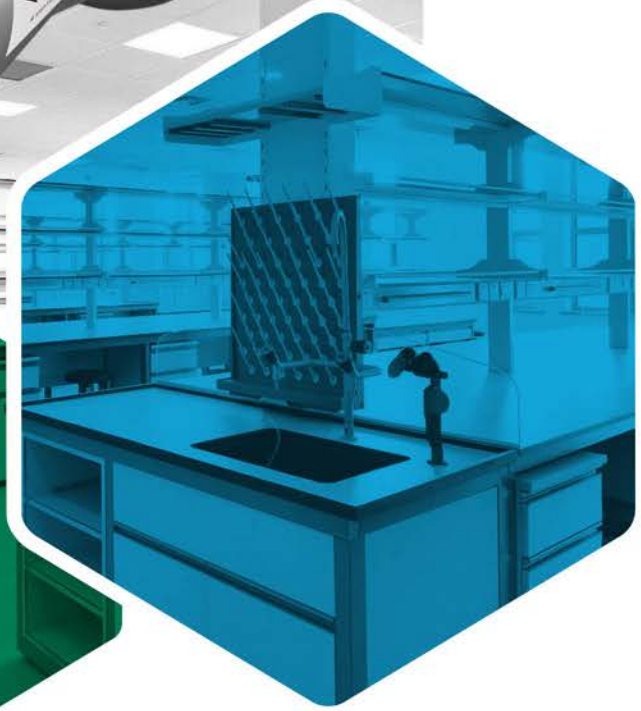
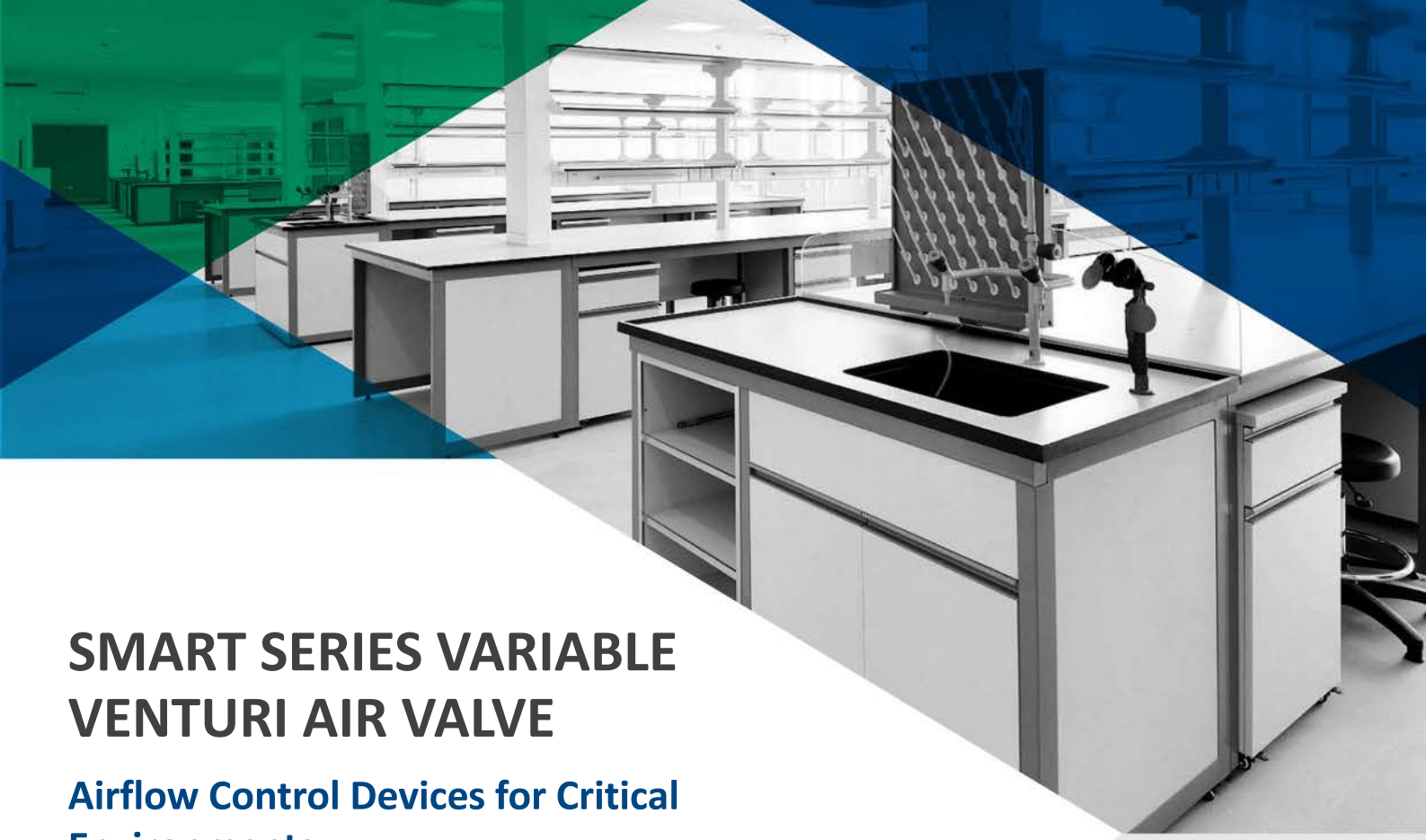
SMART
VENTURI VALVE

CVA UVA VVA & SVA

SMART SERIES VARIABLE VENTURI AIR VALVE



Making
Critical
Environments
Reliable



SMART SERIES VARIABLE VENTURI AIR VALVE

Airflow Control Devices for Critical Environments

SMART Venturi Valve employs a different technique effectively provides a more stable and accurate airflow control. **SMART Venturi Valve** is pressure independent to duct static changes by making adaptive adjustment to the pressure fluctuation through the spring within the cone quickly (less than 1 second) and accurately. **SMART Venturi Valve** has additional features of achieving a turndown ratio of 20:1 and a duct velocity of 0.5 m/s, a perfect airflow device suitable for use in critical environments control that require precise, stable airflow and pressurisation control.

Unique Airflow Control Technique Effectively Reduces Operation And Maintenance Costs

Every **SMART Venturi Valve** is factory calibrated using 0.5% accuracy instrumentation traceable to NIST with 50 points characterisation curve. The airflow volume is controlled using this calibrated airflow curve without the need for any airflow sensor, effectively reduces regular maintenance, on-site debugging and labour cost, at the same time provides a precise and stable control.

Professional-grade Products Built For Harsh Environments

SMART Venturi Valve only uses SS304 / 316L stainless steel for structural components such as valve body, cone, bracket, etc construction which have better mechanical strength and corrosion resistance. Teflon coating is available for corrosive airstream that requires better protection. Its sturdy, durable and anti-corrosion properties are particularly suitable for laboratories, pharmaceuticals, clean rooms, vivaria and healthcare facilities where flow control is critical to system performance.

CVA Constant Air Volume Venturi Valve

CVA constant air volume venturi valve is a mechanical regulating airflow control device. The valve body is constructed in a venturi shape with a spring loaded cone assembly in the airstream that regulates the effective free area for air to pass through. The cone assembly spring will compensate for any duct static fluctuation to maintain a constant airflow quickly and precisely.

FEATURES

CVA constant air volume venturi valve is a high precision, fast response and pressure independent that does not require any power supply airflow control device.

CVA venturi valve has a unique cone and spring assembly that will compensate for the duct static fluctuation instantly to maintain a constant airflow.

UVA Universal Variable Air Volume Venturi Valve

UVA universal variable air volume venturi valve is the most widely used airflow control device. It does not have inbuilt programming function and can be controlled by any third party DDC controller as a passive device. The airflow control can either be through low level AI and AO for command and feedback or high level Modbus RTU communication. Upon receiving a command, the UVA will base on the pre downloaded calibration characteristic curve to adjust the fast response linear actuator to the required command airflow.

FEATURES

UVA is an upgraded version of a CVA incorporating a PCB Board and a fast respond linear actuator to vary the cone assembly position to control different air volume. Each UVA is equipped with 1 x 0-10kΩ AI, 1 x 0-10 vdc AI, 1 x Dry contact DI and 1 x 0-10 vdc AO or Modbus RTU port for third party control.

Every UVA venturi valve is strictly calibrated using 0.5% accuracy instrumentation traceable to NIST with 50 points characterisation curve and downloaded to the PCB before leaving factory.

VVA Multi-function Variable Air Volume Venturi Valve

VVA multi-function variable air volume venturi valve is developed to have some programming functions by adding an independent control module to a UVA venturi valve. VVA can be used as a passive control just like UVA or as an active control mode that can take various transmitters like temperature sensor to control the desired airflow based on preset program.

FEATURES

VVA is an upgraded version of a UVA incorporating an additional control module to it. Each VVA is equipped with 1 x 0-10kΩ AI, 1 x 0-10 vdc AI, 2 x Dry contact DI, 1 x 0-10 vdc AO and 2 x 200 VAC 1A DO or Modbus RTU port for third party control or localised active control.

Every VVA venturi valve is strictly calibrated using 0.5% accuracy instrumentation traceable to NIST with 50 points characterisation curve and downloaded to the PCB before leaving factory.

SVA Intelligent Variable Air Volume Venturi Valve

SVA intelligent variable air volume venturi valve is the most functional among the SMART series venturi valves. The control module is upgraded to provide a simpler and easy to manage control solution. SVA can be used for complex ventilation equipment control within each room to intake auxiliary sensors like temperature, RH and differential pressure transmitters and controls other airflow devices like VAV boxes, venturi valves, fume hood and BSC exhausts for critical environment.

FEATURES

SVA is an upgraded version of a VVA with fully functional module. Each SVA is equipped with 1 x 0-10kΩ AI, 3 x 0-10 vdc AI, 3 x Dry contact DI, 2 x 0-10 vdc AO and 4 x 200 VAC 1A DO or Modbus RTU port for localised active control. SVA is also capable of communicating through BACnet MSTP with other devices or linking to Building Automation System.

Every SVA venturi valve is strictly calibrated using 0.5% accuracy instrumentation traceable to NIST with 50 points characterisation curve and downloaded to the PCB before leaving factory.

Table 1: Valve					
Designation		Description	Size	Flow Range (M^3/h)	Weight (kg)
Material	Body & Cone	Stainless Steel 304, 316, Heresite or PFA coating optional	108	60 - 1,150	10.00
	Shaft	SS316, PFA coatng optional	110	85 - 1,700	11.00
	Bracket	SS316, PFA coatng optional	210	170 - 3,400	20.00
	Spring	Stainless steel spring	112	150 - 2,500	12.00
Operating Pressure Range		150 to 750 Pa	212	300 - 5,000	23.00
Accuracy		±5% command signal	114	340 - 4,250	14.00
Operating Range	Temperature	0°C to 50°C	214	680 - 8,500	29.00
	R.H.	±10% to 90% non-condensing			

Table 2									
Valve Code	Duct Mounting	Dimensions (mm)							
		D	A	B	L	B	F1	F2	F3
108 - C30	Round slip-fit	200	x	x	596	330	x	x	x
110 - C40	Round slip-fit	250	x	x	554	378	x	x	x
210 - R42	Rectangular Flange	x	580	310	554	416	15	110	94
112 - C50	Round slip-fit	300	x	x	680	435	x	x	x
212 - R52	Rectangular Flange	x	680	360	680	455	15	130	110
114 - C60	Round slip-fit	365	x	x	763	471	x	x	x
214 - R62	Rectangular Flange	x	801	422	763	500	17	192	97

Controller				
Signal Input/ Output		SVA	VVA	UVA
	AI0	0-10kΩ	0-10kΩ	0-10kΩ
	AI1	0-10VDC	0-10VDC	0-10VDC
	AI2	0-10VDC	X	X
	AI3	0-10VDC	X	X
	DI1	Dry contact	Dry contact	Dry contact
	DI2	Dry contact	Dry contact	X
	DI3	Dry contact	X	X
	AO1	0-10VDC	0-10VDC	0-10VDC
	AO2	0-10VDC	X	X
	DO1	200 VAC, 1A	200 VAC, 1A	X
	DO2	200 VAC, 1A	200 VAC, 1A	X
	DO3	200 VAC, 1A	X	X
	DO4	200 VAC, 1A	X	X
Communication Protocol	M Port	Modbus RTU	Modbus RTU	Modbus RTU
	S Port	BA Cnet MS/TP	X	X
	Speed	9,600 Baud	9,600 Baud	9,600 Baud
Full Stroke Time	High speed linear electric actuator <1.5s			
Fail Safe (Optional)	Designated position or last position			
FMS (Optional)	Designated position or last position			
Power	24 VAC @50/60 Hz or 220 VAC @ 50/60 HZ			
Certificate	CE			

BA Cnet or Lon System is available with UVA model for BMS link up

SMART Series Variable Venturi Air Valve Feature

LESS THAN 1 SECOND RESPONSE TIME

SMART Venturi Valve is pressure independent to any duct static fluctuation caused by the operation of other devices within the ducting system. The stainless steel spring in the cone assembly will compress or expand accordingly to the decrease or increase in duct static instantly to maintain a constant airflow and prevent oscillation or hunting effect of the ventilation system.

ACCURACY IS NOT AFFECTED BY DUCT LAYOUT

SMART Venturi Valve technology without the need of a cross flow sensor and its unique pressure independent characteristic do not require any minimum 3 diameter straight duct installation requirement to achieve an accurate airflow. The airflow accuracy is not affected even the venturi valve is installed after a bent or reduce diameter.

CONTROL ACCURACY: WITHIN 5% OF SET POINT

SMART Venturi Valve has an accuracy of ±5% signal accuracy.

PRESSURE RANGE: 150 - 750 Pa

SMART Venturi Valve can operate accurately as long as the differential pressure across the valve falls within the 150 – 750 Pa for the medium pressure series venturi valve regardless of any duct static fluctuation. A lower pressure range with a lower airflow of venturi valve is available for certain application.

VARIABLE AIR VOLUME SETTING

CVA constant venturi valve airflow can be adjusted in field through the set and lock lever. Variable air volume venturi valve has a factory calibrated airflow curve downloaded to the valve DDC for controlling the airflow through the linear fast response actuator.

LOW AIRFLOW LEAK

SMART Venturi Valve has a patented sealing device for the connecting rod at the valve body opening hole meeting Class A leakage.

FACTORY CALIBRATION

All CVA constant venturi valves are individually and accurately calibrated according to user requirements before leaving factory and can be used immediately after installation without any tedious adjustment. All variable air volume venturi valves are individually factory calibrated using 0.5% accuracy instrumentation traceable to NIST with 50 points characterisation curve predownloaded to each individual DDC controller.

STAINLESS STEEL VALVE CONSTRUCTION

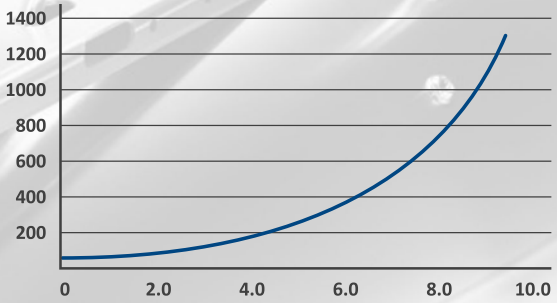
SMART Venturi Valves are only constructed from SS304 / SS316L and not aluminium or galvanised iron for higher quality in term of mechanical strength, corrosion resistance and smoother surface.

Air Volume Venturi Valve Calibration Curve

SMART Series Venturi Valve has a unique airflow characteristic calibration curve and is predownloaded to each individual venturi valve before leaving the factory. This characteristic curve is linearised to a scaling factor depending on the valve sizes and airflow control is based on this curve to control without the need for any airflow sensor. This technique ensures a stable, fast and accurate airflow control.

Air Volume Calibration Curve Equation

$Y = 2.61x^3 - 9.2283x^2 + 28.851x + 41.684$



PRECISE CONTROL
Accurately control airflow and maintain an accuracy range of ±5%

DURABLE & RELIABLE
SS316 stainless steel for reliable corrosion resistance

LEAK-PROOF
Excellent anti-leakage effect, Class A valve leakage standards

QUICK RESPONSE
Respond to the air volume change control signal within 1 second

FLEXIBLE LINK
Variety of connection interfaces suitable for various air ducts

everything under control

JAD SOLUTIONS PTE LTD

(A member of Natural Cool Holdings Limited)

87 Defu Lane 10 #05-02 Singapore 539219
Tel 65-6841 8656 ▪ **Fax** 65-6284 4415
Email enquiry@jad-venture.com ▪ **Web** jad-venture.com
Company Reg No. 200703726E ▪ GST Reg No. 200703726E