



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0360

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: ACME Engineering & Manufacturing Corporation

Manufacturer's Technical Representative: Adam Sterne

Mailing Address: 1820 North York Street, Muskogee, OK 74403

Telephone: 918.684.0595 Email: asterne@acmefan.com

Product Information

Product Name: PDU & PNU Centrifugal Exhausters

Product Type: Exhaust Fan

Product Model Number: See Attachment 1

(List all unique product identification numbers and/or part numbers)

General Description: Direct drive and belt drive roof exhausters and wall exhausters. Seismic enhancements made to the test units shall be incorporated into the production units.

Mounting Description: Rigid base mounted on curb or rigid wall mounted.

Applicant Information

Applicant Company Name: Manwill Engineering LLC

Contact Person: Derek Manwill, SE

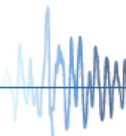
Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: 541.241.2102 Email: derek@manwillSE.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 10/15/2019

Title: President Company Name: Manwill Engineering LLC





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

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

Company Name: Manwill Engineering LLC

Name: Derek Manwill, SE California License Number: S6266

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: 541.241.2102 Email: derek@manwillSE.com

Supports and Attachments Preapproval

- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

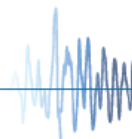
Testing Laboratory

Company Name: Environmental Testing Laboratory

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229

Telephone: 972.247.9657 Email: jeremy@etldallas.com





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: Yes No

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

S_{DS} (Design spectral response acceleration at short period, g) = 2.50

a_p (In-structure equipment or component amplification factor) = 2.5

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See Attachment 2

Overall dimensions and weight (or range thereof) = See Attachments 1 & 2

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: Yes No

Design Basis of Equipment or Components (V/W) = _____

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

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2015: Yes No

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): Attachments 1, 2, & 3

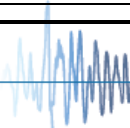
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2025

Signature:  Date: March 22, 2021

Print Name: William Staehlin Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.50 z/h = 1

Condition of Approval (if applicable): _____



ATTACHMENT 1: CERTIFIED COMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 1 - ROOF EXHAUSTERS

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
PDU Direct Drive Centrifugal Roof Exhausters						
PDU080XXSC	20.6	20.6	13.1	44		EXTRAP
PDU100XXSC	20.6	20.6	16.1	57		EXTRAP
PDU110XXSC	20.6	20.6	16.4	63		EXTRAP
PDU120XXSC	26.4	26.4	19.5	85		EXTRAP
PDU120RFHSC	26.4	26.4	19.5	85		UUT 5
PDU135XXSC	26.4	26.4	20.9	80		INTERP
PDU150XXSC	30.2	30.2	21.9	90		INTERP
PDU165XXSC	30.2	30.2	23.9	101		INTERP
PDU185XXSC	34.7	34.7	25.8	115		INTERP
PDU200XXSC	34.7	34.7	25.8	153		INTERP
PDU200RGSC	34.7	34.7	25.8	153		UUT 2
PNU Belt Drive Centrifugal Roof Exhausters						
PNU080XXSC	33.7	33.7	26.4	159		EXTRAP
PNU100XXSC	33.7	33.7	26.4	161		EXTRAP
PNU120XXSC	33.7	33.7	27.4	165		EXTRAP
PNU135SESC	33.7	33.7	27.4	158		UUT 12
PNU135XXSC	33.7	33.7	27.4	194		EXTRAP
PNU135RGHSC	33.7	33.7	27.4	194		UUT 3
PNU150XXSC	38.0	38.0	25.9	224		INTERP
PNU155XXSC	38.0	38.0	25.6	247		INTERP
PNU160XXSC	38.0	38.0	25.6	249		INTERP
PNU165XXSC	38.0	38.0	25.9	255		INTERP
PNU185XXSC	39.8	39.8	31.6	297		INTERP
PNU200XXSC	39.8	39.8	31.6	331		INTERP
PNU235XXSC	44.8	44.8	35.0	422		INTERP
PNU240XXSC	44.8	44.8	35.0	425		INTERP
PNU245XXSC	44.8	44.8	38.8	435		INTERP
PNU290XXSC	55.4	55.4	40.4	556		INTERP
PNU295XXSC	55.4	55.4	40.4	559		INTERP
PNU300XXSC	55.4	55.4	42.5	573		INTERP
PNU355XXSC	66.0	66.0	44.1	725		INTERP
PNU360XXSC	66.0	66.0	44.1	729		INTERP
PNU365XXSC	66.0	66.0	46.0	748		INTERP
PNU425XXSC	79.8	79.8	53.5	919		INTERP
PNU490RGSC	79.8	79.8	58.0	860		UUT 11
PNU490XXSC	79.8	79.8	58.0	1115		INTERP
PNU490SESC	79.8	79.8	58.0	1115		UUT 1
MOUNTING:	Rigid floor mounted on curb.			SEISMIC LEVEL:	$S_{DS} = 2.5g$ for $z/h = 1$ $I_p = 1.5$	
NOTES:	<p>Product Construction: Rolled aluminum housing. Aluminum backward curved wheel (carbon steel available for PNU).</p> <p>Options/Subcomponents: 8-24in carbon steel curb (height excludes curb), inlet guard, grease trough, birdscreen, heat shield, compartment shield, stainless steel shaft, pillow block bearings; subcomponents listed in Table 3.</p> <p>Nomenclature: See Attachment 3 for product nomenclature and available model numbers.</p>					

ATTACHMENT 1: CERTIFIED COMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 2 - WALL EXHAUSTERS

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
PDU Direct Drive Centrifugal Wall Exhausters						
PDU080XXWSC	20.6	20.6	13.1	44		EXTRAP
PDU100XXWSC	20.6	20.6	16.1	57		EXTRAP
PDU110XXWSC	20.6	20.6	16.4	63		EXTRAP
PDU120XXWSC	26.4	26.4	19.5	70		EXTRAP
PDU120RFWSC	26.4	26.4	19.5	70		UUT 10
PDU135XXWSC	26.4	26.4	20.9	80		INTERP
PDU150XXWSC	30.2	30.2	21.9	90		INTERP
PDU165XXWSC	30.2	30.2	23.9	101		INTERP
PDU185XXWSC	34.7	34.7	25.8	115		INTERP
PDU200XXWSC	34.7	34.7	25.8	126		INTERP
PDU200RFWSC	34.7	34.7	25.8	126		UUT 7
PNU Belt Drive Centrifugal Wall Exhausters						
PNU080XXWSC	33.7	33.7	26.4	94		EXTRAP
PNU100XXWSC	33.7	33.7	26.4	96		EXTRAP
PNU120XXWSC	33.7	33.7	27.4	100		EXTRAP
PNU135XXWSC	33.7	33.7	27.4	110		EXTRAP
PNU135RFWSC	33.7	33.7	27.4	111		UUT 14
PNU150XXWSC	38.0	38.0	25.9	140		INTERP
PNU155XXWSC	38.0	38.0	25.6	163		INTERP
PNU160XXWSC	38.0	38.0	25.6	165		INTERP
PNU165XXWSC	38.0	38.0	25.9	171		INTERP
PNU185XXWSC	39.8	39.8	31.6	213		INTERP
PNU200XXWSC	39.8	39.8	31.6	247		INTERP
PNU235XXWSC	44.8	44.8	35.0	238		INTERP
PNU240XXWSC	44.8	44.8	35.0	241		INTERP
PNU245XXWSC	44.8	44.8	38.8	251		INTERP
PNU290XXWSC	55.4	55.4	40.4	340		INTERP
PNU295XXWSC	55.4	55.4	40.4	343		INTERP
PNU300XXWSC	55.4	55.4	42.5	357		INTERP
PNU300RGWSC	55.4	55.4	42.5	357		UUT 13
MOUNTING:	Rigid wall mounted.			SEISMIC LEVEL:	S _{DS} = 2.5g for z/h = 1 I _p = 1.5	
NOTES:	<p>Product Construction: Rolled aluminum housing. Aluminum backward curved wheel.</p> <p>Options/Subcomponents: Performance baffle, grease trough, birdscreen, pillow block bearings; subcomponents listed in Table 4.</p> <p>Nomenclature: See Attachment 3 for product nomenclature and available model numbers.</p>					

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 3 - ROOF MNT SUBCOMPONENTS

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
ACME Engineering & Manufacturing Corp. - Aluminum Backward Curved Centrifugal Wheels						
235342	10.4	10.4		3.2	PDU080	EXTRAP
235118	10.4	10.4		4.0	PDU100	EXTRAP
235214	11.1	11.1		4.2	PDU110	EXTRAP
235497	12.3	12.3		3.2	PNU080	EXTRAP
235498	12.3	12.3		3.5	PNU100	EXTRAP
235249	12.3	12.3		4.5	PDU120	UUT 5
185272	12.3	12.3		4.5	PNU120	INTERP
235243	13.9	13.9		5.0	PDU135	INTERP
185523	13.9	13.9		5.0	PNU135	UUT 3
205009	15.4	15.4		6.5	PNU150	INTERP
235201	15.5	15.5		6.5	PDU150	INTERP
235488	17.0	17.0		6.5	PNU155	INTERP
235487	17.0	17.0		7.5	PNU160	INTERP
235244A	17.0	17.0		8.0	PDU165	INTERP
185524	17.0	17.0		8.0	PNU165	INTERP
235250A	19.0	19.0		8.5	PDU185	INTERP
185466	19.0	19.0		8.5	PNU185	INTERP
235246	21.0	21.0		9.0	PDU200	UUT 2
185525	21.0	21.0		9.0	PNU200	INTERP
235490	25.5	25.5		11	PNU235	INTERP
235489	25.5	25.5		12	PNU240	INTERP
205014	25.5	25.5		14	PNU245	INTERP
235492	31.0	31.0		12	PNU290	INTERP
235491	31.0	31.0		14	PNU295	INTERP
185475	31.0	31.0		18	PNU300	INTERP
235496	37.5	37.5		24	PNU355	INTERP
235495	37.5	37.5		29	PNU360	INTERP
185476	37.5	37.5		35	PNU365	INTERP
185477	43.5	43.5		55	PNU425	INTERP
185478	50.0	50.0		77	PNU490	UUT 11
ACME Engineering & Manufacturing Corp. - Carbon Steel Backward Curved Centrifugal Wheels						
785011	12.3	12.3		6.3	PNU080	EXTRAP
775004	12.3	12.3		7.0	PNU100	EXTRAP
685209	12.3	12.3		8.9	PNU120	EXTRAP
705393	13.9	13.9		9.9	PNU135	UUT 12
785005	15.4	15.4		12	PNU150	INTERP
705746	17.0	17.0		13	PNU155	INTERP
705745	17.0	17.0		16	PNU160	INTERP
705389	17.0	17.0		18	PNU165	INTERP
705534	19.0	19.0		21	PNU185	INTERP
705402	21.0	21.0		27	PNU200	INTERP
705750	25.5	25.5		35	PNU235	INTERP
NOTES:	Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.					

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 3 - ROOF MNT SUBCOMPONENTS (continued)

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
ACME Engineering & Manufacturing Corp. - Carbon Steel Backward Curved Centrifugal Wheels (continued)						
705751	25.5	25.5		39	PNU240	INTERP
685181	25.5	25.5		46	PNU245	INTERP
705741	31.0	31.0		49	PNU290	INTERP
785014	31.0	31.0		54	PNU295	INTERP
705404	31.0	31.0		63	PNU300	INTERP
785018	37.5	37.5		72	PNU355	INTERP
705743	37.5	37.5		89	PNU360	INTERP
705371	37.5	37.5		107	PNU365	INTERP
705451	43.5	43.5		165	PNU425	INTERP
705527	50.0	50.0		231	PNU490	UUT 1
McMillan - Direct Drive Motors						
0.10HP				8		EXTRAP
...		...			Extrapolated sizes	EXTRAP
0.25HP				8		UUT 5
...		...			Interpolated sizes	INTERP
1.0HP				20		UUT 2
Regal - Belt Drive Motors						
0.25HP				13		EXTRAP
...		...			Extrapolated sizes	EXTRAP
0.75HP				27		UUT 3,12
...		...			Interpolated sizes	INTERP
5.0HP				89		INTERP
...		...			Interpolated sizes	INTERP
10.0HP				220		UUT 1,11
ACME Engineering & Manufacturing Corp. - Back Draft Dampers						
AR8.75	8.8	8.8		4		EXTRAP
AR14	14	14		6		UUT 5
AR18	18	18		7		UUT 3,12
AR22	22	22		9		INTERP
AR28	28	28		15		INTERP
ARH34	34	34		21		INTERP
ARH40	40	40		26		INTERP
ARH54	54	54		37		UUT 1,11
Multi Products - Actuator						
TB2000						UUT 1, 11
Square D - Disconnect Switch						
2510						UUT 2
Hubbell - Disconnect Switch						
13R92D						UUT 3,12
DDI Inc. - Belt Tensioner						
FS0434						UUT 3,12
NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.						

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 3 - ROOF MNT SUBCOMPONENTS (continued)

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Honeywell - Firestats						
L4029E						UUT 3,12
KB Electronics - Speed Control						
KBWC-16LK						UUT 5,12
MOUNTING:	Mounted within unit.			SEISMIC LEVEL:	S _{DS} = 2.5g for z/h = 1 I _p = 1.5	
NOTES:	Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.					

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 4 - WALL MNT SUBCOMPONENTS

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
ACME Engineering & Manufacturing Corp. - Aluminum Backward Curved Centrifugal Wheels						
235342	10.4	10.4		3.2	PDU080	EXTRAP
235118	10.4	10.4		4.0	PDU100	EXTRAP
235214	11.1	11.1		4.2	PDU110	EXTRAP
235497	12.3	12.3		3.2	PNU080	EXTRAP
235498	12.3	12.3		3.5	PNU100	EXTRAP
185272	12.3	12.3		4.5	PNU120	EXTRAP
235249	12.3	12.3		4.5	PDU120	UUT 10
235243	13.9	13.9		5.0	PDU135	INTERP
185523	13.9	13.9		5.0	PNU135	UUT 14
205009	15.4	15.4		6.5	PNU150	INTERP
235201	15.5	15.5		6.5	PDU150	INTERP
235488	17.0	17.0		6.5	PNU155	INTERP
235487	17.0	17.0		7.5	PNU160	INTERP
185524	17.0	17.0		8.0	PNU165	INTERP
235244A	17.0	17.0		8.0	PDU165	INTERP
235250A	19.0	19.0		8.5	PDU185	INTERP
185466	19.0	19.0		8.5	PNU185	INTERP
235246	21.0	21.0		9.0	PDU200	UUT 7
185525	21.0	21.0		9.0	PNU200	INTERP
235490	25.5	25.5		11	PNU235	INTERP
235489	25.5	25.5		12	PNU240	INTERP
205014	25.5	25.5		14	PNU245	INTERP
235492	31.0	31.0		12	PNU290	INTERP
235491	31.0	31.0		14	PNU295	INTERP
185475	31.0	31.0		18	PNU300	UUT 13
McMillan - Direct Drive Motors						
0.10HP				8		EXTRAP
...		...			Extrapolated sizes	EXTRAP
0.25HP				8		UUT 10
...		...			Interpolated sizes	INTERP
1.0HP				20		UUT 7
Regal - Belt Drive Motors						
0.25HP				13		EXTRAP
...		...			Extrapolated sizes	EXTRAP
0.75HP				27		UUT 14
...		...			Interpolated sizes	INTERP
5.0HP				89		UUT 13
Square D - Disconnect Switch						
2510					NEMA 1	UUT 14
Hubbell - Disconnect Switch						
13R92D					NEMA 3R	UUT 13
NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.						

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 4 - WALL MNT SUBCOMPONENTS (continued)

DOCUMENT NO.: 19101CR1.0

MANUFACTURER: ACME ENGINEERING & MANUFACTURING CORPORATION						
PRODUCT FAMILY: CENTRIFUGAL EXHAUSTERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
DDI Inc. - Belt Tensioner						
FS0434						UUT 14
Honeywell - Firestats						
L4029E						UUT 7
KB Electronics - Speed Control						
KBWC-16LK						UUT 10
MOUNTING:	Mounted within unit.			SEISMIC LEVEL:	$S_{DS} = 2.5g$ for $z/h = 1$ $I_p = 1.5$	
NOTES:	Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.					

ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 1

DOCUMENT NO.: 19101CR1.0

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PNU490SESC				
UNIT FUNCTION:		ROOF EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
79.8	79.8	58.0	1115	6.1	6.0	7.0
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid floor mounted on 24in carbon steel curb using (40) 1/4in screws. Curb is rigid floor mounted to table with (52) 3/8in lag screws.				
CONSTRUCTION:		Rolled aluminum housing, carbon steel backward curved wheel.				
SUBCOMPONENTS:		ACME - steel wheel (705527), Regal - motor (10.0HP 200-230/460V 3-phase), ACME - back draft damper (ARH54), Multi Products - actuator (TB2000).				



UUT 2

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PDU200RGSC				
UNIT FUNCTION:		ROOF EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
34.7	34.7	25.8	153	16.9	16.7	13.0
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid floor mounted on 8in carbon steel curb using (20) 1/4in screws. Curb is rigid floor mounted to table with (24) 3/8in lag screws.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, grease trough.				
SUBCOMPONENTS:		ACME - aluminum wheel (235246), McMillan - motor (1.0HP 115V EC), Square D - disconnect switch (2510).				



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 3

DOCUMENT NO.: 19101CR1.0

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PNU135RGHSC				
UNIT FUNCTION:		ROOF EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
33.7	33.7	27.4	194	10.0	10.5	7.1
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid floor mounted on 24in carbon steel curb using (20) 1/4in screws. Curb is rigid floor mounted to table with (20) 3/8in lag screws.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, hurricane rated construction, inlet guard, heat shield, stainless steel shaft, pillow block bearings.				
SUBCOMPONENTS:		ACME - aluminum wheel (185523), Regal - motor (0.75HP 115/200-230V 1-phase), ACME - back draft damper with manual lever (AR18), Hubbell - disconnect switch (13R92D), DDI Inc. - belt tensioner (FS0434), Honeywell - firestats (L4029E).				



UUT 5

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PDU120RFHSC				
UNIT FUNCTION:		ROOF EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
26.4	26.4	19.5	85	26.9	26.9	27.3
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid floor mounted on 8in carbon steel curb using (16) 1/4in screws. Curb is rigid floor mounted to table with (16) 3/8in screws.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, hurricane rated construction, birdscreen, compartment shield.				
SUBCOMPONENTS:		ACME - aluminum wheel (235249), McMillan - motor (0.25HP 115V 1-phase), ACME - back draft damper (AR14), KB Electronics - speed control (KBWC-16LK).				



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 7

DOCUMENT NO.: 19101CR1.0

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PDU200RFWSC				
UNIT FUNCTION:		WALL EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
34.7	34.7	25.8	126	N/A	N/A	N/A
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid wall mounted to ACME wall mount bracket using (20) 1/4in screws. Wall mount bracket is rigid wall mounted to fixture with (28) 3/8in Grade 5 bolts.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, performance baffle.				
SUBCOMPONENTS:		ACME - aluminum wheel (235246), McMillan - motor (1.0HP 115V EC), Honeywell - firestats (L4029E).				



UUT 10

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PDU120RFWSC				
UNIT FUNCTION:		WALL EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
26.4	26.4	19.5	70	N/A	N/A	N/A
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		12819, Rev. 1		August 12, 2013		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid wall mounted to ACME wall mount bracket using (12) 1/4in screws. Wall mount bracket is rigid wall mounted to fixture with (20) 3/8in Grade 5 bolts.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, birdscreen.				
SUBCOMPONENTS:		ACME - aluminum wheel (235249), McMillan - motor (0.25HP 115V 1-phase), KB Electronics - speed control (KBWC-16LK).				



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 11

DOCUMENT NO.: 19101CR1.0

MANUFACTURER:	ACME ENGINEERING & MANUFACTURING
MODEL NUMBER:	PNU490RGSC
UNIT FUNCTION:	ROOF EXHAUSTER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
79.8	79.8	58.0	860	6.0	5.8	13.6

CODE & CRITERIA:	2016 CBC	ICC-ES AC156
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TEST LABORATORY:	ENVIRONMENTAL TESTING LABORATORY
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REPORT & DATE:	13151, Rev. 0	April 30, 2014
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S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
2.5	1	4.00	3.00	1.68	0.68
2.5	0				

IMPORTANCE FACTOR, I_p = 1.5

Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.



MOUNTING:	Unit is rigid floor mounted on 24in carbon steel curb using (40) 1/4in screws. Curb is rigid floor mounted to table with (28) 3/8in lag screws.
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CONSTRUCTION:	Rolled aluminum housing, aluminum backward curved wheel, grease trough.
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SUBCOMPONENTS:	ACME - aluminum wheel (185478), Regal - motor (10.0HP 200-230/460V 3-phase), ACME - back draft damper (ARH54), Multi Products - actuator (TB2000).
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UUT 12

MANUFACTURER:	ACME ENGINEERING & MANUFACTURING
MODEL NUMBER:	PNU135SESC
UNIT FUNCTION:	ROOF EXHAUSTER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
33.7	33.7	27.4	158	12.5	12.8	25.7

CODE & CRITERIA:	2016 CBC	ICC-ES AC156
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TEST LABORATORY:	ENVIRONMENTAL TESTING LABORATORY
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REPORT & DATE:	13151, Rev. 0	April 30, 2014
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S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
2.5	1	4.00	3.00	1.68	0.68
2.5	0				

IMPORTANCE FACTOR, I_p = 1.5

Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.



MOUNTING:	Unit is rigid floor mounted on 24in carbon steel curb using (20) 1/4in screws. Curb is rigid floor mounted to table with (16) 3/8in lag screws.
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CONSTRUCTION:	Rolled aluminum housing, carbon steel backward curved wheel, inlet guard, heat shield, stainless steel shaft, pillow block bearings.
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SUBCOMPONENTS:	ACME - steel wheel (705393), Regal - motor (0.75HP 115/200-230V 1-phase), ACME - back draft damper (AR18), Hubbell - disconnect switch (13R92D), DDI Inc. - belt tensioner (FS0434), Honeywell - firestats (L4029E), KB Electronics - speed control (KBWC-16LK).
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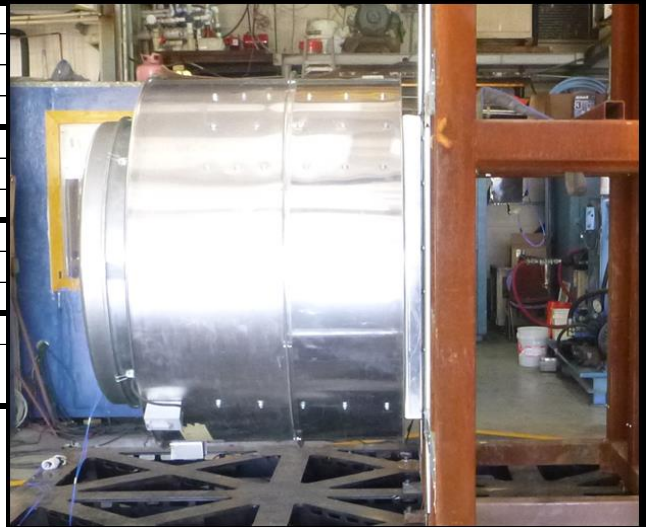
ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 13

DOCUMENT NO.: 19101CR1.0

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PNU300RGWSC				
UNIT FUNCTION:		WALL EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
55.4	55.4	42.5	357	N/A	N/A	N/A
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		13151, Rev. 0		April 30, 2014		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid wall mounted to ACME wall mount bracket using (20) 1/4in screws. Wall mount bracket is rigid wall mounted to fixture with (24) 3/8in Grade 5 bolts.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, grease trough.				
SUBCOMPONENTS:		ACME - aluminum wheel (185475), Regal - motor (5.0HP 200-230/460V 3-phase), Hubbell - disconnect switch (13R92D).				



UUT 14

MANUFACTURER:		ACME ENGINEERING & MANUFACTURING				
MODEL NUMBER:		PNU135RFWSC				
UNIT FUNCTION:		WALL EXHAUSTER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
33.7	33.7	27.4	111	N/A	N/A	N/A
CODE & CRITERIA:		2016 CBC		ICC-ES AC156		
TEST LABORATORY:		ENVIRONMENTAL TESTING LABORATORY				
REPORT & DATE:		13151, Rev. 0		April 30, 2014		
S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
2.5	1	4.00	3.00	1.68	0.68	
2.5	0					
IMPORTANCE FACTOR, I_p = 1.5						
Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.						
MOUNTING:		Unit is rigid wall mounted to ACME wall mount bracket using (12) 1/4in screws. Wall mount bracket is rigid wall mounted to fixture with (16) 3/8in Grade 5 bolts.				
CONSTRUCTION:		Rolled aluminum housing, aluminum backward curved wheel, stainless steel shaft, pillow block bearings.				
SUBCOMPONENTS:		ACME - aluminum wheel (185523), Regal - motor (0.75HP 200-230/460V 3-phase), Square D - disconnect switch (2510), DDI Inc. - belt tensioner (FS0434).				



ATTACHMENT 3: MODEL NOMENCLATURE

SEISMIC COMPLIANCE REPORT

PDU ROOF CENTRIFUGAL EXHAUSTERS

DOCUMENT NO.: 19101CR1.0

DIGIT:	1	2	3	4	5	6	7	8	9	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAMPLE:	P	D	U	1	2	0	R	F	H	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-3	Product Family	PDU	PDU Direct Drive Centrifugal Roof Exhausters
4-6	Model Size	080	Size 080
		...	Interpolated Sizes (See Table 1)
		200	Size 200
7-8	Application Type	RF	Roof Exhauster (Aluminum Wheel)
		RG	Restaurant Grease Rated Roof Exhauster (Aluminum Wheel)
		SE	Smoke Rated Roof Exhauster (Carbon Steel Wheel)
9	Hurricane Rating <i>(optional; Seismic Construction starts at digit 9 if not present)</i>	[null]	No Hurricane Rated Construction if Character is Not Present
		H	Hurricane Rated Construction
10-11	Seismic Construction	SC	Seismic Construction

PNU ROOF CENTRIFUGAL EXHAUSTERS

DIGIT:	1	2	3	4	5	6	7	8	9	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAMPLE:	P	N	U	1	3	5	R	G	H	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-3	Product Family	PNU	PNU Belt Drive Centrifugal Roof Exhausters
4-6	Model Size	080	Size 080
		...	Interpolated Sizes (See Table 1)
		490	Size 490
7-8	Application Type	RF	Roof Exhauster (Aluminum Wheel)
		RG	Restaurant Grease Rated Roof Exhauster (Aluminum Wheel)
9	Hurricane Rating <i>(optional; Seismic Construction starts at digit 9 if not present)</i>	[null]	No Hurricane Rated Construction if Character is Not Present
		H	Hurricane Rated Construction
10-11	Seismic Construction	SC	Seismic Construction

ATTACHMENT 3: MODEL NOMENCLATURE

SEISMIC COMPLIANCE REPORT

PDU WALL CENTRIFUGAL EXHAUSTERS

DOCUMENT NO.: 19101CR1.0

DIGIT:	1	2	3	4	5	6	7	8	9	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAMPLE:	P	D	U	1	2	0	R	F	W	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-3	Product Family	PDU	PDU Direct Drive Centrifugal Wall Exhausters
4-6	Model Size	080	Size 080
		...	Interpolated Sizes (See Table 2)
		200	Size 200
7-8	Application Type	RF	Roof Exhauster (Aluminum Wheel)
		RG	Restaurant Grease Rated Roof Exhauster (Alumunum Wheel)
		SE	Smoke Rated Roof Exhauster (Carbon Steel Wheel)
9	Mounting	W	Wall Mounted with ACME Wall Mount Bracket
10-11	Seismic Construction	SC	Seismic Construction

PNU WALL CENTRIFUGAL EXHAUSTERS

DIGIT:	1	2	3	4	5	6	7	8	9	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAMPLE:	P	N	U	1	3	5	R	F	W	S	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-3	Product Family	PNU	PNU Belt Drive Centrifugal Wall Exhausters
4-6	Model Size	080	Size 080
		...	Interpolated Sizes (See Table 2)
		300	Size 300
7-8	Application Type	RF	Roof Exhauster (Aluminum Wheel)
		RG	Restaurant Grease Rated Roof Exhauster (Alumunum Wheel)
9	Mounting	W	Wall Mounted with ACME Wall Mount Bracket
10-11	Seismic Construction	SC	Seismic Construction