac/dc.

Table 6. Modulating Control 24 Vac.				
Standard Symbol	Function	Terminal Designation	Color	Color Symbol
1	Supply (SP)	G	Red	RD
2	System Neutral	G0	Black	BK
8	Input Signal: 0-10 Vdc (GMA161) or 2-10 Vdc (GMA15x)	Y	Gray	GY
9	Position Output: 0-10 Vdc (GMA161) or 2-10 Vdc (GMA15x)	U	Pink	PK

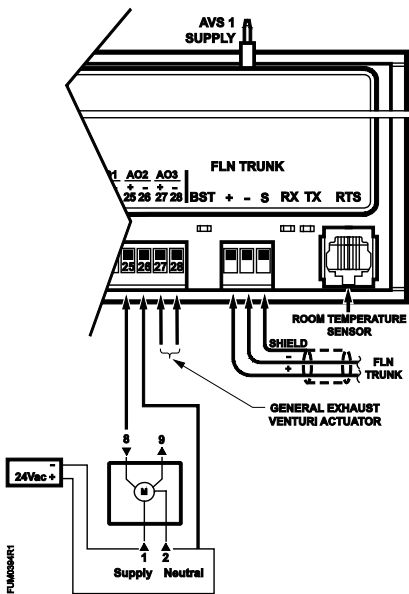
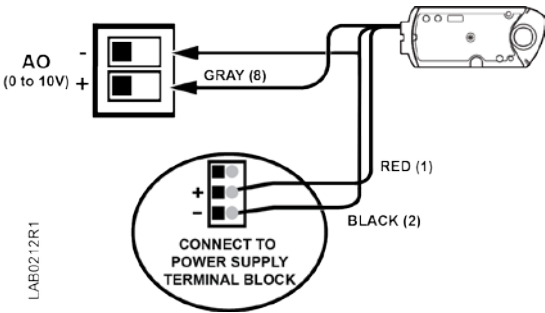


Figure 10: Actuator wiring for Basic LRC.

GNP191 Actuation— Modulating Control (0 to 10 Vdc)

1. Connect the Fast Acting Lab Electronic Actuator to a source of 24 Vac power.



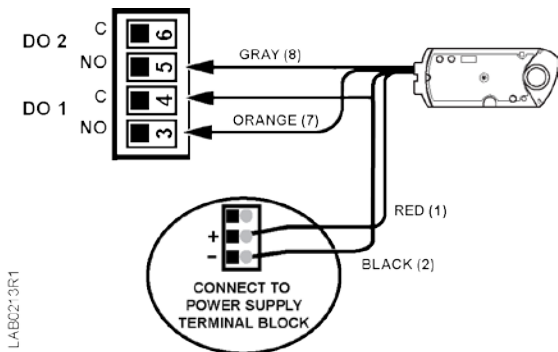
2. Connect the wire from the Fast Acting Lab Electronic Actuator to the controller.



Switch Settings for the Fast Acting Lab Electronic Actuator.

GNP191 Actuation — Pulsed Control

1. Connect the Fast Acting Lab Electronic Actuator to a source of 24 Vac power.



2. Connect the wire from the Fast Acting Lab Electronic Actuator to the controller.



Switch Settings for the Fast Acting Lab Electronic Actuator.

	CAUTION
	<p>This actuator requires a maximum of 20 VA, 24 Vac source.</p> <p>DO NOT connect any other non-isolated devices to the transformer that powers the electronic actuator or the hot water valve actuator.</p>



NOTE:
See the *Open Air® GNP/GAP Fail-Safe/Fail-in-Place 53 lb-in (6 Nm), Rotary, Electronic Damper Actuators Technical Instructions (155-771)* for more details.

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