

Description

Figure 1: Venturi Air Valve



Venturi Air Valves play a critical role in room pressure containment applications to ensure safety, reliability, and efficiency. Venturi Air Valves are a position-based flow control device that relies on factory calibration instead of real-time flow measurement by a flow sensor. Venturi Air Valves have no sensors in the air stream, which allows for safe and reliable operation in various caustic environments where flow sensors need regular maintenance. This robust design gives Venturi Air Valves an advantage in critical environments with many years of reliable service.

Venturi Air Valves are mechanically pressure independent due to a spring-loaded cone design. As the duct pressure fluctuates, the spring-loaded cone assembly rides these pressure waves to maintain a consistent volumetric flow, regardless of the duct static pressure variances. This mechanism provides immediate speed of response to duct pressure changes and does not require actuator movement.

Venturi Air Valves use fast-acting electric actuators that provide a rapid response to changes in conditions and dynamic air flow requirements. This rapid response ensures that room pressure containment is maintained to protect people from airborne threats such as viruses, chemicals, and particulates.

Features and benefits

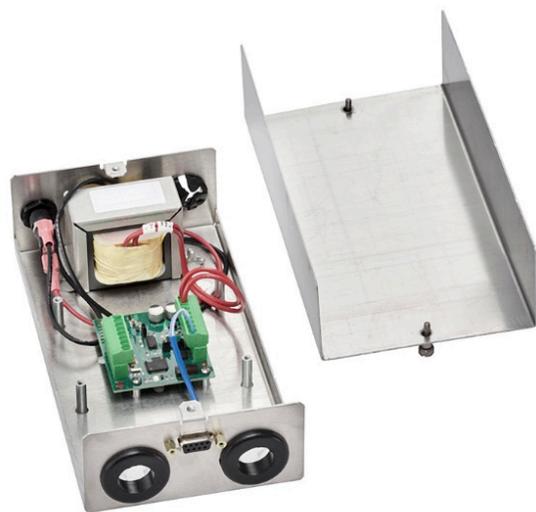
- Medium or low pressure ratings
- Partially closed or full shut-off design
- Valves available in 8 in., 10 in., 12 in., and 14 in. (203 mm, 254 mm, 305 mm, and 355 mm) diameters
- Available with Heresite® coatings
- Kynar® coated valve options is available for special requirements
- Dependable design, with no sensors in the air stream, which results in years of reliable maintenance free service

- Easy to install
- Available as a constant volume or with a fast acting smart actuator
- Mechanically pressure independent in low and medium pressure applications
- Factory calibrated airflow
- Field adjustable Universal Valve Module (UVM) configuration tool
- Low pressure drop
- Gang together for increased flow
- Maintenance-free link with no sensors due to position based CFM
- Calibration for vertical or horizontal positions

Venturi air valve options

Universal valve module

Figure 2: Universal valve module



Each Venturi Air Valve comes with a UVM-1000 linearization module that provides fast and simple control of the air valve. You can command with a 0 VDC to 10 VDC control signal which scales to represent 0% to 100% of the air valve's minimum to maximum CFM range. The UVM-1000 provides a 0 VDC to 10 VDC position feedback signal as confirmation the actuator has been repositioned to meet the target CFM setpoint. For example, if 0 VDC to 10 VDC is equal to 0 CFM to 1000 CFM, a 750 CFM setpoint requires a 7.5 VDC command signal sent to the UVM-1000. The command signal drives the valve to the 750 CFM position and returns a 7.5 VDC position feedback signal as confirmation.

For more information, refer to the *UVM-1000 Product Bulletin (LIT-12013292)* and the *UVM-1000 Installation Guide (LIT-12013155)*.

Aluminum or stainless steel

Venturi Valves are made of aluminum for general exhaust or supply applications. A 316 stainless steel option is also available for environments with highly corrosive or dangerous chemicals in the air stream.

Heresite

Figure 3: Heresite coated valve



Heresite is a brown phenolic coating baked on exposed aluminum to minimize corrosion. Heresite coatings provide resistance to a wide range of corrosives.

Thermal insulation

Figure 4: Thermal insulated Venturi valve



You can use thermal insulation for supply valves. Thermal insulation decreases energy costs by reducing thermal losses and prevents duct condensation.

Constant volume

Figure 5: Constant volume lateral front Venturi valve



Constant volume (CV) Venturi Air Valves provide a single CFM set point for applications that require only one air flow set point. CV valves do not come with a controller or actuator.

Medium or low pressure

Medium pressure Venturi Valves (0.6 in. to 3 in. W.C.) allow for higher flows for a given valve size, while low pressure Venturi Valves (0.3 in. to 3 in. W.C.) require a smaller pressure drop across the valve to maintain a constant flow.

Partially closed or full shut-off

Partially closed Venturi Valves allow for higher flows for a given valve size, while full shut-off Venturi Valves allow the valve to close completely for zero flow application requirements.

Horizontal or vertical

You can specify how the valve is situated in the duct work. For example, horizontal, vertical up flow, or vertical down flow. Each orientation is calibrated differently to account for the effects of gravity on the spring-loaded cone assembly to ensure mechanical pressure independence is maintained.

Size

Titus offers 8 in., 10 in., 12 in., and 14 in. (203 mm, 254 mm, 305 mm, and 355 mm) diameter valves for a variety of applications.

Figure 6: Venturi Valve sizes



Ganged valves

To increase flow, gang valves together.

Figure 7: Dual Venturi valve

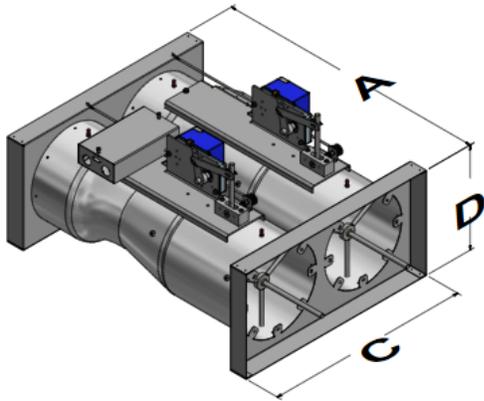


Figure 8: Triple Venturi valve

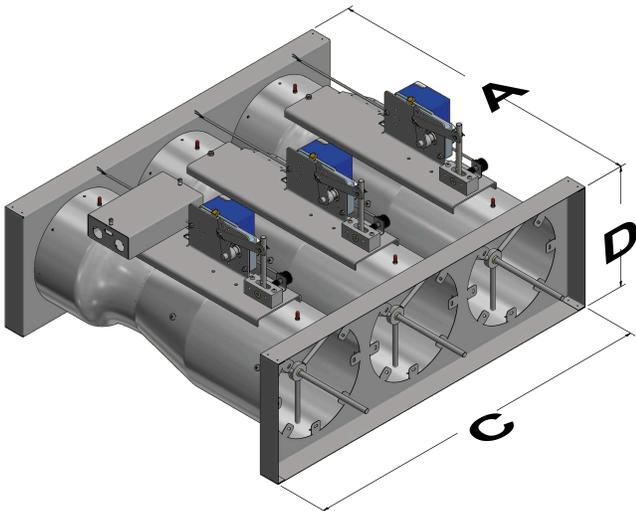


Figure 9: Quad Venturi valve

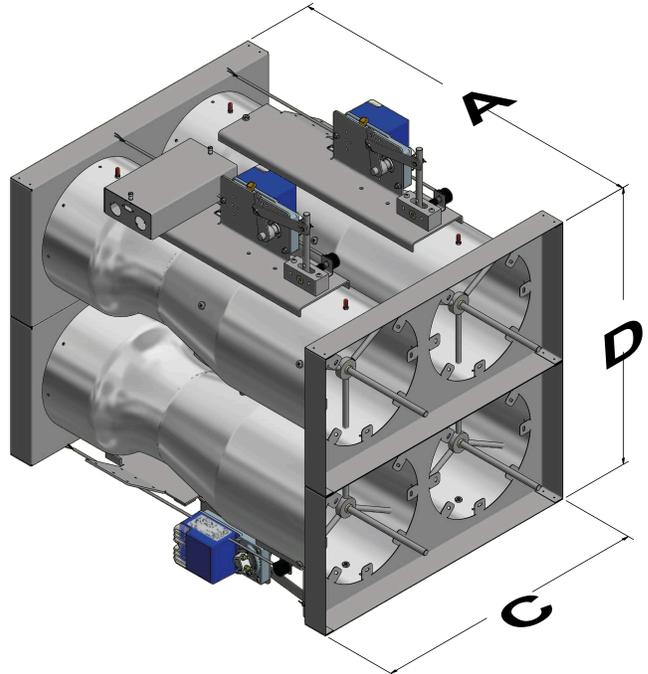


Figure 10: Hex Venturi valve

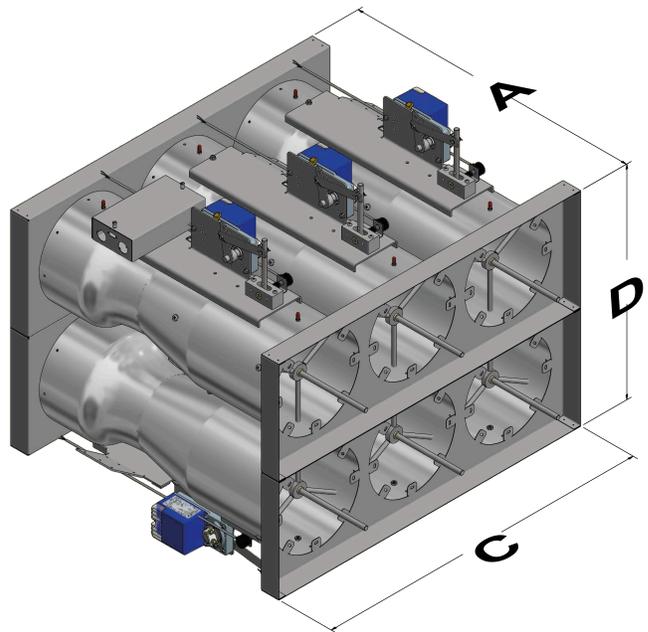


Table 1: Dimensions

Callout	Description
A	Valve length
C	Collar width
D	Collar height

Selection charts

Table 2: Dimensions and weights

Unit size		Weight				Valve diameter		Valve length (A)		Valve height (B)		Collar width (C)		Collar width (D)	
		Aluminium		SS316											
		lb	kg	lb	kg	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
8 in.	1	15	7	20	9	7.75	197	23	584	14	356	N/A			
10 in.	1	20	9	27	12	9.74	247	26	660	16	406	N/A			
	2	40	18	54	24	N/A	N/A	30	762	17	432	22.63	575	11.44	291
	3	60	27	81	37	N/A	N/A	30	762	17	432	33.75	857	11.44	291
	4	100	45	135	61	N/A	N/A	30	762	35	889	22.63	575	22.88	581
	6	140	64	189	86	N/A	N/A	30	762	35	889	33.75	857	22.88	581
12 in.	1	20	9	27	12	11.68	297	26.8	681	18	457	N/A			
	2	40	18	81	37	N/A	N/A	30.8	782	19	483	26.75	679	13.5	343
	3	60	27	108	49	N/A	N/A	30.8	782	19	483	40	1016	13.5	343
	4	100	45	135	61	N/A	N/A	30.8	782	38	965	26.75	679	27	686
	6	150	68	203	92	N/A	N/A	30.8	782	38	965	40	1016	27	686
14 in.	1	25	11	N/A		13.62	346	30	762	22	559	N/A			
	2	50	23			N/A	N/A	34	864	24	610	32.15	817	16	406
	3	75	34			N/A	N/A	34	864	24	610	48.3	1227	16	406
	4	120	54			N/A	N/A	34	864	48	1219	32.15	817	32	813
	6	160	73			N/A	N/A	34	864	48	1219	48.3	1227	32	813

Table 3: Partially closed (PC) Venturi valve flow rates

Unit size		Low pressure - 0.3 inches of water column (in. W.C.)				Medium pressure - 0.6 in. W.C.			
		Minimum flow		Maximum flow		Minimum flow		Maximum flow	
		CFM	CMH	CFM	CMH	CFM	CMH	CFM	CMH
8 in.	1	35	59	500	850	35	59	700	1189
10 in.	1	50	85	550	934	50	85	1000	1699
	2	100	170	1100	1869	100	170	2000	3398
	3	150	255	1650	2803	150	255	3000	5097
	4	200	340	2200	3738	200	340	4000	6796
	6	300	510	3300	5607	300	510	6000	10194
12 in.	1	90	153	1050	1784	90	153	1500	2549
	2	180	306	2100	3568	180	306	3000	5097
	3	270	459	3150	5352	270	459	4500	7646
	4	360	612	4200	7136	360	612	6000	10194
	6	540	917	6300	10704	540	917	9000	15291
14 in.	1	175	297	1400	2379	175	297	2100	3568
	2	350	595	2800	4757	350	595	4200	7136
	3	525	892	4200	7136	525	892	6300	10704
	4	700	1189	5600	9514	700	1189	8400	14272
	6	1050	1784	8400	14272	1050	1784	12600	21408

① **Note:** Minimum flow for SS316 8in PC valve is 50 CFM. Minimum flow for SS316 12in PC valve is 110 CFM.

Table 4: Full shut-off (FS) Venturi valve flow rates

Unit size		Low pressure - 0.3 in. W.C.				Medium pressure 0.6 in. W.C.			
		Minimum flow		Maximum flow		Minimum flow		Maximum flow	
		CFM	CMH	CFM	CMH	CFM	CMH	CFM	CMH
8 in.	1	0	0	400	680	0	0	600	1019
10 in.	1	0	0	450	765	0	0	850	1444
	2	0	0	900	1529	0	0	1700	2888
	3	0	0	1350	2294	0	0	2550	4332
	4	0	0	1800	3058	0	0	3400	5777
12 in.	6	0	0	2700	4587	0	0	5100	8665
	1	0	0	750	1274	0	0	1100	1869
	2	0	0	1500	2549	0	0	2200	3738
	3	0	0	2250	3823	0	0	3300	7476
	4	0	0	3000	5097	0	0	4400	14951
	6	0	0	4500	7646	0	0	6600	29903

Ordering information

Venturi air valves are custom built to meet specific application requirements for each customer project. The selection process has several steps to ensure that you select the correct Venturi air valve configuration. Venturi air valves are built according to their SKU number. The ordering guide helps you select the correct SKU. Ensure you select the correct Venturi air valve configuration to meet your application requirements. For guidance on how to select the correct Venturi air valve SKU for your application requirements, see the following steps:

1. Locate the project air valve schedule and determine the design pressure rating. Choose either medium pressure or low-pressure Venturi air valves.
2. Use the air valve schedule to determine the valve diameter size. Ensure the valve meets the maximum CFM setpoint. If it does not meet the maximum CFM, you may need to gang the valves together in a double, triple, quadruple or six configurations to increase the air flow capacity.

3. Cross-reference with the Venturi air valve flow rates to ensure the selected Venturi air valve size and pressure meets the minimum and maximum CFM setpoints on the air valve schedule.
4. Confirm the final orientation for Venturi air valve installation so that the factory characterization assembles the correct application.
5. The stakeholders review and approve the valve configuration before production begins. A customer supplied tag file ensures that the selected Venturi air valve configuration meets the application requirements.
6. If the application needs are not clear, contact your sales representative for guidance and support.

① **Note:** Because each Venturi air valve configuration is custom built, the valves cannot be resold to other customers. Non-defective Venturi air valve orders built for customers cannot be returned for credit or refund.

Table 5: Ordering guide

Feature	Code letter or number and description	Product code number example: TTN10HNFAFULU
Brand	TT = Titus	TT
Ganged	N = Not ganged 2 = Dual 3 = Triple 4 = Quad 6 = Hexa F = Flanged	N
Size	08 = 8 in. 10 = 10 in. 12 = 12 in. 14 = 14 in.	10
Material	A = Aluminium H = Heresite S = SS316	H
Insulation	N = No insulation I = Insulated	N
Actuator	CV = Constant volume FA = Fast acting SA = Special actuator	FA
Type	P = Partially closed F = Full shut-off	F
Airflow	H = Horizontal U = Upflow D = Downflow	U
Pressure	L = Low pressure 0.3 to 3 inches of water column (in. W.C.) M = Medium pressure 0.6 to 3 in. W.C.	L
Linearization module	U = Universal Valve Module (UVM) N = None (CV valves only)	U

① Note:

- You cannot gang flanged valves together.
- Contact Titus Sales for special actuator requirements.
- When you order constant volume (CV) valves, include the required flow volume. Specify CFM for this purpose.
- Constant Volume valves do not come with a UVM or any electronic components.
- 14 in. valves are not available in full shut-off (Type = F) or SS316 (Material = S) at this time.
- Low pressure (Pressure = L), full shutoff (Type = F) valves are not available in vertical upflow orientation (Airflow = U).
- Vertical up flow (Airflow = U) low pressure (Pressure = L) valves maintain flow from 0.4 in. W.C. to 3 in. W.C.

Technical specifications

Table 6: Technical specifications

Specification	Description
Aluminum shell thickness	14 gauge (0.0641 in.)
Stainless steel shell thickness	18 gauge (0.05 in.)
Air flow set point accuracy	± 5% or 10% CFM, whichever is greater
Internal assembly construction materials	316 stainless steel shaft and struts with Teflon® PTFE bearings
Operating range	32 °F to 150 °F (0 °C to 65 °C) 10% to 90% non-condensing RH
Flame/smoke rating	25/50
Density	2 lb/3 ft (32 kg/m3)
Performance	<ul style="list-style-type: none">• Pressure independent over a 0.3 in.W.C. to 3 in.W.C. for low pressure and 0.6 in. W. C. to 3 in. W.C. for medium pressure applications.• Volume control accurate to ±5% of airflow command signal.• No additional straight duct runs needed before or after valve.• Response time to change in command signal: <1 second.• Response time to change in duct static pressure: <1 second.

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult your local Titus representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

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Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

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Contact information

Contact our support units: <https://www.titus-hvac.com/main/contact>