



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

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

OFFICE USE ONLY

APPLICATION #: **OSP – 0372 – 10**

**OSHPD Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Daikin Manufacturing Company, L.P.

Manufacturer's Technical Representative: Chris Bellshaw

Mailing Address: 1645 Wallace Drive, Carrollton, Texas 75006

Telephone: 972-245-1510

Email: Chris.Bellshaw@daikinac.com

**Product Information**

Product Name: VRV-III

Product Type: Outdoor Heat Pump

Product Model Number: See attachment "Table 1: Certified Unit List" for complete list.

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

General Description: Outdoor heat pumps. Seismic enhancements made to the test units and modifications required to  
Address anomalies observed during testing shall be incorporated into the production units.

Mounting Description: Rigid Base/Floor Mounted

**Applicant Information**

Applicant Company Name: Buehler & Buehler Structural Engineers, Inc.


Contact Person: Scott Hooker

Mailing Address: 600 Q Street, Suite 200, Sacramento, CA 95758

Telephone: 916.443.0303

Email: shooker@bbse.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: 

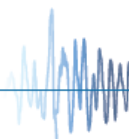
Date: 11/15/13

Title: President

Company Name: Buehler & Buehler Structural Engineers, Inc.

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY  
OSH-FD-759 (REV 6/14/13)



osHPD



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

Company Name: Buehler & Buehler Structural Engineers, Inc.

Name: Scott R. Hooker California License Number: S3937

Mailing Address: 600 Q Street, Suite 200, Sacramento, CA 95811

Telephone: 916.443.0303 Email: Shooker @bbse.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): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

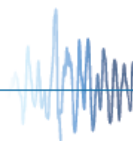
**Testing Laboratory**

Company Name: Qual Tech NP

Contact Name: Marie S. Nemier

Mailing Address: 4600 East Tech Drive, Cincinnati, OH 45245

Telephone: 513.528.9292 Email: mnemier@curtisswright.com





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**Seismic Parameters**

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

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.875

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

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

$R_p$  (Equipment or component response modification factor) = 6.0

$\Omega_0$  (System overstrength factor) = 2.5

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachment Table 3

Overall dimensions and weight (or range thereof) = See attachment Table 1

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) = \_\_\_\_\_

$\Omega_0$  (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, 2010:  Yes  No

**List of Attachments Supporting Special Seismic Certification**

Test Report(s)  Drawings  Calculations  Manufacturer's Catalog

Other(s) (Please Specify): Test Witness Letter

**OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019**

Signature:  Date: 1/30/2013

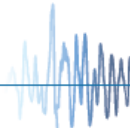
Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to:  $S_{DS}$  (g) = 2.50  $z/h$  = 1.0

Condition of Approval (if applicable): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Table 1. Certified Unit List**

**Group G: Outdoor Heat Pump (VRV-III)**

Model Number <sup>1</sup>	Nominal Btu/h	Tested/ Interpolated	Height (in.)	Width (in.)	Depth (in.)	Operating <sup>4</sup> Weight (lbs)	Mounting
REYQ72_TJ	69,000	Interpolated	66.1	51.2	30.1	730	Base - Rigid Mount
REYQ72_YD	69,000	Interpolated	66.1	51.2	30.1	732	
RXYQ96_TJ <sup>2</sup>	92,000	UUT-8	66.1	48.9	30.1	620	
RXYQ96_YD <sup>2</sup>	92,000	Interpolated	66.1	48.9	30.1	633	
REYQ96_TJ <sup>2</sup>	96,000	Interpolated	66.1	51.2	30.1	730	
REYQ96_YD <sup>2</sup>	96,000	Interpolated	66.1	51.2	30.1	732	
RXYQ120_TJ <sup>2</sup>	114,000	Interpolated	66.1	48.9	30.1	620	
RXYQ120_YD <sup>2</sup>	114,000	Interpolated	66.1	48.9	30.1	633	
REYQ120_TJ <sup>2</sup>	114,000	Interpolated	66.1	51.2	30.1	730	
REYQ120_YD <sup>2</sup>	114,000	UUT-9	66.1	51.2	30.1	732	
RXYQ144_TJ <sup>2</sup>	138,000	Interpolated	66.1	51.2	30.1	747	
REYQ144_YD <sup>2</sup>	138,000	UUT-10	66.1	51.2	30.1	747	
RXYQ168 <sup>3</sup>	168,000	Interpolated	RXYQ72 + RXYQ96				
RXYQ192 <sup>3</sup>	192,000	Interpolated	RXYQ72 + RXYQ120				
RXYQ216 <sup>3</sup>	216,000	Interpolated	RXYQ96 + RXYQ120				
RXYQ240 <sup>3</sup>	240,000	Interpolated	2 x RXYQ120				
RXYQ264 <sup>3</sup>	264,000	Interpolated	RXYQ72 + 2 x RXYQ96				
RXYQ288 <sup>3</sup>	288,000	Interpolated	RXYQ72 + RXYQ96 + RXYQ120				
RXYQ312 <sup>3</sup>	312,000	Interpolated	RXYQ72 + 2 x RXYQ120				
RXYQ336 <sup>3</sup>	336,000	Interpolated	RXYQ96 + 2 x RXYQ120				
RXYQ360 <sup>3</sup>	360,000	Interpolated	3 x RXYQ120				



1. R410A refrigerant
2. Single Unit
3. Modular unit (individually mounted single units) including \_TJ and \_YD options
4. Weight of unit only, see Table 2 for certified options



Special Seismic Certification  
 OSHPD Preapproval  
 Daikin Product Line



**Table 2. Certified Sub-Component List**

**Group G: Heat Pump (Outdoor Section) - VRV-III**

Heat Exchanger			
Description	Manufacturer	Material	Tested or Interpolated
8 mm x 0.3 mm coil	DAIKIN	Al Fin, Cu Tube	UUT-8, UUT-9, UUT-10

Compressor (scroll)				
Nominal Capacity Btu/h	Manufacturer	Material	Voltage	Tested or Interpolated
60,000	DAIKIN	Carbon Steel	208-230V	UUT-8, UUT-9
60,000	DAIKIN	Carbon Steel	460V	UUT-9
72,000	DAIKIN	Carbon Steel	208-230V	UUT-8, UUT-10

Fan Motor				
Description	Manufacturer	Material	Voltage	Tested or Interpolated
Propeller Fan/Direct Drive (350W x 2)	NIDEC	Aluminum	208-230V	UUT-8
Propeller Fan/Direct Drive (350W x 2)	NIDEC	Aluminum	460V	UUT-9
Propeller Fan/Direct Drive (750W x 2)	Panasonic	Polyester resin	208-230V	UUT-10

Printed Circuit Board				
Description	Part Number	Manufacturer	Material	Tested or Interpolated
Inverter Assy. (Fan Driver)	1873092	DAIKIN	Hard Plastic	UUT-8, UUT-9
Printed Circuit Assy. (Inverter)	1873078	DAIKIN	Hard Plastic	UUT-8, UUT-9, UUT-10
Printed Circuit Assy. (Sub 1)	1852242	DAIKIN	Hard Plastic	UUT-10
Printed Circuit Assy. (Sub 2)	1873148	DAIKIN	Hard Plastic	UUT-10
Printed Circuit Board(ABC I/P)	1716788	DAIKIN	Hard Plastic	UUT-8
Current Sensor	1695780	DAIKIN	Hard Plastic	UUT-8
Earth Leakage Detector	1894246	DAIKIN	Hard Plastic	UUT-8, UUT-9, UUT-10
Main	2041533	DAIKIN	Hard Plastic	UUT-8, UUT-9, UUT-10
Noise Filter	1852235	DAIKIN	Hard Plastic	UUT-8, UUT-9

Other			
Description	Manufacturer	Material	Tested or Interpolated
Cabinet	DAIKIN	Carbon Steel	UUT-8, UUT-9, UUT-10
Cool/Heat Selector (Requires BRP2A81 ABC Terminal Kit)	DAIKIN	Plastic	UUT-8, UUT-9, UUT-10



Special Seismic Certification  
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**Table 3. UUT Summary**

<i>Model Number</i>	<i>Nominal Btu/hr</i>	<i>UUT Mark*</i>	<i>Mounting</i>	<i>S<sub>ds</sub> (g)</i>	<i>z/h</i>	<i>Excitation Direction</i>	<i>Frequency (Hz)</i>	<i>Length (in)</i>	<i>Width (in)</i>	<i>Height (in)</i>	<i>Operating Weight (lbs)</i>
RXYQ96PBTJ	92000	UUT-8	Base - Rigid Mount	3.05	1.0	X	9.1	48.9	30.1	66.0	585
						Y	7.2				
						Z	14.5				
REYQ120PBYD	114000	UUT-9	Base - Rigid Mount	2.87	1.0	X	9.5	51.4	30.3	66.0	736
						Y	8.2				
						Z	N/A				
REYQ144PBTJ	138000	UUT-10	Base - Rigid Mount	2.98	1.0	X	8.4	51.4	30.3	66.0	728
						Y	7.7				
						Z	14.6				



**Special Seismic Certification**  
**OSHPD Preapproval**  
**Daikin Product Line**

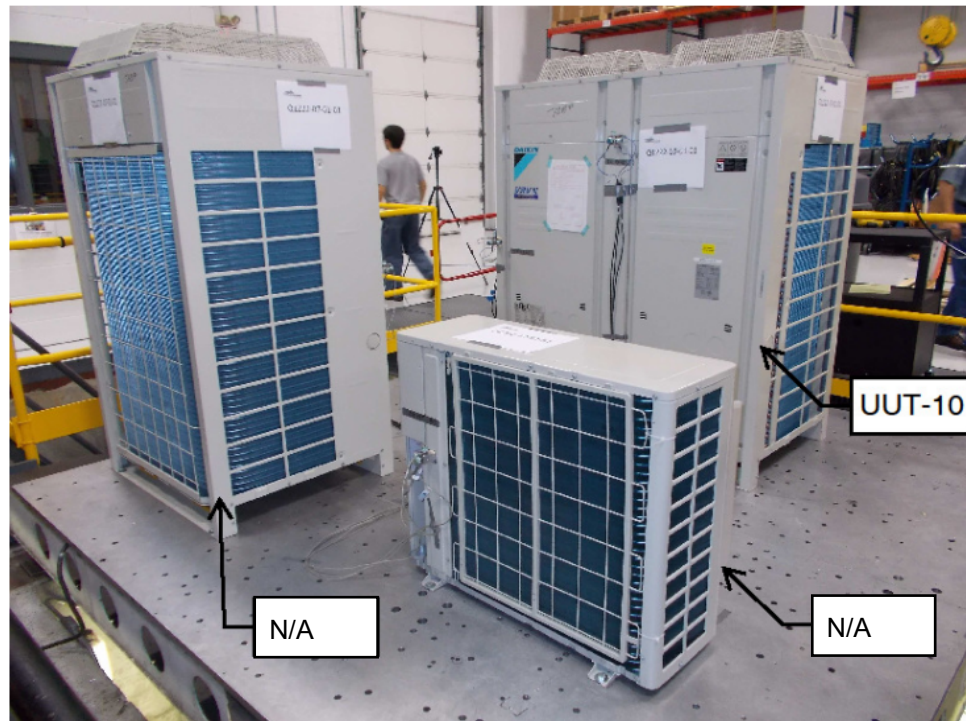


**Table 4. UUT Summary Sub-Component List**

	Type	Description	Manufacturer	Material	Part #
<b>UUT-8 RXYQ96PBTJ</b>	Heat Exchanger	8 mm x 0.3 mm coil	DAIKIN	Al fin, Cu Tube	CA-RXYQ12PY1
	Compressor	Capacity 48,000 Btu/h, 2200 W	DAIKIN	Carbon Steel	JT100GCVDKW
	Compressor	Capacity 48,000 Btu/h, 4500 W	DAIKIN	Carbon Steel	JT170G-KWTJ
	Fan	Propeller Fan/Direct Drive (350W x 2)	NIDEC	Aluminium	3P170281-2
	Printed Circuit Board	Main	DAIKIN	Hard Plastic	2041533
	Printed Circuit Board	Noise Filter	DAIKIN	Hard Plastic	1852235
	Printed Circuit Board	Printed Circuit Assy. (Inverter)	DAIKIN	Hard Plastic	1873078
	Printed Circuit Board	Inverter Assy. (Fan Driver)	DAIKIN	Hard Plastic	1873092
	Printed Circuit Board	Current Sensor	DAIKIN	Hard Plastic	1695780
	Printed Circuit Board	Earth Leakage Dectector	DAIKIN	Hard Plastic	1894246
	Printed Circuit Board	ABC I/P	DAIKIN	Hard Plastic	1716788
	Other	Cabinet	DAIKIN	Carbon steel	N/A
Other	Cool/Heat Selector (Requires BRP2A81 ABC Terminal Kit)	DAIKIN	Plastic	BRP2A81	
<b>UUT-9 REYQ120PBYD</b>	Heat Exchanger	8 mm x 0.3 mm coil	DAIKIN	Al fin, Cu Tube	CA-REYQ5PY1
	Compressor	Capacity 60,000 Btu/h, 3500 W	DAIKIN	Carbon Steel	JT1G-VDKWYR
	Compressor	Capacity 60,000 Btu/h, 4500 W	DAIKIN	Carbon Steel	JT170G-KWYD
	Fan	Propeller Fan/Direct Drive (350W x 2)	NIDEC	Aluminum	3P170281-2
	Printed Circuit Board	Main	DAIKIN	Hard Plastic	2041533
	Printed Circuit Board	Noise Filter	DAIKIN	Hard Plastic	1852235
	Printed Circuit Board	Printed Circuit Assy. (Inverter)	DAIKIN	Hard Plastic	1873078
	Printed Circuit Board	Inverter Assy. (Fan Driver)	DAIKIN	Hard Plastic	1873092
	Printed Circuit Board	Earth Leakage Dectector	DAIKIN	Hard Plastic	1894246
	Other	Cabinet	DAIKIN	Carbon steel	N/A
	other	Cool/Heat Selector (Requires BRP2A81 ABC Terminal Kit)	DAIKIN	Plastic	BRP2A81
	<b>UUT-10 REYQ144PBTJ</b>	Heat Exchanger	8 mm x 0.3 mm coil	DAIKIN	Al fin, Cu Tube
Compressor		Capacity 72,000 Btu/h (2), 3800 W (2)	DAIKIN	Carbon Steel	JT100GCVDKW
Fan		Propeller Fan/Direct Drive (750W x 2)	Panasonic	Polyester Resin	3P180619-1
Printed Circuit Board		Printed Circuit Assy. (Inverter)	DAIKIN	Hard Plastic	1873078
Printed Circuit Board		Printed Circuit Assy. (Sub 1)	DAIKIN	Hard Plastic	1852242
Printed Circuit Board		Printed Circuit Assy. (Sub 2)	DAIKIN	Hard Plastic	1873148
Printed Circuit Board		Earth Leakage Detector	DAIKIN	Hard Plastic	1894246
Printed Circuit Board		Main	DAIKIN	Hard Plastic	2041533
Other		Cabinet	DAIKIN	Carbon steel	N/A
Other		Cool/Heat Selector (Requires BRP2A81 ABC Terminal Kit)	DAIKIN	Plastic	BRP2A81

Shake Table Test Setup      Test #4

UUT Designation	UUT-10	<b>Seismic Parameters</b>							
Identification No.	REYQ144PBTJ	<b>Building Code</b>	<b>Test Criteria</b>	<b>S<sub>Ds</sub> (g)</b>	<b>z/h</b>	<b>Horizontal</b>		<b>Vertical</b>	
Attachment Method	(4) 1/2"Ø A207 Bolts					<b>A<sub>FLX-H</sub></b>	<b>A<sub>RIG-H</sub></b>	<b>A<sub>FLX-V</sub></b>	<b>A<sub>RIG-V</sub></b>
		CBC 2013	AC156	2.98	1.0	4.77	3.58	1.99	0.79

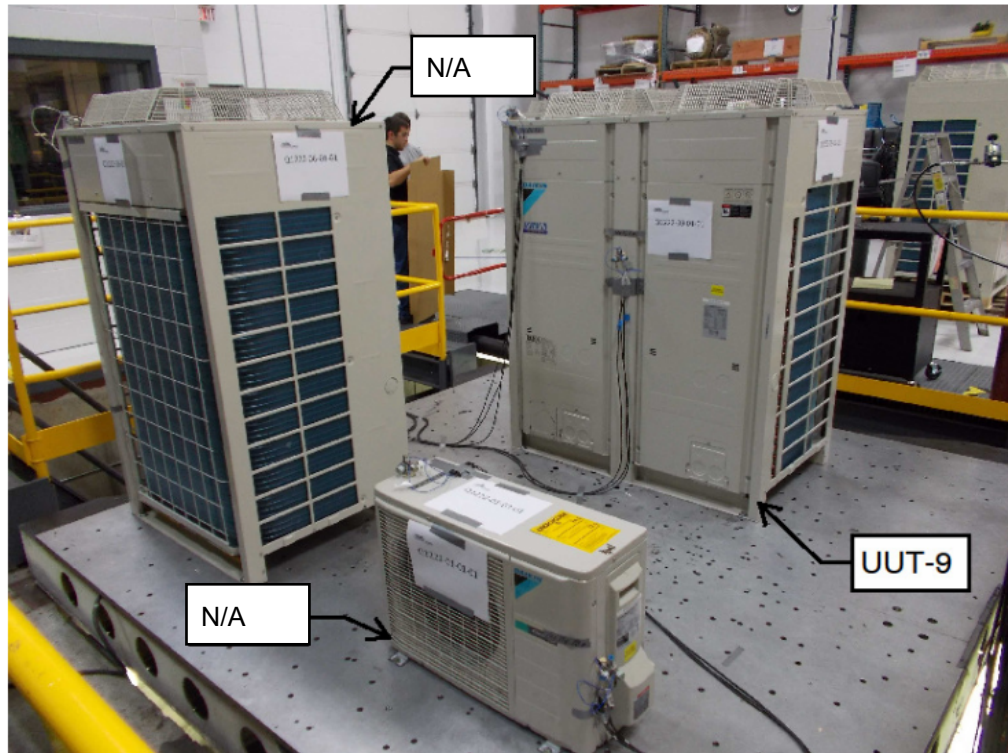


Notes:      The UUT was full of content during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.



Shake Table Test Setup      Test #3

UUT Designation	UUT-9	<b>Seismic Parameters</b>							
Identification No.	REYQ120PBYD	<b>Building Code</b>	<b>Test Criteria</b>	<b>S<sub>Ds</sub> (g)</b>	<b>z/h</b>	<b>Horizontal</b>		<b>Vertical</b>	
Attachment Method	(4) 1/2"Ø A207 Bolts					<b>A<sub>FLX-H</sub></b>	<b>A<sub>RIG-H</sub></b>	<b>A<sub>FLX-V</sub></b>	<b>A<sub>RIG-V</sub></b>
		CBC 2013	AC156	2.87	1.0	4.59	3.44	1.91	0.77



Notes:    The UUT was full of content during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

Shake Table Test Setup      Test #9

UUT Designation Identification No. Attachment Method	UUT-8 RXYQ96PBTJ (4) 1/2"Ø A207 Bolts	<b>Seismic Parameters</b>							
		<b>Building Code</b>	<b>Test Criteria</b>	<b>S<sub>Ds</sub> (g)</b>	<b>z/h</b>	<b>Horizontal</b>		<b>Vertical</b>	
						<b>A<sub>FLX-H</sub></b>	<b>A<sub>RIG-H</sub></b>	<b>A<sub>FLX-V</sub></b>	<b>A<sub>RIG-V</sub></b>
		CBC 2013	AC156	3.05	1.0	4.88	3.66	2.03	0.81



Notes:    The UUT was full of content during the test.  
 After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

# VRV Systems

## Nomenclature

**For Reference Only**

Outdoor Unit



- Standard compatibility symbol  
U: United States of America
- Power supply symbol  
YD: 3 phase, 460V, 60 Hz  
TJ: 3 phase, 208-230V, 60 Hz
- Indicates major design category
- Capacity indication in cooling
 

72: 72,000 Btu/h	240: 240,000 Btu/h
84: 84,000 Btu/h	252: 252,000 Btu/h
96: 96,000 Btu/h	264: 264,000 Btu/h
120: 120,000 Btu/h	288: 288,000 Btu/h
144: 144,000 Btu/h	312: 312,000 Btu/h
168: 168,000 Btu/h	336: 336,000 Btu/h
192: 192,000 Btu/h	360: 360,000 Btu/h
216: 216,000 Btu/h	
- Refrigerant type  
Q: R-410A
- Unit category  
RXY: Heat pump type  
REY: Heat recovery type  
REM: Heat recovery multi unit  
RWEY: Water-cooled heat pump/heat recovery type