

RE-SUBMITTAL DATA

Project: Immucell
Mechanical Engineer: Stantec
Mechanical Contractor: AAA Energy Services
Date: January 11, 2017
Product: Outdoor Central Station AHUs
Specification Section: 237413
Revision: 1

Tag	Qty	Model / Description	Manufacturer
AHU-1	1	OAH065GDGC/ Rooftop AHU	Daikin Applied
AHU-2	1	OAH021GDGM / Rooftop AHU	Daikin Applied
AHU-3	1	OAH032GDGM / Rooftop AHU	Daikin Applied
AHU-4	1	OAH014GDGM / Rooftop AHU	Daikin Applied

Prepared by:
 Ann Marie Juliano
ajuliano@briggsac.com
 207-657-7123 ext. 202

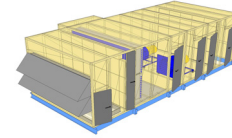


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Technical Data Sheet for AHU-1

Job Information		Technical Data Sheet
Job Name	ImmuCell Portland	
Date	January 11 2017	
Submitted By	Briggs Equipment Sales, Inc.	
Software Version	11.10	
Unit Tag	AHU-1	



Unit Overview

Model Number	Supply					
	Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in
OAH065GDGC	25610	5.00	7.66	92*	136*	326

*Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.

Unit

Model Number:	OAH065GDGC					
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)					
Construction:	High pressure low leakage construction					
Max. Design Leakage:	Less than 1% of Supply Air Volume					
Outer Panel:	Painted heavy-gauge G60 Galvanized Steel					
Liner:	Galvanized Steel (unless noted per section)					
Insulation:	R-13 Injected Foam					
Unit Configuration:	Inline horizontal			Drive (Handling) Location:	Right	
Base:	Curb ready			Wall Thickness:	2 in	
Roof Curb Kit:	18 in			Shrink Wrapping:	Yes	
Altitude:	0 ft			Warranty:	Two Year Parts and Labor	

Mixing Box		Component: 1		Length: 56 in		Shipping Section: 1		
Portion	Damper			Rated CFM	Air Pressure Drop	Quantity	Hoods	
	Size (length x width)		Location					Type
	Overall	Opening						
Outside Air	46 in x 132 in	42 in x 122 in	End	UltraSeal Low Leak	25610 cfm	0.04 insWg	1	Fitted
Return Air	52 in x 132 in	48 in x 122 in	Bottom	UltraSeal Low Leak	25610 cfm		1	
Door								
Location			Width			Opening		
Drive side			24 in			Outward		

Technical Data Sheet for AHU-1

Combination Filter		Component: 2			Length: 16 in		Shipping Section: 1		
Access		Face Velocity			Face Area		Air Volume		
Side		357 ft/min			71.7 ft ²		25610 cfm		
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Pre-Filter	Pleated	MERV 8	0.15 inWc	0.57 inWc	1.00 inWc	15	24 in	24 in	2 in
						8	24 in	12 in	2 in
Filter	AmAir 1300	MERV 13	0.14 inWc	0.57 inWc	1.00 inWc	15	24 in	24 in	4 in
						8	24 in	12 in	4 in
Door									
Location				Width			Opening		
Drive side				12 in			Outward		
Special Text									
Extra filters 1 set(s)									

Chilled Water Coil		Component: 3			Length: 36 in		Shipping Section: 2		
Coil Model	Total Capacity	Sensible Capacity	Number of Coils	Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)		
5WD0912B	1167531 Btu/hr	824114 Btu/hr	2	12	9	0.625 in	1.50 in x 1.299 in		
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity
	Entering		Leaving						
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb					
25610 cfm	73.2 °F	61.0 °F	43.8 °F	43.6 °F	0.93 inWc	39 in	123 in	66.63 ft ²	384 ft/min
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Weight	Piping Vestibule		
Entering	Leaving								
38.0 °F	50.3 °F	197.00 gpm	15.00 ftHd	2.00 ft/s	101.0 gal	845.00 lb	24 in		
Connection					Glycol Type	Min. Fin Surface Temp.	Min. Tube Wall Surface Temp.	Fouling Factor	
Type	Quantity	Size	Location	Material					
Threaded	2	2.50 in	Opp drive side	Carbon steel	Propylene (30%)	38.0 °F	38.0 °F	0.000	
Material					Drain Pan	Drain Side	Turbospiral		
Fin	Tube	Header	Case						
Aluminum .0075 in	Copper .020 in	Copper	Galv. steel		Stainless steel	Drive side	Yes		

AHRI 410 Certification

Coil is NOT certified by AHRI Due to Use of Glycol

Door									
Location				Width			Opening		
Non-drive side				28 in			Outward		

Humidifier Section		Component: 4			Length: 36 in		Shipping Section: 2		
Capacity	150 #/Hr	Inlet Pressure		25 PSI		Absorption Distance: 0.43 ft			
Valve Size:	1/2"	Valve Cv		2.80		Valve Type:		316 SS	

See full humidifier submittal information for additional details
24" Vestibule with Door on Opposite Drive Side.

Technical Data Sheet for AHU-1

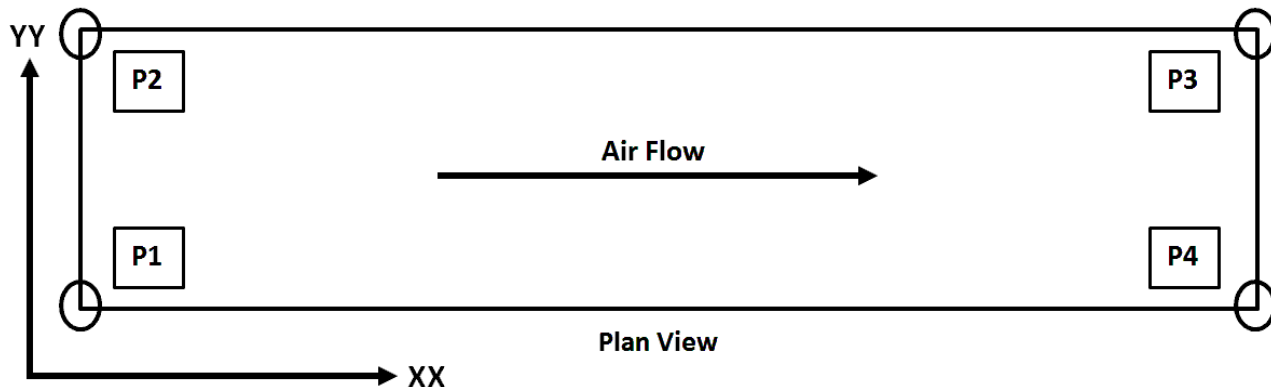
Access Section		Component: 5			Length: 36 in		Shipping Section: 3			
Door										
Location			Width			Opening				
Drive side			28 in			Outward				
Supply Fan		Component: 6			Length: 54 in		Shipping Section: 4			
Fan Performance										
Air Volume		Static Pressure			Brake		Speed		Fan Circuit	
		External	Total	Cabinet	Horsepower		Operating	Maximum	MOP	MCA
12805 cfm (per fan) 25610 cfm (total)		5.00 inWc	7.66 inWc	0.00 inWc	22.05 BHP (per fan) 44.10 BHP (total)		1902 rpm	1981 rpm	90.0 A	67.5 A
Fan Data										
Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location			
Centrifugal - Plenum	Airfoil / 2	2	27.00 in	Aluminium	12	Axial	Behind Fan			
Motor Data (Typical of 2)										
Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*	
25.0 HP	460/60/3 V/Hz/Phase	1750 rpm	Premium	TEFC	284 T frame	Generic	4	185.1 A	30 A	
Fan Options										
Seismic Restraint:		With snubbers			Block Off Plate:		Yes			
Isolator Type:		Spring								
Door										
Location			Width			Opening				
Drive side			30 in			Outward				
Access Section		Component: 7			Length: 36 in		Shipping Section: 5			
Door										
Location			Width			Opening				
Drive side			28 in			Outward				
Special Options										
Tread Plate Floor Liner										
Tread plate installed										
Final Filter		Component: 8			Length: 16 in		Shipping Section: 5			
Access		Face Velocity			Face Area		Air Volume			
Front		387 ft/min			66.1 ft ²		25610 cfm			
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth	
Final	Varicel II MH cartridge	MERV 15	Clean Air	Mean Air	Dirty Air	15	24 in	24 in	4 in	
			0.55 inWc	1.03 inWc	1.50 inWc		5	12 in	24 in	4 in


Technical Data Sheet for AHU-1

Plenum Section	Component: 9	Length: 40 in	Shipping Section: 5
Opening Location	Opening Size		Air Pressure Drop
Bottom	36.00" x 132.00"		0.01 inWc
Door			
Location	Width		Opening
Drive side	30 in		Outward

Unit Sound Power (dB)								
Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	83	79	73	72	72	61	46	51
Unit Discharge:	85	82	80	82	82	75	66	61
Unit Return:	83	79	73	72	72	61	46	51

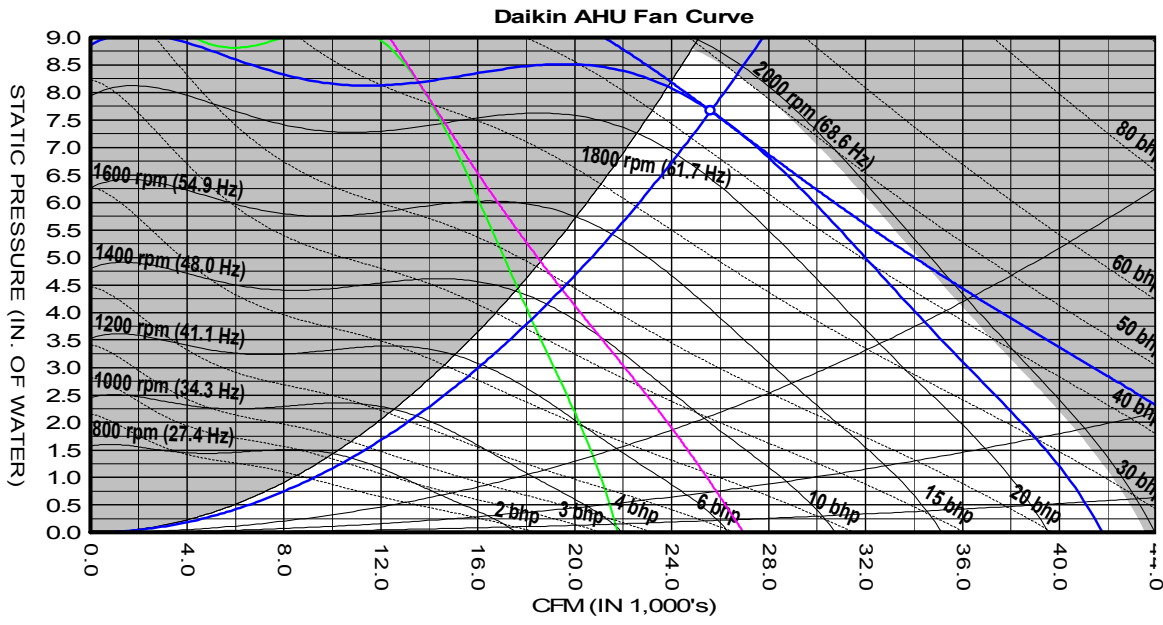
Shipping Section Details									
Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	72	2969	727	727	757	757	37	68	50
2	72	5266	1659	1767	949	890	25	70	50
3	36	801	200	200	200	200	18	68	50
4	54	3746	960	960	913	913	26	68	43
5	92	2956	749	749	729	729	45	68	50
6	72	797	199	199	199	199	36	12	50
Entire Unit	326	16535	4230	4835	3985	3486	147	73	49
Roof Curb	326	1245							



AHRI Certification	
	Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.

Notes	
Standard	
1. As a standalone component, unit meets or exceeds requirements of ASHRAE 90.1 - 2007. The approving authority is responsible for compliance of multi-component building systems.	

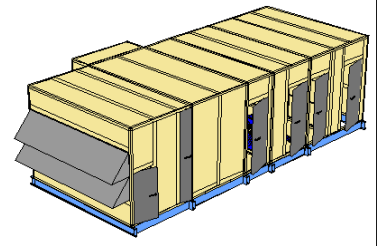
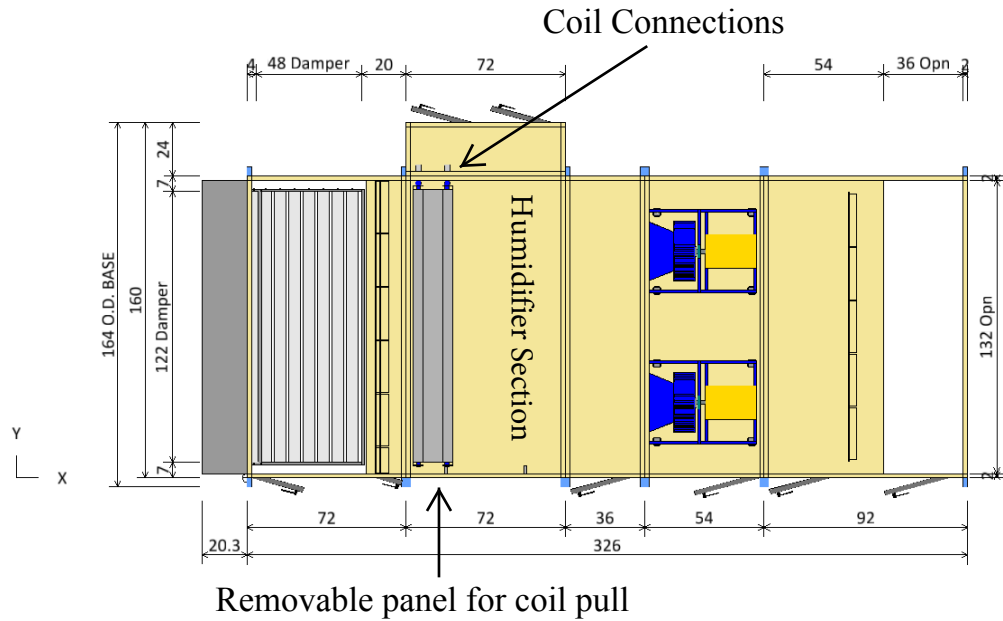
Fan Curve for AHU-1



AF 27 DD PLENUM 12BL (100% Width) 1x2 Supply Fan at Standard Conditions					
Air volume	25610	cfm	Fan speed	1902	rpm
Total static	7.66	insWg	Max speed	1981	rpm
Brake horsepower	44.1	bhp	Efficiency	70.0	%
Approx VFD Setting	65.2	Hz	Motor Speed	1750	rpm
Redundancy	71.5	%			
Unit tagging	AHU-1		Date	January-11-2017	
Job name	ImmuCell Portland		Time	10:30	

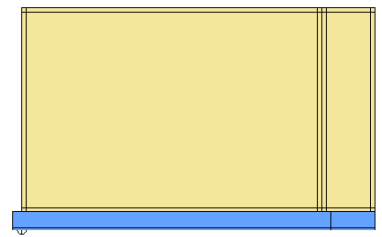
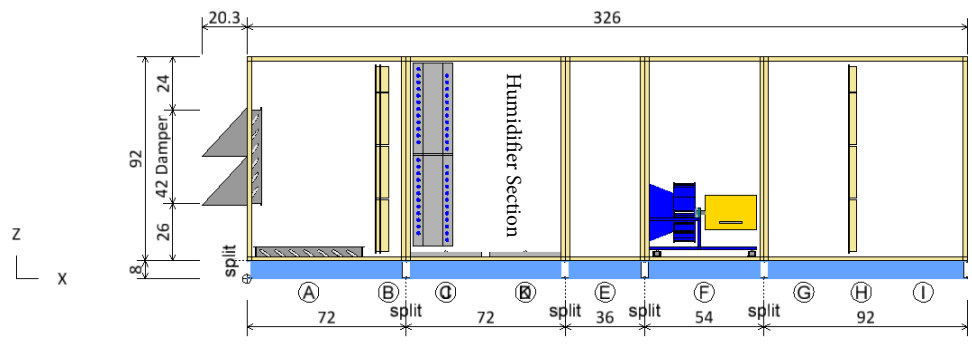
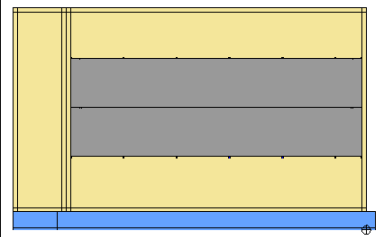


Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.



PLAN VIEW


ISOMETRIC VIEW

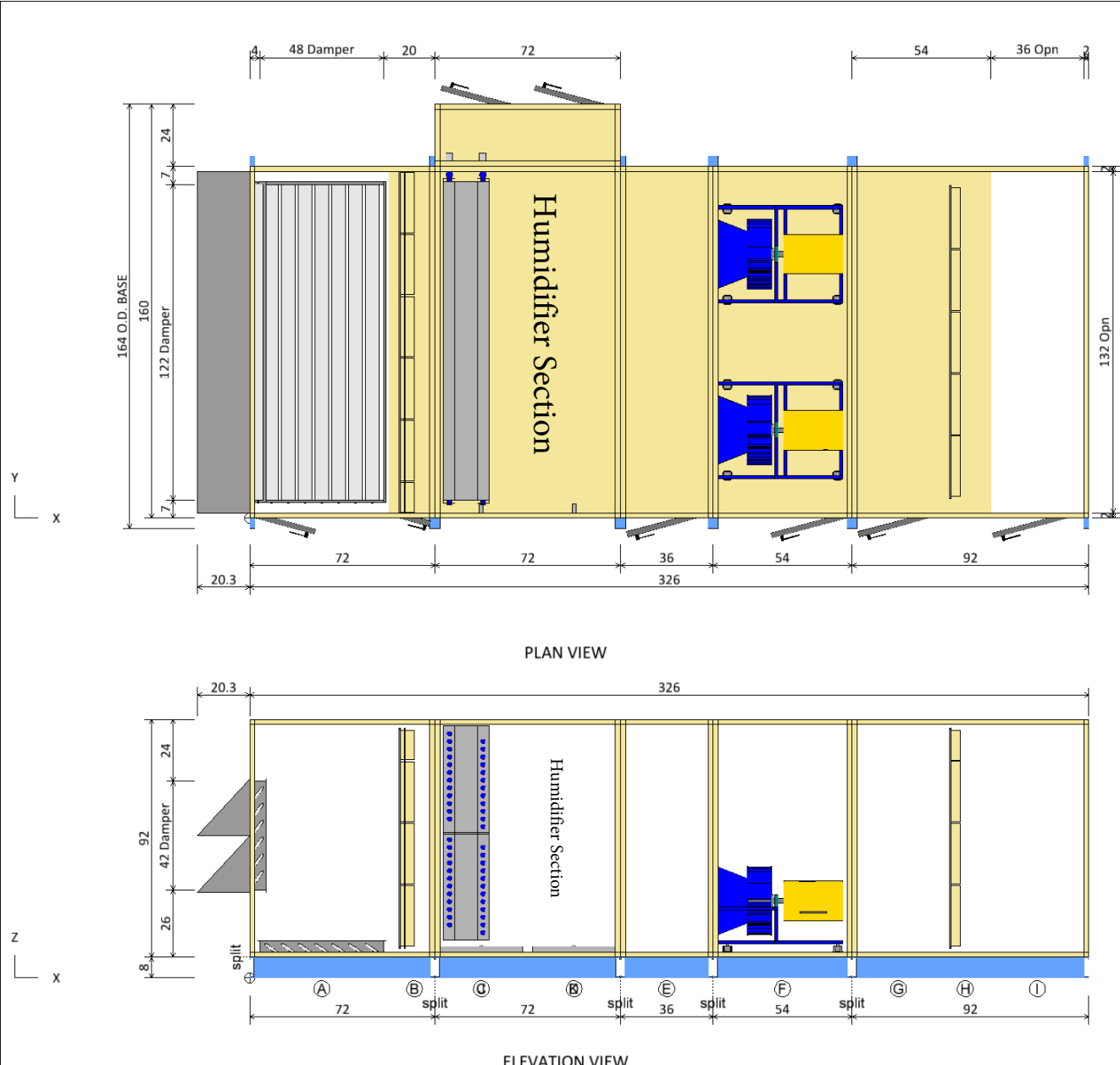


FRONT END VIEW

ELEVATION VIEW


REAR END VIEW

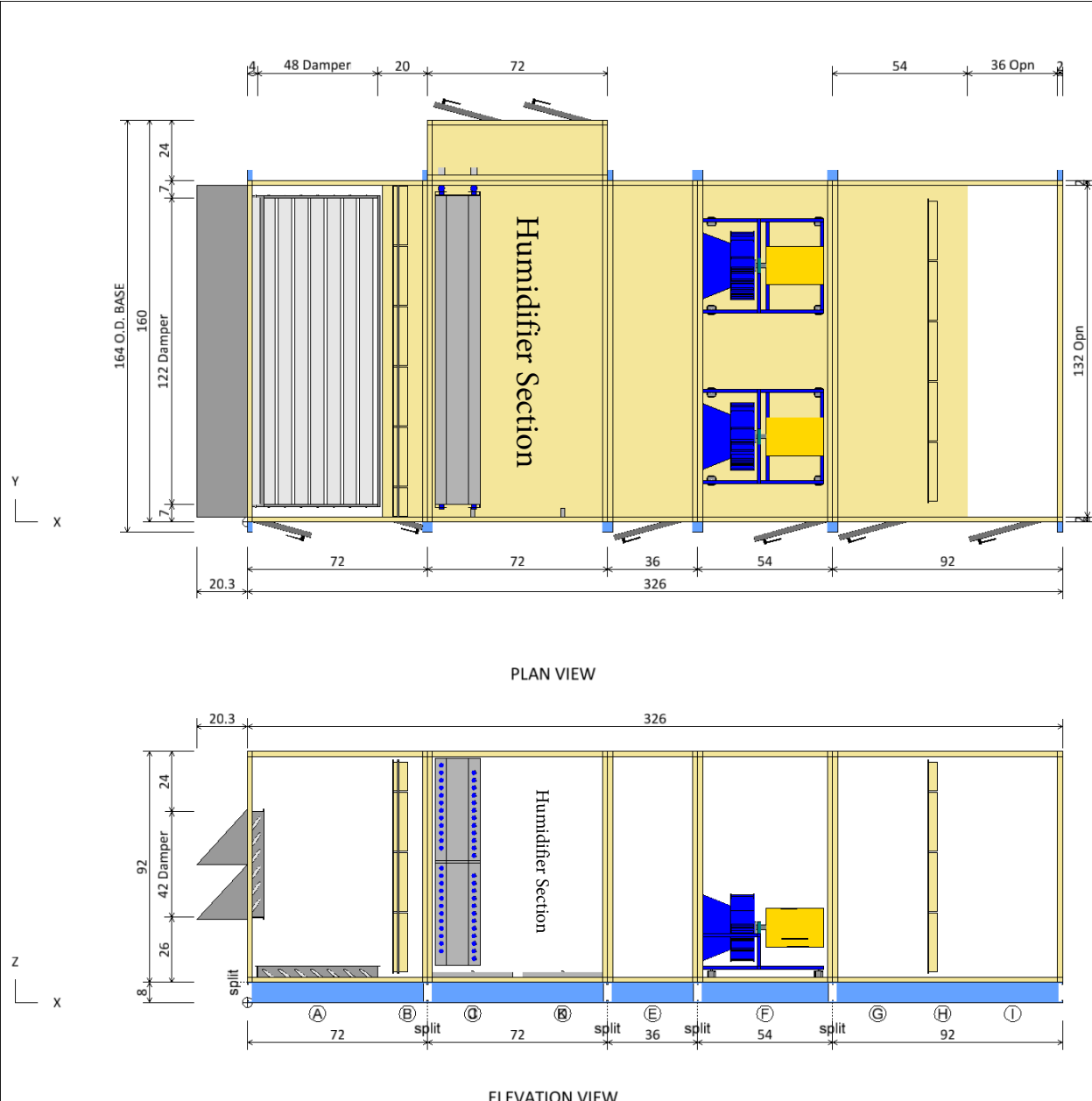
Plan/Elevation	Unit Tag: AHU-1		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler	Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH065GDGC	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		



Component Key	
(A)	Mixing Box Right Door (WxH): 24 ins x 48 ins
(B)	Panel and Bag Filter Pre Filter Type: Pleated (MERV 8) Bag Filter Type: AmAir 1300 Right Door (WxH): 12 ins x 88 ins
(C)	Chilled Water coil Coil Model: 5WD0912B Total Capacity: 1167531.0 Btu/hr Right Door (WxH): 28 ins x 68 ins
(D)	Chilled Water coil Coil Model: 5WH0010C Total Capacity: 0.0 Btu/hr Right Door (WxH): 28 ins x 68 ins
(E)	Access Section Right Door (WxH): 28 ins x 68 ins
(F)	Supply Fan Fan Type: Centrifugal - Plenum Fan Size (Class): 27 (2) Air Flowrate: 12805.0 cfm T.S.P.: 7.7 insWg Motor Power: 25.0 HP Right Door (WxH): 30 ins x 68 ins
(G)	Access Section Right Door (WxH): 28 ins x 68 ins
(H)	Panel and Cartridge Filter Pre Filter Type: Throwaway (StrataDensity) Cartridge Filter Type: Varicel II MH
(I)	Plenum Section Opening Location: Bottom Opening Size: 36 ins x 132 ins Right Door (WxH): 30 ins x 68 ins
(J)	Vestibule Section Left Door (WxH): 28 ins x 68 ins
(K)	Vestibule Section Left Door (WxH): 28 ins x 68 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends		Unit Tag: AHU-1		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH065GDGC		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	



Component Key					
Type	X	Y	Z	Wid	Hgt
Mixing Box					
Ⓐ Outside air damper	0.00	7.00	34.00	122.00	42.00
Return air damper	4.00	7.00	8.00	122.00	48.00
Ⓛ Plenum Section					
Opening	288.00	2.00	8.00	132.00	36.00

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.


Note: Dimensions are measured from the origin point.

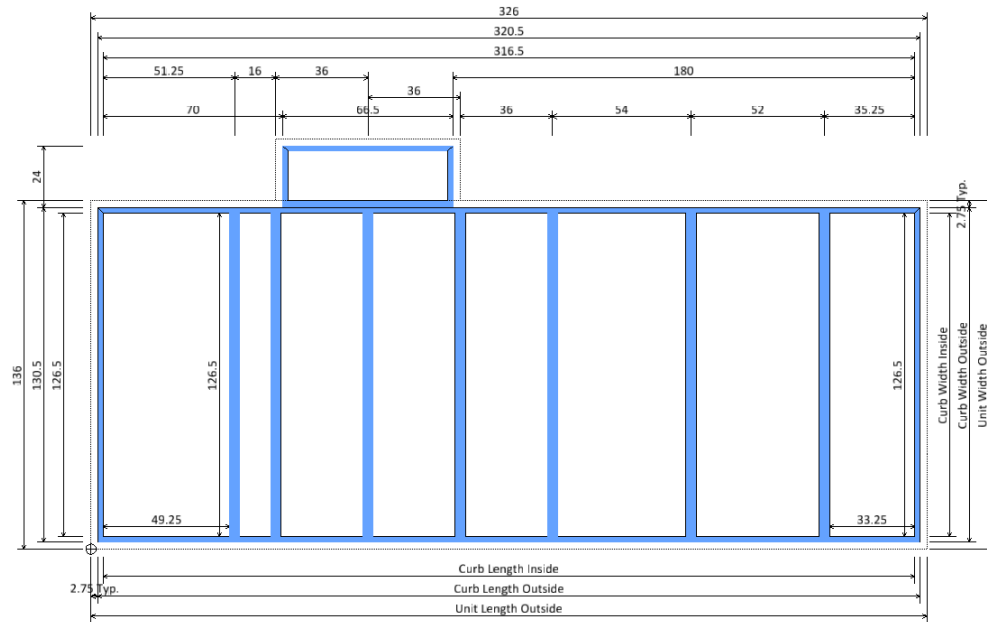
Opening/Damper Connections		Unit Tag: AHU-1		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH065GDGC		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		



Coil and Drain Connections				
Type	X	Y	Z	Diam
Chilled Water coil				
Condensate drain conn:	90.00	-3.40	11.73	1.50
Ⓒ Cold water inlet:	90.54	139.00	17.31	2.50
Cold water outlet:	77.54	139.00	53.69	2.50
Cold water inlet:	90.54	139.00	58.31	2.50
Cold water outlet:	77.54	139.00	94.69	2.50
Ⓓ Chilled Water coil				
Condensate drain conn:	126.00	-3.40	11.73	1.50

Note: Dimensions are measured from the origin point.


Coil and Drain Connections		Unit Tag: AHU-1		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH065GDGC		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	
				Dwg Units: in			



PLAN VIEW

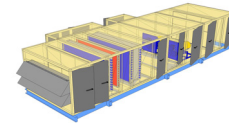


ELEVATION VIEW

Plan/Elevation - No Ends	Unit Tag: AHU-1		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline base	Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH065GDGC	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	

Technical Data Sheet for AHU-2

Job Information		Technical Data Sheet
Job Name	ImmuCell Portland	
Date	January 11 2017	
Submitted By	Briggs Equipment Sales, Inc.	
Software Version	11.01	
Unit Tag	AHU-2	



Unit Overview

Model Number	Supply					
	Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in
OAH021GDGM	8220	3.00	6.17	52*	80*	292

*Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.

Unit

Model Number:	OAH021GDGM		
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)		
Construction:	High pressure low leakage construction		
Max. Design Leakage:	Less than 1% of Supply Air Volume		
Outer Panel:	Painted heavy-gauge G60 Galvanized Steel		
Liner:	Galvanized Steel (unless noted per section)		
Insulation:	R-13 Injected Foam		
Unit Configuration:	Inline horizontal	Drive (Handling) Location:	Right
Base:	Curb ready	Wall Thickness:	2 in
Roof Curb Kit:	18 in	Shrink Wrapping:	Yes
Altitude:	0 ft	Warranty:	Two Year Parts and Labor

Mixing Box (100% OA)	Component: 1			Length: 26 in	Shipping Section: 1			
Portion	Damper			Rated CFM	Air Pressure Drop	Quantity	Hoods	
	Size (length x width)		Location					Type
	Overall	Opening						
Outside Air	28 in x 76 in	24 in x 66 in	End	UltraSeal Low Leak	8220 cfm	0.04 insWg	1	Fitted
Door								
Location			Width		Opening			
Drive side			22 in		Outward			

Combination Filter		Component: 2			Length: 20 in	Shipping Section: 1			
Access		Face Velocity		Face Area		Air Volume			
Side		395 ft/min		20.8 ft ²		8220 cfm			
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Pre-Filter	Pleated	MERV 8	0.17 inWc	0.58 inWc	1.00 inWc	3	24 in	24 in	2 in
						3	20 in	24 in	2 in
Filter	AmAir 1300	MERV 13	0.16 inWc	0.58 inWc	1.00 inWc	3	24 in	24 in	4 in
						3	20 in	24 in	4 in

Technical Data Sheet for AHU-2

Door		
Location	Width	Opening
Drive side	16 in	Outward
Special Text		
Extra filters 1 set(s)		

Energy Recovery Coil		Component: 3		Length: 20 in		Shipping Section: 2	
Coil Model	Total Capacity	Sensible Capacity	Number of Coils	Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)
5WL0906A	64107 Btu/hr	64107 Btu/hr	1	6	9	0.625 in	1.50 in x 1.299 in

SUMMER CONDITIONS									
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity
	Entering		Leaving						
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb					
8220 cfm	86.0 °F	74.0 °F	78.9 °F	72.0 °F	0.23 inWc	42 in	67 in	19.54 ft ²	421 ft/min
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Fluid Weight	Operating Weight		
Entering	Leaving								
76.4 °F	79.9 °F	37.90 gpm	7.30 ftHd	2.00 ft/s	16.0 gal	136.00 lb	607.00 lb		

WINTER CONDITIONS									
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity
	Entering		Leaving						
	Dry Bulb	Dry Bulb							
8220 cfm	-3.0		26.0		0.27 inWc	42 in	67 in	19.54 ft ²	421 ft/min
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Fluid Weight	Operating Weight		
Entering	Leaving								
44.3	27.1	33.90 gpm	12.2 ftHd	1.80 ft/s	16.0 gal	136.00 lb	607.00 lb		

Connection					Glycol Type			
Type	Quantity	Size	Location	Material				
Threaded	2	2.50 in	Opp drive side	Carbon steel	Propylene (30%)			
Material					Drain Pan	Drain Side	Turbospiral	
Fin	Tube	Header	Case					
Aluminum .0075 in	Copper .025 in	Copper	Galv. steel	Stainless steel	Drive side	Yes		

AHRI 410 Certification
Coil is Built to AHRI Standards but, Coil is NOT certified by AHRI Due to the Use of Glycol
Access
24" Coil Vestibule with Door

Technical Data Sheet for AHU-2

Hot Water Coil		Component: 4			Length: 16 in		Shipping Section: 2			
Coil Model	Total Capacity	Number of Coils		Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)			
5WH1101C	518056 Btu/hr	1		1	11	0.625 in	1.50 in x 1.299 in			
Air Volume	Air Temperature			Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity		
	Entering		Leaving							
	Dry Bulb	Wet Bulb	Dry Bulb							
8220 cfm	-3.0 °F		54.6 °F	0.14 inWc	42 in	64 in	18.67 ft ²	440 ft/min		
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Weight	Piping Vestibule			
Entering	Leaving									
180.0 °F	150.5 °F	37.00 gpm	4.50 ftHd	2.80 ft/s	4.0 gal	37.00 lb	24 in			
Connection					Glycol Type	Min. Fin Surface Temp.	Min. Tube Wall Surface Temp.	Fouling Factor		
Type	Quantity	Size	Location	Material						
Threaded	2	1.50 in	Opp drive side	Carbon steel	Propylene (30%)	150.5 °F	150.5 °F	0.000		
Material										
Fin		Tube			Header		Case			
Aluminum .0075 in		Copper .020 in			Copper		Galvanized track			
AHRI 410 Certification										
Coil is NOT certified by AHRI Due to the Use of Glycol										
Door										
Location				Width			Opening			
Non-drive side				12 in			Outward			
Chilled Water Coil		Component: 5			Length: 36 in		Shipping Section: 2			
Coil Model	Total Capacity	Sensible Capacity	Number of Coils	Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)			
5WD0812A	735459 Btu/hr	366603 Btu/hr	1	12	8	0.625 in	1.50 in x 1.299 in			
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity	
	Entering		Leaving							
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb						
8220 cfm	86.0 °F	74.0 °F	45.2 °F	45.0 °F	0.52 inWc	42 in	67 in	19.54 ft ²	421 ft/min	
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Weight	Piping Vestibule			
Entering	Leaving									
38.0 °F	47.9 °F	154.00 gpm	22.90 ftHd	3.00 ft/s	31.0 gal	263.00 lb	24 in			
Connection					Glycol Type	Min. Fin Surface Temp.	Min. Tube Wall Surface Temp.	Fouling Factor		
Type	Quantity	Size	Location	Material						
Threaded	2	2.50 in	Opp drive side	Carbon steel	Propylene (30%)	38.0 °F	38.0 °F	0.000		
Material					Drain Pan	Drain Side	Turbospiral			
Fin	Tube	Header	Case							
Aluminum .0075 in	Copper .020 in	Copper	Galv. steel		Stainless steel	Drive side	Yes			

Technical Data Sheet for AHU-2

AHRI 410 Certification

Coil is NOT certified by AHRI Due to the Use of Glycol

Door

Location	Width	Opening
Non-drive side	28 in	Outward

Access Section	Component: 6	Length: 24 in	Shipping Section: 2
----------------	--------------	---------------	---------------------

Door

Location	Width	Opening
Drive side	20 in	Outward

Humidifier Section	Component: 4	Length: 34 in	Shipping Section: 2
--------------------	--------------	---------------	---------------------

Capacity	200 #/Hr	Inlet Pressure	25 PSI	Absorption Distance:	1.54 ft
Valve Size:	1/2"	Valve Cv	3.6	Valve Type:	316 SS

See full humidifier submittal information for additional details
24" Vestibule with Door on Opposite Drive Side.

Supply Fan	Component: 8	Length: 38 in	Shipping Section: 3
------------	--------------	---------------	---------------------

Fan Performance

Air Volume	Static Pressure			Brake	Speed		Fan Circuit	
	External	Total	Cabinet	Horsepower	Operating	Maximum	MOP	MCA
4110 cfm (per fan)	3.00 inWc	6.17 inWc	0.00 inWc	5.99 BHP	3086 rpm	3650 rpm	25.0 A	20.3 A
8220 cfm (total)				11.98 BHP (total)				

Fan Data

Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location
Centrifugal - Plenum	Airfoil / 2	2	15.75 in	Aluminium	9	Axial	Behind Fan

Motor Data (Typical of 2)

Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*
7.5 HP	460/60/3 V/Hz/Phase	3500 rpm	Premium	TEFC	213 T frame	Generic	2	64 A	9 A

Fan Options

Seismic Restraint:	With snubbers	Block Off Plate:	Yes
Isolator Type:	Spring		

Door

Location	Width	Opening
Drive side	30 in	Outward

Access Section	Component: 9	Length: 32 in	Shipping Section: 4
----------------	--------------	---------------	---------------------

Door

Location	Width	Opening
Drive side	28 in	Outward

Special Options

Tread Plate Floor Liner

Tread plate installed

Technical Data Sheet for AHU-2

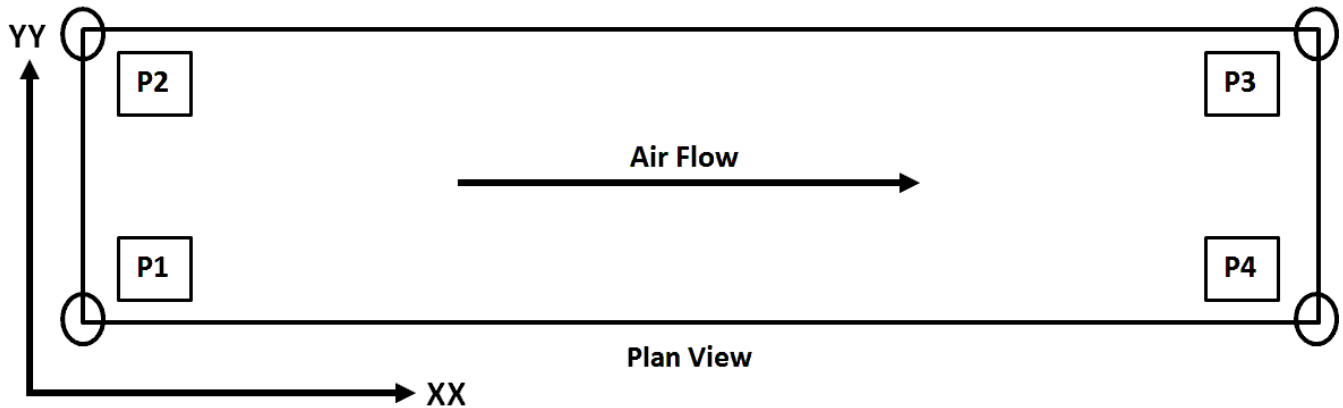
Combination Filter		Component: 10			Length: 18 in		Shipping Section: 4		
Access		Face Velocity			Face Area		Air Volume		
Front		419 ft/min			19.6 ft ²		8220 cfm		
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Filter	Varicel II MH cartridge	MERV 15	0.61 inWc	1.05 inWc	1.50 inWc	2	24 in	24 in	4 in
						1	24 in	20 in	4 in
						2	20 in	24 in	4 in
						1	20 in	20 in	4 in

Plenum Section		Component: 11			Length: 28 in		Shipping Section: 4		
Opening Location		Opening Size			Air Pressure Drop				
Bottom		24.00" x 76.00"			0.01 inWc				
Door									
Location		Width			Opening				
Drive side		24 in			Outward				

Unit Sound Power (dB)								
Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	76	72	66	75	67	60	48	51
Unit Discharge:	78	75	74	81	77	74	68	60
Unit Return:	76	72	66	75	67	60	48	51

Technical Data Sheet for AHU-2

Shipping Section Details									
Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	46	1066	265	265	268	268	23	40	29
2	96	3202	874	956	716	656	41	42	29
3	72	1708	374	377	481	476	40	40	26
4	78	1224	305	305	307	307	39	40	29
5	72	527	132	132	132	132	36	12	29
6	34	308	77	77	77	77	17	12	29
Entire Unit	292	8035	1925	2626	2010	1474	127	46	28
Roof Curb	292	864							



NOTE: Piping vestibule shipping section length(s) not included in the total shipping section length.

NOTE: Special components aren't included in the corner weights and center of gravity data.

AHRI Certification



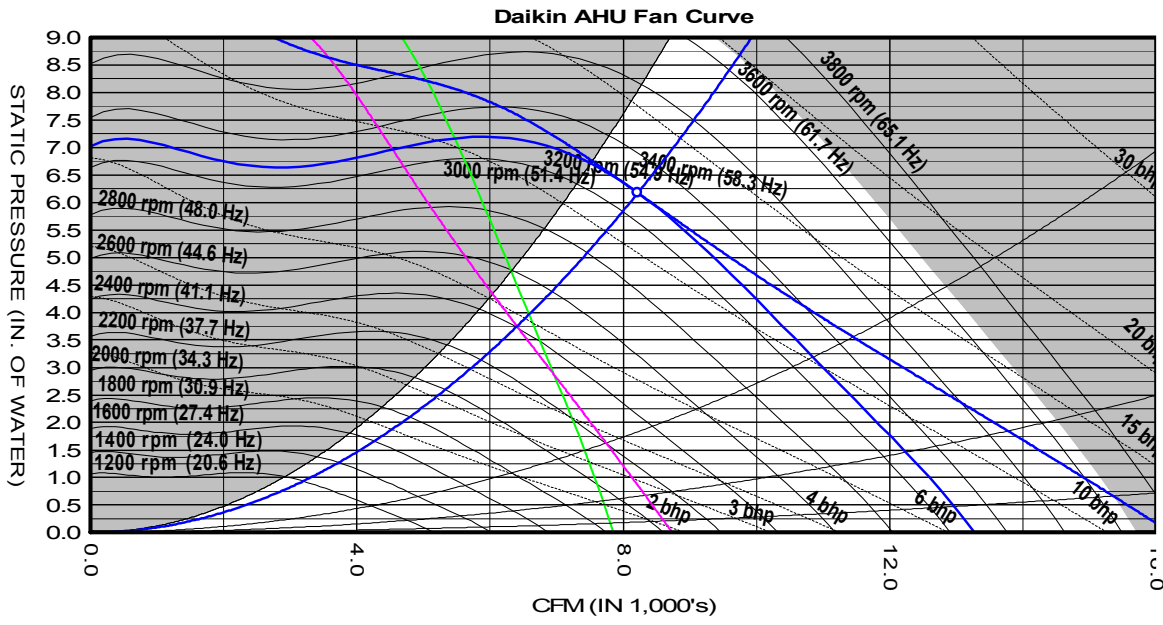
Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.

Notes

Standard

1. As a standalone component, unit meets or exceeds requirements of ASHRAE 90.1 - 2007. The approving authority is responsible for compliance of multi-component building systems.
2. Note: Pre-filter media not provided by Daikin Applied, quantity and size data is for informational purposes only.

Fan Curve for AHU-2

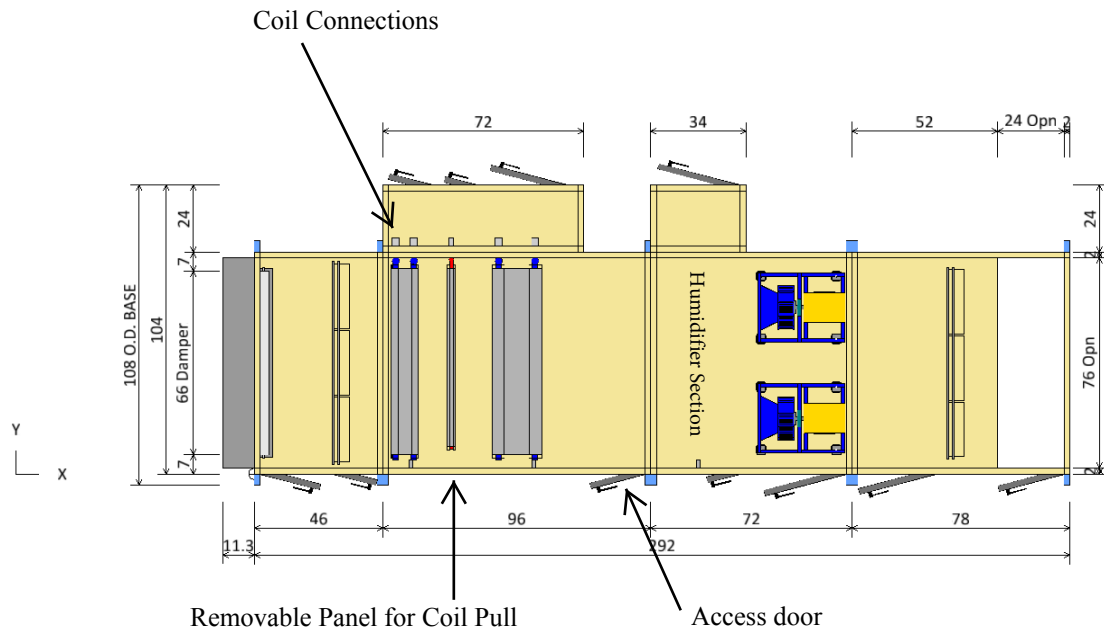


Green line = fan curve for 1 fan(s) at max speed Red line = BHP curve for 1 fan(s) at max power of selected motor

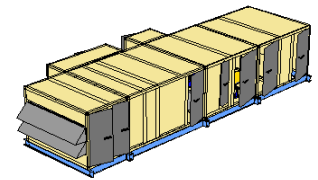
AF 16 DD PLENUM 9BL (100% Width) 1x2 Supply Fan at Standard Conditions					
Air volume	8220	cfm	Fan speed	3086	rpm
Total static	6.17	insWg	Max speed	3650	rpm
Brake horsepower	12.0	bhp	Efficiency	66.6	%
Approx VFD Setting	52.9	Hz	Motor Speed	3500	rpm
Redundancy	77.9	%			
Unit tagging	AHU-2		Date	January-11-2017	
Job name	ImmuCell Portland		Time	10:52	



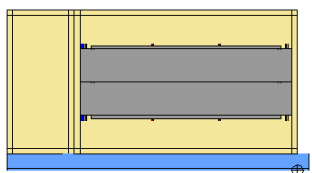
Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.



PLAN VIEW

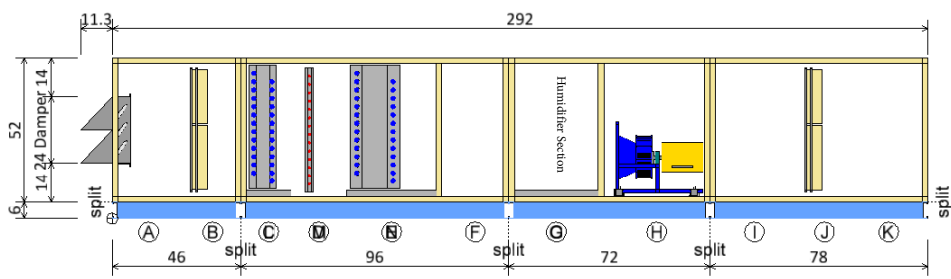


ISOMETRIC VIEW

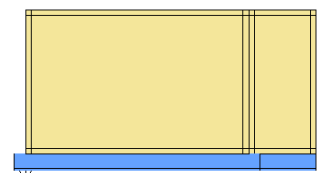


Z


X

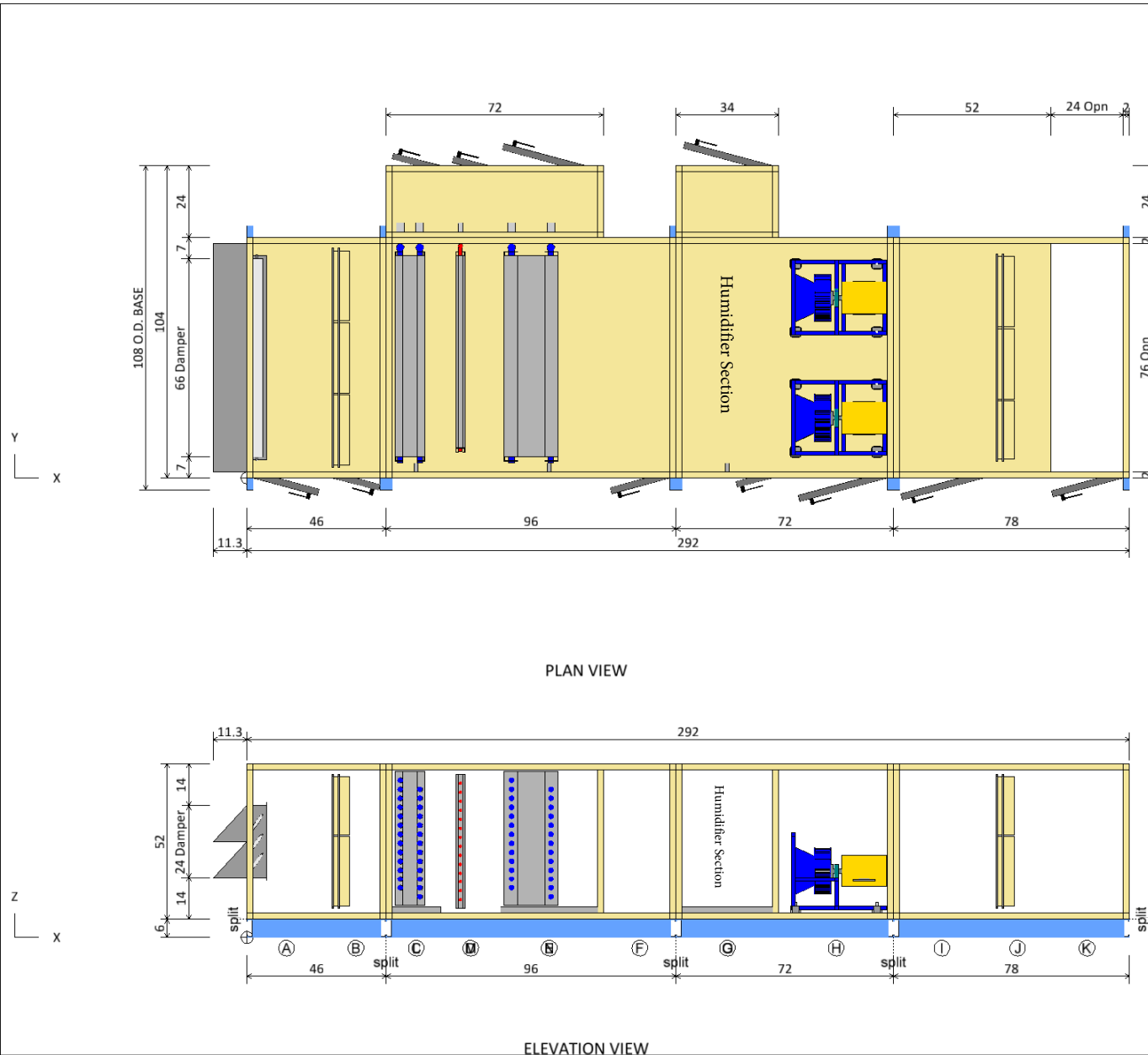


ELEVATION VIEW




REAR END VIEW

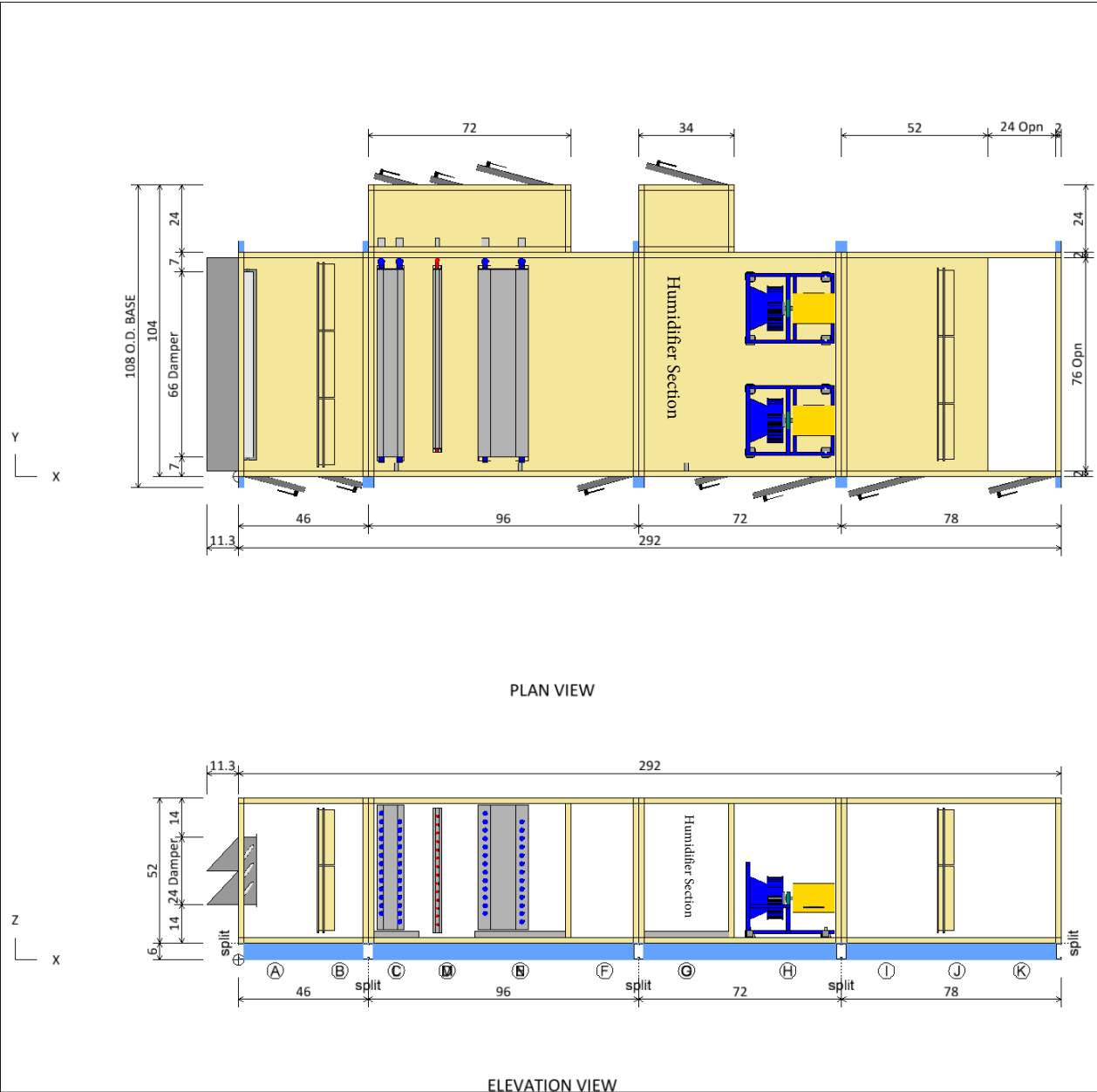
FRONT END VIEW		ELEVATION VIEW				REAR END VIEW	
Plan/Elevation		Unit Tag: AHU-2		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH021GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		



Component Key	
(A)	Mixing Box Right Door (WxH): 22 ins x 48 ins
(B)	Panel and Bag Filter Pre Filter Type: Pleated (MERV 8) Bag Filter Type: AmAir 1300 Right Door (WxH): 16 ins x 48 ins
(C)	Chilled Water coil Coil Model: 5WL0906A Total Capacity: 64107.0 Btu/hr Right Door (WxH): 16 ins x 48 ins
(D)	Hot Water Coil Coil Model: 5WH1101C Total Capacity: 518056.0 Btu/hr Right Door (WxH): 12 ins x 48 ins
(E)	Chilled Water coil Coil Model: 5WD0812A Total Capacity: 735459.0 Btu/hr Right Door (WxH): 28 ins x 48 ins
(F)	Access Section Right Door (WxH): 20 ins x 48 ins
(G)	Chilled Water coil Coil Model: 5WH0010C Total Capacity: 0.0 Btu/hr Right Door (WxH): 30 ins x 48 ins
(H)	Supply Fan Fan Type: Centrifugal - Plenum Fan Size (Class): 16 (2) Air Flowrate: 4110.0 cfm T.S.P.: 6.2 insWg Motor Power: 7.5 HP Right Door (WxH): 30 ins x 48 ins
(I)	Access Section Right Door (WxH): 28 ins x 48 ins
(J)	Panel and Cartridge Filter Pre Filter Type: None - Future Filter Cartridge Filter Type: Varicel II MH
(K)	Plenum Section Opening Location: Bottom Opening Size: 24 ins x 76 ins Right Door (WxH): 24 ins x 48 ins
(L)	Vestibule Section Left Door (WxH): 16 ins x 48 ins
(M)	Vestibule Section Left Door (WxH): 12 ins x 48 ins
(N)	Vestibule Section Left Door (WxH): 28 ins x 48 ins
(O)	Vestibule Section Left Door (WxH): 30 ins x 48 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.


Plan/Elevation - No Ends		Unit Tag: AHU-2		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH021GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	

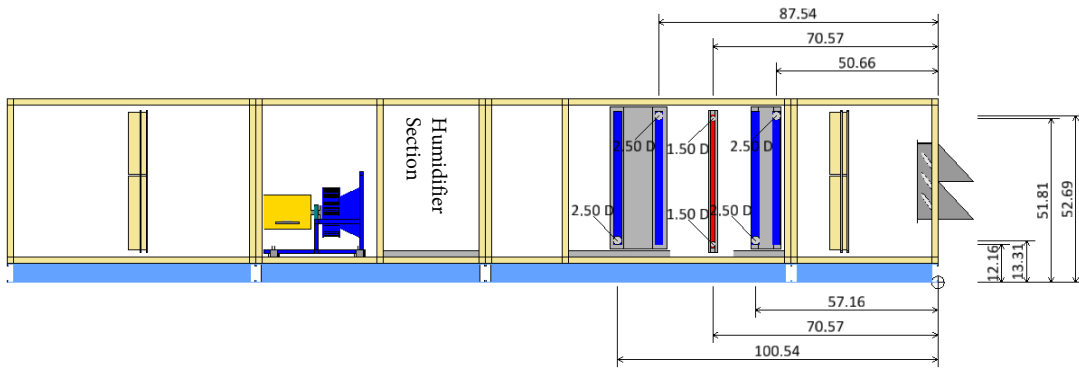


Component Key						
Type	X	Y	Z	Wid	Hgt	
(A) Mixing Box						
(B) Outside air damper	0.00	7.00	20.00	66.00	24.00	
(C) Plenum Section						
(K) Opening	266.00	2.00	6.00	76.00	24.00	

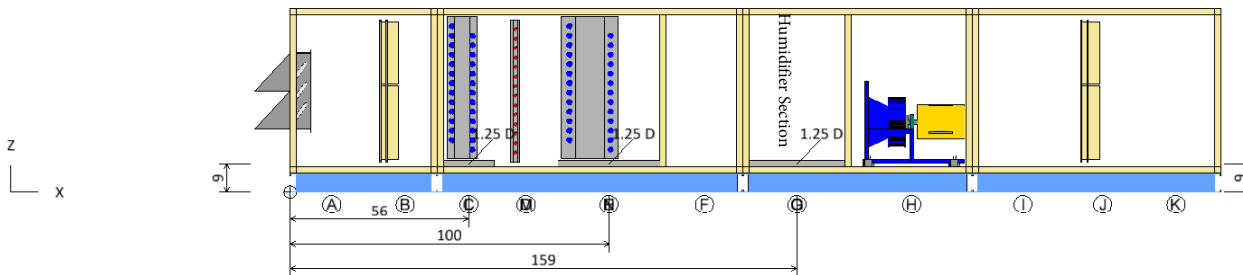
Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Note: Dimensions are measured from the origin point.

Opening/Damper Connections		Unit Tag: AHU-2		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH021GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	



LEFT ELEVATION VIEW




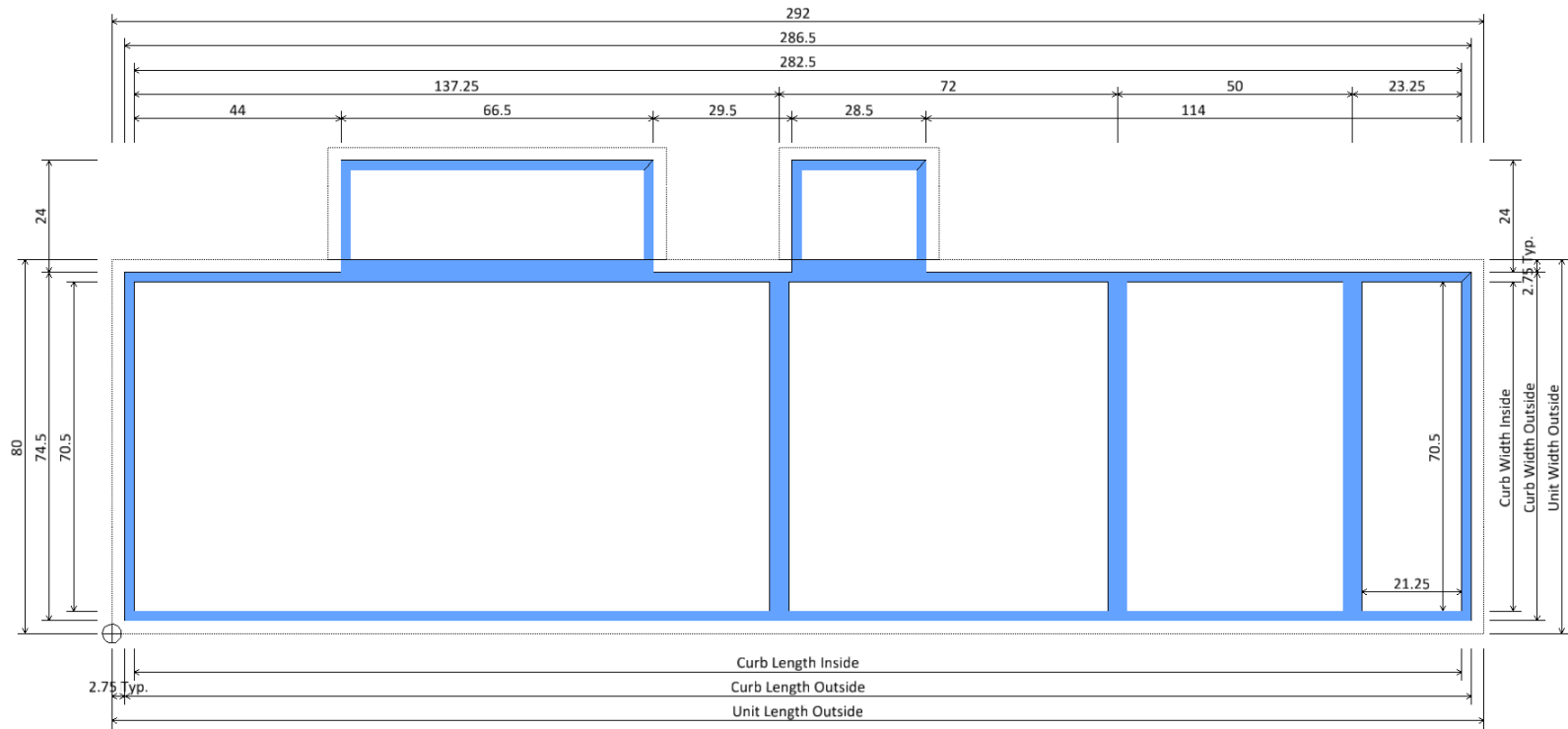
RIGHT ELEVATION VIEW

Coil and Drain Connections

	Type	X	Y	Z	Diam
C	Chilled Water coil	56.00	-2.90	9.00	1.25
	Condensate drain conn:	57.16	83.00	13.31	2.50
	Cold water inlet:	50.66	83.00	52.69	2.50
D	Hot Water Coil				
	Hot water inlet:	70.57	83.00	12.16	1.50
	Hot water outlet:	70.57	83.00	51.81	1.50
E	Chilled Water coil	100.00	-2.90	9.00	1.25
	Condensate drain conn:	100.54	83.00	13.31	2.50
	Cold water inlet:	87.54	83.00	52.69	2.50
G	Chilled Water coil				
	Condensate drain conn:	159.00	-2.90	9.00	1.25

Note: Dimensions are measured from the origin point.


Coil and Drain Connections		Unit Tag: AHU-2		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH021GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in	



PLAN VIEW

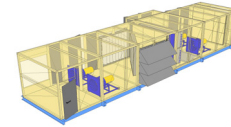


ELEVATION VIEW

Plan/Elevation - No Ends	Unit Tag: AHU-2			Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
	Product: Skyline base			Sales Engineer:			
	Model: OAH021GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	

Technical Data Sheet for AHU-3

Job Information		Technical Data Sheet
Job Name	ImmuCell Portland	
Date	January 11 2017	
Submitted By	Briggs Equipment Sales, Inc.	
Software Version	11.10	
Unit Tag	AHU-3	



Unit Overview

Model Number	Supply						Return/Exhaust					
	Air Volume cfm	Static Pressure		External Dimensions			Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in		External inWc	Total inWc	Height in	Width in	Length in
OAH032GDGM	13520	3.00	6.24	70*	88*	272	13520	3.00	3.12	70*	88*	136

*Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.

Unit

Model Number:	OAH032GDGM		
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)		
Outer Panel:	Painted heavy-gauge G60 Galvanized Steel		
Liner:	Galvanized Steel (unless noted per section)		
Insulation:	R-13 Injected Foam		
Unit Configuration:	Inline horizontal	Drive (Handling) Location:	Left
Base:	Curb ready	Wall Thickness:	2 in
Roof Curb Kit:	18 in	Shrink Wrapping:	Yes
Altitude:	0 ft	Warranty:	Two Years Parts and Labor
High Pressure Door Handles:	Provided		

Exhaust Air Stream

Plenum Section	Component: 1	Length: 46 in	Shipping Section: 1
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Air Pressure Drop			
0.08 inWc			

Custom Openings – RETURN AIR OPENING DRIVE SIDE

Custom Opening	Location	Width	Height	Rainhood w/Screen
1	Drive side	42 in	42 in	None
Door				
Location		Width	Opening	
Non-drive side		24 in	Outward	

Access Section	Component: 2	Length: 22 in	Shipping Section: 1
-----------------------	--------------	---------------	---------------------

Door			
Location		Width	Opening
Drive side		18 in	Outward

Technical Data Sheet for AHU-3

Return/Exhaust Fan	Component: 3	Length: 44 in	Shipping Section: 2
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Fan Performance

Air Volume	Static Pressure			Brake Horsepower	Speed		Fan Circuit	
	External	Total	Cabinet		Operating	Maximum	MOP	MCA
6760 cfm (per fan) 13520 cfm (total)	3.00 inWc	3.12 inWc	0.00 inWc	5.56 BHP (per fan) 11.12 BHP (total)	2442 rpm	3650 rpm	30.0 A	21.1 A

Fan Data

Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location
Centrifugal - Plenum	Airfoil / 2	2	18.25 in	Aluminium	9	Axial	Behind Fan

Motor Data (Typical of 2)

Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*
7.5 HP	460/60/3 V/Hz/Phase	1750 rpm	Premium	TEFC	213 T frame	Generic	4	70.6 A	9.4 A

Fan Options

Seismic Restraint:	With snubbers	Block Off Plate:	Yes
Isolator Type:	Spring		

Door

Location	Width	Opening
Drive side	30 in	Outward

Access Section	Component: 4	Length: 24 in	Shipping Section: 2
-----------------------	--------------	---------------	---------------------

Door

Location	Width	Opening
Drive side	20 in	Outward

Economizer	Component: 5	Length: 68 in	Shipping Section: 3
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Portion	Damper				Rated CFM	Air Pressure Drop	Quantity	Hoods
	Size (length x width)		Location	Type				
	Overall	Opening						
Outside Air	32 in x 60 in	26 in x 50 in	Right	UltraSeal Low Leak	13520 cfm	0.04 inWc	2	Fitted
Return Air	32 in x 60 in	26 in x 50 in	Internal	UltraSeal Low Leak	13520 cfm	0.04 inWc	2	N/A
Exhaust Air	32 in x 60 in	26 in x 50 in	Left	UltraSeal Low Leak	13520 cfm	0.04 inWc	2	Fitted

Supply Air Stream

Combination Filter	Component: 1	Length: 18 in	Shipping Section: 3
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Access	Face Velocity	Face Area	Air Volume
Side	447 ft/min	30.3 ft ²	13520 cfm

Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Pre-Filter	Pleated	MERV 8	0.20 inWc	0.60 inWc	1.00 inWc	3	24 in	24 in	2 in
						6	20 in	24 in	2 in
Filter	AmAir 1300	MERV 13	0.19 inWc	0.60 inWc	1.00 inWc	3	24 in	24 in	4 in
						6	20 in	24 in	4 in

Technical Data Sheet for AHU-3

Door		
Location	Width	Opening
Drive side	14 in	Outward
Special Text		
Extra filters 1 set(s)		

Chilled Water Coil		Component: 2			Length: 36 in		Shipping Section: 4		
Coil Model	Total Capacity	Sensible Capacity	Number of Coils	Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)		
5WM1412A	574758 Btu/hr	420745 Btu/hr	2	12	14	0.625 in	1.50 in x 1.299 in		
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity
	Entering		Leaving						
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb					
13520 cfm	72.5 °F	60.2 °F	44.0 °F	43.8 °F	0.85 inWc	27 in	75 in	28.13 ft²	481 ft/min
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Weight	Piping Vestibule		
Entering	Leaving	93.00 gpm	9.30 ftHd	1.80 ft/s	44.0 gal	370.00 lb	24 in		
38.0 °F	50.9 °F								
Connection					Glycol Type	Min. Fin Surface Temp.	Min. Tube Wall Surface Temp.	Fouling Factor	
Type	Quantity	Size	Location	Material					
Threaded	2	2.50 in	Drive side	Carbon steel	Propylene (30%)	38.0 °F	38.0 °F	0.000	
Material				Drain Pan	Drain Side	Turbospiral			
Fin	Tube	Header	Case	Stainless steel	Opp drive side	Yes			
Aluminum .0075 in	Copper .020 in	Copper	Galv. steel						

AHRI 410 Certification

Coil is NOT certified by AHRI Due to the Use of Glycol

Door		
Location	Width	Opening
Drive side	- in	Outward

Humidifier Section		Component: 4		Length: 36 in		Shipping Section: 2	
Capacity	55 #/Hr	Inlet Pressure	25 PSI	Absorption Distance:	0.60 ft		
Valve Size:	1/2"	Valve Cv	1.3	Valve Type:	316 SS		

See full humidifier submittal information for additional details
24" Vestibule with Door on Opposite Drive Side.

Technical Data Sheet for AHU-3

Supply Fan		Component: 4		Length: 46 in		Shipping Section: 5				
Fan Performance										
Air Volume		Static Pressure			Brake Horsepower		Speed		Fan Circuit	
		External	Total	Cabinet			Operating	Maximum	MOP	MCA
6760 cfm (per fan) 13520 cfm (total)		3.00 inWc	6.24 inWc	0.00 inWc	9.55 BHP (per fan) 19.1 BHP (total)		2408 rpm	2674 rpm	35.0 A	27.0 A
Fan Data										
Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location			
Centrifugal - Plenum	Airfoil / 2	2	20.00 in	Aluminium	9	Axial	Behind Fan			
Motor Data (Typical of 2)										
Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*	
10.0 HP	460/60/3 V/Hz/Phase	1750 rpm	Premium	TEFC	215 T frame	Generic	4	106.7 A	12 A	
Fan Options										
Seismic Restraint:		With snubbers			Block Off Plate:		Yes			
Isolator Type:		Spring								
Door										
Location			Width			Opening				
Drive side			30 in			Outward				
Access Section		Component: 5		Length: 32 in		Shipping Section: 5				
Door										
Location			Width			Opening				
Drive side			28 in			Outward				
Special Options										
Tread Plate Floor Liner										
Tread plate installed										
Combination Filter		Component: 6		Length: 16 in		Shipping Section: 5				
Access		Face Velocity		Face Area		Air Volume				
Front		447 ft/min		30.3 ft ²		13520 cfm				
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth	
			Clean Air	Mean Air	Dirty Air					
Final	Varicel II MH cartridge	MERV 15	0.66 inWc	1.08 inWc	1.50 inWc	3	24 in	24 in	4 in	
						6	20 in	24 in	4 in	
Supply Plenum Section		Component: 7		Length: 20 in		Shipping Section: 6				
Air Pressure Drop										
0.08 inWc										
Custom Openings – DISCHARGE AIR OPENING										
Custom Opening		Location		Width		Height		Rainhood w/Screen		
1		End		42 in		42 in		None		
Door										
Location			Width			Opening				
Drive side			16 in			Outward				

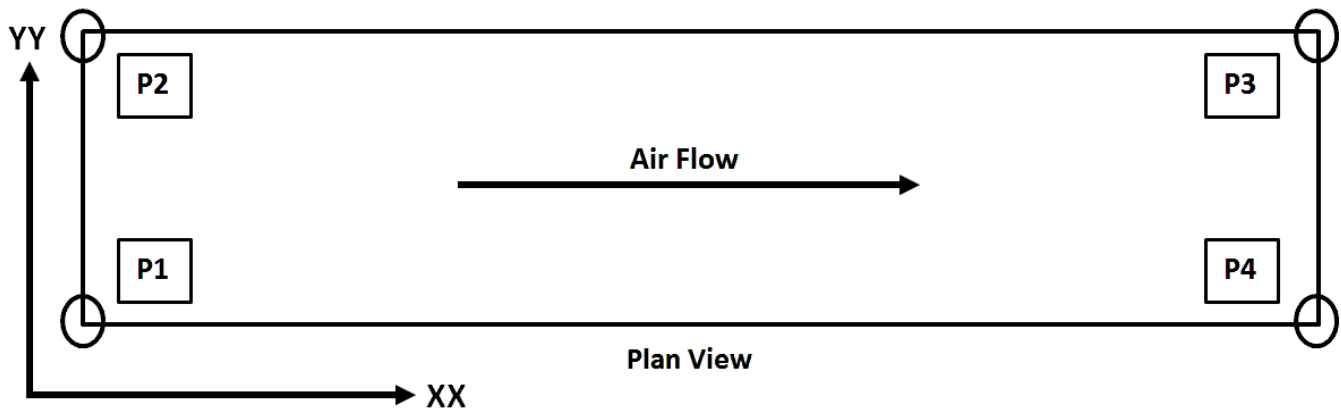
Technical Data Sheet for AHU-3

Unit Sound Power (dB)

Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	80	76	75	78	71	61	50	51
Unit Discharge:	80	77	78	83	77	72	65	58
Unit Return:	80	77	81	90	77	76	76	68

Shipping Section Details

Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	68	1468	367	367	367	367	34	44	38
2	68	1821	557	557	353	353	26	44	34
3	86	1652	421	421	405	405	42	44	38
4	72	3057	1015	928	532	582	26	42	38
5	94	2572	741	741	545	545	40	44	35
6	20	477	119	119	119	119	10	44	38
7	72	601	150	150	150	150	36	12	38
Entire Unit	408	11648	2636	2936	3201	2874	213	46	37
Roof Curb	408	965							



NOTE: Piping vestibule shipping section length(s) not included in the total shipping section length.

NOTE: Special components aren't included in the corner weights and center of gravity data.

AHRI Certification



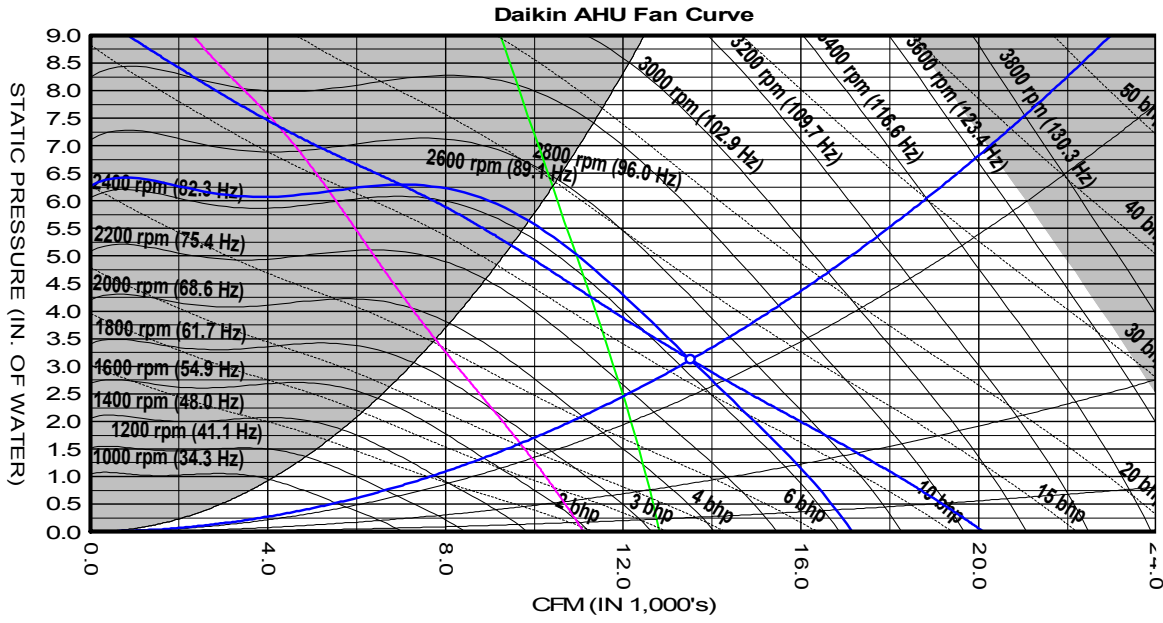
Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.

Notes

Important

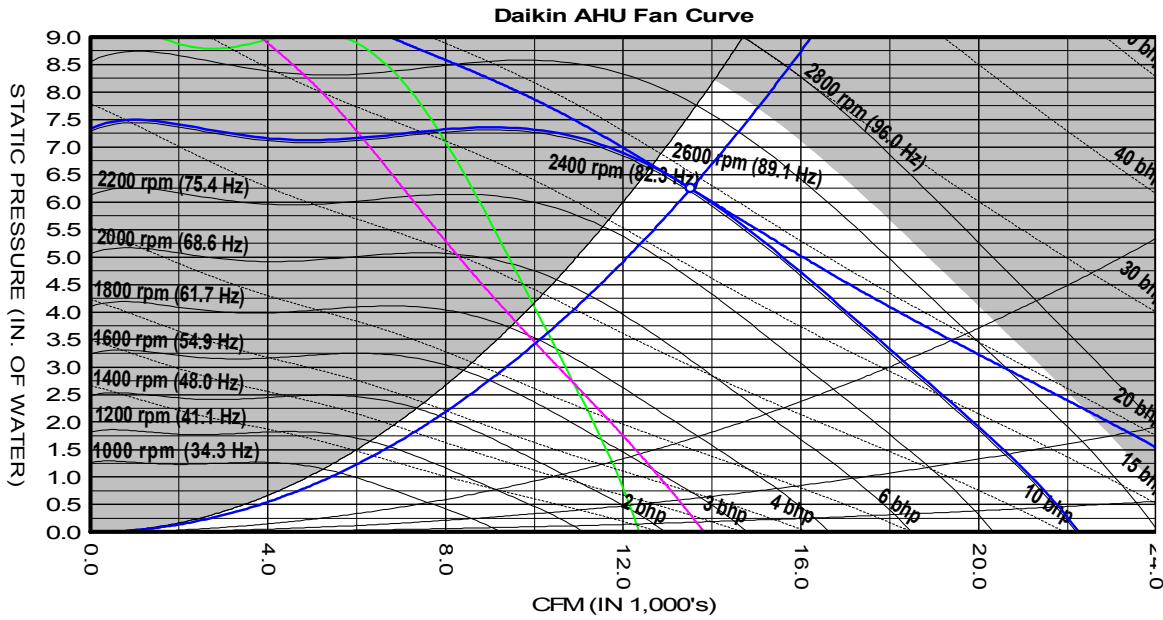
1. This unit may not meet ASHRAE Standard 90.1 - 2007 fan motor power limitations. If that code applies, alternate fan selections may be required.
2. The designer and installer must ensure compliance with applicable codes. A component supplier cannot determine the brake horsepower ("BHP") for other motors in the air handling system.
3. Before approving this unit, determine whether ASHRAE Standard 90.1 - 2007 has been adopted in the specific jurisdiction or contract specifications in which the unit will be installed.

Fan Curve for AHU-3



AF 18 DD PLENUM 9BL (100% Width) 1x2 Ret/Exh Fan at Standard Conditions					
Air volume	13520	cfm	Fan speed	2442	rpm
Total static	3.12	insWg	Max speed	3650	rpm
Brake horsepower	11.1	bhp	Efficiency	59.6	%
Approx VFD Setting	83.7	Hz	Motor Speed	1750	rpm
Redundancy	71.6	%			
Unit tagging	AHU-3		Date	January-11-2017	
Job name	ImmuCell Portland		Time	11:24	

Fan Curve for AHU-3

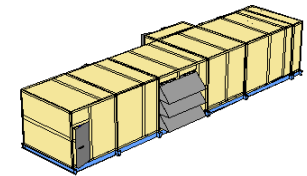
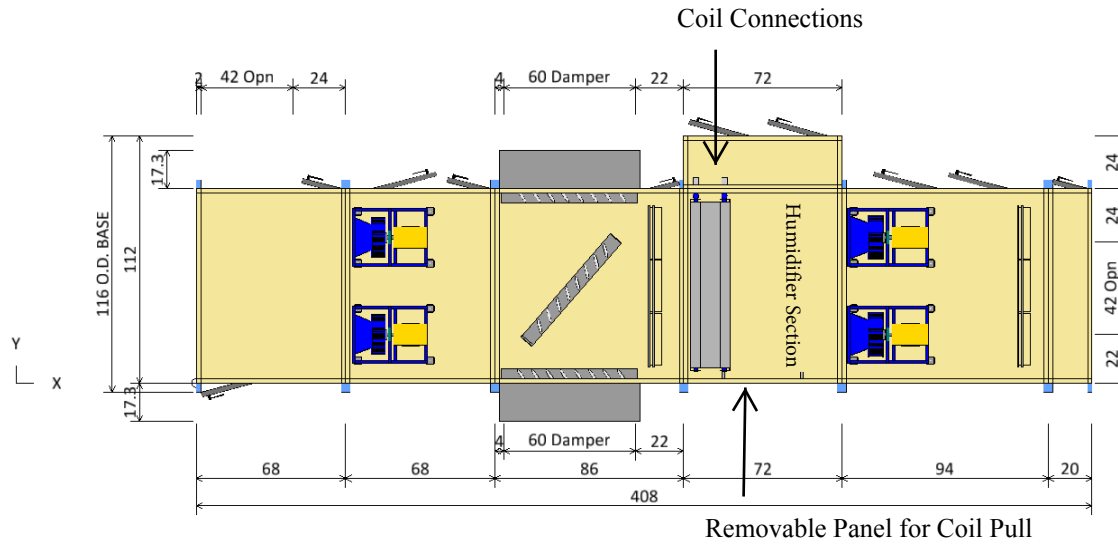


Green line = fan curve for 1 fan(s) at max speed Red line = BHP curve for 1 fan(s) at max power of selected motor

AF 20 DD PLENUM 9BL (100% Width) 1x2 Supply Fan at Standard Conditions				
Air volume	13520	cfm	Fan speed	2408 rpm
Total static	6.24	insWg	Max speed	2674 rpm
Brake horsepower	19.1	bhp	Efficiency	69.5 %
Approx VFD Setting	82.5	Hz	Motor Speed	1750 rpm
Redundancy	74.2	%		
Unit tagging	AHU-3		Date	January-11-2017
Job name	ImmuCell Portland		Time	11:24



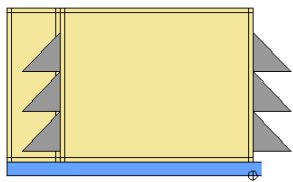
Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.



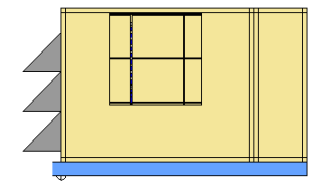
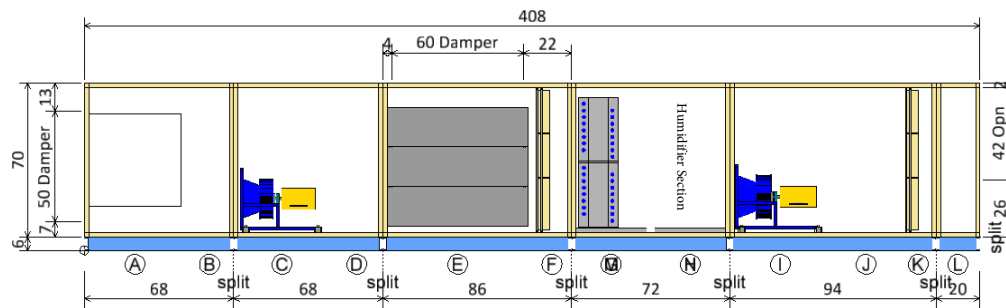
Note: Submittal comments requested coil connections and coil pull to be on the same side of the unit. This is only possible if you disconnect all of the associated piping connected to the coil in the vestibule.

PLAN VIEW

ISOMETRIC VIEW




Z
X



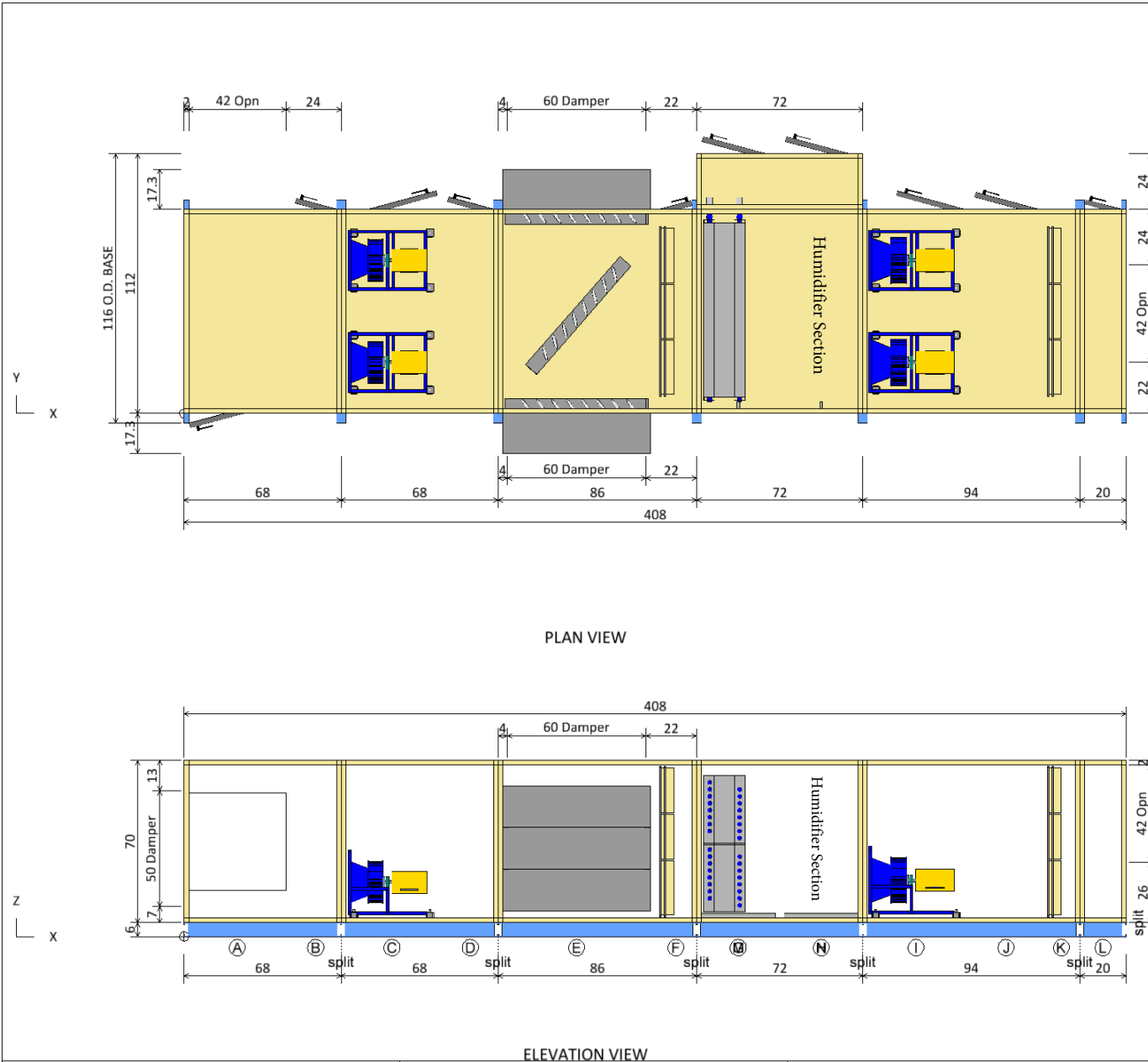
FRONT END VIEW

ELEVATION VIEW

REAR END VIEW


Plan/Elevation	Unit Tag: AHU-3		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler	Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH032GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

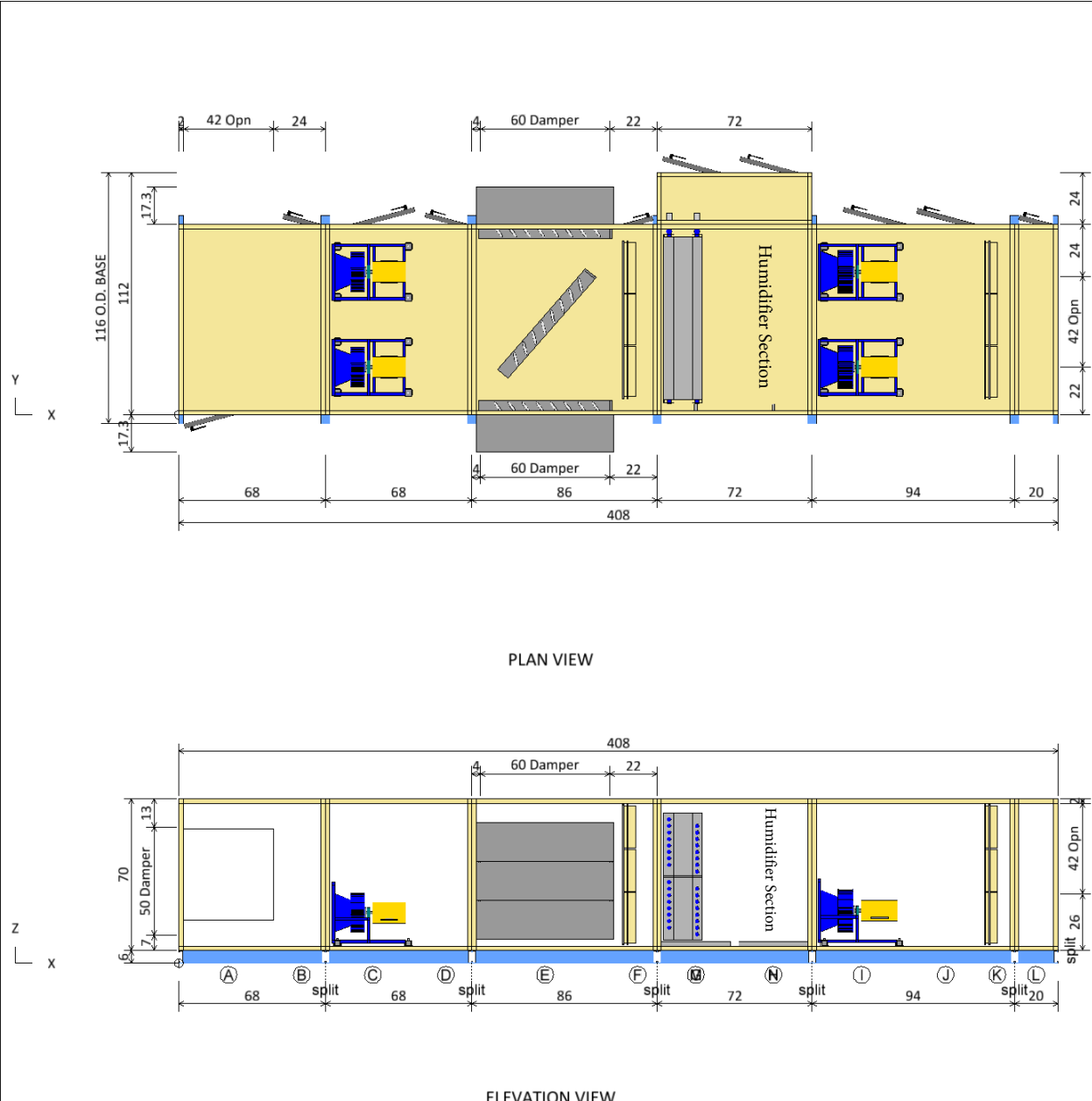


Component Key	
(A)	Plenum Section Right Door (WxH): 24 ins x 48 ins
(B)	Access Section Left Door (WxH): 18 ins x 66 ins
(C)	Return Fan Fan Type: Centrifugal - Plenum Fan Size (Class): 18 (2) Air Flowrate: 6760.0 cfm T.S.P.: 3.1 insWg Motor Power: 7.5 HP Left Door (WxH): 30 ins x 66 ins
(D)	Access Section Left Door (WxH): 20 ins x 66 ins
(E)	Double Mixing Box
(F)	Panel and Bag Filter Pre Filter Type: Pleated (MERV 8) Bag Filter Type: AmAir 1300 Left Door (WxH): 14 ins x 66 ins
(G)	Chilled Water coil Coil Model: 5WM1412A Total Capacity: 574758.0 Btu/hr Right Door (WxH): 28 ins x 66 ins
(H)	Chilled Water coil Coil Model: 5WH0010C Total Capacity: 0.0 Btu/hr Right Door (WxH): 28 ins x 66 ins
(I)	Supply Fan Fan Type: Centrifugal - Plenum Fan Size (Class): 20 (2) Air Flowrate: 6760.0 cfm T.S.P.: 6.2 insWg Motor Power: 10.0 HP Left Door (WxH): 30 ins x 66 ins
(J)	Access Section Left Door (WxH): 28 ins x 66 ins
(K)	Panel and Cartridge Filter Pre Filter Type: None - Future Filter Cartridge Filter Type: Varicel II MH
(L)	Plenum Section Left Door (WxH): 16 ins x 48 ins
(M)	Vestibule Section Left Door (WxH): 28 ins x 66 ins
(N)	Vestibule Section Left Door (WxH): 28 ins x 66 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends		Unit Tag: AHU-3		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH032GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	


All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

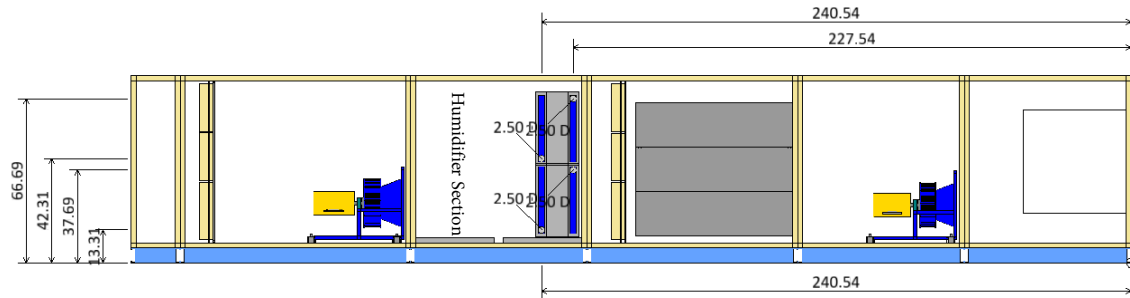


Component Key						
Type	X	Y	Z	Wid	Hgt	
Ⓐ Plenum Section Opening	2.00	88.00	20.00	42.00	42.00	
Ⓔ Double Mixing Box						
Ⓔ Outside air damper	140.00	0.00	13.00	50.00	60.00	
Ⓔ Exhaust air damper	140.00	88.00	13.00	50.00	60.00	
Ⓕ Plenum Section Opening	408.00	22.00	32.00	42.00	42.00	

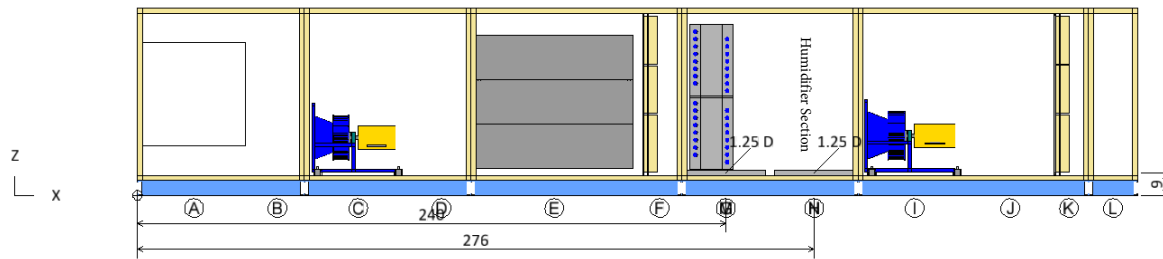
Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Note: Dimensions are measured from the origin point.

Opening/Damper Connections		Unit Tag: AHU-3		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler		Project Name: Immucell Portland		Sales Engineer:			
Model: OAH032GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		
All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.							




LEFT ELEVATION VIEW



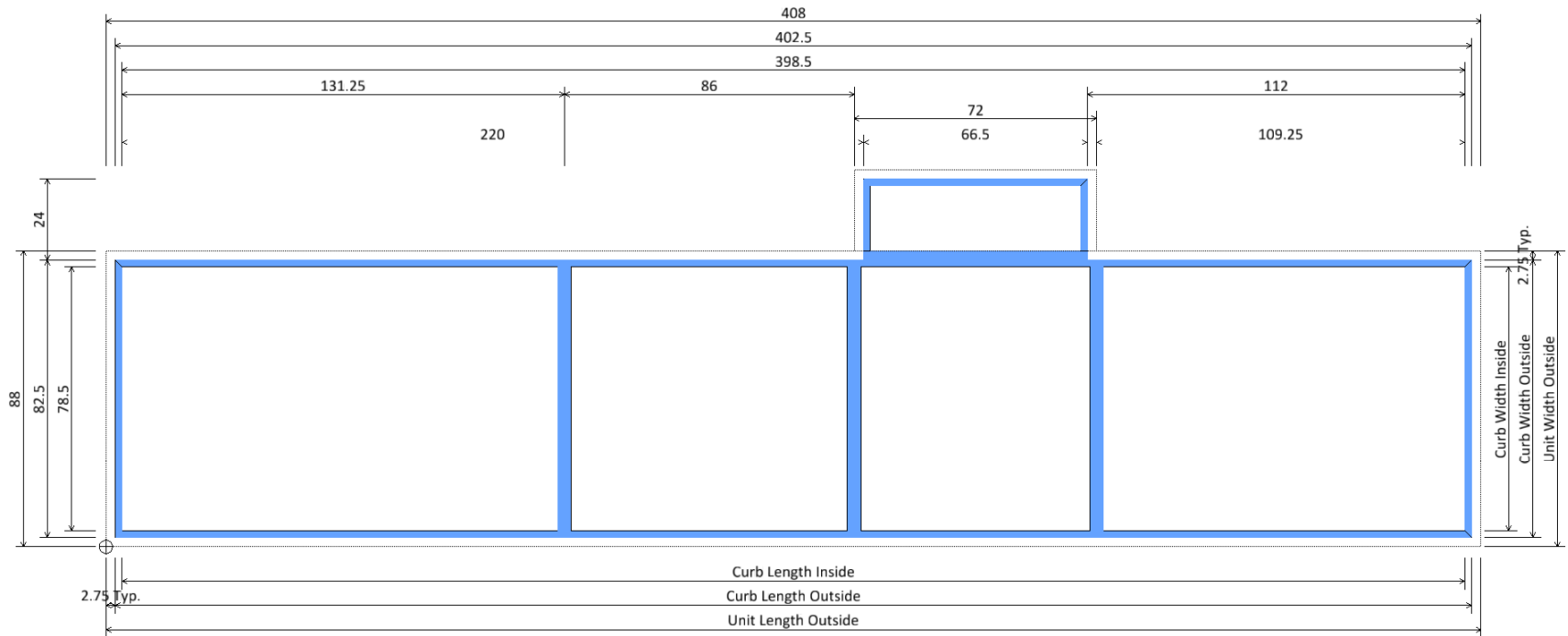
RIGHT ELEVATION VIEW

Coil and Drain Connections				
Type	X	Y	Z	Diam
Chilled Water coil				
Condensate drain conn:	240.00	-2.90	9.00	1.25
Ⓒ Cold water inlet:	240.54	91.00	13.31	2.50
Cold water outlet:	227.54	91.00	37.69	2.50
Ⓒ Cold water inlet:	240.54	91.00	42.31	2.50
Cold water outlet:	227.54	91.00	66.69	2.50
Ⓓ Chilled Water coil				
Condensate drain conn:	276.00	-2.90	9.00	1.25

Note: Dimensions are measured from the origin point.

Coil and Drain Connections		Unit Tag: AHU-3		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH032GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		


All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.



PLAN VIEW



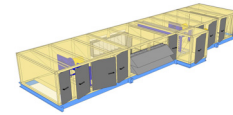
ELEVATION VIEW

Plan/Elevation - No Ends		Unit Tag: AHU-3		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline base		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH032GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25" Dwg Units: in	

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

Technical Data Sheet for AHU-4

Job Information		Technical Data Sheet
Job Name	ImmuCell Portland	
Date	January 11 2017	
Submitted By	Briggs Equipment Sales, Inc.	
Software Version	11.10	
Unit Tag	AHU-4	



Unit Overview

Model Number	Supply						Return/Exhaust					
	Air Volume cfm	Static Pressure		External Dimensions			Air Volume cfm	Static Pressure		External Dimensions		
		External inWc	Total inWc	Height in	Width in	Length in		External inWc	Total inWc	Height in	Width in	Length in
OAH014GDGM	5380	2.00	4.96	40*	76*	234	5380	2.00	2.08	40*	76*	98

*Not including base rails, coil connectors, drain connectors, vestibule sections, control boxes and hoods.

Unit

Model Number:	OAH014GDGM		
Approval:	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)		
Outer Panel:	Painted heavy-gauge G60 Galvanized Steel		
Liner:	Galvanized Steel (unless noted per section)		
Insulation:	R-13 Injected Foam		
Unit Configuration:	Inline horizontal	Drive (Handling) Location:	Right
Base:	Curb ready	Wall Thickness:	2 in
Roof Curb Kit:	18 in	Shrink Wrapping:	Yes
Altitude:	0 ft	Warranty:	Two Years Parts and Labor
High Pressure Door Handles:	Provided		

Exhaust Air Stream

Plenum Section	Component: 1	Length: 18 in	Shipping Section: 1
Opening Location	Opening Size		Air Pressure Drop
Bottom	14.00" x 72.00"		0.04 inWc
Door			
Location	Width		Opening
Drive side	14 in		Outward

Access Section	Component: 2	Length: 24 in	Shipping Section: 1
Door			
Location	Width		Opening
Drive side	20 in		Outward

Technical Data Sheet for AHU-4

Return/Exhaust Fan	Component: 3	Length: 32 in	Shipping Section: 1
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Fan Performance

Air Volume	Static Pressure			Brake Horsepower	Speed		Fan Circuit	
	External	Total	Cabinet		Operating	Maximum	MOP	MCA
2690 cfm (per fan) 5380 cfm (total)	2.00 inWc	2.08 inWc	0.00 inWc	1.61 BHP (per fan) 3.22 BHP (total)	2632 rpm	3909 rpm	15.0 A	8.3 A

Fan Data

Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location
Centrifugal - Plenum	Airfoil / 2	2	14.00 in	Aluminium	9	Axial	Behind Fan

Motor Data (Typical of 2)

Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*
3.0 HP	460/60/3 V/Hz/Phase	3500 rpm	Premium	TEFC	182 T frame	Generic	2	32 A	3.7 A

Fan Options

Seismic Restraint:	With snubbers	Block Off Plate:	Yes
Isolator Type:	Spring		

Door

Location	Width	Opening
Drive side	28 in	Outward

Access Section	Component: 4	Length: 24 in	Shipping Section: 1
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Door

Location	Width	Opening
Drive side	20 in	Outward

Economizer	Component: 5	Length: 68 in	Shipping Section: 2
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Portion	Damper				Rated CFM	Air Pressure Drop	Quantity	Hoods
	Size (length x width)		Location	Type				
	Overall	Opening						
Outside Air	32 in x 30 in	26 in x 20 in	Right	UltraSeal Low Leak	5380 cfm	0.04 inWc	2	Fitted
Return Air	32 in x 30 in	26 in x 20 in	Internal	UltraSeal Low Leak	5380 cfm	0.04 inWc	2	N/A
Exhaust Air	32 in x 30 in	26 in x 20 in	Left	UltraSeal Low Leak	5380 cfm	0.04 inWc	2	None

Supply Air Stream

Combination Filter	Component: 1	Length: 16 in	Shipping Section: 2
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Access	Face Velocity	Face Area	Air Volume
Side	358 ft/min	15.0 ft ²	5380 cfm

Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Pre-Filter	Pleated	MERV 8	0.15 inWc	0.57 inWc	1.00 inWc	3	20 in	24 in	2 in
						3	12 in	24 in	2 in
Filter	AmAir 1300	MERV 13	0.14 inWc	0.57 inWc	1.00 inWc	3	20 in	24 in	4 in
						3	12 in	24 in	4 in

Technical Data Sheet for AHU-4

Door		
Location	Width	Opening
Drive side	12 in	Outward
Special Text		
Extra filters 1 set(s)		

Chilled Water Coil		Component: 2			Length: 36 in		Shipping Section: 3		
Coil Model	Total Capacity	Sensible Capacity	Number of Coils	Number of Rows	Fins per Inch	Tube Diameter	Tube Spacing (Face x Row)		
5WS0908B	222665 Btu/hr	164674 Btu/hr	1	8	9	0.625 in	1.50 in x 1.299 in		
Air Volume	Air Temperature				Coil Air Pressure Drop	Finned Height	Finned Length	Face Area	Face Velocity
	Entering		Leaving						
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb					
5380 cfm	74.2 °F	61.4 °F	46.2 °F	46.0 °F	0.68 inWc	30 in	63 in	13.13 ft ²	410 ft/min
Fluid		Flow Rate	Pressure Drop	Velocity	Volume	Weight	Piping Vestibule		
Entering	Leaving	44.00 gpm	12.70 ftHd	2.40 ft/s	14.0 gal	119.00 lb	24 in		
38.0 °F	48.5 °F								
Connection					Glycol Type	Min. Fin Surface Temp.	Min. Tube Wall Surface Temp.	Fouling Factor	
Type	Quantity	Size	Location	Material					
Threaded	2	2.00 in	Drive side	Carbon steel	Propylene (30%)	38.0 °F	38.0 °F	0.000	
Material					Drain Pan	Drain Side	Turbospiral		
Fin	Tube	Header	Case		Stainless steel	Opp drive side	Yes		
Aluminum .0075 in	Copper .020 in	Copper	Galv. steel						

AHRI 410 Certification

Coil is NOT certified by AHRI Due to Use of Glycol

Door		
Location	Width	Opening
Drive side	- in	Outward

Access Section		Component: 3		Length: 24 in		Shipping Section: 3	
Door							
Location		Width		Opening			
Drive side		20 in		Outward			

Technical Data Sheet for AHU-4

Supply Fan		Component: 4		Length: 32 in		Shipping Section: 3			
Fan Performance									
Air Volume		Static Pressure		Brake Horsepower		Speed		Fan Circuit	
		External	Total			Cabinet	Operating	Maximum	MOP
2690 cfm (per fan) 5380 cfm (total)		2.00 inWc	4.96 inWc	0.00 inWc	3.28 BHP (per fan) 6.56 BHP (total)	3215 rpm	3909 rpm	15.0 A	13.3 A
Fan Data									
Fan Type	Blade Type / Class	Quantity of Fans	Wheel Diameter	Material Type	Number of Blades	Discharge	Motor Location		
Centrifugal - Plenum	Airfoil / 2	2	14.00 in	Aluminium	9	Axial	Behind Fan		
Motor Data (Typical of 2)									
Power	Electrical Supply	Speed	Efficiency	Enclosure	Frame Size	Supplier	Number of Poles	Lock Rotor Current*	Full Load Current*
5.0 HP	460/60/3 V/Hz/Phase	3500 rpm	Premium	TEFC	184 T frame	Generic	2	46 A	5.9 A
Fan Options									
Seismic Restraint:		With snubbers			Block Off Plate:		Yes		
Isolator Type:		Spring							
Door									
Location			Width			Opening			
Drive side			28 in			Outward			
Access Section		Component: 5		Length: 24 in		Shipping Section: 4			
Door									
Location			Width			Opening			
Drive side			20 in			Outward			
Special Options									
Tread Plate Floor Liner									
Tread plate installed									
Final Filter		Component: 6		Length: 16 in		Shipping Section: 4			
Access		Face Velocity		Face Area		Air Volume			
Front		533 ft/min		10.1 ft ²		5380 cfm			
Portion	Type	Efficiency	Air Pressure Drop			Number of Filters	Height	Width	Depth
			Clean Air	Mean Air	Dirty Air				
Final	Varicel SH cartridge	MERV 14	0.64 inWc	1.07 inWc	1.50 inWc	1	24 in	24 in	12 in
						2	24 in	20 in	12 in
Plenum Section		Component: 7		Length: 18 in		Shipping Section: 4			
Opening Location			Opening Size			Air Pressure Drop			
Bottom			14.00" x 72.00"			0.01 inWc			
Door									
Location			Width			Opening			
Drive side			14 in			Outward			

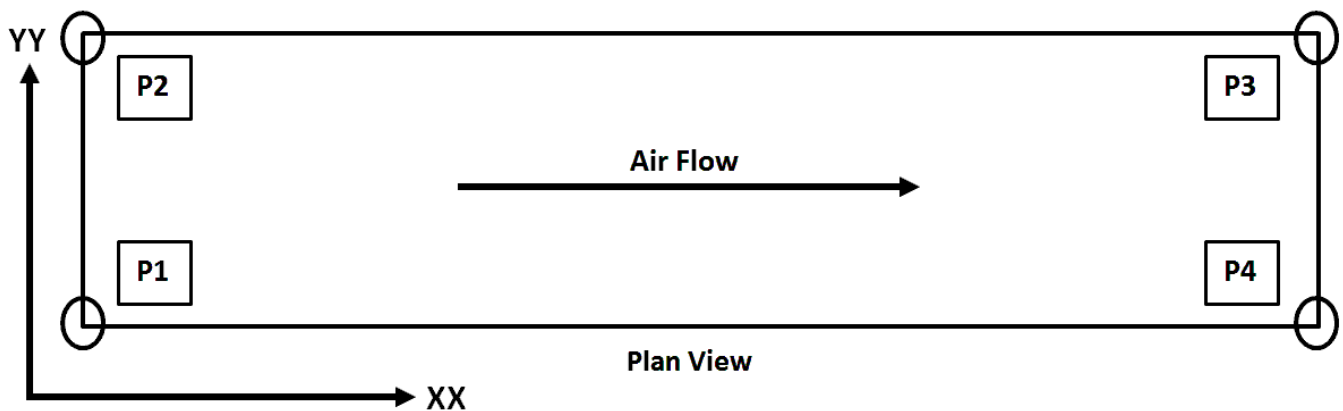
Technical Data Sheet for AHU-4

Unit Sound Power (dB)

Type	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Radiated:	70	69	63	72	65	58	51	51
Unit Discharge:	71	71	69	75	73	65	64	55
Unit Return:	71	69	71	84	69	75	78	67

Shipping Section Details

Section	Length in	Weight lb	Corner Weights (lb)				Center of Gravity (in)		
			P1	P2	P3	P4	XX	YY	ZZ
1	98	1928	467	467	496	496	50	38	22
2	84	1371	351	351	335	335	41	38	23
3	92	2139	557	534	513	535	45	37	22
4	58	927	229	229	235	235	29	38	23
5	36	241	60	60	60	60	18	12	23
Entire Unit	332	6606	1732	1552	1570	1752	167	36	22
Roof Curb	332	896							



NOTE: Piping vestibule shipping section length(s) not included in the total shipping section length.

NOTE: Special components aren't included in the corner weights and center of gravity data.

AHRI Certification



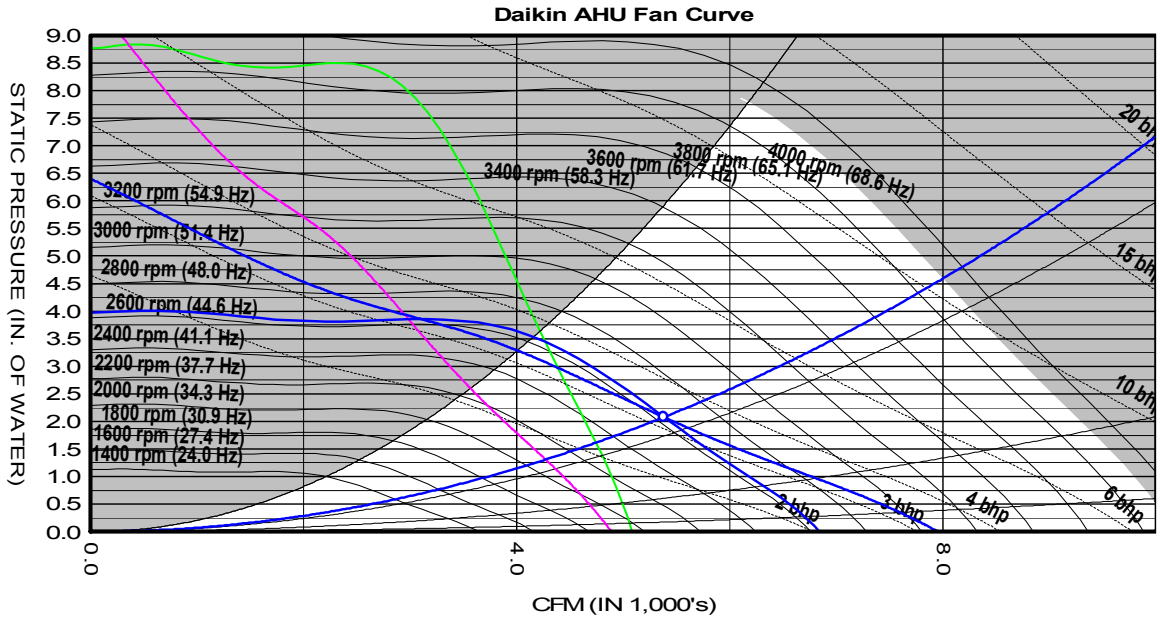
Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.

Notes

Standard

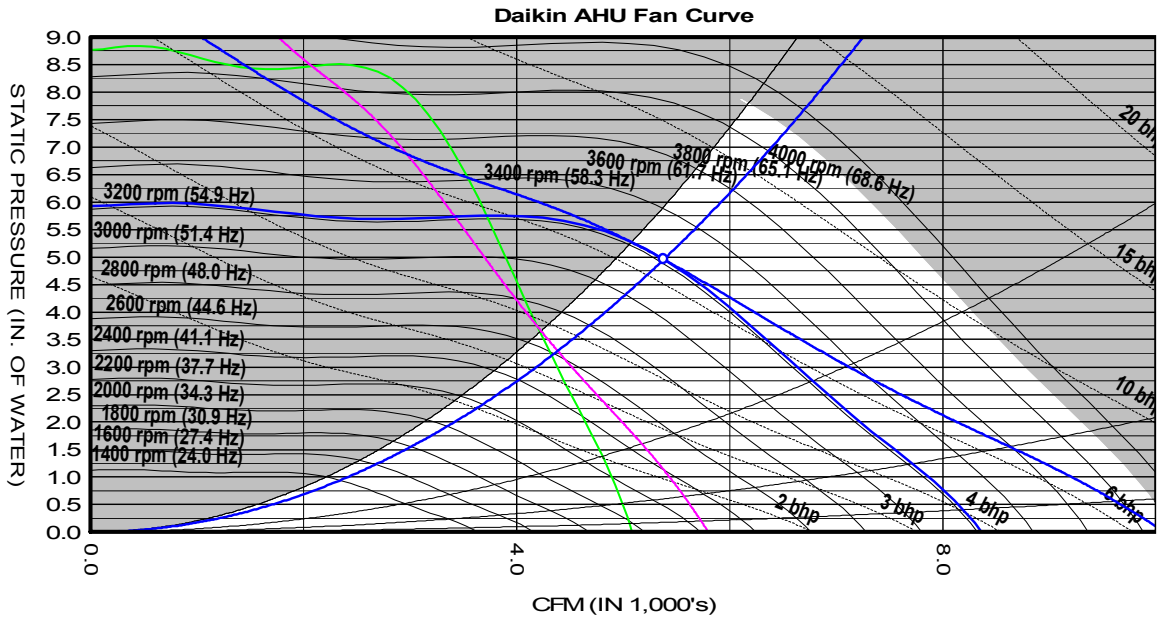
- As a standalone component, unit meets or exceeds requirements of ASHRAE 90.1 - 2007. The approving authority is responsible for compliance of multi-component building systems.
- Note: Pre-filter media not provided by Daikin Applied, quantity and size data is for informational purposes only.

Fan Curve for AHU-4



AF 15 DD PLENUM 9BL (100% Width) 1x2 Ret/Exh Fan at Standard Conditions					
Air volume	5380	cfm	Fan speed	2632	rpm
Total static	2.08	insWg	Max speed	3909	rpm
Brake horsepower	3.2	bhp	Efficiency	54.4	%
Approx VFD Setting	45.1	Hz	Motor Speed	3500	rpm
Redundancy	79.4	%			
Unit tagging	AHU-4		Date	January-11-2017	
Job name	ImmuCell Portland		Time	10:30	

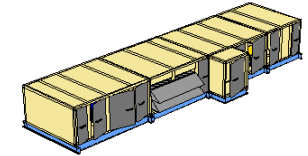
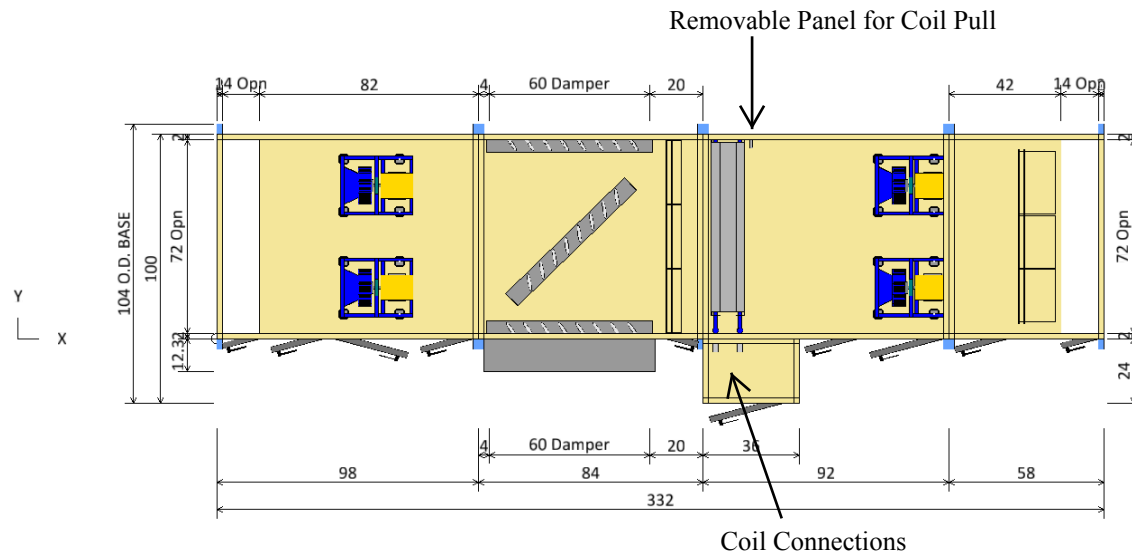
Fan Curve for AHU-4



AF 15 DD PLENUM 9BL (100% Width) 1x2 Supply Fan at Standard Conditions				
Air volume	5380	cfm	Fan speed	3215 rpm
Total static	4.96	insWg	Max speed	3909 rpm
Brake horsepower	6.6	bhp	Efficiency	64.0 %
Approx VFD Setting	55.1	Hz	Motor Speed	3500 rpm
Redundancy	81.5	%		
Unit tagging	AHU-4		Date	January-11-2017
Job name	ImmuCell Portland		Time	10:30

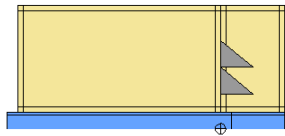


Supply fan performance is certified in accordance with the Central Station Air-Handling Unit Certification Program, which is based on AHRI Standard 430.

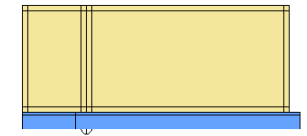
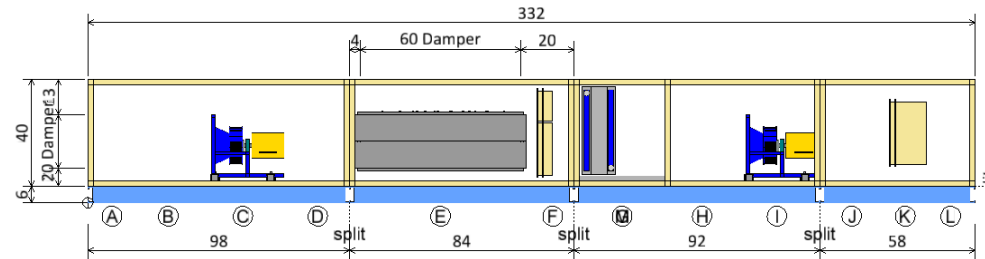


PLAN VIEW

ISOMETRIC VIEW




Z
X

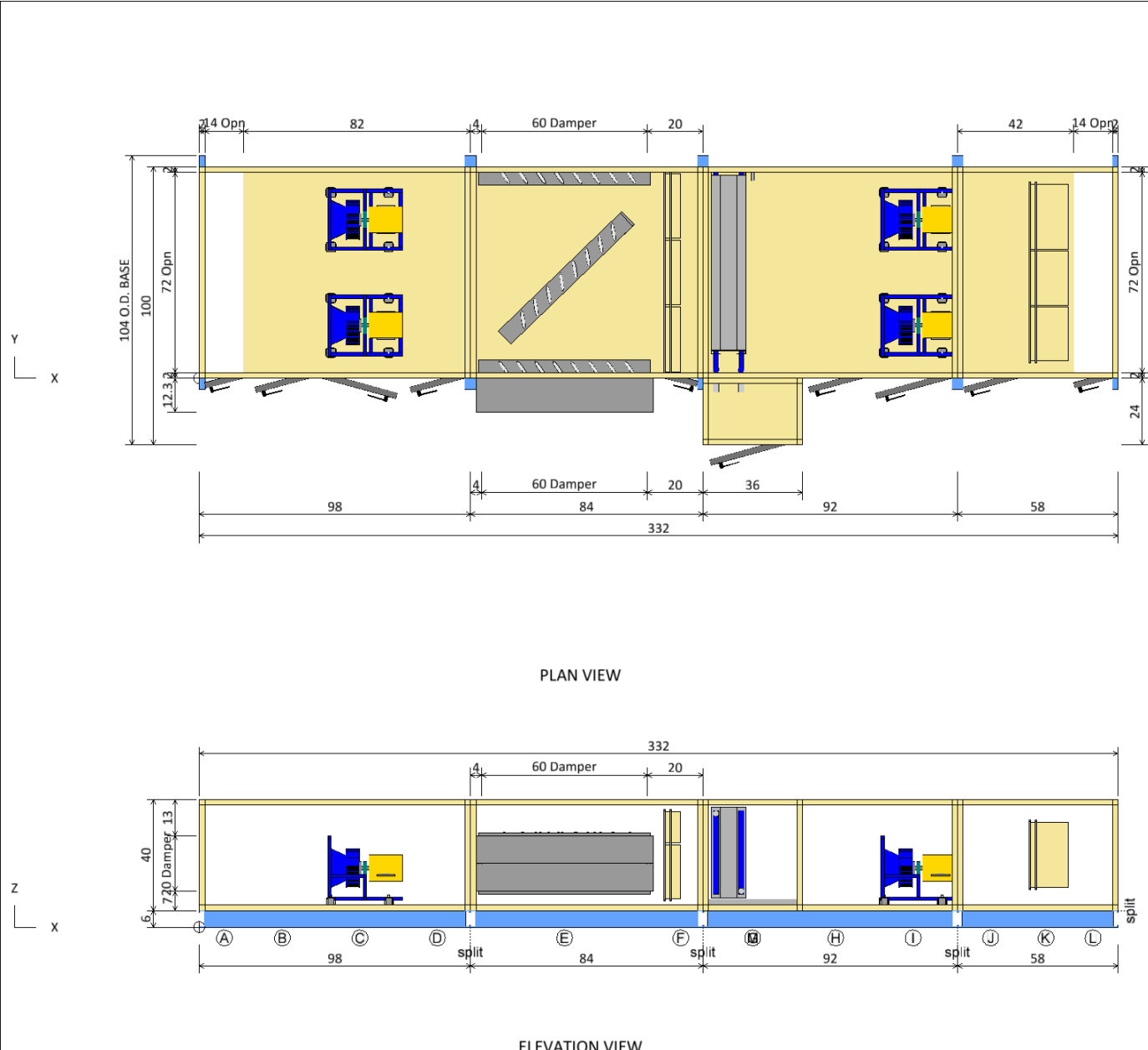


FRONT END VIEW

ELEVATION VIEW


REAR END VIEW

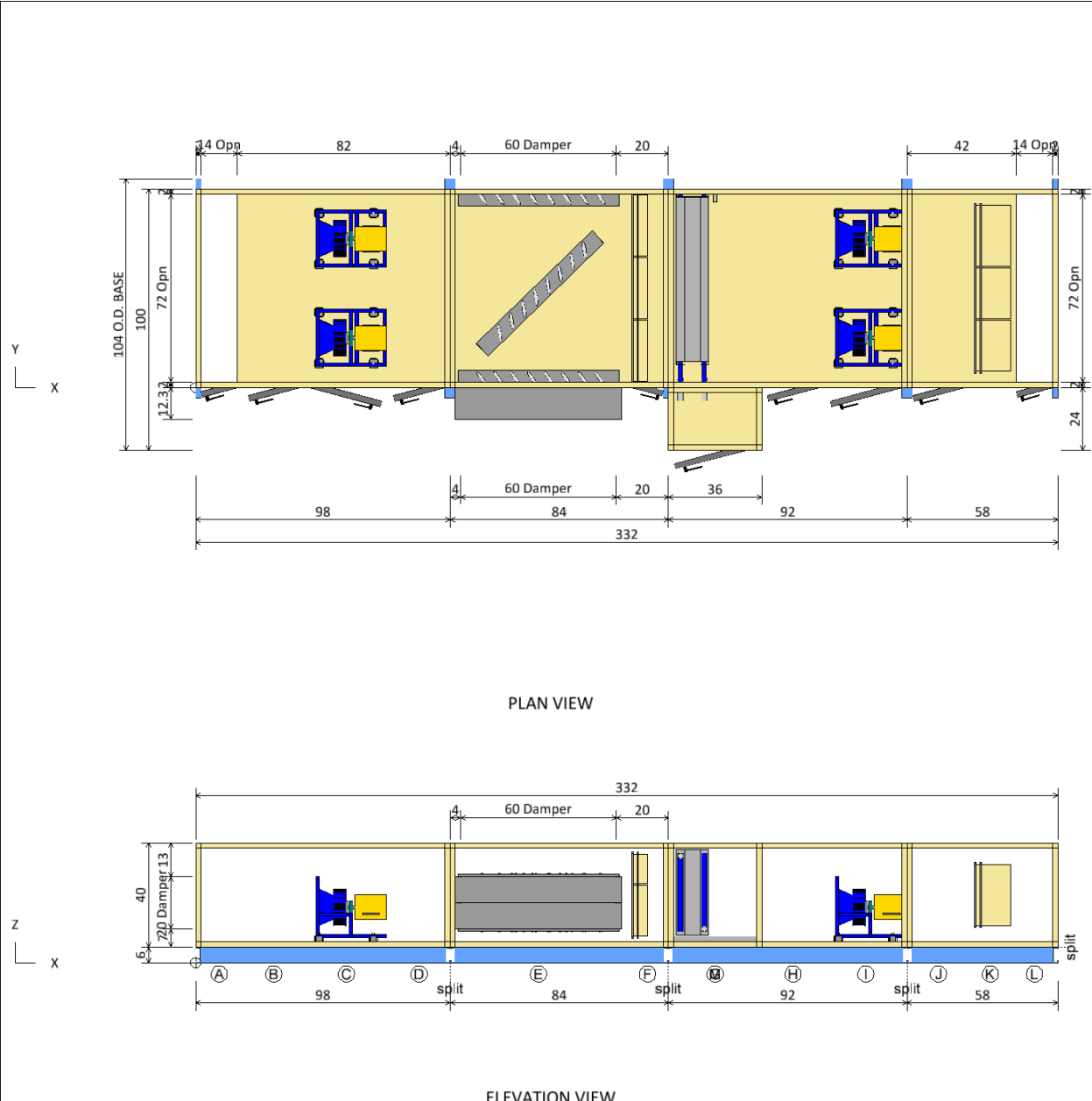
Plan/Elevation	Unit Tag: AHU-4		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler	Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH014GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		



Component Key	
Plenum Section	
Ⓐ Opening Location:	Bottom
Opening Size:	14 ins x 72 ins
Right Door (WxH):	14 ins x 36 ins
Access Section	
Ⓑ Right Door (WxH):	20 ins x 36 ins
Return Fan	
Fan Type:	Centrifugal - Plenum
Fan Size (Class):	15 (2)
Ⓒ Air Flowrate:	2690.0 cfm
T.S.P.:	2.1 insWg
Motor Power:	3.0 HP
Right Door (WxH):	28 ins x 36 ins
Access Section	
Ⓓ Right Door (WxH):	20 ins x 36 ins
Double Mixing Box	
Panel and Bag Filter	
Ⓕ Pre Filter Type:	Pleated (MERV 8)
Bag Filter Type:	AmAir 1300
Right Door (WxH):	12 ins x 36 ins
Chilled Water coil	
Ⓖ Coil Model:	5WS0908B
Total Capacity:	222665.0 Btu/hr
Left Door (WxH):	28 ins x 36 ins
Access Section	
Ⓗ Right Door (WxH):	20 ins x 36 ins
Supply Fan	
Fan Type:	Centrifugal - Plenum
Fan Size (Class):	15 (2)
Ⓘ Air Flowrate:	2690.0 cfm
T.S.P.:	5.0 insWg
Motor Power:	5.0 HP
Right Door (WxH):	28 ins x 36 ins
Access Section	
Ⓙ Right Door (WxH):	20 ins x 36 ins
Panel and Cartridge Filter	
Ⓚ Pre Filter Type:	None - Future Filter
Cartridge Filter Type:	Varicel SH
Plenum Section	
Ⓛ Opening Location:	Bottom
Opening Size:	14 ins x 72 ins
Right Door (WxH):	14 ins x 36 ins
Vestibule Section	
Ⓜ Right Door (WxH):	28 ins x 36 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.


Plan/Elevation - No Ends		Unit Tag: AHU-4		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH014GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	

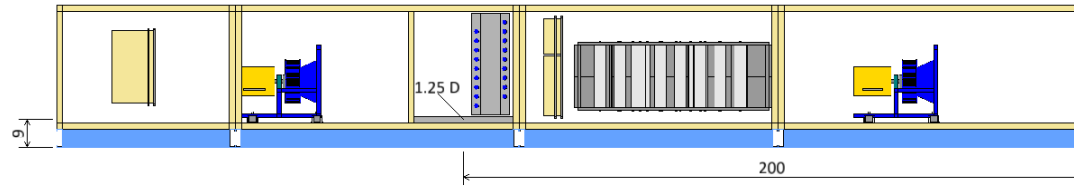


Component Key						
Type	X	Y	Z	Wid	Hgt	
Ⓐ Plenum Section Opening	2.00	2.00	6.00	72.00	14.00	
Ⓔ Double Mixing Box						
Ⓔ Outside air damper	102.00	0.00	13.00	20.00	60.00	
Ⓔ Exhaust air damper	102.00	76.00	13.00	20.00	60.00	
Ⓐ Plenum Section Opening	316.00	2.00	6.00	72.00	14.00	

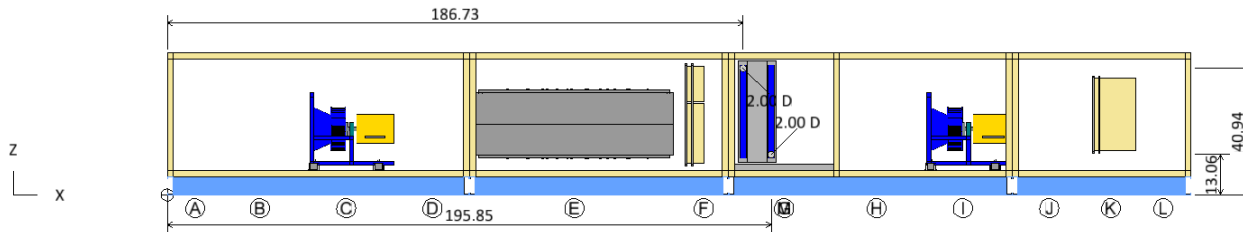
Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Note: Dimensions are measured from the origin point.

Opening/Damper Connections		Unit Tag: AHU-4		Sales Office: Briggs Equipment Sales		 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10	
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH014GDGM		Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS		




LEFT ELEVATION VIEW

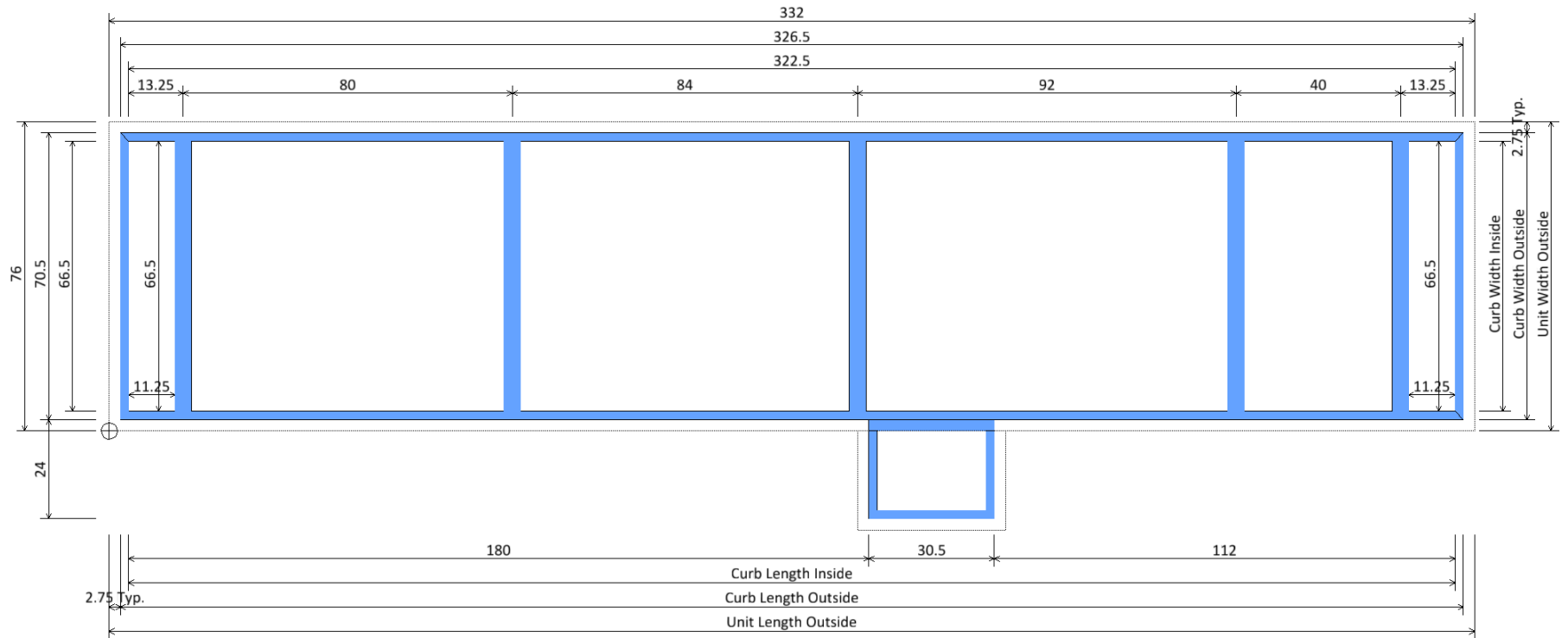


RIGHT ELEVATION VIEW

Coil and Drain Connections				
Type	X	Y	Z	Diam
Chilled Water coil				
⑥ Condensate drain conn:	200.00	78.90	9.00	1.25
Cold water inlet:	195.85	-7.00	13.06	2.00
Cold water outlet:	186.73	-7.00	40.94	2.00

Note: Dimensions are measured from the origin point.


Coil and Drain Connections		Unit Tag: AHU-4		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline Air Handler		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH014GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in	



PLAN VIEW



ELEVATION VIEW

Plan/Elevation - No Ends		Unit Tag: AHU-4		Sales Office: Briggs Equipment Sales			 13600 Industrial Park Blvd, Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 11.10
Product: Skyline base		Project Name: ImmuCell Portland		Sales Engineer:			
Model: OAH014GDGM	Jan. 11, 2017	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in	

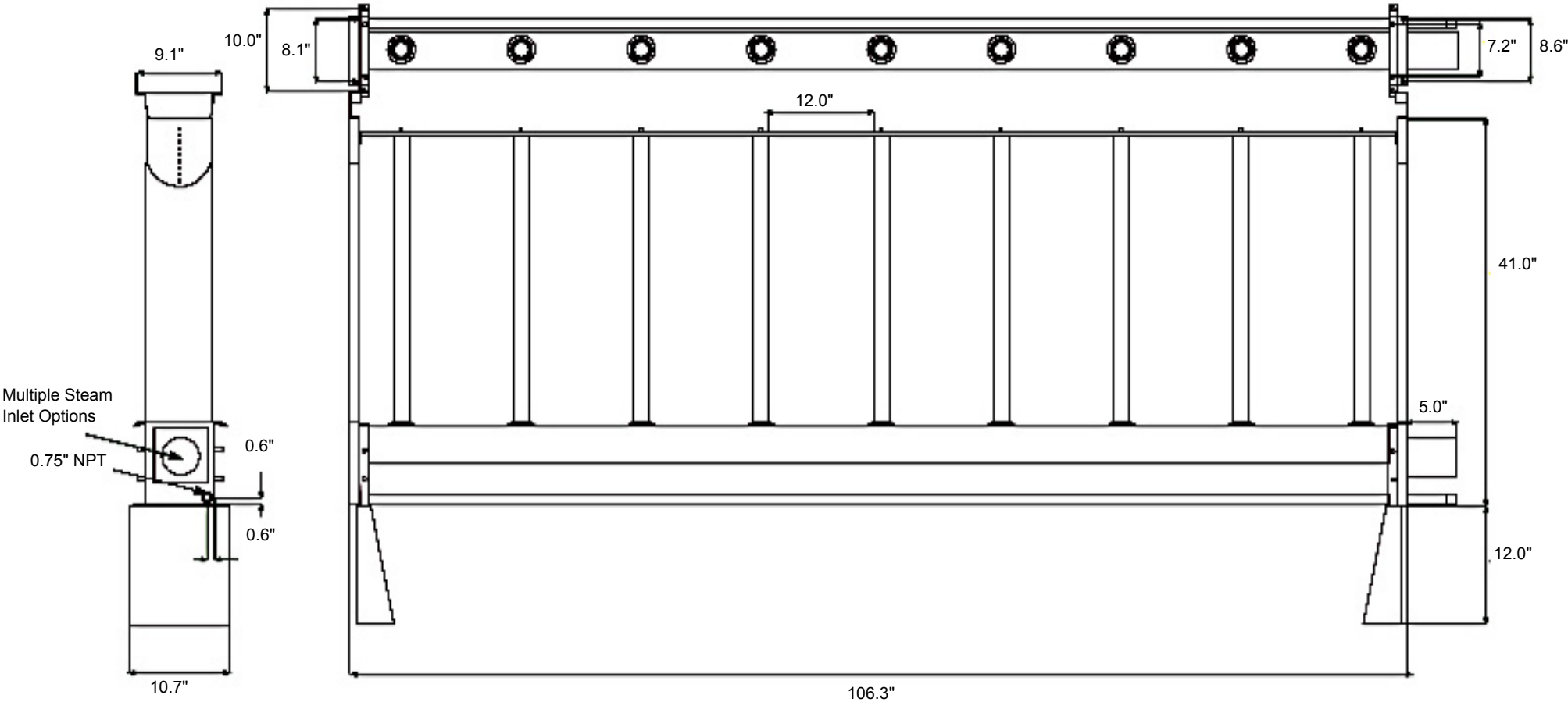
Immucell Humidifier Data

Tag:	Grid Size W x H	Capacity #/Hr	Inlet PSI	Valve Size	Valve Cv	Tube Spacing	Tube Qty	Absorption Distance	Notes
AHU-1	108" x 59"	150	25	1/2"	2.8	12"	9	0.43 ft	All SS Construction
AHU-2	68" x 38"	200	25	1/2"	3.6	3"	19	1.54 ft	All SS Construction
AHU-3	60" x 48"	55	25	1/2"	1.3	12"	5	0.60 ft	All SS Construction

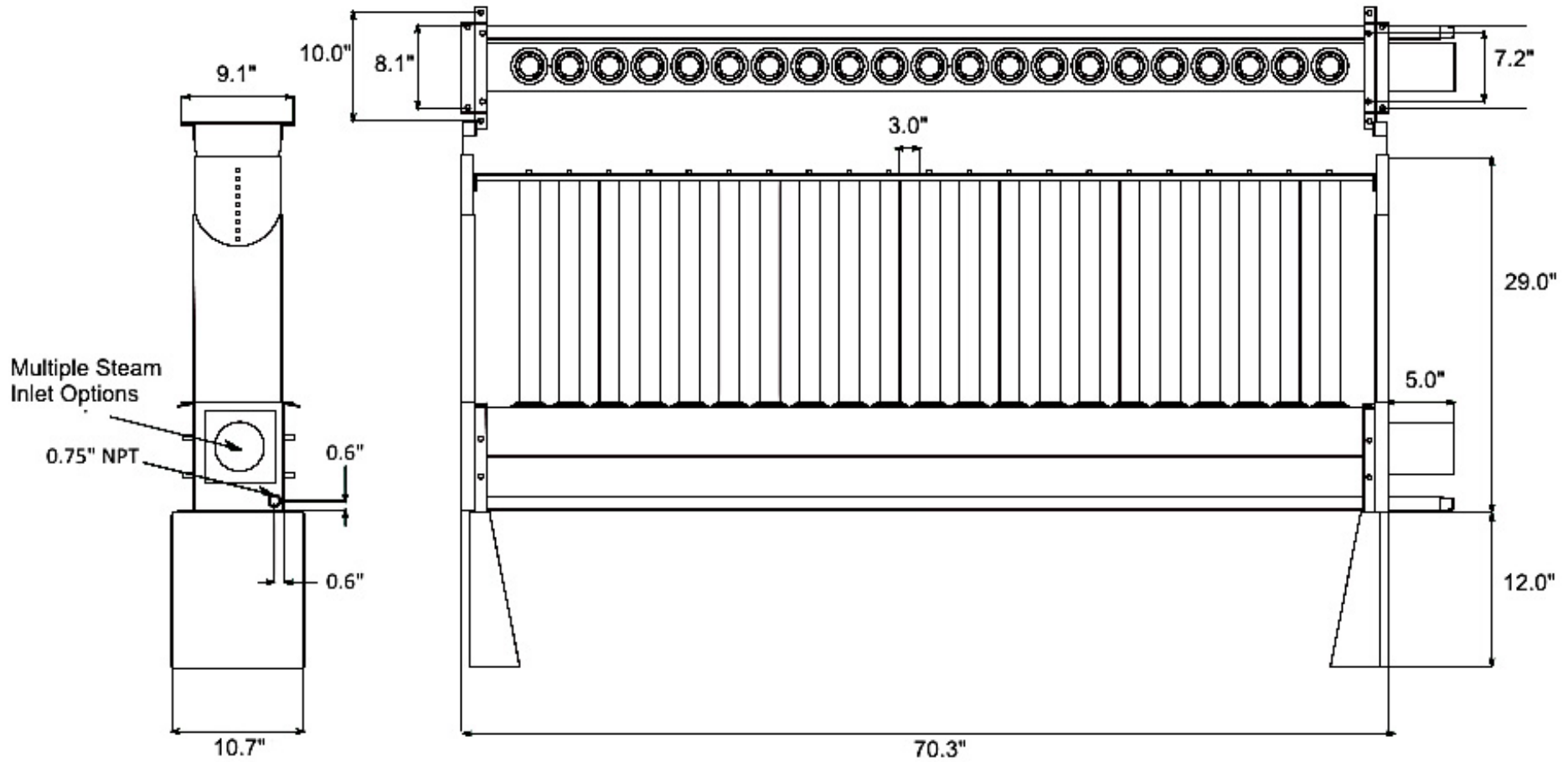
All Humidifiers Include the Following:

Item	Part Number	Description
Actuator 0-10Vdc 1/2"	1507549	<u>LIVESTEAM / SE Series Electric Modulating Actuator</u> , provides motive power to operate steam valves. The actuators are designed mount directly to the valves without the use of linkages. They are linear acting and feature a return spring to close the valve in case of a loss of power. A manual override simplifies commissioning and allows the user to set the correct pre-load tension on the valve stem. The actuators are designed for safe operation and feature overload protection as well as a plenum rated polymer housing. Control voltage, 0-10VDC feedback signal reports position of the valve. All actuators a operate with a 24 VAC supply voltage.
Wye Strainer, 0.75 in. NPT, SST	1599631	<u>LIVESTEAM Wye Strainer</u> , used in the supply steam line to remove impurities by filtering the steam through a strainer screen, stainless steel construction.
Trap Inv Bucket SS up to 75 psig	1599616	<u>Stainless Steel LIVESTEAM Steam Trap</u> , inverted bucket for pressures up to 75 psig. The trap allows removal of condensate from a pressurized steam system while preventing the passage of steam.

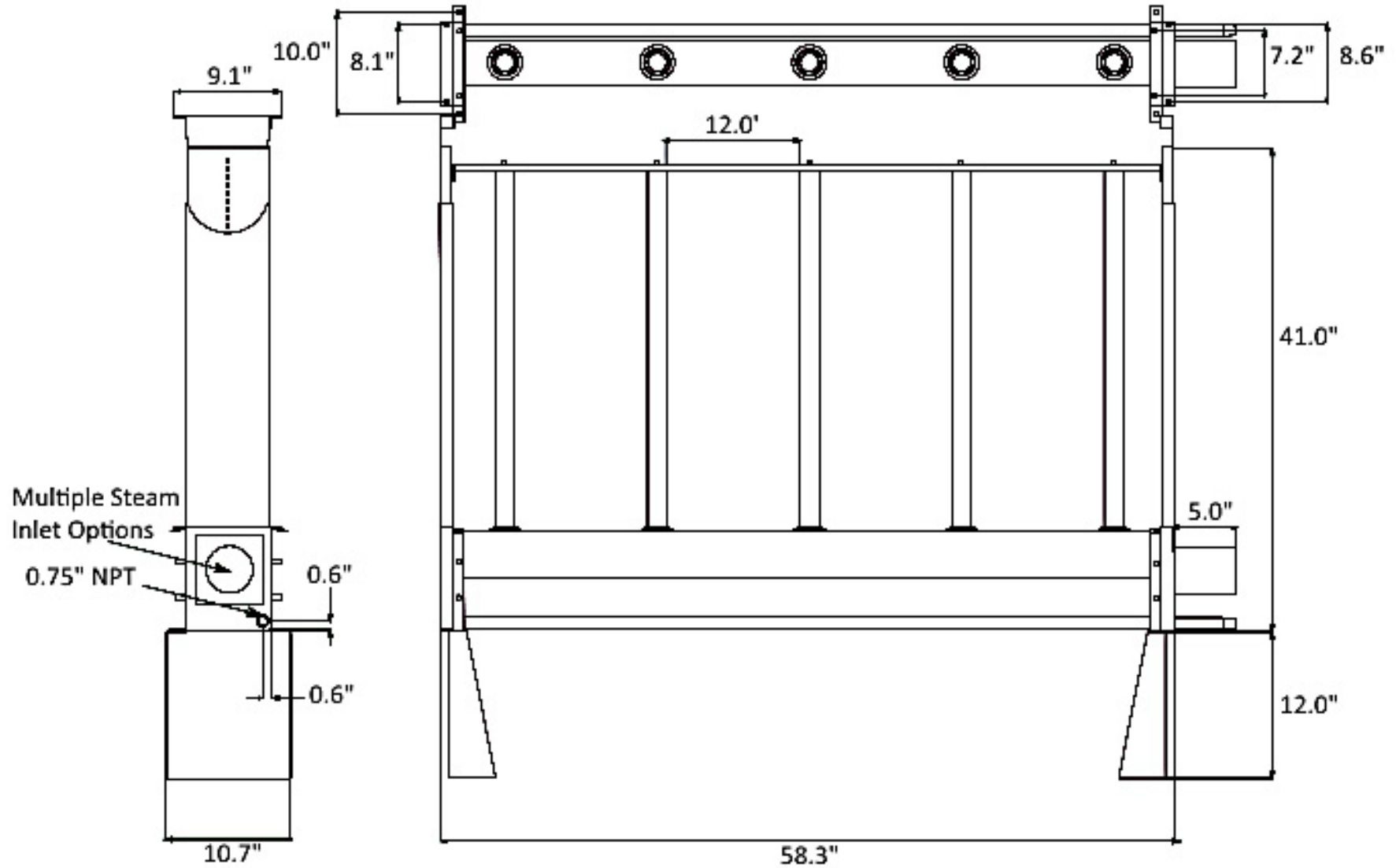
TAG: AHU-1



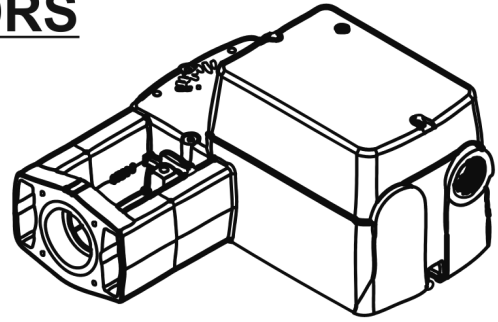
TAG: AHU-2



TAG: AHU-3



ELECTRIC ACTUATORS



For bronze 1/2" - 2" and stainless steel 1/2" - 3/4" valves, for incoming pressures from 2 to 50 psi for all valves, except for 1 1/2" which would be 2 to 34 psi and 2" which would be 2 to 19 psi.

Actuator Inputs

Control Signal: On/Off, 0-10 Vdc, ~~4-20 mAdc~~

Power Input: See Table-1. All 24 Vac circuits are Class 2. All circuits 30 Vac and above are class 1.

Connections: 3 ft (91cm) appliance wire or plenum cables, enclosure accepts 1/2" (13mm) conduit connectors. For M20 metric connector, use 1/2" NPT to M20 adaptor.

Actuator Outputs

Electrical:

Position Feedback Voltage (proportional or floating only): For voltage ranges, the feedback signal is the same range as the input signal. The 4-20 mAdc current range and floating actuators have a 2-10 Vdc position feedback signal. The position feedback signal can supply up to 0.5 mA to operate up to 4 additional slave actuators.

Mechanical:

Linear Stroke: 1/2" (13mm) nominal.

Approx. Stroke Timing: Powered, 44-60 sec.

Manual Override: Allows positioning of valve and pre-load using manual crank.

Right/Left Jumper: Permits reverse acting/direct acting linear motion (0-10 Vdc and 4-20 mAdc only).

Environment:

Shipping & Storage: -40 to 160°F (-40 to 71°C)

Operating: -22 to 140°F (-30 to 60°C)

Temperature Restrictions: For maximum ambient 140°F (60°C) the maximum allowable fluid temperature should not exceed 366°F (186°C).

Humidity: 15-95%RH, non-condensing

Location: NEMA 1. NEMA 2 (enclosure is air plenum rated), UL Type 2 (IEC IP54) with customer supplied water tight conduit connectors.

Overall Dimensions: 6.76" (172mm) x 3.5" (89mm) x 6.31" (160mm)

Agency Listings

UL 873: Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).

CUL: UL Listed for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No. 24-93.

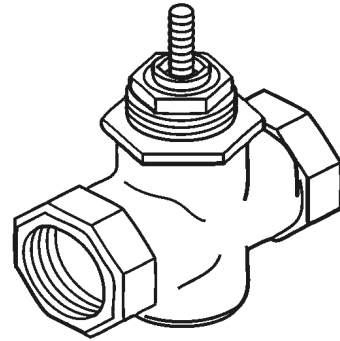
Table 1

Part Number	Control Action	Voltage	Actuator Power Input						Linear Stroke Inches	Approx. Stroke Timing in Seconds @ 70°F (21°C)		Output Force Rating lb (Newton)		
			Running				DC Amps	Holding 50/60Hz		Powered	Spring Return	Min.	Max Stall	
			50Hz VA	50Hz W	60Hz VA	60Hz W								
1507549	0-10 Vdc	24 Vac±20% 20-30 Vdc	6.6	4.2	6.6	4.2	0.14	1.5	1/2	60	16	-	-	
1507550	4-20 mAdc													
1507551	On/Off		5.3	4.1	5.3	4.1	0.15	1.2		44	19			



Electric Actuator
Part # 1507549, 1507550, 1507551

VALVE DATA



Valve Manufacturer: Schneider electric
Valve Model: VBS-9263
Valve Size: 1/2" - 3/4"
Flow Type: Modified Equal Percentage
Flow Coefficient (Cv) Factor: As Specified

Valve Body Data		Material	
Maximum Static Pressure	250 Psig	Body	Stainless Steel
Maximum Inlet Pressure (Steam)	100 Psig	Seat	Stainless Steel
Recommended Differential Pressure	35 Psig	Stem	Stainless Steel
		Plug	Stainless Steel
Maximum Media Temperature	340°F(171°C)	Packing	Spring Loaded Teflon Cone
Plug Type	Parabolic	Disc	EPDM

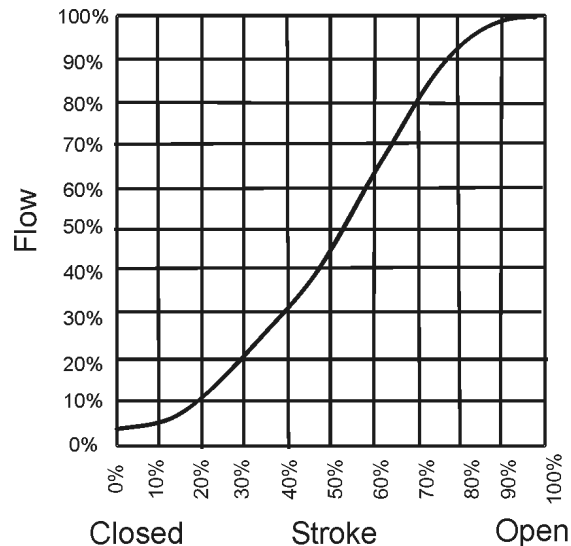
Rangeability:

Rangeability is defined as the ratio of rated flow to the minimum controllable flow.

For two-way valves, modulation occurs when plug displacement allows flow through the area between the plug and the port. The rangeability value is achieved by accurately machining the plug and port diameters for appropriate clearance. The following are normal values, with 25% tolerances.

Nominal Size		Valve Cv	Nominal Ratio
Standard	Metric		
1/2"	15mm	0.1	1:1
		0.22	2:1
		0.4	4:1
		0.75	8:1
		0.95	10:1
		1.3	15:1
		1.75	20:1
		2.2	25:1
		2.8	30:1
		3.6	40:1
	AHU-3		
	AHU-1		
	AHU-2		

Typical Flow Curve



*For representative purposes only

NORTEC reserves the right to ship the selected valve or an equivalent valve depending on availability

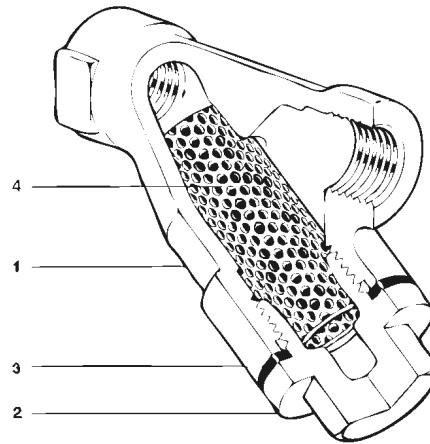


CONTROL VALVE
STAINLESS STEEL BODY

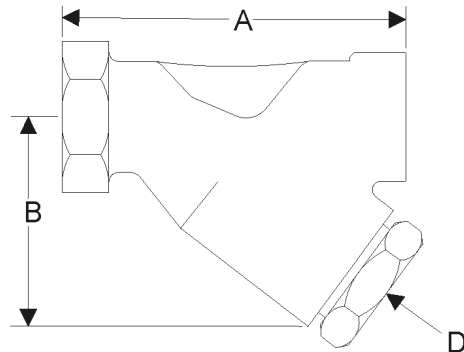
STRAINER DATA

Strainer Type: "Y" Type
 Strainer Size: 1/2" to 2"
 Connection: NPT
 Body Material: Stainless Steel Type 316L
 Screen Material: Stainless Steel Type 316L – 0.040" Perforation
 Pressure (non-shock): 670 psi (4619 kPa) - 748°F (398°C)
 Installation: The strainer should be installed with the flow direction as indicated on the body, in a vertical down or horizontal pipe line. The strainer must be accessible for periodic removal of accumulated debris by either blowing down or removal and cleaning of the screen.

No	Part	Material
1	Body	Type 316L Stainless Steel ASTM A351 GR CF 3M
2	Cap	Type 316L Stainless Steel ASTM A351 GR CF 3M
3	Cap Gasket	Type 316 SS Jacketed Graphite
4	Strainer Screen	Type 316L Stainless Steel



Dimension	A	B	C	D	Weight
Size	inch	inch	inch	NPT	lbs
1/2	2.9	2.0	3.3	1/4"	0.63
3/4	3.6	2.9	4.9	1/2"	2.9
1	4.2	3.3	5.7	1/2"	4.3
1-1/4	5.6	4.2	7.2	1/2"	6.5
1-1/2	6.0	4.5	7.8	1/2"	9.6
2	7.0	5.5	9.4	1/2"	12.9



Note: Plug for port "D" is not supplied by NORTEC.

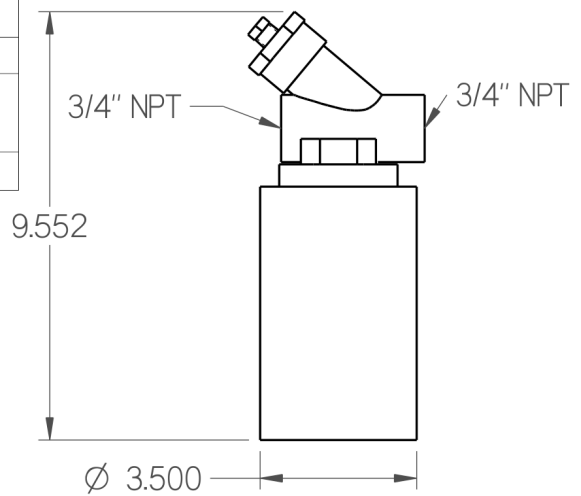
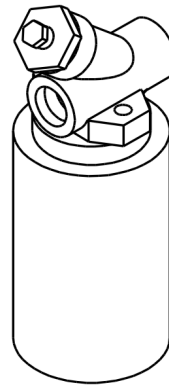


Strainer - Stainless Steel
 Nortec Part #159-9630 to 159-9635

TRAP DATA

- Trap Type:** Float and Thermostatic
- Trap Connection:** 3/4" NPT
- Construction:** Stainless Steel
- Maximum Operating Pressure:** 65 psig (448 kPa)
- Installation:** Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane so that the float rises and falls vertically, and with the direction of flow as indicated on the body. Trap **MUST** be installed with included universal connector.
- Maintenance:** This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.

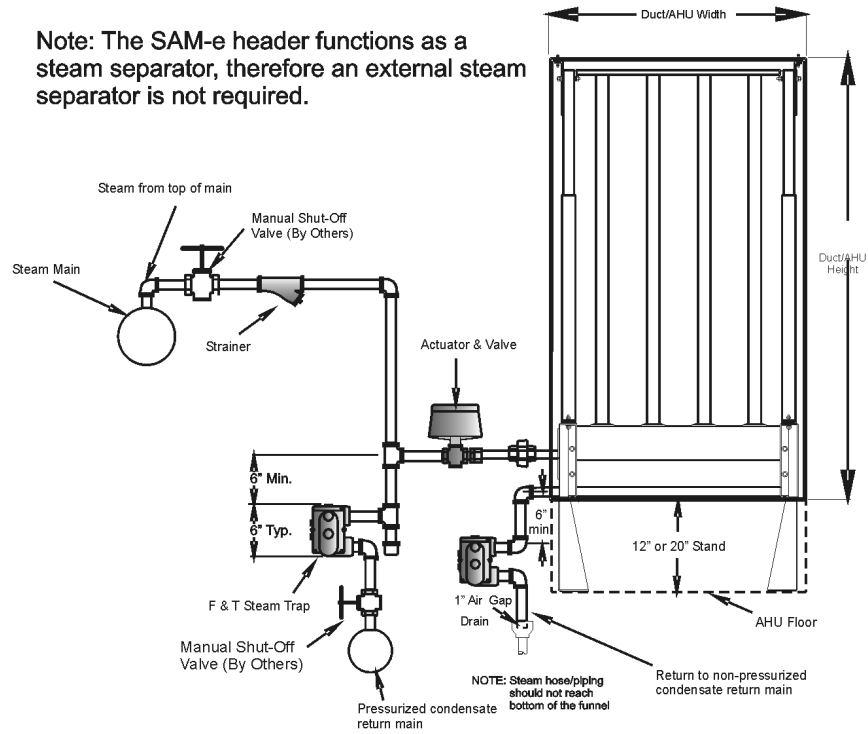
Construction Materials	
Part	Material
Body	Stainless Steel GR CF3
Cover	304L Stainless Steel
Internals	300 Series Stainless Steel
Valve Disc	420F Stainless Steel
Valve Seat	17-4 Ph Stainless Steel
Bolts	17-4 Ph Stainless Steel
Gasket	Spiral-Wound 304 Stainless Steel with Grafoil Filler
Swivel Flange	303 Stainless Steel



Steam Trap - F&T Stainless Steel
 Nortec Part #1599614

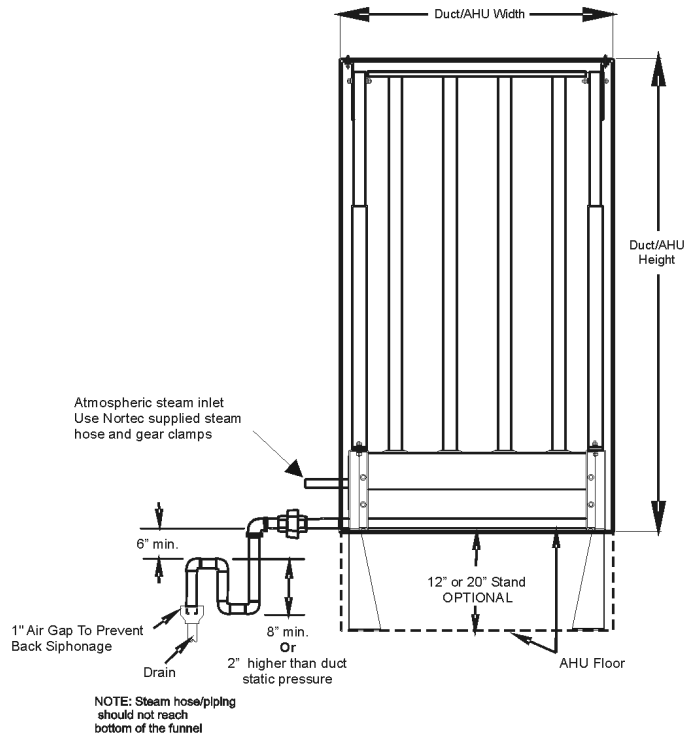
Pressurized Steam

Note: The SAM-e header functions as a steam separator, therefore an external steam separator is not required.

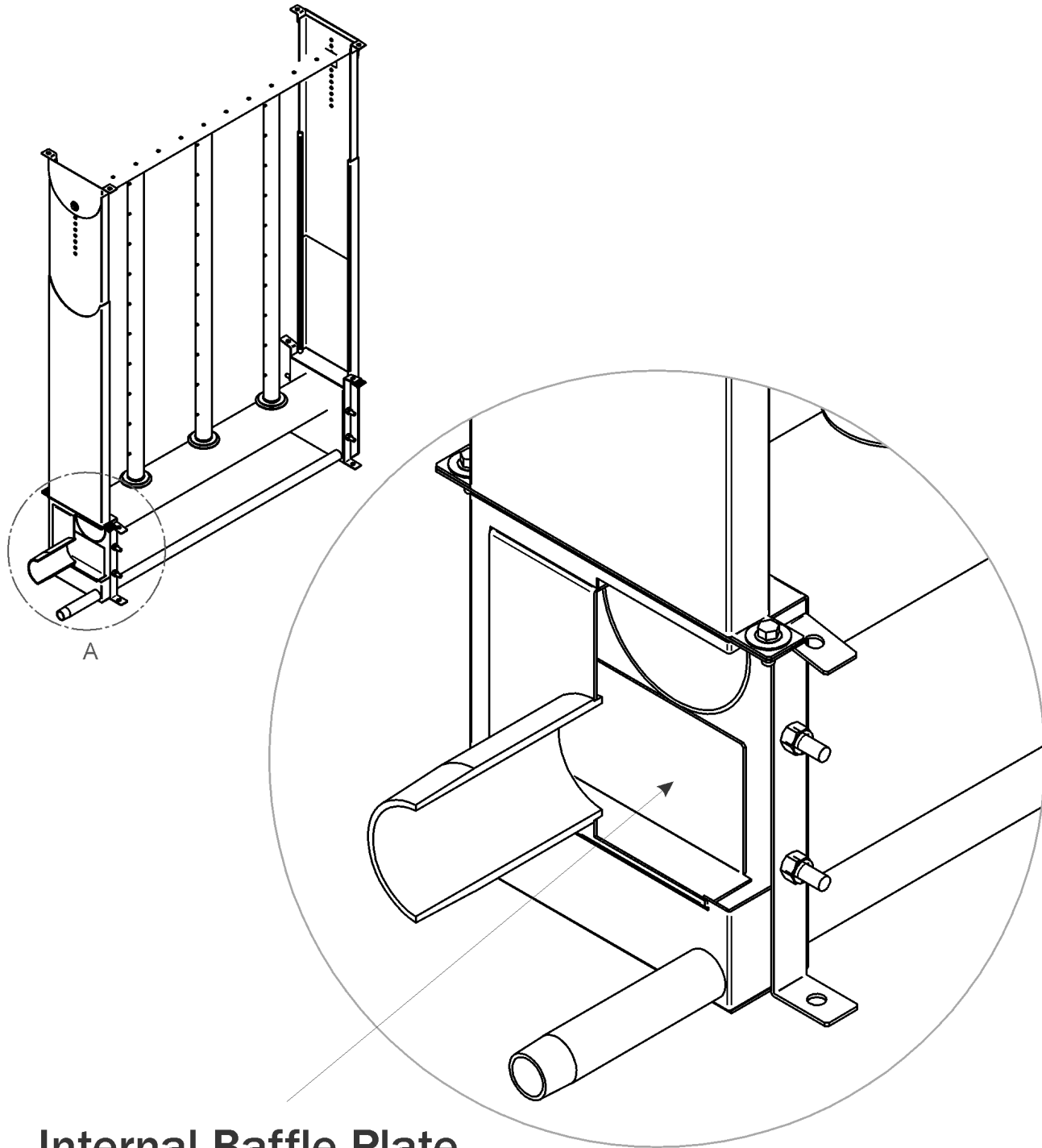


Installation without External Separator

Atmospheric Steam



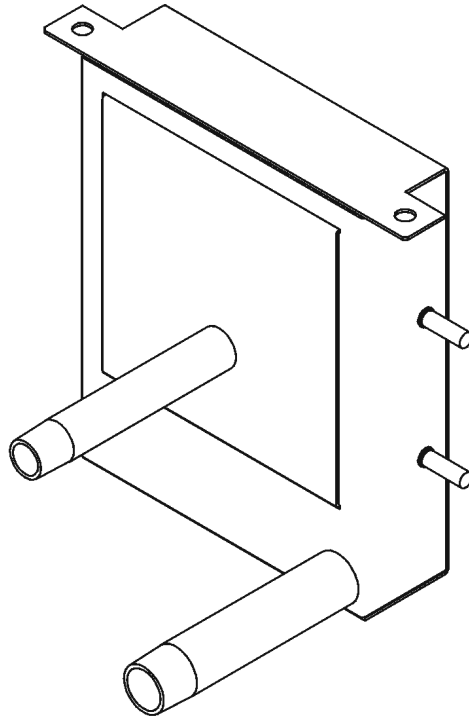
Typical SAM-e Installation for Atmospheric and Pressurized Steam Applications
July 5, 2012



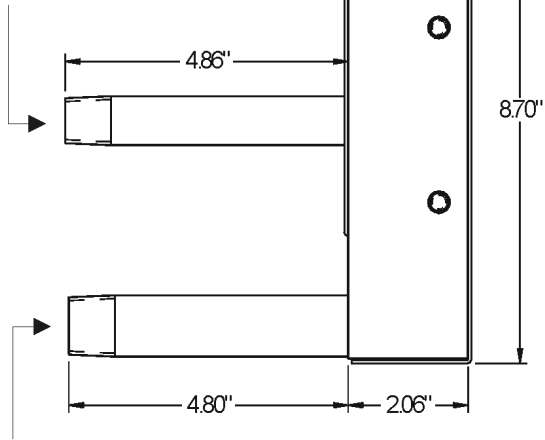
Internal Baffle Plate

DETAIL A

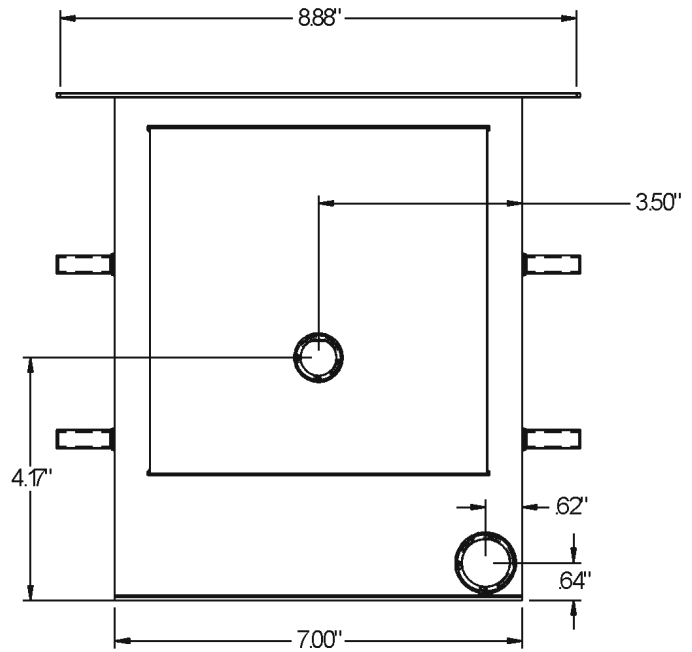
All pressurized SAM-e inlet kits come with a standard internal baffle plate. The baffle plate redirects the flow of steam causing condensate to 'fall out', eliminating the need to install an external steam separator.



Steam Line Connection
1/2" NPT



Condensate Drain
3/4" NPT



Physical Dimensions
1503473 - 1/2" NPT Pressure Inlet

Specifications



LIVESTEAM HUMIDIFIERS

Pressurized Boiler Steam Humidifier (Isothermal Technology)

Humidification system designed to control and distribute steam under pressure, from a facility steam boiler, for introduction into a duct or Air Handling Unit.

The system is configured to operate with regular or purified boiler steam, up to 50 psig, using stainless steel components.

Steam distributors are constructed of high quality stainless steel and can be configured for single or multiple configurations.

All LIVESTEAM systems consist of: a steam valve, separator, actuator/linkage and steam distributor(s). Required optional components: steam trap(s), wye strainers, humidistat(s) and temperature switch.

FEATURES

- Stainless steel separator
- All stainless steel valve construction
- Electric actuator
- Stainless steel steam distributors
- Single distributor capacity: up to 1501 lbs/hr @ 50 psi
- Multiple distributor capacity: up to 3209 lbs/hr @ 50 psi
- Modulating control

Distributors

SAM-e Overview:

The SAM-e precisely distributes either atmospheric or pressure steam uniformly across the entire air stream ensuring short absorption distance.

The SAM-e consists of up to 5 maintenance free components:

- Header
- Inlet Kit
- Distribution tubes
- Mounting frame

SAM-e Headers:

The header is the primary component of the SAM-e providing connections for steam and support for the steam tubes. It is typically installed with vertical tubes for horizontal airflow applications, but can also be mounted horizontally (10 deg. incline from horizontal) for vertical airflow applications. The headers can be ordered with 3, 6, 9, or 12 inch center to center tube spacing for maximum flexibility and optimal steam distribution. Manufactured out of high grade 304 stainless steel, the header features welded inlet and condensate connections to ensure leak-free operation. Specialized synthetic grommets form an air and water-tight seal around the base of the steam tubes, simplifying installation and ensuring reliable leak-free operation.

SAM-e Inlet Kit:

The inlet kit adapts the header to match the humidifier being used. The specific kit is determined based on which humidifier is to be mated with the SAM-e system, and is available for both pressure steam or atmospheric steam applications.

Atmospheric steam inlet kits are made from high quality 304 stainless steel and include a 1 foot long flexible steam hose and 2 clamps for a simple connection to the hard pipe between the humidifier and SAM-e.

Pressurized steam inlet kits are also constructed from high quality 304 stainless steel and are available with male NPT threaded connections.

SAM-e Distribution Tubes:

Distribution tubes are constructed of 1.5" O.D. (3.8 cm) type 304 stainless steel tubing, and stand vertically on the header to disperse steam uniformly into the air stream. To ensure that only condensate free steam is distributed, the distribution tubes feature evenly spaced nozzles on two sides. These nozzles draw condensate free steam from the center of the tube while condensate drains down the tube walls. Any condensate generated drains out through the header eliminating the need for traditional jacketed steam tubes. During manufacturing nozzles are hydraulically pressed into the steam tubes to ensure a leak free seal. Additionally, the nozzles have the same thermal expansion characteristics as the tubes ensuring a permanent union and preventing nozzles from loosening or dislodging over time.

AmAir® 1300

MERV 13 Filters

EXTENDED SURFACE PLEATED PANEL FILTER



- Premium performance and construction
- Synthetic, electrostatically charged media with low initial resistance to airflow
- Excellent as a final filter or prefilter
- 1", 2" and 4" models
- Meets efficiency standards for achieving points toward LEED® Certification
- 4" filters are constructed with pleat stabilizers to ensure uniform spacing and increased rigidity
- MERV 13

Premium Construction and Performance

Designed to meet the demands of the toughest applications, the AmAir® 1300 offers a totally unitized, die-cut box, beverage board frame with double thickness in the perimeter wall. The AmAir 1300 is extremely strong and durable under normal operating conditions.

AmAir 1300 also has a heavy duty, expanded metal pleat support grid laminated to the media pack to increase rigidity and help maintain proper spacing between pleats. Proper pleat spacing ensures maximum efficiency, low resistance, and maximizes dust holding capacity.

The media pack is bonded to the frame at all points of contact. This bonding prevents dirty air bypass and promotes even airflow through the media pack. The AmAir 1300 construction process results in a filter which is very stable, with no racking or vibration of the pleats under normal airflow. Pleat stability minimizes the chances of captured particulate shaking loose and re-entering the airstream.

High Efficiency Media Captures More Fine Particulate

A MERV 13 rating requires 90% efficiency on 1 – 3 micron particles and greater than 90% efficiency on 3 – 10 micron particles, when tested in accordance with ASHRAE Test Standard 52.2. AmAir 1300 meets and exceeds these requirements. Electrostatically charged media has a high initial efficiency and is particularly effective in capturing finer particulate.

Applications

The AmAir 1300 will work in any application where an extended surface pleated panel filter is currently in service. It is particularly suited to applications where high initial efficiency and lower initial resistance are required.



BETTER AIR IS OUR BUSINESS®

AmAir® 1300

Product Information

⁽¹⁾ Standard Sizes ⁽²⁾ Nominal Sizes (inches) (W x H x D)	⁽²⁾ Actual Sizes (Inches) (W x H x D)	Rated Airflow (SCFM)			Pleats Per Filter	Gross Media Area (Sq. Ft.)
		300 FPM	500 FPM	625 FPM		
10 x 10 x 1	9 $\frac{3}{8}$ x 9 $\frac{3}{8}$ x $\frac{7}{8}$	200	—	—	11	1.5
12 x 24 x 1	11 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x $\frac{7}{8}$	600	—	—	14	4.6
16 x 20 x 1	15 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x $\frac{7}{8}$	650	—	—	20	5.5
16 x 25 x 1	15 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x $\frac{7}{8}$	850	—	—	20	6.8
20 x 20 x 1	19 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x $\frac{7}{8}$	850	—	—	24	6.6
20 x 25 x 1	19 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x $\frac{7}{8}$	1050	—	—	24	8.2
24 x 24 x 1	23 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x $\frac{7}{8}$	1200	—	—	28	9.3
12 x 24 x 2	11 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 1 $\frac{3}{4}$	600	1000	—	15	9.4
16 x 20 x 2	15 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 1 $\frac{3}{4}$	650	1100	—	19	9.9
16 x 25 x 2	15 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 1 $\frac{3}{4}$	850	1400	—	19	12.4
18 x 24 x 2	17 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 1 $\frac{3}{4}$	900	1500	—	21	13.2
20 x 20 x 2	19 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 1 $\frac{3}{4}$	850	1400	—	24	12.5
20 x 24 x 2	19 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 1 $\frac{3}{4}$	1000	1650	—	24	15.0
20 x 25 x 2	19 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 1 $\frac{3}{4}$	1050	1750	—	24	15.7
24 x 24 x 2	23 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 1 $\frac{3}{4}$	1200	2000	—	28	17.6
12 x 24 x 4	11 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	600	1000	1250	11	12.8
16 x 20 x 4	15 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 3 $\frac{3}{4}$	650	1100	1400	14	14.0
16 x 25 x 4	15 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 3 $\frac{3}{4}$	850	1400	1750	14	17.5
18 x 24 x 4	17 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	900	1500	1900	16	19.4
20 x 20 x 4	19 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 3 $\frac{3}{4}$	850	1400	1750	18	18.3
20 x 25 x 4	19 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1050	1750	2150	18	22.9
24 x 20 x 4	23 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1000	1650	2100	21	22.6
24 x 24 x 4	23 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1200	2000	2500	21	27.1
25 x 29 x 4	24 $\frac{3}{8}$ x 28 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1500	2500	3150	25	33.5

(1) Additional sizes available in die cut:

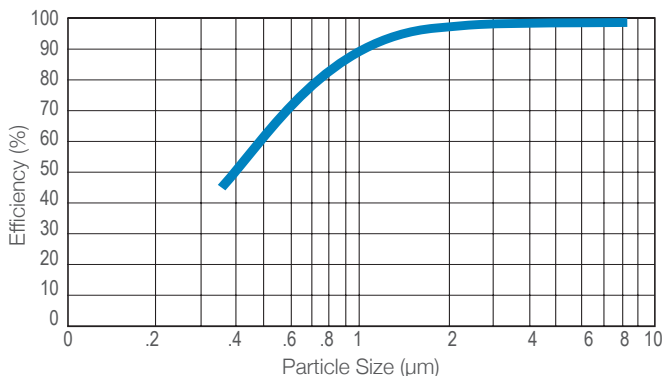
10 x 20 x 1 14 x 20 x 1 15 x 20 x 1 18 x 24 x 1 25 x 25 x 1 15 x 20 x 2 16 x 24 x 2 25 x 25 x 2
 12 x 12 x 1 14 x 25 x 1 16 x 16 x 1 18 x 25 x 1 12 x 20 x 2 16 x 16 x 2 18 x 25 x 2 24 x 20 x 4

(2) Other standard size and special size AmAir 1300 filters are available in handmade construction assembled from four beverage board strips. The filters are stapled in each corner with the pleated media pack bonded to the inside of the frame. Special sizes are available in the same construction.

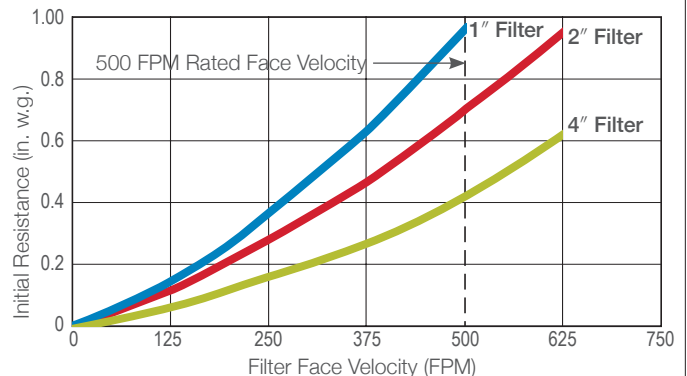
(3) Width and height dimensions are interchangeable. All AmAir 1300 filters may be installed with the pleats either vertical or horizontal.

Performance Data

Composite Minimum Efficiency Curve



Initial Resistance vs. Filter Face Velocity



AmAir 1300 filters are UL Classified. Testing was performed according to UL Standard 900 and ULC-S111.
 Recommended Final Resistance - 1.0 in. w.g.
 Continuous Operating Temperature Limit - 200°F (93°C)

AmAir® is a registered trademark of AAF International in the U.S.

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 888.223.2003 Fax 888.223.6500 | www.aafintl.com



AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm
 AFP-1-167C 06/15

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VariCel® II

MERV 15 Filters

EXTENDED SURFACE MINI-PLEAT FILTERS



- Slim line, mini-pleat design lowers operating costs
- Engineered for a variety of applications
- True high efficiency filters - only 4" thick media pack
- MERV 15
- Available with antimicrobial

Designed for high performance under both normal and difficult operating conditions, VariCel II filters are appropriate for general HVAC and applications operating with variable air volume, turbulent airflow, and high humidity. The combination of durable construction and high efficiency also makes VariCel II filters ideal for specialized systems such as diffusion filters in paint booths and prefilters in cleanrooms.

Unique Combination - High Performance and Cost-Saving Features

- High efficiency filtration
- Available with antimicrobial in MERV 15
- Suitable for a broad range of applications
- Rigid construction holds up in difficult operating conditions
- Microglass paper with water repellent binder
- Easy handling, installation, and removal
- Easy disposal
- Slim Line packaging reduces shipping costs and storage space

VariCel® II

Product Information

⁽¹⁾ Rated Filter Face Velocity (FPM)	⁽²⁾ Nominal Size (Inches) (W x H x D)	⁽²⁾ Actual Size (Inches) (W x H x D)	⁽³⁾ Rated Airflow Capacity (CFM)	⁽³⁾ Rated Initial Resistance (in. w.g.)	⁽⁴⁾ Recommended Final Resistance (in. w.g.)	Gross Media Area (Sq.Ft.)	Shipping Weight (Lbs. Per Carton)
⁽³⁾ MERV 15 - Available with Antimicrobial							
500	24 x 24 x 4	23 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	2000	.75	1.5	119	26
500	20 x 25 x 4	19 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1750	.75	1.5	103	22
500	20 x 24 x 4	19 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1650	.75	1.5	99	21
500	20 x 20 x 4	19 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1400	.75	1.5	82	18
500	18 x 24 x 4	17 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1500	.75	1.5	88	19
500	16 x 25 x 4	15 $\frac{3}{8}$ x 24 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1400	.75	1.5	82	18
500	16 x 20 x 4	15 $\frac{3}{8}$ x 19 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1100	.75	1.5	65	14
500	12 x 24 x 4	11 $\frac{3}{8}$ x 23 $\frac{3}{8}$ x 3 $\frac{3}{4}$	1000	.75	1.5	58	13
500	12 x 12 x 4	11 $\frac{3}{8}$ x 11 $\frac{3}{8}$ x 3 $\frac{3}{4}$	500	.75	1.5	28	7

(1) Filters can be operated up to 125% of rated face velocity.

(2) Width and height dimensions are interchangeable. VariCel II filters may be installed with the pleats either vertical or horizontal.

(3) All performance data based on ASHRAE Standard 52.2. Performance tolerances conform to Section 7.4 of ARI Standard 850-93. For maximum service life, VariCel II filters should always be operated with a prefilter.

(4) The final operating resistance shown is typical of systems currently in operation.

Filters can be operated to a higher or lower final resistance without materially affecting filter efficiency; however, dust holding capacity will be reduced if the filters are changed at a lower final resistance.

(5) VariCel II filters are shipped four per carton.

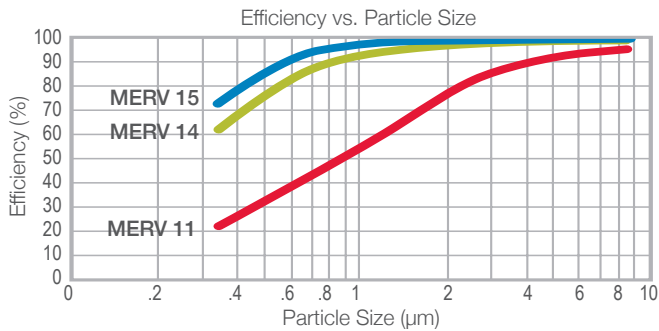
Underwriters Laboratories Classification: All VariCel II filters are UL Classified. Testing was performed according to UL Standard 900.

Continuous Operating Temperature Limits: 150°F (66°C)

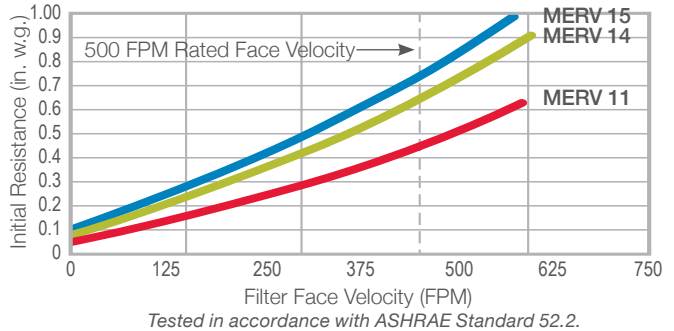
For product information on VariCel II MH filters, request bulletin AFP-1-239.

Performance Data

Composite Minimum Efficiency Curve



Initial Resistance vs. Filter Face Velocity (NH Model)



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AFP-1-237S 07/15

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PerfectPleat® SC M8

MERV 8 Filters

EXTENDED SURFACE PLEATED PANEL FILTERS



- Mechanical efficiency – does not rely on electret charge technology
- Self-supporting DuraFlex® media made from virgin fiber – no wire support needed
- Consistent media with controlled fiber size and blend
- Available in 2" and 4" models
- Environmentally friendly – no dies, no metal, fully incinerable
- Patented media, filter design, and manufacturing process. Patents covered under one or more of the following: US 6398839 B2; US 6254653 B1; US 6159318; US 6165242; US 6387140 B1

PerfectPleat SC M8 filters are designed to consistently increase efficiency throughout the service life of the filter. They have an initial MERV 8 rating respectively, but the efficiency increases significantly when dust loading begins. PerfectPleat SC M8 filters have distinctive self-supporting characteristics that allow a pleating pattern, which promotes airflow and maximizes dust holding capacity (DHC). The PerfectPleat SC M8 filter is best suited for standard capacity pleated panel filter applications, where pleated filters are currently in use. They can also be used to upgrade applications using panel filters.

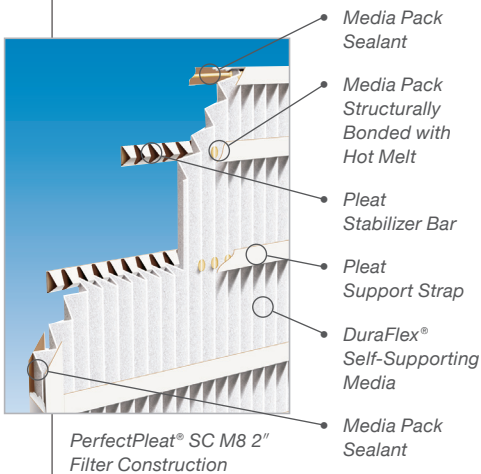
Superior Design and Construction

The perimeter frame is constructed from the highest wet-strength 28 pt. beverage carrier board, securely bonded to the media pack. Support straps on the air entering side are used in combination with uniquely designed pleat stabilizers on the air leaving side of the 2" model to provide additional strength. The support straps and pleat stabilizers ensure integrity against turbulent airflow. The 2" filter resists crushing and abuse and provides excellent lateral stability for installation in side access systems.

The 4" model utilizes a two piece die cut frame with integral pleat spacers on the air leaving side. Pleat spacing is controlled by straps bonded to the air entering side and the multiple rows of pleat spacers on the air leaving side. The pleat spacers also ensure the pleats remain open during use, maximizing filter life.

DuraFlex® Media – Patented Media Design

Uniform size virgin fibers are assembled in closely controlled blends to create a media that is both self-supporting and consistent in performance. When pleated, DuraFlex media will hold its shape without the wire support characteristic of conventional pleated filters. That means no potential for the formation of rust and safer handling. With the superior resiliency of DuraFlex media and no need for wire support, PerfectPleat SC M8 filters can sustain significant abuse and maintain their shape and pleat spacing. The absence of wire also makes the filter totally incinerable, which can simplify disposal.

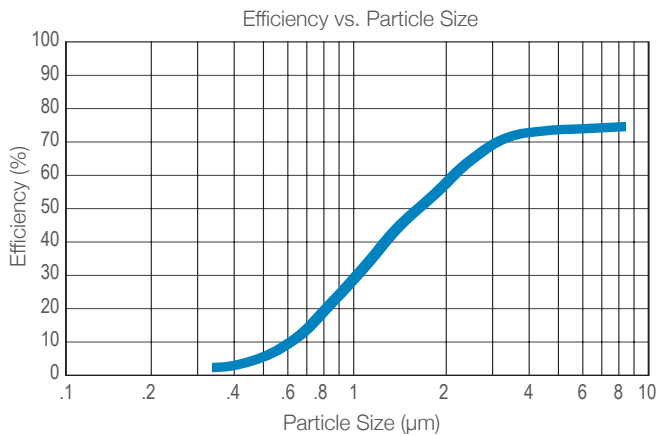


PerfectPleat® SC M8

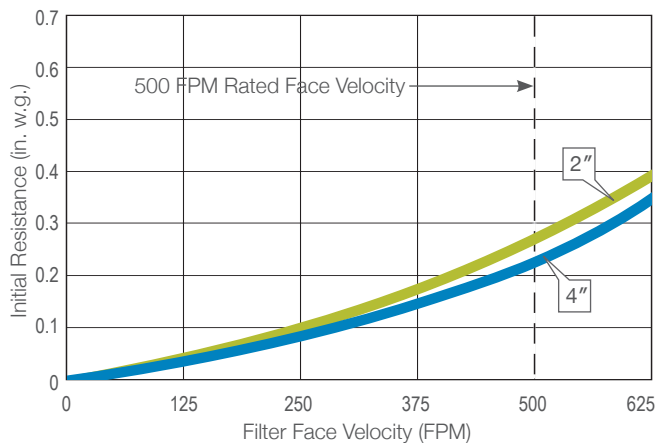
Performance Data

Filter	Pleats Per Lineal Foot	Rated Initial Resistance (in. w.g.)			Recommended Final Resistance (in. w.g.)	MERV	Continuous Operating Temperature Limits
		300 FPM	500 FPM	625 FPM			
2" PerfectPleat SC M8	10.0	.13	.27	.39	1.0	8	150°F / 66°C
4" PerfectPleat SC M8	9.0	.11	.23	.35	1.0	8	200°F / 93°C

Composite Minimum Efficiency Curve



Initial Resistance vs. Filter Face Velocity



PerfectPleat SC M8 filters are UL Classified.
Testing was performed according to UL Standard 900 and ULC-S111.

PerfectPleat® and DuraFlex® are registered trademarks of AAF International in the U.S. and other countries.

Product Information – Standard Sizes

Nominal Sizes (Inches) (W x H x D)	Actual Sizes (Inches) (W x H x D)	Rated Airflow (SCFM)			Pleats Per Filter
		300 FPM	500 FPM	625 FPM	
10 x 20 x 2	9½ x 19½ x 1¾	400	700	850	8
12 x 20 x 2	11½ x 19½ x 1¾	500	850	1050	10
12 x 24 x 2	11¾ x 23¾ x 1¾	600	1000	1250	10
14 x 25 x 2	13½ x 24½ x 1¾	750	1200	1500	11
15 x 20 x 2	14½ x 19½ x 1¾	650	1050	1300	12
15 x 25 x 2	14½ x 24½ x 1¾	800	1300	1650	12
16 x 16 x 2	15½ x 15½ x 1¾	550	900	1100	13
16 x 20 x 2	15½ x 19½ x 1¾	650	1100	1400	13
16 x 24 x 2	15¾ x 23¾ x 1¾	800	1350	1650	13
16 x 25 x 2	15½ x 24½ x 1¾	850	1400	1750	13
18 x 24 x 2	17¾ x 23¾ x 1¾	900	1500	1900	15
18 x 25 x 2	17½ x 24½ x 1¾	950	1550	1950	15
20 x 20 x 2	19½ x 19½ x 1¾	850	1400	1750	17
20 x 24 x 2	19¾ x 23¾ x 1¾	1000	1650	2100	17
20 x 25 x 2	19½ x 24½ x 1¾	1050	1750	2150	17
24 x 24 x 2	23¾ x 23¾ x 1¾	1200	2000	2500	20
25 x 25 x 2	24½ x 24½ x 1¾	1300	2150	2700	21
12 x 24 x 4	11¾ x 23¾ x 3¾	600	1000	1250	8
16 x 20 x 4	15¾ x 19¾ x 3¾	650	1100	1400	11
16 x 25 x 4	15¾ x 24¾ x 3¾	850	1400	1750	11
18 x 24 x 4	17¾ x 23¾ x 3¾	900	1500	1875	12
20 x 20 x 4	19¾ x 19¾ x 3¾	850	1400	1750	14
20 x 25 x 4	19¾ x 24¾ x 3¾	1050	1750	2150	14
24 x 20 x 4	23¾ x 19¾ x 3¾	1000	1650	2100	14
24 x 24 x 4	23¾ x 23¾ x 3¾	1200	2000	2500	17
25 x 29 x 4	24¾ x 28¾ x 3¾	1500	2500	3150	21

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