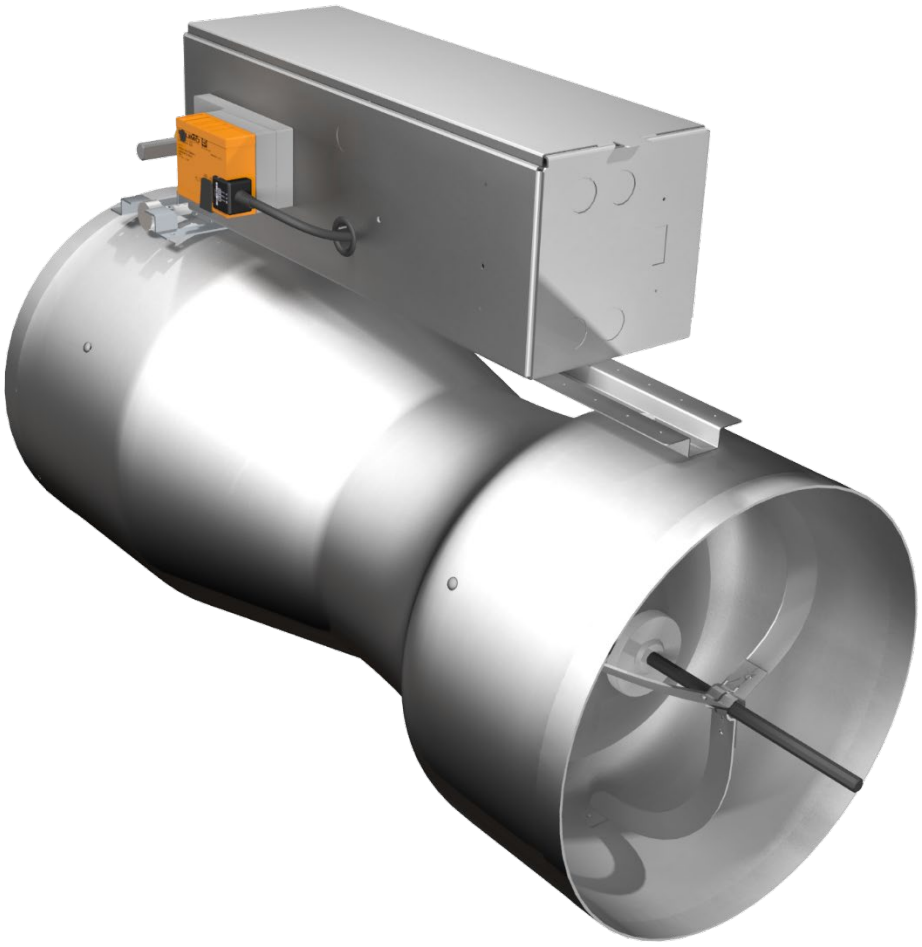
VENTURI VALVE



MANUAL v119

ANTEC controls by price

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INTRODUCTION

General

In this manual, you will find information regarding:

- Venturi Valve (VV) specifications
- How to install the VV with Constant Volume, Variable Volume and Two Position (2P) Switch
- Detailed description of all options available for each setup

Safety Precautions

1. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
2. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
3. Use this unit only in the manner intended by the manufacturer.
4. Before servicing or cleaning unit, switch power off at service panel and lock service panel to prevent power from being switched on accidentally.
5. Protect flammable materials nearby when brazing, use flame and heat protection barriers where needed. Always have a fire extinguisher ready.
6. The manufacturer assumes no responsibility for personal injury or property damage resulting from improper handling, installation, service or operation of the product.

Caution to Contractors

Venturi Valves are not intended for use as temporary heat or ventilation sources during building construction. The units are not designed nor equipped to operate in a dusty construction environment. Internal parts can become coated in construction dust, resulting in loss of calibration and excess wear on the product which in turn can contribute to reduced life.

This mark indicates an important point for the proper function of the Venturi Valve and any of its accessories. Pay close attention to all caution points throughout this manual.

For support and in-depth training on this product and other associated system components, please contact your local Antec Controls Representative.

For more information visit www.AntecControls.com

Product Overview

Venturi Valves (VV) are mechanically pressure independent airflow control valves designed specifically for room pressure and fume hood control applications.

Some of the key features include:

- Electronic airflow feedback prevents dust/lint contamination from deteriorating airflow reading
- Characterized using NVLAP-accredited airflow stations
- Medium or low-pressure operation
- Operating pressure feedback

Technical Specifications

Environmental (Operating)	50°F to 122°F (10°C to 50°C), 5% to 95% R.H. (non-condensing)
Environmental (Storage)	-22°F to 122°F (-30°C to 50°C), 0% to 95% R.H. (non-condensing)
Valve Body	14 Ga Aluminum
Cone	16 Ga Aluminum
Shaft	Teflon Coating 316 Stainless Steel
Shaft Supports	316 Stainless Steel
Shaft Bearings	Wear-resistant with Teflon additive

Airflow Ranges

Standard Valve Body Venturi Valves

	Medium Pressure (0.6 to 3.0 in.w.c.) (149.3 to 746.5 Pa)		Low Pressure (0.3 to 3.0 in.w.c.) (74.7 to 746.5 Pa)	
Unit Size	Minimum CFM (L/s)	Maximum CFM (L/s)	Minimum CFM (L/s)	Maximum CFM (L/s)
108	35 (17)	700 (330)	35 (17)	500 (236)
110	50 (24)	1000 (472)	50 (24)	550 (260)
112	90 (42)	1500 (708)	90 (42)	1200 (566)
114	200 (94)	2500 (1180)	200 (94)	1400 (660)
210	100 (48)	2000 (944)	100 (48)	1100 (519)
212	180 (84)	3000 (1416)	180 (84)	2400 (1132)
214	400 (188)	5000 (2360)	400 (188)	2800 (1320)
312	270 (126)	4500 (2124)	270 (126)	3600 (1699)
314	600 (282)	7500 (3540)	600 (282)	4200 (1980)
412	360 (168)	6000 (2832)	360 (168)	4800 (2264)
414	800 (376)	10000 (4720)	800 (376)	5600 (2640)

Shutoff Valve Body Venturi Valves

	Medium Pressure (0.6 to 3.0 in.w.c.) (149.3 to 746.5 Pa)		Low Pressure (0.3 to 3.0 in.w.c.) (74.7 to 746.5 Pa)	
Unit Size	Minimum CFM (L/s)	Maximum CFM (L/s)	Minimum CFM (L/s)	Maximum CFM (L/s)
108	35 (17)	600 (283)	35 (17)	400 (188)
110	50 (24)	850 (401)	50 (24)	550 (260)
112	90 (42)	1300 (614)	90 (42)	900 (424)
114	200 (94)	1500 (708)	-	-
210	100 (48)	1700 (802)	100 (48)	1100 (519)
212	180 (84)	2600 (1227)	180 (84)	1800 (840)
214	400 (188)	3000 (1415)	-	-
312	270 (126)	3900 (1842)	270 (126)	2700 (1260)
314	600 (282)	4500 (2167)	-	-
412	360 (168)	5200 (2454)	360 (168)	3600 (1680)
414	800 (376)	6000 (2830)	-	-

NOTES:

1. Factory calibrated controls must be selected within the flow range limits.
2. When setting the flow, the value must be greater than the minimum setting and within the range limits. Selection of air flow below the listed values is not recommended. Stability and accuracy may not be acceptable at lower than recommended air flow limits.
3. Pressure ranges are measured across valve static pressure ports.
4. Standard Valve Body VVs are available in Horizontal, Vertical Up and Vertical Down orientations.
5. Shutoff Valve Body VVs are only available in Horizontal orientations.
6. Size 114, 214, 314 and 414 Shutoff VVs are only available in Medium Pressure.
7. Low Leakage Shutoff VVs are only available in Medium Pressure Size 108, 110, 112, 212 and 312.

GETTING STARTED WITH THE VENTURI VALVE (VV)

Receiving Inspection

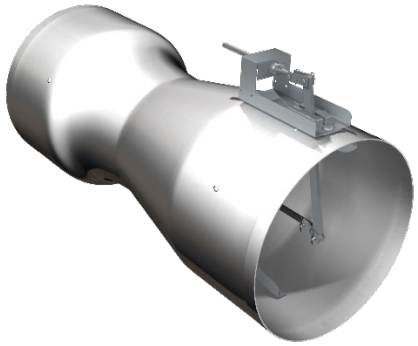
After unpacking the assembly, check carefully for shipping damage. If any damage is found, report it immediately to the delivering carrier. During unpacking and installation, do not handle the valve by the inlet cone shaft or center shaft support bracket. Damage may result from improper handling.

CAUTION

Do not tamper with the linkage assembly as the valve is shipped factory calibrated. Never carry or lift the valve by the linkage assembly support brackets, or control box.

In the Box

For each of the available options, the order includes the following components outlined in this section.

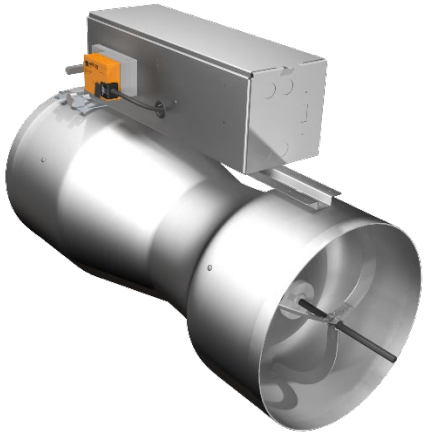


Constant Volume (CV) Venturi Valve

CV valves will ship with the below components.

Component	Quantity	Description
Valve Body	1, 2 or 3	Venturi Valve **NOTE:** Dual and Triple CV valves will be shipped as a ganged assembly. Each individual valve body will come with its own Constant Volume Assembly.
Constant Volume Assembly	1, 2 or 3	Single constant volume assembly.

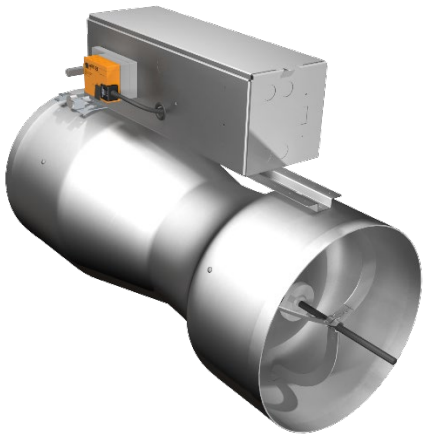
NOTE: The Constant Volume Assembly must be field assembled after installation.



Variable Air Volume (VAV) Venturi Valve

VAV valves will ship with the below components.

Component	Quantity	Description
Valve Body	1, 2 or 3	Venturi Valve **NOTE:** Dual and Triple VAV valves will be shipped as a ganged assembly.
Green Pressure Tubing	1	The low-pressure tubing comes factory installed connected to the valve's control system and a connector tee for field verification.
Red Pressure Tubing	1	The high-pressure tubing comes factory installed connected to the valve's control system and a connector tee for field verification.
Actuator	1 or 2	The actuator is factory mounted on the mounting bracket and shaft. **NOTE:** Triple valves will be shipped with 2 actuators.
Controls Enclosure	1	Enclosure for the controls system.
Controller	1	PACE, FVM, or LMX are factory installed in the control's enclosure.



Two Position (2P) Venturi Valve

2P valves will ship with the following components.

Component	Quantity	Description
Valve Body	1, 2 or 3	Venturi Valve **NOTE:** Dual and Triple VAV valves will be shipped as a ganged assembly.
Green Pressure Tubing	1	The low-pressure tubing comes factory installed connected to the valve's control system and a connector tee for field verification.
Red Pressure Tubing	1	The high-pressure tubing comes factory installed connected to the valve's control system and a connector tee for field verification.
Actuator	1 or 2	The actuator is factory mounted on the mounting bracket and shaft and is calibrated to the desired Minimum and Maximum Airflow. **NOTE:** Triple valves will be shipped with 2 actuators.
Controls Enclosure	1	Enclosure for the controls system.
Relay	1	PACE, FVM, or LMX are factory installed in the control's enclosure.

Construction Options

Below is an outline of some of the key options that are available when selecting and ordering Venturi Valves (VV). These options will affect its available flow range, how the valve is installed and under what system conditions it must operate.

See the VV Product Submittal on AntecControls.com for Specifications and Dimensions of each option shown below.

Valve Size

Venturi Valves are available in the following size options. The size selected below will be a factor in determining the airflow range of the valve.

8 inches	
Model:	VV-108
Features:	• Available in Single construction only
10 inches	
Model:	VV-110, VV-210
Features:	• Available in Single and Dual construction • Dual construction is provided in a welded ganged unit and no additional field assembly is required
12 inches	
Model:	VV-112, VV-212, VV-312, VV-412
Features:	• Available in Single, Dual, Triple and Quad construction • Dual and Triple construction is provided in a welded ganged unit and no additional field assembly is required • Quad construction is provided as two dual valves and field assembly is required
14 inches	
Model:	VV-114, VV-214, VV-314, VV-414
Features:	• Available in Single, Dual, Triple and Quad construction • Dual and Triple construction is provided in a welded ganged unit and no additional field assembly is required • Quad construction is provided as two dual valves and field assembly is required

Pressure Range

Venturi Valves (VV) can be ordered for either Medium or Low Pressure operation. This selection will affect the operating airflow range of the valve.

CAUTION

Ensure that the VV is in the specified Pressure Range **before** balancing the valve.

Medium Pressure

Model: VV-M

Features:
- 0.6 to 3.0 in.w.c. differential pressure range
- Offers a large airflow capacity with high turndown

Low Pressure

Model: VV-L

Features:
- 0.3 to 3.0 in.w.c. differential pressure range
- Provides potential for energy savings due to lower pressure requirement

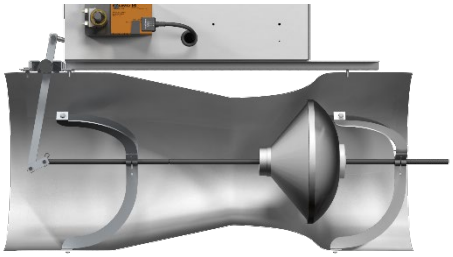
Body Type

Venturi Valves (VV) are available in Standard and Shutoff body types. Shutoff VVs offer the same mechanical pressure independence between their specified airflow ranges, with an additional position to provide 0 CFM (0 L/s).

Standard Valve Body

Model: VV-[Blank]

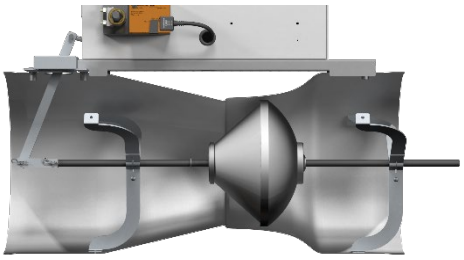
Features:
- Valve provides mechanical pressure independence from Min. Flow to Max. Flow
- Smooth valve body with no contact between the valve body and cone assembly



Shutoff Valve Bodies

Model: VV-SSO

Features:
- Valve provides mechanical pressure independence from Min. Flow to Max. Flow
- Valve provides 0 CFM (0 L/s) when overridden to the minimum position
- Metal on metal seal between the valve body and cone assembly



Model: VV-LLSO

Features:
- Valve provides mechanical pressure independence from Min. Flow to Max. Flow
- Valve provides 0 CFM (0 L/s) when overridden to the minimum position
- Metal on gasket seal between the valve body and cone assembly

Valve Orientation

Venturi Valves (VV) are available in Vertical Up, Vertical Down and Horizontal orientations. An airflow direction label is on the valve and indicates the direction of airflow and the valve's orientation.

CAUTION

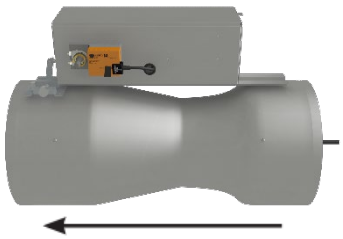
Do not install valves in an orientation other than what is indicated on the valve. Valve performance is not guaranteed in other orientations.

Horizontal

Model: VV-H

Features:

- Airflow travels horizontally through the valve
- For optimal performance, the valve should be mounted +/- 10° from horizontal

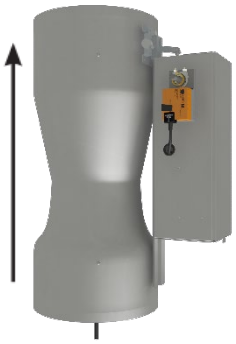


Vertical Up

Model: VV-VU

Features:

- Airflow travels up through the valve
- For optimal performance, the valve should be mounted +/- 10° from vertical

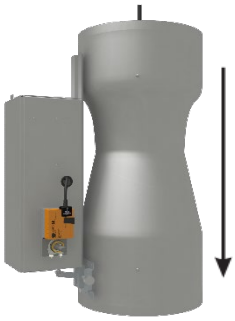


Vertical Down

Model: VV-VD

Features:

- Airflow travels down through the valve
- For optimal performance, the valve should be mounted +/- 10° from vertical



Control Type

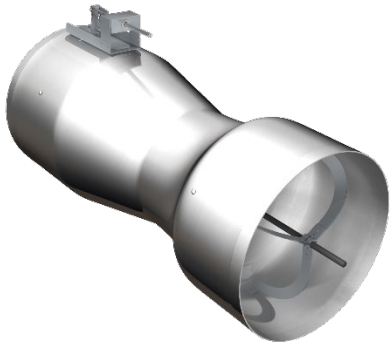
The control type specifies whether the valve is provided with controls and an actuator or is a mechanically fixed assembly.

Constant Volume

Model: VV-CV

Features:

- Mechanical linkage to lock the valve in place
- If airflow adjustments are required, they are done manually
- Mechanical linkage must be assembled in the field prior to turning on the air handler
- No controls are required
- *Optional: Valve Pressure Switch (VPS) can be included for alarming*

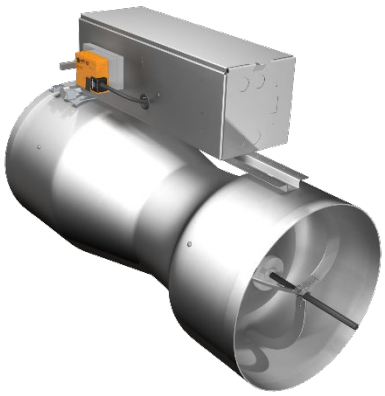


Variable Volume

Model: VV-VAV

Features:

- Actuator controls the valve's position to control to desired airflow setpoint
- Available with factory provided PACE, FVM or LMX
- Factory provided actuator is calibrated and wired
- Linkage is set to provide full range of airflow control



Connection Type

The connection type of the Venturi Valve (VV) will determine how the valve is installed in the ductwork. See the Installation Instructions section for more detail on the installation process.

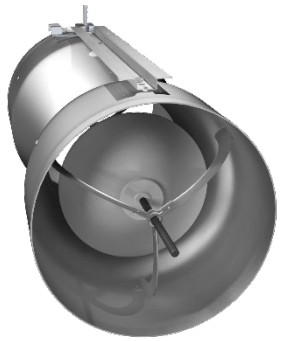
Slip

Model: VV-SL

Features:

- VV does not contain any mounting holes
- Single sizes are designed to slip into nominal sized round ductwork
- Dual, Triple and Quad sizes are designed to slip over rectangular ductwork

NOTE: See the Installing the Venturi Valve for detailed installation instructions.



Flanged

Model: VV-FL

Features:

- VV comes with pre-welded mounting flange

NOTES:

- See the Installing the Venturi Valve for detailed installation instructions.
- See the VV Product Submittal for hole pattern and dimensions.

Coating

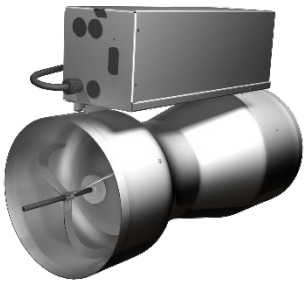
Venturi Valves (VV) are available in four different protective coating options depending on the application.

Aluminum

Model: VV-AL

Features:
- Aluminum valve body with Stainless Steel (SS) internal hardware

NOTE: Can be mounted using sheet metal screws.

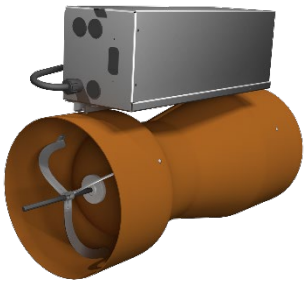


Phenolic – Class 1

Model: VV-P1

Features:
- Phenolic coated valve body with Stainless Steel (SS) internal hardware
- Scratches and holes can compromise the coating

NOTE: Do not use sheet metal screws in valve body.

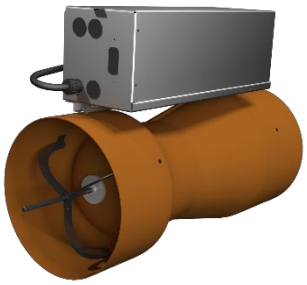


Phenolic – Class 2

Model: VV-P2

Features:
- Phenolic coated valve body with PVDF coated internal hardware
- Scratches and holes can compromise the coating

NOTE: Do not use sheet metal screws in valve body.

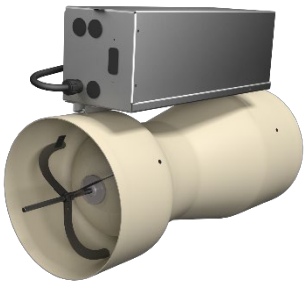


PVDF Kynar

Model: VV-K

Features:
- Kynar coated valve body with PVDF coated internal hardware
- Scratches and holes can compromise the coating

NOTE: Do not use sheet metal screws in valve body.



INSTALLATION & MOUNTING INSTRUCTIONS

Installing the Venturi Valve (VV)

The instructions below detail general installation of a VV without the use of any valve accessories. When using accessories with the VV, please see the appropriate installation detailed for the accessory being used in the Valve Accessories section.

Before Installation

- Visually inspect the valve for damage:
  - On the inlet of the valve as it can be detrimental to performance
  - To the coating on fume hood valves as it can lead to corrosion
- Ensure the packing material has been removed from the inside of the valve body.
- Inspect the tamper proof paint to ensure it has not been removed. Tamper proof paint can be found on:
  - Mechanical linkage for Constant Volume and Variable Volume valves
  - Actuator for Variable Volume valves
  - Potentiometer for VAV VVs
- Ensure the specification label for the valve matches the intended installation location.

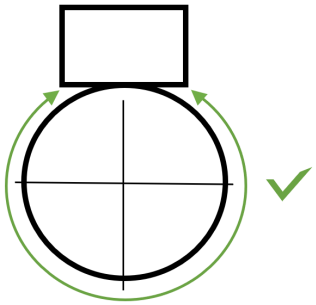
General Installation Notes

1. Ductwork to be supported within a maximum distance of eighteen inches (18 in., 457.2mm) of the VV, unless otherwise specified. Direct valve supports will avoid excess weight on supporting clamps.
2. Access doors are not required.
3. Leave eight inches (8 in., 203.2 mm) of free space in all directions of the controls enclosure to facilitate future access to the controls.
4. During operation, the center shaft of the VV may extend past the inlet or discharge of the valve. Ensure that a minimum of six inches (6 in., 152.4 mm) of duct is clear of any obstructions or obstacles (i.e. duct stiffeners) from the valve inlet and discharge.

CAUTION

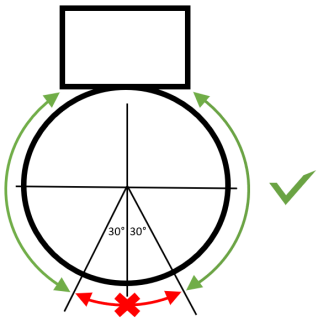
Do not screw into Phenolic or Kynar coated valve bodies. Screws will compromise its resistance to corrosion. **Warranty will be void if screws are used, excluding mounting slip connection multi-body valves.**

Enclosure Orientation



Supply (SAV) or General Exhaust (GEV) Applications

When installing a VV in SAV or GEV applications, it is acceptable to install the Venturi Valve with the control's enclosure mounted in any orientation around the circumference of the duct.

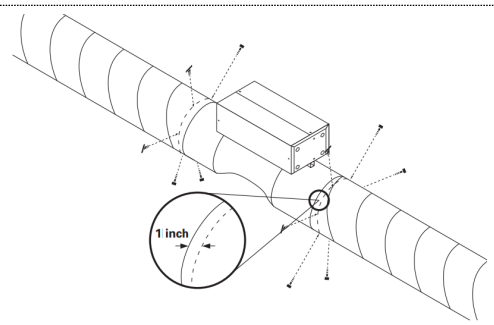


Fume Hood Applications

In fume hood applications, or in conditions that may cause condensation inside the ductwork, the enclosure should not be mounted within +/- 30 degrees from straight down.

Slip-Connection Venturi Valve Mounting Instructions

The instructions below are detailed for Aluminum Venturi Valves (VV) only. Do not use screws for Phenolic or Kynar coated valves.

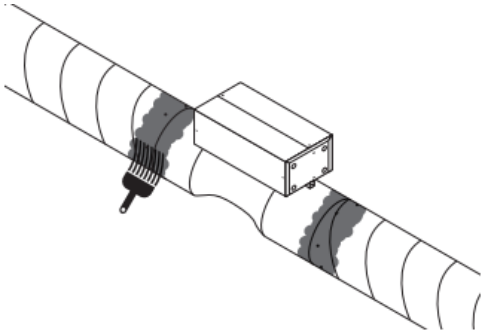


STEP 1

Mount the VV by slipping both the inlet and the discharge one inch (1 in., 25.4 mm) into the appropriately sized ductwork.

STEP 2

Fasten the VV to the ductwork using six (6) sheet metal screws per slip connection.



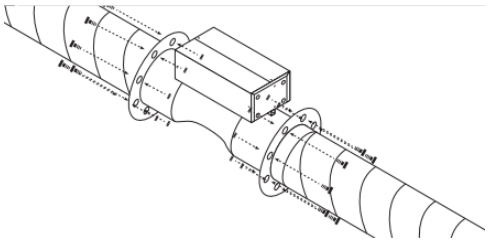
STEP 3

Seal the ductwork using duct sealer.

CAUTION

Instructions above are for slip valves without drawband clamps. For information on installing slip valves with drawband clamps, please see the Drawband Clamps Installation section of this manual.

Flange-Connection Venturi Valve Mounting Instructions



STEP 1

Align the duct flange holes with the VV flange holes and fasten using a bolt, lock washer and nut. Fasten every hole to reduce airflow leakage.

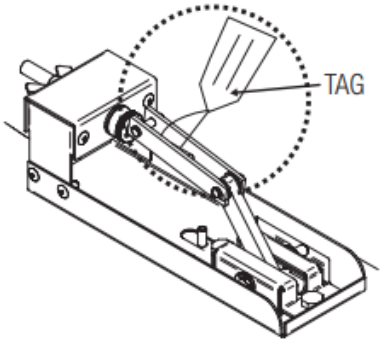
NOTE: It is recommended to use a duct sealant or gasket between the valve flange and the ductwork flange.

CAUTION

Instructions above are for flanged valves without companion flanges. For information on installing flanged valves with companion flanges, please see the Companion Flanges Installation section of this manual.

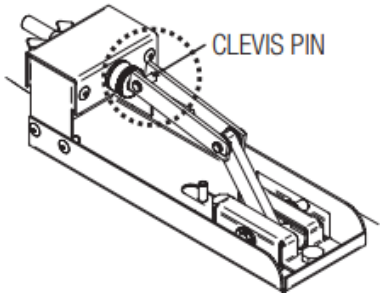
Constant Volume Valve Reassembly

After installing a Constant Volume (CV) Venturi Valve and before turning air on to the system, it is necessary to reconnect the factory calibrated linkage.



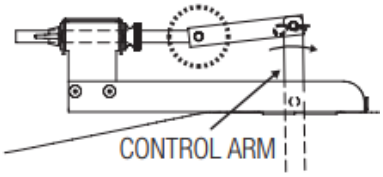
STEP 1

Cut cable tie and remove instruction tag from the valve. For a multi-body valve there will be more than one cable tie.



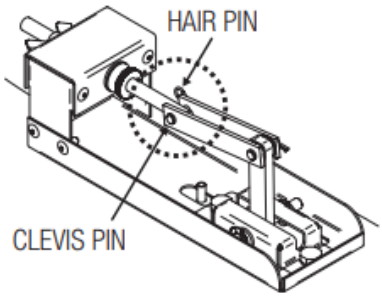
STEP 2

First take out the hair pin and then remove the clevis pin. Keep both the clevis pin and hair pin for Step 4.



STEP 3

Move the control arm to line up the holes.



STEP 4

Re-insert clevis and hair pin.

NOTE: After the linkage has been reconnected, the valve will be set to the factory calibrated airflow rate. Please refer to the VVs specification label to confirm the airflow value. If adjustment is required to the airflow during the balancing process, please see the Balancing section.

VALVE ACCESSORIES

Venturi Valves (VV) can function with a variety of different products to control air temperature, decrease noise and improve ease of installation.

Valve accessories and optional products provided by Antec Controls include:

1. Hot Water Coils (VVHWC)
2. Electric Coils (VVEC)
3. Silencer (VVSIL)
4. Valve Companion Connections (VCT)
5. Valve Installation Tape (VIT)
6. Valve Pressure Switch (VPS)
7. Valve Actuator
8. Valve Relay

CAUTION

Different types of valve accessories can be used with the VV. When using accessories by Others, ensure the dimensions and installation are compatible with the Antec Controls VV.

Hot Water Coils (VVHWC)

Hot Water Coils (VVHWC) are devices installed with Venturi Valves that control room environment by heating air moving through the valve. The VVHWC is designed to optimize heat transfer and access doors are available for upstream installation for convenient maintenance.

Overview

See the VVHWC Product Submittal on AntecControls.com for Specifications and Dimensions of the options below.

Options

Standard Capacity Hot Water Coil

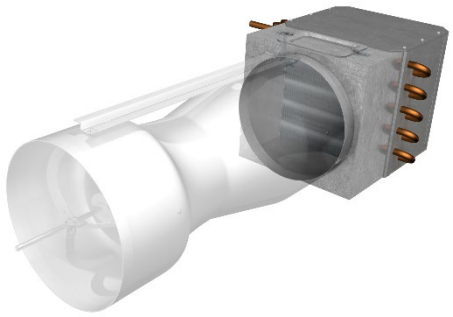
Model: VVHWC-SC

Features:
- 22 Gauge zinc-coated steel casing
- One to four row construction
- Aluminum fins spaced at 10 fins per inch

High Capacity Hot Water Coil

Model: VVHWC-HC

Features:
- 22 Gauge zinc-coated steel casing
- One or two row construction
- Aluminum fins spaced at 12 fins per inch



Oversized Standard Capacity Hot Water Coil

Model: VVHWC-OSC

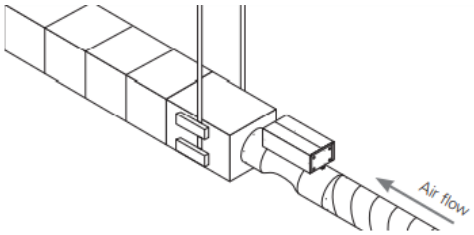
Features:
- 22 Gauge zinc-coated steel casing
- One to four row construction
- Aluminum fins spaced at 10 fins per inch

Oversized High Capacity Hot Water Coil

Model: VVHWC-OHC

Features:
- 22 Gauge zinc-coated steel casing
- One or two row construction
- Aluminum fins spaced at 12 fins per inch

Installation



STEP 1

Hot water coils are only available in supply orientation and should always be located down stream of the supply Venturi Valve.

STEP 2

For single VVHWC's, position the bead connection so that it faces the airflow.

For multibody VVHWC's, position the slip connection so that it faces the airflow.

NOTE: Both single and multibody valves have slip and drive connections that will face down stream of the airflow.

STEP 3

Before installing the plumbing connections for the VVHWC, check the coil hand designation and ensure that it matches the system.

Generally, coils are plumbed with the supply connection located on the bottom of the leaving air-side and the return connection at the top of the entering air-side of the coil to provide counter flow heat exchange and positive coil drainage.

For one or two row water coils both parallel and counterflow orientations are acceptable, however, for three or four row water coils only counterflow orientation is acceptable.

If a universal coil is supplied, cap off the two unused connections.

The coils inlet for the heating medium is provided with copper connectors with the customers requested ends. If pipe fittings have been furnished, use a back-up wrench to install or un-install the coil.

NOTE: The configuration of the coil connection varies with size, type and circuitry of coil.

STEP 4

Maintain proper clearance (minimum 1.5 in., 38.1 mm) between the coil and other structures such as the fan, filter racks, transition areas, etc.

STEP 5

Mount the coil firmly and level to ensure it's secure in its location and it's able to drain.

Use the support method prescribed for the duct work in the job specifications.

Coils with intermediate headers can be pitched 1/8 in. (3.2 mm) per foot of coil finned length towards the coil's header/connection end.

The system must be adequately vented to operate effectively.

STEP 6

All field piping must be self-supporting. System piping should be flexible enough to allow for thermal expansion and contraction of the coil.

STEP 7

If freezing is likely, blow compressed air into the coil. This will ensure that it has been thoroughly drained.

Anti-freeze protection should be added if needed.

Electric Coils (VVEC)

Electric Coils (VVEC) are devices installed with Venturi Valves that control room environment by heating the air moving through the valve. The VVEC operates using standard building electrical power and is designed to optimize heat transfer.

Overview

See the VVEC Product Submittal on AntecControls.com for Specifications and Dimensions of the options below.

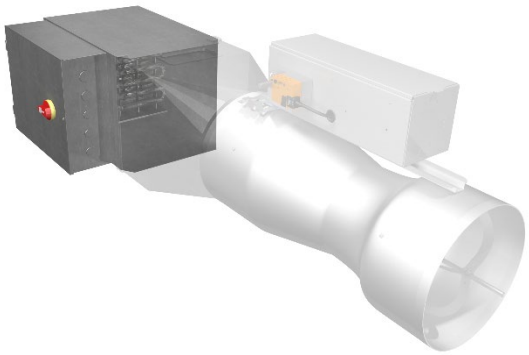
Options

Electric Coils

Model: VVEC

Features:

- Automatic reset thermal cut-out
- Manual reset thermal cut-out
- Air flow switch
- 20 Gauge galvanized steel, mechanically sealed, leak resistant construction
- SCR Controls – 2 to 10 VDC



CAUTION

When installing, do not handle the unit by the inlet velocity sensor. Ensure any packing material is removed from the inside of the unit.

Before Installation

1. Check for shipping damage to heater assembly including, but not limited to, ceramic coil clips and wire damage. If damage is found, do not power up heater, file claim with carrier and/or replace heater.
2. Check electrical specification label to ensure proper voltage/current ratings.
3. Before wiring, review and adhere to all local building codes, ordinances and the National Electric Code, pertaining to installation of the equipment.
4. Determine if the unit is field flippable between left and right handling.
5. If mercury contactors are included, ensure the arrow on the label is pointed upward.

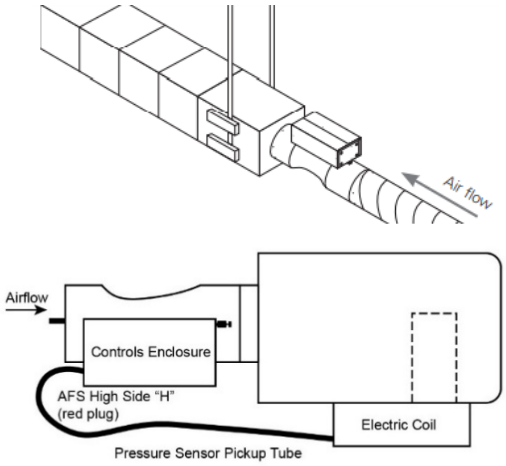
NOTES:

1. To maintain ETL certification, electric coils must only be installed as they have been marked on the installation label provided on the door of the electric coil control panel. (Installation Label PIC)
2. A minimum static pressure of 0.20 in.w.c (49.8 Pa) is required for stable operation with electric heater controls.

Electrical Installation

1. Review Electrical Wiring diagram included with heater (typically glued to inside of electrical enclosure door).
2. Ensure circuit powering the heater has proper capacity. Follow local building codes.
3. The electric duct heater must have an uninterrupted or unbroken electrical ground to minimize the chance of injury should an electrical fault occur. This may consist of an electrical wire or approved conduit when installed in accordance with existing electrical codes.
4. Review and inspect safety devices.
   a. Automatic Reset – trips if air surrounding the coils is too hot (~130F, 55C); will reset itself after cooling (~115F, 45C)
   b. Manual Reset – trips if air surrounding coils increases rapidly (~150F, 65C); to reset press the red tab towards the reset switch contacting the protruding metal tab on the relay
      i. If electric coil does not have a red tab, press down the protruding metal tab on the relay by hand
   c. Airflow Switch – trips ON when valve pressure differential is detected
      i. Ensure airflow switch probe points into the air stream
      ii. Note, the airflow switch must be mounted in a vertical plane; if this is not followed, the switch will always output a constant ON or OFF regardless of airflow

Mechanical Installation



STEP 1

Electric coils are only available in supply orientation and should always be located down stream of the supply Venturi Valve (VV).

STEP 2

Use the support method prescribed for the duct work in the job specifications.

STEP 3

Connect the provided pressure tubing for the pressure switch to the Hi Pressure tee of the VV. (The included Duct Probe is not required for VV and can be discarded.)

CAUTION

Disconnect all incoming power before any electrical installation or service is performed on the unit(s).

Silencer (VVSIL)

Silencers (VVSIL) are highly engineered 14-inch (355.6 mm) silencers specifically designed for the full spectrum attenuation of sounds produced by Venturi Valves (VV). The packless design provides minimal disturbance in the airflow resulting in low pressure drops across the silencer.

Overview

See the VVSIL Product Submittal on AntecControls.com for Specifications and Dimensions.

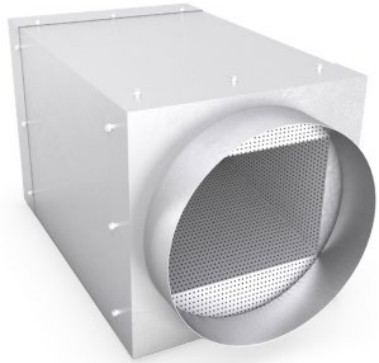
Options

VV Silencer

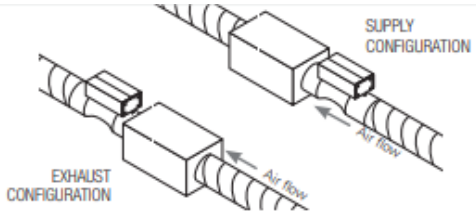
Model: VVSIL

Features:

- Factory Mounted Transitions
- Slip Connection
- Made to fit Single, Dual, Triple or Quad valve
- 22ga Galvanized Steel Construction or 24ga 316 Stainless Steel Construction

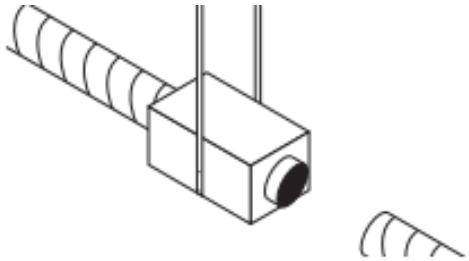


Installation



STEP 1

Position silencer before the inlet of the VV when the VV is operating as an exhaust valve. Position silencer on the discharge of the VV when the VV is operating as a supply valve.



STEP 2

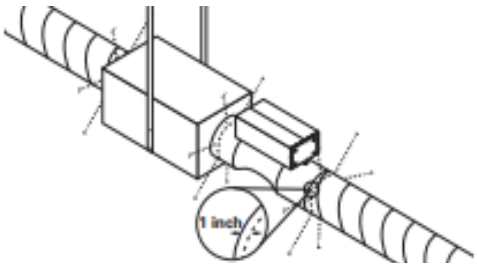
It is recommended that the silencer be installed prior to installing the VV.

STEP 3

Use the support method prescribed for the duct work in the job specifications.

STEP 4

Mount the silencer to the duct. The slip connection should overlap a minimum of one inch (1", 25.4 mm) to ensure a proper fit.



STEP 5

Mount the VV by slipping the appropriate end into the available duct work and the other end into the free slip connection of the silencer. Each slip connection should overlap a minimum of one inch (1 in., 25.4 mm) to ensure a proper fit.

STEP 6

Fasten all connections using six (6) sheet metal screws per slip connection.

STEP 7

Seal slip connections using duct sealer.

Valve Companion Connections (VCT)

Valve Companion Connections (VCT) come in two different types: drawband clamps and companion flanges.

Drawband clamps are designed as a connection method specifically for slip Venturi Valves (VV). Drawband clamps are an alternative to directly fastening the valve to the ductwork. The drawband clamp provides uniform compression, connecting spiral or plain ductwork to a valve, ensuring that the valve is properly supported. Drawband clamps allow for quick installation or removal of the VV while minimizing damage from metal screws.

Companion flanges are available for single body valves. Companion flanges are to be slid onto duct with a 1.5-inch (38.1 mm) overlap and mechanically fastened to the valve flange.

Overview

See the VCT Product Submittal on AntecControls.com for Specifications and Dimensions.

Options

Slip Connection Venturi Valve with Drawband Clamps

Model: VCT - DBC

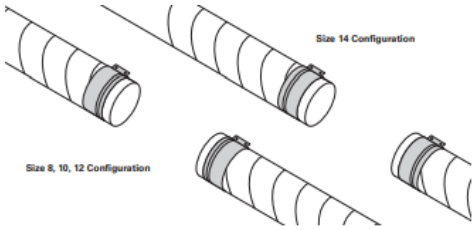
Features:
- Galvanized steel band and brackets
- UL 94 Elastomeric foam gasket
- Zinc plated flanged hex bolts with nylock nuts
- 25ga galvanized steel or 24ga 304 stainless steel construction

Flange Connection Venturi Valve with Companion Flange

Model: VCT - CFL

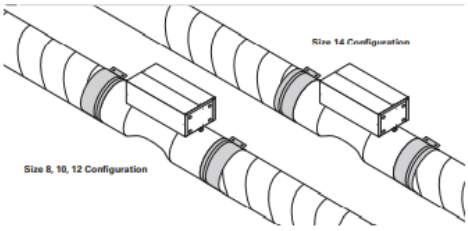
Features:
- Aluminum or 316 Stainless Steel (SS) construction

Slip-Connection Venturi Valve with Drawband Clamps Installation



STEP 1

Slide drawband clamps completely onto the inlet and discharge ductwork.



STEP 2

Mount the Venturi Valve by slipping both the inlet and the discharge one inch (1 in., 25.4 mm) into the appropriate sized ductwork.

STEP 3

Apply appropriate tape to seal valve to duct work if required. Two full wraps around the connection are recommended.

NOTES:

1. For non-corrosive applications duct tape can be used.
2. For corrosive applications VIT must be used.

STEP 4

Slide the drawband clamps onto the valve ensuring that at least one and a half inches (1.5 in., 38.1 mm) of the drawband clamps are in contact with the valve body.

STEP 5

Tighten both nuts to 15 in-lbs to ensure that the drawband clamp is securely fastened to the valve body and duct work. Neither the valve nor the band clamp should shift after fastening.

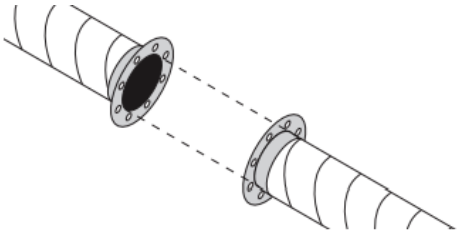
NOTE: Over-torquing the drawband clamp may cause improper connection. Recommended torque is listed on the drawband clamp label (typically the first torque setting on an electrical drill).

CAUTION

Ensure location of bead is correct. For size 8, 10, and 12 valves, the bead should be on the valve. For size 14 valves, the bead should be on the ductwork. Refer to torque rating on the drawband clamp label.

Do not screw through the drawband clamp into the Venturi Valve body.

Flange-Connection Venturi Valve with Companion Flanges Installation



STEP 1

Slide companion flanges completely onto the inlet and discharge ductwork with the flanged end of the companion flanges toward the free space.

STEP 2

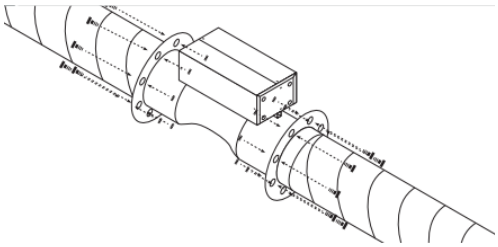
Align hole pattern to match opposing companion flange.

STEP 3a

For Aluminum Companion Flanges, fasten each companion flange with six (6) sheet metal screws. Apply duct sealant to seal the ductwork.

STEP 3b

For Stainless Steel Companion Flanges, continuously weld the companion flange to the duct to ensure zero leakage.



STEP 4

Align the duct flange holes with the venturi flange holes and fasten using a bolt, lock washer and nut. Fasten every hole to reduce airflow leakage.

NOTE: It is recommended to use a duct sealant or gasket between the valve flange and the ductwork flange.

Valve Installation Tape (VIT)

Valve Installation Tape (VIT) is used during installation of the Venturi Valve in corrosive applications and is wrapped around the valve and ductwork connection to ensure an airtight seal.

Overview

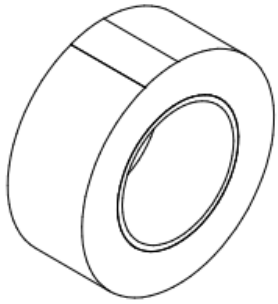
See the VIT Product Submittal on AntecControls.com for Specifications.

Options

Valve Installation Tape

Model: VIT

Features:
- PTFE adhesive tape
- 108 ft. (32.9 m) in length
- 2.0 in. (50.8 mm) in width



Valve Pressure Switch (VPS)

Valve Pressure Switch (VPS) is an adjustable, pressure-actuated electrical switch that makes or breaks an electrical circuit at a predetermined pressure.

Overview

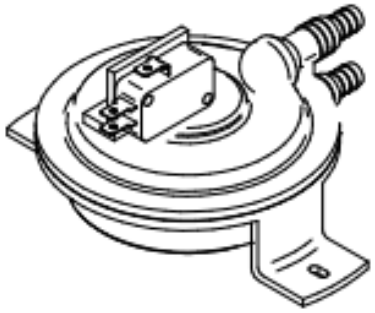
See the VPS Product Submittal on AntecControls.com for Specifications and Dimensions.

Options

Valve Pressure Switch (VPS)

Model: VPS

Features:
- Factory set to actuate on a pressure rise of 0.30 in.w.c. (74.7 Pa) for low pressure Venturi Valves and 0.60 in.w.c. (149.3 Pa) for medium pressure Venturi Valves
- Adjustable setpoint range



Installation

The VPS is provided factory installed when ordered with a Venturi Valve. For any field mounted applications, see instructions below.

STEP 1

Using self-tapping screws, mount the VPS to a location within the valve's controls enclosure. Make sure there is adequate room around the VPS to make the electrical connections and connect the pressure tubing.

STEP 2

Connect the pressure tubing from the Hi side of the Venturi Valve to the Hi port on the pressure switch.

STEP 3

Connect the pressure tubing from the Lo side of the Venturi Valve to the Lo port on the pressure switch.

STEP 4

Connect the NO or NC (depending on the application) and COM wires from the VPS to the device being used to monitor the valve pressure.

Field Adjustment

STEP 1

Ensure that the VPS is being calibrated at a temperature as close to the actual operating temperature as possible.

STEP 2

The set point range adjusting screw is located on the underside of the switch. To get access to the adjusting screw, unmount the VPS from the valve by removing the screws on both mounting feet.

STEP 3

To determine the number of turns required to reach the new set point, perform the following calculation:

$$Number\ of\ Turns = \frac{(Required\ Set\ Point - Initial\ Set\ Point)}{0.18}$$

If the number of turns is a positive value, the adjusting screw will need to be turned clockwise.

If the number of turns is a negative value, the adjusting screw will need to be turned counterclockwise.

NOTES:

1. Turning the adjusting screw clockwise will increase the setpoint and turning the adjusting screw counterclockwise will decrease the setpoint.
2. Each full turn represents approximately 0.18 in.w.c. (44.8 Pa)
3. The maximum set point value is 1.0 in.w.c. (2488.4 Pa), do not exceed this value.

STEP 4

Insert a 1/16-inch hex wrench into the adjusting screw. Holding the VPS so that the diaphragm is vertical, turn the adjusting screw the direction and number of turns determined from the calculation in the previous step.

A digital manometer and multi-meter can be used to achieve precise set point calibration.

STEP 5

Use a digital manometer and multi-meter to confirm that the new set point was achieved.

Valve Actuator

Valve actuators are wired into the valve controller and are attached to the linkage bars of the valve. The actuator controls the position of the cone assembly inside of the Venturi Valve which controls the amount of air that flows through the valve. Valve actuators come in two main options: Standard Speed and High Speed.

Overview

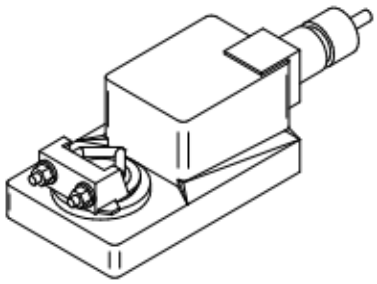
See the Valve Actuator Product Submittal on AntecControls.com for list of all available models with their associated Specifications and Dimensions.

Options

Standard Speed Actuator

Model: SSA

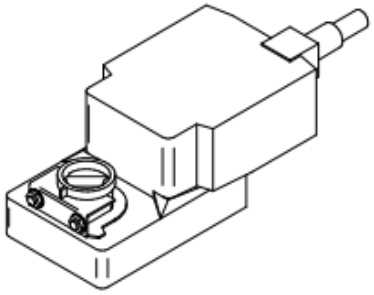
Features:
- Running time ranging between 75 to 95 seconds
- External push button manual override
- Reversible direction of rotation with built-in switch
- 2-10 VDC or 2P



High Speed Actuator

Model: HSA

Features:
- Running time ranging between 2.5 to 4 seconds
- External push button manual override
- Reversible direction of rotation with built-in switch
- 2-10 VDC or 2P



Valve Relay

Valve relays are miniature switches that use electromagnetic coils to close or open a circuit.

Overview

See the Valve Relay Product Submittal on AntecControls.com for Specifications and Dimensions.

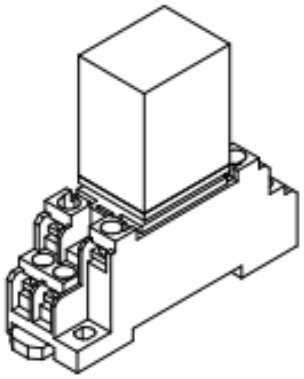
Options

Valve Relay

Model: Valve Relay

Features:

- Latching levers for convenient circuit checking
- Push-in plus terminal sockets with light insertion force and strong pull-out strength to decrease wiring work need
- Lead free and environmentally safe



Installation

The Valve Relay is provided factory installed when ordered with a Venturi Valve. For any field mounted applications, see instructions below.

STEP 1a

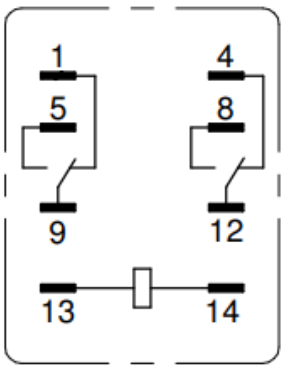
For foot mounting:

1. The Valve Relay has 2 holes on its base at opposite corners
2. Place a screw through each hole and secure the screws in the desired location

STEP 1b

For din rail mounting:

1. Fix a length of din rail in the desired mounting location
2. Snap or slide the Valve Relay onto the din rail



STEP 2

Wire the Valve Relay according to the project specific wiring.

If the project does not specify the wiring, wire according to the internal termination connections as shown in the image to the left.

BALANCING

The balancing process is required in the field to ensure that the valves are providing the necessary flow into and out of the pressure-controlled space. The process involves measuring the airflow through the valve in the field, using third party calibrated equipment and comparing it to the calibrated position feedback from the Venturi Valve (VV).

Variable Volume Venturi Valve (VV)

There are two tools that are available in the Antec Controls system that will help adjust the calibrated position feedback from the VV, they are scale factor and offset.

NOTE: When using PACE or CAVA controllers from Antec Controls, please refer to the appropriate manual for instructions on adjusting the settings described below.

Scale Factor

Scale factor is a multiplication factor that is applied to the controller's electronic flow feedback. Its default value is 1.000, which will not affect the flow feedback.

A scale factor greater than 1.000 will increase the flow feedback. A scale factor less than 1.000 will decrease the flow feedback. To determine the scale factor required simply use the following formula.

$$Scale\ Factor = \frac{Balancer's\ Airflow\ Measurement}{Electronic\ Flow\ Feedback}$$

NOTE: Scale factor is the recommended method of adjusting airflow readings.

Offset

Offset is an addition or subtraction in CFM (L/s), which is applied to the controller's electronic flow feedback. Its default value is 0 CFM (0 L/s), which will not affect the flow feedback.

$$Offset = Balancer's\ Airflow\ Measurement - Electronic\ Airflow\ Feedback$$

Recommended Balancing Procedure

Below are the recommended steps to take when balancing Venturi Valves.

1. Check to make sure the pressure across the VVs is within the operating range of the valve.
   Note: The minimum pressure drop will be indicated on the Specification label on the valve.
2. Depending on the balancer's process (which varies based on local requirements, balancer's test method, etc…), one of the following will be required:
   a. One airflow will be measured. Typically, the Max Scheduled airflow for the valve.
   b. Two airflows will be measured. Typically, the Max Scheduled and Min Scheduled airflow for the valve.
3. In both cases, it is preferable to only use a scale factor to modify the flow feedback from the valve.
4. If two airflows are measured and using only the scale factor cannot satisfy the requirements, a combination of scale factor and offset can be used.

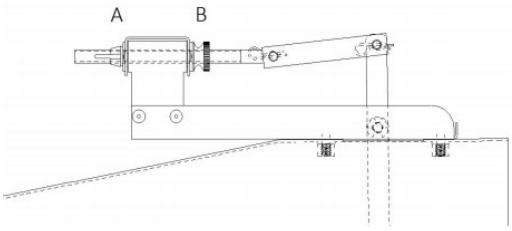
CAUTION

Adjustments should only be made after the differential pressure across the valve has been checked to ensure it is within the operating range of the valve.

Constant Volume (CV) Venturi Valve

Constant Volume Valves are factory calibrated for a selected airflow and can be installed in the field without adjustment for maintenance free operation. The valve can be adjusted in the field if changes to the airflow are required. The control arm is held in place with two locking nuts.

CV Valves are shipped with the linkage disassembled. See instructions above to reassemble the linkage before installation.



STEP 1

Loosen Nut A, to provide more threaded bar length to adjust Nut B.

STEP 2

Turning Nut B clockwise (as viewed from the inlet) will adjust the control to decrease the flow rate. To increase the flow rate, adjust Nut B counterclockwise.

STEP 3

Once the correct airflow has been achieved, Nut A should be re-tightened.

NOTE: Dual and Triple Constant Volume Valves are shipped with an assembly on each valve body. Make sure each assembly is moved by roughly the same amount when adjusting the airflow.

CAUTION ▼

Adjustments should only be made after the differential pressure across the valve has been checked to ensure it is within the operating range of the valve.

TROUBLESHOOTING

Venturi Valve Troubleshooting

Symptoms	Possible Cause
Noise	Foreign material in valve Vibrating duct work
Actuator does not operate for Variable Volume Valves	Confirm that power is being delivered to the unit Verify control signal Verify that the disconnect switch (where available) is not open Verify that the fuse (where available) is not blown Verify there are no ductwork obstructions
Actual airflow does not match airflow feedback	Confirm static pressure is within specified range Confirm that there is no blockage inside the duct or valve Confirm that there is no damage to any tamper proof paint Verify that there are no ductwork leaks before or after the valve Verify that the valve is installed in the correct orientation Verify that the valve is installed in the correct airflow direction
Pressure is in alarm on module, but airflow is present	Measure static pressure across valve on available brass tees to confirm pressure reading Ensure that red tubing runs from the valve inlet to the high (red) port and the green tubing runs from the valve discharge to the low (green) port Verify that the valve is installed in the correct airflow direction Ensure the tubing is not clogged with liquid or foreign debris

Electric Coil Troubleshooting

Symptoms	Possible Cause	Potential Solution
No Heat	Disconnection Switch	Check to see if the door interlock is active
	Fuses	Use a Digital Multimeter (DMM) to measure resistance (R) of each fuse, should read a negligible amount. If R is in MΩ, fuse most likely is blown, order a new fuse from replacement list
	Wiring	De-energize panel and trace wires with wiring diagram to check for loose or broken/burned wires
	Transformers	The transformer provides 24 volts to secondary; with primary voltage active, use a digital multi-meter to measure the secondary: 24V ± 2V, if not in this range, replace transformer
	Automatic Temperature Limit-Switch	Increase airflow to allow coils to cool faster, switch will automatically reset
	Manual Temperature Limit-Switch	Use the metal tab (if applicable) to press towards the switch to reset it, the airflow may have to be increased
	Airflow Switch	Consult “Airflow Switch” Troubleshooting section
Heat Cycles On/Off	Automatic Temperature Limit-Switch	Increase airflow to allow coils to cool faster, switch will automatically reset, check to see if airflow to coils is unobstructed
	Manual Temperature Limit-Switch	Use the metal reset tab (if applicable), press it toward the switch to contact the switch and reset it, airflow should be increased, check to see if airflow to coils is free
	Airflow Switch	Consult “Airflow Switch” Troubleshooting section

Replacement Parts

Replacement parts are available. Please contact your local Antec Controls Representative.

Technical Support

If technical support is required, please contact us:
By Email: Applications@AntecControls.com
By Phone: 866.884.3524
Hours of Operation: Monday – Friday, 8:00 AM to 4:30 PM CT

NOTE: If you will need support after hours, please contact us 48 hours in advance.

Product Improvement is a continuing endeavour at Antec Controls by Price. Therefore, specifications are subject to change without notice.

Consult your Sales Representative for current specifications or more detailed information. Not all products may be available in all geographic areas. All goods described in this document are warranted as described in the Limited Warranty.

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