



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

APPLICATION FOR HCAI SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0352

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Air Distribution Technologies, Inc.

Manufacturer's Technical Representative: Steve Attri

Mailing Address: 605 Shiloh Road, Plano, TX 75074

Telephone: (972) 212-4815

Email: steve.attri@adticorp.com

Product Information

Product Name: Dual Duct (PEDV, DEDV), Single Duct (PESV, EESV, AESV, DESV, ESV-S, LMHS-S, SDV-S), Series Fan Powered (PTFS, ATFS, DTFS, PTFS-A, ATFS-A, DTFS-A, PTFS-G, ATFS-G, DTFS-G, PTFS-F, ATFS-F, DTFS-F)

Product Model Number(s): Dual Duct (PEDV, DEDV), Single Duct (PESV, EESV, AESV, DESV, ESV-S, LMHS-S, SDV-S), Series Fan Powered (PTFS, ATFS, DTFS, PTFS-A, ATFS-A, DTFS-A, PTFS-G, ATFS-G, DTFS-G, PTFS-F, ATFS-F, DTFS-F)

Product Category: Air Conditioning Units

Product Sub-Category: Air Conditioning Units - Inline Fan and Terminal

General Description: Suspended cataloged VAV terminal units with dampers and controls. No fans, motors or coils. Suspended cataloged fan terminal units. Coils and silencers cannot be used with dual duct units, as configuration was not tested.

Mounting Description: Suspended Rigid and Spring Vibration Isolated

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: Air Distribution Technologies

Contact Person: Steve Attri

Mailing Address: 605 Shiloh Road, Plano, TX 75074

Telephone: (214) 315-1937

Email: steve.attri@adticorp.com

Title: Sr. Product Manager



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

Company Name: RESPONSE STRUCTURAL ENGINEERS

Name: Todd Kemen

California License Number: S5409

Mailing Address: 5441 Fair Oaks Blvd, STE G2, Carmichael, CA 95608

Telephone: (530) 200-4022

Email: toddk@response-eng.com

Certification Method

☐ GR-63-Core

☒ ICC-ES AC156

☐ IEEE 344

☐ IEEE 693

☐ NEBS 3

☐ Other (Please Specify): _____

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657

Email: jeremy@etldallas.com

BY: Mohammad Karim

DATE: 01/16/2026



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Seismic Parameters

Certified Response Spectral Acceleration Factors: (F_p/W_p)

Horizontal (A Flx-H), $g =$ 3.20 (A Rig-H), $g =$ 2.15

Vertical (A Flx-V), $g =$ 1.33 (A Rig-V), $g =$ 0.53

SDS (Design spectral response acceleration at short period, g) = 2.00

H_f (Force amplification height factor) = 3.5 at $z/h=1$

R_u (Structure ductility reduction factor) = 1.3 at $z/h=1$

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

HCAI Approval (For Office Use Only) - Approval Expires on 01/06/2032

Date: 1/6/2026

Name: Mohammad Karim

Title: Supervisor, Health Facilities

Condition of Approval (if applicable): Coils and silencers cannot be used with dual duct units, as configuration was not tested.

BY: Mohammad Karim

DATE: 01/16/2026



Table DD-1A
Certified Product
Cabinet Sizes Without Mixing Box
Mounting Configuration: Rigid Rod Suspension
 $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$
Manufacturer: Titus

Product Family	Model ^a	Inlet Size (in)	Height (in)	Width (in)	Length (in)	Max Weight (lb)	UUT
Dual Duct	PEDV-S_XX0XXX0404	4	8	33	15.5	66	Extrapolated
	PEDV-S_XX0XXX0505	5	8	33	15.5	66	Extrapolated
	PEDV-S_3A002R0606	6	8	33	16.7	66	DD-UUT-3
	PEDV-S_XX0XXX0707	7	15.1	33	16.7	85	Interpolated
	PEDV-S_XX0XXX0808	8	15.1	33	16.7	85	Interpolated
	PEDV-S_XX0XXX0909	9	15.1	37.1	15.5	99	Interpolated
	PEDV-S_XX0XXX1010	10	15.1	37.1	15.5	99	Interpolated
	PEDV-S_XX0XXX1212	12	15.1	42.1	15.5	114	Interpolated
	PEDV-S_XX0XXX1414	14	17.6	49	15.5	137	Interpolated
	PEDV-S_XX0XXX1616	16	18	57	15.5	151	Interpolated
	DEDV-S_XX0XXX0404	4	8	24.125	15.5	66	Extrapolated
	DEDV-S_XX0XXX0505	5	8	24.125	15.5	66	Extrapolated
	DEDV-S_XX0XXX0606	6	8	33	15.5	66	Interpolated
	DEDV-S_XX0XXX0707	7	12.4	37.1	15.5	85	Interpolated
	DEDV-S_XX0XXX0808	8	12.4	37.1	15.5	85	Interpolated
	DEDV-S_XX0XXX0909	9	12.5	41.1	15.5	99	Interpolated
	DEDV-S_XX0XXX1010	10	12.5	41.1	15.5	99	Interpolated
	DEDV-S_XX0XXX1212	12	15	45.1	15.5	114	Interpolated
	DEDV-S_XX0XXX1414	14	17.5	53.1	15.5	137	Interpolated
	DEDV-S_3A042R1616	16	18	61.1	18.9	151.5	DD-UUT-4

Notes:

a. Titus Models DEDV and PEDV were seismically tested and certified. Subsequent DEDV and PEDV models use the -S to denote OSPHD certification. Additional designations may include: PESV, EESV, AESV, or DESV to denote (P)neumatic control, (E)lectric control, (A)nalog control, and (D)igital control.



Table DD-1B

Certified Product

Cabinet Sizes With Mixing Box

Mounting Configuration: Rigid Rod Suspension

$S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Titus

Product Family	Model ^a	Inlet Size (in)	Height (in)	Width (in)	Length (in)	Max Weight (lb)	UUT
Dual Duct	DEDV-S_XX1XXX0404	4	12.4	32	21	80.5	Extrapolated
	DEDV-S_XX1XXX0505	5	12.4	32	21	80.5	Extrapolated
	DEDV-S_3A102R0606	6	12.4	32	21	80.5	DD-UUT-1
	DEDV-S_XX1XXX0707	7	12.4	36	23.25	92	Interpolated
	DEDV-S_XX1XXX0808	8	12.4	36	23.25	92	Interpolated
	DEDV-S_XX1XXX0909	9	12.4	40	27.1	111	Interpolated
	DEDV-S_XX1XXX1010	10	12.4	40	27.1	111	Interpolated
	DEDV-S_XX1XXX1212	12	15.125	44	31.1	133	Interpolated
	DEDV-S_XX1XXX1414	14	18.125	48	35.2	161	Interpolated
	DEDV-S_XX1XXX1616	16	18.125	49	38	192	Interpolated
	PEDV-S_XX1XXX0404	4	15.1	28.9	19	81	Extrapolated
	PEDV-S_XX1XXX0505	5	15.1	28.9	19	81	Extrapolated
	PEDV-S_XX1XXX0606	6	15.1	28.9	19	81	Interpolated
	PEDV-S_XX1XXX0707	7	15.1	32.9	23	92	Interpolated
	PEDV-S_XX1XXX0808	8	15.1	32.9	23	92	Interpolated
	PEDV-S_XX1XXX0909	9	15.1	36.9	27	111	Interpolated
	PEDV-S_XX1XXX1010	10	15.1	39.6	27	111	Interpolated
	PEDV-S_XX1XXX1212	12	15.1	40.9	31	133	Interpolated
	PEDV-S_XX1XXX1414	14	17.5	44.9	35	161	Interpolated
	PEDV-S_3A142R1616	16	18.125	49	38	192	DD-UUT-2

Notes:

a. Titus Models DEDV and PEDV were seismically tested and certified. Subsequent DEDV and PEDV models use the -S to denote OSPHD certification. Additional designations may include: PESV, EESV, AESV, or DESV to denote (P)neumatic control, (E)lectric control, (A)nalog control, and (D)igital control.



For Reference Only

Dual Duct Model Nomenclature

Code	Sensor Location
3A	Multipoint Sensor located in Cold & Hot Inlet
3B	Multipoint Sensor located in Hot Inlet & Total Discharge Duct
3C	Multipoint Sensor located in Cold Inlet & Total Discharge Duct
3D	Multipoint Sensor located in Total Discharge Duct
3E	Multipoint Sensor located in Cold Inlet, Hot Inlet & Total Discharge Duct

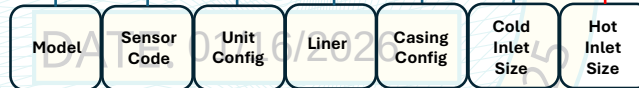
Code	Control	Model
P	Pneumatic	EDV-S
E	Electric	
A	Analog	
D	Digital	

Code	Unit Configuration
0	No Attenuator Mixer
1	Integral Attenuator Mixer
2	Integral Attenuator Mixer with Baffle

Code	Liner Option
0	1/2" Fiberglass
1	1" Fiberglass
2	SteriLoc
4	UltraLoc
6	No Liner
7	1/2" Fibre Free
8	1" Fibre Free
9	3/8" Fibre Free
J	1/2" EcoShield
K	1" EcoShield
L	1/2" EcoShield Foil Face
M	1" EcoShield Foil Face

Cold Inlet Size Code	Inlet Size	Available Hot Inlet Size Codes	
		Default	Unequal Inlet Sizes
04	4"	04	--
05	5"	05	04
06	6"	06	05, 04
07	7"	07	06, 05
08	8"	08	07, 06, 05
09	9"	09	08, 07, 06, 05
10	10"	10	09, 08, 07, 06
12	12"	12	10, 09, 08
14	14"	14	12, 10
16	16"	16	14, 12

Code	Casing Configuration
2R	20 gauge Cold Duct, RH
2L	20 gauge Cold Duct, LH





**Table SFP-1 Certified Product
Series Fan Powered Cabinet Sizes**

Mounting Configurations:

1. Rigid Rod Suspension OR 2. Rigid Rod Suspension with Isolators

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Titus

Product Family	Model	Unit Size	Inlet Size (in)	Max Dimensions			Weight (lbs)	UUT
				Height	Width	Depth		
				(in)	(in)	(in)		
Series Fan Powered	TFS-3302RA06	A	6	10.5	48.0	21.0	100	SFP-UUT-1a, SFP-UUT-1b
	TFS-1012RB06	B	6	16.0	43.0	37.0	210	SFP-UUT-2a, SFP-UUT-2b
	TFS-XXXXXB08		8	16.0	43.0	37.0	180	Interpolated
	TFS-XXXXXB10		10	16.0	43.0	37.0	180	Interpolated
	TFS-1322RB12		12	16.0	43.0	37.0	200	SFP-UUT-3a, SFP-UUT-3b
	TFS-XXXXXC06	C	6	16.0	43.0	37.0	185	Interpolated
	TFS-XXXXXC08		8	16.0	43.0	37.0	185	Interpolated
	TFS-XXXXXC10		10	16.0	43.0	37.0	185	Interpolated
	TFS-XXXXXC12		12	16.0	43.0	37.0	185	Interpolated
	TFS-XXXXXD10	D	10	20.0	47.5	39.0	260	Interpolated
	TFS-XXXXXD12		12	20.0	47.5	39.0	260	Interpolated
	TFS-XXXXXD14		14	20.0	47.5	39.0	260	Interpolated
	TFS-XXXXXD14		16	20.0	47.5	39.0	260	Interpolated
	TFS-30M2RE12	E	12	20.0	47.5	39.0	285	SFP-UUT-4a, SFP-UUT-4b
	TFS-XXXXXE14		14	20.0	47.5	39.0	260	Interpolated
	TFS-X3M2RE16		16	20.0	47.5	39.0	240	SFP-UUT-5a, SFP-UUT-5b
	TFS-XXXXXG16	G	16	18.0	52.0	39.0	240	Extrapolated

**Table SD-1 Certified Product
Single Duct Cabinet Sizes**

Mounting Configurations:

1. Rigid Rod Suspension OR 2. Rigid Rod Suspension with Isolators

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

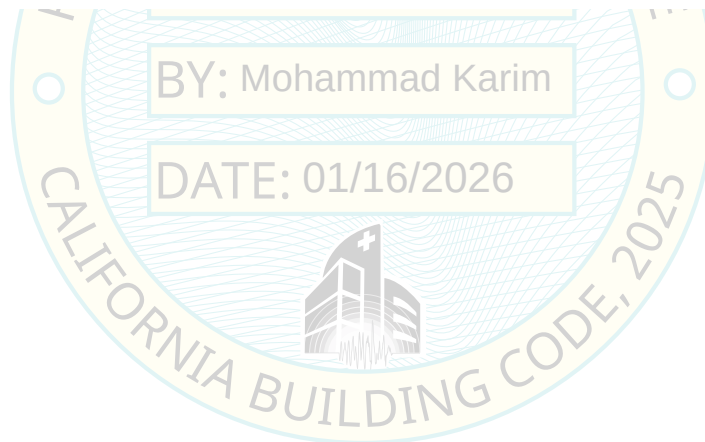
Manufacturer: Titus

Product Family	Model			Inlet Size (in)	Max Dimensions			Weight	UUT
	Titus ^a	Tuttle & Bailey ^b	Krueger ^b		Height	Width	Depth		
					(in)	(in)	(in)	(lbs)	
Single Duct	ESV-S-XXXXXX04	SDV-S-XXXXXX04	LMHS-S-XXXXXX04	4	8.0	15.5	12.0	23	Extrapolated
	ESV-S-XXXXXX05	SDV-S-XXXXXX05	LMHS-S-XXXXXX05	5	8.0	15.5	12.0	23	Extrapolated
	ESV-S-XXXXXX06	SDV-S-XXXXXX06	LMHS-S-XXXXXX06	6	8.0	15.5	12.0	23	Extrapolated
	ESV-S-XXXXXX07	SDV-S-XXXXXX07	LMHS-S-XXXXXX07	7	10.0	15.5	12.0	25	Extrapolated
	ESV-S-X302RX08	SDV-S-X302RX08	LMHS-S-X302RX08	8	10.0	15.5	12.0	60	SD-UUT-6a, SD-UUT-6b
	ESV-S_XXXXXX09	SDV-S-XXXXXX09	LMHS-S-XXXXXX09	9	12.5	15.5	14.0	30	Interpolated
	ESV-S-XXXXXX10	SDV-S-XXXXXX10	LMHS-S-XXXXXX10	10	12.5	15.5	14.0	30	Interpolated
	ESV-S-XXXXXX12	SDV-S-XXXXXX12	LMHS-S-XXXXXX12	12	15.0	16.0	15.5	35	Interpolated
	ESV-S-XXXXXX14	SDV-S-XXXXXX14	LMHS-S-XXXXXX14	14	17.5	20.0	15.5	35	Interpolated
	ESV-S-XXXXXX16	SDV-S-XXXXXX16	LMHS-S-XXXXXX16	16	18.0	24.0	15.5	47	Interpolated
	ESV-S-X342RX40	SDV-S-X342RX40	LMHS-S-X342RX40	24x16	18.0	38.0	15.5	250	SD-UUT-7a, SD-UUT-7b

Notes:

a. Titus Model ESV was seismically tested and certified. Subsequent ESV models use the -S to denote OSPHD certification. Additional designations may include: PESV, EESV, AESV, or DESV to denote (P)neumatic control, (E)lectric control, (A)nalog control, and (D)igital control.

b. Tuttle & Bailey, Krueger models are only a change in branding.





For Reference Only

Single Duct Model Nomenclature

Model	Brand
TFS	Titus
ESV-S	Titus
LMHS-S	Krueger
SDV-S	Tuttle & Bailey

Code	Sensor
1	Pneumatic
3	Digital

Code	Unit Configuration
0	Basic
1	Basic w/Integral Attenuator
2	Basic w/Open Attenuator
3	Electric Heater Unit

Code	Liner Option
0	1/2" Fiberglass
1	1" Fiberglass
2	SteriLoc
4	UltraLoc
6	No Liner
7	1/2" Fibre Free
8	1" Fibre Free
9	3/8" Fibre Free
J	1/2" EcoShield
K	1" EcoShield
L	1/2" EcoShield Foil Face
M	1" EcoShield Foil Face

Code	Casing Configuration
2R	20 gauge RH
2L	20 gauge LH

Code	Inlet Size
04	4"
05	5"
06	6"
07	7"
08	8"
09	9"
10	10"
12	12"
14	14"
16	16"
20	8"x14"
30	8"x25"
40	8"x16"

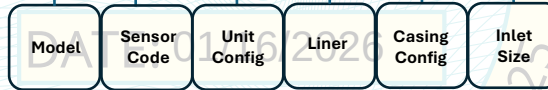




Table DD-2

Certified Product Subcomponent

External Box

Manufacturer: Titus

Exterior Wall/Roof/Floor Panel Material	Thickness	UUT
Galvanized Carbon Steel	20 ga	DD-UUT-1 to DD-UUT-4

Table DD-3

Certified Product Subcomponent

Certified Liners

Manufacturer: Pamaco Inc.

Material	UUT
Standard 1/2"	DD-UUT-1, DD-UUT-3
1"	Interpolated
Steriloc	Interpolated
Ultraloc (Double Wall)	DD-UUT-2, DD-UUT-4

Table DD-4

Certified Product Subcomponent

Controls

Manufacturer: Titus

Type	Model Number	Height (in)	Width (in)	Length (in)	Voltage	UUT
Pneumatic (controller)	CSC-3004	3.5 dia	3.5 dia	4	N/A	DD-UUT-2, DD-UUT-3
Pneumatic (controller)	CSC-3017	3.5	4.25	2	N/A	Interpolated
Digital (controller/actuator)	BAC-8005-03	6.5	4.25	2.25	24	DD-UUT-1, DD-UUT-4

Table DD-5

Certified Product Subcomponent

Disconnect

Manufacturer: ABB

Type	Model Number	Height (in)	Width (in)	Length (in)	Voltage	Amperes	UUT
Non-Fusible, 3 poles	ABBIPN63EP	2.89	2.07	3.25	600	30-60	DD-UUT-1 to DD-UUT-4

Table DD-6

Certified Product Subcomponent

Transformers

Manufacturer: Hartland Controls

Type	Model Number	Height (in)	Width (in)	Length (in)	VA	Voltage	UUT
AirCore Class 2	HCT-01DBB06132	3.125	2.125	3.5	0.07 or 50VA	120/24V	DD-UUT-1 to DD-UUT-4

Table DD-7

Certified Product Subcomponent

Relays

Manufacturer: Hartland Controls

Type	Height (in)	Width (in)	Length (in)	Amperes	Voltage	UUT
SPST	2.37	2.1	2.1	0.75	277V	DD-UUT-1 to DD-UUT-4

Table DD-8

Certified Product Subcomponent

Airflow Switch

Manufacturer: Cleveland Controls

Type	Height (in)	Width (in)	Length (in)	Amperes	Voltage	UUT
ElectorPneumatic	2.94	3.25	6.12	5.6	277V	DD-UUT-1 to DD-UUT-4

Table DD-9A

Certified Product Subcomponent

Dampers

Quantity: 1

Manufacturer: Titus

Unit Size	Diameter (in)	UUT
A06	5.875	DD-UUT-1
B06	5.875	DD-UUT-3
B12	11.875	Interpolated
E12	11.875	Interpolated
E16	15.785	DD-UUT-2, DD-UUT-4
E8	7.875	Interpolated

Table DD-9B

Certified Product Subcomponent

Damper Material

Damper Material		UUT
Frame	Blades	
N/A	Galvanized Carbon Steel	DD-UUT-1, DD-UUT-4

Table DD-10

Certified Product

Subcomponent

Sensor

Manufacturer: Titus

Model	UUT
K4 Lineacross Sensor	DD-UUT-1 to DD-UUT-4



Table SD-2
Certified Product Subcomponent
External Sheeting
Manufacturer: Titus

Exterior Wall/Roof/Floor Panel Material	Thickness	UUT
Galvanized Carbon Steel	20 gauge	SFP-UUT-1a - SD-UUT-7b

Table SD-3
Certified Product Subcomponent
Liner

Material	Manufacturer	UUT
Standard 1/2"	Pamaco Inc	SFP-UUT-1a/1b, SD-UUT-6a/6b
Standard 1"	Pamaco Inc	SFP-UUT-2a/2b
Steriloc	Pamaco Inc	SFP-UUT-3a/3b
Ultraloc	Pamaco Inc	SD-UUT-7a/7b
EcoShield Foil 1"	Bonded Logic	SFP-UUT-4a/4b, SFP-UUT-5a/5b





Table SD-4A

Certified Product Subcomponent

Hydronic Coils

Manufacturer: Great American Coil

Dimension		UUT
Height (in)	Width (in)	
10	12	SD-UUT-6a/6b
10	18.5	Interpolated
12.5	20.5	SFP-UUT-2a/2b
12.5	20.5	Interpolated
17.5	25	SFP-UUT-4a/4b
17.5	25	Interpolated
18	38	SD-UUT-7a/7b

Table SD-4B

Certified Product Subcomponent

Hydronic Coil Construction

Component	Option	UUT
Casing Material	Galvanized Carbon Steel	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Tube Material	Copper	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Tube OD (in)	0.5	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Tube Thickness (in)	0.032	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Fin Material	Aluminum	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Fin Thickness (in)	0.0045	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Fin Pitch	10	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Pipe Quantity	2	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b
Tube Rows	1	UUT-SFP-2a/2b, UUT-SD-6a/6b
	2	UUT-SFP-4a/4b, UUT-SD-7a/7b
Header Material	Copper	UUT-SFP-2a/2b, UUT-SFP-4a/4b, UUT-SD-6a/6b, UUT-SD-7a/7b



Table SD-5

Certified Product Subcomponent

Fan Motors

Phase: Single

Voltage Rating: 120, 208/240, 277

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Regal Beloit

Motor Type	Model Number	Weight (lb)	Tested Voltage (V)	UUT
PSC	10056901	8.2	208/240	UUT-SFP-1a/1b
PSC	10096701	8.4	277	UUT-SFP-3a/3b
PSC	10051202	10.4	--	Interpolated
ECM	321014055	10.4	277	UUT-SFP-2a/2b
PSC	10151202	12.2	--	Interpolated
ECM	321014056	10.4	--	Interpolated
ECM	321014057	12.2	--	Interpolated
PSC	10317203	17.2	120	UUT-SFP-4a/4b
ECM	321014076	13.2	277	UUT-SFP-5a/5b



Table SD-6

Certified Product Subcomponent Housed Fans

Housing Material: Galvanaized Carbon Steel

Wheel Material: Galvanized Carbon Steel

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Lau Fans

Fan Parameter				Motor Parameter			UUT
Model	Model Number	Diameter (in)	Width (in x in)	Weight (lb)	Rating (HP)	Weight	
DD9-4A	10192401	12.8	12.5 x 6.8	8.2	0.1	8.2	UUT-SFP-1a/1b
DD9-4A	10192401	12.8	12.5 x 6.8	8.2	0.17	8.4	UUT-SFP-3a/3b
DD10-4A	10045001	17.4	16.6 x 6.81	9.5	0.25	10.4	Interpolated
DD9-4A	10192401	12.8	12.5 x 6.8	8.2	0.33	12.2	UUT-SFP-2a/2b
DD10-4A	10045001	17.4	16.6 x 6.81	9.5	0.33	12.2	Interpolated
DD10-8A	10358001	17.4	16.6 x 10.5	14.6	0.33	12.2	Interpolated
DD10-8A	10358001	17.4	16.6 x 10.5	14.6	0.5	12.2	Interpolated
DD10-10A	10051005	17.4	16.6 x 13.1	17.8	0.75	17.2	UUT-SFP-4a/4b UUT-SFP-5a/5b

Table SD-7

Certified Product Subcomponent Flat Filter Rack (Side Load)

Frame Material: Galvanized Carbon Steel

Filter Media: Fiberglass (Disposable)

Quantity: 1

Manufacturer: Koch/Flanders

Dimensions		UUT
Width (in)	Height (in)	
16	10	UUT-SFP-1a/1b
16	14	UUT-SFP-2a/2b UUT-SFP-3a/3b
14	18	UUT-SFP-4a/4b UUT-SFP-5a/5b

Table SD-8
Certified Product Subcomponent
Electric Heat
Manufacturer: Titus

Model	Model Number	Stage	Heat Output (kW)	Max Dimensions			Weight (lbs)	Output Range		Tested Voltage (V)	UUT
				Height	Width	Depth		Phase: 1	Phase: 3		
				(in)	(in)	(in)		(115 V - 277 V)	(208 V - 600 V)		
TFS/TFS-F	314861634	3	4	8-7/16	10-1/2	9-11/16	23	0.5 kW - 13.0 kW	0.5 kW - 36.0 kW	208	SFP-UUT-1a/1b
TFS/TFS-F	314861634	3	4	11-3/8	14-1/2	9-3/4	25			277	SFP-UUT-3a/3b
TFS/TFS-F	314861845	1 ^b	11	11	17	9-3/4	30			277	SFP-UUT-5a/5b
ESV/SDV-S/LMHS-S ^a	314861623	1	7	9	6-1/2	8	18			240	SD-UUT-6a/6b
ESV/SDV-S/LMHS-S ^a	314861867	3	35	17	6-1/2	34	30			480	SD-UUT-7a/7b

Notes:

a. SDV-S (Tuttle & Bailey), LMHS-S (Krueger)

b. SCR Heat

Table SD-9
Certified Product Subcomponent
Controls
Manufacturer: Titus

Type	Model Number	Max Dimensions			Voltage (V)	UUT
		Height	Width	Depth		
		(in)	(in)	(in)		
Pneumatic (Actuator)	10058501	4.25 (OD)	4.25 (OD)	5.5	--	Extrapolated
Pneumatic (Controller)	70500001	3.5 (OD)	3.5 (OD)	4	--	SFP-UUT-2a/2b SFP-UUT-3a/3b
Pneumatic (Actuator)	10058501	4.25 (OD)	4.25 (OD)	5.5	--	Extrapolated
Pneumatic (Controller)	10065001	3.5	4.25	2	--	Interpolated
Digital (Actuator/Controller)	10538301	6.5	4.92	2.87	24	SFP-UUT-1a/1b SFP-UUT-4a/4b

Table SD-10
Certified Product Subcomponent
Miscellaneous Subcomponents

Subcomponent	Model/Type	Manufacturer	Max Dimensions			Amps (A)	Voltage (V)	Volt-Amps (VA)	Power (HP)	UUT
			Height (in)	Width (in)	Depth (in)					
Disconnect	Non-fusible, 3 poles	ABB	2.9	2.1	3.3	30-60	600	--	--	SFP-UUT-1a/1b - SFP-UUT-5a/5b
Fuse	KLK, Fast Acting, Line Fuse	Littell Fuse	0.41	0.41	1.5	8	600	--	--	SFP-UUT-1a/1b
			0.41	0.41	1.5	16	600	--	--	SFP-UUT-2a/2b
			0.41	0.41	1.5	24	600	--	--	SFP-UUT-3a/3b
			0.41	0.41	1.5	32	600	--	--	SFP-UUT-4a/4b
			0.41	0.41	1.5	40	600	--	--	SFP-UUT-5a/5b
Contactor	Magnetic	Hartland Controls	2.44	1.63	3.25	--	277/480	--	11/16	SFP-UUT-1a/1b
			2.44	1.63	3.25	--	120	--	11	SFP-UUT-2a/2b, SFP-UUT-4a/4b, SFP-UUT-5a/5b
			2.44	1.63	3.25	--	277/480	--	11/16	SFP-UUT-3a/3b
Transformer	AirCore Class 2	Hartland Controls	3.13	2.13	3.50	--	120/24	0.7 or 50VA	--	Extrapolated
			3.13	2.13	3.50	--	277/24	0.7 or 50VA	--	SFP-UUT-3a/3b, SFP-UUT-5a/5b
			3.13	2.13	3.50	--	480/24	0.7 or 50VA	--	SD-UUT-7a/7b
			3.13	2.13	3.50	--	208/240/24	0.7 or 50VA	--	SFP-UUT-1a/1b, SD-UUT-6a/6b
Relay	SPST	Hartland Controls	2.37	2.10	2.10	260	277	--	0.75	SFP-UUT-1a/1b - SFP-UUT-5a/5b
Airflow Switch	ElectroPneumatic	Cleveland Controls	2.94	3.25	6.12	260	277	--	5.6	SFP-UUT-1a/1b - SD-UUT-7a/7b

Table SD-11
Certified Product Subcomponent
Inductors

Used with ECM motors only

Voltage: 120 - 208/277 V

Manufacturer: Tyco

HP	Amps (A)	UUT
1/3	12	SFP-UUT-2a/2b SFP-UUT-3a/3b
1/2	5.9	SFP-UUT-4a/4b
3/4	5.5	SFP-UUT-5a/5b
1	3	Extrapolated

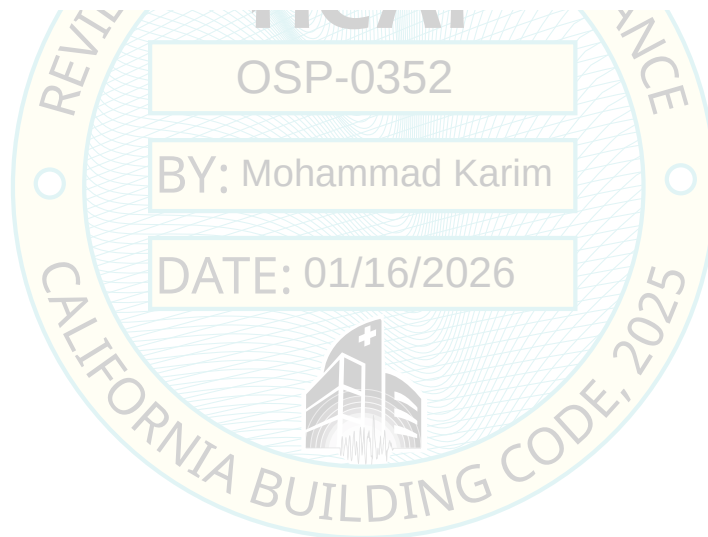
Table SD-12

Certified Product Subcomponent

Dampers

Quantity: 1

Type	Max Dimensions		Damper Material		Manufacturer	UUT
	Diameter	Width	Frame	Blades		
	(in)	(in)				
A06	5.875	--	--	Galvanized Steel	Titus	UUT-SFP-1a/1b
B06	5.875	--	--	Galvanized Steel	Titus	UUT-SFP-2a/2b
B12	11.875	--	--	Galvanized Steel	Titus	UUT-SFP-3a/3b
E12	11.875	--	--	Galvanized Steel	Titus	UUT-SFP-4a/4b
E16	15.875	--	--	Galvanized Steel	Titus	UUT-SFP-5a/5b
8	5.875	--	--	Galvanized Steel	Titus	UUT-SD-6a/6b
24 x 16	16 (Height)	24	Aluminum	Aluminum	Ruskin	UUT-SD-7a/7b



UUT Summary - Table Series Fan Powered

Mounting Configurations:

1. Rigid Rod Suspension OR 2. Rigid Rod Suspension with Isolators

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Titus

Product Family	Model	Unit Size	Inlet Size (in)	Max Dimensions			Weight (lbs)	UUT
				Height	Width	Depth		
				(in)	(in)	(in)		
Series Fan Powered	TFS-3302RA06	A	6	10.5	48.0	21.0	100	SFP-UUT-1a, SFP-UUT-1b
	TFS-1012RB06	B	6	16.0	43.0	37.0	210	SFP-UUT-2a, SFP-UUT-2b
	TFS-1322RB12		12	16.0	43.0	37.0	200	SFP-UUT-3a, SFP-UUT-3b
	TFS-30M2RE12	E	12	20.0	47.5	39.0	285	SFP-UUT-4a, SFP-UUT-4b
	TFS-X3M2RE16		16	20.0	47.5	39.0	240	SFP-UUT-5a, SFP-UUT-5b

UUT Summary Table - Single Duct

Mounting Configurations:

1. Rigid Rod Suspension OR 2. Rigid Rod Suspension with Isolators

Seismic Parameters: $S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Titus

Product Family	Model			Inlet Size (in)	Max Dimensions			Weight	UUT
	Titus ^a	Tuttle & Bailey ^b	Krueger ^b		Height	Width	Depth		
					(in)	(in)	(in)	(lbs)	
Single Duct	ESV-S-X302RX08	SDV-S-X302RX08	LMHS-S-X302RX08	8	10.0	15.5	12.0	60	SD-UUT-6a, SD-UUT-6b
	ESV-S-X342RX40	SDV-S-X342RX40	LMHS-S-X342RX40	24x16	18.0	38.0	15.5	250	SD-UUT-7a, SD-UUT-7b

Notes:

a. Titus Model ESV was seismically tested and certified. Subsequent ESV models use the -S to denote OSPHD certification. Additional designations may include: PESV, EESV, AESV, or DESV to denote (P)neumatic control, (E)lectric control, (A)nalog control, and (D)igital control.

b. Tuttle & Bailey, Krueger models are only a change in branding.

SFP-UUT - 1A TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-3302RA06

Unit Size: A

Inlet Size: 6"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Standard 1/2" (Table SD-3)
- Fan/Motor: PSC Model Number: 10056901 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat: TFS Model Number: 314861634 (Table SD-8)
- Controller (Digital (Actuator/Controller): Model Number:10538301 (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

UUT Properties

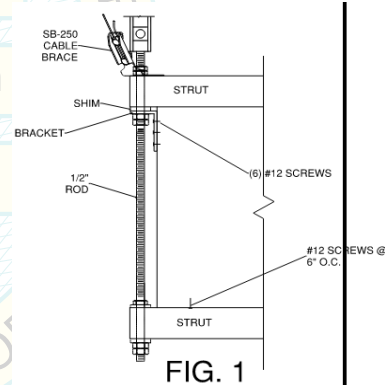
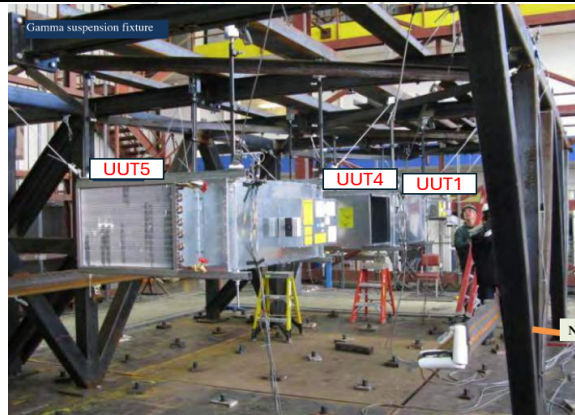
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
100	21	48	10.5	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _h	H _f	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT1

SFP-UUT - 1B TEST RESULT SUMMARY							
Manufacturer: Titus							
Model: TFS-3302RA06							
Unit Size: A							
Inlet Size: 6"							
Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)							
Options/Sub-Component Summary:							
-Liner: Standard 1/2" (Table SD-3)							
-Fan/Motor: PSC Model Number: 10056901 (Table SD-5)							
-Filter: Fiberglass, Disposable (Table SD-7)							
-Electric Heat: TFS Model Number: 314861634 (Table SD-8)							
-Controller (Digital (Actuator/Controller): Model Number:10538301 (Table SD-9)							
-Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)							
UUT Properties							
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
	Depth	Width	Height	Front-Back	Side-Side	Vertical	
100	21	48	10.5	N/A	N/A	N/A	
Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _H	H _F	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--
The UUT was functional before and after shake test.							
The structural integrity of the component and attachment system and force resisting systems were maintained.							



Unit Mounting Description:
Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.
Test Lab: UC Berkely - PEER
Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series
Report #: PEER-STI/2013-02, Rev. 0
Report Date: 03/12/2013
Test UUT: UUT1

SFP-UUT - 2A TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-1012RB06

Unit Size: B

Inlet Size: 6"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

-Liner: Standard 1" (Table SD-3)

-Fan/Motor: ECM Model Number: 321014055 (Table SD-5)

-Filter: Fiberglass, Disposable (Table SD-7)

-Electric Heat (Table SD-8)

-Controller (Pneumatic): Model Number:70500001 (Table SD-9)

-Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

-Inductor: 1/3 HP, 12A (Table SD-11)

UUT Properties

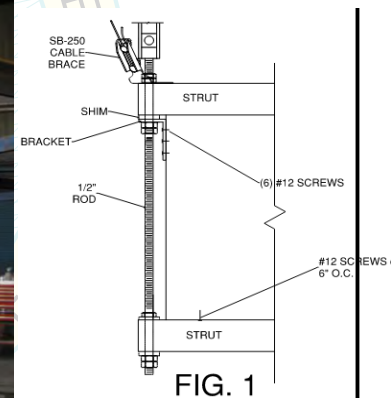
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
210	37	43	16	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _h	H _r	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	--	--	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

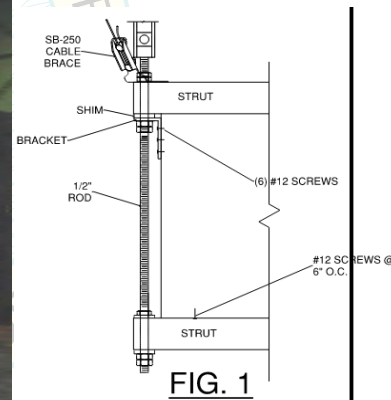
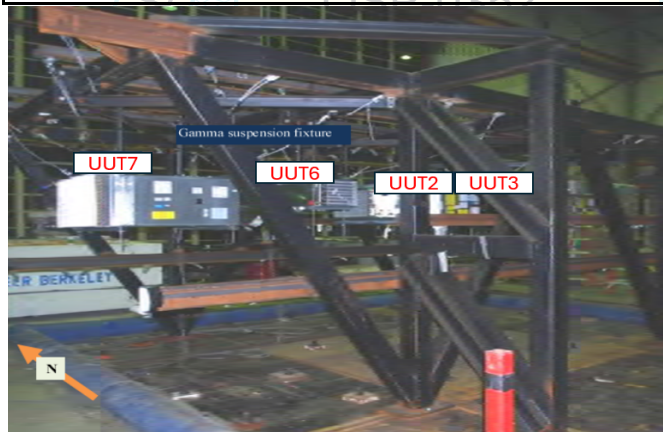
Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT2

SFP-UUT - 2B TEST RESULT SUMMARY							
Manufacturer: Titus							
Model: TFS-1012RB06							
Unit Size: B							
Inlet Size: 6"							
Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)							
Options/Sub-Component Summary:							
-Liner: Standard 1" (Table SD-3)							
-Fan/Motor: ECM Model Number: 321014055 (Table SD-5)							
-Filter: Fiberglass, Disposable (Table SD-7)							
-Electric Heat (Table SD-8)							
-Controller (Pneumatic): Model Number:70500001 (Table SD-9)							
-Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)							
-Inductor: 1/3 HP, 12A (Table SD-11)							
UUT Properties							
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
	Depth	Width	Height	Front-Back	Side-Side	Vertical	
210	37	43	16	N/A	N/A	N/A	
Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _h	H _r	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--
The UUT was functional before and after shake test.							
The structural integrity of the component and attachment system and force resisting systems were maintained.							



Unit Mounting Description:
Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.
Test Lab: UC Berkely - PEER
Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series
Report #: PEER-STI/2013-02, Rev. 0
Report Date: 03/12/2013
Test UUT: UUT2

SFP-UUT - 3A TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-1322RB12

Unit Size: B

Inlet Size: 12"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Steriloc (Table SD-3)
- Fan/Motor: PSC Model Number: 10096701 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat: TFS Model Number: 314861634 (Table SD-8)
- Controller (Pneumatic): Model Number: 70500001 (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)
- Inductor: 1/3 HP, 12A (Table SD-11)

UUT Properties

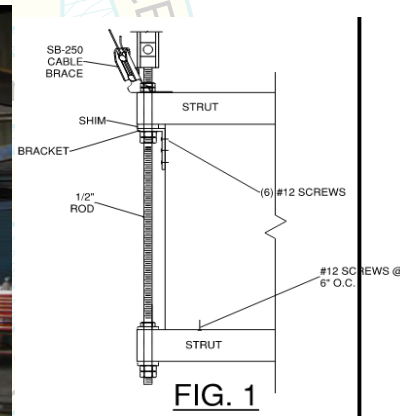
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
200	37	43	16	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{ps} (g)	R _{IL}	H _I	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT3

SFP-UUT - 3B TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-1322RB12

Unit Size: B

Inlet Size: 12"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Steriloc (Table SD-3)
- Fan/Motor: PSC Model Number: 10096701 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat: TFS Model Number: 314861634 (Table SD-8)
- Controller (Pneumatic): Model Number: 70500001 (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)
- Inductor: 1/3 HP, 12A (Table SD-11)

UUT Properties

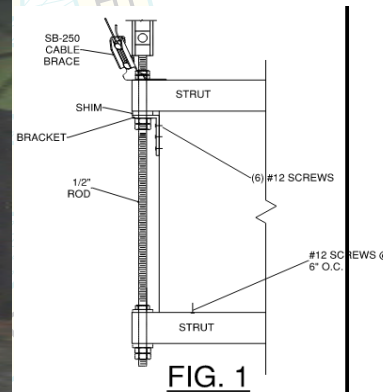
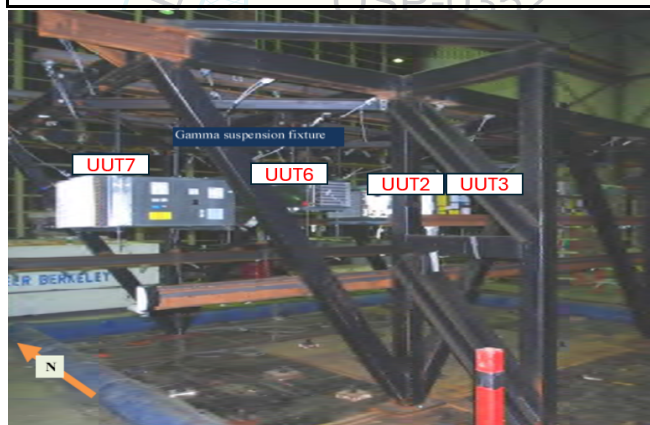
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
200	37	43	16	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H ₁	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

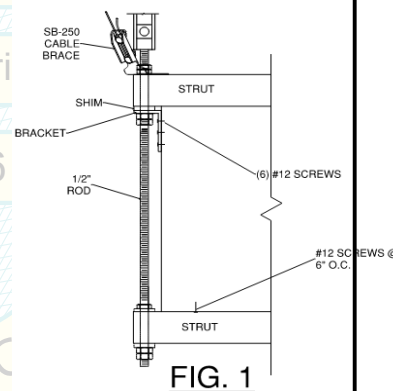
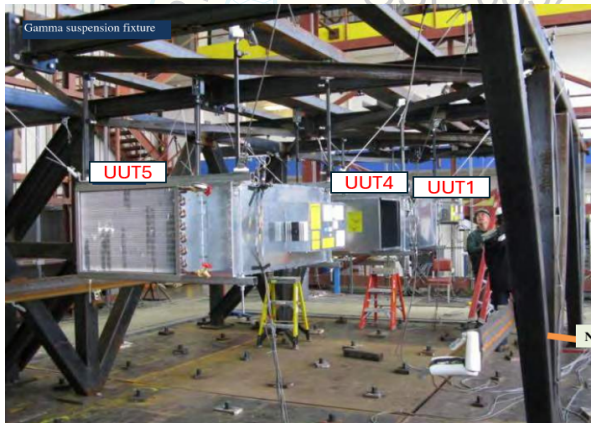
Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT3

SFP-UUT - 4A TEST RESULT SUMMARY							
Manufacturer: Titus							
Model: TFS-30M2RE12							
Unit Size: E							
Inlet Size: 12"							
Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)							
Options/Sub-Component Summary:							
-Liner:EcoShield Foil 1" (Table SD-3)							
-Fan/Motor: PSC Model Number: 10317203 (Table SD-5)							
-Filter: Fiberglass, Disposable (Table SD-7)							
-Electric Heat (Table SD-8)							
-Controller (Digital (Actuator/Conroller): Model Number:10538301 (Table SD-9)							
-Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)							
-Inductor: 1/2 HP, 5.9A (Table SD-11)							
UUT Properties							
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
	Depth	Width	Height	Front-Back	Side-Side	Vertical	
285	39	47.5	20	N/A	N/A	N/A	
Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _μ	H _f	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--
The UUT was functional before and after shake test.							
The structural integrity of the component and attachment system and force resisting systems were maintained.							



Unit Mounting Description:
Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.
Test Lab: UC Berkely - PEER
Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series
Report #: PEER-STI/2013-02, Rev. 0
Report Date: 03/12/2013
Test UUT: UUT4

SFP-UUT - 4B TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-30M2RE12

Unit Size: E

Inlet Size: 12"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

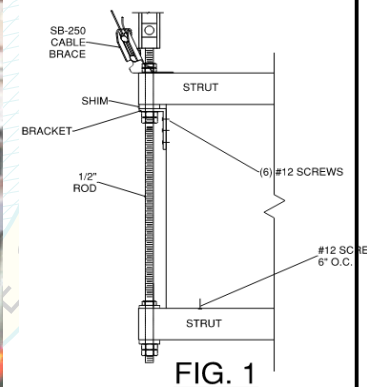
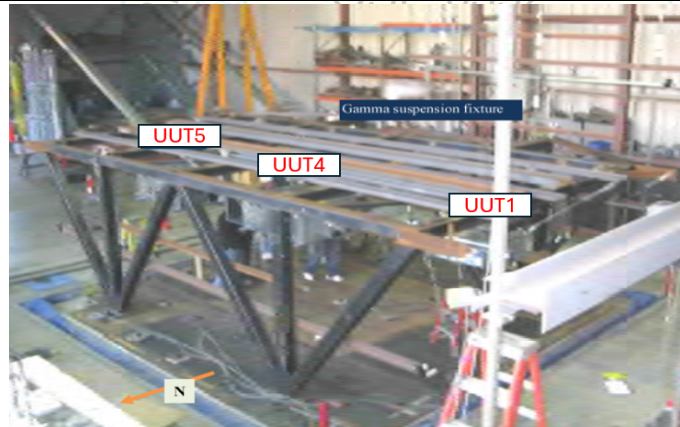
- Liner:EcoShield Foil 1" (Table SD-3)
- Fan/Motor: PSC Model Number: 10317203 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat (Table SD-8)
- Controller (Digital (Actuator/Conroller): Model Number:10538301 (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)
- Inductor: 1/2 HP, 5.9A (Table SD-11)

UUT Properties

Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
	Depth	Width	Height	Front-Back	Side-Side	Vertical	
285	39	47.5	20	N/A	N/A	N/A	
Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _H	H _r	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT4

SFP-UUT - 5A TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-X3M2RE16

Unit Size: E

Inlet Size: 16"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner:EcoShield Foil 1" (Table SD-3)
- Fan/Motor: ECM Model Number: 321014076 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat: TFS Model Number: 314861845 (Table SD-8)
- Controller (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)
- Inductor: 3/4 HP, 5.5A (Table SD-11)

UUT Properties

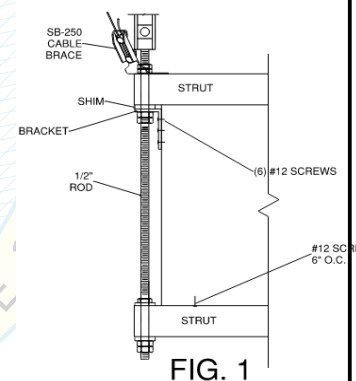
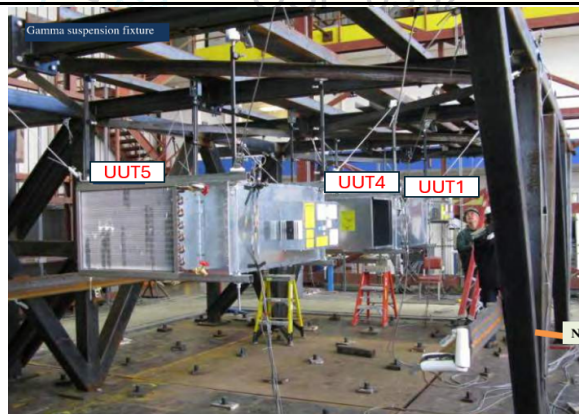
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
240	39	47.5	20	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H ₁	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	--	--	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT5

SFP-UUT - 5B TEST RESULT SUMMARY

Manufacturer: Titus

Model: TFS-X3M2RE16

Unit Size: E

Inlet Size: 16"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner:EcoShield Foil 1" (Table SD-3)
- Fan/Motor: ECM Model Number: 321014076 (Table SD-5)
- Filter: Fiberglass, Disposable (Table SD-7)
- Electric Heat: TFS Model Number: 314861845 (Table SD-8)
- Controller (Table SD- 9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)
- Inductor: 3/4 HP, 5.5A (Table SD-11)

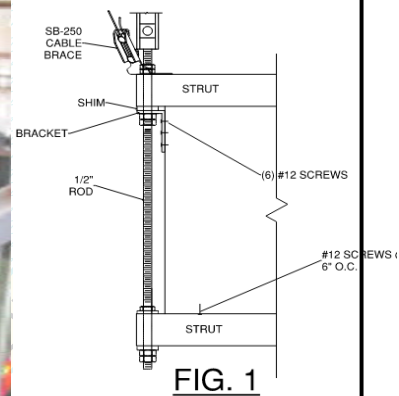
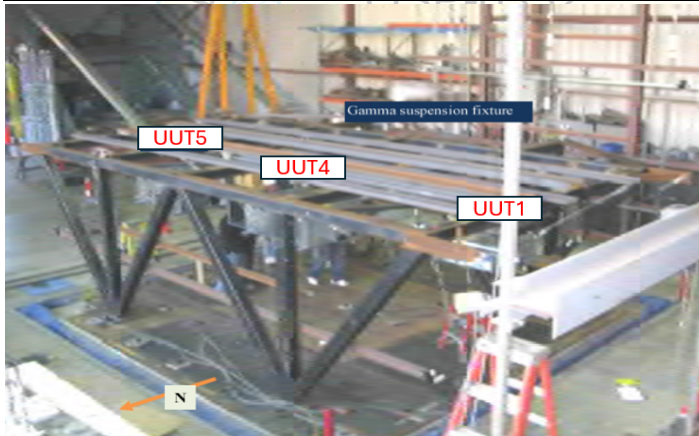
UUT Properties

Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
240	39	47.5	20	N/A	N/A	N/A

Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _H	H _i	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3		3.2	2.4	1.33	0.53
	--	--	--	--	--	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT5

SD-UUT - 6A TEST RESULT SUMMARY

Manufacturer: Titus

Model: ESV-S-X302RX08

Unit Size: NA

Inlet Size: 8"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Standard 1/2" (Table SD-3)
- Fan/Motor (Table SD-5)
- Electric Heat:ESV/SDV-S/LMHS-S Model Number: 314861623 (Table SD-8)
- Controller (Table SD- 9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

UUT Properties

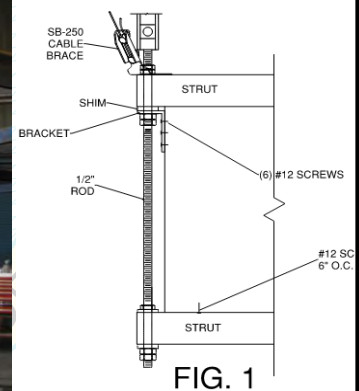
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
60	12	15.5	10	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H _T	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT6

SD-UUT - 6B TEST RESULT SUMMARY

Manufacturer: Titus

Model: ESV-S-X302RX08

Unit Size: NA

Inlet Size: 8"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Standard 1/2" (Table SD-3)
- Fan/Motor (Table SD-5)
- Electric Heat: ESV/SDV-S/LMHS-S Model Number: 314861623 (Table SD-8)
- Controller (Table SD- 9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

UUT Properties

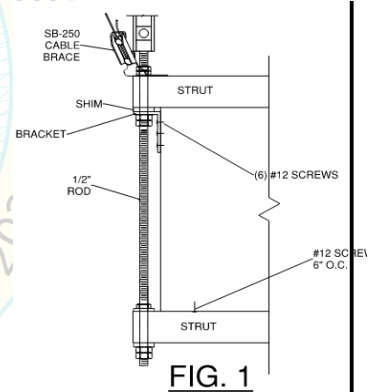
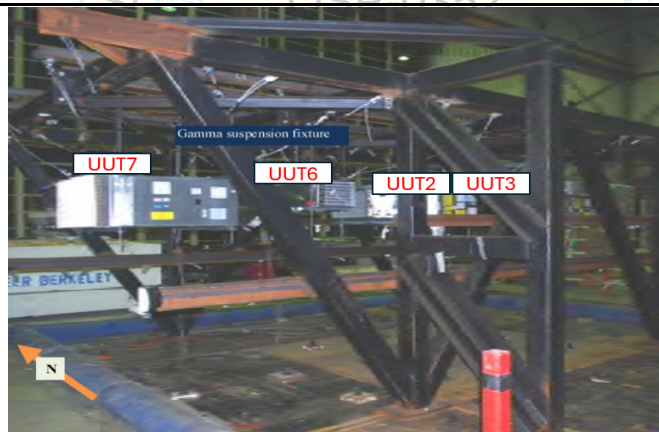
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
60	12	15.5	10	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _u	H _r	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT6

SD-UUT - 7A TEST RESULT SUMMARY

Manufacturer: Titus

Model: ESV-S-X342RX40

Unit Size: NA

Inlet Size: 24" x 16"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

-Liner:Ultraloc (Table SD-3)

-Fan/Motor (Table SD-5)

-Electric Heat: ESV/SDV-S/LMHS-S Model Number: 314861867(Table SD-8)

-Controller (Table SD- 9)

-Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

UUT Properties

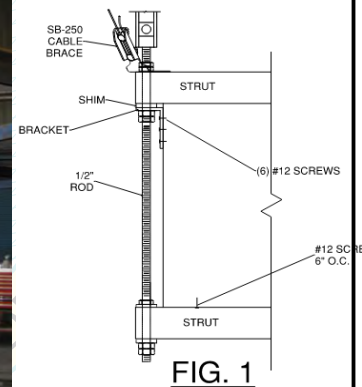
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
250	15.5	38	18	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H ₁	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	--	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with VMC HRSA Hangers, (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT7

SD-UUT - 7B TEST RESULT SUMMARY

Manufacturer: Titus

Model: ESV-S-X342RX40

Unit Size: NA

Inlet Size: 24" x 16"

Cabinet Construction: 20 gauge galvanized carbon steel (Base, Walls, Roof)

Options/Sub-Component Summary:

- Liner: Ultraloc (Table SD-3)
- Fan/Motor (Table SD-5)
- Electric Heat: ESV/SDV-S/LMHS-S Model Number: 314861867 (Table SD-8)
- Controller (Table SD-9)
- Disconnect/Fuse/Contactor/Transformer/Relay/Airflow Switch (Table SD-10)

UUT Properties

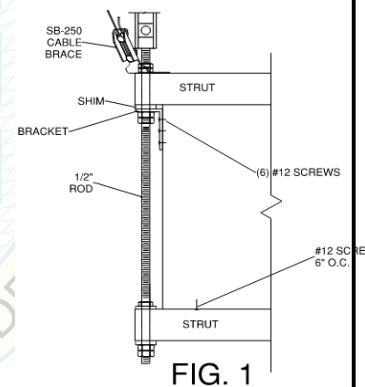
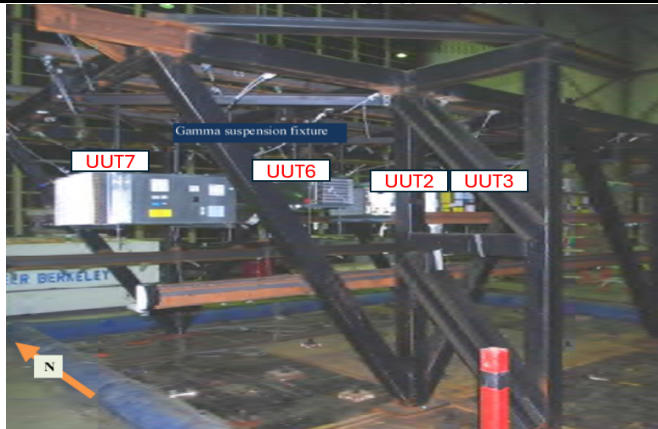
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
250	15.5	38	18	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _u	H _t	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.33	0.53
	--	--	--	-	-	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Suspended unit on (4) 1/2" ASTM-A307 rod, with (4) SB-250 (1/4") Seismic Cable Kits and (3 per rod) SRBC-1 Rod Stiffening Clamps. SB-250s are attached to structure using 5/8" hardware. SRBC-1s are fastened to L1x1x1/4 ASTM-A36 angle. Each Rod is double nutted to 1-5/8"-12ga strut fastened to the bottom of the unit with #12 screws at min 6" O.C., and it is double nutted to 1-5/8"-12ga strut fastened to the top with 2"x2"x10ga A36 angle bracket attached to the side-top-corner of the unit with (6) #12 screws. Shims fill gap between top bracket and strut. Brackets are placed on common side for rectangular attachment pattern, show in Fig. 1.

Test Lab: UC Berkely - PEER

Report Title: Seismic Certification Testing of Titus Air Terminal Units TFS and ESV Series

Report #: PEER-STI/2013-02, Rev. 0

Report Date: 03/12/2013

Test UUT: UUT7

UUT Summary - Dual Duct

Mounting Configuration: Rigid Rod Suspension

$S_{DS} = 2.0$, $z/h = 1.0$, $R_{\mu} = 1.3$, $H_f = 3.5$

Manufacturer: Titus

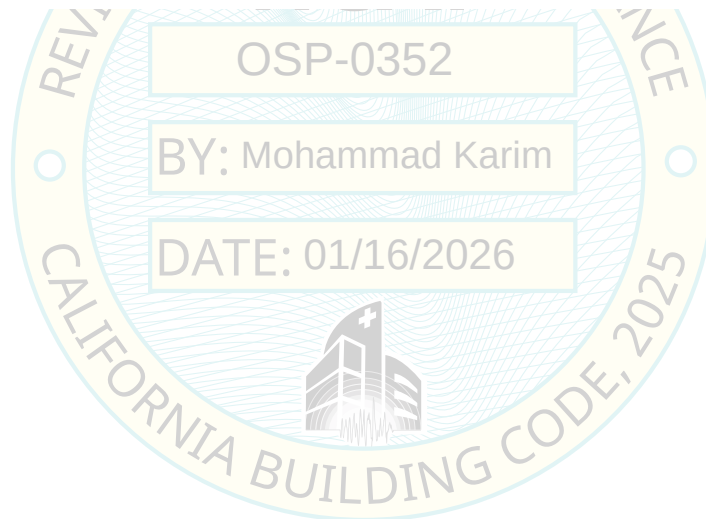
Product Family	Model ^a	Inlet Size (in)	Height (in)	Width (in)	Length (in)	Max Weight (lb)	UUT
Dual Duct	DEDV-S_3A102R0606 ^b	6	12.4	32	21	80.5	DD-UUT-1
	PEDV-S_3A142R1616 ^b	16	18.125	49	38	192	DD-UUT-2
	PEDV-S_3A002R0606 ^c	6	8	33	16.7	66	DD-UUT-3
	DEDV-S_3A042R1616 ^c	16	18	61.1	18.9	151.5	DD-UUT-4

Notes:

a. Titus Models DEDV and PEDV were seismically tested and certified. Subsequent DEDV and PEDV models use the -S to denote OSPHD certification. Additional designations may include: PESV, EESV, AESV, or DESV to denote (P)neumatic control, (E)lectric control, (A)nalog control, and (D)igital control.

b. With Mixing Box.

c. Without Mixing Box



DD-UUT - 1 TEST RESULT SUMMARY

Manufacturer: Titus

Model: DEDV-S

Model Number: DEDV-S_3A102R0606

Inlet Size: 5-7/8"

Mixing Box: Yes

Cabinet Construction: 20 gauge galvanized carbon steel

Options/Sub-Component Summary:

-Controller: Digital
-Damper: Butterfly Valve
-Disconnect
-Transformer
-Relay
-Airflow Switch
-Aerocross Sensor

UUT Properties

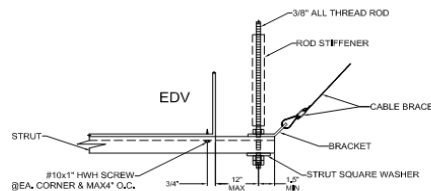
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
80.5	32	21	12.4	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H _f	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.34	0.54
	--	--	--	--	--	--	--

The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Rigid suspended unit on (2) 1-5/8" Unistrut P1000 trapeze. (4) 3/8" ASTM-A307 rods at 35"x15" aspect ratio support the trapeze up to the fixture, fastened with 3/8" square washers and nuts. Unistrut P1000 used to stiffen the rods were fastened with Mason (2 per rod) UC-1 Rod Stiffening Clamps. Seismic bracing with (4) SCB-1 (1/8") Mason Seismic Cable Kits. SCB-1s were attached to structure using 1/2" A307 hardware. Unit was attached to the 1-5/8" Unistrut P1000 trapeze with (10) #10 Teks ASTM A510 Grade 1018-1022, at each corner and evenly spaced @ 4" O.C. along the trapeze.

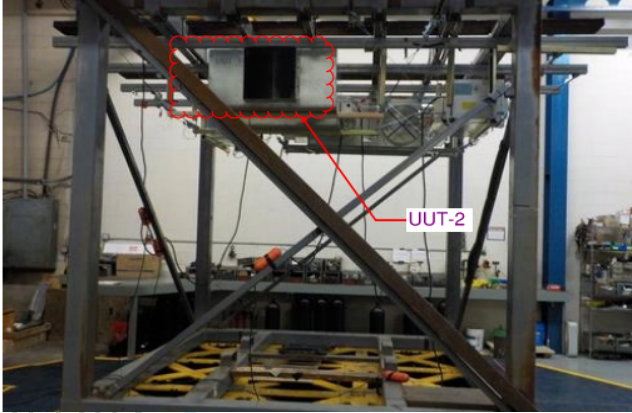
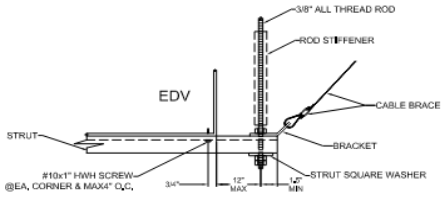
Test Lab: Environmental Testing Laboratory, Inc.

Report Title: AC156 Seismic Certification Test Report

Report #: 15020, Rev. 0

Report Date: 09/25/2018

Test UUT: UUT1

DD-UUT - 2 TEST RESULT SUMMARY							
Manufacturer: Titus							
Model: PEDV-S							
Model Number: PEDV-S_3A142R1616							
Inlet Size: 15-7/8"							
Mixing Box: Yes							
Cabinet Construction: 20 gauge galvanized carbon steel							
Options/Sub-Component Summary:							
-Controller: Pneumatic							
-Damper: Butterfly Valve							
-Disconnect							
-Transformer							
-Relay							
-Airflow Switch							
-Aerocross Sensor							
UUT Properties							
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)			
	Depth	Width	Height	Front-Back	Side-Side	Vertical	
191.5	49	38	18,125	N/A	N/A	N/A	
Seismic Test Parameter							
Test Criteria	S _{DS} (g)	R _h	H _r	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.34	0.54
The UUT was functional before and after shake test.							
The structural integrity of the component and attachment system and force resisting systems were maintained.							
							
							
Unit Mounting Description:							
Rigid suspended unit on (2) 1-5/8" Unistrut P1000 trapeze. (4) 3/8" ASTM-A307 rods at 58.5"x26" aspect ratio support the trapeze up to the fixture, fastened with 3/8" square washers and nuts. Unistrut P1000 used to stiffen the rods were fastened with Mason (2 per rod) UC-1 Rod Stiffening Clamps. Seismic bracing with (4) SCB-2 (3/16") Mason Seismic Cable Kits. SCB-2s were attached to structure using 1/2" A307 hardware. Unit was attached to the 1-5/8" Unistrut P1000 trapeze with (18) #10 Teks ASTM A510 Grade 1018-1022, at each corner and evenly spaced @ 4" O.C. along the trapeze.							
Test Lab: Environmental Testing Laboratory, Inc.							
Report Title: AC156 Seismic Certification Test Report							
Report #: 15020, Rev. 0							
Report Date: 09/25/2018							
Test UUT: UUT2							

DD-UUT - 3 TEST RESULT SUMMARY

Manufacturer: Titus

Model: PEDV-S

Model Number: PEDV-S_3A002R0606

Inlet Size: 5-7/8" (Dual)

Mixing Box: No

Cabinet Construction: 20 gauge galvanized carbon steel

Options/Sub-Component Summary:

-Controller: Pneumatic
-Damper: Butterfly Valve
-Disconnect
-Transformer
-Relay
-Airflow Switch
-Aerocross Sensor

UUT Properties

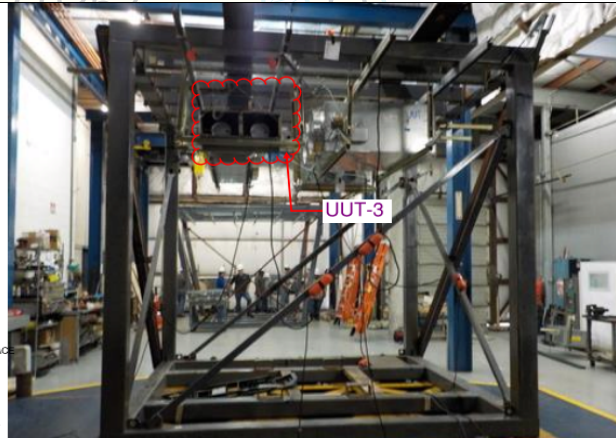
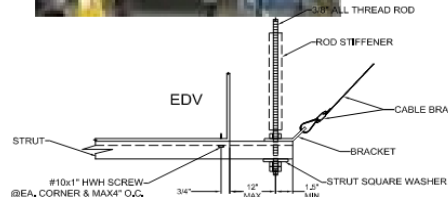
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
66	33	16.7	8	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H _f	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.34	0.54
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The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Rigid suspended unit on (2) 1-5/8" Unistrut P1000 trapeze. (4) 3/8" ASTM-A307 rods at 40"x12.5" aspect ratio support the trapeze up to the fixture, fastened with 3/8" square washers and nuts. Unistrut P1000 used to stiffen the rods were fastened with Mason (2 per rod) UC-1 Rod Stiffening Clamps. Seismic bracing with (4) GS10 (1/8") Gripple Seismic Cable Kits. GSS4 cable brackets were attached to structure using 1/2" A307 hardware. Unit was attached to the 1-5/8" Unistrut P1000 trapeze with (12) #10 Teks ASTM A510 Grade 1018-1022, at each corner and evenly spaced @ 4" O.C. along the trapeze.

Test Lab: Environmental Testing Laboratory, Inc.

Report Title: AC156 Seismic Certification Test Report

Report #: 15020, Rev. 0

Report Date: 09/25/2018

Test UUT: UUT3

DD-UUT - 4 TEST RESULT SUMMARY

Manufacturer: Titus

Model: DEDV-S

Model Number: DEDV-S_3A042R1616

Inlet Size: 15-7/8"

Mixing Box: No

Cabinet Construction: 20 gauge galvanized carbon steel

Options/Sub-Component Summary:

- Controller: Pneumatic
- Damper: Butterfly Valve
- Disconnect
- Transformer
- Relay
- Airflow Switch
- Aerocross Sensor

UUT Properties

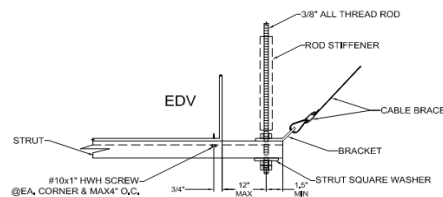
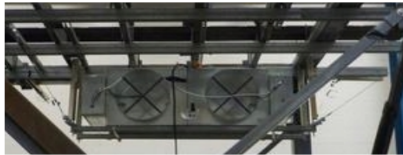
Operating Weight (lb)	Dimensions (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
151.5	61.1	18.9	18	N/A	N/A	N/A

Seismic Test Parameter

Test Criteria	S _{DS} (g)	R _μ	H _i	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
ICC-ES AC-156	2.0	1.3	3.5	3.2	2.4	1.34	0.54
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The UUT was functional before and after shake test.

The structural integrity of the component and attachment system and force resisting systems were maintained.



Unit Mounting Description:

Rigid suspended unit on (2) 1-5/8" Unistrut P1000 trapeze. (4) 3/8" ASTM-A307 rods at 63"x11.5" aspect ratio support the trapeze up to the fixture, fastened with 3/8" square washers and nuts. Unistrut P1000 used to stiffen the rods were fastened with Mason (2 per rod) UC-1 Rod Stiffening Clamps. Seismic bracing with (4) SCB-1 (1/8") Mason Seismic Cable Kits. SCB-1s were attached to structure using 1/2" A307 hardware. Unit was attached to the 1-5/8" Unistrut P1000 trapeze with (22) #10 Teks ASTM A510 Grade 1018-1022, at each corner and evenly spaced @ 4" O.C. along the trapeze.

Test Lab: Environmental Testing Laboratory, Inc.

Report Title: AC156 Seismic Certification Test Report

Report #: 15020, Rev. 0

Report Date: 09/25/2018

Test UUT: UUT4