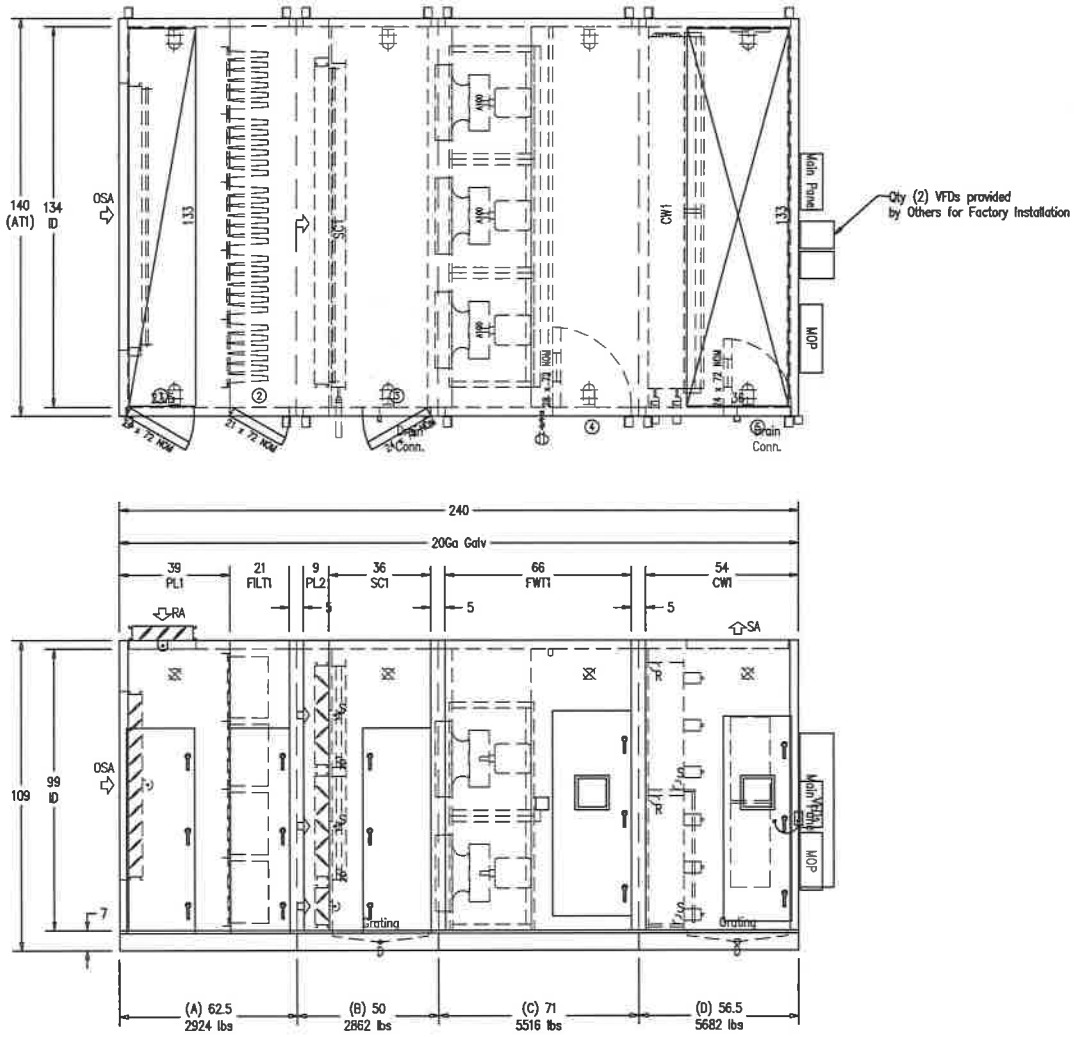
Preliminary | Knockdown Construction



All dimensions shown in inches, Operating weights shown in pounds. Overall unit dimensions do not include lifting lugs, electrical panels, pipe connections, door handles, etc.
ITF – Integrated Frame Knockdown Construction 40,000 ACFM

Rev	Revision Description	Date m/d/y

OUHSC School of Pharmacy 2

Unit Tag	Unit Type	Dwg Qty
AHU-1	Indoor	1
Rev	Weight	Box Qty
	16,984	4

QUOTE #	JOB #	HAZDA Ver	Factory Sal	Date m/d/y	Rev
22-1935		8.3.4	TMS	7/1/2022	A

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Printed (yyyy-MM-dd) 2022-12-20

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

106 Static Pressure Summary

106.1 Condition 1

106.1.1 Supply

Tunnel	*Description*	*APD (in.H20)*
AirTunnel 1	RA Damper - Damper (Return Air)	0.08
AirTunnel 1	Filter 1, Final Filter (Average Pressure Drop)	1.13
AirTunnel 1	Face Damper - Damper (Outside Air)	0.02
AirTunnel 1	Steam Coil 1	0.16
AirTunnel 1	FANWALL 1 (Supply) 40,000 ACFM @ 4.46 in.H20	0.00
AirTunnel 1	Chilled Water Coil 1	0.84
AirTunnel 1	UVLight 1	0.06
AirTunnel 1	SA Opening (Supply Air)	0.17
	Chilled Water Coil 1 - Supply Air - SA Opening ESP:	2.00
	Total Static Pressure:	4.46

Legend: ESP - External Static Pressure, OSA - Outside Air, EXH - Exhaust Air, RA - Return Air, SA - Supply Air

106.2 Notes/Legend

1. Summary report does not include static pressure of components supplied by others in the field unless otherwise noted.

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

200 FANWALL 1 (Supply) : FWT1 : Box C — 20-90 - 213T - 40 x 40 x 30 - B3

200.1 Configuration / Quantity

1. Function	Supply Fan
2. Quantity	6
3. Array	2 Rows x 3 Cols
4. Construction	PentaCube
5. Stand Height	N/A

Cell Size	6.Height	7.Width	8.Depth	9.Overall Depth
	40	40	30	37.25

10.Elev. / Temp.	1,302 ft / 70.0 °F		
11.Motor & Wheel Weight	269 lb	13.Redundant	0
12.Fan Cell Weight	445 lb	14.Empty	0
15.Ship Loose Fan (Wheel, Motor and Mounting Base)			0

200.2 Options

1. Coplanar Insulation	Standard Melamine	6. Blankoff Material	16Ga Galv
2. Back Draft Dampers	FBD8	7. Removal Rail	Yes
3. Inlet Cone Type	A100 Curved Cone	8. Anti-Vibration Structure	N/A
4. Discharge Safety Guard	No		
5. Cell Material	Steel		

200.3 Fan Wheel

1. Wheel Type	HPF-A100	3. Width	90
2. Diameter	20	4. Max RPM	3521
		5. Wheel Finish	None

200.4 Motor

1. Manufacturer	Toshiba	6. Efficiency	91.7
2. HP Each / Total	7.5 / 45	7. Service Factor	1.15
3. Poles / RPM	4-Pole / 1,760	8. Shaft Isolation	Ceramic Bearings
4. Frame / Casing	213T / TEAO	9. FLA Each / Total	9.8 / 58.8 Amps
5. Volts / Phase / Hz	460/3/60	10.Motor HP Safety Factor	3.0 %

200.5 Variable Frequency Drive

1. Furnished by	Others	7. Input / Output Amps	34 / 34 Amps
2. Quantity	2	8. Maximum Hertz	86.28
3. Manufacturer	ABB ACH580	9. Switching Frequency	Default
4. Model No	ACH580-01-034A-4		
5. Horsepower	25		
6. Voltage	460/3/60		

Notes:
1. Standalone VFD, not located in electrical panel.

200.6 Control System

1. Drive	Standard	3. Flow Monitoring	None
2. Control Method	By Others	4. Fans to Monitor	None
		5. Display	N/A

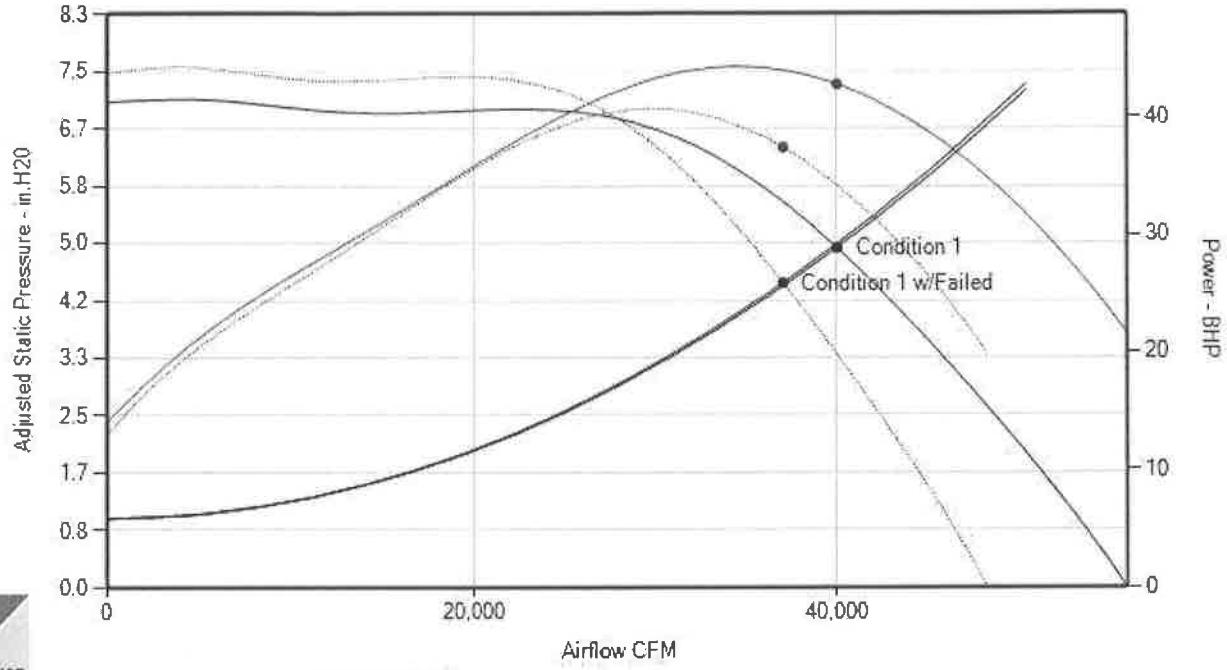
200.7 Notes / Features

1. To view patents and other pending U.S. or Canadian applications visit www.nortekair.com/patents.
2. Cell velocity is greater than 750.00 ft/min.
3. Cone constant = 2524, cone flow differential pressure = 8.22 in.H2O at 7410 CFM per fan.
4. The estimated VFD input watts are based on the motor and VFD efficiency at the selected load and RPM.
5. Fans balanced to a maximum allowable level of 0.022 inches per second peak.

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

200 FANWALL 1 (Supply) : FWT1 : Box C (Continued) 20-90 - 213T - 40 x 40 x 30 - B3



····· Failed Fan

AMCA Licensed for Sound and Air Performance Without Appurtenances (Accessories).
Performance certified is for installation type A: Free Inlet/Free Outlet
Power [bhp] excludes drives

200.8 Operating Conditions

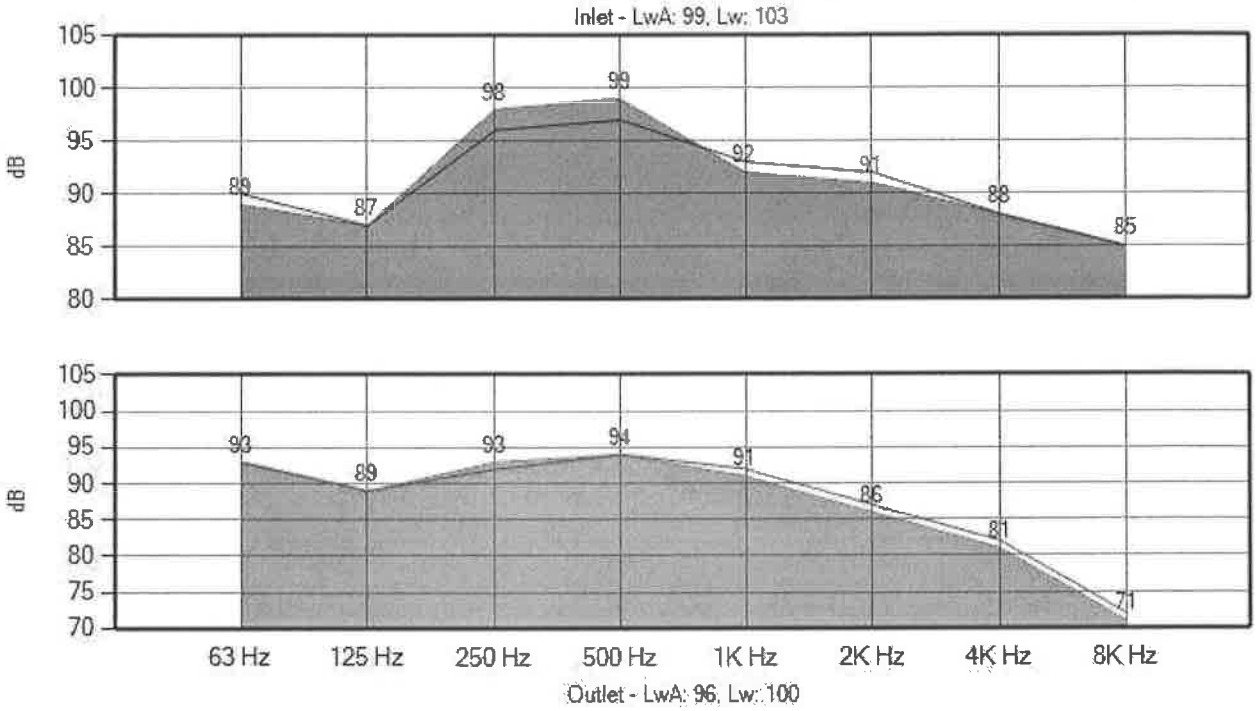
Operating Condition	Usage (%)	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel. (ft/min)	Watts	FEG % Off Peak
			Input	Adj.	On	Off	Fail			Each	Total			
Condition 1	100	40,000	4.46	4.92	6	0	0	2,450	83.5	7.14	42.86	741	35,947	FEG85 0%
Condition 1 w/ Failed	100	37,052	3.83	4.41	5	0	1	2,531	86.3	7.49	37.47	823	32,056	FEG85 2%

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

200 FANWALL 1 (Supply) : FWT1 : Box C (Continued) 20-90 - 213T - 40 x 40 x 30 - B3

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)



200.9 Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)											
Operating Condition		63	125	250	500	1k	2k	4k	8k	LwA	Lw
Condition 1	Inlet	89	87	98	99	92	91	88	85	99	103
	Outlet	93	89	93	94	91	86	81	71	96	100
Condition 1 w/ Failed	Inlet	90	87	96	97	93	92	88	85	99	102
	Outlet	93	89	92	94	92	87	82	72	96	100

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

200 FANWALL 1 (Supply) : FWT1 : Box C (Continued) 20-90 - 213T - 40 x 40 x 30 - B3

200.10 AMCA Statement

Nortek Air Solutions LLC certifies that the HPF-A100 fan wheel shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

The AMCA licensed air and/or sound performance data has been modified for installation,appurtenances or accessories, etc. not included in the certified data. The modified performance is not AMCA licensed but is provided to aid in selection and applications of the product. Performance certified is for installation type A: Free Inlet/Free Outlet Power [bhp] excludes drives

FWTRating DLL: Ver-1.6 / May 2022

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

300 Chilled Water Coil 1 : CW1 : Box D — 5WC - 4 - 45 x 124 x 8 - 8 AL

300.1 Coil Layout

1. Coil Hand	Right	6. Blankoff Material	16Ga 304 SS
2. Configuration	Single		
3. Connection Orientation	Straight		
4. Connection Material	Red Brass		
5. Connection Type	MPT		

300.2 Construction

1. Quantity	2	8. Stand Height	1 in	14.Casing	14Ga 304 SS
2. Serpentine	2	*Tube Detail - Primary Surface*		15.Coating	None
3. Fin Height	45.000 in	9. Material	Copper	*Fin Detail - Secondary Surface*	
4. Fin Length	124.000 in	10.O.D. x Wall	0.625 x 0.025 in	16.Material	Aluminum
5. Rows	8	11.Spacing	1.500 x 1.299 in	17.Thickness	0.010 in
6. Fins per Inch	8	12.Internal	Smooth	18.Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	77.50 ft²	13.Return Bends	0.035 in		

Single Bank, Right Hand, 2 per unit — **5WC - 4 - 45 x 124 x 8 - 8 AL**

Supply / Return Connections				*Vent and Drain*		
Quantity	Type	Pipe Size	Material	Type	Vent Location	Drain Location
2	MPT	3.0 in	Red Brass	0.125 in FPT	Return Connection	Supply Connection

300.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	40,000 ACFM	10.Total Capacity	2,218.4 MBH
2. Standard Airflow	36,866 SCFM	11.Sensible Capacity	1,487.4 MBH
3. Elevation	1,302 ft	12.Actual Face Velocity	516.13 ft/min
4. Entering Air DB	88.5 °F	13.Leaving Air DB	51.8 °F
5. Entering Air WB	70.5 °F	14.Leaving Air WB	51.7 °F
6. Fluid Type	Water	15.APD	0.84 in.H20
7. Entering Fluid Temp	43.0 °F	16.Leaving Fluid Temp	57.0 °F
8. Fluid Flow Rate	315.8 GPM	17.Fluid Velocity	3.02 ft/s
9. Fluid Fouling Internal	0.0000	18.Fluid Pressure Drop	8.51 ft.H20

Notes:
1. Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

300.4 Notes / Features

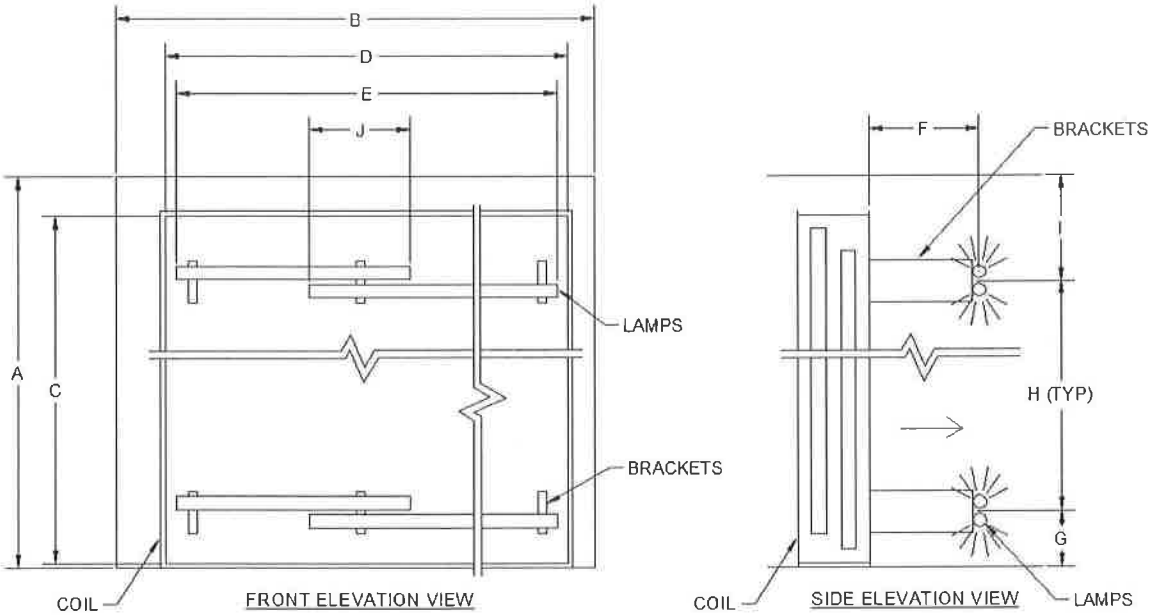
1. Manufacturer: Nortek Air Solutions, 5510 SW 29th Street, Oklahoma City, OK 73179
2. Top and bottom casing flange height is 1.000 in.
3. SCFM is corrected for Elevation and EDB.
4. Coils to be pressure tested at 315 PSI
5. Total operating weight is 3,059 lb.
6. Total fluid volume is 81.4 Gal.

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

301 UVLight 1 : CW1 : Box D

301.1 Construction			
1. Provided By	Factory	12.Safety Switch	Factory Supplied
2. Product Type	RLM Xtreme	13.Extra Relay Switches	0
3. Fixture	Lamp Included	14.Conduit Loom Kits	Yes
4. Voltage	120/1/60	15.LampLoom Down Exit	Yes
5. Total Watts	2220		
6. Watts at Coil Surface	21.5 Watts/ft²		
7. Rows of Lights	6		
8. Fixtures Per Row	2		
9. Total Lamp Sets	1		
10.Encapsulamp	Yes		
11.X-Box Panel Type	P - 12V Contact Controller Not Included		



301.2 Dimensional Data (in)									
A	B	C	D	E	F	G	H	I	J
99.00	134.00	94.00	124.00	124.00	6.00	5.40	16.60	10.60	-2.00

301.3 Purchased Items		
UVR Part Num	Description	Quantity
55086551	RLM Xtreme 61" Single Ended- High Output EncapsuLamp	12
55008022	RLM Conduit Loom Kit-20' S/S Flex Conduit w/Down Exit LampHolder	12
55000009	Dual LampHolster - Extended Base	6
55800066	RLM-X-Box 6P 120-277V w/CU2	2

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

302 Steam Coil 1 : SC1 : Box B — 9NS - 2 - 36 x 114 x 1 - 5 AL

302.1 Coil Layout

1. Coil Hand	Right	6. Blankoff Material	16Ga Galv
2. Configuration	Single		
3. Connection Orientation	Straight		
4. Connection Material	Red Brass		
5. Connection Type	MPT		

302.2 Construction

1. Quantity	2	8. Stand Height	17 in	13.Casing	16Ga 304 SS
2. Serpentine	0.5	*Tube Detail - Primary Surface*		14.Coating	None
3. Fin Height	36.000 in	9. Material	Copper	*Fin Detail - Secondary Surface*	
4. Fin Length	114.000 in	10.O.D. x Wall	1.125 x 0.035 in	15.Material	Aluminum
5. Rows	1	11.Internal	Internal Steam Distributing (ISDT)	16.Thickness	0.010 in
6. Fins per Inch	5			17.Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	57.00 ft²	12.Return Bends	N/A		

Connections	*Quantity*	*Type*	*Material*	*Pipe Size*
Supply	1	MPT	Red Brass	2.000 in
Return	1	MPT	Red Brass	1.500 in

302.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	40,000 ACFM		
2. Standard Airflow	40,934 SCFM	7. Sensible Capacity	1,817.0 MBH
3. Elevation	1,302 ft	8. Actual Face Velocity	701.75 ft/min
4. Entering Air DB	34.0 °F	9. Leaving Air DB	74.9 °F
5. Steam Pressure	25.0 psig	10.APD	0.16 in.H20
6. Steam Temperature	266.1 °F	11.Condensate	1,946.4 lb/hr

302.4 Notes / Features

1. Manufacturer: Nortek Air Solutions, 5510 SW 29th Street, Oklahoma City, OK 73179
2. Customer has verified room outside the unit for proper trapping and piping so that the coil can be installed on the unit floor.
3. If EDB is less than or equal to 32°F, 5 psig is the recommended minimum steam pressure with NO modulating steam valve.
4. This coil is built with casing flanges pitched from 2.125 in. to 0.875 in.
5. This coil is built with tubes pitched toward the return end to insure proper condensate removal.
6. SCFM is corrected for Elevation and EDB.
7. Total operating weight is 536 lb
8. Certified in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program which is based on AHRI Standard 410 within the Range of Standard Rating Conditions listed in Table 1 of the Standard. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

500 Filter 1 : FILT1 : Box A

500.1 Final Filter Size & Quantity			
1. Loading	Upstream Face Load	5. Bank Size	120.250 in W x 96.000 in H
2. Frame Material	Galvanized	6. Qty / set & Frame Size 1	(20) 24 in x 24 in
3. Filter Clips	(80) C-70	7. Qty / set & Frame Size 2	
4. Blankoff / Rack Material	16Ga Galv	8. Qty / set & Frame Size 3	
		9. Qty / set & Frame Size 4	

500.2 Final Filter			
1. Filter Depth	15.000 in	4. Number of Sets	1
2. Efficiency	MERV 14	5. Max Face Velocity	500.00 ft/min at 40,000 ACFM
3. Manufacturer	AAF	6. Model	DriPak 2000

500.3 Notes / Features
1. Filter clips to ship loose inside unit.

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

600 OA Damper : OSA : Box A : End Wall

600.1 Opening Construction			
1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	40,000 ACFM	5. Max APD	0.02 in.H20
3. Size	94 W x 66 H in		

600.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	928.43 ft/min
3. Size	94.000 in (Blade Direction) x 66.000 in		
4. Blade Config	Parallel		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

600.3 Damper Actuator			
1. Type		2. Furnished By	Others
		3. Mounted By	Others
		4. Wiring By	Others

600.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Left Hand location.
2. Damper Actuators wired by Others

601 SA Opening : SA : Box D : Roof

601.1 Opening Construction			
1. Description	Supply Air	4. Shape	Rectangle
2. Max CFM	40,000 ACFM	5. Max APD	0.17 in.H20
3. Size	133 W x 36 H in	6. Max Velocity	1,204.00 ft/min

602 RA Damper : RA : Box A : Roof

602.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	40,000 ACFM	5. Max APD	0.08 in.H20
3. Size	133 W x 23.5 H in		

602.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	1,842.91 ft/min
3. Size	133.000 in (Blade Direction) x 23.500 in		
4. Blade Config	Parallel		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

602.3 Damper Actuator			
1. Type		2. Furnished By	Others
		3. Mounted By	Others
		4. Wiring By	Others

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

602 RA Damper : RA : Box A : Roof (Continued)

602.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Right Hand location.
2. Damper Actuators wired by Others

603 Bypass Damper : OSA : Box B : Internal Wall

603.1 Opening Construction

1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	12,000 ACFM	5. Max APD	0.15 in.H20
3. Size	114 W x 15 H in		

603.2 Damper Specifications

1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	1,010.53 ft/min
3. Size	114.000 in (Blade Direction) x 15.000 in		
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

603.3 Damper Actuator

1. Type		2. Furnished By	Others
		3. Mounted By	Others
		4. Wiring By	Others

603.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Right Hand location.
2. Damper Actuators wired by Others

604 Face Damper : OSA : Box B : Internal Wall

604.1 Opening Construction

1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	10,000 ACFM	5. Max APD	0.02 in.H20
3. Size	114 W x 37 H in		

604.2 Damper Specifications

1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	341.39 ft/min
3. Size	114.000 in (Blade Direction) x 37.000 in		
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

604.3 Damper Actuator

1. Type		2. Furnished By	Others
		3. Mounted By	Others
		4. Wiring By	Others

604.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Right Hand location.
2. Damper Actuators wired by Others

Project Name: OUHSC School of Pharmacy 2
Unit Tag: AHU-1

Quote #: 22-1935-001

605 Face Damper : OSA : Box B : Internal Wall

605.1 Opening Construction

1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	10,000 ACFM	5. Max APD	0.02 in.H20
3. Size	114 W x 37 H in		

605.2 Damper Specifications

1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	341.39 ft/min
3. Size	114.000 in (Blade Direction) x 37.000 in		
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

605.3 Damper Actuator

1. Type		2. Furnished By	Others
		3. Mounted By	Others
		4. Wiring By	Others

605.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Right Hand location.
2. Damper Actuators wired by Others