APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0290

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Phoenix Controls (a business of Honeywell International, Inc.)

Manufacturer's Technical Representative: Lloyd Le

Mailing Address: 75 Discovery Way, Acton, MA 01720

Telephone: (978) 795-3442 Email: Lloyd.le@honeywell.com

Product Information

Product Name: Air Conditioning Units

Product Type: Variable Air Volume Units

Product Model Number: Accel II Airflow Control Valves

General Description: Airflow control valves featuring various controllers, actuators and additional options as specified in attachments.

Mounting Description: Horizontal in-line duct mounted (ceiling suspended) and vertical in-line duct mounted, -

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories, LLC

Contact Person: Daniel Rodgers

Mailing Address: 1315 Greg Street, Sparks, NV 89431

Telephone: (775) 358-5085 Email: daniel.rodgers@shaketest.com

Title: Laboratory Project Manager

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: THE VMC GROUP

Name: Kenneth Tarlow California License Number: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Daniel Rodgers

Mailing Address: 1315 Greg St., Ste 109, Sparks NV 89431

Telephone: (775) 358-5085 Email: daniel.rodgers@shaketest.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.88

S_{DS} (Design spectral response acceleration at short period, g) = 2.5

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 05/31/2030

Date: 5/31/2024

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.5 z/h = 1

Condition of Approval (if applicable):

Table 1- Certified Components, Constant Volume - Horizontal Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (in)			Weight (lb.)	Max. Hanger Rod Spacing (in)	Connection Type [1]	Unit
				Depth	Width	Height				
CSV/CEV Constant Volume	CSVA106M-ACNHZ	Single	6	16.5	8.5	11.7	6	30	NF, DB, SF, WF [2]	Extrapolated
	CSVA108M-ACNHZ	Single	8	23.5	7.9	12.0	6	48	NF	UUT1a
	CSVA108M-ACNHZ	Single	8				8		DB	UUT1b
	CSVA108M-ACNHZ-SFB	Single	8				8		SF	UUT1c
	CxVxx08x-ACNxZ	Single	8	23.5 to 30.0	7.9 to 14.0	12.0 to 19.5	6 to 16		NF, DB, SF, WF [2]	Interpolated
	CxVxx08x-ACNxZ-SFB	Single	8						NF, DB, SF, WF [2]	Interpolated
	CxVxx10x-ACNxZ	Single	10						NF, DB, SF, WF [2]	Interpolated
	CxVxx10x-ACNxZ-SFB	Single	10						NF, DB, SF, WF [2]	Interpolated
	CxVxx12x-ACNxZ	Single	12						NF, DB, SF, WF [2]	Interpolated
	CxVxx12x-ACNxZ-SFB	Single	12						NF, DB, SF, WF [2]	Interpolated
	CxVxx14x-ACNxZ	Single	14						NF, DB, SF, WF [2]	Interpolated
	CxVxx14x-ACNxZ-SFB	Single	14						NF, DB, SF, WF [2]	Interpolated
	CSVA114M-ACNHZ	Single	14	30.0	14.0	19.5	12		NF	UUT3a
	CSVA114M-ACNHZ	Single	14				15		DB	UUT3b
	CSVA114M-ACNHZ-SFB	Single	14				16		SF	UUT3c
	CSVA210M-ACNHZ	Dual	10	24.0	20.0	14.0	18		SF	UUT4
	CxVx210x-ACNxZ	Dual	10	24.0 to 33.0	20.0 to 30.0	14.0 to 18.5	18 to 33		SF	Interpolated
	CxVx212x-ACNxZ	Dual	12						SF	Interpolated
	CxVx214x-ACNxZ	Dual	14						SF	Interpolated
	CSVA214M-ACNHZ	Dual	14	33.0	30.0	18.5	33		SF	UUT2

Notes:

1. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF), Welded Flange (WF)
2. Welded Flange (WF) connection type tested in UUT9

Table 2- Certified Components, Variable Volume - Horizontal Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (inches)			Weight (lb.)	Max. Hanger Rod Spacing (in)	Connection Type [2]	Unit
				Depth	Width	Height				
PSV/PEV Pneumatic[1]	PxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF	Extrapolated
	PxVxx08x-xxxxx-xxx	Single	8	23.5 to 33.0	10.3 to 30.0	14.6 to 20.5	9 to 49	48	NF, DB, SF, WF	Extrapolated
	PxVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF	Extrapolated
	PxVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF	Extrapolated
	PxVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF	Extrapolated
	PxVx210x-xxxxx-xxx	Dual	10						SF	Extrapolated
	PxVx212x-xxxxx-xxx	Dual	12						SF	Extrapolated
	PxVx214x-xxxxx-xxx	Dual	14						SF	Extrapolated
BSV/BEV Base Upgradeable[1]	BxVxx06x-xxxxx-xxx	**Single**	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF	Extrapolated
	BxVxx08x-xxxxx-xxx	Single	8	23.5 to 33.0	10.3 to 30.0	14.6 to 20.5	9 to 49	48	NF, DB, SF, WF	Extrapolated
	BxVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF	Extrapolated
	BxVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF	Extrapolated
	BxVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF	Extrapolated
	BxVx210x-xxxxx-xxx	Dual	10						SF	Extrapolated
	BxVx212x-xxxxx-xxx	Dual	12						SF	Extrapolated
	BxVx214x-xxxxx-xxx	Dual	14						SF	Extrapolated
MAV/EXV Analog / Celeries	MAV/EXVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF	Extrapolated
	EXVA108M-AMEHO	Single	8	23.5	10.3	14.6	9	48	NF	UUT5a
	EXVA108M-AMEHO	Single	8				11		DB	UUT5b
	EXVA108M-ALEHZ-SFB	Single	8				11		SF	UUT5c
	EXVA108M-AIEHZ-SFB	Single	8				11		SF	UUT5d
	EXVDF08M-AAEHO-PSL / EXVDF08M-AAHHO	Single	8	23.5	10.3	14.6	17		WF	UUT9
	MAV/EXVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 20		NF, DB, SF, WF	Interpolated
	MAV/EXVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF	Interpolated
	MAV/EXVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF	Interpolated
	MAV/EXVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF	Interpolated
	EXVA114M-AMEHO	Single	14	30.0	13.9	21.4	20		NF	UUT6a
	EXVA114M-AMEHO	Single	14	30.0	13.9	21.4	23		DB	UUT6b
	EXVB114M-SMEHO	Single	14	30.0	13.9	21.4	24		SF	UUT10
	EXVA210M-AMEHC	Dual	10	25.0	20.0	16.5	30		SF	UUT7a
	EXVA210M-ANEHO	Dual	10				30		SF	UUT7b
	EXVA210M-ANEHC	Dual	10				30		SF	UUT7c
	EXVA210M-AEEHC	Dual	10				30		SF	UUT7d
	MAV/EXVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		SF	Interpolated
	MAV/EXVx212x-xxxxx-xxx	Dual	12						SF	Interpolated
	MAV/EXVx214x-xxxxx-xxx	Dual	14						SF	Interpolated
	EXVA214M-AMEHC	Dual	14	33.0	30.0	20.5	49		SF	UUT8a

Notes:

1. PSV/PEV and BSV/BEV are depopulated units from the MAV/EXV valve families
2. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF) , Welded Flange (WF)

Table 2- Certified Components, Variable Volume - Horizontal Orientation (Continued)

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (inches)			Weight (lb.)	Max. Hanger Rod Spacing (in)	Connection Type [2]	Unit
				Depth	Width	Height				
HSV/HEV Theris[1]	HxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF [3]	Extrapolated
	HxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24	48	NF, DB, SF, WF [3]	Extrapolated
	HxVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF [3]	Extrapolated
	HxVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF [3]	Extrapolated
	HxVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF [3]	Extrapolated
	HSVA114M-ALOHZ-SFB	Single	14	30.0	13.9	21.4	24		SF	UUT6c
	HxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		SF	Interpolated
	HxVx212x-xxxxx-xxx	Dual	12						SF	Interpolated
	HxVx214x-xxxxx-xxx	Dual	14						SF	Interpolated
VSV/VEV Venturian[1,4]	VxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF [3]	Extrapolated
	VxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24	48	NF, DB, SF, WF [3]	Extrapolated
	VxVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF [3]	Extrapolated
	VxVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF [3]	Extrapolated
	VxVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF [3]	Extrapolated
	VxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		SF	Interpolated
	VxVx212x-xxxxx-xxx	Dual	12						SF	Interpolated
	VxVx214x-xxxxx-xxx	Dual	14						SF	Interpolated
	VxVx214x-xxxxx-xxx	Dual	14	33.0	30.0	20.5	49		SF	Interpolated[5]
PVE/PVS[1] PHOENIX CONTROLS CSCP VENTURI VALVES	PVxxx06x-xxxxx-xxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF [3]	Extrapolated
	PVxxx08x-xxxxx-xxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24	48	NF, DB, SF, WF [3]	Same as UUT5a,b,c,d
	PVxxx10x-xxxxx-xxx-xxx	Single	10						NF, DB, SF, WF [3]	Interpolated
	PVxxx12x-xxxxx-xxx-xxx	Single	12						NF, DB, SF, WF [3]	Interpolated
	PVxxx14x-xxxxx-xxx-xxx	Single	14						NF, DB, SF, WF [3]	Same as UUT6a,b,c
	PVxx210x-xxxxx-xxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		SF	Same as UUT7a,b,c,d
	PVxx212x-xxxxx-xxx-xxx	Dual	12						SF	Interpolated
	PVxx214x-xxxxx-xxx-xxx	Dual	14						SF	Same as UUT8a,b
TSV/TEV Traccel[1]	TxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	30	NF, DB, SF, WF [3]	Extrapolated
	TxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24	48	NF, DB, SF, WF [3]	Extrapolated
	TxVxx10x-xxxxx-xxx	Single	10						NF, DB, SF, WF [3]	Extrapolated
	TxVxx12x-xxxxx-xxx	Single	12						NF, DB, SF, WF [3]	Extrapolated
	TxVxx14x-xxxxx-xxx	Single	14						NF, DB, SF, WF [3]	Extrapolated
	TxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		SF	Interpolated
	TxVx212x-xxxxx-xxx	Dual	12						SF	Interpolated
	TxVx214x-xxxxx-xxx	Dual	14						SF	Interpolated
	TSVA214M-ALXHZ	Dual	14	33.0	30.0	20.5	49		SF	UUT8b

Notes:

1. HSV/HEV, TSV/TEV, PVE/PVS, and VSV/VEV valves are similar to the MAV/EXV valve families and only differ by the type of controller (Theris controller tested in UUT6c and Traccel controller tested in UUT8b).
2. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF), Welded Flange (WF)
3. No Flange with Drawband Clamps (DB) Tested in UUT 1b, 3b, 6b, welded Flange (WF) Tested in UUT 9
4. Same as the Traccel control valves, just alternate branding
5. Same as UUT8b

Table 3 - Options - Horizontal Orientation

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**Unit**
AAA	Valve Family	CSV/CEV	Constant Volume	UUT1-4
		PSV/PEV	Pneumatic	Interpolated[1]
		BSV/BEV	Base Upgradeable	Interpolated[1]
		MAV/EXV	Analog	UUT7d, 9
		MAV/EXV	Celeris	UUT5, 6a-b, 7a-c, 8a, 10
		VSV/VEV	Venturian	Interpolated[2]
		FSV/FEV	Flex	Interpolated[2]
		HSV/HEV	Theris	UUT6c
		TSV/TEV	Traccel	UUT8b
		PVE/PVS	Critical Spaces Control Platform (CSCP)	Same as UUT5a-b, UUT6a-b, 7a, 8a, 10
B	Valve Construction	A	Body and cone - uncoated aluminum; shaft - uncoated 316 SS	UUT1-8
		B	Body and cone with baked phenolic coating; PFA-coated 316 SS shaft	UUT10
		C	Body, cone and hardware w/ baked phenolic/epoxy coating; PFA-coated 316 SS shaft	Interpolated[3]
		D	Body, cone and hardware with PVDF coating; PFA-coated 316 SS shaft	UUT9
C	Number of Valve Bodies	F	Single valve with welded circular flange	UUT9
		1	One valve body (single, no flange)	UUT1, 3, 5, 6, 10
		2	Two valve bodies (dual)	UUT2, 4, 7-8
		3	Three valve bodies (triple)	Extrapolated[4]
		4	Four valve bodies (quad)	Extrapolated[4]
DD	Valve Size	06	6" valve	Extrapolated[5]
		08	8" valve	UUT1, 5, 9
		10	10" valve	UUT4, 7
		12	12" valve	Interpolated
		14	14" valve	UUT2, 3, 6, 8, 10
E	Flow/Pressure Operating Range	M	Medium Pressure	UUT1 -10
		L	Low Pressure	Extrapolated[6]
F	Valve Design	A	Conical-shape diffuser (Accel II)	UUT1-9
		S	Standard - Shut-Off Valve	UUT10
		L	Low Leakage - Shut-Off Valve	Extrapolated[7]

Notes:

1. PSV/PEV pneumatically operated valves are the same as the pneumatic actuator valves tested for UUT7b, UUT7c and UUT9 except the controller and potentiometer are removed. BSV/BEV are the same as the tested Celeris MAV/EXV valves, except potentiometer and/or controller tested in the MAV/EXV are removed.
2. Venturian VSV/VEV and Flex FSV/FEV are the same as Traccel (UUT8b) with different brand name.
3. Within the confines of the tested options.
4. Within the confines of the tested options. Three and Four valve bodies consist of a combination of the One and Two valve bodies mounted next to each other in the field (no components are different).
5. Similar to valves tested in UUT1, 5, 9 but smaller in dimensions
6. Extrapolated option is identical to tested option.
7. Low Leakage Shut-Off valve is the same construction as the Standard Shut-Off Valve.

Table 3 - Options - Horizontal Orientation (Continued)

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**Unit**
G	Control Type	C	Constant Volume	UUT1-4
		P	Pneumatic	Interpolated[1]
		B	Base Upgradeable - Pneumatic	Interpolated[1]
		F	Fixed, field adjustable to increase/decrease flow	Same as UUT1-4
		I	IP54 Electric Actuator with fail-to-last position; floating point	UUT5d
		A	Analog Pneumatic	UUT9
		E	Analog High Speed Electric	UUT7d
		L	Linear low-speed electric actuator; floating point; IP67	Same as UUT5a-b, UUT6a-b, 7a, 8a, 10
		H	Rotary low-speed electric; floating point; NEMA 1	UUT5c, 6c, 8b
		M	Digital - Linear High-speed electric	UUT5a-b, UUT6a-b, 7a, 8a, 10
		T	Smart- Linear High Speed Electric (2-10VDC)	Interpolated[2]
		N	Digital - Pneumatic	UUT7b-c
		Y	Base Upgradeable - Low Speed Electric (0-10 VDC)	Same as UUT5d
		Z	Base Upgradeable - Low Speed Electric (2-10 VDC)	Same as UUT5d
		Q	Base upgradeable- Med. Speed Electric (2-10 VDC)	Same as UUT5d
		R	Base upgradeable - Med. Speed Electric (4-20 mA)	Same as UUT5d
		S	Base upgradeable- Med. Speed Electric (0.5-10 VDC)	Same as UUT5d
H	Valve Controller Designation	N	No electronics	UUT1-4
		E	Celeris/Analog Electronic Controller (Analog without boosters only)	UUT5, 6a-b, 7a-c, 8a, 10
		E	LonMarkElectronic Valve - Controlling Valve of Tracking Pair	UUT7d
		X	LonMark Electronic Valve - Controlling valve of tracking pair with expanded features	UUT8b
		O	LonMark Supply only Valve	UUT6c
		A	BACnet Electronic Valve - Controlling Valve of Tracking Pair	Same as UUT7d
		B	BACnet Electronic Valve - Controlling Valve of Tracking Pair with expanded features	Same as UUT8b
		V	BACnet Electronic Valve-Programmable	Same as UUT7d
		Y	BACnet TX-RTN - Supply controlling primary exhaust and return	Same as UUT6c
		Z	BACnet TX-EXH - Supply controlling primary exhaust and locally controlled exhaust	Same as UUT6c
		C	BACnet Supply only Valve	Same as UUT6c
		D	BACnet Exhaust only Valve	Same as UUT6c
		H	Hood exhaust valve with pressure switch	UUT9
		F	Flow feedback in small black box	Smaller version of UUT9
		P	BACnet Electronic Valve for Phoenix Control brand	Same as UUT6c
		1	BACnet Electronic Valve for Alerton brand	Same as UUT6c
		B	BACnet Electronic Valve -high speed (for PVE/PVS valve family only)	Same as UUT5, 6a-b, 7a-c, 8a, 10
		D	BACnet Electronic Valve -high speed (for PVE/PVS valve family only)	Same as UUT5, 6a-b, 7a-c, 8a, 10
		P	BACnet Electronic Valve -low speed (for PVE/PVS valve family only)	Same as UUT5, 6a-b, 7a-c, 8a, 10
		T	No electronics (for PVE/PVS valve family only)	Same as UUT1-4
I	Valve Orientation	H	Horizontal	UUT1-10
		U	Vertical upflow	N/A
		D	Vertical downflow	N/A

Notes:

1. Pneumatic and base-upgradeable pneumatic control types are represented by the valves tested for UUT7b and UUT7c except the controller and/or potentiometer are removed.

2. Bookended by UUT5a-b, UUT6a-b, 7a, 8a, 10

Table 3 - Options - Horizontal Orientation (Continued)

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**Unit**
J	Fail Safe Position	C	Normally closed valve	UUT7a, c, d; UUT8a
		O	Normally open valve	UUT5a-b, 6a-b, 7b, 9-10
		Z	Not applicable	UUT1-4, 5c-d, 6c, 8b
		Y	Programmable fail-safe position (Normally open or Normally closed valve)	UUT7a, c, d; UUT8a, UUT5a-b, 6a-b, 7b, 9-10
		N	Not applicable	UUT7a, c, d; UUT8a
XXX	COMMUNICATION PROTOCOL (PVE/PVS family only)	BMT	BACnet MS/TP without BLE (Bluetooth Low Energy)	Same as UUT5, 6a-b, 7a-c, 8a, 10
		500	PBC with BACnet MS/TP with BLE (Bluetooth Low Energy)	Same as UUT5, 6a-b, 7a-c, 8a, 10
		501	PBC with BACnet MS/TP without BLE (Bluetooth Low Energy)	Same as UUT5, 6a-b, 7a-c, 8a, 10
xxx	Valve Options	EVI	Exhaust valve with insulation and blocks	Interpolated[1]
		IBO	Insulation blocks only, no insulation	Interpolated[1]
		PSL	Pressure Switch, low limit	UUT9
		PTR	Pressure sensor	Same as UUT9
		LCL	Low casing leakage on Design = A valves	Same as UUT10
		SFB	Square flange on both ends of single body valve	UUT1c, 3c, 5c-d; 6c
		SFX	Square flange on one end of single body valve; inlet on exhaust; discharge on supply	Interpolated[2]
		SFI	Square flange on inlet end of single body valve	Interpolated[2]
		SFD	Square flange on discharge end of single body valve	Interpolated[2]
		SSB	Stainless steel shaft brackets instead of galvaneal; Valve Construction = A Only	Same as UUT10

Notes:

1. Fail Safe Position: EVI and IBO valve options were represented in constant volume valves UUT1 - UUT4.
2. SFX, SFI and SFD are bookended by valve option SFB as tested in UUT1c, 3c, 5c-d, 6c

Table 4 - Certified Components, Constant Volume - Vertical Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Vertical in-line duct mounted

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (in)			Weight (lb.)	Max. Vertical Duct Support Spacing	Orientation (Upflow / Downflow)	Connection Type [1]	Unit
				Depth	Width	Height					
CSV/CEV Constant Volume	CxVxx06x-ACNxZ-xxx	Single	6	16.5	8.5	11.7	6	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [2]	Extrapolated
	CSVA108M-ACNDZ	Single	8	23.5	7.9	12.0	6		D	NF	UUT11
	CxVxx08x-ACNxZ-xxx	Single	8	23.5 to 30.0	7.9 to 14.0	12.0 to 19.5	6 to 16		U,D	NF, DB, SF, WF [2]	Interpolated
	CxVxx10x-ACNxZ-xxx	Single	10						U,D	NF, DB, SF, WF [2]	Interpolated
	CxVxx12x-ACNxZ-xxx	Single	12						U,D	NF, DB, SF, WF [2]	Interpolated
	CxVxx14x-ACNxZ-xxx	Single	14						U,D	NF, DB, SF, WF [2]	Interpolated
	CSVA114M-ACNDZ	Single	14	30.0	14.0	19.5	12		D	NF	UUT12
	CSVA210M-ACNDZ	Dual	10	24.0	20.0	14.0	18		D	SF	UUT13
	CxVx210x-ACNxZ-xxx	Dual	10	24.0 to 33.0	20.0 to 30.0	14.0 to 18.5	18 to 33		U,D	SF	Extrapolated [3]
	CxVx212x-ACNxZ-xxx	Dual	12						U,D	SF	Extrapolated [3]
	CxVx214x-ACNxZ-xxx	Dual	14						U,D	SF	Extrapolated [3]
	CSVA214M-ACNUZ	Dual	14	33.0	30.0	18.5	33		U	SF	Extrapolated [3]

Notes:

1. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF), Welded Flange (WF)
2. DB tested in UUT 15b and 17, WF tested in UUT 16
3. Dual valve bodies tested in UUT 18 and 20

Table 5 - Certified Components, Variable Volume - Vertical Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Vertical in-line duct mounted

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (in)			Weight (lb.)	Max. Vertical Duct Support Spacing	Orientation (Upflow / Downflow)	Connection Type [2]	Unit
				Depth	Width	Height					
PSV/PEV Pneumatic[1]	PxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	PxVxx08x-xxxxx-xxx	Single	8	23.5 to 33.0	10.3 to 30.0	14.6 to 20.5	9 to 49		U,D	NF, DB, SF, WF [3]	Extrapolated
	PxVxx10x-xxxxx-xxx	Single	10						U,D	NF, DB, SF, WF [3]	Extrapolated
	PxVxx12x-xxxxx-xxx	Single	12						U,D	NF, DB, SF, WF [3]	Extrapolated
	PxVxx14x-xxxxx-xxx	Single	14						U,D	NF, DB, SF, WF [3]	Extrapolated
	PxVx210x-xxxxx-xxx	Dual	10						U,D	SF	Extrapolated
	PxVx212x-xxxxx-xxx	Dual	12						U,D	SF	Extrapolated
	PxVx214x-xxxxx-xxx	Dual	14						U,D	SF	Extrapolated
BSV/BEV Base Upgradeable[1]	BxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U	NF, DB, SF, WF [3]	Extrapolated
	BxVxx08x-xxxxx-xxx	Single	8	23.5 to 33.0	10.3 to 30.0	14.6 to 20.5	9 to 49		U,D	NF, DB, SF, WF [3]	Extrapolated
	BxVxx10x-xxxxx-xxx	Single	10						U,D	NF, DB, SF, WF [3]	Extrapolated
	BxVxx12x-xxxxx-xxx	Single	12						U,D	NF, DB, SF, WF [3]	Extrapolated
	BxVxx14x-xxxxx-xxx	Single	14						U,D	NF, DB, SF, WF [3]	Extrapolated
	BxVx210x-xxxxx-xxx	Dual	10						U,D	SF	Extrapolated
	BxVx212x-xxxxx-xxx	Dual	12						U,D	SF	Extrapolated
	BxVx214x-xxxxx-xxx	Dual	14						U,D	SF	Extrapolated
MAV/EXV Analog / Celeris	MAV/EXVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	EXVD108M-AAEUC	Single	8	23.5	10.3	14.6	11		D	NF	UUT15a
	EXVD108M-AMEUC	Single	8	23.5	10.3	14.6	11		U	DB	UUT15b
	MAV/EXVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 20		U,D	NF, DB, SF, WF [3]	Interpolated
	MAV/EXVxx10x-xxxxx-xxx	Single	10						U,D	NF, DB, SF, WF [3]	Interpolated
	MAV/EXVxx12x-xxxxx-xxx	Single	12						U,D	NF, DB, SF, WF [3]	Interpolated
	MAV/EXVxx14x-xxxxx-xxx	Single	14						U,D	NF, DB, SF, WF [3]	Interpolated
	MAVC114M-ALEUZ-SFX	Single	14	30.0	13.9	21.4	24		U	DB & SF [4]	UUT17
	MAV/EXVx210x-xxxxx-xxx	Dual	10	25.0	20.1	16.4	30		U,D	SF	Interpolated
	MAV/EXVx212x-xxxxx-xxx	Dual	12	30.0	24.5	18.4	32 to 36		U,D	SF	Interpolated
	EXVA212M-ANEDO	Dual	12	30.0	24.5	18.4	36		D	SF	UUT19
	MAV/EXVx214x-xxxxx-xxx	Dual	14	33.0	30.0	21.4	45 to 49		U,D	SF	Interpolated
	EXVA214M-AMEUO-PSL	Dual	14	33.0	30.0	21.4	49		U	SF	UUT20

Notes:

1. PSV/PEV and BSV/BEV are depopulated units from the MAV/EXV valve families
2. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF), Welded Flange (WF)
3. Welded Flange (WF) tested in UUT 16
4. Valve constructed with a Drawband Clamp on one end and a Square Flange on the other

Table 5 - Certified Components, Variable Volume - Vertical Orientation (Continued)

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Mounting Description: Vertical in-line duct mounted

Valve Family	Model Number	Valve Body	Diameter (in)	Dimensions (inches)			Weight (lb.)	Max. Vertical Duct Support Spacing	Orientation (Upflow / Downflow)	Connection Type [2]	Unit
				Depth	Width	Height					
HSV/HEV Theris[1]	HxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	HSVAF08M-LIXDZ	Single	8	23.5	10.3	14.6	11		D	WF	UUT16
	HxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24		U, D	NF, DB, SF, WF [3]	Interpolated
	HxVxx10x-xxxxx-xxx	Single	10						U, D	NF, DB, SF, WF [3]	Interpolated
	HxVxx12x-xxxxx-xxx	Single	12						U, D	NF, DB, SF, WF [3]	Interpolated
	HxVxx14x-xxxxx-xxx	Single	14						U, D	NF, DB, SF, WF [3]	Interpolated
	HxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		U, D	SF	Interpolated
	HxVx212x-xxxxx-xxx	Dual	12						U, D	SF	Interpolated
	HxVx214x-xxxxx-xxx	Dual	14						U, D	SF	Interpolated
VSV/VEV Venturian[1,4]	VxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	VxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24		U, D	NF, DB, SF, WF [3]	Interpolated
	VxVxx10x-xxxxx-xxx	Single	10						U, D	NF, DB, SF, WF [3]	Interpolated
	VxVxx12x-xxxxx-xxx	Single	12						U, D	NF, DB, SF, WF [3]	Interpolated
	VxVxx14x-xxxxx-xxx	Single	14						U, D	NF, DB, SF, WF [3]	Interpolated
	VxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		U, D	SF	Interpolated
	VxVx212x-xxxxx-xxx	Dual	12						U, D	SF	Interpolated
	VxVx214x-xxxxx-xxx	Dual	14						U, D	SF	Interpolated
	VxVx214x-xxxxx-xxx	Dual	14	33.0	30.0	20.5	49		U	SF	Interpolated[5]
PVE/PVS[1] PHOENIX CONTROLS CSCP VENTURI VALVES	PVxxx06x-xxxxx-xxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	PVxxx08x-xxxxx-xxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24		U, D		Same as UUT15a,b, UUT16
	PVxxx10x-xxxxx-xxx-xxx	Single	10						U, D		Interpolated
	PVxxx12x-xxxxx-xxx-xxx	Single	12						U, D		Interpolated
	PVxxx14x-xxxxx-xxx-xxx	Single	14						U, D	NF, DB, SF, WF [3]	Same as UUT17
	PVxx210x-xxxxx-xxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		U, D		Interpolated
	PVxx212x-xxxxx-xxx-xxx	Dual	12						U, D		Same as UUT19
	PVxx214x-xxxxx-xxx-xxx	Dual	14						U, D		Same as UUT18, 20
TSV/TEV Traccel[1]	TxVxx06x-xxxxx-xxx	Single	6	16.5	8.5 to 10.2	12	9	Within 12" from the edge of the valve	U,D	NF, DB, SF, WF [3]	Extrapolated
	TxVxx08x-xxxxx-xxx	Single	8	23.5 to 30.0	10.3 to 13.9	14.6 to 21.4	9 to 24		U, D	NF, DB, SF, WF [3]	Interpolated
	TxVxx10x-xxxxx-xxx	Single	10						U, D	NF, DB, SF, WF [3]	Interpolated
	TxVxx12x-xxxxx-xxx	Single	12						U, D	NF, DB, SF, WF [3]	Interpolated
	TxVxx14x-xxxxx-xxx	Single	14						U, D	NF, DB, SF, WF [3]	Interpolated
	TxVx210x-xxxxx-xxx	Dual	10	25.0 to 33.0	20.0 to 30.0	16.5 to 20.5	30 to 49		U, D	SF	Interpolated
	TxVx212x-xxxxx-xxx	Dual	12						U, D	SF	Interpolated
	TxVx214x-xxxxx-xxx	Dual	14						U, D	SF	Interpolated
	TSVA214M-ALXUZ	Dual	14	33.0	30.0	21.4	49		U	SF	UUT18

Notes:

1. HSV/HEV, VSV/VEV, PVE/PVS, and TSV/TEV valves are similar to the MAV/EXV valve families and only differ by the type of controller.
2. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF), Welded Flange (WF)
3. DB tested in UUT 15b and 17, NF tested in UUT 11, 12, 15a
4. Same as the Traccel control valves, just alternate branding
5. Same as UUT18

Table 6 - Options - Vertical Orientation

Mounting Description: Vertical in-line duct mounted

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**Unit**
AAA	Valve Family	CSV/CEV	Constant Volume	UUT11-13
		PSV/PEV	Pneumatic	Interpolated[1]
		BSV/BEV	Base Upgradeable	Interpolated[1]
		MAV/EXV	Analog	UUT15a,b
		MAV/EXV	Celeris	UUT17, 19, 20
		HSV/HEV	Theris	UUT16
		VSV/VEV	Venturian	Interpolated[2]
		FSV/FEV	Flex	Interpolated[2]
		TSV/TEV	Traccel	UUT18
		PVE/PVS	Critical Spaces Control Platform (CSCP)	Same as UUT15a-b, UUT17, 19, 20
B	Valve Construction	A	Body and cone - uncoated aluminum; shaft - uncoated 316 SS	UUT11-13, 16, 18-20
		B	Body and cone with baked phenolic coating; PFA-coated 316 SS shaft	Interpolated
		C	Body, cone and hardware w/ baked phenolic/epoxy coating; PFA-coated 316 SS shaft	UUT17
		D	Body, cone and hardware with PVDF coating; PFA-coated 316 SS shaft	UUT15
C	Number of Valve Bodies	F	Single valve with welded circular flange	UUT16
		1	One valve body (single, no flange)	UUT11-12, 15a,b, 17
		2	Two valve bodies (dual)	UUT13, 18-20
		3	Three valve bodies (triple)	Extrapolated[3]
		4	Four valve bodies (quad)	Extrapolated[3]
DD	Valve Size	06	6" valve	Extrapolated[4]
		08	8" valve	UUT11, 15a-b, 16
		10	10" valve	Interpolated
		12	12" valve	UUT19
		14	14" valve	UUT12, 17, 18, 20
E	Flow/Pressure Operating Range	M	Medium Pressure	UUT11-13, 15-20
		L	Low Pressure	Same as UUT11-13, 15-20
F	Valve Design	A	Conical-shape diffuser (Accel II)	UUT11-13, 15, 17-20
		S	Standard - Shut-Off Valve	Same as UUT16
		L	Low Leakage - Shut-Off Valve	UUT16

1. PSV/PEV pneumatically operated valves are the same as the pneumatic actuator valves tested except the controller and potentiometer are removed. BSV/BEV are the same as the tested Celeris MAV/EXV valves, except potentiometer and/or controller tested in the MAV/EXV are removed.
2. Venturian VSV/VEV and Flex FSV/FEV are the same as Traccel (UUT18) with different brand name.
3. Within the confines of the tested options. Three and Four valve bodies consist of a combination of the One and Two valve that are structurally independent.
4. Same as UUT11, 15a-b, 16 but smaller in diameter.

Table 6 - Options - Vertical Orientation (Continued)

Mounting Description: Vertical in-line duct mounted

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**UUT**
G	Control Type	C	Constant Volume	UUT11-13
		P	Pneumatic	Interpolated[1]
		B	Base Upgradeable - Pneumatic	Interpolated[1]
		F	Fixed, field adjustable to increase/decrease flow	Same as UUT11-13
		I	IP54 Electric Actuator with fail-to-last position; floating point	UUT 16
		A	Analog Pneumatic	UUT15a
		E	Analog High Speed Electric	Interpolated[2]
		L	Linear low-speed electric actuator; floating point; IP67	Same as UUT15b, 20
		H	Rotary low-speed electric; floating point; NEMA 1	UUT17, 18
		M	Digital - Linear High-speed electric	UUT15b, 20
		T	Smart- Linear High Speed Electric (2-10VDC)	Interpolated[3]
		N	Digital - Pneumatic	UUT19
		Y	Base Upgradeable - Low Speed Electric (0-10 VDC)	Same as UUT17, 18
		Z	Base Upgradeable - IP54 Low Speed Electric (2-10 VDC)	Same as UUT17, 18
		Q	Base upgradeable - Med. Speed Electric (2-10 VDC)	Same as UUT17, 18
		R	Base upgradeable - Med. Speed Electric (4-20 mA)	Same as UUT17, 18
		S	Base upgradeable - Med. Speed Electric (0.5-10 VDC)	Same as UUT17, 18
H	Valve Controller Designation	N	No electronics	UUT11-13
		E	Celeris/Analog Electronic Controller (Analog without boosters only)	UUT15a,b
		E	LonMarkElectronic Valve - Controlling Valve of Tracking Pair	UUT19, 20
		X	LonMark Electronic Valve - Controlling valve of tracking pair with expanded features	UUT18
		O	LonMark Supply only Valve	Same as UUT18
		A	BACnet Electronic Valve - Controlling Valve of Tracking Pair	UUT16
		B	BACnet Electronic Valve - Controlling Valve of Tracking Pair with expanded features	Same as UUT16
		Y	BACnet TX-RTN - Supply controlling primary exhaust and return	Same as UUT16
		Z	BACnet TX-EXH - Supply controlling primary exhaust and locally controlled exhaust	Same as UUT16
		V	BACnet Electronic Valve-Programmable	Same as UUT16
		C	BACnet Supply only Valve	Same as UUT16
		D	BACnet Exhaust only Valve	Same as UUT16
		H	Hood exhaust valve with pressure switch	Same as UUT20
		F	Flow feedback in small black box	Extrapolated
		P	BACnet Electronic Valve for Phoenix Control brand	Same as UUT16
		1	BACnet Electronic Valve for Alerton brand	Same as UUT16

1. Pneumatic and base-upgradeable pneumatic control types are represented by the valves tested for UUT15a and UUT19 except the controller and/or potentiometer are removed.
2. Interpolated option: using the same PCB as UUT15a and actuator as UUT15b.
3. Bookended by UUT15b, 20.

Table 6 - Options - Vertical Orientation (Continued)

Mounting Description: Vertical in-line duct mounted

Nomenclature: AAA B C DD E - F G H I J - XXX - xxx				
Nomenclature	**Property**	**Allowable Value**	**Allowable Value Description**	**UUT**
H	Valve Controller Designation	2	BACnet Electronic Valve for Alerton brand	Same as UUT16
		V	BACnet Electronic Valve for Phoenix Control brand	Same as UUT16
		B	BACnet Electronic Valve -high speed (for PVE/PVS valve family only)	Same as UUT15a,b
		D	BACnet Electronic Valve -high speed (for PVE/PVS valve family only)	Same as UUT15a,b
		P	BACnet Electronic Valve -low speed (for PVE/PVS valve family only)	Same as UUT15a,b
		T	No electronics (for PVE/PVS valve family only)	Same as UUT11-13
I	Valve Orientation	H	Horizontal	N/A
		U	Vertical upflow	UUT15a-b, 17-20
		D	Vertical downflow	UUT10-13, 16
J	Fail Safe Position	C	Normally closed valve	UUT15a,b
		O	Normally open valve	UUT19,20
		Z	Not applicable	UUT16,17,18
		Y	Programmable fail-safe position (Normally open or Normally closed valve)	Same as UUT15a,b UUT19,20
		N	Not applicable	Same as UUT16,17,18
XXX	COMMUNICATION PROTOCOL (PVE/PVS family only)	BMT	BACnet MS/TP without BLE (Bluetooth Low Energy)	Same as UUT15a,b
		500	PBC with BACnet MS/TP with BLE (Bluetooth Low Energy)	Same as UUT15a,b
		501	PBC with BACnet MS/TP without BLE (Bluetooth Low Energy)	Same as UUT15a,b
xxx[1]	Valve Options	EVI	Exhaust valve with insulation and blocks	UUT 17
		IBO	Insulation blocks only, no insulation	Depopulated UUT17
		PSL	Pressure Switch, low limit	UUT20
		PTR	Pressure sensor	Same as UUT20
		LCL	Low casing leakage on Design = A valves	Interpolated
		SFB	Square flange on both ends of single body valve	Extrapolated
		SFX	Square flange on one end of single body valve; inlet on exhaust; discharge on supply	UUT17[2]
		SFI	Square flange on Inlet end of single body valve	Same as UUT17
		SFD	Square flange on discharge end of single body valve	Same as UUT17
		SSB	Stainless steel shaft brackets instead of galvaneal; Valve Construction = A Only	Same as UUT15a-b

1. Not all valves have options. Optionless valves have this portion of the model number left blank
2. SFI and SFD valve options are bookended by the SFX valve option as tested in UUT17

Nomenclature Chart: Phoenix Controls Accel II Airflow Control Valves

M A V A 1 1 4 M - A M E H C - _ - _

VALVE FAMILY

CSV	=	Constant volume Supply Valve
CEV	=	Constant volume Exhaust Valve
PSV	=	Pneumatic supply valve (no feedback)
PEV	=	Pneumatic exhaust valve (no feedback)
BSV	=	Base upgradeable supply valve
BEV	=	Base upgradeable exhaust valve
MAV	=	Analog/Celeris supply valve
EXV	=	Analog/Celeris exhaust valve
HSV	=	Theris Supply Valve Healthcare
HEV	=	Theris Exhaust Valve Healthcare
TSV	=	Traccel Supply Valve Life Science
TEV	=	Traccel Exhaust Valve Life Science
VEV	=	Venturian Exhaust Valve
VSV	=	Venturian Supply Valve
FEV	=	Flex Exhaust
FSV	=	Flex Supply
PVE	=	Phoenix Valve: Exhaust (CSCP)
PVS	=	Phoenix Valve: Supply (CSCP)

VALVE CONSTRUCTION

A	=	Body and cone - uncoated aluminum; Shaft - uncoated 316 stainless steel
B	=	Body and cone with baked phenolic coating; PFA-coated 316 stainless steel shaft
C	=	Body, cone and hardware with baked phenolic/epoxy phenolic coating; PFA-coated 316 stainless steel shaft
D	=	Body, cone and hardware with PVDF coating; PFA-coated 316 stainless steel shaft

NUMBER OF VALVE BODIES

F	=	Single valve with welded Circular Flanges
1	=	One valve body (single, no flange)
2	=	Two valve bodies (dual)
3	=	Three valve bodies (triple) (Analog and Uncontrolled Valves only)
4	=	Four valve bodies (quad) (Analog and Uncontrolled Valves only)

VALVE SIZE

06	=	6" valve (5.8" actual diameter)
08	=	8" valve (7.88" actual diameter)
10	=	10" valve (9.88" actual diameter)
12	=	12" valve (11.88" actual diameter)
14	=	14" valve (13.88" actual diameter)

FLOW/PRESSURE OPERATING RANGE

M	=	Medium pressure (0.6" to 3.0")
L	=	Low Pressure (0.3" to 3.0")

FAIL SAFE POSITION

C	=	**Normally closed valve**
O	=	**Normally open valve**
Z	=	**Not applicable**
Y	=	**Programmable fail-safe position**
N	=	**None**

VALVE ORIENTATION

H	=	**Horizontal**
U	=	**Vertical upflow**
D	=	**Vertical downflow**

CONTROL TYPE (Platform and Actuator)

C	=	**Constant Volume (field adjustable with 7/16" hex head nut driver)**
P	=	**Pneumatic**
B	=	**Base upgradeable - Pneumatic**
F	=	**Fixed, field adjustable with knob and increase/decrease flow label**
I	=	**All: IP54 electric actuator with fail-to-last position; BxV: Floating point**
Y	=	**Base upgradeable - Low Speed Electric (2-10VDC/4-20mA)**
Z	=	**Base upgradeable - IP 54 Low Speed Electric (2-10VDC)**
A	=	**Analog-Pneumatic**
E	=	**Analog - High-speed electric**
L	=	**Linear low-speed electric actuator; floating point; IP67**
H	=	**Rotary low-speed electric; floating point; NEMA 1**
M	=	**Digital - Linear High-speed electric**
N	=	**Digital - Pneumatic**
Q	=	**Base upgradeable - Medium Speed Electric (2-10VDC)**
S	=	**Base upgradeable - Medium Speed Electric (4-20 mA)**
R	=	**Base upgradeable - Medium Speed Electric (0.5-10VDC)**
T	=	**Smart- Linear High Speed Electric (2-10VDC)**

VALVE DESIGN

A	=	**Conical-shape diffuser (Accel II)**
S	=	**Standard. Shut-Off Valve**
L	=	**Low Leakage, Shut-Off Valve**

VALVE OPTIONS - (As required; list alphabetically separated by dashes, when multiples are ordered)

EVI	=	Exhaust Valve with insulation and blocks
IBO	=	Insulation blocks only, no insulation
PSL	=	Pressure switch, low limit
PTR	=	Pressure sensor (for PVE/PVS valve family only)
LCL	=	Low casing leakage on Design = A valves
SFB	=	Square flange on both ends of single body valve
SFX	=	Square flange on one end of single body valve: inlet on exhaust; discharge on supply
SFI	=	Square flange on inlet end of single body valve
SFD	=	Square flange on discharge end of single body valve
SSB	=	Stainless steel shaft brackets instead of galvaneal (Valve construction A only, PVE/PVS family only)

COMMUNICATION PROTOCOL (PVE/PVS family only)

BMT	=	BACnet MS/TP without BLE (Bluetooth Low Energy)
500	=	PBC with BACnet MS/TP with BLE (Bluetooth Low Energy)
501	=	PBC with BACnet MS/TP without BLE (Bluetooth Low Energy)

VALVE CONTROLLER DESIGNATION

N	=	No electronics (Traccel/Theris Tracking Valve or CV)
T	=	No electronics -Only terminal strip in plastic enclosure
E	=	Celeris/Analog Electronic Controller (Analog without boosters only)
E	=	LonMark Electronic valve - Controlling Valve of Tracking Pair
X	=	LonMark Electronic valve - Controlling Valve of Tracking Pair with Expanded Features
O	=	LonMark Supply only Valve - No Tracking Pair Ability
A	=	BACnet Electronic Valve - Controlling Valve of Tracking Pair
B	=	BACnet Electronic Valve - Controlling Valve of Tracking Pair with Expanded Features
Y	=	BACnet TX-RTN (Supply controlling primary exhaust and Return Valve)
Z	=	BACnet TX-EXH (Supply controlling primary exhaust and locally controlled exhaust)
C	=	BACnet Supply Only Valve - No Tracking Pair Ability
D	=	BACnet Exhaust Only Valve - No Tracking Pair Ability
H	=	Hood exhaust valve with pressure switch
F	=	Flow Feedback in Small Black box
1	=	BACnet Electronic Valve-Programmable Alerton brand (Same as A/B/C/D/Y/Z, programmable)
2	=	BACnet Electronic Valve-Programmable Alerton brand (Same as A/B/C/D/Y/Z, programmable)
P	=	BACnet Electronic Valve-Programmable Phoenix brand Same as A/B/C/D/Y/Z, programmable)
V	=	BACnet Electronic Valve-Programmable Phoenix brand Same as A/B/C/D/Y/Z, programmable)
B	=	BACnet Electronic Valve - High Speed (for PVE/PVS valve family only)
D	=	BACnet Electronic Valve - High Speed (for PVE/PVS valve family only)
P	=	BACnet Electronic Valve - Low Speed (for PVE/PVS valve family only)
T	=	No electronics (for PVE/PVS valve family only)

Table 7 - Certified Subcomponents - Horizontal Orientation

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Subcomponent [MFR]	Model Number	Description	Approximate Weight (lbs.)	Unit
Controller Board [PHOENIX CONTROLS] Material: PCB	C2V LOSEA	Low Speed	1	UUT5c-d
	THERIS	Low Speed	1	UUT6c
	TRACCEL	Low Speed	1	UUT8b
	LVC HISEA	High Speed	1	UUT5a-b, 6a-b, 7a, 8a, 10
	AVC HISEA	High Speed Analog	1	UUT7d
	C2V PNU	Pneumatic	1	UUT7b-c
	VLV CNTRL ANALOG	Pneumatic Analog	1	UUT9
	CSCP LoSEA	Low Speed	1	Same as UUT5c-d
	CSCP HiSEA	High Speed	1	Same as UUT5a-b, 6a-b, 7a, 8a, 10
Actuator [PHOENIX CONTROLS] Material: Galvanized Carbon Steel	Integral Part of Valve	Manual control actuator	1	UUT1a-c, 2, 3a-c, 4
Actuator [PHOENIX CONTROLS] Material: Plastic and Carbon Steel	490-000-073	High Speed Electric Linear Actuator	3	UUT5b, 6a, 7d
	490-000-092	High Speed Electric Linear Actuator	3	Same as UUT5b, 6a, 7d
	490-000-095	Medium Speed Electric Linear Actuator	3	Same as UUT5b, 6a, 7d
	490-000-096	Smart High Speed Electric Linear Actuator	3	Extrapolated[1]
	490-000-097	Smart High Speed Electric Linear Actuator	3	Extrapolated[1]
	490-000-098	Smart High Speed Electric Linear Actuator	3	Extrapolated[1]
	490-000-099	Smart High Speed Electric Linear Actuator	3	Extrapolated[1]
	490-000-100	Medium Speed Electric Linear Actuator	3	Same as UUT5a, 6a
	490-000-101	High Speed Electric Linear Actuator	3	Same as UUT6a
	490-000-102	High Speed Electric Linear Actuator	3	Same as UUT6a
Actuator [THOMSON] Material: Plastic and Carbon Steel	DH12-17W41	High Speed Electric Linear Actuator	2	UUT8a
	DH12-17W42	High Speed Electric Linear Actuator	2	UUT5a, 6b, 7a, 10
Actuator [BELIMO] Material: Plastic and Carbon Steel	GMB24-3 PH	On/off Floating Point Control, Non-Spring Return, Direct Coupled, 24 V	3	UUT8b
	GMB24-SR	Proportional Control, Non-Spring Return, Direct Coupled, 24 V	3	Same as UUT8b
	AMQBX24-MFT	Programmable, Non-Spring Return, Direct Coupled, 24 V	3	Interpolated[2]
	AMB24-3.1 PH	On/off Floating Point Control, Non-Spring Return, 24 V	3	UUT6c
	AMB24-SR	Proportional Control, Non-Spring Return, 24 V	3	Same as UUT6c
	NMQBX24-MFT	Programmable, Non-Spring Return, 24 V	5	Same as UUT6c
	NMB24-3.1 PH	On/off Floating Point Control, Non-Spring Return, Direct Coupled, 24 V	5	UUT5d
	NMB24-SR	Proportional Control, Non-Spring Return, Direct Coupled, 24 V	5	Same as UUT5d
Actuator [HONEYWELL] Material: Plastic and Carbon Steel	ML6174B2019	On/off Floating Point Control, Non-Spring Return Damper Actuator, 24 V	3	UUT5c
	ML7174A2001	Proportional Control, Non-Spring Return Damper Actuator, 24 V	3	Same as UUT5c
Actuator [KMC] Material: Plastic and Carbon Steel	MCP-0335	3" Pneumatic control actuator (open/closed position)	3	UUT7c, 9
	MCP-0435	4" Pneumatic control actuator (open/closed position)	4	UUT7b
Pressure Switch [HONEYWELL] Material: Plastic and Carbon Steel	1227D1/A, 0.30" WC PF	Pressure Switch	<1	UUT9
Pressure Sensor [HONEYWELL] Material: Plastic and Carbon Steel	100-004-424	Pressure sensor	<1	Extrapolated[3]
	100-004-425		<1	Extrapolated[3]

Notes:

1. Same as tested in UUT5b, 6a, 7d, except software change and added control interface. Similar actuators were tested in the Belimo range.
2. Same as controller tested in UUT8b, except slightly smaller and with software change.
3. Same as the pressure switch tested in UUT9, but slightly smaller.

Table 8 - Certified Subcomponents - Vertical Orientation

Mounting Description: Vertical in-line duct mounted

Subcomponent [MFR]	Model Number	Description	Approx. Weight (lbs.)	Unit
Controller Board [PHOENIX CONTROLS] Material: PCB	C2V LOSEA	Low Speed	1	UUT17
	THERIS	Low Speed	1	UUT16
	TRACCEL	Low Speed	1	UUT18
	LVC HISEA	High Speed	1	UUT15b,20
	AVC HISEA	High Speed Analog	1	Interpolated
	C2V PNU	Pneumatic	1	UUT19
	VLV CNTRL ANALOG	Pneumatic Analog	1	UUT15a
	CSCP LoSEA	Low Speed	1	Same as UUT17
	CSCP HiSEA	High Speed	1	Same as UUT15b, 20
Actuator [PHOENIX CONTROLS] Material: Galvanized Carbon Steel	Integral part of valve	Manual control actuator	1	UUT11-13
Actuator [PHOENIX CONTROLS] Material: Plastic and Carbon Steel	490-000-073	High Speed Electric Linear Actuator	3	UUT15b
	490-000-092	High Speed Electric Linear Actuator	3	Same as UUT15b
	490-000-095	Medium Speed Electric Linear Actuator	3	Same as UUT15b
	490-000-096	Smart High Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-097	Smart High Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-098	Smart High Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-099	Smart High Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-100	Medium Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-101	High Speed Electric Linear Actuator	3	Extrapolated[3]
	490-000-102	High Speed Electric Linear Actuator	3	Extrapolated[3]
Actuator [THOMSON] Material: Plastic and Carbon Steel	DH12-17W41	High Speed Electric Linear Actuator	2	Same as UUT20
	DH12-17W42	High Speed Electric Linear Actuator	2	UUT20
Actuator [BELIMO] Material: Plastic and Carbon Steel	NMB24-SR	Proportional Control, Non-Spring Return, Direct Coupled, 24V	3	UUT18
	NMB24-3.1 PH	On/off Floating Point Control, Non-Spring Return, 24 V	3	Interpolated[1]
	NMQBX24-MFT	Programmable, Non-Spring Return, 24 V	3	Interpolated[1]
	AMB24-SR	Proportional Control, Non-Spring Return, 24V	3	Extrapolated[2]
	AMB24-3.1 PH	On/off Floating Point Control, Non-Spring Return, 24 V	3	UUT17
	AMQBX24-MFT	Programmable, Non-Spring Return, 24 V	5	Extrapolated[2]
	GMB24-ST	Proportional Control, Non-Spring Return, 24V	5	Extrapolated[2]
	GMB24-3 PH	On/Off Floating Point Control, Non-Spring Return, Direct Coupled, 24V	5	Extrapolated[2]
Actuator [HONEYWELL] Material: Plastic and Carbon Steel	ML6174B2019	On/off Floating Point Control, Non-Spring Return Damper Actuator, 24 V	3	UUT16
	ML7174A2001	Proportional Control, Non-Spring Return Damper Actuator, 24 V	3	Same as UUT16
Actuator [KMC] Material: Plastic and Carbon Steel	MCP-0335	3" Pneumatic control actuator (open/closed position)	3	UUT15a
	MCP-0435	4" Pneumatic control actuator (open/closed position)	4	UUT19
Pressure Switch [HONEYWELL] Material: Plastic and Carbon Steel	1227D1/A, 0.30" WC PF	Pressure Switch	<1	UUT20
Pressure Sensor [HONEYWELL] Material: Plastic and Carbon Steel	100-004-424	Pressure sensor	<1	Extrapolated[4]
	100-004-425		<1	Extrapolated[4]

1. Same as tested in UUT18, except slightly smaller and with software change.
2. Same as tested in UUT17, except slightly smaller and with software change.
3. Same as tested in UUT15b, except software change and added control interface. Similar actuators were tested in the Belimo range.
4. Same as the pressure switch tested in UUT9, but slightly smaller.

Table 9 - Tested Units - Horizontal Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Tested Product Construction: Valve construction is Type A, B, C or D. Body and cone are aluminum with 316 stainless steel shaft (coated or uncoated).

Tested Options: Various valve construction, valve body number and size (8" to 14"), horizontal orientation, controllers, actuators and pressure switch.

Mounting Description: Horizontal in-line duct mounted (ceiling suspended)

Model Number	Valve Family	Valve Body	Diameter (in)	Dimensions (in)			Weight (lb.)	Max. Hanger Rod Spacing (in)	Connection Type [1]	Unit
				Depth	Width	Height				
CSVA108M-ACNHZ	CSV/CEV Constant Volume	Single	8	23.5	7.9	12.0	6	48	NF	UUT1a
CSVA108M-ACNHZ	CSV/CEV Constant Volume	Single	8	23.5	7.9	12.0	8	48	DB	UUT1b
CSVA108M-ACNHZ-SFB	CSV/CEV Constant Volume	Single	8	23.5	7.9	12.0	8	48	SF	UUT1c
CSVA214M-ACNHZ	CSV/CEV Constant Volume	Dual	14	33.0	30.0	18.5	33	48	SF	UUT2
CSVA114M-ACNHZ	CSV/CEV Constant Volume	Single	14	30.0	14.0	19.5	12	48	NF	UUT3a
CSVA114M-ACNHZ	CSV/CEV Constant Volume	Single	14	30.0	14.0	19.5	15	48	DB	UUT3b
CSVA114M-ACNHZ-SFB	CSV/CEV Constant Volume	Single	14	30.0	14.0	19.5	16	48	SF	UUT3c
CSVA210M-ACNHZ	CSV/CEV Constant Volume	Dual	10	24.0	20.0	14.0	18	48	SF	UUT4
EXVA108M-AMEHO (Celeris)	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	9	48	NF	UUT5a
EXVA108M-AMEHO (Celeris)	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	11	48	DB	UUT5b
EXVA108M-ALEHZ-SFB (Celeris)	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	11	48	SF	UUT5c
EXVA108M-AIEHZ-SFB (Celeris)	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	11	48	SF	UUT5d
EXVA114M-AMEHO (Celeris)	MAV/EXV Analog / Celeris	Single	14	30.0	13.9	21.4	20	48	NF	UUT6a
EXVA114M-AMEHO (Celeris)	MAV/EXV Analog / Celeris	Single	14	30.0	13.9	21.4	23	48	DB	UUT6b
HSVA114M-ALOHZ-SFB	HSV/HEV Theris	Single	14	30.0	13.9	21.4	24	48	SF	UUT6c
EXVA210M-AMEHC (Celeris)	MAV/EXV Analog / Celeris	Dual	10	25.0	20.0	16.5	30	48	SF	UUT7a
EXVA210M-ANEHO (Celeris)	MAV/EXV Analog / Celeris	Dual	10	25.0	20.0	16.5	30	48	SF	UUT7b
EXVA210M-ANEHC (Celeris)	MAV/EXV Analog / Celeris	Dual	10	25.0	20.0	16.5	30	48	SF	UUT7c
EXVA210M-AEEHC (Analog)	MAV/EXV Analog / Celeris	Dual	10	25.0	20.0	16.5	30	48	SF	UUT7d
EXVA214M-AMEHC (Celeris)	MAV/EXV Analog / Celeris	Dual	14	33.0	30.0	20.5	49	48	SF	UUT8a
TSVA214M-ALXHZ	TSV/TEV Traccel	Dual	14	33.0	30.0	20.5	49	48	SF	UUT8b
EXVDF08M-AAEHO-PSL / EXVDF08M-AAHHO (Analog)	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	17	48	WF	UUT9
EXVB114M-SMEHO (Celeris)	MAV/EXV Analog / Celeris	Single	14	30.0	13.9	21.4	24	48	SF	UUT10

Notes:

1. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF) , Welded Flange (WF)

Table 10 - Tested Units - Vertical Orientation

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Tested Product Construction: Valve construction is Type A, B, C or D. Body and cone are aluminum with 316 stainless steel shaft (coated or uncoated).

Tested Options: Various valve construction, valve body number and size (8" to 14"), vertical upflow/downflow orientation, controllers, actuators and pressure switch.

Mounting Description: Vertical in-line duct mounted

Model Number	Valve Family	Valve Body	Diameter (in)	Dimensions (in)			Weight (lb.)	Max. Vertical Duct Support Spacing	Connection Type [1]	Unit
				Depth	Width	Height				
CSVA108M-ACNDZ	CSV/CEV Constant Volume	Single	8	23.5	7.9	12.0	6	Within 12" from the edge of the valve	NF	UUT11
CSVA114M-ACNDZ	CSV/CEV Constant Volume	Single	14	30.0	14.0	19.5	12		NF	UUT12
CSVA210M-ACNDZ	CSV/CEV Constant Volume	Dual	10	24.0	20.0	14.0	18		NF	UUT13
EXVD108M-AAEUC	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	11		NF	UUT15a
EXVD108M-AMEUC	MAV/EXV Analog / Celeris	Single	8	23.5	10.3	14.6	11		DB	UUT15b
HSVAF08M-LI**X**DZ	HSV/HEV Theris	Single	8	23.5	10.3	14.6	11		WF	UUT16
MAVC114M-ALEUZ-SFX	MAV/EXV Analog / Celeris	Single	14	30.0	13.9	21.4	24		DB & SF	UUT17
TSVA214M-AL**X**UZ	TSV/TEV Traccel	Dual	14	33.0	30.0	21.4	49		SF	UUT18
EXVA212M-ANEDO	MAV/EXV Analog / Celeris	Dual	12	30.0	24.5	18.4	36		SF	UUT19
EXVA214M-AMEUO-PSL	MAV/EXV Analog / Celeris	Dual	14	33.0	30.0	21.4	49		SF	UUT20

Notes:

1. No Flange (NF) , No Flange with Drawband Clamps (DB) , Square Flange (SF) , Welded Flange (WF)

UUT1a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA108M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, single valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
6	23.5	7.9	12	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 1a was ceiling-suspended. Duct was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT1b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA108M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
8	23.5	7.9	12	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 1b was ceiling-suspended. Duct was attached to the unit with (2) DBK-1-08 drawband clamps. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT1c - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA108M-ACNHZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

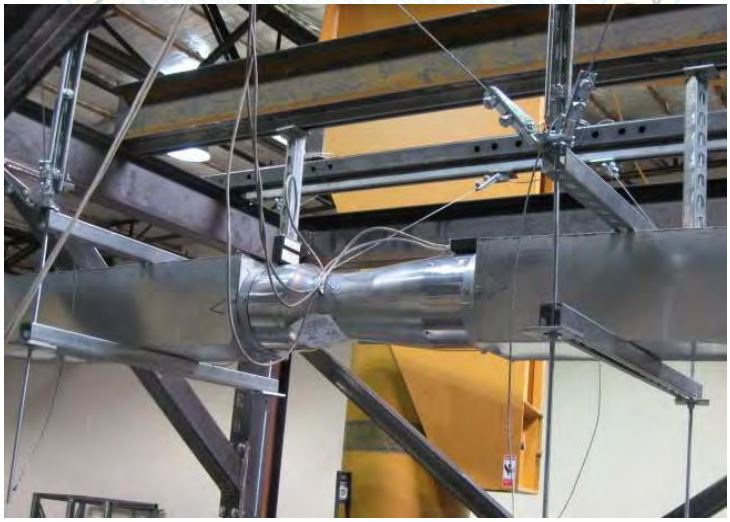
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
8	23.5	7.9	12	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 1c was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (4) #14 self tapping screws, one on each side. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT2 - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA214M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, two valve bodies, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
33	33	30	18.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 2 was ceiling-suspended; the rectangular duct was attached to the unit with (10) #14 self tapping screws, (3) on each long side, (2) on each short side, approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT3a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA114M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
12	30	14	19.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 3a ceiling-suspended. Duct was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT3b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA114M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
15	30	14	19.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 3b ceiling-suspended. Duct was attached to the unit with (2)DBK-1-14 drawband clamps. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT3c - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA114M-ACNHZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
16	30	14	19.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 3c was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (8) #14 self tapping screws, spaced 1'' in from the corners. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT4 - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA210M-ACNHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, two valve bodies, 10" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
18	24	20	14	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 4 was ceiling-suspended; the rectangular duct was attached to the unit with (10) #14 self tapping screws, (3) on each long side, (2) on each short side, approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT5a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA108M-AMEHO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
9	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 5a was ceiling-suspended. Duct was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT5b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA108M-AMEHO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 5b was ceiling-suspended. Duct was attached to the unit with (2) DBK-1-08 drawband clamps. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT5c - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA108M-ALEHZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 5c was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (4) #14 self tapping screws, one on each side. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT5d - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA108M-AIEHZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 5d was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (4) #14 self tapping screws, one on each side. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT6a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA114M-AMEHO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 14" valve, medium pressure operating range, conical shaped diffuser, digital high speed electric controller type, Celeris electronic controller designation, horizontal orientation, normally open valve fail safe position. Phoenix Controls actuator, horizontal orientation.

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
20	30	13.9	21.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 6a was ceiling-suspended. Duct was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT6b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA114M-AMEHO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, one valve body, 14" valve, medium pressure operating range, conical shaped diffuser, digital high speed electric controller type, Celeris electronic controller designation, horizontal orientation, normally open valve fail safe position. Thomson DH12-17W42 actuator.

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

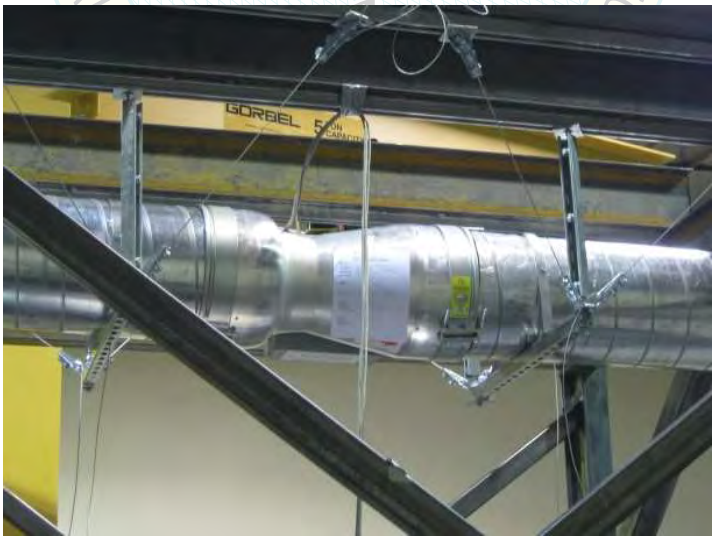
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
23	30	13.9	21.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 6b was ceiling-suspended. Duct was attached to the unit with (2) DBK-1-14 drawband clamps. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT6c - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: HSVA114M-ALOHZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Theris valve family, valve construction A, one valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
24	30	13.9	21.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 6c was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (8) #14 self tapping screws, spaced 1'' in from the corners. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT7a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA210M-AMEHC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, two valve bodies, 10" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
30	25	20	16.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 7a was ceiling-suspended; the rectangular duct was attached to the unit with (12) #14 self tapping screws approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT7b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA210M-ANEHO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, two valve bodies, 10" valve, medium pressure operating range, conical shaped diffuser, digital pneumatic controller type, Celeris electronic controller designation, horizontal orientation, normally open valve fail safe position. 4" pneumatic actuator.

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

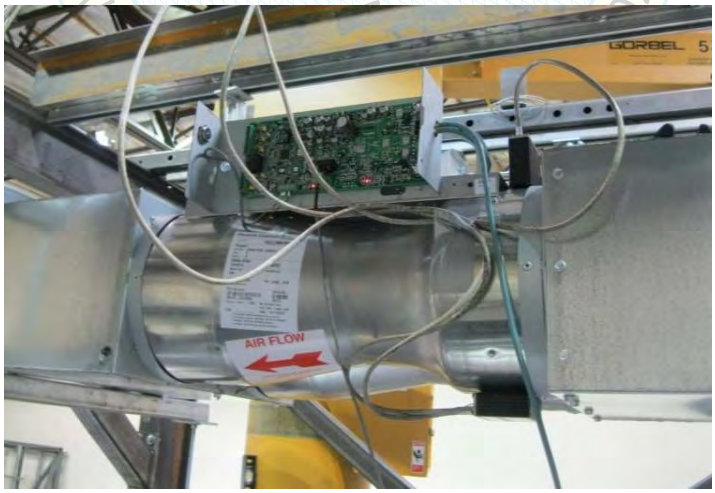
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
30	25	20	16.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 7b was ceiling-suspended; the rectangular duct was attached to the unit with (12) #14 self tapping screws approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT7c - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA210M-ANEHC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, two valve bodies, 10" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
30	25	20	16.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 7c was ceiling-suspended; the rectangular duct was attached to the unit with (12) #14 self tapping screws approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT7d - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA210M-AEEHC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, two valve bodies, 10" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
30	25	20	16.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 7d was ceiling-suspended; the rectangular duct was attached to the unit with (12) #14 self tapping screws approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT8a - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA214M-AMEHC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, two valve bodies, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
49	33	30	20.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 8a was ceiling-suspended; the rectangular duct was attached to the unit with (10) #14 self tapping screws, (3) on each long side, (2) on each short side, approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT8b - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: TSVA214M-ALXHZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Traccel valve family, valve construction A, two valve bodies, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
49	33	30	20.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 8b was ceiling-suspended; the rectangular duct was attached to the unit with (10) #14 self tapping screws, (3) on each long side, (2) on each short side, approximately 1'' in from the corners and in the center. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT9 - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVDF08M-AAEHO-PSL / EXVDF08M-AAHHO

Product Construction Summary:

Body, cone and hardware - aluminum with PVDF coating; PFA-coated 316 stainless steel shaft.

Options / Component Summary:

Celeris valve family, valve construction D, single valve with welded circular flange, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
17	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 9 was ceiling-suspended. Duct was attached to the unit with (6) 1/4'' diameter, grade 5, bolts spaced at 60 degrees. The flanges attached to the duct with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the top of the strut with steel 3/4'' wide, 24ga strap using 3/8-inch diameter Grade 5 bolts. The strap was attached to the duct with three #14 self tapping screws per side, spaced at 90 degrees. The strut was suspended with 3/8-inch diameter threaded rod spaced at 48'' apart and 24'' down from the fixture. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT10 - DCL Test Report 43003-1201

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVB114M-SMEHO

Product Construction Summary:

Body and cone - aluminum with baked phenolic coating; PFA-coated 316 stainless steel shaft

Options / Component Summary:

Celeris valve family, valve construction B, single valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
24	30	13.9	21.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 10 was ceiling-suspended with square flange mount; the flange was attached to the unit with (4) #14 self tapping screws spaced at 90 degrees. The duct was attached to the flange with (8) #14 self tapping screws, spaced 1'' in from the corners. The duct was fastened top and bottom 1 5/8'' 12 ga strut; the strut was attached to the duct, 24'' from the center of the valve with (6) #14 self tapping screws per strut spaced approximately 2'' on center. The unit was suspended with 3/8-inch diameter threaded rod spaced at 48'' and hung approximately 24'' down. Rod stiffeners and rod stiffening clips were used. 22'' lengths of 1 5/8'' 12 ga strut with (3) Power Strut PS 3500, A307, rod stiffening clips. Lateral bracing consisted of Mason SCB hangers with 1/8-inch diameter cable, 2 per drop rod, angled at approximately 45 degrees horizontally and vertically.

UUT11 - DCL Test Report 43003-1201b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA108M-ACNDZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
6	23.5	7.9	12	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 11 was mounted in a vertical orientation, in-line with duct. Unit was attached to one square and one round duct using (4) #14 self tapping screws per each duct spaced evenly at 90 degrees. The top duct was attached to the DCL steel shake table interface frame with 24 ga steel strap (3) #14 screws spaced at 90 degrees. The bottom duct was attached to the interface frame with angle (8) #14 self tapping screws. This lateral bracing of the assembly was provided at 8-feet on-center. The interface frame was mounted to the shake table using M12 threaded rod at approximately 8-inches on-center.

UUT12 - DCL Test Report 43003-1201b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA114M-ACNDZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, one valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
12	30	14	19.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 12 was mounted in a vertical orientation, in-line with duct. Unit was attached to one square and one round duct using (4) #14 self tapping screws per each duct spaced evenly at 90 degrees. The top duct was attached to the DCL steel shake table interface frame with 24 ga steel strap (3) #14 screws spaced at 90 degrees. The bottom duct was attached to the interface frame with angle (8) #14 self tapping screws. This lateral bracing of the assembly was provided at 8-feet on-center. The interface frame was mounted to the shake table using M12 threaded rod at approximately 8-inches on-center.

UUT13 - DCL Test Report 43003-1201b

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: CSVA210M-ACNDZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Constant Volume valve family, valve construction A, two valve bodies, 10" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
18	24	20	14	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UTU 13 was mounted in a vertical orientation, in-line with duct. Unit was attached to two rectangular ducts using (1) #14 screws per each duct spaced at 1'' in from the corners and in the middle on the long side. The top duct was attached to the DCL steel shake table interface frame with 24ga steel strap (3) #14 self tapping screws. The bottom duct was attached to the interface frame with angle (8) #14 self tapping screws. This lateral bracing of the assembly was provided at 8-feet on-center. The interface frame was mounted to the shake table using M12 threaded rod at approximately 8-inches on-center.

UUT15a - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVD108M-AAEUC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction D, single valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 15a was mounted in a vertical orientation, in-line with 8'' diameter duct. The unit was attached to the ducts using (2) DBK-1-08 drawband clamps. The duct was attached to the DCL steel shake table interface frame with 3/4'' wide, 24ga hanger strap and (3) #14 self tapping screws spaced 90 degrees apart. The strap was spaced 12'' from the edge of the duct. Strap attached to the DCL interface fixture with (2) 1/4'' diameter, grade 5, bolts and washers with a 1.5'' x 1.5'' x 3/16'' low carbon steel plate washer.

UUT15b - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVD108M-AMEUC

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction D, single valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 15a was mounted in a vertical orientation, in-line with 8'' diameter duct. The unit was attached to the ducts using (2) DBK-1-08 drawband clamps. The duct was attached to the DCL steel shake table interface frame with 3/4'' wide, 24ga hanger strap and (3) #14 self tapping screws spaced 90 digress apart. The strap was spaced 12'' from the edge of the duct. The strap attached to the DCL interface fixture with (2) 1/4'' diameter, grade 5, bolts and washers with a 1.5'' x 1.5'' x 3/16'' low carbon steel plate washer.

UUT16 - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: HSVAF08-LIXDZ-SFB

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Theris valve family, valve construction A, single valve body, 8" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

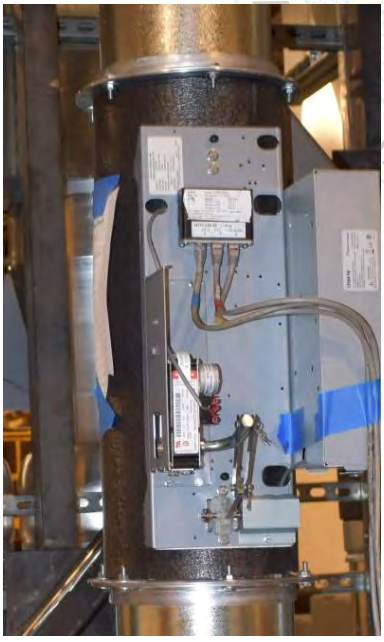
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11	23.5	10.3	14.6	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 16 was mounted in a vertical orientation, in-line with 8'' diameter duct. The unit was attached to the duct using (6) 1/4'' diameter, grade 5, bolts spaced 60 degrees apart. The duct was attached to the DCL steel shake table interface frame with 3/4'' wide, 24ga hanger strap and (3) #14 self tapping screws spaced 90 digress apart. The strap was spaced 12'' from the edge of the duct. Strap attached to the DCL interface fixture with (2) 1/4'' diameter, grade 5, bolts and washers with a 1.5'' x 1.5'' x 3/16'' low carbon steel plate washer.

UUT17 - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: MAVC114M-ALEUZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Theris valve family, valve construction C, single valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

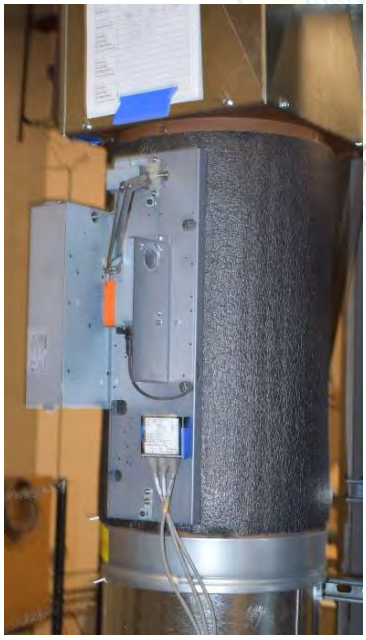
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
24	30	13.9	21.4	N/A	N/A	N/A

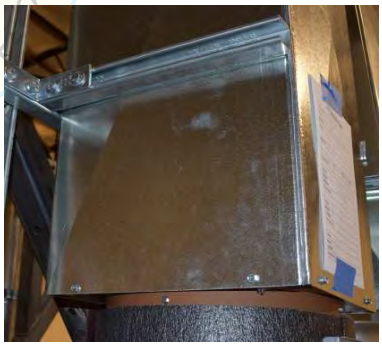
Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



bottom attachment



top attachment

UUT 17 was mounted in a vertical orientation, in-line with 14'' diameter duct on one side and square duct on the other. The unit was attached to the round duct using a DBK-1-14 drawband clamp. The unit was attached to the square duct with (8) #14 self tapping screws spaced 1'' from the corner. The round duct was attached to the DCL steel shake table interface frame with 3/4'' wide, 24ga hanger strap and (3) #14 self tapping screws spaced 90 degrees apart. Attachment points were spaced 12'' from the edge of the duct. The square duct was attached to the DCL steel shake table interface frame with (8) #14 self tapping screws, spaced 2'' on center, into (2) 1 5/8'' 12 ga strut. Strut was attached with (4) 3/8'' diameter, grade 5 bolts via angle bracket.

UUT18 - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: TSVA214M-ALXUZ

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Traccel valve family, valve construction A, dual valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

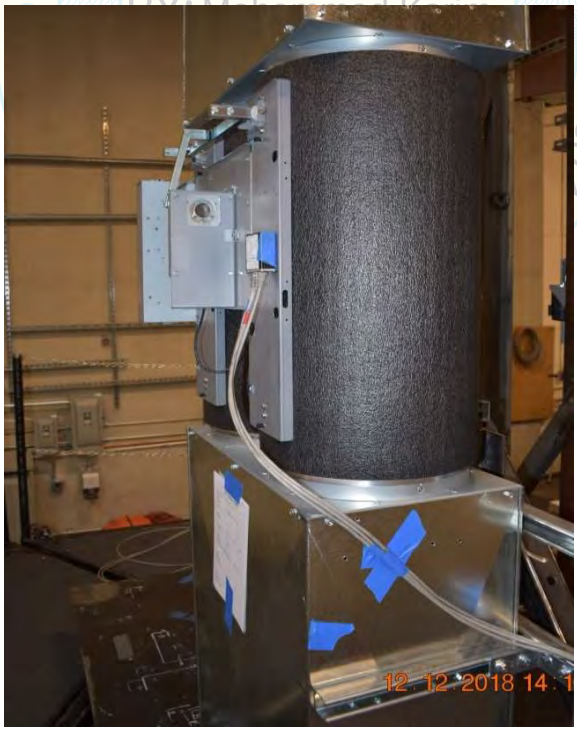
UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
49	33	30	24.1	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 18 was mounted in a vertical orientation, in-line with rectangular duct. The unit was attached to the square duct with (10) #14 self tapping screws spaced 1'' from the corners and in the center of the valve in the long direction. The duct was attached to the DCL steel shake table interface frame with (8) #14 self tapping screws, spaced 2'' on center, into (2) 1 5/8'' 12 ga strut. Strut was attached with (4) 3/8'' diameter, grade 5 bolts via angle bracket and spaced 12'' from the edge of the valve.

UUT19 - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA212M-ANEDO

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, dual valve body, 12" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
36	30	24.5	18.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 19 was mounted in a vertical orientation, in-line with rectangular duct. The unit was attached to the square duct with (10) #14 self tapping screws spaced 1'' from the corners and in the center of the valve in the long direction. The duct was attached to the DCL steel shake table interface frame with (8) #14 self tapping screws, spaced 2'' on center, into (2) 1 5/8'' 12 ga strut. Strut was attached with (4) 3/8'' diameter, grade 5 bolts via angle bracket and spaced 12'' from the edge of the valve.

UUT20 - DCL Test Report 43012-1801

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Phoenix Controls

Product Line: Accel II Airflow Control Valves

Model Number: EXVA214M-AMEUO-PSL

Product Construction Summary:

Body and cone -- uncoated aluminum; Shaft -- uncoated 316 stainless steel

Options / Component Summary:

Celeris valve family, valve construction A, dual valve body, 14" valve

Note: The UUT was operational before, during and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
49	33	30	21.4	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 20 was mounted in a vertical orientation, in-line with rectangular duct. The unit was attached to the square duct with (10) #14 self tapping screws spaced 1'' from the corners and in the center of the valve in the long direction. The duct was attached to the DCL steel shake table interface frame with (8) #14 self tapping screws, spaced 2'' on center, into (2) 1 5/8'' 12 ga strut. Strut was attached with (4) 3/8'' diameter, grade 5 bolts via angle bracket and spaced 12'' from the edge of the valve.