

Phoenix Controls Venturi Valves for the Critical Spaces Control Platform (CSCP) are available for Constant Volume, Two-State, or fully Variable Air Volume (VAV) applications. The Phoenix Controls Venturi Valve maintains setpoint and accuracy without the need for airflow measurement or field calibration. Whether wet chemistry, research, healthcare, high purity manufacturing, life science, or general ventilation, Phoenix Controls has a venturi valve to meet the strict needs of the most demanding customers.



## VENTURI VALVE FEATURES

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- Mechanically pressure independent internal cone and spring assembly.  
Valves are pressure independent across the entire rated pressure specification and flow range. This provides stability of airflow and instantaneous response to changing duct pressure. No actuation is needed to maintain flow setpoint.
- Accurate to +/-5% of setpoint at any flow and any pressure within rated specification.  
Factory characterization on 3rd party validated air stations guarantees accuracy. Less field balancing translates to quicker startup on site.
- Inlet and exit insensitive.  
Elbows and duct transitions do not cause inaccuracies or require field calibration of venturi valves.
- No scheduled maintenance.  
Once installed, the venturi valves will remain maintenance free for many years.
- Turndown ratios up to 20:1.  
High turndown ratios offer maximum flexibility in flow range for energy savings, and allow for future expansion for changing needs.
- Fast speed of response to setpoint changes.  
High-speed linear actuators provide <1 second position response to a setpoint change.

## APPLICATIONS

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Phoenix Controls offers a wide variety of venturi valves in various sizes, chemical resistive coatings, pressure ranges, and actuation styles to meet your needs.

High-speed actuation (<1 second response to command change) is used for demanding environments where instantaneous containment is required - such as fume hoods in wet chemistry, research, pharmaceutical manufacturing, or compounding pharmacies but can be used for any application. Hospitals, BSL spaces, Life Sciences, EV Mobility manufacturing, and general ventilation all require airflow accuracy and repeatability yet typically only operate at standard speed actuation (40 - 90 seconds).

Standard speed tracking control is an economical solution for room-level ventilation, pressurization, temperature, and humidity control in either standalone or integrated systems where up to 4 individual valves can be controlled from one single zone controller. Fewer components mean lower upfront cost and easier installation.

Constant volume applications provide steady and accurate airflow control without sophisticated electronics. Phoenix Controls constant volume venturi valves have no electronics thus require no wiring and no power yet are still factory characterized to provide the same level of accuracy as the fully electronic valves. Constant volume valves are field adjustable with simple hand tools if airflow requirements change in the future.

## VENTURI VALVE CONTROL OPTIONS

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### Actuator Control Module (Control Types B and D)

Valve position control for high-speed valves is achieved through the Actuator Control Module (ACM). The ACM houses the factory valve characterization curve,  $V_{pot}$  data, motor control, RS485 communication, and two universal inputs/outputs (UIO). The ACM can be used as a standalone valve controller or linked together with up to 20 ACMs in one zone for high-speed zone control. The ACM can also be programmed for standard speed control if that is what the application requires. The ACM can be ordered with an optional fail-safe module that performs a soft shut-down of the ACM and drives the valve position to open, closed, or to a configured setpoint. For more information, see the ACM Datasheet (MKT-0513).

### Programmable BACnet Controller (Control Types D and P)

The Programmable BACnet Controller (PBC) is a multipurpose zone controller:

- In a high-speed zone, the PBC is the central location for zone balance, offset control, temperature control, humidity control, reheat control, emergency control, occupancy control, and other zone-level functions.
- In a standard speed zone, the PBC is hard-wired to up to four valve bodies and is the sole controller for valve position control and feedback zone balance, offset control, temperature control, humidity control, reheat control, emergency control, occupancy control, and other zone-level functions.
- The PBC can also be used as a standalone programmable controller where additional I/O and programmability is needed. For more information, see the PBC Datasheet (MKT-0511).

### SMART Actuator (Actuator Type T)

The SMART Actuator is an all-in-one actuator with position control and feedback, designed to be used when you want the quality and reliability of the Phoenix Venturi valve but also want a simple analog controlled device. The SMART actuator houses the factory characterization curve and operates on analog linear input/output signals used with third-party controllers. SMART actuators can also be ordered with an optional fail-safe module that, upon power failure, fails the valve to either the open or closed position.

## CERTIFICATIONS

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### HCAI (formerly OSHPD) Certified

These devices are certified for HCAI Seismic Certification. Preapproval per 2013 CBC, 2012 IBC, ASCE 7-10, and IEC-ES-AC-156. HCAI Special Certification number OSP-0290.

### NVLAP Accreditation

All venturi valves are characterized on NVLAP Accredited Airstations, Lab Code 200992-0. NVLAP is administered by the National Institute of Standards and Technology (NIST).

### ISO

Phoenix Controls designs, develops, manufactures, and sells products, systems, and service to control the environment and airflow of critical spaces. Phoenix Controls is registered to ISO 9001:2015.

## SPECIFICATIONS

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### Construction

- Aluminum Valve Bodies: 16 ga. spun aluminum valve body with continuous welded seam  
Aluminum Valve bodies available as uncoated aluminum (Class A), with corrosion-resistant baked phenolic (Class B and C), or with PVDF coatings for more chemical intense applications (Class D); external components such as base channel and enclosure are made from galvalume
- 6" valve cone made of industrial grade composite material (PPS) with bearings integrated into cone
- Composite Teflon® shaft bearings
- Spring grade stainless steel spring and polyester or PPS slider assembly
- Supply valves insulated with 3/8" (9.5 mm) flexible closed-cell polymer-based foam; flame/smoke rating 25/50; density is 1.5 lb/ft<sup>3</sup> (24.0 kg/m<sup>3</sup>)

### Operating Range

- 32 - 122°F (0 - 50°C) ambient
- 10 - 90% non-condensing RH

### Performance

- Pressure independent over 0.3" - 3.0" WC (75 - 750 Pa) drop across valve
  - Volume control accurate to ±5% of airflow command signal
  - No additional straight duct runs needed before or after valve
  - Available in flows from 30 - 5,000 CFM (51 - 8495 m<sup>3</sup>/hr) - more flow can be achieved by ganging valves together
    - Single 06" valve flow range: 30 - 350 CFM (51 - 595 m<sup>3</sup>/hr)
    - Single 08" valve flow range: 35 - 700 CFM (60 - 1189 m<sup>3</sup>/hr)\*
    - Single 10" valve flow range: 50 - 1000 CFM (85 - 1700 m<sup>3</sup>/hr)\*
    - Single 12" valve flow range: 90 - 1500 CFM (153 - 2549 m<sup>3</sup>/hr)\*
    - Single 14" valve flow range: 200 - 2500 CFM (340 - 4248 m<sup>3</sup>/hr)\*
    - Dual 10" valve flow range: 100 - 2000 CFM (170 - 3398 m<sup>3</sup>/hr)\*
    - Dual 12" valve flow range: 180 - 3000 CFM (306 - 5097 m<sup>3</sup>/hr)\*
    - Dual 14" valve flow range: 400 - 5000 CFM (680 - 8495 m<sup>3</sup>/hr)\*
  - Actuation speed after change in command signal:
    - <1 second: Control Types M and T (≤3 second full stroke)
    - <40 seconds: Control Type L (≤50 second full stroke)
    - <1 minute: Control Type H (with 60 Hz power) and I (except dual 14") (≤90sec full stroke)
  - Response time to change in duct static pressure: <1 second
- \*Max valve flows may be less on low pressure or shutoff valves.*

### Sound

Designed for low sound power levels to meet or exceed ASHRAE noise guidelines

## Power

24 Vac ( $\pm 15\%$ ) @ 50/60 Hz

## Power Consumption

- All power consumption VA ratings listed here are based on fully-loaded I/O
- Singles/Duals *per valve*
  - Standard-speed Electric (Control Type H, I, and L): 50 VA Max
  - High-speed Electric (Control Type M): Single 50 VA Max, Dual 70 VA Max

## I/Os

Available on the Programmable BACnet Controller (PBC), Controller Options D and P



- 16 universal inputs/outputs (UIO), programmable
- 8 Solid State Relays (SSR)
- 4 Dry Contact
- 24 VAC output (50/60 Hz)
- 24 VDC output (50/60 Hz)
- Input accuracy: Voltage, current, resistance:  $\pm 1\%$  full scale
- Output accuracy:  $\pm 15\%$
- 0 to 10 Vdc:  $\pm 1\%$  full scale into 10 k $\Omega$  minimum
- 4 to 20 mA:  $\pm 1\%$  full scale into 500 $\Omega$  +0/-50 $\Omega$

Available on the Actuator Control Module (ACM), Controller Options B and D



- Motor (factory wired)
- DP Sensor / Switch (typically factory wired)
- 2 universal input/output (UIO) Programmable for Fume Hood Sensors, Zone Presence Sensor, or other input.
- Vpot (factory wired)
- Fail-Safe Module (via right touch-flake connectors)

## Room-Level Communications: Actuator Bus (A-BUS)

RS485, speeds up to 76.8 kbps

## Building-Level Communications

BACnet MS/TP, speeds up to 76.8 kbps

## REGULATORY COMPLIANCES

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### WEEE Directive 2012/19/EC

#### Waste Electrical and Electronic Equipment Directive

At the end of the product life dispose of the packaging and product in a corresponding recycling center. Do not dispose of the unit with the usual domestic refuse. Do not burn the product.

**Certificates:** CE, FCC, ICES, UL/cUL, RoHS3, REACH, Prop 65

- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - 1.This device may not cause harmful interference.
  - 2.This device must accept any interference received, including interference that may cause undesired operation.

### EU Contact Address:

Pittway Tecnologica Srl  
Via Caboto 19/3  
34147 Trieste TS  
Italy

Teflon is a registered trademark of DuPont Company.

BACnet is a registered trademark of ASHRAE.

# ORDERING GUIDE

## PVE A 1 10 M - A M B H Y - BMT PSL

### TYPE

**PVE** = Phoenix Valve: Exhaust  
**PVS** = Phoenix Valve: Supply

### CHEMICAL RESISTANCE

**A** = Class A - Uncoated Aluminum body and cone, stainless hardware  
**B** = Class B - Heresite Coated Aluminum body and cone, stainless hardware  
**C** = Class C - Heresite Coated Aluminum body and cone, Heresite coated hardware  
**D** = Class D - PVDF Coated Aluminum body and cone, PVDF/Teflon coated hardware

### BODY NUMBER

**1** = Single  
**2** = Dual  
**F** = Flanged

### SIZE

**06** = 6-inch; Outer Diameter 5.8"/148 mm; Bodies = F, 1 Only; Pressure Rating = M Only; Body Design = A Only; Valve Orientations = H and U Only  
**08** = 8-inch; Outer diameter 7.88"/200 mm; Bodies = F, 1 Only  
**10** = 10-inch; Outer diameter 9.88"/251 mm  
**12** = 12-inch; Outer diameter 11.88"/302 mm  
**14** = 14-inch; Outer diameter 13.88"/353 mm

### PRESSURE RATING

**L** = Low: 0.3 inch WC minimum pressure requirement  
**M** = Medium: 0.6 inch WC minimum pressure requirement

### BODY DESIGN

**A** = Standard  
**L** = Low leakage shut-off  
**S** = Standard shut-off

### ACTUATOR TYPE

**C** = Constant Volume - no Vpot, field adjustable with 7/16" hex head nut driver; Controller = N Only  
**F** = Fixed - has Vpot, field adjustable with knob and increase/decrease flow label; Controller = N Only, Bodies = 2, further limited to Size = 10 and 12 Only  
**H** = Rotary standard-speed electric - floating point, NEMA 1; Size = 06, 08, 10, 12 with Controller = P or T Only  
**I** = Rotary standard-speed electric - floating point or 2-position when mechanically clamped, IP54; Size = 08, 10, 12, 14 with Controller = N, P, T Only  
**L** = Linear standard-speed electric actuator - floating point, IP56; Controller = P or T Only  
**M** = Linear high-speed electric actuator - floating point, IP56; Controller = B or D Only  
**T** = SMART linear high-speed electric actuator - proportional 2 - 10 Vdc; Controller = N Only

### OPTIONS

**EVI** = Exhaust valve with insulation blocks and insulation; Type = PVE Only  
**IBO** = Insulation blocks only, no insulation  
**LCL** = Low casing leakage on Design = A valves; Size = 08, 10, 12, 14 Only, Size = 14 further limited to 1600 CFM  
**PSL** = Pressure switch, low limit  
**PTR** = Pressure transducer  
**REI** = Remote electronics - indoor; Controller = B, D, P Only  
**SFB** = Square flanges on both ends of Bodies = 1; Chemical Resistance = A, B, C Only  
**SFD** = Single square flange on discharge of Bodies = 1; Chemical Resistance = A, B, C Only  
**SFI** = Single square flange on inlet of Bodies = 1; Chemical Resistance = A, B, C Only  
**SSB** = Stainless steel shaft brackets instead of galvanneal; Chemical Resistance = A of Body Design = A Only

### COMMUNICATION PROTOCOL

Mandatory for Controller Type = B  
**BMT** = BACnet MS/TP without BLE (Bluetooth Low Energy)  
Mandatory for Controller Type = D and P  
**500** = PBC with BACnet MS/TP with BLE (Bluetooth Low Energy)  
**501** = PBC with BACnet MS/TP without BLE (Bluetooth Low Energy)

### FAIL-SAFE MODULE

**N** = None - fail to last position  
**Y** = Programmable fail-safe position

### VALVE ORIENTATION

**D** = Vertical down  
**H** = Horizontal  
**U** = Vertical up

### CONTROLLER TYPE

For Actuator = M  
**B** = ACM (Actuator Control Module) without BLE (Bluetooth Low Energy)  
**D** = Includes both Controllers B and P - ACM (Actuator Control Module) without BLE (Bluetooth Low Energy) and PBC (Programmable BACnet Controller)  
For Actuator = C, F, I, T  
**N** = None  
For Actuator = H, L, L  
**P** = PBC - typical for low-speed tracking master valve  
**T** = Terminal strip connector (tracking valves); must link with PBC either on a valve or as a standalone