



15860 SW Upper Boones Ferry Rd
Lake Oswego, OR 97035
Phone 503.620.4300
Fax 503.620-4238
airreps.com

3990 Roosevelt Blvd. Suite A
Eugene, OR 97402
Phone 503.620.4300
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SUBMITTAL

Project: Highland Park Middle School
Beaverton, OR

Contractor: N/A
N/A

Engineer: MFIA
Portland, OR

Specification Section: Unit Ventilators

Manufacturer:



<u>Quantity</u>	<u>Tag</u>	<u>Model</u>
37	VU's (1,500 CFM)	UAVV9H15
5	VU's (750 CFM)	UAVV9H07
1	UV-CL-4	UAVH9H07

- Indoor vertical unit ventilator (UV-CL-4 is the only horizontal UV)
- Welded frame, painted access panels, discharge grill – factory standard colors
- 0-100% economizer damper – actuator by others
- 4 row coil, stainless steel drain pan – valve by others
- 1" MERV8 filter
- Direct drive supply fans and 3 speed ECM motor
- Disconnect switch
- Sub base – ships loose for install by others
- 1" end panels
- 1 year parts warranty

Notes:

1. Please confirm colors – see color chart at the end of this submittal
2. DDC controls by others – please confirm prior to release
3. Please confirm voltage – 208/60/1
4. UV-C-13C (new office UV) is in a newer office that was part of room CR-13 approx 10 years ago – this unit is not scheduled. BSD has requested its replacement so it will be able to provide cooling. Please confirm this unit will be replaced
5. UV-C-13B is not scheduled but is in the same classroom as UV-C-13 – please confirm this unit will be replaced
6. 1" end panels are provided to match existing – 12" end panels are not provided



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Rob Grace
Oregon Air Reps, Inc.

Highland Park ES																																		
Unit								Fan			Chilled Water Coil								Hot Water Coil															
TAG	Qty	Model	Cooling Coil Type	Heating Coil Type	Voltage	Min Circuit Amps	Max Fuse Amps	Airflow (CFM)	ESP (inH ₂ O)	Fan Speed	Motor Power (HP)	Coil Rows	EAT		LAT		Fluid Type	EWT	LWT	Flow Rate (gpm)	WPD (ft H ₂ O)	Total Capacity (Btu/hr)	Sensible Capacity (Btu/hr)	Coil Rows	EAT		LAT		Fluid Type	EWT (°F)	LWT (°F)	Flow Rate (gpm)	WPD (ft H ₂ O)	Total Capacity (Btu/hr)
													EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)									EDB (°F)	LDB (°F)								
UV-A-1	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94041		
UV-A-2	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94042		
UV-A-3	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94043		
UV-A-4	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94044		
UV-A-5	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94045		
UV-A-6	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94046		
UV-A-7	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94047		
UV-A-8	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94048		
UV-A-9	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94049		
UV-A-10	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94050		
UV-A-11	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94051		
UV-A-12	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94052		
UV-A-14	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94053		
UV-B-1	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94054		
UV-B-2	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94055		
UV-B-3	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94056		
UV-B-4	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94057		
UV-B-5	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94058		
UV-B-6	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94059		
UV-B-7	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94060		
UV-B-8	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94061		
UV-B-9	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94062		
UV-B-10	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94063		
UV-B-12	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94064		
UV-B-14	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94065		
UV-C-1	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94066		
UV-C-2	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94067		
UV-C-3	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94068		
UV-C-4	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94069		
UV-C-5	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94070		
UV-C-6	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94071		
UV-C-7A	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94072		
UV-C-7B	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94073		
UV-C-8	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94074		
UV-C-10	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94075		
UV-C-11	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94076		
UV-C-13	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94077		
UV-C-13B	1	UAVV9H15	2-Pipe CW / HW	2-Pipe CW / HW	208/60/1	3.80	15	1474	0.00	High	0.333	4	83.0	64.0	60.1	54.3	20% Propylene Glycol	44.0	54.8	8.00	5.59	41768	36586	4	57.0	115.8	20% Propylene Glycol	140.0	116.5	8.00	4.20	94077		
UV-110B	1	UAVV9H07	2-Pipe CW / HW	2-Pipe CW /																														

TAG	LH / RH Coil Connection	UV Depth (in)	UV Length (in)	UV Height (in)	Sub Base	Draft Stop	Front RA	1"End Panels
UV-A-1	RH	16.625	100	30	6	no	yes	yes
UV-A-2	LH	16.625	100	30	6	no	yes	yes
UV-A-3	RH	16.625	100	30	6	yes	no	yes
UV-A-4	RH	16.625	100	30	6	yes	no	yes
UV-A-5	RH	16.625	100	30	6	yes	no	yes
UV-A-6	RH	16.625	100	30	6	yes	no	yes
UV-A-7	RH	16.625	100	30	6	yes	no	yes
UV-A-8	RH	16.625	100	30	6	yes	no	yes
UV-A-9	RH	16.625	100	30	6	yes	no	yes
UV-A-10	RH	16.625	100	30	6	yes	no	yes
UV-A-11	RH	16.625	100	30	6	yes	no	yes
UV-A-12	RH	16.625	100	30	6	yes	no	yes
UV-A-14	RH	16.625	100	30	6	yes	no	yes
UV-B-1	RH	16.625	100	30	6	no	yes	yes
UV-B-2	LH	16.625	100	30	6	no	yes	yes
UV-B-3	RH	16.625	100	30	6	yes	no	yes
UV-B-4	RH	16.625	100	30	6	yes	no	yes
UV-B-5	RH	16.625	100	30	6	yes	no	yes
UV-B-6	RH	16.625	100	30	6	yes	no	yes
UV-B-7	RH	16.625	100	30	6	yes	no	yes
UV-B-8	RH	16.625	100	30	6	yes	no	yes
UV-B-9	RH	16.625	100	30	6	yes	no	yes
UV-B-10	RH	16.625	100	30	6	yes	no	yes
UV-B-12	RH	16.625	100	30	6	yes	no	yes
UV-B-14	RH	16.625	100	30	6	yes	no	yes
UV-C-1	RH	16.625	100	30	6	no	yes	yes
UV-C-2	LH	16.625	100	30	6	no	yes	yes
UV-C-3	RH	16.625	100	30	6	yes	no	yes
UV-C-4	RH	16.625	100	30	6	yes	no	yes
UV-C-5	RH	16.625	100	30	6	yes	no	yes
UV-C-6	RH	16.625	100	30	6	yes	no	yes
UV-C-7A	RH	16.625	100	30	6	yes	no	yes

UV-C-7B	RH	16.625	100	30	6	yes	no	yes
UV-C-8	RH	16.625	100	30	6	yes	no	yes
UV-C-10	RH	16.625	100	30	6	yes	no	yes
UV-C-11	RH	16.625	100	30	6	yes	no	yes
UV-C-13A	RH	16.625	100	30	2	yes	no	yes
UV-C-13B	RH	16.625	100	30	2	yes	no	yes
UV-110B	RH	16.625	64	30	N/A	no	yes	yes
UV-210B	RH	16.625	64	30	N/A	no	yes	yes
UV-310B	RH	16.625	64	30	N/A	no	yes	yes
UV-C -13C (new office)	RH	16.625	64	30	2	no	yes	yes
UV-CL-3	RH	16.625	64	30	2	no	yes	yes
UV-CL-4	LH	64	36	16.625	N/A	N/A	N/A	yes

Job Information		Technical Data Sheet
Job Name	Highland Park ES	
Date	3/19/2019	
Submitted By	Robert Grace	
Software Version	06.10	
Unit Tag	UV-A-1 thru UV-C-13 (Qty-37)	



Unit Overview			
Model Number	Model Type	Cooling Coil Type	Heating Coil Type
UAVV9H15	Valve Control	2-Pipe CW / HW	2-Pipe CW / HW
Arrangement	Control Type	Cooling Coil Hand	Heating Coil Hand
Vertical, Floor Mounted	Field Mounted Controls (By Others)	Left Hand Cooling	Left Hand Heating

Physical			
Unit Length	Unit Depth	Unit Height	Weight
98.00 in	16.63 in	30.13 in	570 lb

Electrical				
Voltage	Minimum Voltage	Maximum Voltage	Total Unit MCA	Maximum Fuse Size
208/60/1 V/Hz/Phase	197 v	228 v	3.8 A	15 A

Fan					
Performance					
Fan Motor	Speed	Air Volume CFM	External Static Pressure inH ₂ O	Motor Power HP	Fan Full Load Current A
ECM, 3-Speed	High	1474	0.00	0.333	3.00

Chilled Water Coil					
Performance					
Capacity		Air Temperature			
Total Btu/hr	Sensible Btu/hr	Entering		Leaving	
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F
41768	36586	83.0	64.0	60.1	54.3
Number of Rows	Fluid				
	Temperature		Type	Glycol Concentration %	Flow Rate gpm
	Entering °F	Leaving °F			
4	44.0	54.8	Propylene	20.0	8.00
					Pressure Drop ft H ₂ O
					5.59

Hot Water Coil				
Performance				
Total Capacity Btu/hr	Air Temperature Dry Bulb		Fluid Temperature	
	Entering °F	Leaving °F	Entering °F	Leaving °F
94041	57.0	115.8	140.0	116.5
Fluid				
Type	Glycol Concentration %		Flow Rate gpm	Pressure Drop ft H ₂ O
Propylene	20.0		8.00	4.20

Warranty	
Type	
Extended:	None

Notes

Accessories	
Part Number	Description
106041190	1" End Pnl, Ant Ivory, 16-5/8"D, Solid (AV AZ)
105660706	6" Subbase- 16 5/8" Deep AV- S15

Job Information		Technical Data Sheet
Job Name	Highland Park ES	
Date	3/19/2019	
Submitted By	Robert Grace	
Software Version	06.10	
Unit Tag	UV-110B thru UV310B, UV-CL-3, UV-C-13 (new office) (Qty-5)	



Unit Overview			
Model Number	Model Type	Cooling Coil Type	Heating Coil Type
UAVV9H07	Valve Control	2-Pipe CW / HW	2-Pipe CW / HW
Arrangement	Control Type	Cooling Coil Hand	Heating Coil Hand
Vertical, Floor Mounted	Field Mounted Controls (By Others)	Right Hand Cooling	Right Hand Heating

Physical			
Unit Length	Unit Depth	Unit Height	Weight
62.00 in	16.63 in	30.13 in	350 lb

Electrical				
Voltage	Minimum Voltage	Maximum Voltage	Total Unit MCA	Maximum Fuse Size
208/60/1 V/Hz/Phase	197 v	228 v	3.8 A	15 A

Fan					
Performance					
Fan Motor	Speed	Air Volume CFM	External Static Pressure inH ₂ O	Motor Power HP	Fan Full Load Current A
ECM, 3-Speed	High	748	0.00	0.333	3.00

Chilled Water Coil					
Performance					
Capacity		Air Temperature			
Total Btu/hr	Sensible Btu/hr	Entering		Leaving	
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F
20755	18147	83.0	64.0	60.6	54.5
Number of Rows	Fluid				
	Temperature		Type	Glycol Concentration %	Flow Rate gpm
	Entering °F	Leaving °F			
4	44.0	54.7	Propylene	20.0	4.00
					Pressure Drop ft H ₂ O
					3.89

Hot Water Coil				
Performance				
Total Capacity Btu/hr	Air Temperature Dry Bulb		Fluid Temperature	
	Entering °F	Leaving °F	Entering °F	Leaving °F
51502	57.0	120.5	140.0	127.1
Fluid				
Type	Glycol Concentration %		Flow Rate gpm	Pressure Drop ft H ₂ O
Propylene	20.0		8.00	11.66

Warranty	
Type	
Extended:	None

Notes

Accessories	
Part Number	Description
106041190	1" End Pnl, Ant Ivory, 16-5/8"D, Solid (AV AZ)

Certified Drawing

AVV-HC-025J

Daikin Applied certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval to this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomsoever is subject to acceptance by Daikin

Group: **Unit Ventilator**

Type: **Coil Connections**

Date: **May 2018**

Daikin Classroom Floor Unit Ventilator Model AVV (J Vintage)

Model Nomenclature - Coil Connection Locations

Code Designation & Description: **U** **AVV** **6** **S10** **A** **U[1]** **65** **A**

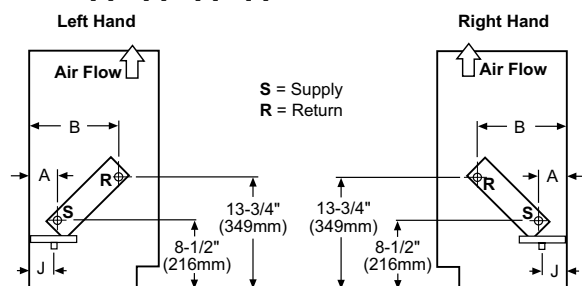
Code Item: **1** **2** **3** **4** **5** **6** **7** **8**

Category	Code Item	Code Option	Code Designation & Description			
Product Category	1	1	U	Unit Ventilators		
Model Type	2	2-4	AVV	Floor, Valve Control		
Design Series	3	5	9	Design J		
Motor Type	4	6	S	PSC Motor, 3-Speed	V	EC Motor, Variable Airflow
			H	EC Motor, 3-Speed		
Nominal Capacity	4	7-8	07	750 CFM	13	1250 CFM
			10	1000 CFM	15	1500 CFM
Voltage	5	9	A	115/60/1	D	208/60/3
			C	208/60/1	H	230/60/3
			G	230/60/1	K	460/60/3
			J	265-277/60/1		
Coil Options	6	10	U [1]	2 Row CW/HW 2 pipe	V [5]	2 Row CW
			D [2]	3 Row CW/HW 2 pipe	S [6]	3 Row CW
			E [3]	4 Row CW/HW 2 pipe	W [7]	4 Row CW
			F [4]	5 Row CW/HW 2 pipe	Y [8]	5 Row CW
			G [9]	DX	Z	None
Heating Options	7	11-12	12	3 Element Low Cap. Electric Heat	68	Steam Low Cap.
			13	6 Element Low Cap. Electric Heat	69	Steam High Cap.
			65	1 Row HW	78	Opposite End Steam Low Cap.
			66	2 Row HW	79	Opposite End Steam High Cap.
			67	3 Row HW	00	None
Hand Orientation	8	13	A	Same Hand LH	E	LH Heating/RH Cooling
			B	Same Hand RH	F	RH Heating/LH Cooling
			D	RH Electric Heat Only	R	Single Coil Left Hand
			G	RH Electric Heat / LH Cool	S	Single Coil Right Hand

Coil Connection Locations- Heat/Cool

Chilled Water / Hot Water (2-pipe) Unit

☐ Coils U[1], D[2], E[3], F[4]

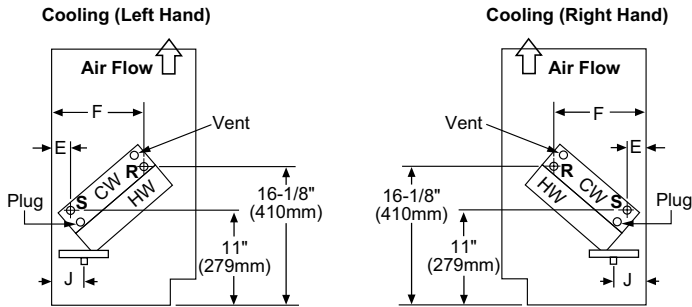


- Notes:**
- For units with 5-row coil (F or Y) add .55" to return connection dimensions shown and .75" to the dimensions shown for supply connection.
 - Numerical codes [#] denote optional stainless steel drain pan (cooling coils).
 - All coils have same end supply and return connections.
 - Cooling condensate drain pan is shipped sloped down towards the cooling coil connections but is field reversible.
 - For limitations with coil combinations see [Table 4 on page 4](#).
 - Coil connections are 7/8" I.D. (female) and terminate 9" (229mm) from the end of the unit.
 - All dimensions are approximated.

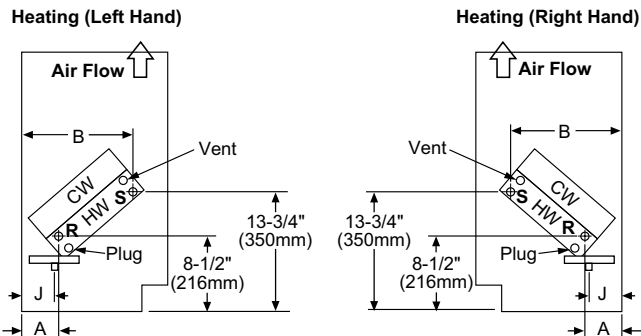


Chilled Water and Hot Water Unit

☐ Cooling Coils V[5], S[6], W[7], Y[8]

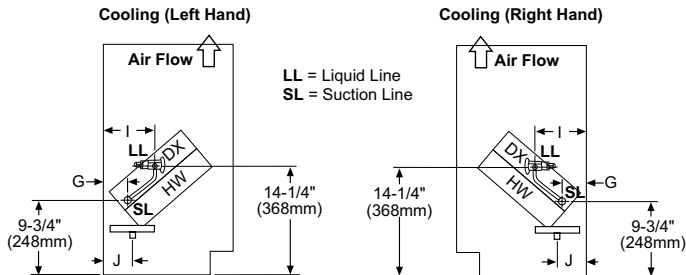


☐ Heating Coils 65, 66, 67

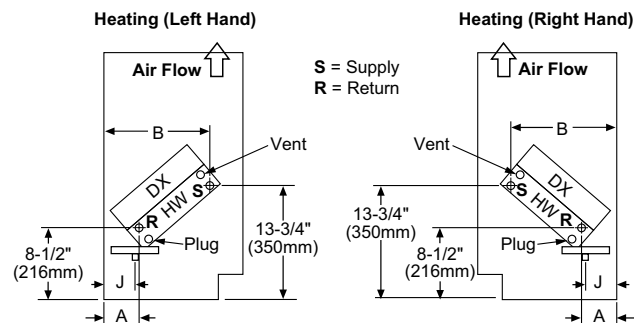


Direct Expansion and Hot Water Unit

☐ Cooling Coils G[9]

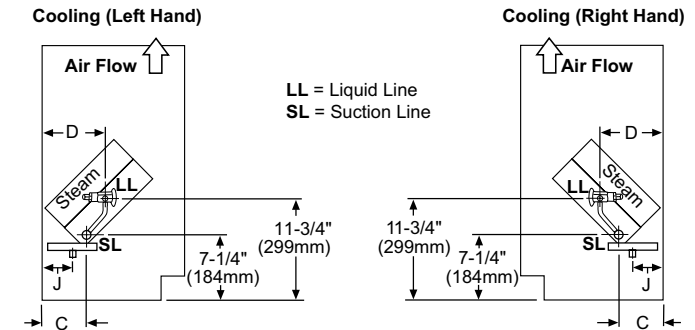


☐ Heating Coils 65, 66, 67

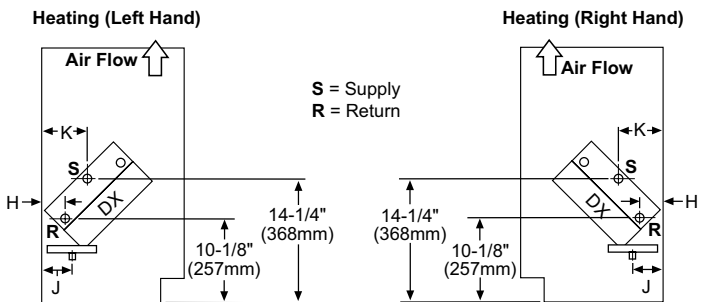


Direct Expansion and Steam Unit

☐ Cooling Coils G[9]



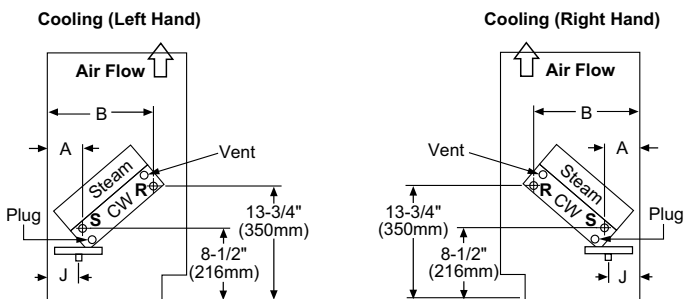
☐ Heating Coils 68, 69, 78, 79



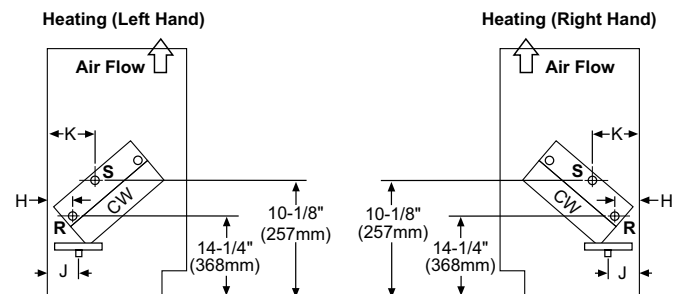
Note: For opposite end drain steam coils (code 78, 79) Return (R) is 7-1/4" (184mm) from bottom of unit and (H) 2" (51mm) from the back of unit. **Unless otherwise noted, LH and RH connections are the same.**

Chilled Water and Steam Unit

☐ Cooling Coils V[5], S[6]



☐ Heating Coils 68, 69, 78, 79



Note: For opposite end drain steam coils (code 78, 79) Return (R) is 7-1/4" (184mm) from bottom of unit and (H) 2" (51mm) from the back of unit. **Unless otherwise noted, LH and RH connections are the same.**

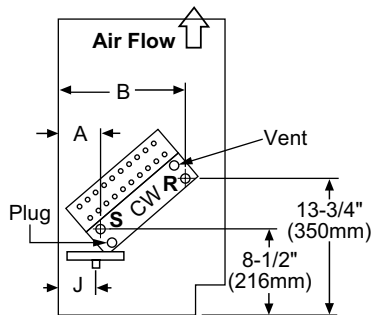


- Notes:** 1. For opposite end drain steam coils (code 78, 79) Return (R) is 7 $\frac{1}{4}$ " (184mm) from bottom of unit and (H) 2" (51mm) from the back of unit. **Unless otherwise noted, LH and RH connections are the same.**
2. Steam coils have a factory installed pressure equalizing valve and a 24" (610mm) long pressure equalizing line which terminates in a 1/2" M.P.T. fitting.
3. Steam/hot water connections may be same end as cooling coil connections, but they are recommended to be opposite end to facilitate piping. (Must be opposite end when using MicroTech® controls.)
4. Electric heating coil power connections are right end only. Junction box has 1" (25mm) and 2" (51mm) (trade size) knockouts, 10-1/2" (267mm) from right end of the unit.
5. For limitations with coil combinations see [Table 4 on page 4](#).
6. Steam coils are 1-1/8" female (sweat) connections and terminate 9" (229mm) from the end of the unit.
7. DX coils (G) have O.D. sweat connections Interconnecting tube by others. See [table 3](#) for correct tubing size.

Chilled Water and Electric Heating Coils

- ☐ Chilled Water (1st Position) and Electric Heating (Cooling Coils V[5], S[6], W[7]), (Heating Coils 12, 13)

Cooling (Left Hand)



Direct Expansion and Electric Heating Coils

- ☐ Direct Expansion (1st Position) and Electric Heating (Cooling Coils G[9]), (Heating Coils 12, 13)

Cooling (Left Hand)

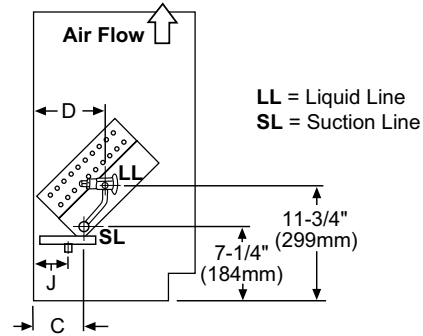


Table 1: Coil Water Capacities (Gallons/Liters)

Coil Rows	Unit Series				
	S07, H07, V07	S10, H10, V10	S13, H13, V13	S15, H15, V15	S20, H20, V20
	Gallons (Liters)				
1 Row Coil	0.25 (0.95)	0.31 (1.17)	0.38 (1.44)	0.44 (1.67)	0.44 (1.67)
2 Row Coil	0.45 (1.70)	0.57 (2.16)	0.69 (2.61)	0.82 (3.10)	0.82 (3.10)
3 Row Coil	0.64 (2.42)	0.82 (3.10)	1.01 (3.82)	1.19 (4.50)	1.19 (4.50)
4 Row Coil	0.83 (3.14)	1.08 (4.09)	1.32 (5.00)	1.57 (5.94)	1.57 (5.94)
5 Row Coil	1.03 (3.90)	1.34 (5.07)	1.64 (6.21)	1.95 (7.38)	1.95 (7.38)

Table 2: Coil Connection Dimensions For Lettered Values

Unit Depth		Dimensions										
		A	B	C	D	E	F	G	H	I	J	K
in.	16-5/8	3-3/4	12-1/4	4-7/8	7-3/4	1-5/8	10-1/8	2-3/4	2-7/8	5-5/8	3	5
mm	422	95	311	124	198	41	257	70	73	143	76	127
in.	21-7/8	9	17-1/2	10-1/8	13	6-7/8	15-3/8	8	8-1/8	10-7/8	8-1/4	10-1/4
mm	556	229	445	257	330	175	391	203	206	276	210	260

Table 3: Direct Expansion (DX) Coil G[9] Connection Tubing

Unit Series	S07, H07, V07		S10, H10, V10		S13, H13, V13		S15, H15, V15	
	in	mm	in	mm	in	mm	in	mm
Suction Line OD:	3/4	19	3/4	19	7/8	22	7/8	22
Liquid Line OD:	1/4	6.35	1/4	6	3/8	10	3/8	10



Table 4: Heat/Cool Position/Combinations in Air Stream (one coil per position)

Heat/Cool		Model AVV – Valve Control	
First Position In Airstream	Second Position In Airstream	Basic Valve Control	Electric Heat/Cool
U, D, E, F, 1, 2, 3, 4	00	•	
65	V, S, W, Y, G, 5, 6, 7, 8, 9	•	
66	V, S, W, G, 5, 6, 7, 9	•	
67	V, S, G, 5, 6, 9	•	
V, S, G, 5, 6, 9	68, 69, 78, 79	•	
V, S, W, G, 5, 6, 7, 9	12, 13		•

• = Available

Cooling Coils:

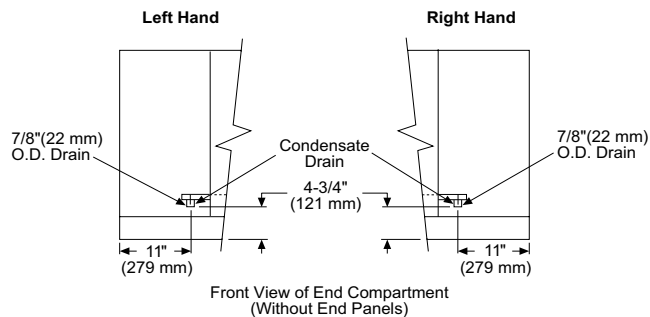
U or [1] = 2 Row CW/HW 2-Pipe Coil
D or [2] = 2 Row CW/HW 2-Pipe Coil
E or [3] = 4 Row CW/HW 2-Pipe Coil
F or [4] = 5 Row CW/HW 2-Pipe Coil
V or [5] = 2 Row CW Coil
S or [6] = 3 Row CW Coil
W or [7] = 4 Row CW Coil
Y or [8] = 5 Row CW Coil
G or [9] = Direct Expansion Coil

Heating Coils:

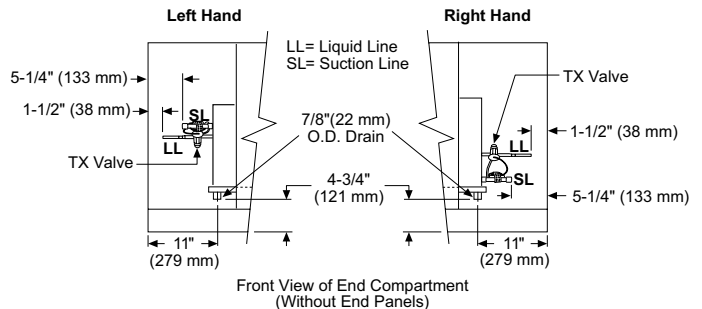
65 = 1 Row Hot Water Coil
66 = 2 Row Hot Water Coil
67 = 3 Row Hot Water Coil
68 = Low Capacity Steam Coil
69 = High Capacity Steam Coil
78 = Opposite End Drain Low Capacity Steam Coil
79 = Opposite End Drain High Capacity Steam Coil
12 = Low Electric Heat Coi
13 = High Electric Heat Coil
00 = None

Note: Numerical codes [#] denote optional stainless steel drain pan (cooling coils).

Condensate Drain Location



Condensate Drain and DX Coil Connections



Certified Drawing		AVV-024J
Daikin Applied certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval to this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomsoever is subject to acceptance by Daikin		Group: Unit Ventilator
		Type: Basic Unit Data
		Date: May 2018

Daikin Classroom Floor Unit Ventilator Model AVV (J Vintage)

Standard Features

- UL/cUL listed.
- AHRI Certified chilled water performance. Unit ventilation rate certified and tested per Air Conditioning, Heating and Refrigeration Institute (AHRI) standard 840.
- Institutional quality cabinet with durable, textured, charcoal bronze paint finish on top surface. Oven baked powder paint on all other exterior panels.
- Welded chassis constructed from galvanized steel.
- Two, top hinged doors for access.
- Removable bar discharge grille.
- Three individual front access panels provided for ease of maintenance and service.
- All access panels have positive positioning threaded fasteners operated with 5/32" hex wrench.
- Insulated unit back.
- Built in pipe tunnel.
- Leveling legs.
- Rigid, double wall, insulated outdoor air damper made from welded galvanized steel, with mohair end and damper seals in turned over edges.
- Galvanized steel drain pan (optional stainless steel). Connection handing is field reversible and direction of slant can be field modified.
- Room air fan shaft have oilable sleeve bearings for quietness and long life.
- Low speed room air fan constructed of injection molded polypropylene for precise, smooth, quiet performance.
- Energy efficient 1/4 H.P. permanent split capacitor (PSC) plug-in room air fan motor fits all size units. Located out of air stream.
- Available 1/3 H.P. Electrically Commutated Motor (ECM) available for applications with External Static Pressures (ESP) up to 0.45 (112 Pa).
- UL listed individual fusing of fan motor and controls.
- PSC and EC motor speed controlled by multi-tap transformer, high-medium-low-off speeds. Optional variable speed ECM.
- MicroTech® Controls (Optional) – State of the art MicroTech unit controller is a stand alone microprocessor based DDC control device that is pre-engineered, pre-programmed, pre-tested and factory installed. It provides correct sequence of operations and the advantage of one source responsibility.
- Steam coils equipped with vacuum breaker.
- Manual air vent and drain plug on water coils.
- Throwaway filter(s) factory installed in unit.
- Heating only units can be adapted for future air conditioning.

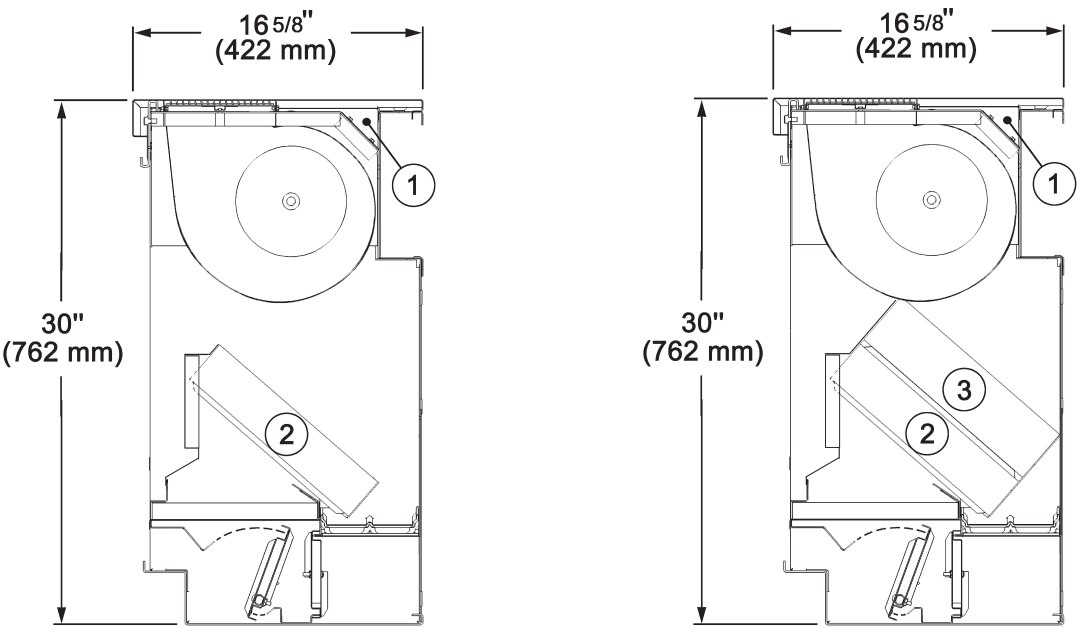
Table 1: Physical Data

			S07 / H07 / V07	S10 / H10 / V10	S13 / H13 / V13	S15 / H15 / V15
Nominal Airflow CFM (L/s)			750 (340)	1000 (472)	1250 (590)	1500 (708)
Fan Data	Number of Fans:		2	3	4	4
	Size	Diameter - in (mm)	8.12 (206mm)	8.12 (206mm)	8.12 (206mm)	8.12 (206mm)
		Width- in (mm)	8.25 (210mm)	8.25 (210mm)	8.25 (210mm)	8.25 (210mm)
Filter Data	Nominal Size	in	10 x 36-1/2 x 1	10 x 48-1/2 x 1	10 x 60-1/2 x 1	10 x 36-1/2 x 1
		(mm)	254 x 927 x 25	254 x 1232 x 25	254 x 1537 x 25	254 x 927 x 25
	Area - Ft ² (m ²)		2.54 (.24)	3.37 (.31)	4.2 (.39)	5.08 (.47)
Shipping Weight	Quantity:		1	1	1	2
	16-5/8" Deep Units		350 (168)	425 (193)	495 (225)	570 (259)
	21-7/8" Deep Units		370 (163)	445 (202)	525 (238)	600 (272)
Coil Water Volume Gallons (Liters)	1 Row Coil		0.25 (0.95)	0.31 (1.17)	0.38 (1.44)	0.44 (1.67)
	2 Row Coil		0.45 (1.70)	0.57 (2.16)	0.69 (2.61)	0.82 (3.10)
	3 Row Coil		0.64 (2.42)	0.82 (3.10)	1.01 (3.82)	1.19 (4.50)
	4 Row Coil		0.83 (3.14)	1.08 (4.09)	1.32 (5.00)	1.57 (5.94)
	5 Row Coil		1.03 (3.90)	1.34 (5.07)	1.64 (6.21)	1.95 (7.38)



Dimensional Data

AVV Unit Cross Sections
Valve Control



Single Coil Units	Two Coil Units	
1 Raceway for factory wiring 2 Hot Water, Steam, Chilled Water, CW/HW (2-pipe), Direct Expansion, Electric Heat	Direct Expansion Units (DX) 1 Raceway for factory wiring 2 Direct Expansion 3 Steam or Electric Heat 2 Hot Water 3 Direct Expansion	Chilled Water Units 1 Raceway for factory wiring 2 Hot Water 3 Chilled Water 2 Chilled Water 3 Electric Heat or Steam



Certified Drawing

AVV-026J

Daikin Applied certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval to this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomsoever is subject to acceptance by Daikin

Group: **Unit Ventilator**

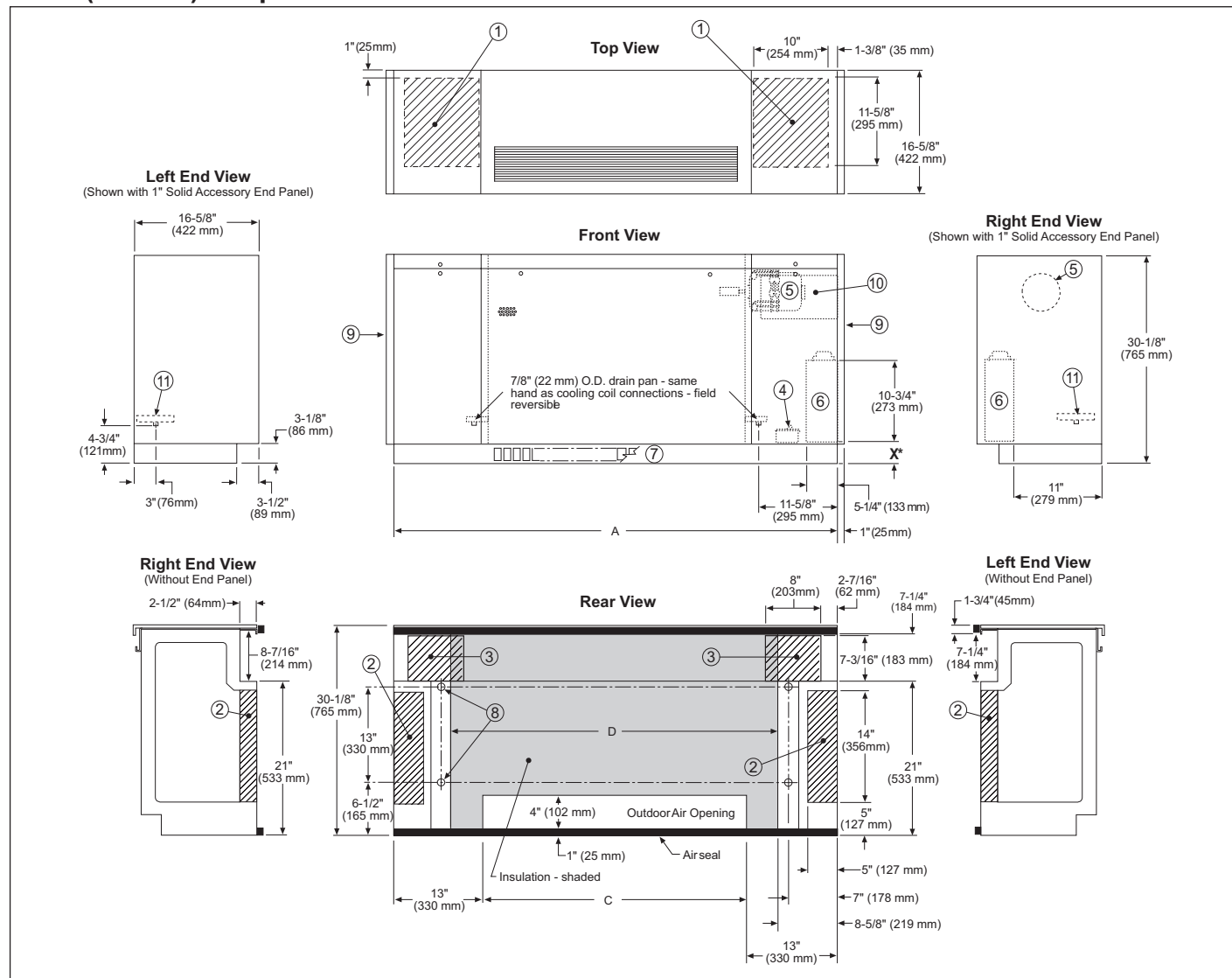
Type: **Inlet Air Arrange.**

Date: **May 2018**

Daikin Classroom Floor Unit Ventilator Model AVV (J Vintage)

Arrangement AL – Open Pipe Tunnel

16⁵/₈" (422mm) Deep Floor Unit – Dimensions



Unit Size	Dimensions in inches (mm)			Drawing Notes (①, *, etc.)
	A	B	C	
S07, H07, V07	62 (1575)	43 (1092)	36 (914)	1 Bottom entry within 10" x 11-5/8" (254 mm x 295 mm) area 2 Rear entry area 14" x 5" (356 mm x 127 mm). 3 Opening between pipe tunnel & end compartment. 4 Disconnect Switch for main power wiring. 5 Fan motor. 6 Electrical connection box. 7 Slotted kickplate for return air arrangements; partially open kickplate for draftstop arrangements. 8 (4) - 7/8" (22 mm) diameter holes in back for anchoring unit to wall. 9 Accessory panels not included with unit, order separately as an accessory. 10 Controls location (MicroTech® units only). 11 Galvanized drain pan (optional stainless steel). X = 3.88" for units with MicroTech controls. X = 14.43" for all other control options.
S10, H10, V10	74 (1880)	55 (1397)	48 (1219)	
S13, H13, V13	86 (2184)	67 (1702)	60 (1524)	
S15, H15, V15	98 (2489)	79 (2007)	72 (1829)	



Certified Drawing

AVS-V-R-B-1in-051

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Group: **Unit Ventilator**

Type: **End Panel Dimen.**

Date: **May 2018**

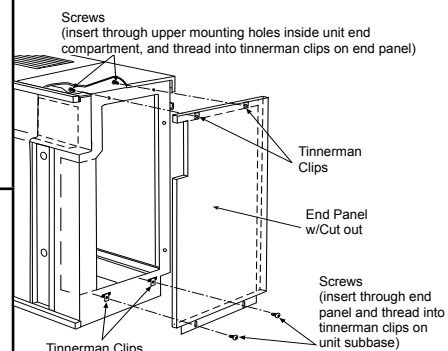
Daikin Classroom Floor Unit Ventilator 1" End Panel & Enclosure Application Models AVS, AVV, AVR & AVB

Available in: (Check one that applies)

- ☐ Antique Ivory ☐ Putty Beige ☐ Cupola White
☐ Off White ☐ Soft Gray

Table 1: 1" (25 mm) End Panel Dimensions (Check one that applies)

	16-5/8" (422mm) Deep End Panel	21-7/8" (556mm) Deep End Panel	28" (711mm) Deep End Panel
Top View			
End View With No Cut-out			
End View With 2-1/2" x 7" (64mm x 178mm) Cut-out			
End View With 4" x 18" (102mm x 457mm) Cut-out			
End View With 4" x 22" (102mm x 559mm) Cut-out			
End View With 2" x 5-1/4" (51mm x 133mm) Step Down			





Job Information		Technical Data Sheet
Job Name	Highland Park ES	
Date	3/19/2019	
Submitted By	Robert Grace	
Software Version	06.10	
Unit Tag	UV-CL-4	

Unit Overview

Model Number	Model Type	Cooling Coil Type	Heating Coil Type
UAHV9H07	Valve Control	2-Pipe CW / HW	2-Pipe CW / HW
Arrangement	Control Type	Cooling Coil Hand	Heating Coil Hand
Horizontal, Ceiling Mounted	Field Mounted Controls (By Others)	Left Hand Cooling	Left Hand Heating

Physical

Unit Length	Unit Depth	Unit Height	Weight
36.00 in	64.00 in	16.62 in	385 lb

Electrical

Voltage	Minimum Voltage	Maximum Voltage	Total Unit MCA	Maximum Fuse Size
208/60/1 V/Hz/Phase	197 v	228 v	3.8 A	15 A

Fan

Performance					
Fan Motor	Speed	Air Volume CFM	External Static Pressure inH ₂ O	Motor Power HP	Fan Full Load Current A
ECM, 3-Speed	High	750	0.00	0.333	3.00


Chilled Water Coil

Performance					
Capacity		Air Temperature			
Total Btu/hr	Sensible Btu/hr	Entering		Leaving	
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F
20783	18181	83.0	64.0	60.7	54.5
Number of Rows	Fluid				
	Temperature		Type	Glycol Concentration %	Flow Rate gpm
	Entering °F	Leaving °F			
4	44.0	54.8	Propylene	20.0	4.00
					Pressure Drop ft H ₂ O
					3.89

Hot Water Coil

Performance				
Total Capacity Btu/hr	Air Temperature Dry Bulb		Fluid Temperature	
	Entering °F	Leaving °F	Entering °F	Leaving °F
51612	57.0	120.4	140.0	127.1
Fluid				
Type	Glycol Concentration %		Flow Rate gpm	Pressure Drop ft H ₂ O
Propylene	20.0		8.00	11.66

Warranty	
Type	
Extended:	None

AHRI Certification	
	All equipment is rated and certified in accordance with AHRI 840.

Notes

Certified Drawing

AHV-AH36-125J

Daikin Applied certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval to this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomsoever is subject to acceptance by Daikin

Group: Unit Ventilator

Type: Inlet Air Arrangement

Date: May 2018

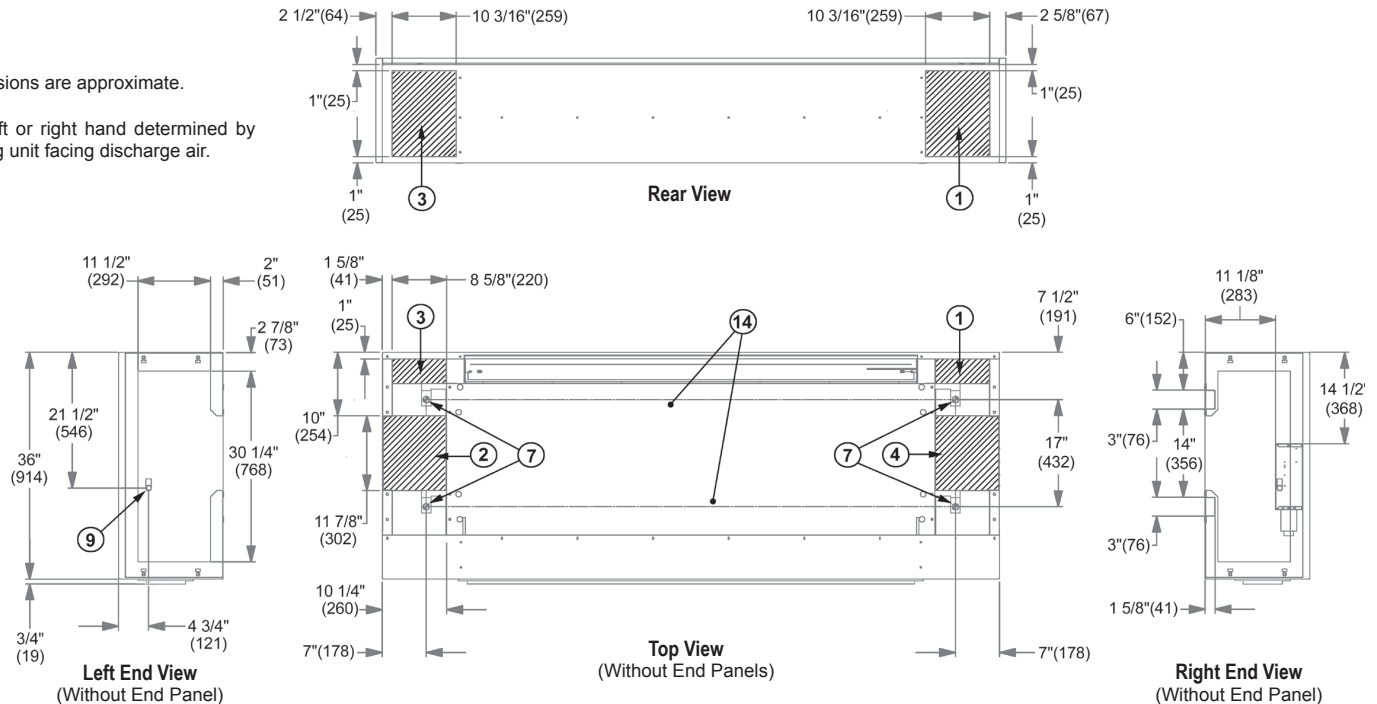
Daikin Classroom Ceiling Unit Ventilator

Model AHV – Air Arrangement AH – 36" Deep Unit Front Discharge With Duct Collar

Note:

Dimensions are approximate.

Unit left or right hand determined by viewing unit facing discharge air.



Component Description

- 1 Rear Entry Area – RH
- 2 Top Entry Area – LH
- 3 Rear Entry Area – LH
- 4 Top Entry Area – RH
- 5 Fan Motor
- 6 Electrical Connection Box
- 7 7/8" (22mm) Diameter Ceiling Mounting Holes
- 8 Duct Collar
- 9 Condensate Drain (Same end as cooling coil)
- 10 Return Air Grille (Optional)
- 11 End Panels
- 12 Bottom Hinged Access Panel (Filter & Controls)
- 13 Bottom Hinged Access Panel (Motor & End Bearing)
- 14 Wire Raceways
- 15 MicroTech® Controller (UVC)

Piping

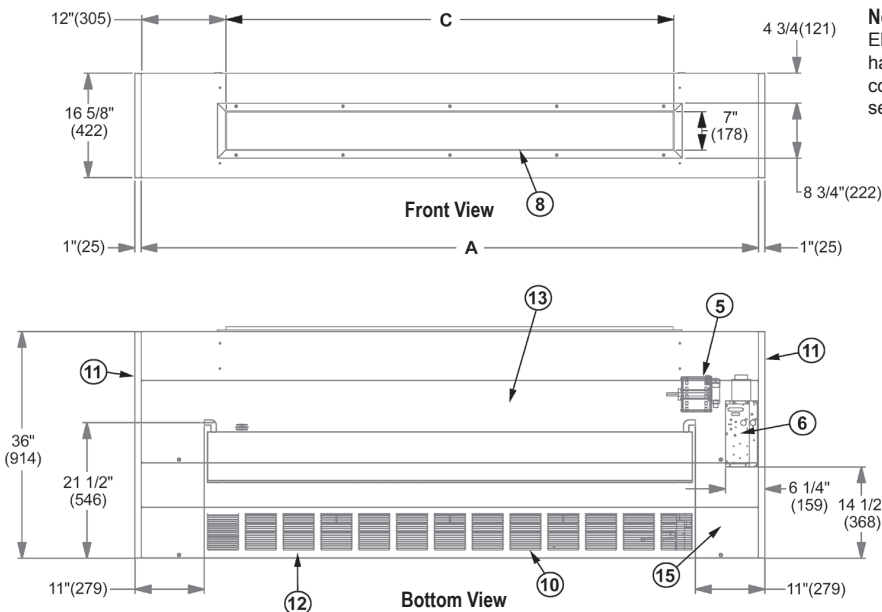
- Piping Entry – Left Hand Coil 1 or 2
 Piping Entry – Right Hand Coil 3 or 4

Electrical – Main Power Wiring

- Wiring Entry 3 or 4
 Wiring Connection (Non-Electric Heat) - 6

Note:

Electrical box location in right hand end will vary based on control and motor options selected.



Dimensions

Unit Size	Dim. "A"	MM	Dim. "C"	MM
H07 / V07	62	1575	36	914
H10 / V10	74	1880	48	1219
H13 / V13	86	2184	60	1524
H15 / V15	98	2489	72	1829



Duct System Considerations

Duct Design for Noise and Vibration Control

Proper acoustics is often a design requirement for schools. Most of the problems that are associated with HVAC generated sound can be avoided by properly selecting and locating the components of the system. There are some general do's and don'ts:

The following suggestions are required to reduce the amount of sound and noise due to vibration that reaches the occupied room:

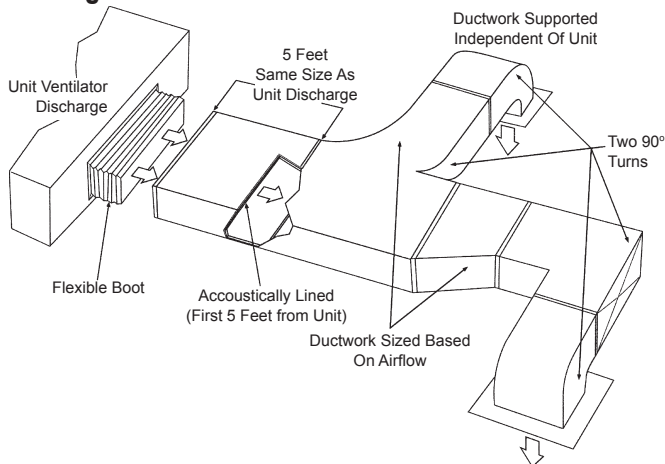
- Use flexible duct connections.
- Make the discharge duct the same size as the unit discharge opening for the first five feet.
- Line the first 5 feet of the supply duct.
- Make two 90-degree turns in the supply and return ducts.
- Keep duct velocity low and follow good duct design procedures.
- Mount and support the ductwork independent of the unit.
- Line the first five feet of the return duct.
- Locate the return air intake away from the unit discharge.
- Provide multiple discharges.
- Restrict use of high pressure drop flexible ducting.
- Size the outdoor air and return air ducts to handle 100% of the total cfm to accommodate economizer or morning warm-up operation.

NOTICE

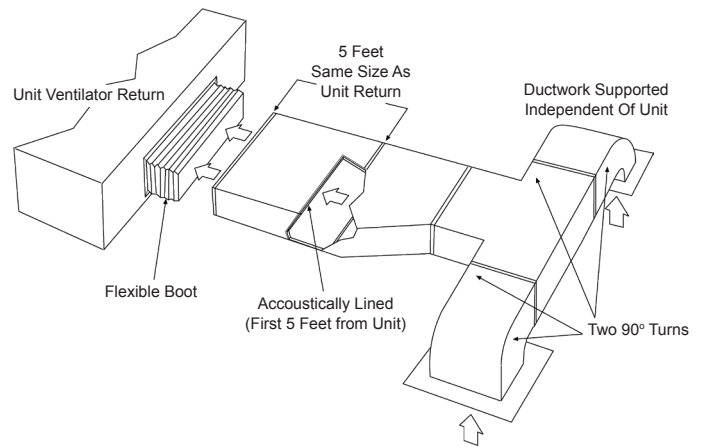
If a supply air duct with improper duct work is placed too close to the unit discharge, it will result in substantial noise. Avoid such forms of connections when designing ductwork where sound attenuation is critical. The following illustrations show suggested duct considerations per SMACNA and ASHRAE.

Sound control applies to the return side of the duct design as well as the supply side. The top-right illustration suggests installation of an intake/return-air duct. Note the return air opening, the sizing and changes in direction of the ductwork. The outdoor air intake and insulated duct work illustration at the lower-right suggests installation of outside air ducting.

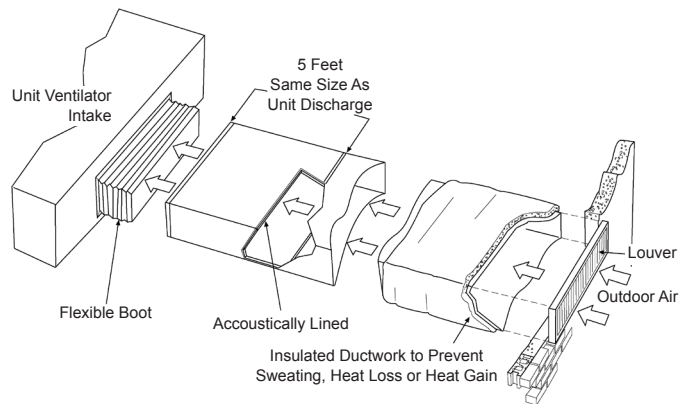
Discharge Air Duct Work



Intake/Return Air Duct Work



Outdoor Air Intake and Insulated Duct Work



NOTICE

These are general suggestions and offered only to stress their importance; however, there are additional important factors that must be considered. Assistance in the design of ductwork can be found in the ASHRAE Handbook and SMACNA publications, as well as other recognized authorities.

Daikin Applied certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval to this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomsoever is subject to acceptance by Daikin

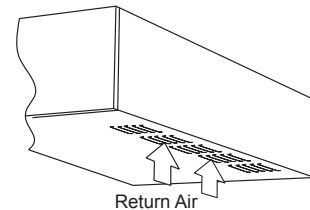
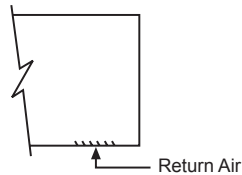
Group: **Unit Ventilator**

Type: **Basic Unit Data**

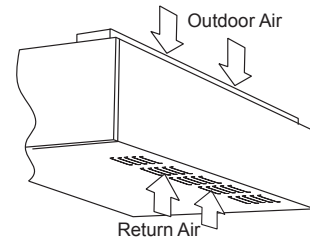
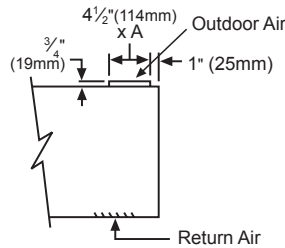
Date: **July 2018**

Daikin Classroom Ceiling Unit Ventilator Model AHF, AHV, AHR and AHB Inlet Air Arrangements (Check Arrangement That Applies)

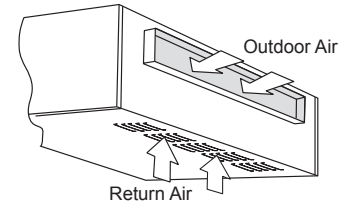
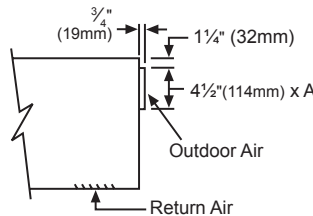
- ☐ **Arrangement 25**
Recirculating Room Air
(No Room Air/Outside Air Dampers)



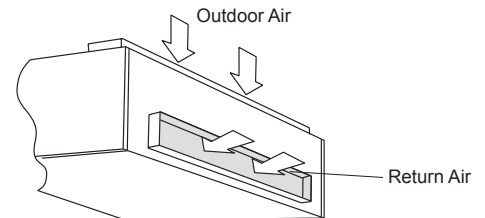
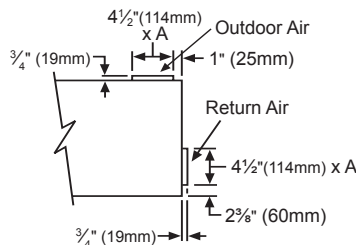
- ☐ **Arrangement 26**
Return Air Bottom Grille/Outdoor Air
Top Duct Collar



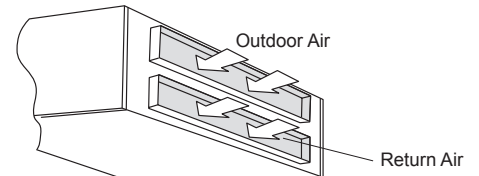
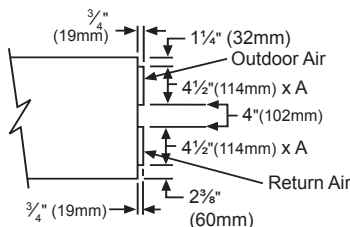
- ☐ **Arrangement 27**
Return Air Bottom Grille/Outdoor Air
Rear Duct Collar



- ☐ **Arrangement 28**
Return Air Rear Duct Collar/Outdoor Air
Top Duct Collar



- ☐ **Arrangement 29**
Return Air Rear Duct Collar/Outdoor Air
Rear Duct Collar



Dimensions

Unit Series		07	10	13	15	20
A	inches	36	48	60	72	72
	mm	914	1219	1524	1829	1829

Notes:

- For all recessed applications (full or partial) it is necessary to carefully examine both the inlet air and the discharge air physical locations. This must be done for each location individually and in combination with each other to ensure they are compatible with the specific installation.
- Duct collars shipped loose for field installation not by Daikin Applied.
- It is important also to verify there is sufficient clearance to open and remove the bottom access panels and end panels for routine maintenance.
- All dimensions approximated.



Duct System Considerations

Duct Design for Noise and Vibration Control

Proper acoustics is often a design requirement for schools. Most of the problems that are associated with HVAC generated sound can be avoided by properly selecting and locating the components of the system. There are some general do's and don'ts:

The following suggestions are required to reduce the amount of sound and noise due to vibration that reaches the occupied room:

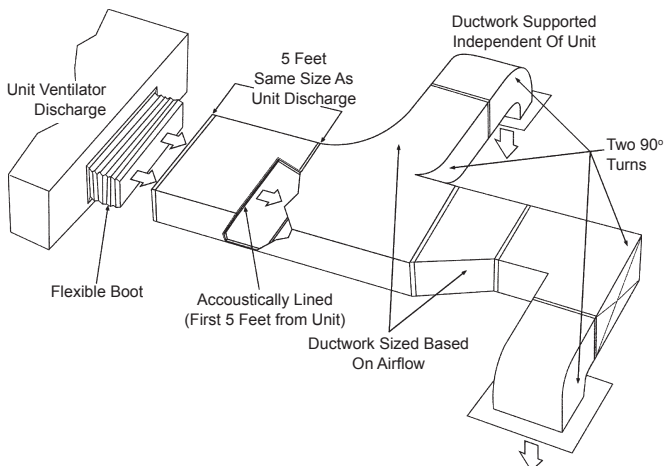
- Use flexible duct connections.
- Make the discharge duct the same size as the unit discharge opening for the first five feet.
- Line the first 5 feet of the supply duct.
- Make two 90-degree turns in the supply and return ducts.
- Keep duct velocity low and follow good duct design procedures.
- Mount and support the ductwork independent of the unit.
- Line the first five feet of the return duct.
- Locate the return air intake away from the unit discharge.
- Provide multiple discharges.
- Restrict use of high pressure drop flexible ducting.
- Size the outdoor air and return air ducts to handle 100% of the total cfm to accommodate economizer or morning warm-up operation.

NOTICE

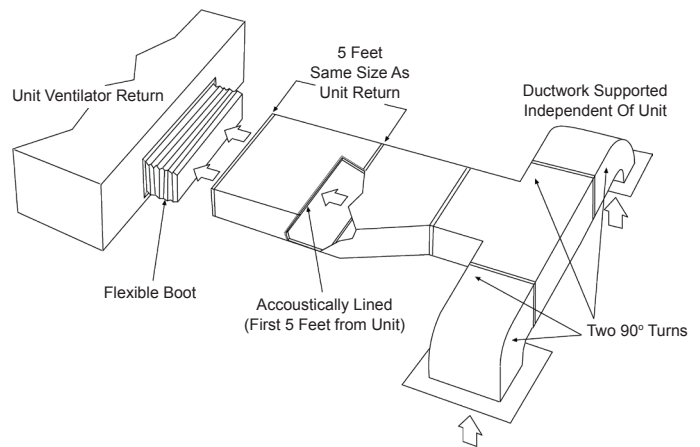
If a supply air duct with improper duct work is placed too close to the unit discharge, it will result in substantial noise. Avoid such forms of connections when designing ductwork where sound attenuation is critical. The following illustrations show suggested duct considerations per SMACNA and ASHRAE.

Sound control applies to the return side of the duct design as well as the supply side. The top-right illustration suggests installation of an intake/return-air duct. Note the return air opening, the sizing and changes in direction of the ductwork. The outdoor air intake and insulated duct work illustration at the lower-right suggests installation of outside air ducting.

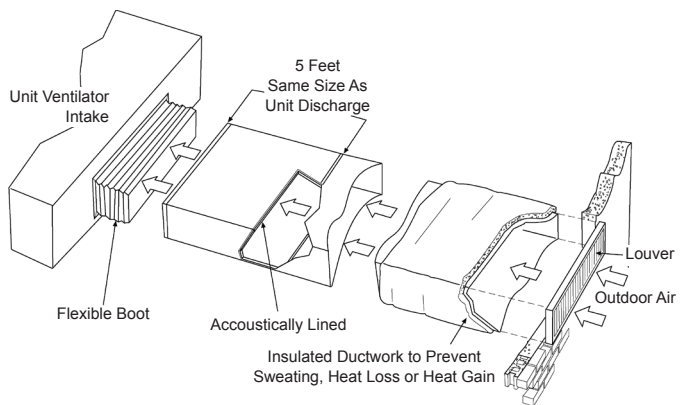
Discharge Air Duct Work



Intake/Return Air Duct Work



Outdoor Air Intake and Insulated Duct Work



NOTICE

These are general suggestions and offered only to stress their importance; however, there are additional important factors that must be considered. Assistance in the design of ductwork can be found in the ASHRAE Handbook and SMACNA publications, as well as other recognized authorities.



PART 1: GENERAL

PART 2: PRODUCTS - Unit Ventilators

2.01 Cabinet and Chassis:

- A. Unit frames shall be of unitized, welded construction, with structural elements aligned in an assembly jig prior to welding, to insure proper dimensions, rigidity, and squareness. Frames assembled with mechanical fasteners shall not be acceptable.
- B. Internal sheet metal parts shall be constructed of galvanized steel to inhibit corrosion.
- C. Exterior cabinet panels shall be fabricated from furniture grade steel of not less than 18 gauge steel with no sharp edges and shall receive an electrostatically applied powder paint, and be oven baked with environmentally friendly thermosetting urethane powder finish to provide a high quality appearance. Finish color shall be off- white.
- D. Exterior cabinet panels shall be fabricated from furniture grade steel of not less than 16 gauge steel with no sharp edges and no unsightly screw heads and shall receive an electro-statically applied powder paint, and be oven baked with environmentally friendly thermosetting urethane powder finish to provide a high quality appearance. Finish color shall be as selected by Architect from manufacturer's standard colors.
- E. The interior areas of the unit ventilator shall be insulated for sound attenuation and to provide protection against condensation of moisture on or within the unit. The unit shall be provided with an ultra-quiet sound package consisting of acoustically matched low speed fans to fan housing, sound barrier insulation material (non-fiberglass) adhered to the bottom underside of the unit top panel, sides of the fan section and sound absorbing insulation (non-fiberglass) material applied to the unit front panel.
- F. Units shall be constructed so that testing and troubleshooting can be accomplished in the end pockets of operating units, without affecting the normal air flow patterns through the unit.
- G. Each unit shall be provided with a non-fused power interrupt switch that disconnects the main power to the unit for servicing or when the unit is to be shut down for an extended period of time. The fan motor and controls shall have the hot line(s) protected by factory installed cartridge type fuse(s).
- H. The manufacturer shall have published cataloged sound data available for the engineer's review. Sound data shall have been conducted using a qualified reverberant room per ANSI S1.31 and ANSI S12.32. Sound test data shall be based on standard cfm at standard air (fixed density of air at 70F) in accordance with ARI procedures based upon ARI 350. The engineer shall have the right to reject equipment not conforming to the specified manufacturer's sound data, as a minimum. Sound levels shall not exceed those shown below:

Octave Band and Center Frequency (Hz)								
UNIT CFM	Speed	2 125	3 250	4 500	5 1000	6 2000	7 4000	8 8000
750	High	57.4	51.8	52.5	52.6	51.2	46.9	35.2
	Med.	50.1	44.9	45.6	44.8	42.8	34.2	19.9
	Low	45.6	40.4	40.8	39.1	35.7	24.4	12.0
1000	High	57.0	52.8	53.9	53.7	51.5	46.8	35.9
	Med.	52.9	48.6	50.2	49.6	46.5	40.1	27.9
	Low	49.4	45.4	47.0	45.5	42.0	33.6	20.7
1250	High	62.4	55.2	55.7	55.3	54.4	49.7	38.5
	Med.	59.3	52.1	52.5	51.7	50.4	44.0	31.8
	Low	55.6	48.6	49.1	47.2	45.6	37.1	24.0
1500	High	63.8	56.6	58.0	58.2	56.4	52.4	41.9
	Med.	58.4	51.3	52.7	52.4	49.5	43.5	30.5
	Low	54.8	47.6	49.4	47.5	44.2	36.2	21.5
Sound Power Levels - dB re 10 ⁻¹² watt								

- Test data based on a valve control unit having 3 rows of coil and no outdoor air. Sound Power data may vary based on the type of unit, number of coil rows and other external factors.

- I. The manufacturer shall have published cataloged sound data available for the engineer's review. Sound data shall have been conducted using a qualified reverberant room per ANSI S1.31 and ANSI S12.32. Sound test data shall be based on standard cfm at standard air (fixed density of air at 70F) in accordance with ARI

procedures based upon ARI 350. The engineer shall have the right to reject equipment not conforming to the specified manufacturer's sound data, as a minimum. Sound levels shall not exceed those shown below:

2.02 Floor Units:

A. Floor mounted units shall have an integral pipe tunnel for convenient crossover of piping and a built-in metal wire raceway from right end compartment to left end compartment to contain any line voltage electrical wiring separate from the air stream. Line voltage wiring shall not be touchable in the air stream of the unit during normal maintenance procedures of oiling bearings or motors. Unit shall come standard with a factory installed and wired disconnect switch.

B. Unit top surface shall be supplied with a charcoal bronze textured finish, to resist scuffing, reduce glare and help hide fingerprints. Unit top shall have two access doors, one at each end (for access to motor and bearings for easy servicing). The front and ends shall be available in a selection of architecturally pleasing colors by the manufacturer, for selection by the Architect.

C. Unit discharge grille shall be constructed of continuous rounded edge steel bars to provide 10 degree vertical deflection. A 1/4" painted, galvanized mesh screen shall be provided beneath the discharge grille to protect against objects being dropped through the discharge grille.

D. The unit top and grille shall be of a modular construction so that it is removable for service and maintenance.

E. The unit front surface shall be comprised of three separate removable panels. The controls and piping shall be accessible without removing the entire front panel. Panels shall be secured to the unit with recessed, tamper resistant, Allen head fasteners. Slots for flat head screwdrivers shall not be acceptable as tamper resistant.

F. Unit ventilators and companion accessory sections shall be a nominal thirty inches (30") high, and shall be furnished with front leveling legs to compensate for uneven floor surfaces. Standard cabinet depth units (16-5/8") shall have 1/2", 1.5# dual density mat faced glass-fiber blanket insulation on the rear of the unit to serve as a thermal barrier and to form an airtight seal between the wall and the unit, when the unit is lagged to the wall. In addition, horizontal metal extensions at the top and bottom of the unit shall have a 1" wide compressible gasket to form an airtight seal between the wall and the unit. The unit shall come with four predrilled mounting holes and washers for lagging to the wall.

2.03 Ceiling Units (Ceiling units shall be similar in construction to floor units, with the following additional features):

A. The unit shall be of modular construction so that the fan, coil and damper sections are removable for service and maintenance.

B. Three bottom panels, two of which are hinged, shall be provided for ease of service access and handling. Retainer chains shall be provided to prevent sudden release of the hinged bottom panels. End panels shall be secured to the unit with recessed, tamper resistant, Allen head fasteners. Slots for flat head screwdrivers shall not be acceptable as tamper resistant.

C. Ceiling mounted units shall have a built-in metal wire raceway from right end compartment to left end compartment to contain any line voltage electrical wiring separate from the air stream. Line voltage wiring shall not be touchable in the air stream of the unit during normal maintenance procedures of oiling bearings or motors.

D. The discharge opening of the unit shall be fitted with a duct collar.

E. A ceiling trim flange shall be provided for recessed units. The trim flange shall be 3-sided or 4-sided as required.

F. The centerline of the cooling condensate drain shall be a minimum of 4" above the bottom of the unit to allow for appropriate trapping of the condensate disposal line.

2.04 Coils:

- A. Coil assembly shall be of a modular construction so that it is removeable from the front of the unit.
- B. Coil assembly shall be of a modular construction so that it is removable from the bottom of the unit.
- C. All coils shall be installed in a draw through position to assure uniform air distribution over the full-face area of the coil, and an even unit discharge temperature.
- D. All heating and cooling coils shall be constructed with copper tubes and mechanically bonded aluminum corrugated plate type fins. All coils shall have aluminum individual unshared fin surfaces. An air break shall exist between coils.
- E. Water heating and cooling coils shall be furnished with a threaded drain plug at the lowest point and a manual air vent at the high point of the coil. A factory installed low temperature freeze-stat shall be provided on the leaving edge of the water heating coil in a wave-like configuration to sense multiple locations and shall react to possible freezing conditions. The unit-mounted controls shall incorporate this device.

2.05 Drain Pan

- A. All units (either heating only, heat/cool, cool only or reheat) shall come furnished with an insulated drain pan constructed of stainless steel. A drain outlet shall be provided on both ends of the drain pan with one outlet capped. The drain hand of connection shall be easily field-reversed by relocating the cap to the opposite end without disassembly of the unit or movement of the unit drain pan.
- B. The drain pan shall be able to be sloped in either direction for proper condensate removal.
- C. Drain shall be provided with a secondary, overflow drain connection on both ends of the pan.

2.06 Fans and Motor:

- A. The fan and motor assembly shall be of a low speed design to assure maximum quietness and efficiency.
- B. Fans shall be double-inlet, forward-curved, centrifugal type with offset aerodynamic blades. Fans and shaft shall be statically and dynamically balanced as an assembly in the unit before shipment.
- C. Fan housings shall be constructed of galvanized steel incorporating logarithmic expansion for quiet operation. Fan and motor assembly shall be of the direct drive type. Belt drive fans shall not be allowed.
- D. Motors shall be 208 volt, single phase, 60 Hz, NEMA permanent split capacitor (PSC), plug-in type with auto reset internal thermal overload device designed specifically for unit ventilator operation. Motors shall be located out of the conditioned air stream.
- E. High Static units with external static pressures (ESP) up to 0.45 shall utilize an Electrically Commutated Motor (ECM).
- F. All components of the fan/motor assembly shall be removable from the top of floor-mounted units.
- G. All components of the fan/motor assembly shall be removable from the bottom of ceiling mounted units.
- H. Units shall have sleeve type motor and fan shaft bearings, and shall not require oiling more than annually. All bearings shall be located out of the airstream. Bearings in the air stream are not acceptable.
- I. ECM Motor speed shall be factory programmed for three (3) speeds, HIGH-MEDIUM-LOW-OFF (not accessible from the exterior of the unit). Fan motor shall have hot leg protected by a factory installed cartridge fuse.

2.07 Valve Control Type Units:

- A. Each unit shall be provided with a factory-installed metal blockoff to ensure all air is drawn from the filter through the coil. This shall be in addition to the outside front panel.

2.08 Outdoor & Room Dampers:

- A. Each unit shall be provided with separate room air and outdoor air dampers.
- B. The room air damper shall be two-piece, double-wall construction fabricated from aluminum, and be counterbalanced against backpressure to close by gusts of wind pressure, thereby preventing outdoor air from blowing directly into the room.

C. The outdoor air damper shall be two piece, double wall construction fabricated from galvanized steel, with ½" thick, 1½ lb. density glassfiber insulation encapsulated between the welded blade halves for rigidity and to inhibit corrosion. The outdoor air damper shall have additional foam insulation on the exterior surface damper blade and on the ends of the outdoor air chamber. A single blade damper, which can be twisted and will leak air, will not be considered.

D. Dampers shall be fitted with blended mohair seals along all sealing edges. Pressure adhesive sponge neoprene or plastic clip-on brush type sealers for damper seals are not acceptable. Rubber type gasket using pressure adhesive for fastening to metal and exposed to the outside air is not acceptable.

E. Dampers shall use the turned-metal principle on long closing ends with no metal-to-metal contact for proper sealing.

F. The damper shaft shall be mechanically fastened to the blade, and shall operate in bearings made of nylon or other material which does not require lubrication.

2.09 Filter:

A. Each unit ventilator shall be equipped with a one-piece filter located to provide filtration of the return air/outdoor air mixture, in lieu of separate filters for each air stream. The entire filter surface must be useable for filtration of 100% room air or 100% of outdoor air. The filter shall be easily accessible from the front, and removable in one piece without removal of the unit return air damper stop. The unit shall ship with a factory installed 1" thick fiberglass, single-use type.

B. Each unit ventilator shall be equipped with a one-piece filter located to provide filtration of the return air/outdoor air mixture, in lieu of separate filters for each air stream. The entire filter surface must be useable for filtration of 100% room air or 100% of outdoor air. The filter shall be easily accessible from the bottom, and removable in one piece without removal of the unit return air damper stop. The unit shall ship with a factory installed 1" thick fiberglass, single-use type.

C. Spare filters shall be:

1. 1" thick fiberglass, single-use type.

2.010 Unit Ventilator Options / Accessories:

A. Draft/Stop Window-Down Draft Protection

1. Where indicated, the floor mounted unit ventilators shall be designed for use with, and provided with Draft/Stop window down draft protection system, installed continuously under the sill. Unit ventilators shall be designed to accommodate either Draft/Stop wall enclosures or Draft/Stop accessory cabinets.

2. Where accessory cabinets are indicated, the window down draft protection system shall be an integral part of the storage cabinets.



Paint colors and finish



Fan coil units

Unit ventilators

Water source heat pumps

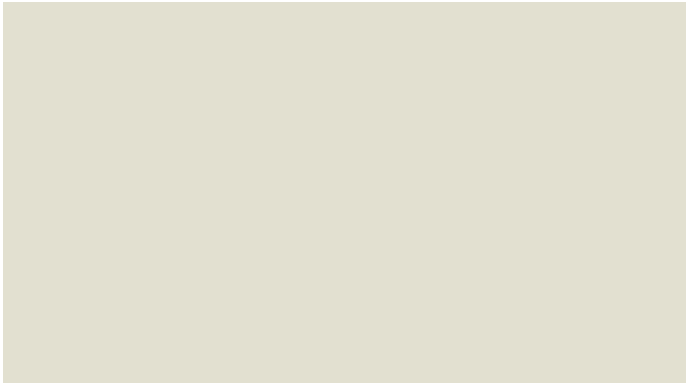


People and ideas you can trust.™

Standard colors

Standard color choices vary by product and model. Consult your Daikin Applied representative for more information.

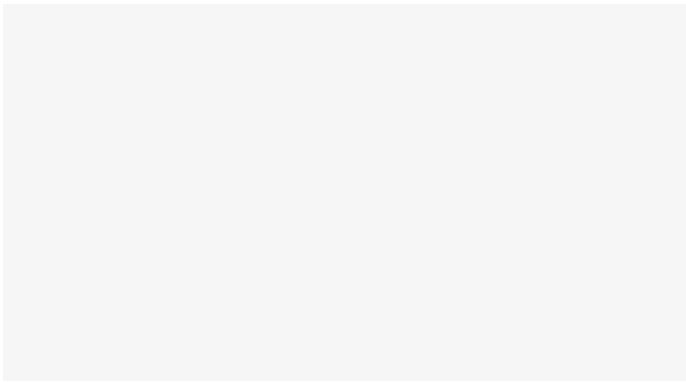
Antique ivory



Oxford brown



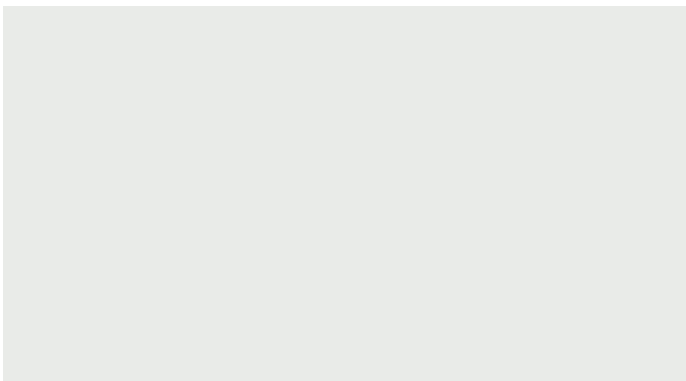
Cupola white



Putty beige



Off white



Soft gray



Custom colors

Not seeing the color you need? Daikin Applied can custom-paint units to match your requirements. Contact your Daikin Applied sales representative for color choices and options.