Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 11/9/2023
Return Request: 11/19/2023
Project: UCA Snow – Fine Arts Center
Supplier: Airetech
Manufacturer: Nortek
Submittal: Central Station AHUs
Submittal Number: 23 73 13-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
H+N Architects
1009 Main Street
Conway, AR 72032
501-327-7525

ENGINEER
Pettit & Pettit
201 E. Markham St. #400
Little Rock, AR 72201
501-374-3731

GENERAL CONTRACTOR
Wagner General Contractors
600 W. Race Ave.
Searcy, AR 72143
501-203-0704

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

*This submittal is preliminary. 11/9/2023

CSUSA PROJECT NO.
23-2020
chowell@comfortar.com

SUBMITTAL DATA

EQUIPMENT: Nortek - Temtrol Air Handling Units

TAGS: RTU-1, RTU-2 and AH-6

PROJECT: UCA Snow Fine Arts

LOCATION: Conway, AR

ENGINEER:

CONTRACTOR:

DATE: 10/31/2023

SUBMITTED BY: Forrest Moseley
forrest@airetechcorp.com
0

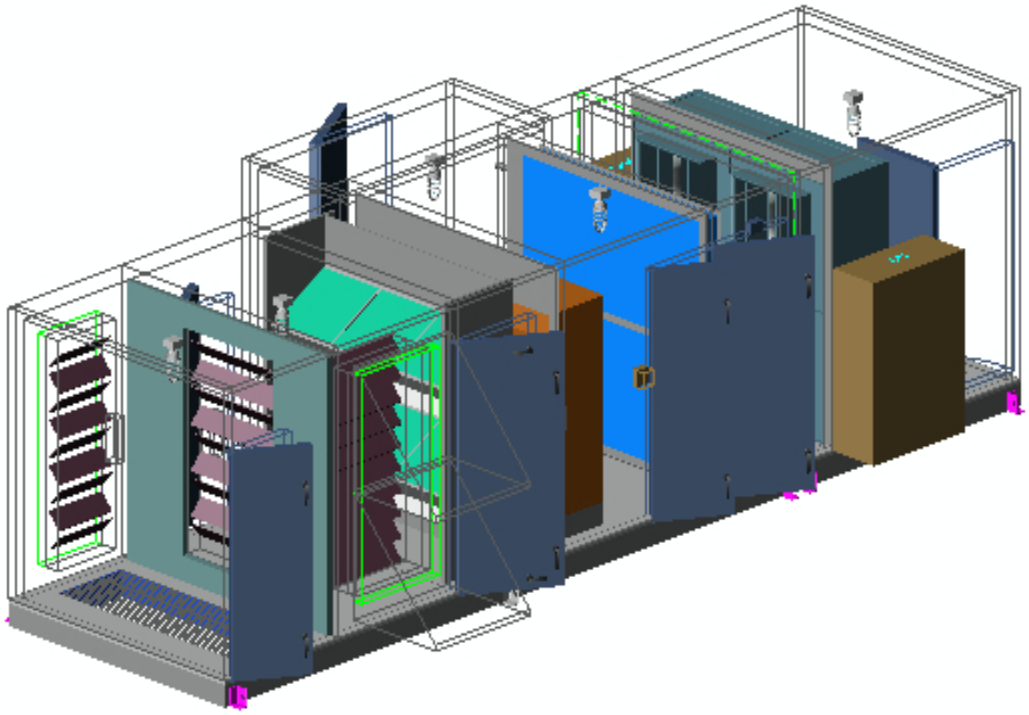
Submittal Comment Sheet

Due to the project completion date being 180 days out, it was important to have these submittals turned in immediately for review. The final electrical portion of this submittal was not able to be included. A final submittal for record will be sent in.

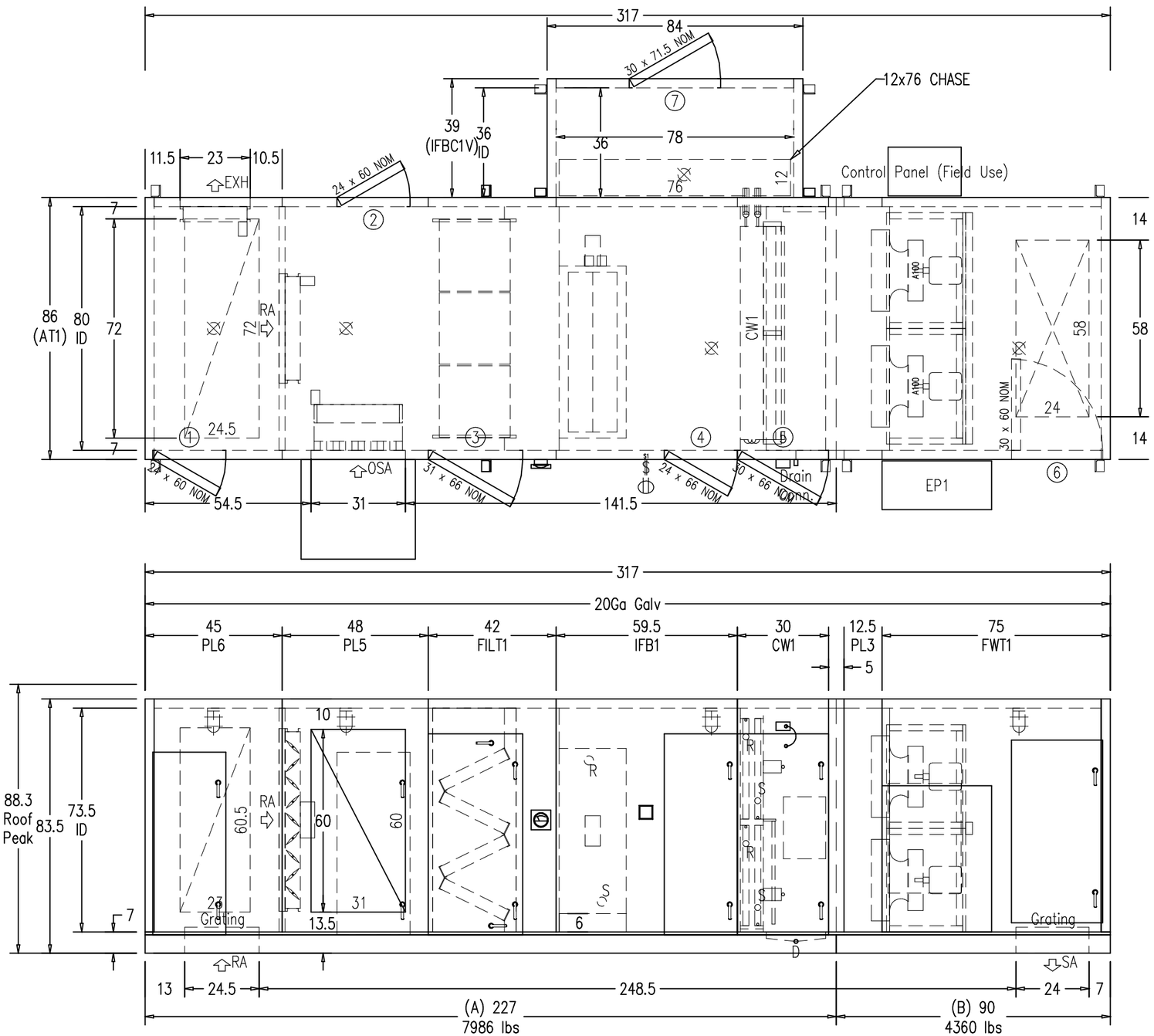
PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

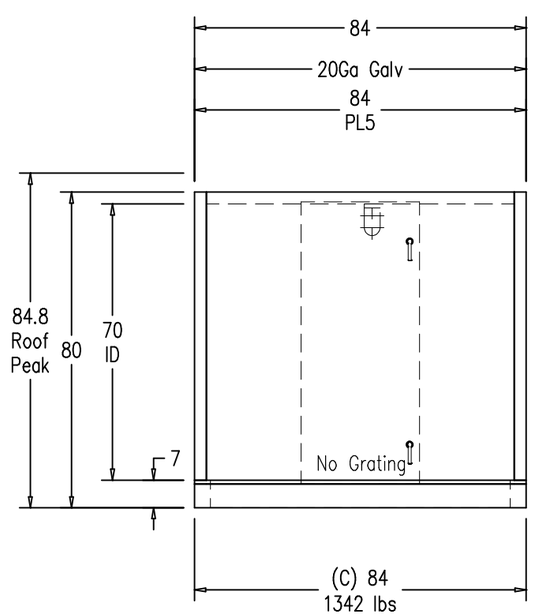
Revision History

Date	Rev	Revision Description



Preliminary





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 Construction 14,500 ACFM
Roof curb provided by others

NORTEK™ AIR SOLUTIONS TEMTROL
106 N Industrial Blvd. (405) 817-9700
Okarche, OK 73762 www.nortekair.com

Rev	Revision Description	Date m/d/y
	UCA Snow Fine Arts	

Unit Tag: RTU-1			Unit Type: Outdoor		Dsg Qty: 1
Rep Firm: Airetech Corp North Little Rock, AR, US			Weight: 13,763		Box Qty: 3
Rep Contact: Forrest Moseley, 501-280-0404			Model No: ITF-RDHE64		
SALES ORDER #: N003312-001	JOB #: N003312001	NASDA Ver: 9.1.0	Factory SAE: BRS	Date m/d/y: 7/24/2023	Rev: A

Printed (yyyy-MM-dd): 2023-11-03

Thybar Corporation has a policy of continuous product improvement and reserves the right to change the product design without notice

NOT PRODUCTION READY
INFORMATION NEEDED

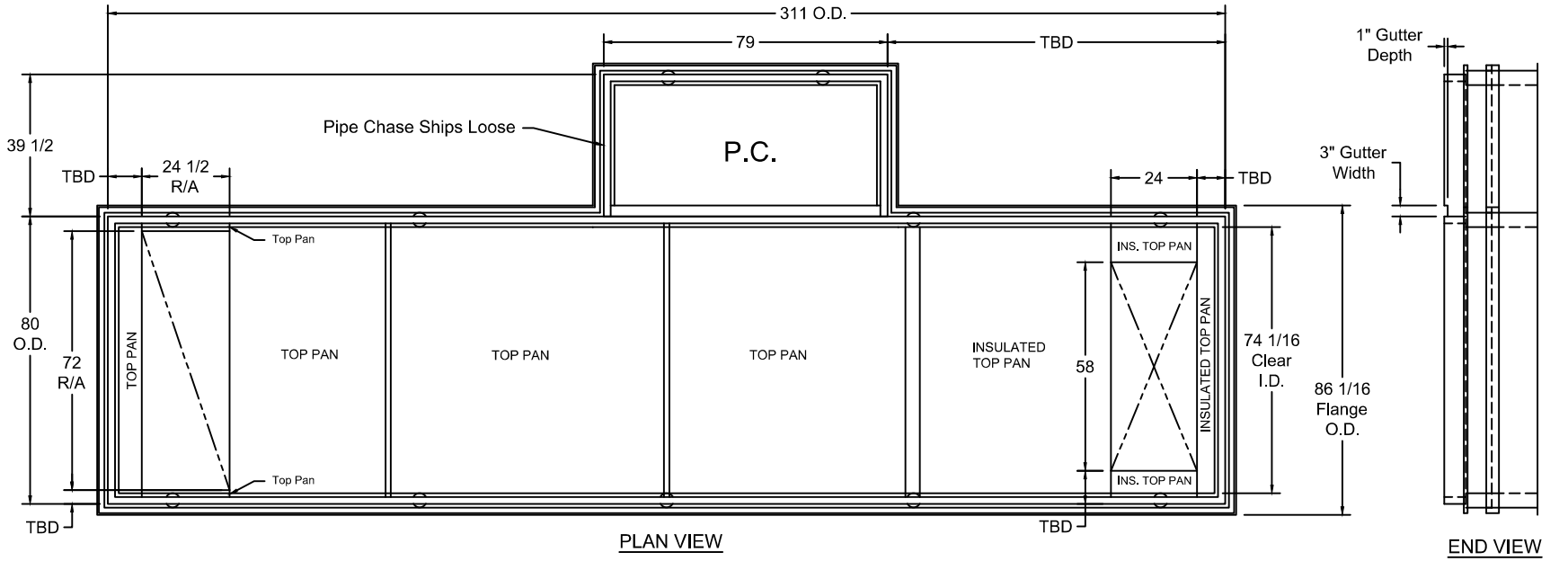
☐ APPROVED
☐ APPROVED PENDING CHANGES
BY:
DATE: / /

SUBMITTAL

CURB WALL THICKNESS AND RESTRAINT REQUIREMENTS TO BE DETERMINED BY SEISMIC/WINDLOAD CALCULATIONS.

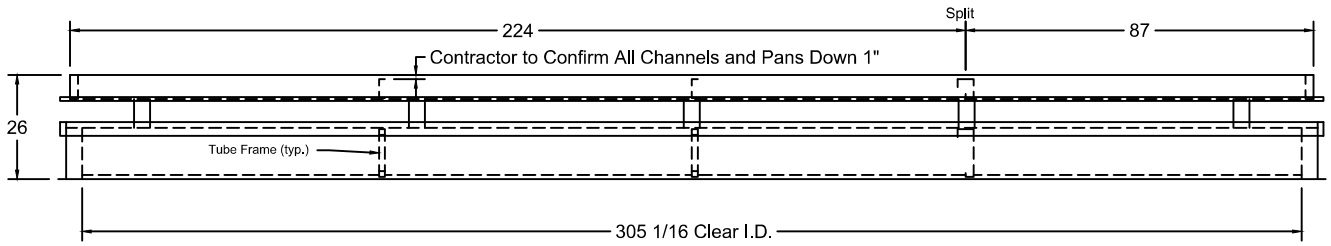
VERIFY ROOF PITCH AND DIRECTION

NOTES:
-CONTRACTOR TO FIELD-CUT SUPPLY & RETURN OPENINGS THROUGH THYBAR CURB FLOOR.
-CONTRACTOR TO SEAL BOTTOM OF UNIT TO TOP OF CURB AND PANS
-CONTRACTOR TO VERIFY SUPPLY, RETURN AND PIPE CHASE LOCATIONS PRIOR TO PRODUCTION

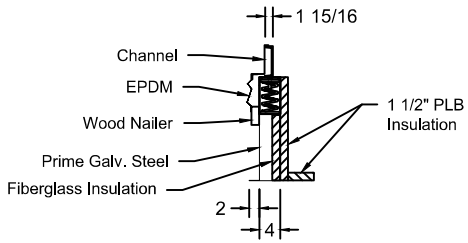


PLAN VIEW

END VIEW



ELEVATION VIEW



SECTION AA
2" Spring Deflection

Rev.	Int.	Date	Description
1	MS	10/24/23	changed to vibrocurb

REVISION HISTORY

(DO NOT SCALE DRAWING) Unless otherwise specified dimensions are in inches tolerances are ± 1/16 ± 0.0625 ± 1°

Date: 8/22/23

Insulated RoofCurb Plenum S and R with pipe chase
New Nortek Custom Unit

Airtech Corporation/ UCA Snow Fine Arts

Qty.: 2 | Job# : Q-25597
Tag:
Drawn: DR
File: S20501-1 | Rev: ----

thybar CORPORATION
Thybar makes it right the first time, every time

Curb final dimensions will be coordinated

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Unit Design Options

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

100 Unit Design Summary

100.1 Electrical

1. Short Circuit Current Rating (SCCR) @ 65 kA
2. ◊ Fans wired to Electrical panel equipped with ABB ACH580 VFD, provided and mounted by Factory. Electrical Panel to have internal overloads with aux. contacts wired in series for field wiring to remote monitoring.
3. ◊ All fan air monitoring with Magnesense transducer.
4. ◊ Factory to provide and mount 24" x 36" NEMA 3R enclosure w/fan, for field installed controls.
5. ◊ All lights controlled by a single light switch. One GFI outlet provided.
6. ◊ 120 volt power for lighting and/or GFI outlets shall be provided by Others.
7. ◊ Unit to ship in individual, bagged sections.

◊ **Project specific requirements**

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

101 Unit Details

101.1 Weights / Jobsite Elevation

1. Shipping Weight	13,599 lb	3. Elevation	266 ft
2. Operating Weight	13,763 lb		

101.2 Preparation for Shipment

1. Knockdown Construction	No

102 Unit Construction

102.1 Construction

1. Cabinet Construction	ITF - Integrated Frame	6. Thermal Break	Modified Thermal Break
2. Design Environment	Outdoor	7. Mounting	Curb Mounted
3. Panel Depth	3 in	8. Roof Curb By	Others
4. Caulk Type	Standard	9. Curb Height	8.000 in
5. Model #	ITF-RDHE64		

102.2 Cabinet Material

1. Exterior Material	16Ga Galv Pre-Paint	7. Blankoff Finish	None
2. Interior Liner type(s)	See Drawing	8. Internal Wall Material	16Ga Galv
3. Exterior Paint Type	Polyester Resin	*Insulation by liner type*	
4. Interior Paint Type	None	9. Solid liner	HD Fiberglass Roll (R12.5)
5. Paint Color	Sandstone	10. Perforated liner	N/A
6. Meets Salt Spray Rating	2500 Hours		

Exceptions:
1. Chilled Water Coil 1: blankoff material is 16Ga 304 SS

102.3 Base Construction

1. Base Structure Material	Steel Tube	6. Base Structure Height	See Drawing
2. Base Floor Material	16Ga Galv	7. Sub Floor Material	20Ga Galv
3. Insulation	Polyurethane Foam	8. Floor Coating	None
4. Floor Drain	None	9. Lifting Lugs	Yes - Welded
5. Floor Options	None		

102.4 Notes / Features

1. Box dimensions do not include lifting lugs, electrical panels, pipe connections, door handles, etc.
2. The height dimensions include raised roof seams and sloped roof for outdoor equipment.

103 Doors

103.1 All Doors (including those associated with specific components)

#	Box	Section	Type[1]	Width	Height	Hinge	Swing	Window	Interior	Exterior	Options[3]
1	A	PL6	3" TBF	24	60	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
2	A	PL5	3" TBF	24	60	RH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
3	A	FILT1	3" TBF	31	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
4	A	IFB1	3" TBF	24	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
5	A	CW1	3" TBF	30	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	MS TO
6	B	FWT1	3" TBF	30	60	LH	In	None	16Ga Galv	16Ga Galv Pre-Paint	TO
7	C	PL5	3" TBF	30	71.5	RH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO

103.2 Notes / Features

1. Door Types
   TBF = Thermal Break Factory
2. All doors insulated with Polyurethane Foam.
3. Options: MS = Manual Safety Interlock, TO = Tool Operated Handle

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

104 Drains

104.1 All Drains (including those associated with specific components)

Box	Section	Type	Conn (in)	Hand	Grating Material	Pan Material
A	CW1	Drain Pan	1.25	Right	None	16Ga 304 SS

104.2 Notes / Features

1. Drain Constructions included: Triple Pitched

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

106 Static Pressure Summary

106.1 Condition 1

106.1.1 Supply

Tunnel	*Description*	*APD (in.H20)*
AirTunnel 1	RA Opening - Damper (Return Air)	0.13
AirTunnel 1	OSA Opening - Damper (Outside Air)	0.01
AirTunnel 1	Filter 1, 4" MERV 13 (Average Pressure Drop)	0.89
AirTunnel 1	IFB Coil 1	0.64
AirTunnel 1	Chilled Water Coil 1	0.59
AirTunnel 1	UVLight 1	0.02
AirTunnel 1	FANWALL 1 (Supply) 14,500 ACFM @ 5.83 in.H20	0.00
AirTunnel 1	SA Opening (Supply Air)	0.35
	ESP:	3.20
	Total Static Pressure:	5.83

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.

106 N Industrial Blvd. Okarche, Ok 73762
(405) 817-9700 FAX (405) 263-4980

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Fans

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

200 FANWALL 1 (Supply) : FWT1 : Box B — 20-60 - 184T - 34 x 38 x 26 - B2

200.1 Configuration / Quantity

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

Cell Size	6.Height	7.Width	8.Depth	9.Overall Depth
	34	38	26	33.25

10. Elev. / Temp.	266 ft / 70.0 °F		
11. Motor & Wheel Weight	168 lb	13. Redundant	0
12. Fan Cell Weight	368 lb	14. Empty	0
15. Ship Loose Fan (Wheel, Motor and Mounting Base)			0

200.2 Options

1. Coplanar Insulation	Standard Melamine	8. Cell Finish	None
2. Extended Coplanar	No	9. Insulation Retainer	No
3. Back Draft Dampers	FBD8	10. Inlet Attenuation	None
4. Inlet Cone Type	A100 Curved Cone	11. Blankoff Material	16Ga Galv
5. Solid Perimeter Material	None	12. Blankoff Finish	None
6. Discharge Safety Guard	No	13. Removal Rail	No
7. Cell Material	Steel		

200.3 Fan Wheel

1. Wheel Type	HPF-A100	3. Width	60
2. Diameter	20	4. Max RPM	3521
		5. Wheel Finish	None

200.4 Motor

1. Manufacturer	Toshiba	6. Efficiency	89.5
2. HP Each / Total	5 / 20	7. Service Factor	1.15
3. Poles / RPM	4-Pole / 1,755	8. Shaft Isolation	Ceramic Bearings
4. Frame / Casing	184T / TEAO	9. FLA Each / Total	13.8 / 55.2 Amps
5. Volts / Phase / Hz	208/3/60	10. Motor HP Safety Factor	3.0 %

200.5 Control System

1. Redundant VFD	No	6. Flow Monitoring	Yes
2. Bypass Circuit	None	7. Fans to Monitor	All Fans
3. Drive	Standard	8. Display	Magnesense
4. Optimization Control	No		
5. Control Method	By Others		

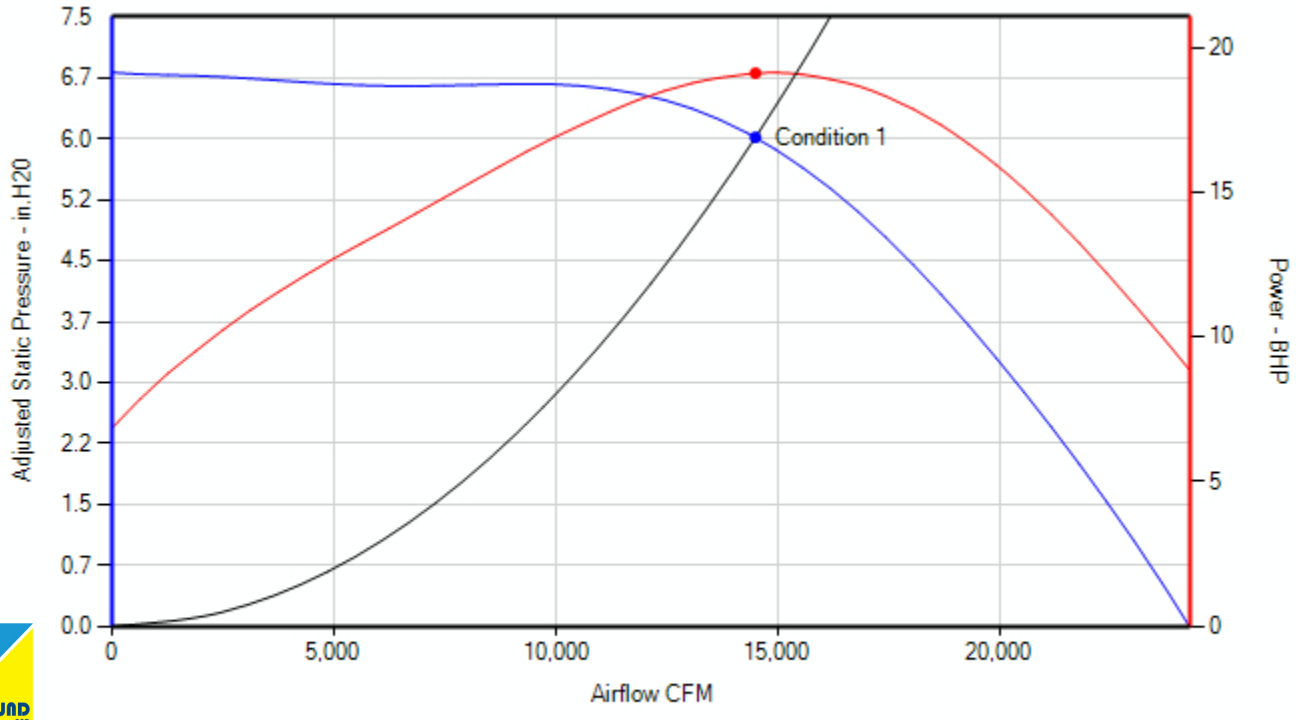
200.6 Notes / Features

1. To view patents and other pending U.S. or Canadian applications visit www.nortekair.com/patents.
2. (4) airflow measurement taps. Cone constant = 2524, cone flow differential pressure = 2.04 in.H2O at 3625 CFM per fan.
3. The estimated VFD input watts are based on the motor and VFD efficiency at the selected load and RPM.
4. Fans balanced to a maximum allowable level of 0.022 inches per second peak.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 20-60 - 184T - 34 x 38 x 26 - B2



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

200.7 Operating Conditions

Operating Condition	Usage (%)	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel. (ft/min)	Watts	FEG % O.P.	FEI
			Input	Adj.	On	Off	Fail			Each	Total				
Condition 1	100	14,500	5.83	5.98	4	0	0	2,382	81.4	4.78	19.11	512	16,439	FEG80 2%	1.25

200.8 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	84	81	96	92	84	84	84	81	94	98
	Outlet	90	85	90	86	83	79	76	67	89	95

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 20-60 - 184T - 34 x 38 x 26 - B2

200.9 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	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Coils

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

300 Chilled Water Coil 1 : CW1 : Box A — 5WC - 6 - 33 x 70 x 4 - 12 AL

300.1 Coil Layout

1. Coil Hand	Left	6. Rack Style	None
2. Configuration	Single	7. Rack Finish	None
3. Connection Orientation	Straight	8. Blankoff Material	16Ga 304 SS
4. Connection Material	Red Brass	9. Blankoff Finish	None
5. Connection Type	MPT		

300.2 Construction

1. Quantity	2	8. Stand Height	1 in	14. Casing	16Ga 304 SS
2. Serpentine	0.6666667	*Tube Detail - Primary Surface*		15. Coating	None
3. Fin Height	33.000 in	9. Material	Copper	*Fin Detail - Secondary Surface*	
4. Fin Length	70.000 in	10. O.D. x Wall	0.625 x 0.020 in	16. Material	Aluminum
5. Rows	4	11. Spacing	1.500 x 1.299 in	17. Thickness	0.008 in
6. Fins per Inch	12	12. Internal	Smooth	18. Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	32.08 ft²	13. Return Bends	0.028 in		

Single Bank, Left Hand, 2 per unit — **5WC - 6 - 33 x 70 x 4 - 12 AL**

Supply / Return Connections				*Vent and Drain*		
Quantity	Type	Pipe Size	Material	Type	Vent Location	Drain Location
2	MPT	2.0 in	Red Brass	0.750 in MPT Extended	Return Header	Supply Header

300.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	14,500 ACFM	10. Total Capacity	636.7 MBH
2. Standard Airflow	14,077 SCFM	11. Sensible Capacity	413.0 MBH
3. Elevation	266 ft	12. Actual Face Velocity	451.95 ft/min
4. Entering Air DB	80.7 °F	13. Leaving Air DB	54.1 °F
5. Entering Air WB	68.4 °F	14. Leaving Air WB	53.9 °F
6. Fluid Type	Water	15. APD	0.59 in.H20
7. Entering Fluid Temp	45.0 °F	16. Leaving Fluid Temp	55.0 °F
8. Fluid Flow Rate	126.9 GPM	17. Fluid Velocity	5.03 ft/s
9. Fluid Fouling Internal	0.0000	18. Fluid Pressure Drop	13.77 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

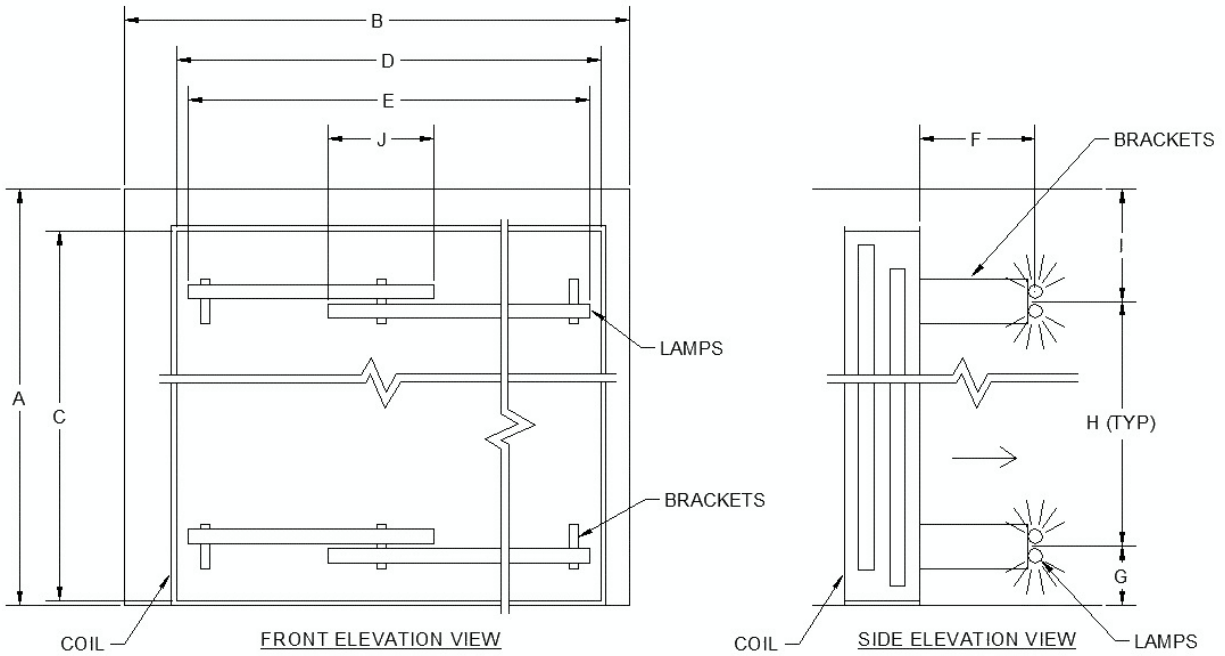
1. Manufacturer: Nortek Air Solutions, 5510 SW 29th Street, Oklahoma City, OK 73179
2. Top and bottom casing flange height is 1.000 in.
3. SCFM is corrected for Elevation and EDB.
4. Coils to be pressure tested at 315 PSI
5. Total operating weight is 741 lb.
6. Total fluid volume is 18.7 Gal.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

301 UVLight 1 : CW1 : Box A

301.1 Construction			
1. Provided By	Factory	12. Safety Switch	Factory Supplied
2. Product Type	RLM Xtreme	13. 12V Contact Connector	No
3. Fixture	Lamp Included	14. Extra Relay Switches	0
4. Voltage	120/1/60	15. UV Report™	No
5. Total Watts	740	16. UV Repeat™	No
6. Watts at Coil Surface	17.04 Watts/ft²	17. Warning Sign	No
7. Rows of Lights	2	18. UV-C Hour Meter	No
8. Fixtures Per Row	2	19. Conduit Loom Kits	Yes
9. Total Lamp Sets	1	20. LampLoom Down Exit	Yes
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
73.50	80.00	70.00	70.00	70.00	6.00	12.30	41.90	19.30	52.00

301.3 Purchased Items		
UVR Part Num	Description	Quantity
55086551	RLM Xtreme 61" Single Ended- High Output EncapsuLamp	4
55008022	RLM Conduit Loom Kit-20' S/S Flex Conduit w/Down Exit LampHolder	4
55000009	Dual LampHolster - Extended Base	2
55800064	RLM-X-Box 4P 120-277V w/CU2	1

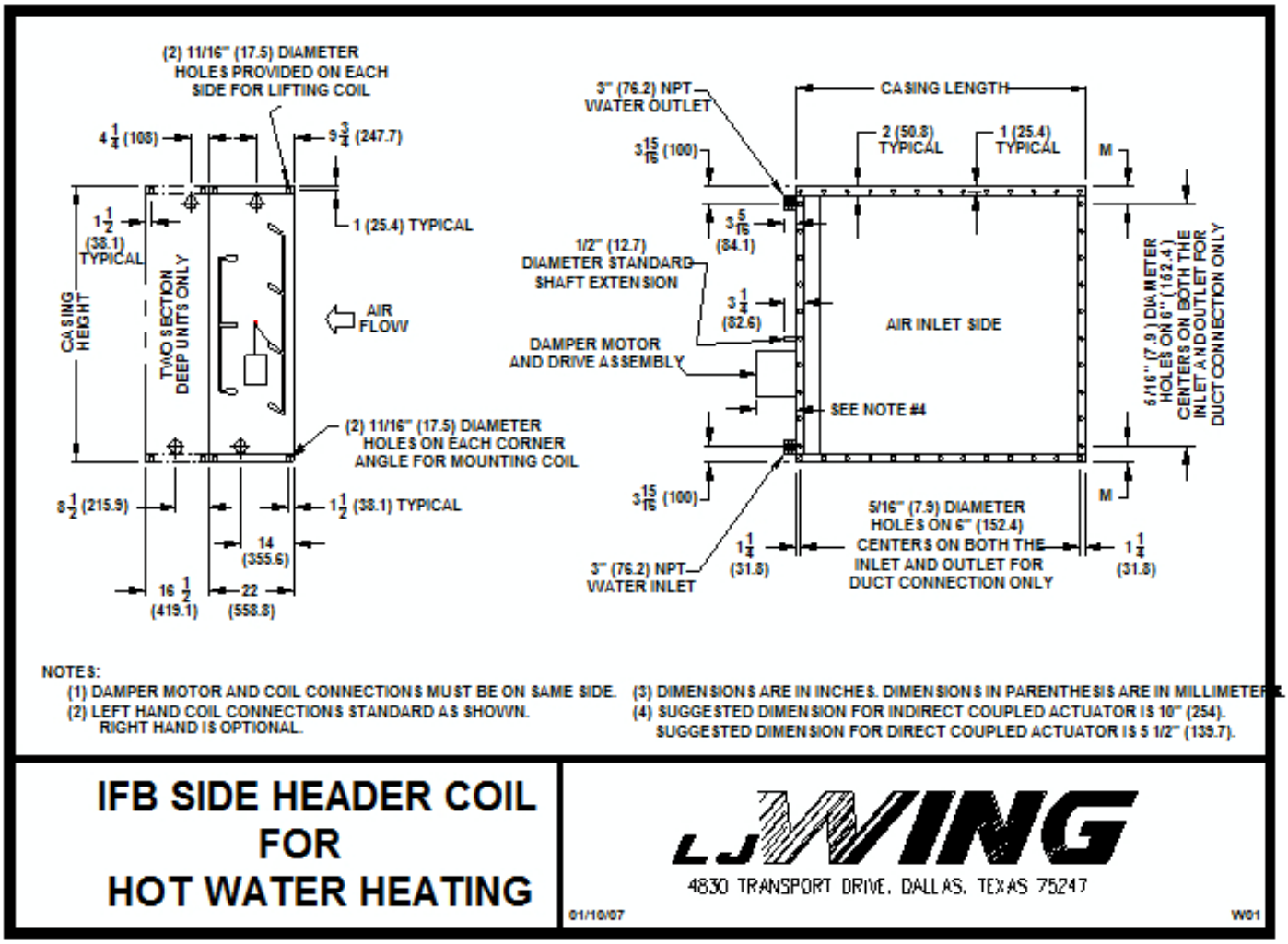
301.4 Electrical Service Information			
1. Volt/Phase/Hertz	120/1/60	3. Provides power to	UVLight 1
2. MCA	6.2		
1. For electrical loads see electrical drawings			

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

302 IFB Coil 1 : IFB1 : Box A — E - 48

302.1 Construction			
1. Fin Material	Aluminum	8. Fin Spacing	12
2. Tube Material	Copper	9. Tube OD	0.625 in
3. Connection Material	Steel	10. Tube Wall	0.035 in
4. Rows	2 (One Section)	11. Connection Location	Far Side
5. Total Face Area	21.3 ft²	12. Stand Height	6 in
6. Casing Finish	Air Dried Enameled Paint (Std.)	13. Anti-Stratification Baffles	No
7. Elevation	266 ft	14. Actuator Location	Left



302.2 Coil Dimensions (in)											
Casing Height	Casing Length	M	N	Q	Z	L	P	R	S	Y	X
54.25	56.5	3.125	-	-	-	-	-	-	-	-	-

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

302 IFB Coil 1 : IFB1 : Box A (Continued) E - 48

302.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	14,500 ACFM	7. Sensible Capacity	538.9 MBH
2. Standard Airflow	15,961 SCFM	8. Face Velocity	865.12 ft/min
3. Entering Air DB	15.0 °F	9. Leaving Air DB	49.6 °F
4. Fluid Type	Water	10. APD	0.64 in.H20
5. Entering Fluid Temp	160.0 °F	11. Leaving Fluid Temp	138.2 °F
6. Fluid Flow Rate	50.0 GPM	12. Fluid Pressure Drop	1.36 ft.H20

Notes:
1. ARI Certified

302.4 Notes / Features

1. SCFM is corrected for Elevation and EDB.
2. Total operating weight is 789 lb

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Components

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

500 Filter 1 : FILT1 : Box A

500.1 Pre-Filter Size & Quantity			
1. Loading	V Side Load	5. Bank Size	72.000 in W x 56.875 in H
2. Filter Clips	By Others	6. Qty / set & Frame Size 1	(12) 24 in x 24 in
3. Blankoff / Rack Material	16Ga Galv	7. Qty / set & Frame Size 2	
4. Blankoff / Rack Finish	None	8. Qty / set & Frame Size 3	
		9. Qty / set & Frame Size 4	

500.2 Pre Filter			
1. Filter Depth	4.000 in	4. Number of Sets	
2. Efficiency		5. Max Face Velocity	302.08 ft/min at 14,500 ACFM
3. Manufacturer		6. Model	

500.3 Pressure Gage Specifications - Gage 2			
1. Manufacturer	Dwyer	3. Options	Hinged Cover
2. Model / Range	Magnehelic 2002 (0-2" w.c.)	4. Quantity	1

500.4 Notes / Features
1. Filters provided by Others.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

600 OSA Opening : OSA : Box A : Near Side

600.1 Opening Construction			
1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	4,775 ACFM	5. Max APD	0.01 in.H20
3. Size	31 W x 60 H in		

600.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin AMS 050 (Aluminum)	7. Max Face Velocity	408.80 ft/min
3. Size	29.000 in (Blade Direction) x 58.000 in	8. End Switches	No
4. Blade Config	Parallel		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 2" frame flange
2. Damper Options: Integrated Controller and Actuators
3. Minimum airflow: 3,875 CFM, Maximum airflow: 25,833 CFM, Set Point airflow: 4,775 CFM

600.3 Damper Actuator			
1. Location	Face Mounted (RH)	3. Floor Mounted	No
2. Type	Modulating 24V – NC	4. Furnished By	Factory
		5. Mounted By	Factory
		6. Wiring By	Others

600.4 Notes / Features

1. Weather hood included: 2 sections (37.500 in W x 32.750 in H x 32.75 D) - custom sizing. Maximum weather hood velocity 357 ft/min. Shipped Loose.

601 SA Opening : SA : Box B : Floor

601.1 Opening Construction			
1. Description	Supply Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.35 in.H20
3. Size	58 W x 24 H in	6. Max Velocity	1,500.00 ft/min

601.2 Notes / Features

1. Steel Floor Grate included.

602 RA Opening : RA : Box A : Floor

602.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.05 in.H20
3. Size	72 W x 24.5 H in	6. Max Velocity	1,184.00 ft/min

602.2 Notes / Features

1. Steel Floor Grate included.

603 EXH Opening : EXH : Box A : Far Side

603.1 Opening Construction			
1. Description	Exhaust Air	4. Shape	Rectangle
2. Max CFM	9,500 ACFM	5. Max APD	0.14 in.H20
3. Size	23 W x 60.5 H in		

603 EXH Opening : EXH : Box A : Far Side (Continued)

603.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	983.11 ft/min
3. Size	23.000 in (Blade Direction) x 60.500 in	8. End Switches	No
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

603.3 Damper Actuator			
1. Location		3. Floor Mounted	
2. Type		4. Furnished By	Others
		5. Mounted By	Others
		6. Wiring By	Others

603.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Face Mounted (RH) location.
2. Damper Actuators wired by Others

604 RA Opening : RA : Box A : Internal Wall

604.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.13 in.H20
3. Size	36 W x 60 H in		

604.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	966.67 ft/min
3. Size	36.000 in (Blade Direction) x 60.000 in	8. End Switches	No
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

604.3 Damper Actuator			
1. Location		3. Floor Mounted	
2. Type		4. Furnished By	Others
		5. Mounted By	Others
		6. Wiring By	Others

604.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Face Mounted (LH) location.
2. Damper Actuators wired by Others

605 Opening : Box C : Floor

605.1 Opening Construction			
1. Max CFM	14,500 ACFM	3. Shape	Rectangle
2. Size	12 W x 76 H in	4. Max APD	0.00 in.H20
		5. Max Velocity	0.00 ft/min

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Electrical

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

700 ElecPanel 1 : FWT1 : Box B : Near Side

700.1 Construction			
1. Enclosure Type	Electrical Panel	4. Mounting	Surface mount on unit
2. Type	NEMA 4 Indoor / Outdoor		
3. Size	See electrical drawings		

701 Control Panel (Field Use) : FWT1 : Box B : Far Side

701.1 Construction			
1. Enclosure Type	Electrical Panel	4. Mounting	Surface mount on unit
2. Type	NEMA 3R Outdoor		
3. Size	See electrical drawings		

702 Additional Lighting

702.1 Switches / Outlets

	Name	Box	Section	Type	Mounted	Illum. Switch	Timer	Cover	GFCI	MOCP
	ElecSwitch 1	A	IFB1	Light Switch / 120V Outlet	External	No	None	Yes	Yes	20.0 Amps

702.2 Lighting Types and Quantities

(5) Vapor Proof 14W LED

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-001
JOB #	N003312001
UNIT TAG	RTU-1
QUANTITY	1

Unit Data

Unit Data

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

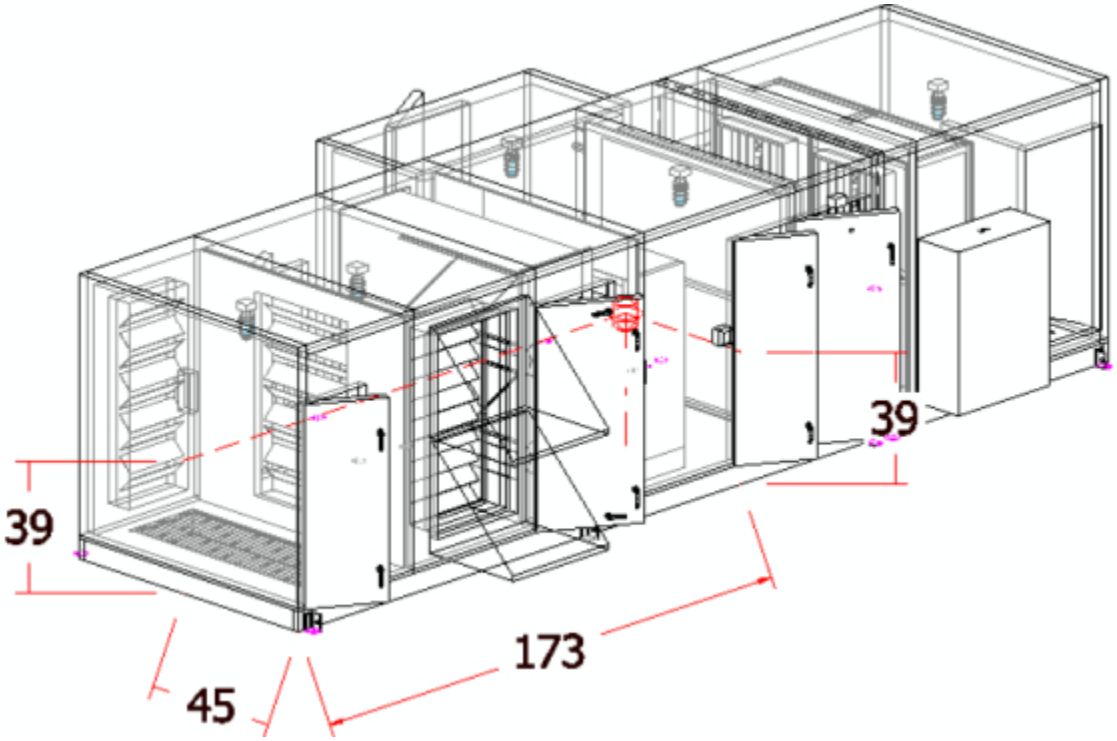
Sales Order #: N003312-001
Job #: N003312001

106 N Industrial Blvd. Okarche, Ok 73762
(405) 817-9700 FAX (405) 263-4980

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

901 Center of Gravity



Size (Inches)			Operating Weight (Pounds)	Center of Gravity (Inches)		
X	Y	Z		X	Y	Z
317.00	125.00	83.50	13,688	173.00	45.00	39.00

901.1 Notes

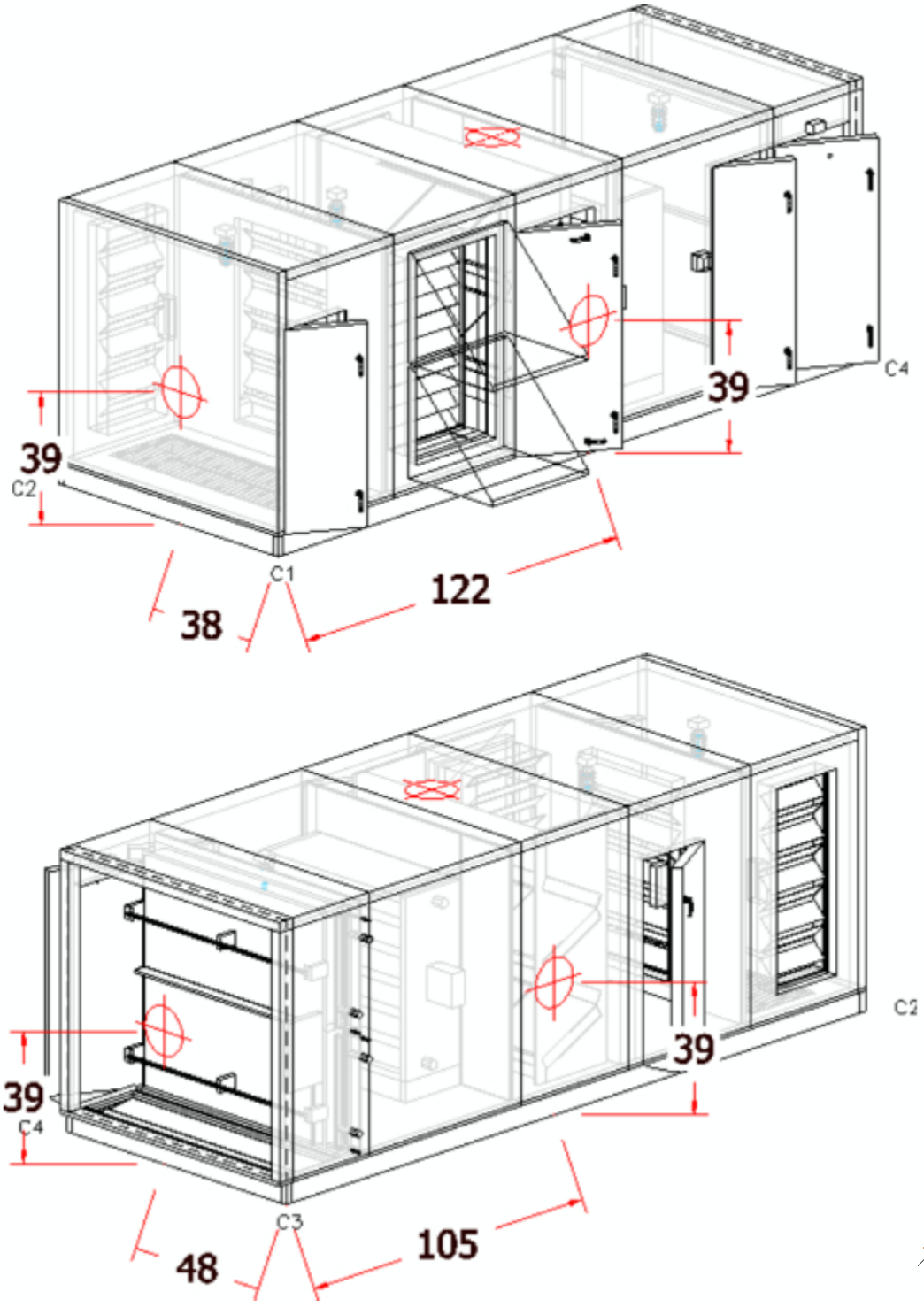
1. Center of gravity and weights are estimates and subject to change.
2. The center of gravity and weights shown above are based on operating weights and do not include packaging materials.
3. A 5% safety factor has been applied to the operating weights.
4. Weights shown do not include roof curbs provided by others.
5. Corner weights apply to rectangular boxes only.
6. Corner weights are to assist in handling of the unit. Some units are not intended to be supported only at the corners. Contact your Sales Representative for support information.

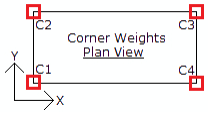
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

901 Center of Gravity (Continued)

901.2 Box A





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
227.00	86.00	83.50	7,822	2,039	1,614	1,842	2,327

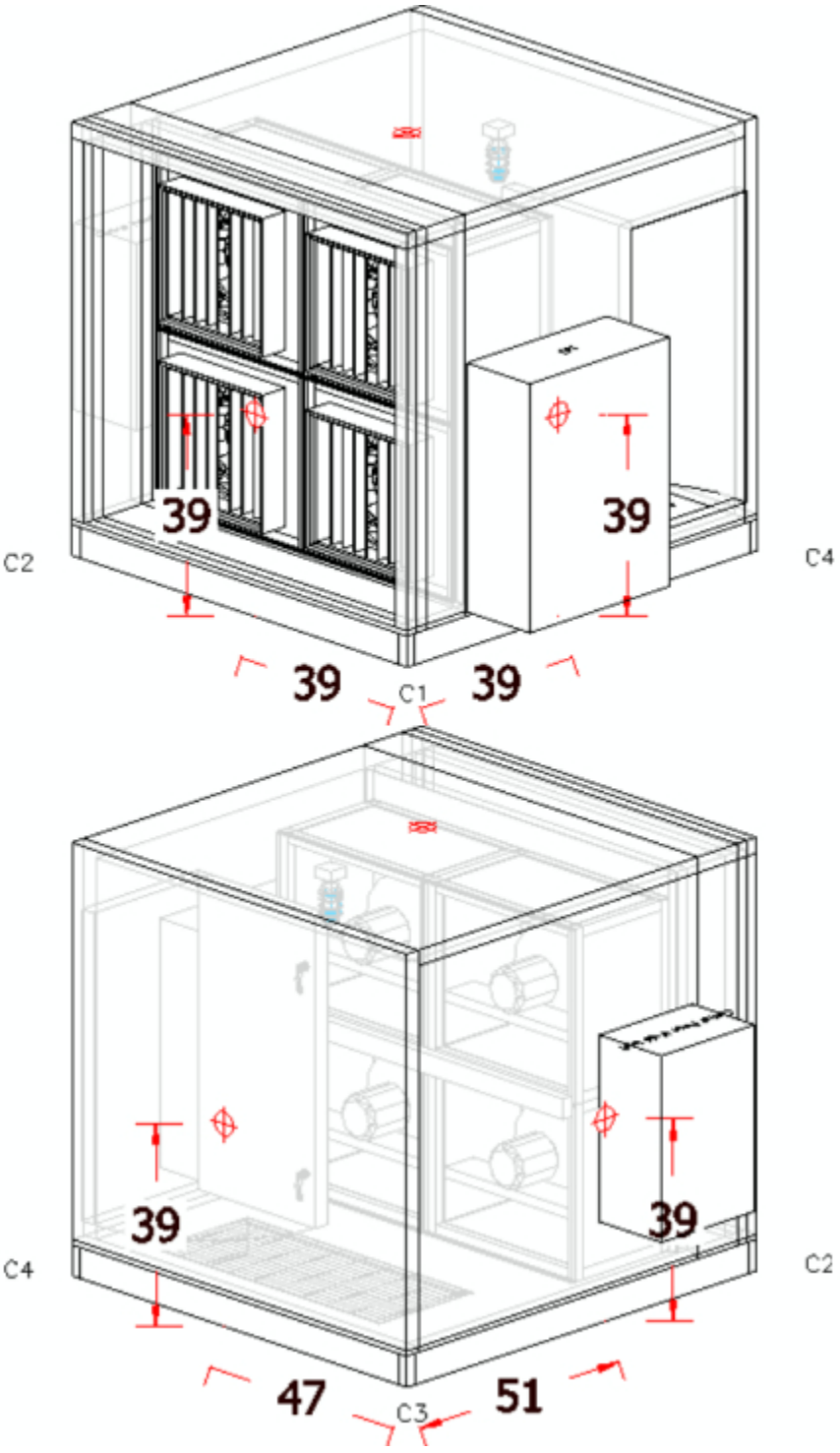
◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

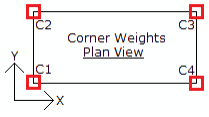
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

Sales Order #: N003312-001
Job #: N003312001

901 Center of Gravity (Continued)

901.3 Box B





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
90.00	86.00	83.50	4,360	1,350	1,120	857	1,032

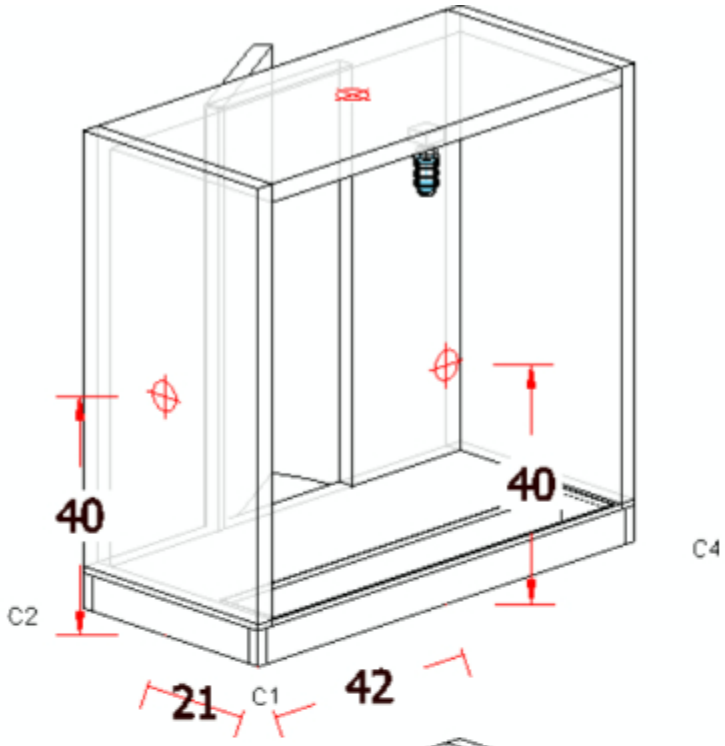
◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

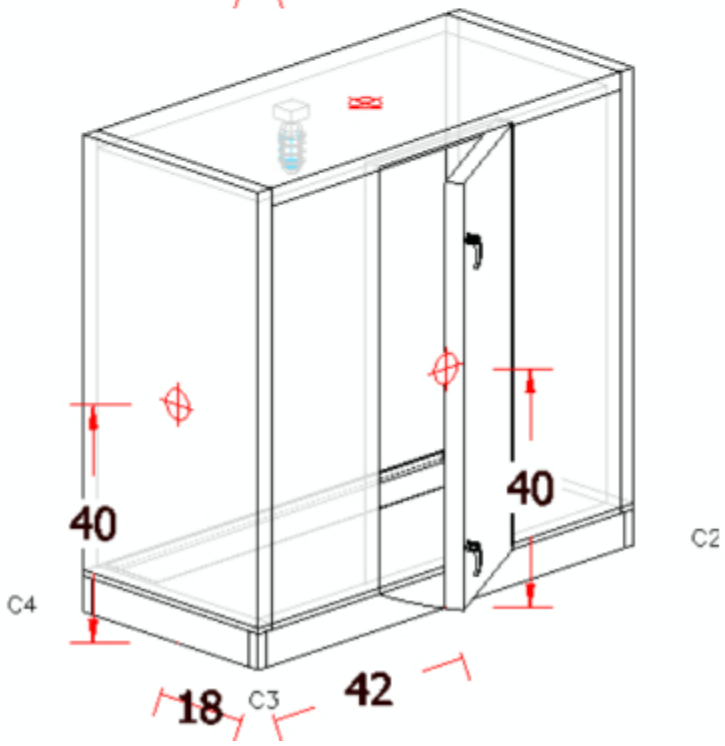
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-1

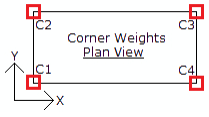
Sales Order #: N003312-001
Job #: N003312001

901 Center of Gravity (Continued)

901.4 Box C





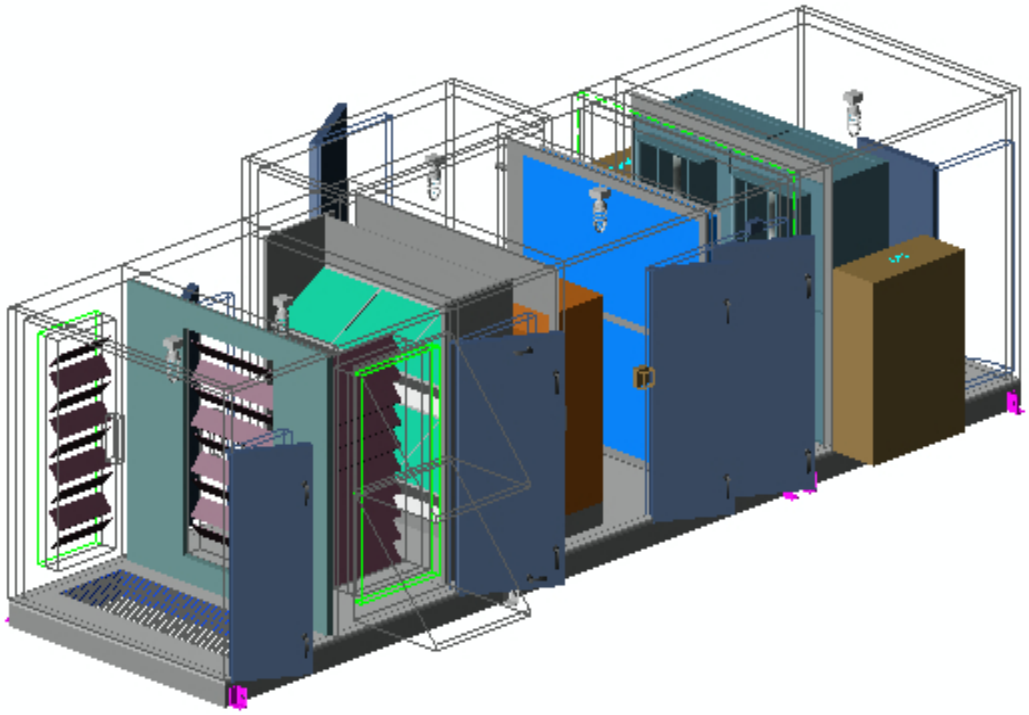


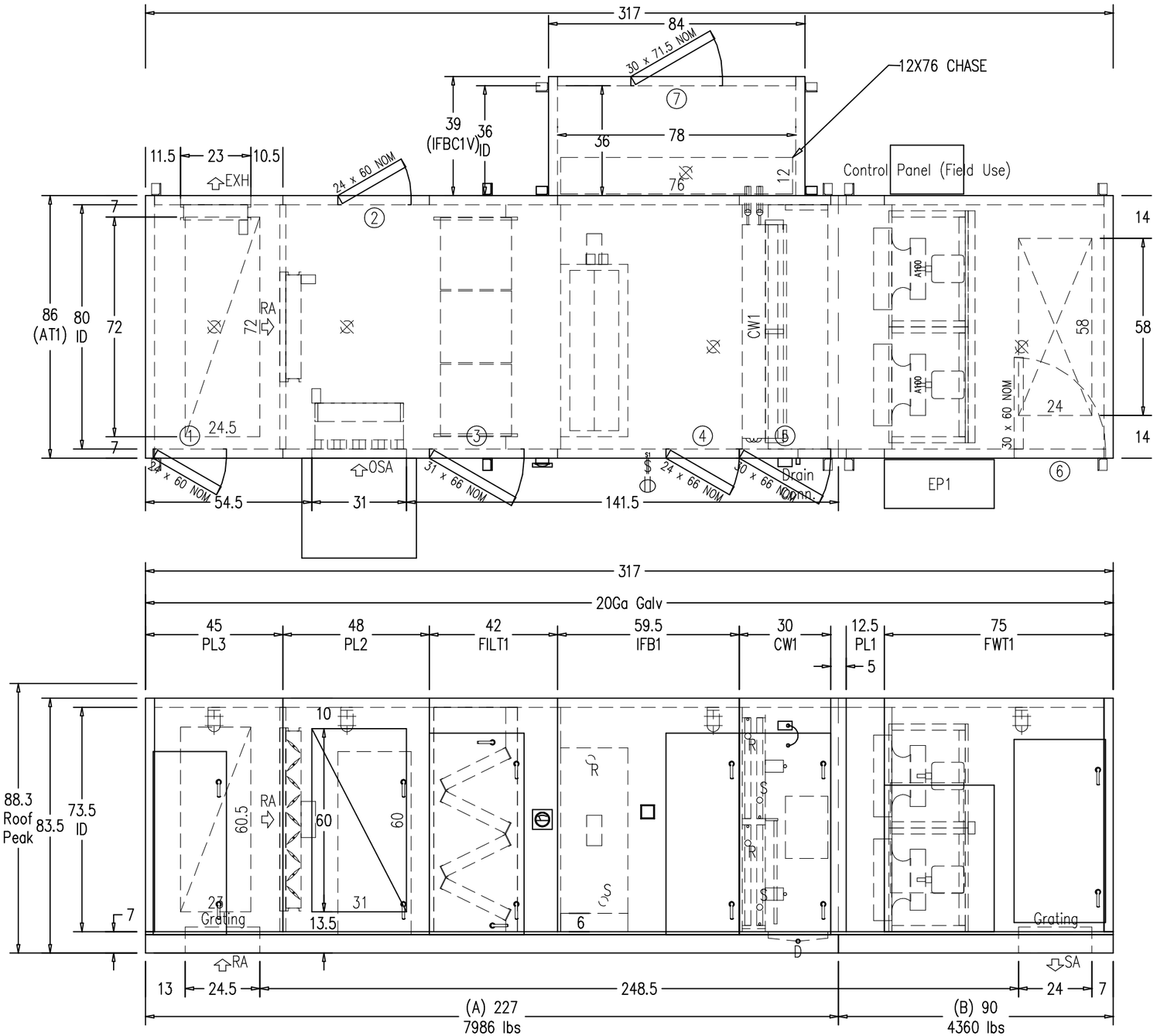
Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
84.00	39.00	80.00	1,342	310	361	361	310

◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Revision History		
Date	Rev	Revision Description





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 Construction 14,500 ACFM
Roof curb provided by others

NORTEK™
AIR SOLUTIONS
TEMTROL
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Okarche, OK 73762
(405) 817-9700
www.nortekair.com

Rev	Revision Description	Date m/d/y

UCA Snow Fine Arts

Unit Tag: RTU-2			Unit Type: Outdoor		Dsg Qty: 1
Rep Firm: Airetech Corp North Little Rock, AR, US			Weight: 13,763		Box Qty: 3
Rep Contact: Forrest Moseley, 501-280-0404			Model No: ITF-RDHE64		
SALES ORDER #: N003312-002	JOB #: N003312002	NASDA Ver: 9.1.0	Factory SAE: BRS	Date m/d/y: 7/24/2023	Rev: A

Printed (yyyy-MM-dd): 2023-11-03

Thybar Corporation has a policy of continuous product improvement and reserves the right to change the product design without notice

NOT PRODUCTION READY
INFORMATION NEEDED

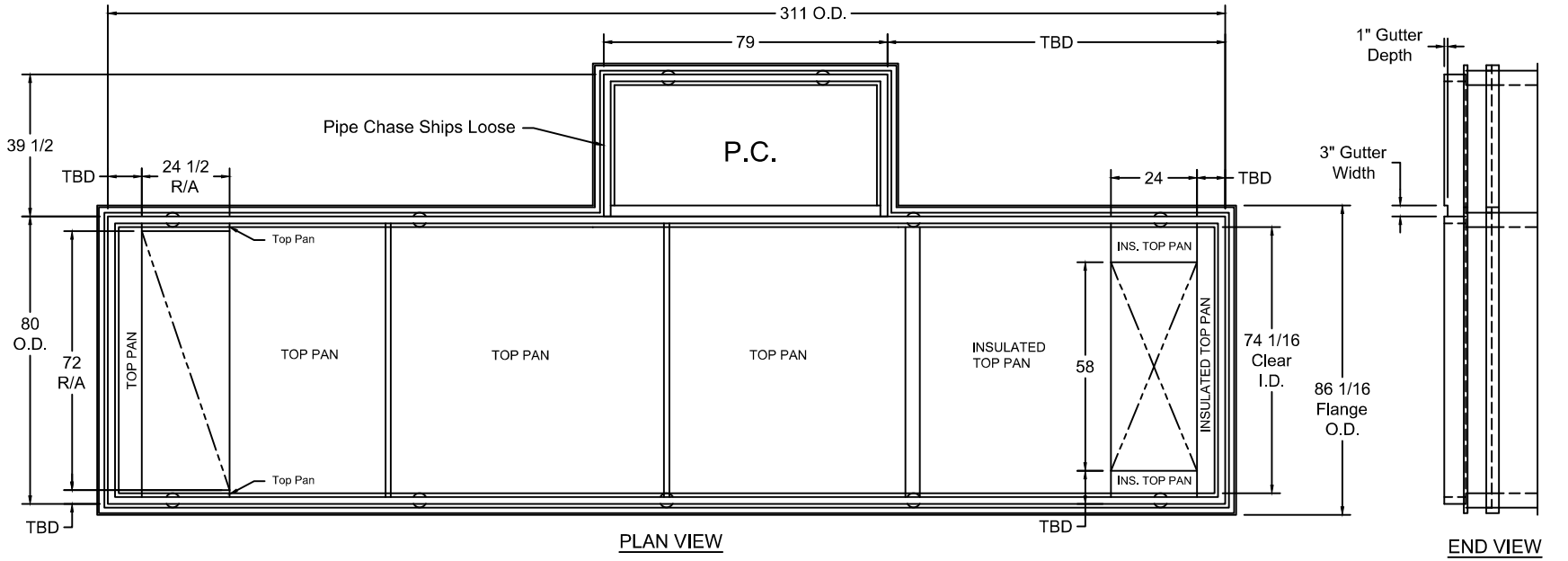
☐ APPROVED
☐ APPROVED PENDING CHANGES
BY:
DATE: / /

SUBMITTAL

CURB WALL THICKNESS AND RESTRAINT REQUIREMENTS TO BE DETERMINED BY SEISMIC/WINDLOAD CALCULATIONS.

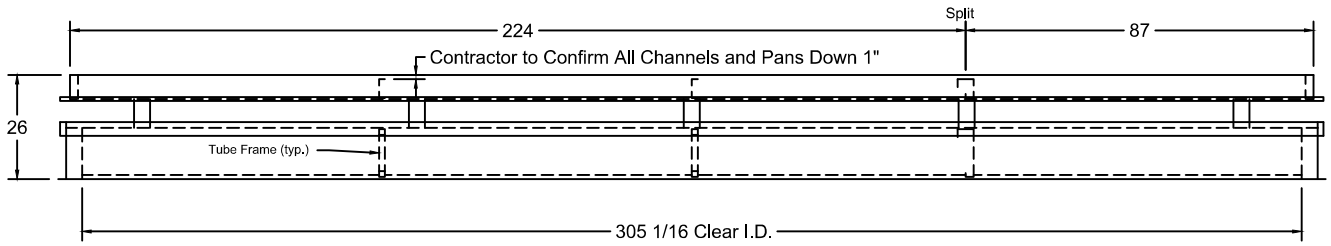
VERIFY ROOF PITCH AND DIRECTION

NOTES:
-CONTRACTOR TO FIELD-CUT SUPPLY & RETURN OPENINGS THROUGH THYBAR CURB FLOOR.
-CONTRACTOR TO SEAL BOTTOM OF UNIT TO TOP OF CURB AND PANS
-CONTRACTOR TO VERIFY SUPPLY, RETURN AND PIPE CHASE LOCATIONS PRIOR TO PRODUCTION

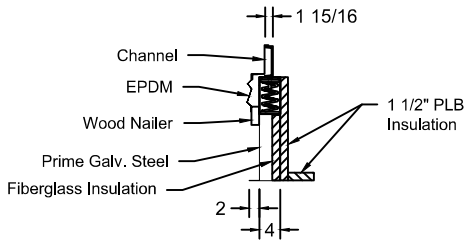


PLAN VIEW

END VIEW



ELEVATION VIEW



SECTION AA
2" Spring Deflection

Rev.	Int.	Date	Description
1	MS	10/24/23	changed to vibrocurb

REVISION HISTORY

(DO NOT SCALE DRAWING) Unless otherwise specified dimensions are in inches tolerances are ± 1/16 ± 0.0625 ± 1°

Date: 8/22/23

Insulated RoofCurb Plenum S and R with pipe chase
New Nortek Custom Unit

Airtech Corporation/ UCA Snow Fine Arts

Qty.: 2 | Job# : Q-25597
Tag:
Drawn: DR
File: S20501-1 | Rev: ----

thybar CORPORATION
Thybar makes it right the first time, every time

Curb final dimensions will be coordinated

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Unit Design Options

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

100 Unit Design Summary

100.1 Electrical

1. Short Circuit Current Rating (SCCR) @ 65 kA
2. ◊ Fans wired to Electrical panel equipped with ABB ACH580 VFD, provided and mounted by Factory. Electrical Panel to have internal overloads with aux. contacts wired in series for field wiring to remote monitoring.
3. ◊ All fan air monitoring with Magnesense transducer.
4. ◊ Factory to provide and mount 24" x 36" NEMA 3R enclosure w/fan, for field installed controls.
5. ◊ All lights controlled by a single light switch. One GFI outlet provided.
6. ◊ 120 volt power for lighting and/or GFI outlets shall be provided by Others.
7. ◊ Unit to ship in individual, bagged sections.

◊ **Project specific requirements**

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

101 Unit Details

101.1 Weights / Jobsite Elevation

1. Shipping Weight	13,599 lb	3. Elevation	266 ft
2. Operating Weight	13,763 lb		

101.2 Preparation for Shipment

1. Knockdown Construction	No

102 Unit Construction

102.1 Construction

1. Cabinet Construction	ITF - Integrated Frame	6. Thermal Break	Modified Thermal Break
2. Design Environment	Outdoor	7. Mounting	Curb Mounted
3. Panel Depth	3 in	8. Roof Curb By	Others
4. Caulk Type	Standard	9. Curb Height	8.000 in
5. Model #	ITF-RDHE64		

102.2 Cabinet Material

1. Exterior Material	16Ga Galv Pre-Paint	7. Blankoff Finish	None
2. Interior Liner type(s)	See Drawing	8. Internal Wall Material	16Ga Galv
3. Exterior Paint Type	Polyester Resin	*Insulation by liner type*	
4. Interior Paint Type	None	9. Solid liner	HD Fiberglass Roll (R12.5)
5. Paint Color	Sandstone	10. Perforated liner	N/A
6. Meets Salt Spray Rating	2500 Hours		

Exceptions:
1. Chilled Water Coil 1: blankoff material is 16Ga 304 SS

102.3 Base Construction

1. Base Structure Material	Steel Tube	6. Base Structure Height	See Drawing
2. Base Floor Material	16Ga Galv	7. Sub Floor Material	20Ga Galv
3. Insulation	Polyurethane Foam	8. Floor Coating	None
4. Floor Drain	None	9. Lifting Lugs	Yes - Welded
5. Floor Options	None		

102.4 Notes / Features

1. Box dimensions do not include lifting lugs, electrical panels, pipe connections, door handles, etc.
2. The height dimensions include raised roof seams and sloped roof for outdoor equipment.

103 Doors

103.1 All Doors (including those associated with specific components)

#	Box	Section	Type[1]	Width	Height	Hinge	Swing	Window	Interior	Exterior	Options[3]
1	A	PL3	3" TBF	24	60	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
2	A	PL2	3" TBF	24	60	RH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
3	A	FILT1	3" TBF	31	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
4	A	IFB1	3" TBF	24	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
5	A	CW1	3" TBF	30	66	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	MS TO
6	B	FWT1	3" TBF	30	60	LH	In	None	16Ga Galv	16Ga Galv Pre-Paint	TO
7	C	PL4	3" TBF	30	71.5	RH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO

103.2 Notes / Features

1. Door Types
   TBF = Thermal Break Factory
2. All doors insulated with Polyurethane Foam.
3. Options: MS = Manual Safety Interlock, TO = Tool Operated Handle

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

104 Drains

104.1 All Drains (including those associated with specific components)

Box	Section	Type	Conn (in)	Hand	Grating Material	Pan Material
A	CW1	Drain Pan	1.25	Right	None	16Ga 304 SS

104.2 Notes / Features

1. Drain Constructions included: Triple Pitched

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

106 Static Pressure Summary

106.1 Condition 1

106.1.1 Supply

Tunnel	*Description*	*APD (in.H20)*
AirTunnel 1	RA Opening - Damper (Return Air)	0.13
AirTunnel 1	OSA Opening - Damper (Outside Air)	0.01
AirTunnel 1	Filter 1, 4" MERV 13 (Average Pressure Drop)	0.89
AirTunnel 1	IFB Coil 1	0.64
AirTunnel 1	Chilled Water Coil 1	0.59
AirTunnel 1	UVLight 1	0.02
AirTunnel 1	FANWALL 1 (Supply) 14,500 ACFM @ 5.83 in.H20	0.00
AirTunnel 1	SA Opening (Supply Air)	0.35
	ESP:	3.20
	Total Static Pressure:	5.83

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.

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(405) 817-9700 FAX (405) 263-4980

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Fans

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

200 FANWALL 1 (Supply) : FWT1 : Box B — 20-60 - 184T - 34 x 38 x 26 - B2

200.1 Configuration / Quantity

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

Cell Size	6.Height	7.Width	8.Depth	9.Overall Depth
	34	38	26	33.25

10. Elev. / Temp.	266 ft / 70.0 °F		
11. Motor & Wheel Weight	168 lb	13. Redundant	0
12. Fan Cell Weight	368 lb	14. Empty	0
15. Ship Loose Fan (Wheel, Motor and Mounting Base)			0

200.2 Options

1. Coplanar Insulation	Standard Melamine	8. Cell Finish	None
2. Extended Coplanar	No	9. Insulation Retainer	No
3. Back Draft Dampers	FBD8	10. Inlet Attenuation	None
4. Inlet Cone Type	A100 Curved Cone	11. Blankoff Material	16Ga Galv
5. Solid Perimeter Material	None	12. Blankoff Finish	None
6. Discharge Safety Guard	No	13. Removal Rail	No
7. Cell Material	Steel		

200.3 Fan Wheel

1. Wheel Type	HPF-A100	3. Width	60
2. Diameter	20	4. Max RPM	3521
		5. Wheel Finish	None

200.4 Motor

1. Manufacturer	Toshiba	6. Efficiency	89.5
2. HP Each / Total	5 / 20	7. Service Factor	1.15
3. Poles / RPM	4-Pole / 1,755	8. Shaft Isolation	Ceramic Bearings
4. Frame / Casing	184T / TEAO	9. FLA Each / Total	13.8 / 55.2 Amps
5. Volts / Phase / Hz	208/3/60	10. Motor HP Safety Factor	3.0 %

200.5 Control System

1. Redundant VFD	No	6. Flow Monitoring	Yes
2. Bypass Circuit	None	7. Fans to Monitor	All Fans
3. Drive	Standard	8. Display	Magnesense
4. Optimization Control	No		
5. Control Method	By Others		

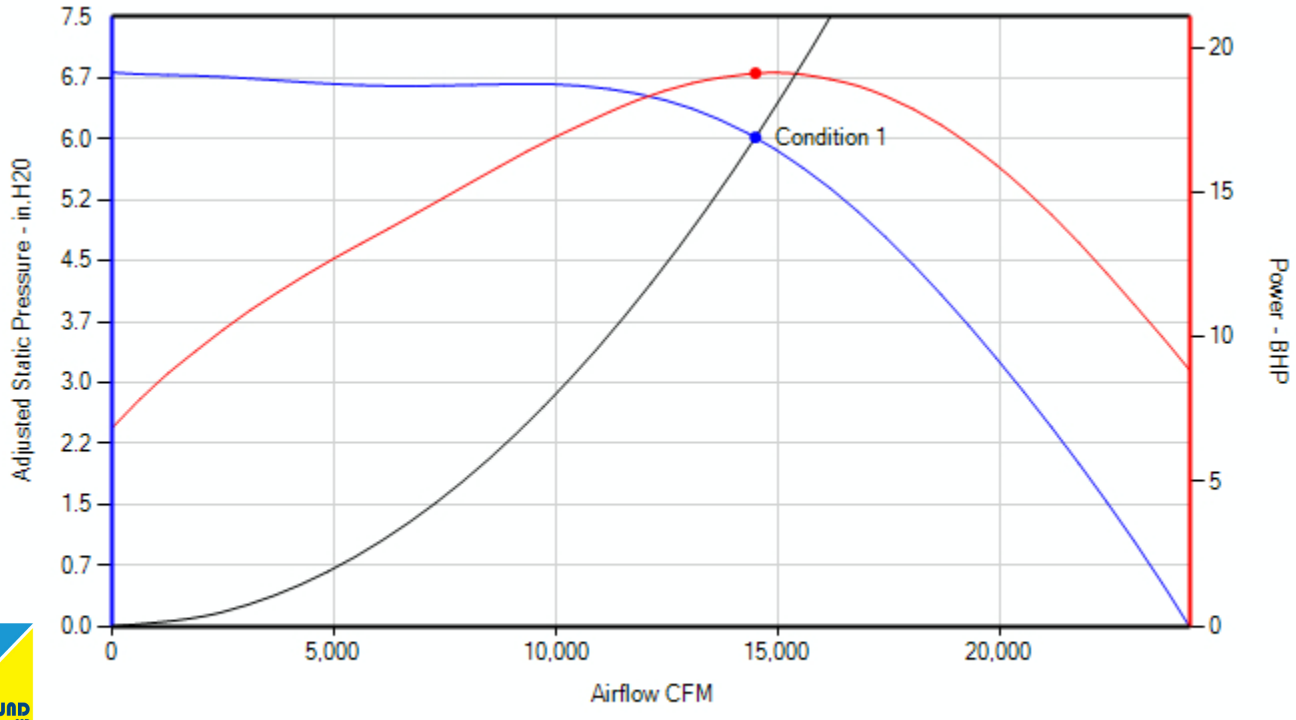
200.6 Notes / Features

1. To view patents and other pending U.S. or Canadian applications visit www.nortekair.com/patents.
2. (4) airflow measurement taps. Cone constant = 2524, cone flow differential pressure = 2.04 in.H2O at 3625 CFM per fan.
3. The estimated VFD input watts are based on the motor and VFD efficiency at the selected load and RPM.
4. Fans balanced to a maximum allowable level of 0.022 inches per second peak.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 20-60 - 184T - 34 x 38 x 26 - B2



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

200.7 Operating Conditions

Operating Condition	Usage (%)	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel. (ft/min)	Watts	FEG % O.P.	FEI
			Input	Adj.	On	Off	Fail			Each	Total				
Condition 1	100	14,500	5.83	5.98	4	0	0	2,382	81.4	4.78	19.11	512	16,439	FEG80 2%	1.25

200.8 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	84	81	96	92	84	84	84	81	94	98
	Outlet	90	85	90	86	83	79	76	67	89	95

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 20-60 - 184T - 34 x 38 x 26 - B2

200.9 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	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Coils

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

300 Chilled Water Coil 1 : CW1 : Box A — 5WC - 6 - 33 x 70 x 4 - 12 AL

300.1 Coil Layout

1. Coil Hand	Left	6. Rack Style	None
2. Configuration	Single	7. Rack Finish	None
3. Connection Orientation	Straight	8. Blankoff Material	16Ga 304 SS
4. Connection Material	Red Brass	9. Blankoff Finish	None
5. Connection Type	MPT		

300.2 Construction

1. Quantity	2	8. Stand Height	1 in	14. Casing	16Ga 304 SS
2. Serpentine	0.6666667	*Tube Detail - Primary Surface*		15. Coating	None
3. Fin Height	33.000 in	9. Material	Copper	*Fin Detail - Secondary Surface*	
4. Fin Length	70.000 in	10. O.D. x Wall	0.625 x 0.020 in	16. Material	Aluminum
5. Rows	4	11. Spacing	1.500 x 1.299 in	17. Thickness	0.008 in
6. Fins per Inch	12	12. Internal	Smooth	18. Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	32.08 ft²	13. Return Bends	0.028 in		

Single Bank, Left Hand, 2 per unit — **5WC - 6 - 33 x 70 x 4 - 12 AL**

Supply / Return Connections				*Vent and Drain*		
Quantity	Type	Pipe Size	Material	Type	Vent Location	Drain Location
2	MPT	2.0 in	Red Brass	0.750 in MPT Extended	Return Header	Supply Header

300.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	14,500 ACFM	10. Total Capacity	636.7 MBH
2. Standard Airflow	14,077 SCFM	11. Sensible Capacity	413.0 MBH
3. Elevation	266 ft	12. Actual Face Velocity	451.95 ft/min
4. Entering Air DB	80.7 °F	13. Leaving Air DB	54.1 °F
5. Entering Air WB	68.4 °F	14. Leaving Air WB	53.9 °F
6. Fluid Type	Water	15. APD	0.59 in.H20
7. Entering Fluid Temp	45.0 °F	16. Leaving Fluid Temp	55.0 °F
8. Fluid Flow Rate	126.9 GPM	17. Fluid Velocity	5.03 ft/s
9. Fluid Fouling Internal	0.0000	18. Fluid Pressure Drop	13.77 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

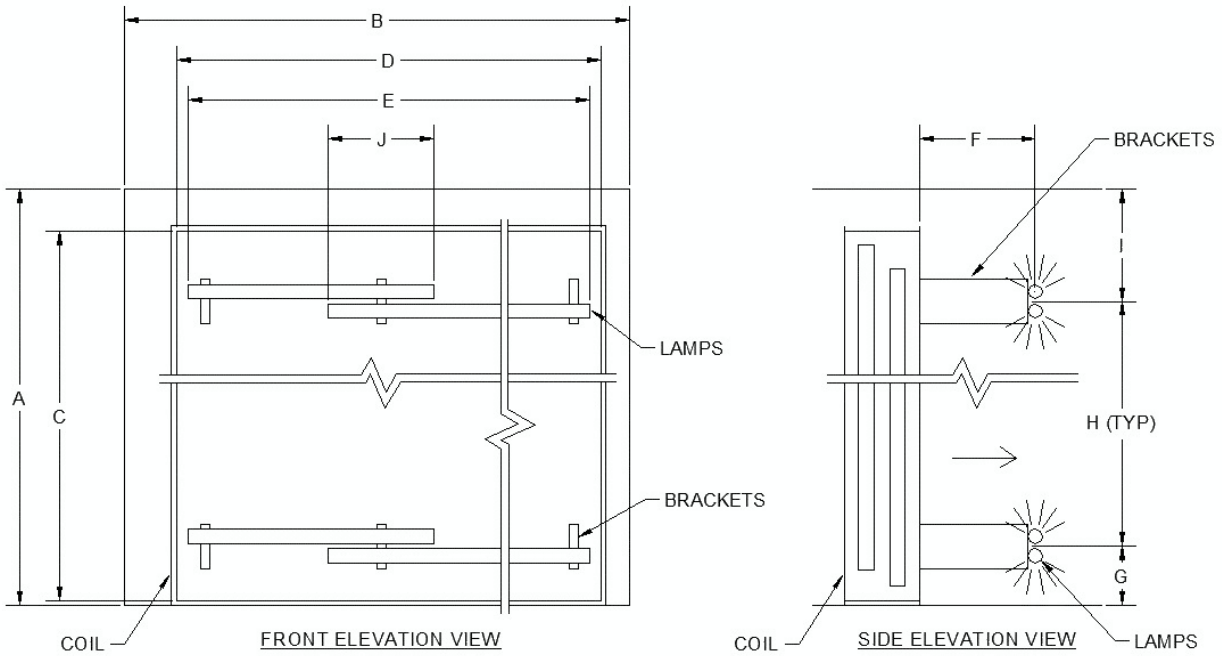
1. Manufacturer: Nortek Air Solutions, 5510 SW 29th Street, Oklahoma City, OK 73179
2. Top and bottom casing flange height is 1.000 in.
3. SCFM is corrected for Elevation and EDB.
4. Coils to be pressure tested at 315 PSI
5. Total operating weight is 741 lb.
6. Total fluid volume is 18.7 Gal.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

301 UVLight 1 : CW1 : Box A

301.1 Construction			
1. Provided By	Factory	12. Safety Switch	Factory Supplied
2. Product Type	RLM Xtreme	13. 12V Contact Connector	No
3. Fixture	Lamp Included	14. Extra Relay Switches	0
4. Voltage	120/1/60	15. UV Report™	No
5. Total Watts	740	16. UV Repeat™	No
6. Watts at Coil Surface	17.04 Watts/ft²	17. Warning Sign	No
7. Rows of Lights	2	18. UV-C Hour Meter	No
8. Fixtures Per Row	2	19. Conduit Loom Kits	Yes
9. Total Lamp Sets	1	20. LampLoom Down Exit	Yes
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
73.50	80.00	70.00	70.00	70.00	6.00	12.30	41.90	19.30	52.00

301.3 Purchased Items		
UVR Part Num	Description	Quantity
55086551	RLM Xtreme 61" Single Ended- High Output EncapsuLamp	4
55008022	RLM Conduit Loom Kit-20' S/S Flex Conduit w/Down Exit LampHolder	4
55000009	Dual LampHolster - Extended Base	2
55800064	RLM-X-Box 4P 120-277V w/CU2	1

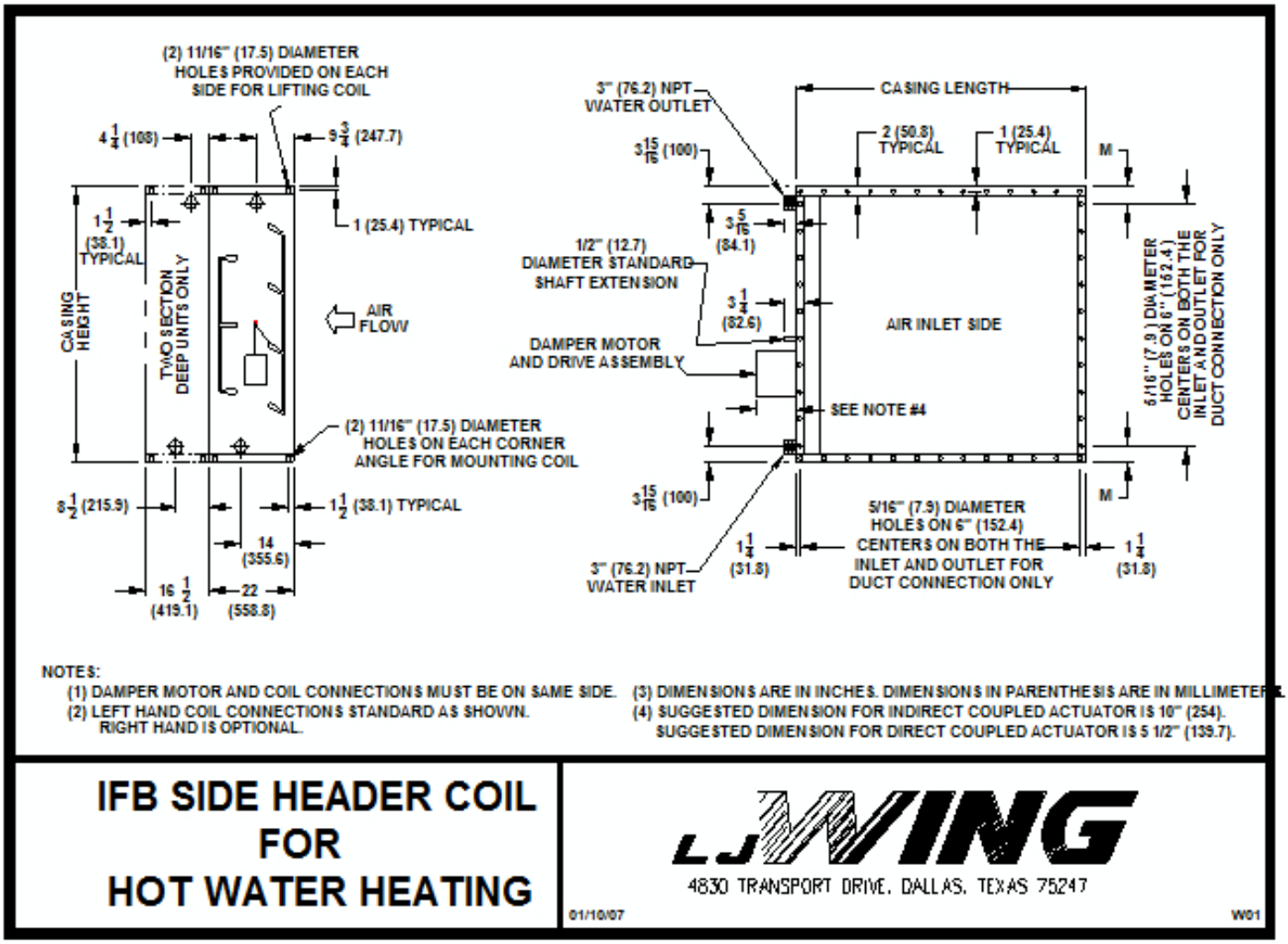
301.4 Electrical Service Information			
1. Volt/Phase/Hertz	120/1/60	3. Provides power to	UVLight 1
2. MCA	6.2		
1. For electrical loads see electrical drawings			

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

302 IFB Coil 1 : IFB1 : Box A — E - 48

302.1 Construction			
1. Fin Material	Aluminum	8. Fin Spacing	12
2. Tube Material	Copper	9. Tube OD	0.625 in
3. Connection Material	Steel	10. Tube Wall	0.035 in
4. Rows	2 (One Section)	11. Connection Location	Far Side
5. Total Face Area	21.3 ft²	12. Stand Height	6 in
6. Casing Finish	Air Dried Enameled Paint (Std.)	13. Anti-Stratification Baffles	No
7. Elevation	266 ft	14. Actuator Location	Left



NOTES:
(1) DAMPER MOTOR AND COIL CONNECTIONS MUST BE ON SAME SIDE.
(2) LEFT HAND COIL CONNECTIONS STANDARD AS SHOWN. RIGHT HAND IS OPTIONAL.
(3) DIMENSIONS ARE IN INCHES. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
(4) SUGGESTED DIMENSION FOR INDIRECT COUPLED ACTUATOR IS 10" (254). SUGGESTED DIMENSION FOR DIRECT COUPLED ACTUATOR IS 5 1/2" (139.7).

IFB SIDE HEADER COIL FOR HOT WATER HEATING

LJ WING
4830 TRANSPORT DRIVE, DALLAS, TEXAS 75247
01/10/07 W01

302.2 Coil Dimensions (in)											
Casing Height	Casing Length	M	N	Q	Z	L	P	R	S	Y	X
54.25	56.5	3.125	-	-	-	-	-	-	-	-	-

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

302 IFB Coil 1 : IFB1 : Box A (Continued) E - 48

302.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	14,500 ACFM	7. Sensible Capacity	538.9 MBH
2. Standard Airflow	15,961 SCFM	8. Face Velocity	865.12 ft/min
3. Entering Air DB	15.0 °F	9. Leaving Air DB	49.6 °F
4. Fluid Type	Water	10. APD	0.64 in.H20
5. Entering Fluid Temp	160.0 °F	11. Leaving Fluid Temp	138.2 °F
6. Fluid Flow Rate	50.0 GPM	12. Fluid Pressure Drop	1.36 ft.H20

Notes:
1. ARI Certified

302.4 Notes / Features

1. SCFM is corrected for Elevation and EDB.
2. Total operating weight is 789 lb

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Components

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

500 Filter 1 : FILT1 : Box A

500.1 Pre-Filter Size & Quantity			
1. Loading	V Side Load	5. Bank Size	72.000 in W x 56.875 in H
2. Filter Clips	By Others	6. Qty / set & Frame Size 1	(12) 24 in x 24 in
3. Blankoff / Rack Material	16Ga Galv	7. Qty / set & Frame Size 2	
4. Blankoff / Rack Finish	None	8. Qty / set & Frame Size 3	
		9. Qty / set & Frame Size 4	

500.2 Pre Filter			
1. Filter Depth	4.000 in	4. Number of Sets	
2. Efficiency		5. Max Face Velocity	302.08 ft/min at 14,500 ACFM
3. Manufacturer		6. Model	

500.3 Pressure Gage Specifications - Gage 2			
1. Manufacturer	Dwyer	3. Options	Hinged Cover
2. Model / Range	Magnehelic 2002 (0-2" w.c.)	4. Quantity	1

500.4 Notes / Features
1. Filters provided by Others.

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

600 OSA Opening : OSA : Box A : Near Side

600.1 Opening Construction			
1. Description	Outside Air	4. Shape	Rectangle
2. Max CFM	5,180 ACFM	5. Max APD	0.01 in.H20
3. Size	31 W x 60 H in		

600.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin AMS 050 (Aluminum)	7. Max Face Velocity	443.47 ft/min
3. Size	29.000 in (Blade Direction) x 58.000 in	8. End Switches	No
4. Blade Config	Parallel		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 2" frame flange
2. Damper Options: Integrated Controller and Actuators

600.3 Damper Actuator			
1. Location	Face Mounted (RH)	3. Floor Mounted	No
2. Type	Modulating 24V – NC	4. Furnished By	Factory
		5. Mounted By	Factory
		6. Wiring By	Others

600.4 Notes / Features

1. Weather hood included: 2 sections (37.500 in W x 32.750 in H x 32.75 D) - custom sizing. Maximum weather hood velocity 387 ft/min. Shipped Loose.

601 SA Opening : SA : Box B : Floor

601.1 Opening Construction			
1. Description	Supply Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.35 in.H20
3. Size	58 W x 24 H in	6. Max Velocity	1,500.00 ft/min

601.2 Notes / Features

1. Steel Floor Grate included.

602 RA Opening : RA : Box A : Floor

602.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.05 in.H20
3. Size	72 W x 24.5 H in	6. Max Velocity	1,184.00 ft/min

602.2 Notes / Features

1. Steel Floor Grate included.

603 EXH Opening : EXH : Box A : Far Side

603.1 Opening Construction			
1. Description	Exhaust Air	4. Shape	Rectangle
2. Max CFM	9,500 ACFM	5. Max APD	0.14 in.H20
3. Size	23 W x 60.5 H in		

603 EXH Opening : EXH : Box A : Far Side (Continued)

603.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	983.11 ft/min
3. Size	23.000 in (Blade Direction) x 60.500 in	8. End Switches	No
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

603.3 Damper Actuator			
1. Location		3. Floor Mounted	
2. Type		4. Furnished By	Others
		5. Mounted By	Others
		6. Wiring By	Others

603.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Face Mounted (RH) location.
2. Damper Actuators wired by Others

604 RA Opening : RA : Box A : Internal Wall

604.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	14,500 ACFM	5. Max APD	0.13 in.H20
3. Size	36 W x 60 H in		

604.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	966.67 ft/min
3. Size	36.000 in (Blade Direction) x 60.000 in	8. End Switches	No
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

604.3 Damper Actuator			
1. Location		3. Floor Mounted	
2. Type		4. Furnished By	Others
		5. Mounted By	Others
		6. Wiring By	Others

604.4 Notes / Features

1. Damper Actuators and mounting accessories furnished and mounted by Others at Face Mounted (LH) location.
2. Damper Actuators wired by Others

605 Opening : Box C : Floor

605.1 Opening Construction			
1. Max CFM	14,500 ACFM	3. Shape	Rectangle
2. Size	12 W x 76 H in	4. Max APD	0.00 in.H20
		5. Max Velocity	0.00 ft/min

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Electrical

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

700 ElecPanel 1 : FWT1 : Box B : Near Side

700.1 Construction			
1. Enclosure Type	Electrical Panel	4. Mounting	Surface mount on unit
2. Type	NEMA 4 Indoor / Outdoor		
3. Size	See electrical drawings		

701 Control Panel (Field Use) : FWT1 : Box B : Far Side

701.1 Construction			
1. Enclosure Type	Electrical Panel	4. Mounting	Surface mount on unit
2. Type	NEMA 3R Outdoor		
3. Size	See electrical drawings		

702 Additional Lighting

702.1 Switches / Outlets

	Name	Box	Section	Type	Mounted	Illum. Switch	Timer	Cover	GFCI	MOCP
	ElecSwitch 1	A	IFB1	Light Switch / 120V Outlet	External	No	None	Yes	Yes	20.0 Amps

702.2 Lighting Types and Quantities

(5) Vapor Proof 14W LED

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-002
JOB #	N003312002
UNIT TAG	RTU-2
QUANTITY	1

Unit Data

Unit Data

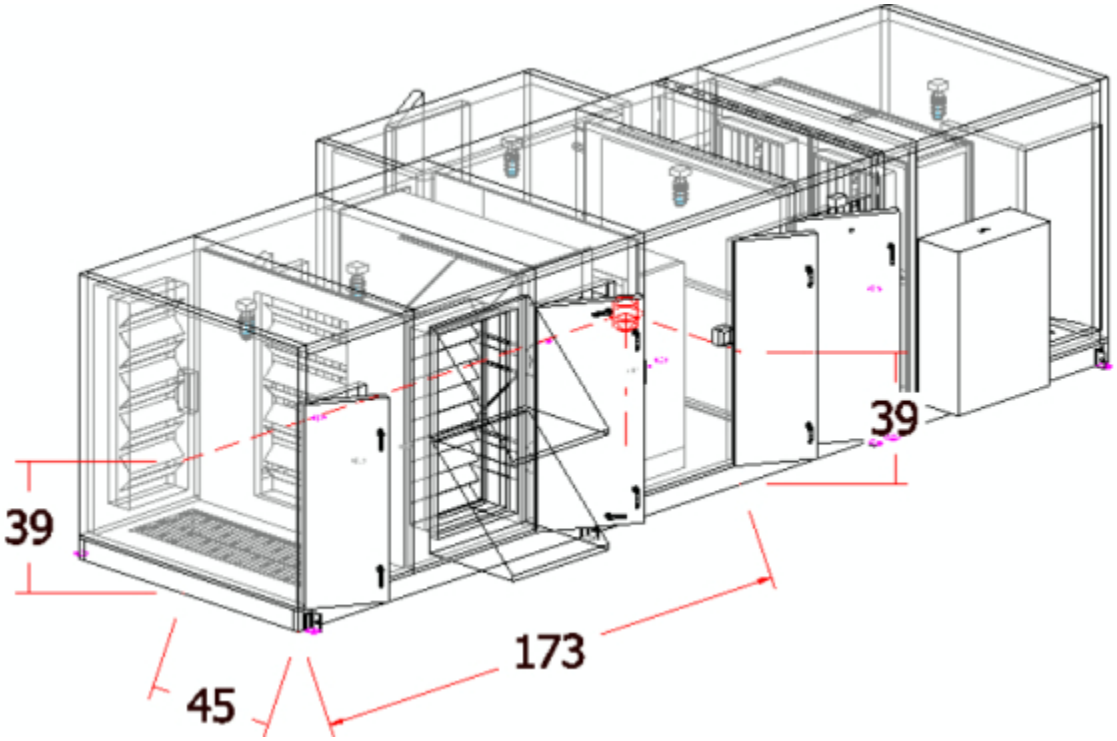
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

901 Center of Gravity



Size (Inches)			Operating Weight (Pounds)	Center of Gravity (Inches)		
X	Y	Z		X	Y	Z
317.00	125.00	83.50	13,688	173.00	45.00	39.00

901.1 Notes

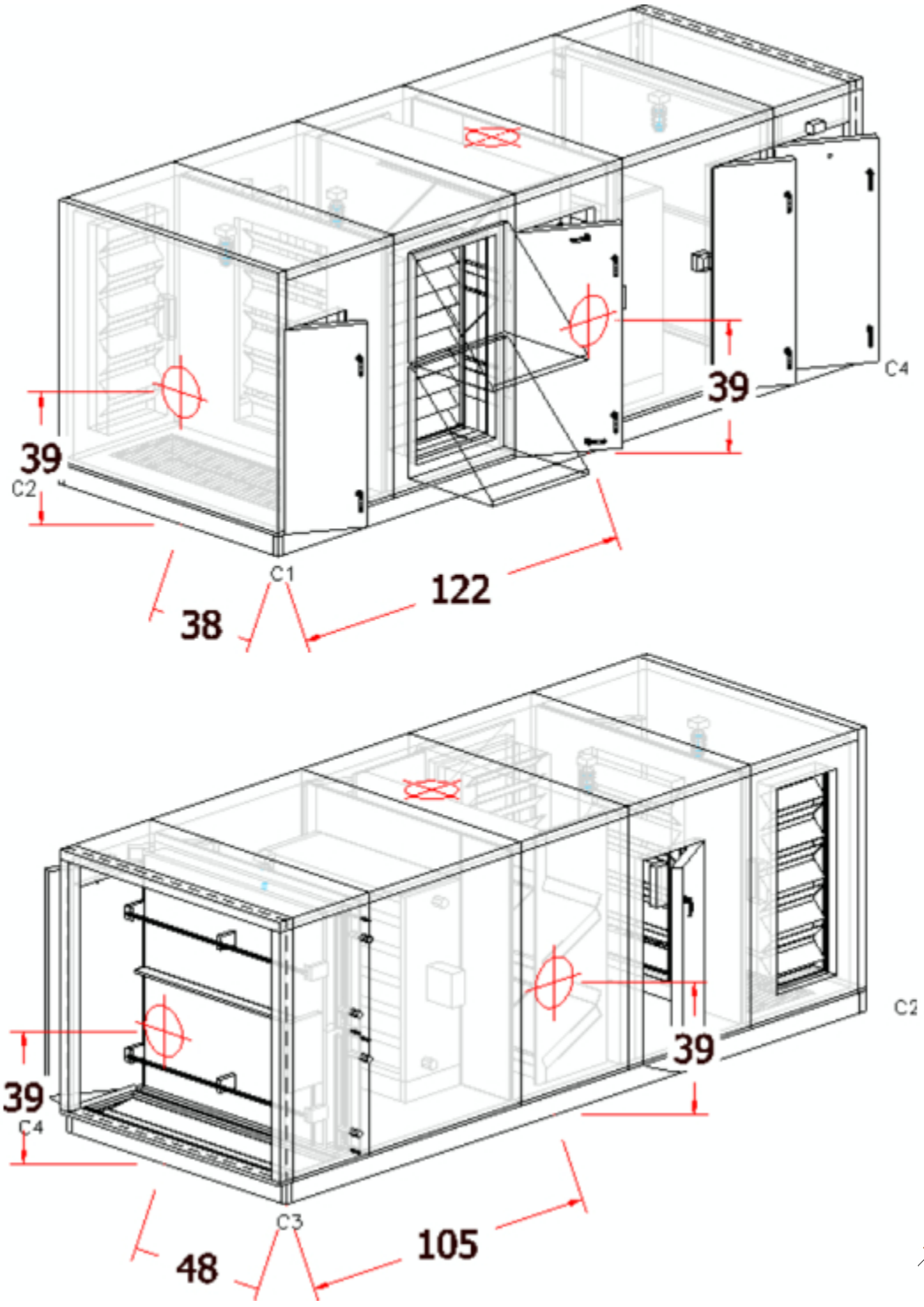
1. Center of gravity and weights are estimates and subject to change.
2. The center of gravity and weights shown above are based on operating weights and do not include packaging materials.
3. A 5% safety factor has been applied to the operating weights.
4. Weights shown do not include roof curbs provided by others.
5. Corner weights apply to rectangular boxes only.
6. Corner weights are to assist in handling of the unit. Some units are not intended to be supported only at the corners. Contact your Sales Representative for support information.

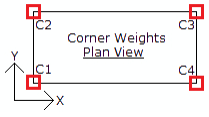
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

901 Center of Gravity (Continued)

901.2 Box A





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
227.00	86.00	83.50	7,822	2,039	1,614	1,842	2,327

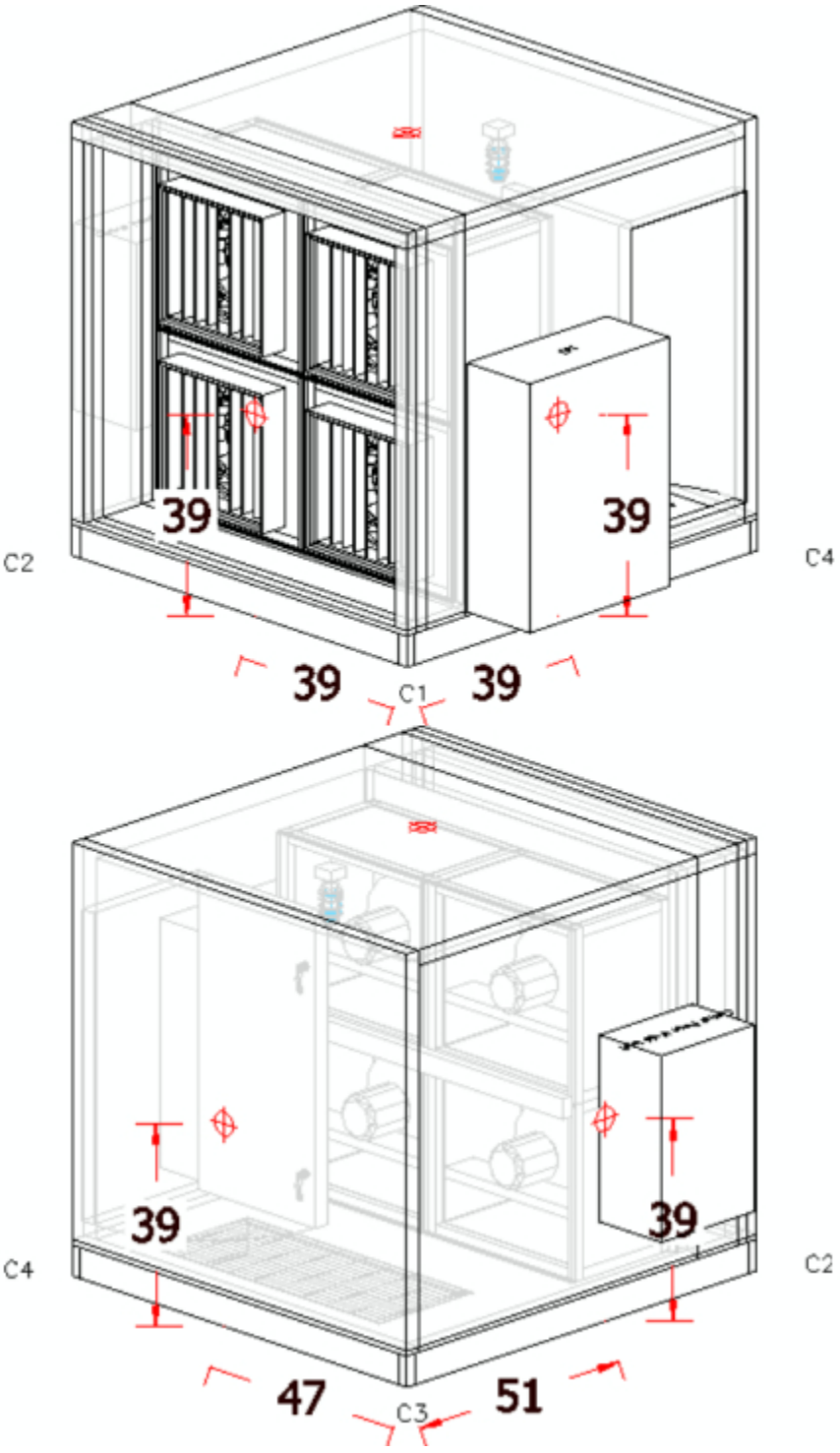
◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

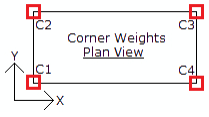
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

Sales Order #: N003312-002
Job #: N003312002

901 Center of Gravity (Continued)

901.3 Box B





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
90.00	86.00	83.50	4,360	1,350	1,120	857	1,032

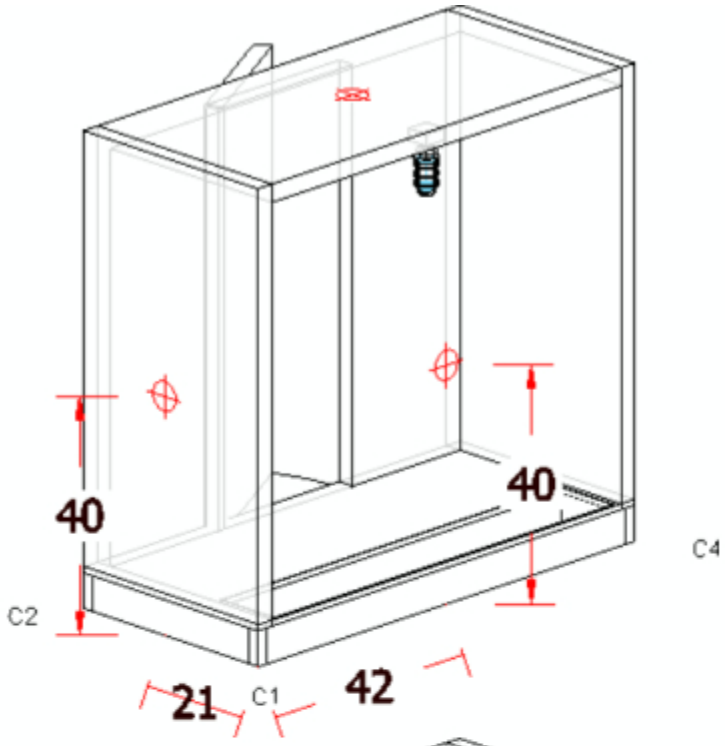
◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

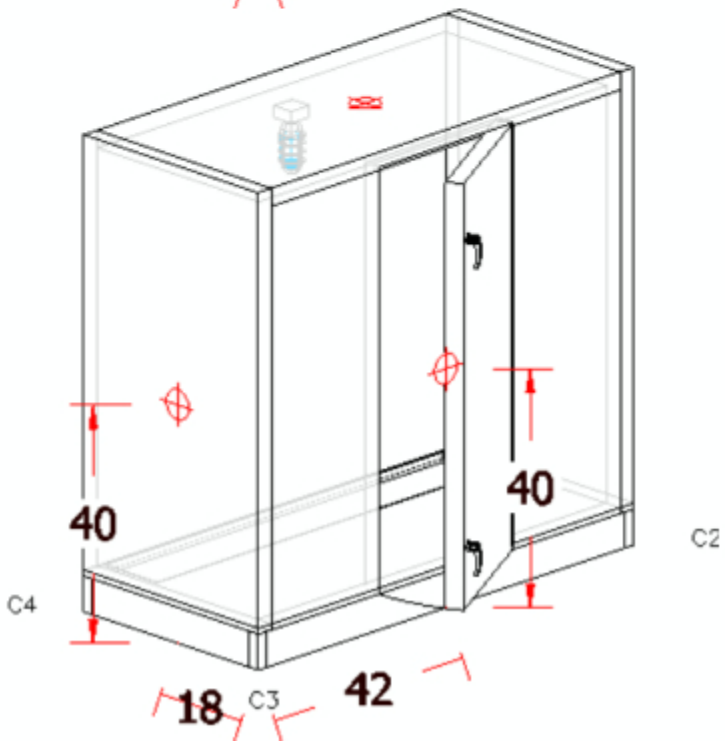
Project Name: UCA Snow Fine Arts
Unit Tag: RTU-2

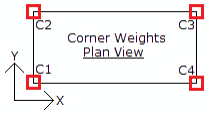
Sales Order #: N003312-002
Job #: N003312002

901 Center of Gravity (Continued)

901.4 Box C







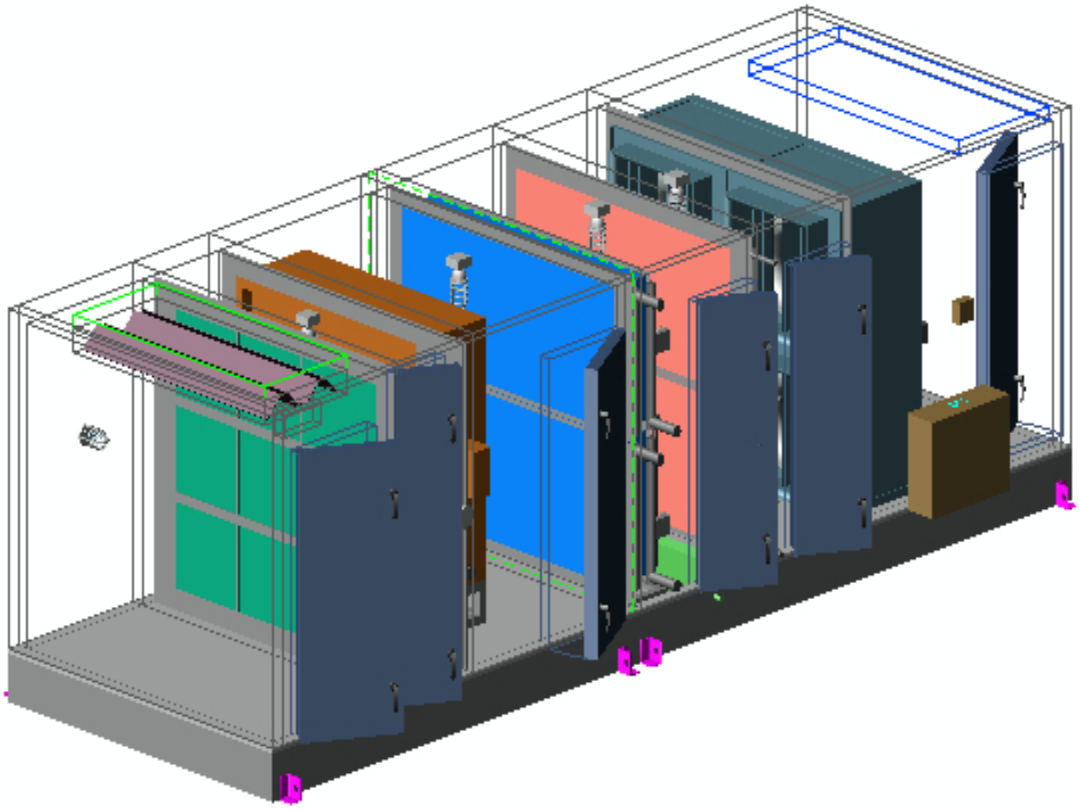
Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
84.00	39.00	80.00	1,342	310	361	361	310

◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

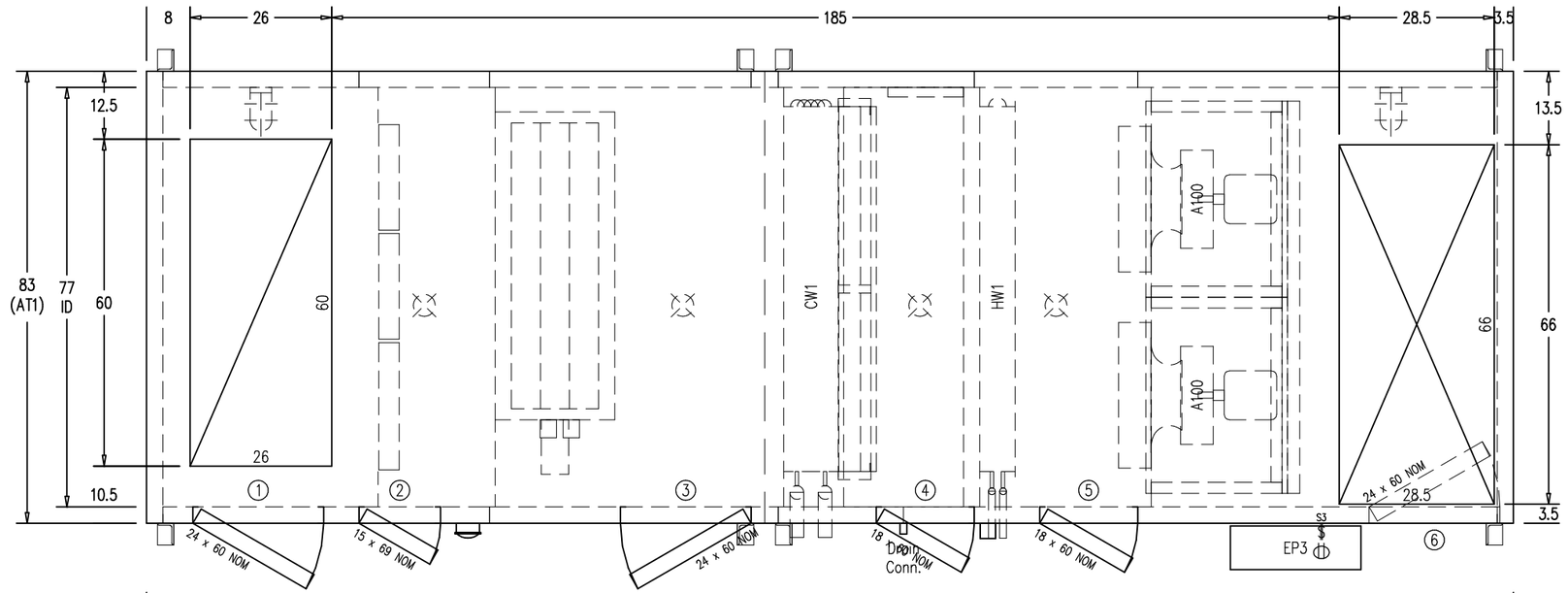
PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
JOB #	N003312002
UNIT TAG	AH-6
QUANTITY	1

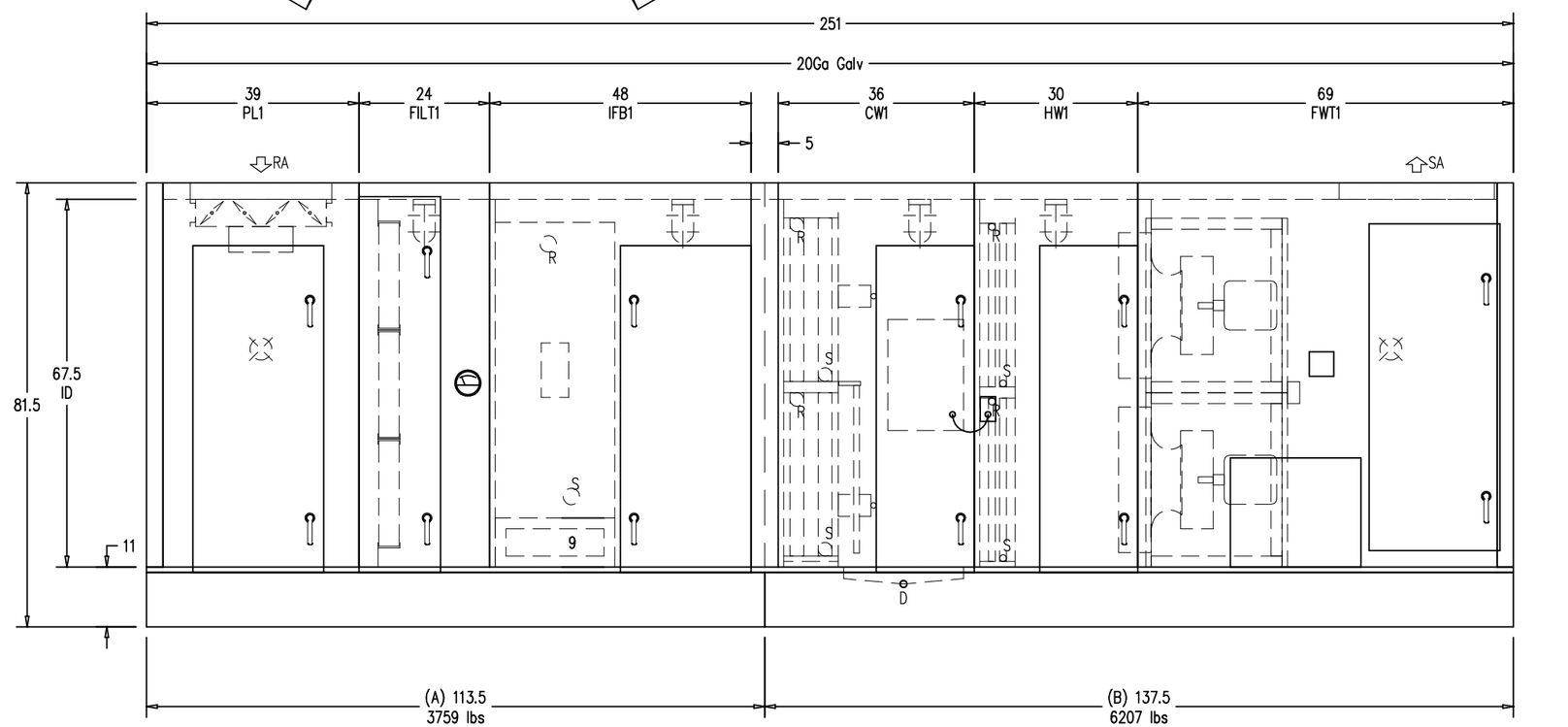
Revision History

Date	Rev	Revision Description



Preliminary





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 Construction 13,000 ACFM

NORTEK AIR SOLUTIONS
TEMTROL

106 N Industrial Blvd.
Okarche, OK 73762
(405) 817-9700
www.nortekair.com

Rev	Revision Description	Date m/d/y

UCA Snow Fine Arts

Unit Tag: AH-6				Unit Type: Indoor	Dsg Qty: 1
Rep Firm: Airetech Corp North Little Rock, AR, US				Weight: 10,035	Box Qty: 2
Rep Contact: Forrest Moseley, 501-280-0404			Model No: ITF-RDHE64		
SALES ORDER #: N003312-003	JOB #: N003312002	NASDA Ver: 9.1.0	Factory SAE: BRS	Date m/d/y: 8/9/2023	Rev: A

Printed (yyyy-MM-dd): 2023-11-03

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
JOB #	N003312002
UNIT TAG	AH-6
QUANTITY	1

Unit Design Options

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

100 Unit Design Summary

100.1 Electrical

1. Short Circuit Current Rating (SCCR) @ 65 kA
2. ◊ Fans wired to Standard MOP with aux. contacts wired in series for field wiring to remote monitoring, provided and mounted by Factory.
3. ◊ All fan air monitoring with Magnesense transducer.
4. ◊ All lights controlled by a single light switch. One GFI outlet provided.
5. ◊ 120 volt power for lighting and/or GFI outlets shall be provided by Others.
6. ◊ Unit to ship in individual, bagged sections.

◊ **Project specific requirements**

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

101 Unit Details

101.1 Weights / Jobsite Elevation

1. Shipping Weight	9,748 lb	3. Elevation	266 ft
2. Operating Weight	10,035 lb		

101.2 Preparation for Shipment

1. Knockdown Construction	No

102 Unit Construction

102.1 Construction

1. Cabinet Construction	ITF - Integrated Frame	6. Thermal Break	Modified Thermal Break
2. Design Environment	Indoor	7. Mounting	Slab Mounted
3. Panel Depth	3 in		
4. Caulk Type	Standard		
5. Model #	ITF-RDHE64		

102.2 Cabinet Material

1. Exterior Material	16Ga Galv Pre-Paint	7. Blankoff Finish	None
2. Interior Liner type(s)	See Drawing	*Insulation by liner type*	
3. Exterior Paint Type	Polyester Resin	8. Solid liner	HD Fiberglass Roll (R12.5)
4. Interior Paint Type	None	9. Perforated liner	N/A
5. Paint Color	Sandstone		
6. Meets Salt Spray Rating	2500 Hours		

Exceptions:
1. Chilled Water Coil 1: blankoff material is 16Ga 304 SS

102.3 Base Construction

1. Base Structure Material	Steel Tube	6. Base Structure Height	See Drawing
2. Base Floor Material	16Ga Galv	7. Sub Floor Material	20Ga Galv
3. Insulation	Polyurethane Foam	8. Floor Coating	None
4. Floor Drain	None	9. Lifting Lugs	Yes - Welded
5. Floor Options	None		

102.4 Notes / Features

1. Box dimensions do not include lifting lugs, electrical panels, pipe connections, door handles, etc.

103 Doors

103.1 All Doors (including those associated with specific components)

#	Box	Section	Type[1]	Width	Height	Hinge	Swing	Window	Interior	Exterior	Options[3]
1	A	PL1	3" TBF	24	60	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
2	A	FILT1	3" TBF	15	69	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
3	A	IFB1	3" TBF	24	60	RH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
4	B	CW1	3" TBF	18	60	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	MS TO
5	B	HW1	3" TBF	18	60	LH	Out	None	20Ga Galv	16Ga Galv Pre-Paint	TO
6	B	FWT1	3" TBF	24	60	LH	In	None	16Ga Galv	16Ga Galv Pre-Paint	TO

103.2 Notes / Features

1. Door Types
   TBF = Thermal Break Factory
2. All doors insulated with Polyurethane Foam.
3. Options: MS = Manual Safety Interlock, TO = Tool Operated Handle

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

104 Drains

104.1 All Drains (including those associated with specific components)

Box	Section	Type	Conn (in)	Hand	Grating Material	Pan Material
B	CW1	Drain Pan	1.25	Right	None	16Ga 304 SS

104.2 Notes / Features

1. Drain Constructions included: Triple Pitched

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

106 Static Pressure Summary

106.1 Condition 1

106.1.1 Unassigned

Tunnel	*Description*	*APD (in.H20)*
AirTunnel 1	RA Opening - Damper (Return Air)	0.04
AirTunnel 1	Filter 1, Final Filter (Average Pressure Drop)	1.03
AirTunnel 1	IFB Coil 1	0.95
AirTunnel 1	Chilled Water Coil 1	0.81
AirTunnel 1	UVLight 1	0.02
AirTunnel 1	Hot Water Coil 1	0.15
AirTunnel 1	FANWALL 1 (Supply) 13,000 ACFM @ 3.72 in.H20	0.00
AirTunnel 1	SA Opening (Supply Air)	0.12
	FANWALL 1 (Supply) - Supply Air - SA Opening ESP:	0.60
	Total Static Pressure:	3.72

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.

106 N Industrial Blvd. Okarche, Ok 73762
(405) 817-9700 FAX (405) 263-4980

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
JOB #	N003312002
UNIT TAG	AH-6
QUANTITY	1

Fans

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

200 FANWALL 1 (Supply) : FWT1 : Box B — 18-80 - 182T - 32 x 36 x 26 - B2

200.1 Configuration / Quantity

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

Cell Size	6.Height	7.Width	8.Depth	9.Overall Depth
	32	36	26	33.25

10. Elev. / Temp.	266 ft / 70.0 °F		
11. Motor & Wheel Weight	159 lb	13. Redundant	0
12. Fan Cell Weight	349 lb	14. Empty	0
15. Ship Loose Fan (Wheel, Motor and Mounting Base)			0

200.2 Options

1. Coplanar Insulation	Standard Melamine	8. Cell Finish	None
2. Extended Coplanar	No	9. Insulation Retainer	No
3. Back Draft Dampers	FBD8	10. Inlet Attenuation	None
4. Inlet Cone Type	A100 Curved Cone	11. Blankoff Material	16Ga Galv
5. Solid Perimeter Material	None	12. Blankoff Finish	None
6. Discharge Safety Guard	No	13. Removal Rail	No
7. Cell Material	Steel		

200.3 Fan Wheel

1. Wheel Type	HPF-A100	3. Width	80
2. Diameter	18	4. Max RPM	3862
		5. Wheel Finish	None

200.4 Motor

1. Manufacturer	Toshiba	6. Efficiency	89.5
2. HP Each / Total	3 / 12	7. Service Factor	1.15
3. Poles / RPM	4-Pole / 1,760	8. Shaft Isolation	Ceramic Bearings
4. Frame / Casing	182T / TEAO	9. FLA Each / Total	8.6 / 34.4 Amps
5. Volts / Phase / Hz	208/3/60	10. Motor HP Safety Factor	3.0 %

200.5 Control System

1. Redundant VFD	No	5. Flow Monitoring	Yes
2. Drive	Standard	6. Fans to Monitor	All Fans
3. Optimization Control	No	7. Display	Magnesense
4. Control Method	By Others		

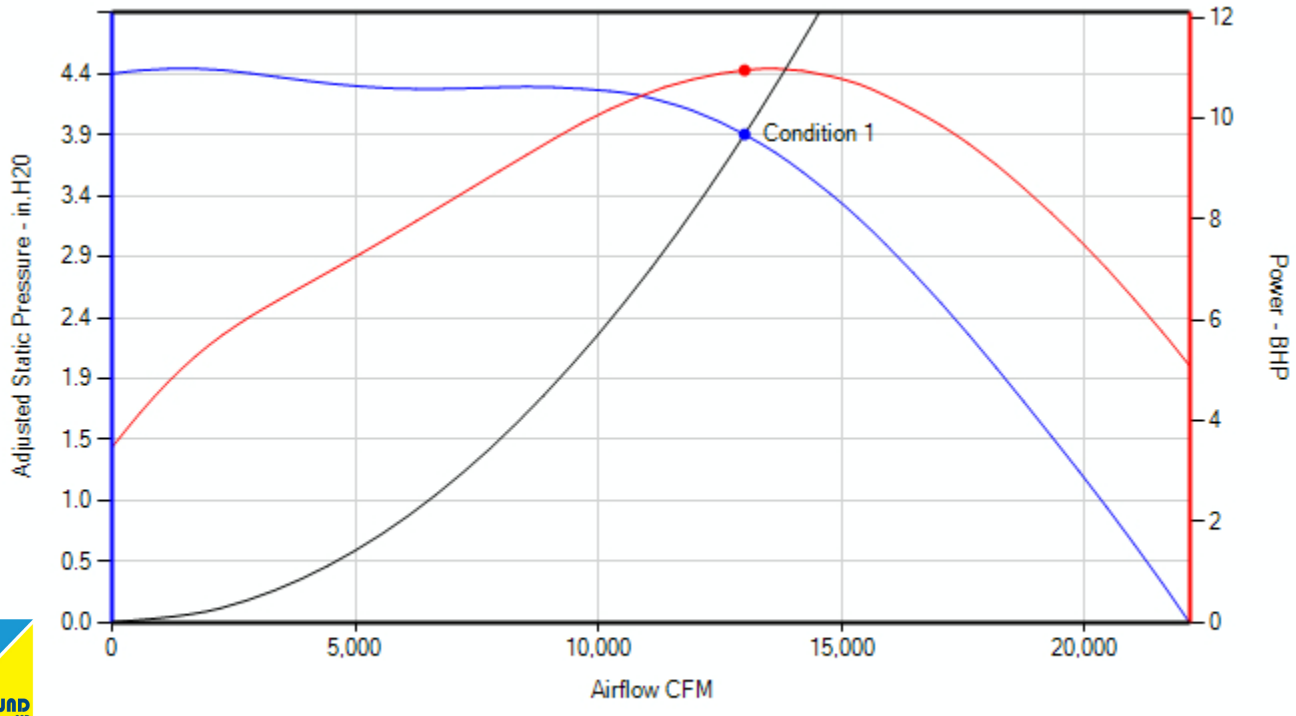
200.6 Notes / Features

1. To view patents and other pending U.S. or Canadian applications visit www.nortekair.com/patents.
2. (4) airflow measurement taps. Cone constant = 2104, cone flow differential pressure = 2.36 in.H2O at 3250 CFM per fan.
3. The estimated VFD input watts are based on the motor and VFD efficiency at the selected load and RPM.
4. Fans balanced to a maximum allowable level of 0.022 inches per second peak.

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 18-80 - 182T - 32 x 36 x 26 - B2



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

200.7 Operating Conditions

Operating Condition	Usage (%)	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel. (ft/min)	Watts	FEG % O.P.	FEI
			Input	Adj.	On	Off	Fail			Each	Total				
Condition 1	100	13,000	3.72	3.90	4	0	0	2,101	71.6	2.74	10.96	522	9,522	FEG85 2%	1.32

200.8 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	78	75	96	84	78	79	78	76	91	97
	Outlet	84	79	90	79	78	75	71	62	85	92

200 FANWALL 1 (Supply) : FWT1 : Box B (Continued) 18-80 - 182T - 32 x 36 x 26 - B2

200.9 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	UCA Snow Fine Arts
SALES ORDER #	N003312-003
JOB #	N003312002
UNIT TAG	AH-6
QUANTITY	1

Coils

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

300 Chilled Water Coil 1 : CW1 : Box B — 5WC - 4 - 30 x 67 x 6 - 11 AL

300.1 Coil Layout

1. Coil Hand	Right	6. Rack Style	None
2. Configuration	Single	7. Rack Finish	None
3. Connection Orientation	Straight	8. Blankoff Material	16Ga 304 SS
4. Connection Material	Red Brass	9. Blankoff Finish	None
5. Connection Type	MPT		

300.2 Construction

1. Quantity	2	8. Stand Height	1 in	14. Casing	16Ga 304 SS
2. Serpentine	1.5	*Tube Detail - Primary Surface*		15. Coating	None
3. Fin Height	30.000 in	9. Material	Copper	*Fin Detail - Secondary Surface*	
4. Fin Length	67.000 in	10. O.D. x Wall	0.625 x 0.020 in	16. Material	Aluminum
5. Rows	6	11. Spacing	1.500 x 1.299 in	17. Thickness	0.008 in
6. Fins per Inch	11	12. Internal	Smooth	18. Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	27.92 ft²	13. Return Bends	0.028 in		

Single Bank, Right Hand, 2 per unit — **5WC - 4 - 30 x 67 x 6 - 11 AL**

Supply / Return Connections				*Vent and Drain*		
Quantity	Type	Pipe Size	Material	Type	Vent Location	Drain Location
2	MPT	2.5 in	Red Brass	0.125 in FPT	Return Connection	Supply Connection

300.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	13,000 ACFM	10. Total Capacity	573.6 MBH
2. Standard Airflow	12,590 SCFM	11. Sensible Capacity	388.9 MBH
3. Elevation	266 ft	12. Actual Face Velocity	465.67 ft/min
4. Entering Air DB	82.0 °F	13. Leaving Air DB	54.0 °F
5. Entering Air WB	68.5 °F	14. Leaving Air WB	53.9 °F
6. Fluid Type	Water	15. APD	0.81 in.H20
7. Entering Fluid Temp	45.0 °F	16. Leaving Fluid Temp	55.0 °F
8. Fluid Flow Rate	114.2 GPM	17. Fluid Velocity	2.11 ft/s
9. Fluid Fouling Internal	0.0000	18. Fluid Pressure Drop	4.02 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.
2. Chilled water velocity is below recommended minimum of 2.5 fps

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 919 lb.
6. Total fluid volume is 24.7 Gal.

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
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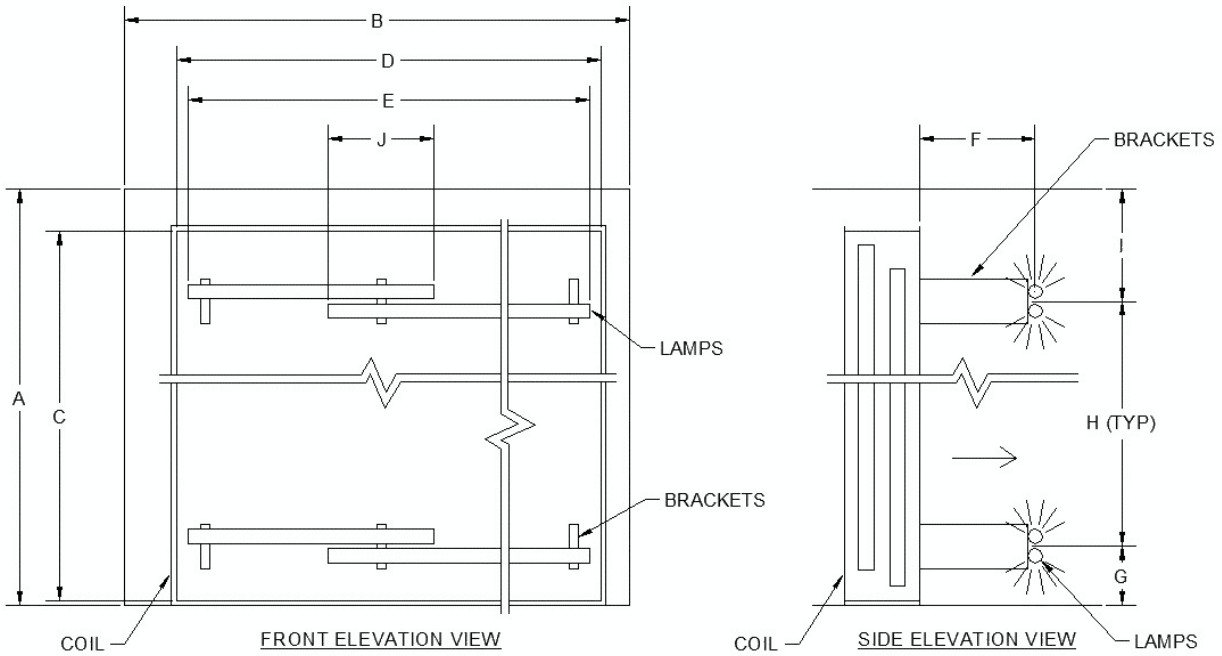
301 UVLight 1 : CW1 : Box B

301.1 Construction			
1. Provided By	Factory	12. Safety Switch	Factory Supplied
2. Product Type	RLM Xtreme	13. 12V Contact Connector	No
3. Fixture	Lamp Included	14. Extra Relay Switches	0
4. Voltage	120/1/60	15. UV Report™	No
5. Total Watts	740	16. UV Repeat™	No
6. Watts at Coil Surface	19.48 Watts/ft²	17. Warning Sign	No
7. Rows of Lights	2	18. UV-C Hour Meter	No
8. Fixtures Per Row	2	19. Conduit Loom Kits	Yes
9. Total Lamp Sets	1	20. LampLoom Down Exit	Yes
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
67.50	77.00	64.00	67.00	67.00	6.00	11.30	38.40	17.80	55.00

301.3 Purchased Items		
UVR Part Num	Description	Quantity
55086551	RLM Xtreme 61" Single Ended- High Output EncapsuLamp	4
55008022	RLM Conduit Loom Kit-20' S/S Flex Conduit w/Down Exit LampHolder	4
55000009	Dual LampHolster - Extended Base	2
55800064	RLM-X-Box 4P 120-277V w/CU2	1

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

302 Hot Water Coil 1 : HW1 : Box B — 5WC - 4 - 30 x 67 x 2 - 8 AL

302.1 Coil Layout

1. Coil Hand	Right	6. Rack Style	None
2. Configuration	Single	7. Rack Finish	None
3. Connection Orientation	Straight	8. Blankoff Material	16Ga Galv
4. Connection Material	Red Brass	9. Blankoff Finish	None
5. Connection Type	MPT		

302.2 Construction

1. Quantity	2	*Tube Detail - Primary Surface*		13. Casing	16Ga Galv
2. Serpentine	0.5	8. Material	Copper	14. Coating	None
3. Fin Height	30.000 in	9. O.D. x Wall	0.625 x 0.020 in	*Fin Detail - Secondary Surface*	
4. Fin Length	67.000 in	10. Spacing	1.500 x 1.299 in	15. Material	Aluminum
5. Rows	2	11. Internal	Smooth	16. Thickness	0.008 in
6. Fins per Inch	8	12. Return Bends	0.028 in	17. Configuration	Corrugated, Waffle with Straight Edge
7. Face Area	27.92 ft²				

Single Bank, Right Hand, 2 per unit — **5WC - 4 - 30 x 67 x 2 - 8 AL**

Supply / Return Connections				*Vent and Drain*		
Quantity	Type	Pipe Size	Material	Type	Vent Location	Drain Location
2	MPT	1.25 in	Red Brass	0.125 in FPT	Return Connection	Supply Connection

302.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	13,000 ACFM		
2. Standard Airflow	13,251 SCFM	9. Sensible Capacity	579.9 MBH
3. Elevation	266 ft	10. Actual Face Velocity	465.67 ft/min
4. Entering Air DB	55.0 °F	11. Leaving Air DB	95.4 °F
5. Fluid Type	Water	12. APD	0.15 in.H20
6. Entering Fluid Temp	160.0 °F	13. Leaving Fluid Temp	130.0 °F
7. Fluid Flow Rate	39.3 GPM	14. Fluid Velocity	2.18 ft/s
8. Fluid Fouling Internal	0.0000	15. Fluid Pressure Drop	3.32 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.
2. Hot water velocity is below recommended minimum of 2.5 fps

302.4 Notes / Features

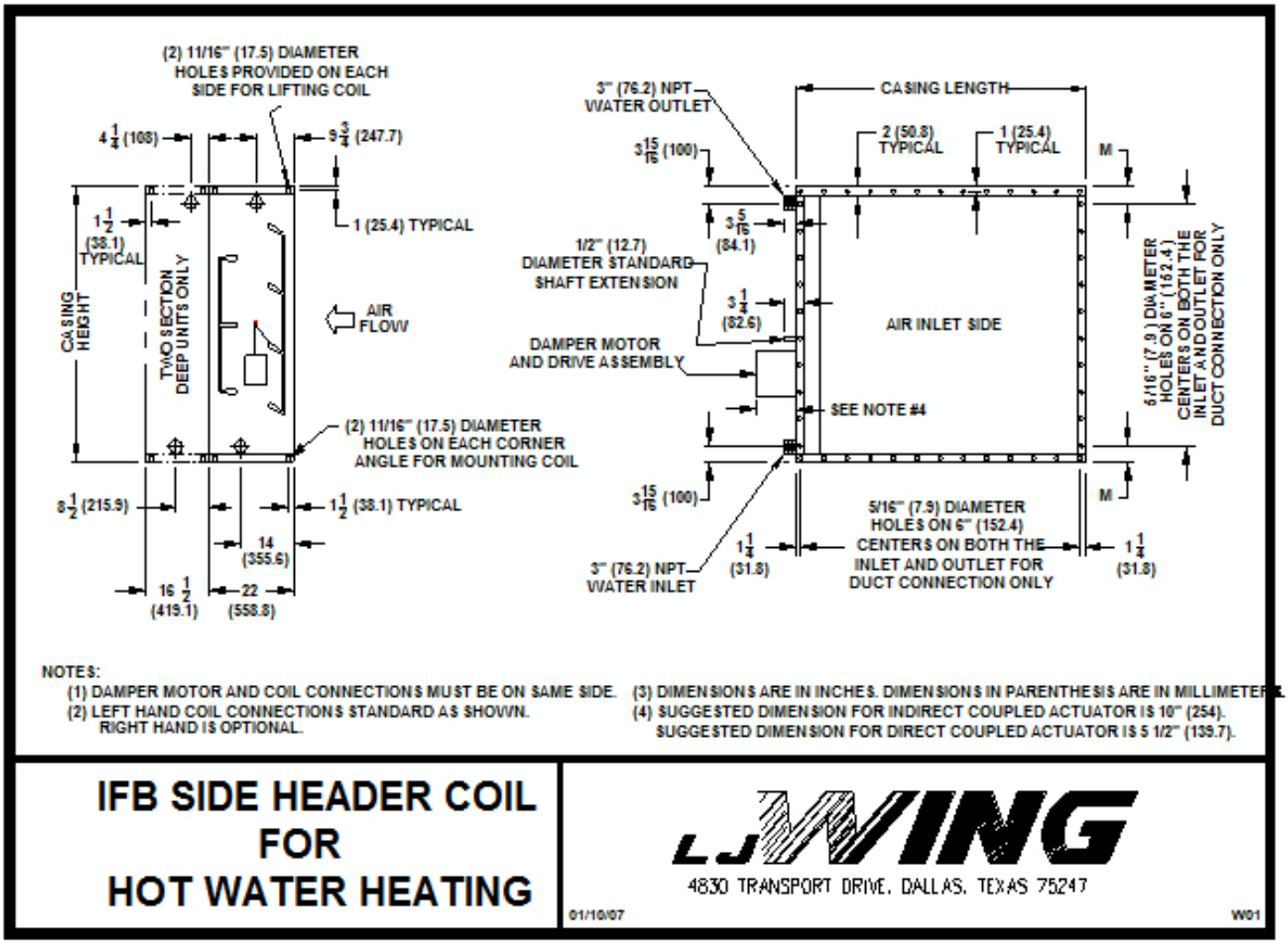
1. Manufacturer: Nortek Air Solutions, 5510 SW 29th Street, Oklahoma City, OK 73179
2. Top and bottom casing flange height is 1.000 in.
3. SCFM is corrected for Elevation and EDB.
4. Coils to be pressure tested at 315 PSI
5. Total operating weight is 352 lb.
6. Total fluid volume is 8.0 Gal.

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

303 IFB Coil 1 : IFB1 : Box A — E - 48 - TR

303.1 Construction			
1. Fin Material	Aluminum	8. Fin Spacing	9
2. Tube Material	Copper	9. Tube OD	0.625 in
3. Connection Material	Steel	10. Tube Wall	0.035 in
4. Rows	3 (One Section)	11. Connection Location	Near Side
5. Total Face Area	21.3 ft²	12. Stand Height	9 in
6. Casing Finish	Air Dried Enameled Paint (Std.)	13. Anti-Stratification Baffles	No
7. Elevation	266 ft	14. Actuator Location	Right



303.2 Coil Dimensions (in)											
Casing Height	Casing Length	M	N	Q	Z	L	P	R	S	Y	X
54.25	56.5	3.125	-	-	-	-	-	-	-	-	-

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

303 IFB Coil 1 : IFB1 : Box A (Continued) E - 48 - TR

303.3 Condition 1

Entering		*Leaving*	
1. Actual Airflow	13,000 ACFM	7. Sensible Capacity	555.4 MBH
2. Standard Airflow	14,310 SCFM	8. Face Velocity	775.66 ft/min
3. Entering Air DB	15.0 °F	9. Leaving Air DB	54.8 °F
4. Fluid Type	Water	10. APD	0.95 in.H20
5. Entering Fluid Temp	160.0 °F	11. Leaving Fluid Temp	130.5 °F
6. Fluid Flow Rate	38.0 GPM	12. Fluid Pressure Drop	2.90 ft.H20

Notes:
1. ARI Certified

303.4 Notes / Features

1. SCFM is corrected for Elevation and EDB.
2. Total operating weight is 806 lb

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
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UNIT TAG	AH-6
QUANTITY	1

Components

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

500 Filter 1 : FILT1 : Box A

500.1 Final Filter Size & Quantity			
1. Loading	Side Load	5. Bank Size	64.000 in W x 60.000 in H
2. Filter Clips	By Others	6. Qty / set & Frame Size 1	(6) 20 in x 20 in
3. Blankoff / Rack Material	16Ga Galv	7. Qty / set & Frame Size 2	(3) 20 in x 24 in
4. Blankoff / Rack Finish	None	8. Qty / set & Frame Size 3	
		9. Qty / set & Frame Size 4	

500.2 Final Filter			
1. Filter Depth	4.000 in	4. Number of Sets	
2. Efficiency		5. Max Face Velocity	487.50 ft/min at 13,000 ACFM
3. Manufacturer		6. Model	

500.3 Pressure Gage Specifications - Gage 1			
1. Manufacturer	Dwyer	3. Options	
2. Model / Range	Magnehelic 2002 (0-2" w.c.)	4. Quantity	1

500.4 Notes / Features
1. Filters provided by Others.

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

600 SA Opening : SA : Box B : Roof

600.1 Opening Construction			
1. Description	Supply Air	4. Shape	Rectangle
2. Max CFM	13,000 ACFM	5. Max APD	0.12 in.H20
3. Size	66 W x 28.5 H in	6. Max Velocity	996.00 ft/min

601 RA Opening : RA : Box A : Roof

601.1 Opening Construction			
1. Description	Return Air	4. Shape	Rectangle
2. Max CFM	13,000 ACFM	5. Max APD	0.04 in.H20
3. Size	60 W x 26 H in		

601.2 Damper Specifications			
1. Manufacturer	Ruskin	6. Jackshaft	Yes
2. Model	Ruskin CD 60 (Galvanized)	7. Max Face Velocity	1,200.00 ft/min
3. Size	60.000 in (Blade Direction) x 26.000 in	8. End Switches	No
4. Blade Config	Opposed		
5. Blade Orientation	Horizontal		

Notes:
1. Ordered with 1" frame flange

601.3 Damper Actuator			
1. Location		3. Floor Mounted	
2. Type		4. Furnished By	Others
		5. Mounted By	Others
		6. Wiring By	Others

601.4 Notes / Features
1. Damper Actuators and mounting accessories furnished and mounted by Others at Face Mounted (RH) location.
2. Damper Actuators wired by Others

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
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UNIT TAG	AH-6
QUANTITY	1

Electrical

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

700 ElecPanel 3 : FWT1 : Box B : Near Side

700.1 Construction			
1. Enclosure Type	MSP Panel	4. Mounting	Surface mount on unit
2. Type	NEMA 4 Indoor / Outdoor		
3. Size	See electrical drawings		

701 Additional Lighting

701.1 Switches / Outlets

	Name	Box	Section	Type	Mounted	Illum. Switch	Timer	Cover	GFCI	MOCP
	ElecSwitch 3	B	FWT1	Light Switch / 120V Outlet	External	No	None	No	Yes	20.0 Amps

701.2 Lighting Types and Quantities

(6) Vapor Proof 14W LED

ACH580 6-Pulse drive package rated UL (NEMA) Type 1. Provided with Main Input Disconnect with VFD fuses and E-Clipse Bypass (Vertical). Rated for 46.2 amps (15 HP) at 208 VAC three phase provided shipped loose for field installation by others. Output of VFD to be field wired to manual motor protector panel mounted on the AHU

NORTEK AIR SOLUTIONS TEMTROL

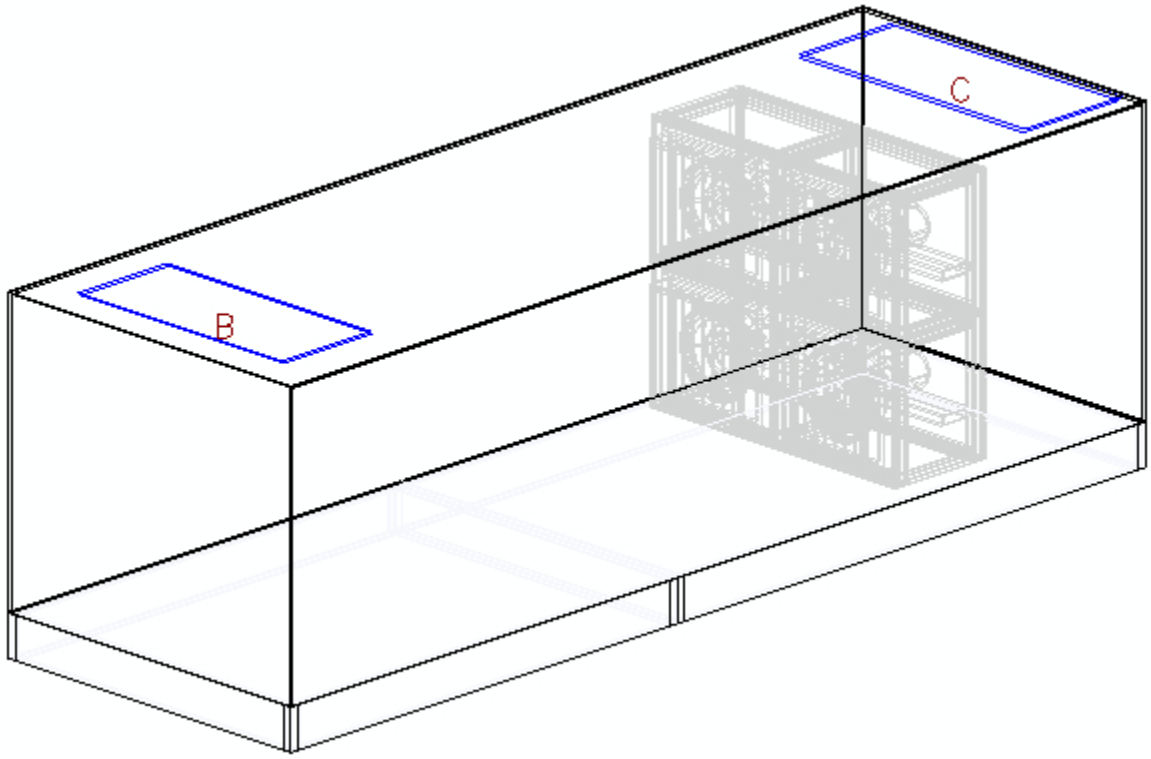
PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312-003
JOB #	N003312002
UNIT TAG	AH-6
QUANTITY	1

Unit Data

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

900 Air Handler Sound Power Projection



900.1 Sound Power Data

Openings - Condition 1				Octave Band Freq. Sound Power (db re: 10E-12 watts)									
Tag	Title	Cabinet Liner	Area	63	125	250	500	1k	2k	4k	8k	LwA	Lw
B	RA Opening	Solid	10.8 ft²	73	72	93	81	76	77	76	74	87	94
C	SA Opening	Solid	13.1 ft²	84	79	90	79	78	75	71	62	85	92
Casing Radiated				73	69	78	61	56	56	54	52	71	80
Floor Radiated				67	63	72	45	38	35	35	35	64	74

900.2 Notes

1. Fan data accuracy as per AMCA 311 (63Hz +6 dB, remaining bands +3 dB with an additional 3 dB available in any one band). Model predictive accuracy is ±6 dB. Fan and modeling accuracy is based on ideal flow patterns and design conditions. Projected fan and system sound levels are provided for comparison purposes only — actual levels may vary.
2. Sound power projections are not valid for opening velocities over 1,500 ft/min.
3. Sound power projects are not valid with VFD motor control carrier frequencies of less than 8KHz.

Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
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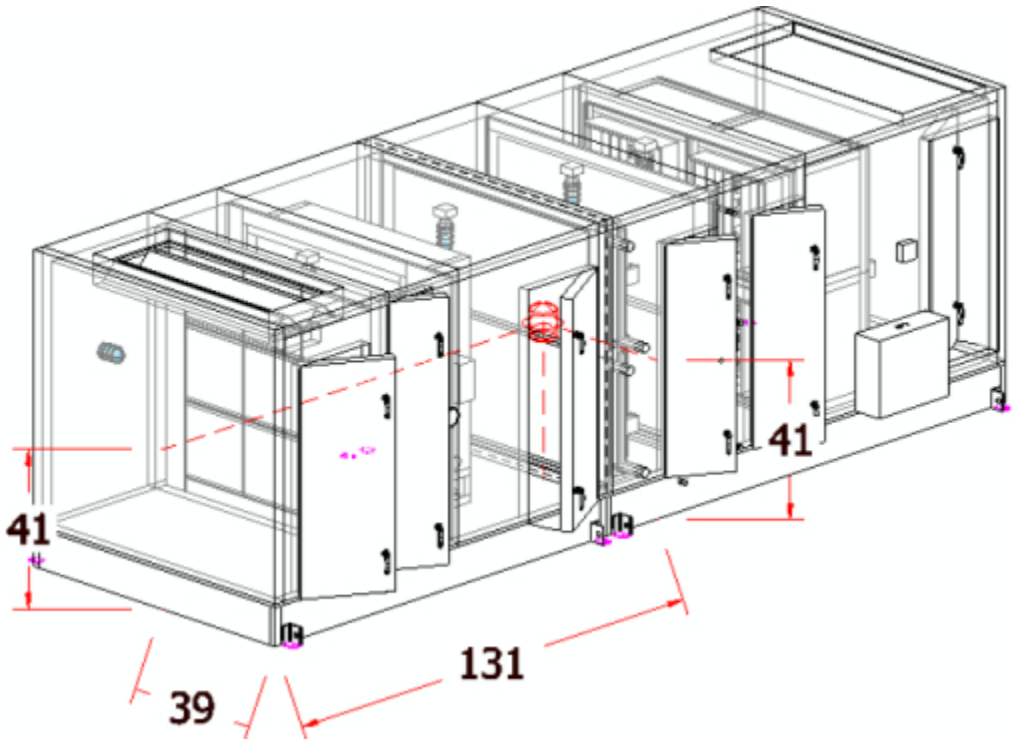
901 Center of Gravity



Size (Inches)			Operating Weight (Pounds)	Center of Gravity (Inches)		
X	Y	Z		X	Y	Z
251.00	83.00	81.50	9,966	131.00	39.00	41.00

901.1 Notes

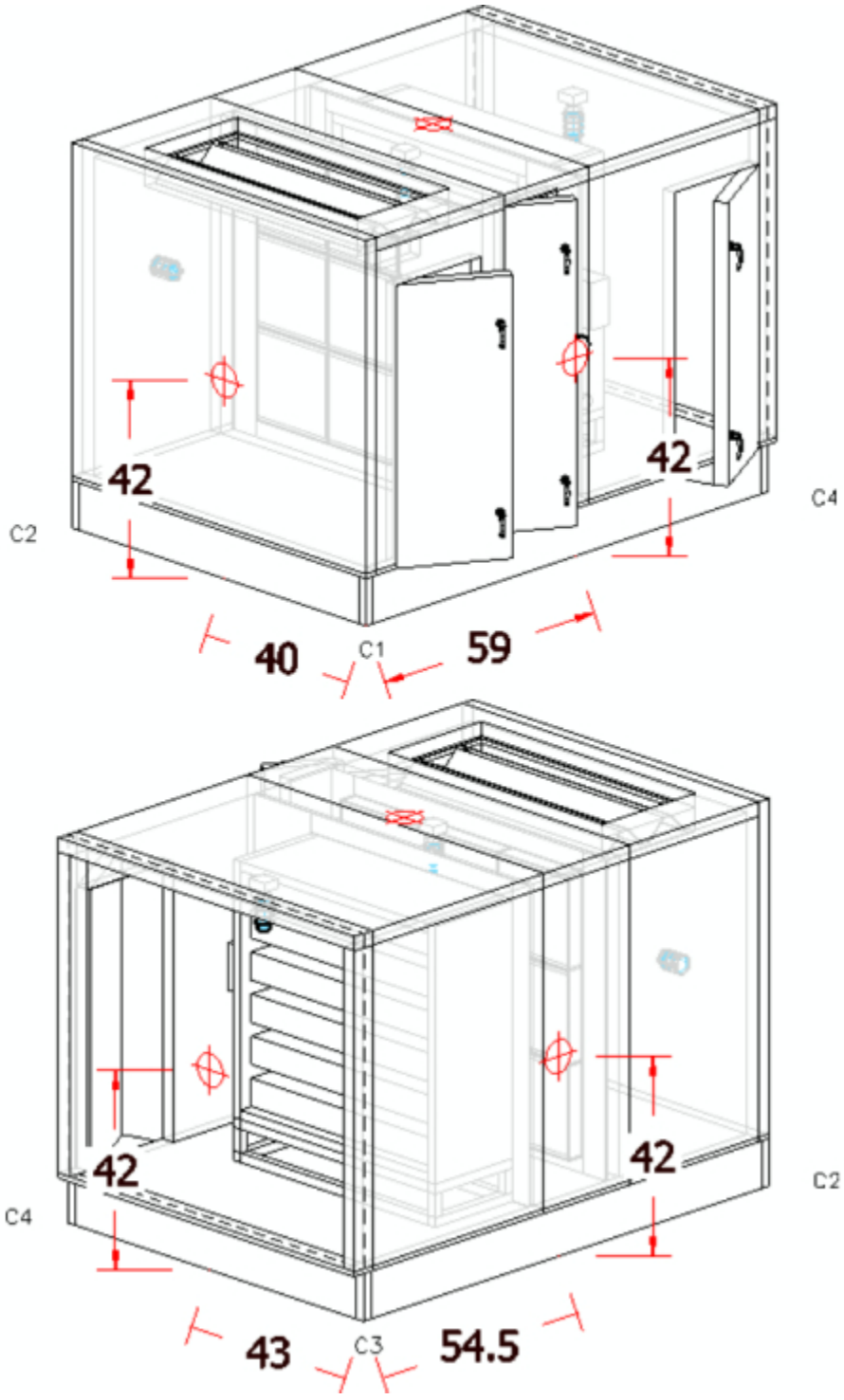
1. Center of gravity and weights are estimates and subject to change.
2. The center of gravity and weights shown above are based on operating weights and do not include packaging materials.
3. A 5% safety factor has been applied to the operating weights.
4. Corner weights apply to rectangular boxes only.
5. Corner weights are to assist in handling of the unit. Some units are not intended to be supported only at the corners. Contact your Sales Representative for support information.

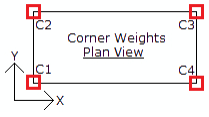
Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

901 Center of Gravity (Continued)

901.2 Box A





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
113.50	83.00	81.50	3,759	935	870	942	1,012

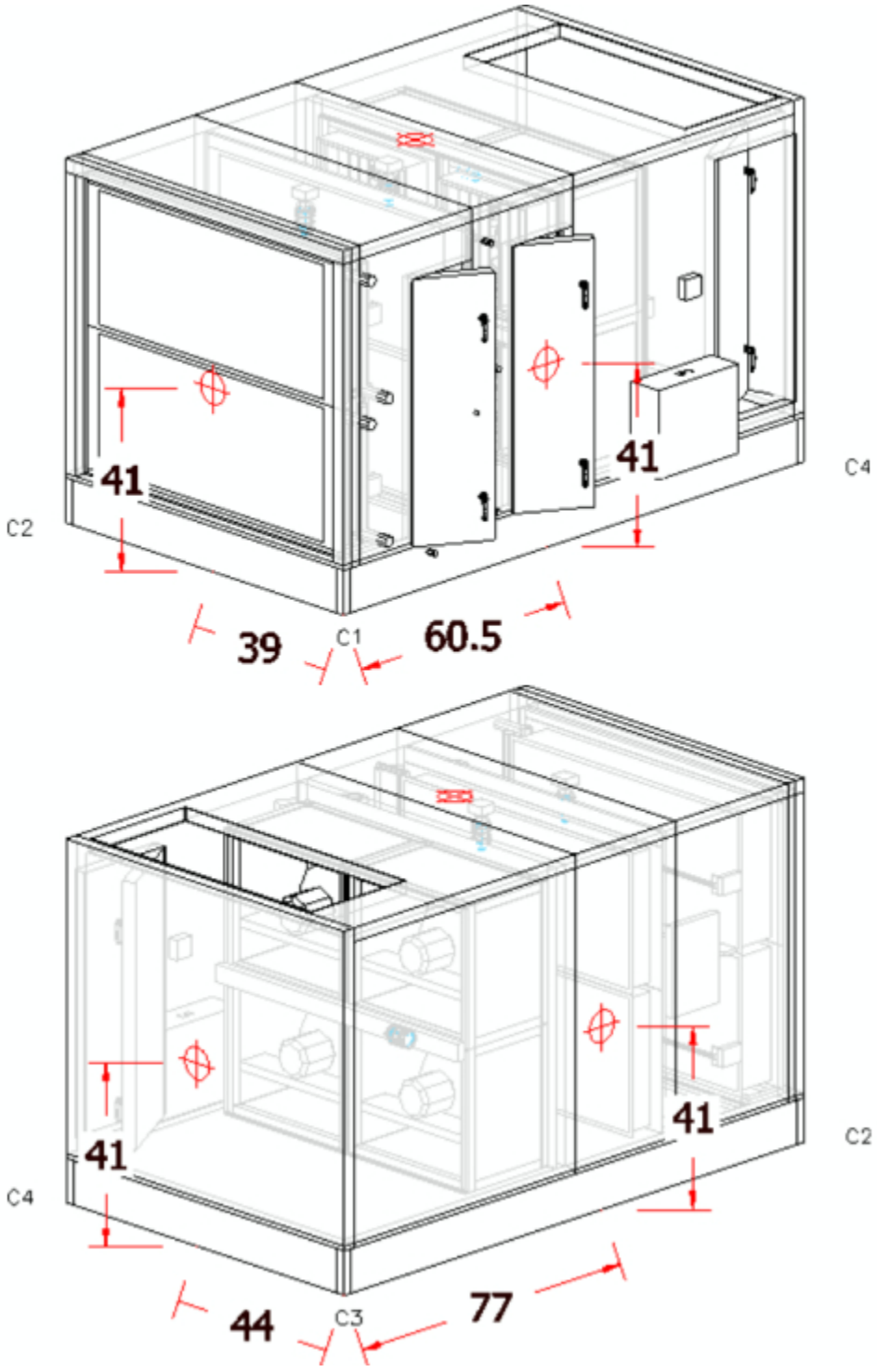
◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

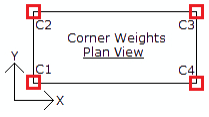
Project Name: UCA Snow Fine Arts
Unit Tag: AH-6

Sales Order #: N003312-003
Job #: N003312002

901 Center of Gravity (Continued)

901.3 Box B





Size (Inches)			Shipping Weight (Pounds)	Corner Weights (Pounds)			
X	Y	Z		C1	C2	C3	C4
137.50	83.00	81.50	5,920	1,712	1,517	1,264	1,426

◊ Center of gravity, weight, and corner weights shown are based on shipping weight. Values are estimates and subject to change.

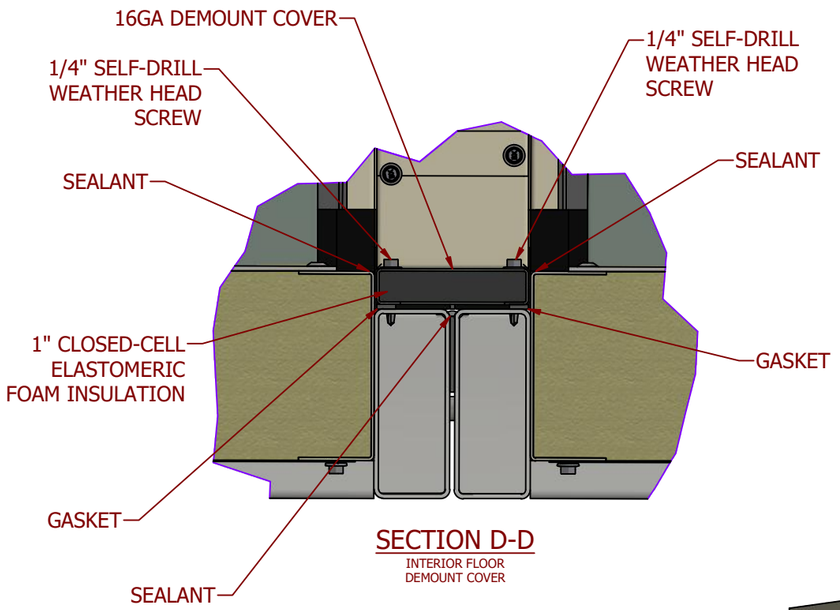
PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

Appendix

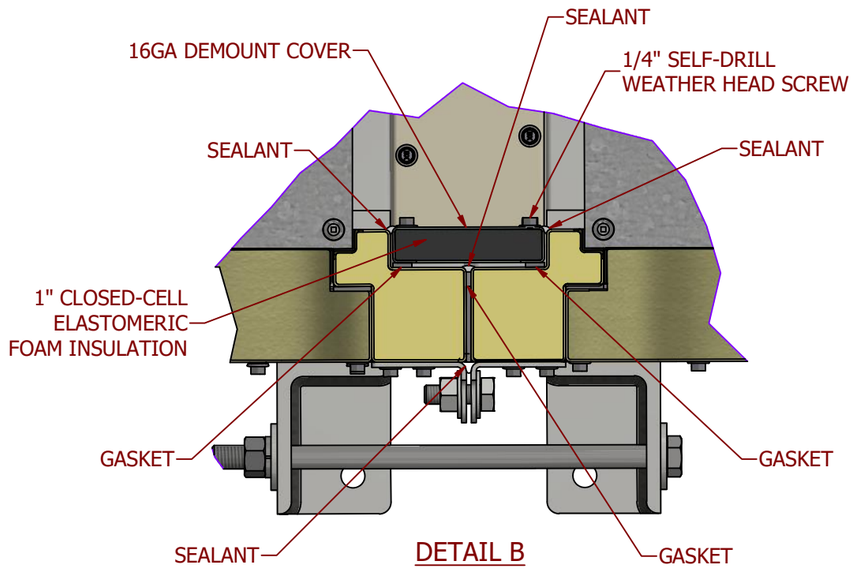
NORTEK AIR SOLUTIONS TEMTROL

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

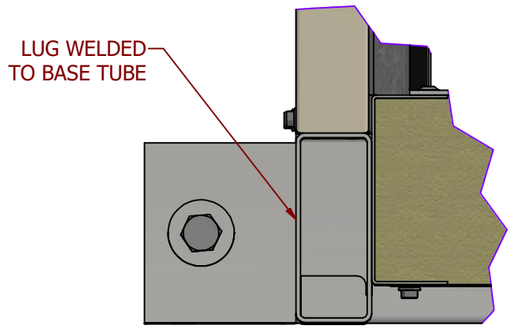
ITF Construction Details



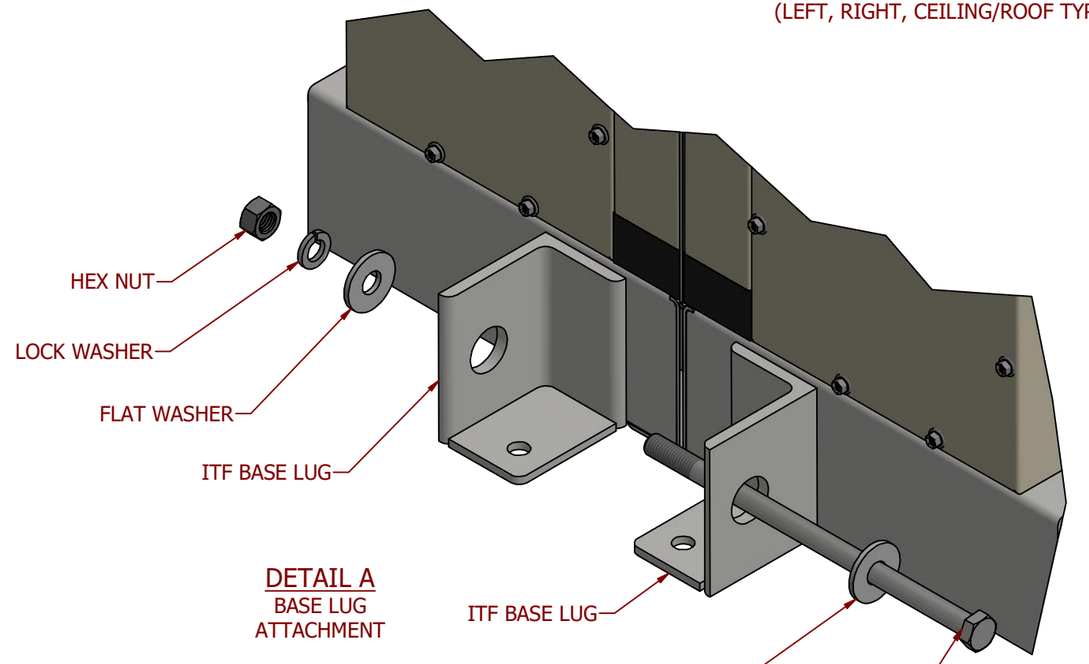
SECTION D-D
INTERIOR FLOOR DEMOUNT COVER



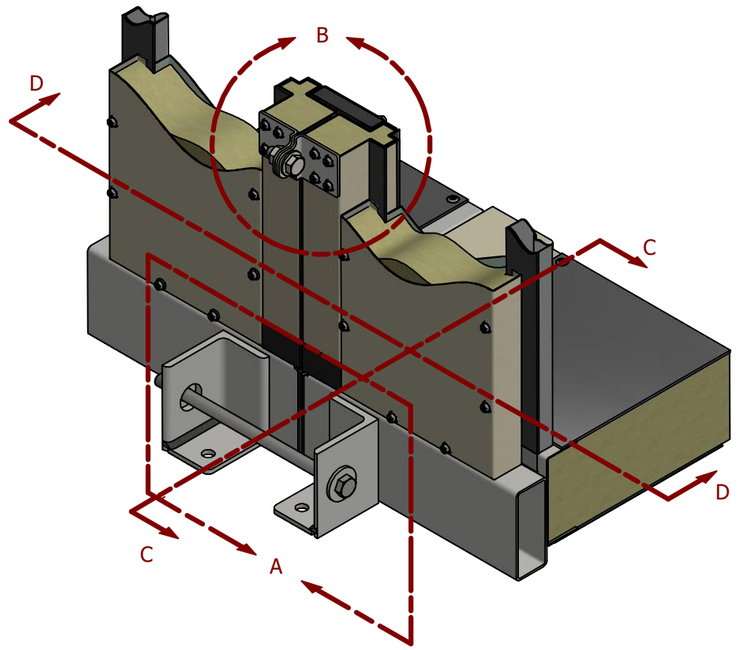
DETAIL B
INTERIOR WALL DEMOUNT COVER (LEFT, RIGHT, CEILING/ROOF TYP)



SECTION C-C
BASE LUG



DETAIL A
BASE LUG ATTACHMENT



NOTE:
1. SEALANT TO BE APPLIED IN THE FIELD AFTER SECTION ASSEMBLY.
2. PANELS/LINERS NOT SHOWN FOR CLARITY.
3. DOCUMENT PREVIOUSLY RELEASED AS 221.00055

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
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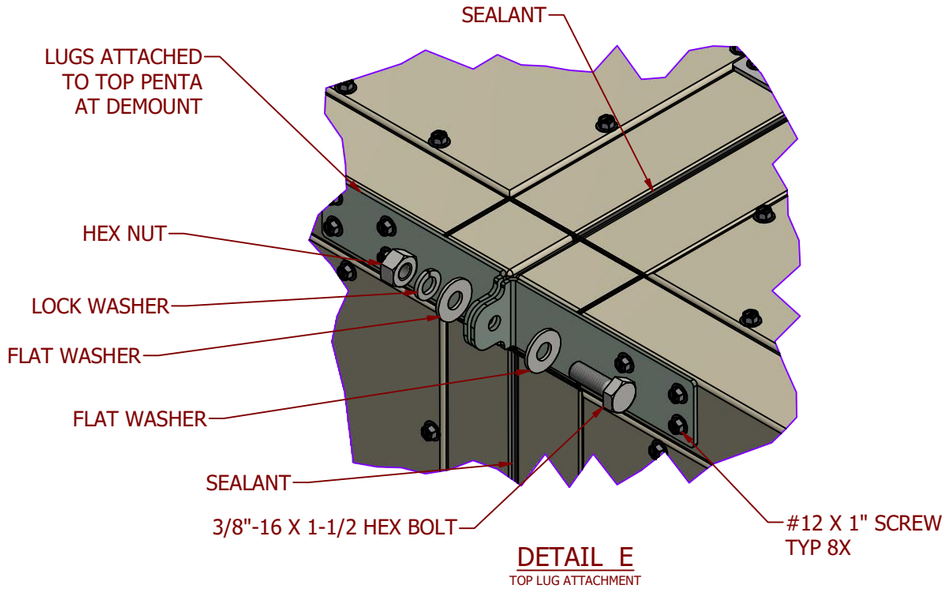
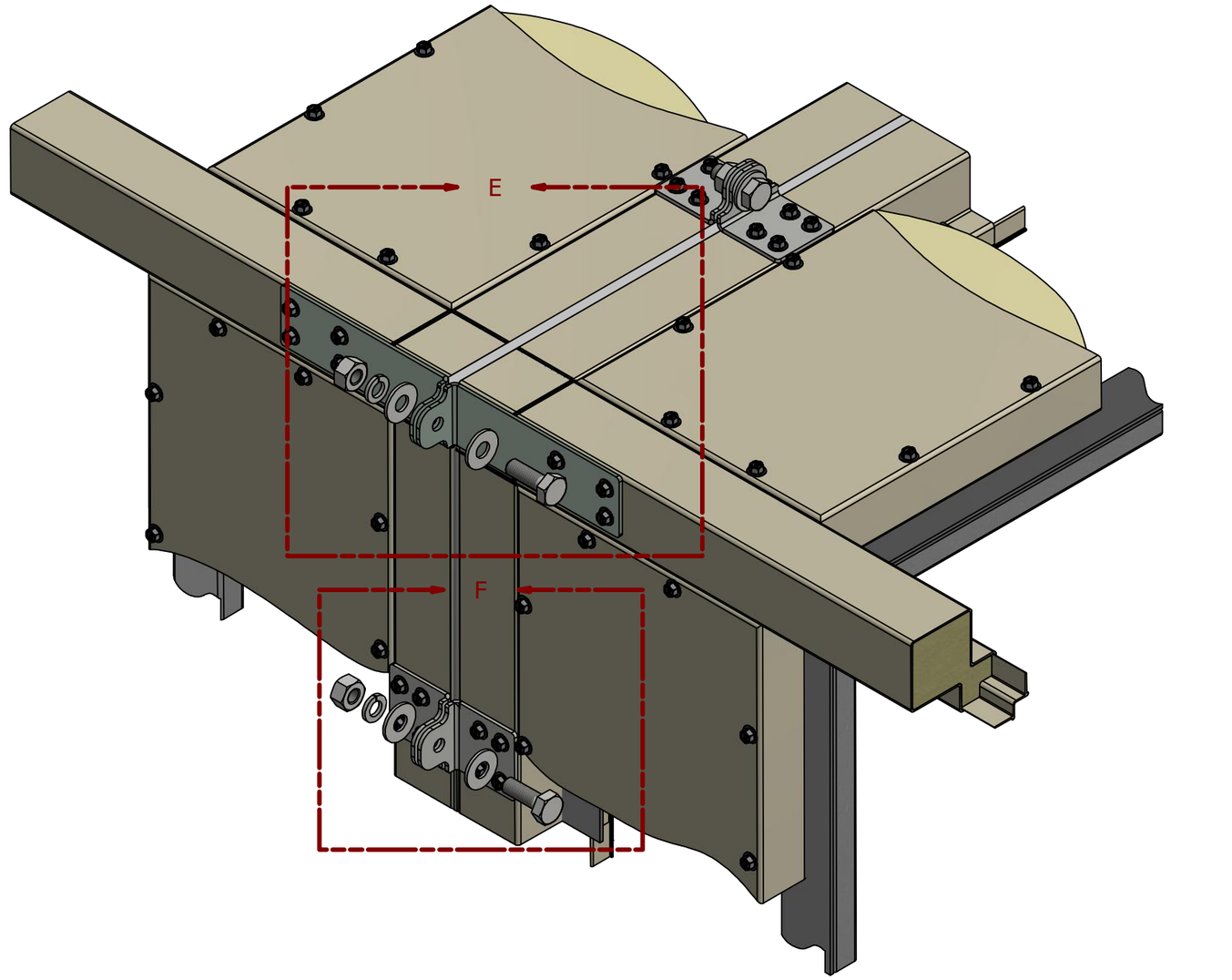
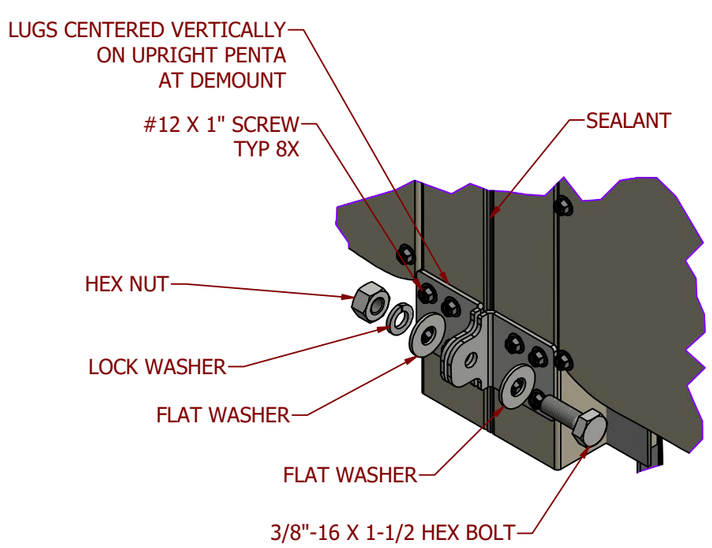
TITLE:
DETAIL DEMOUNT, INDOOR, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000013203	1 OF 3	B



DETAIL E
TOP LUG ATTACHMENT



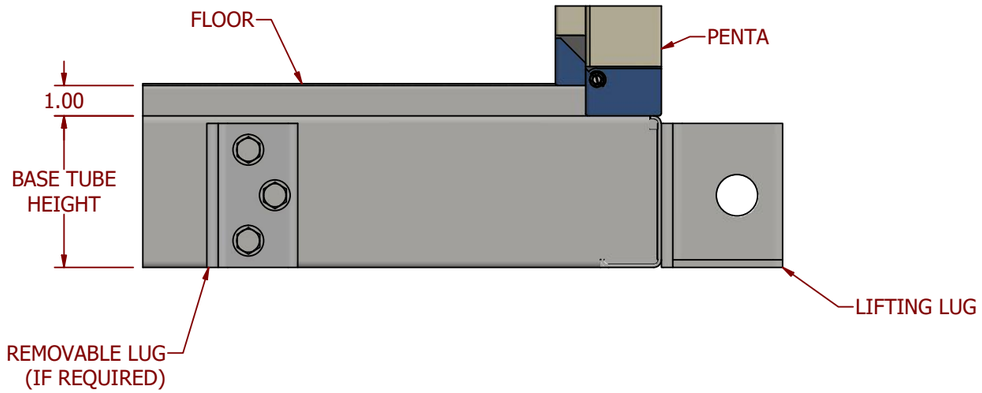


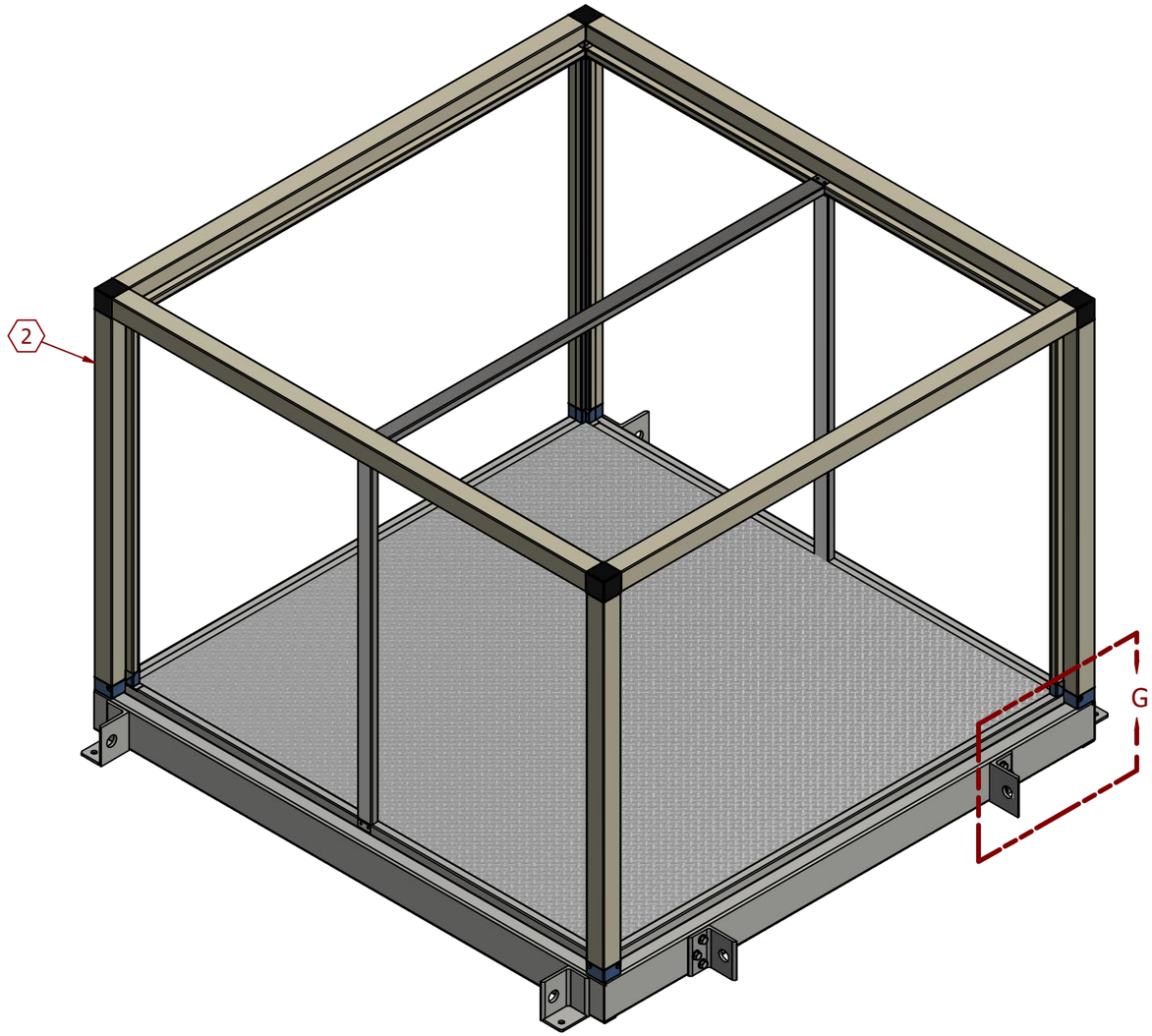
DETAIL F
MID LUG ATTACHMENT

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:
DETAIL
DEMOUNT, INDOOR, ITF

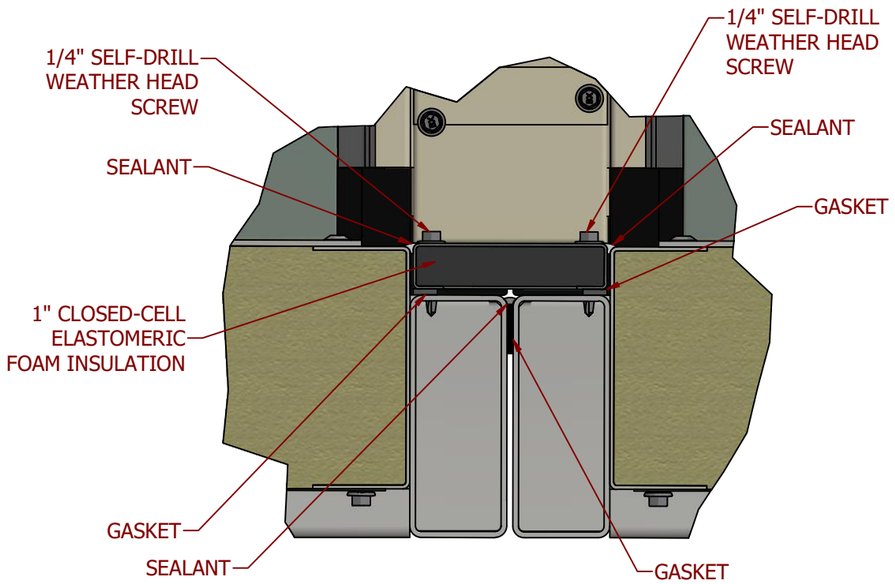
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000013203	2 OF 3	B



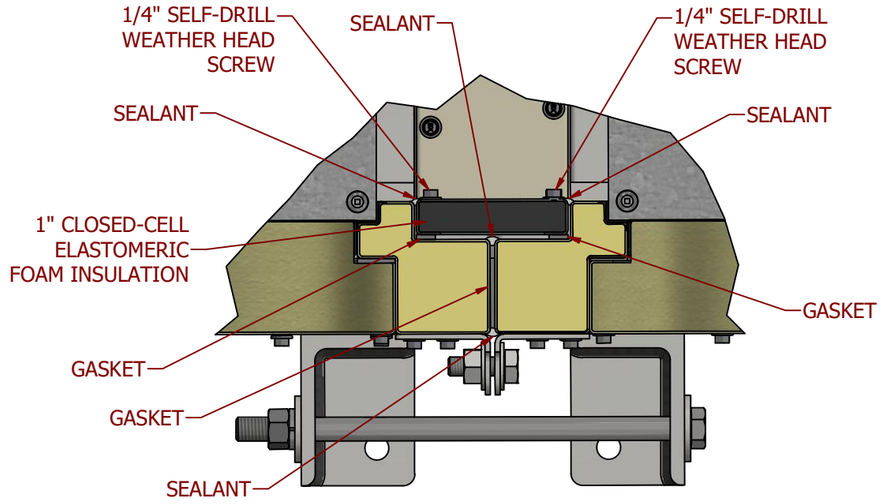


NORTEK AIR SOLUTIONS	106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762 PH: (405) 263-7286	TITLE: DETAIL DEMOUNT, INDOOR, ITF

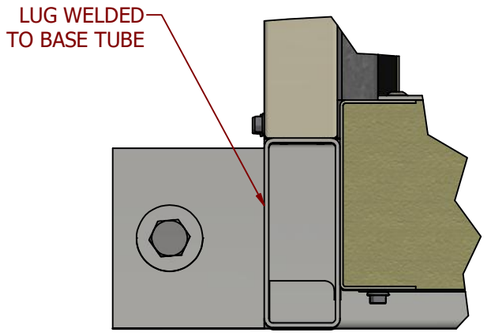
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000013203	3 OF 3	B



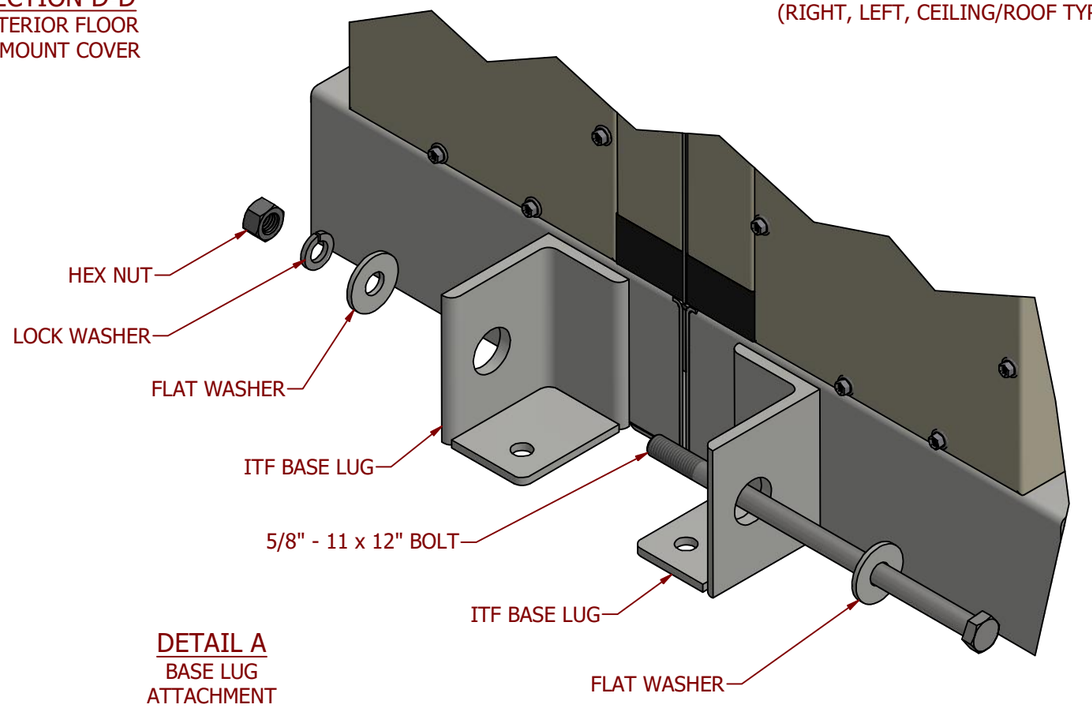
SECTION D-D
INTERIOR FLOOR
DEMOUNT COVER



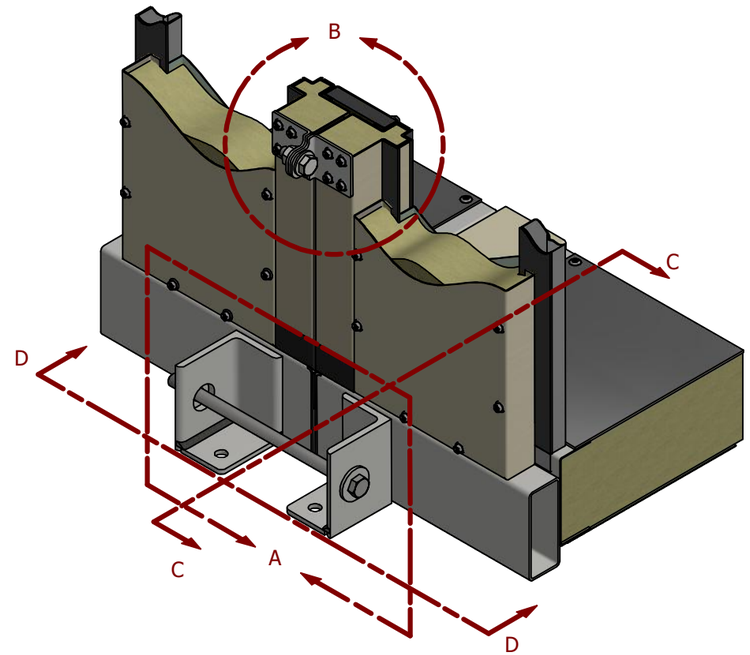
DETAIL B
INTERIOR WALL
DEMOUNT COVER
(RIGHT, LEFT, CEILING/ROOF TYP)



SECTION C-C
BASE LUG



DETAIL A
BASE LUG
ATTACHMENT



NOTE:
1. SEALANT TO BE APPLIED IN THE FIELD AFTER SECTION ASSEMBLY.
2. PANELS/LINERS NOT SHOWN FOR CLARITY.
3. DOCUMENT PREVIOUSLY RELEASED AS 221.00079.

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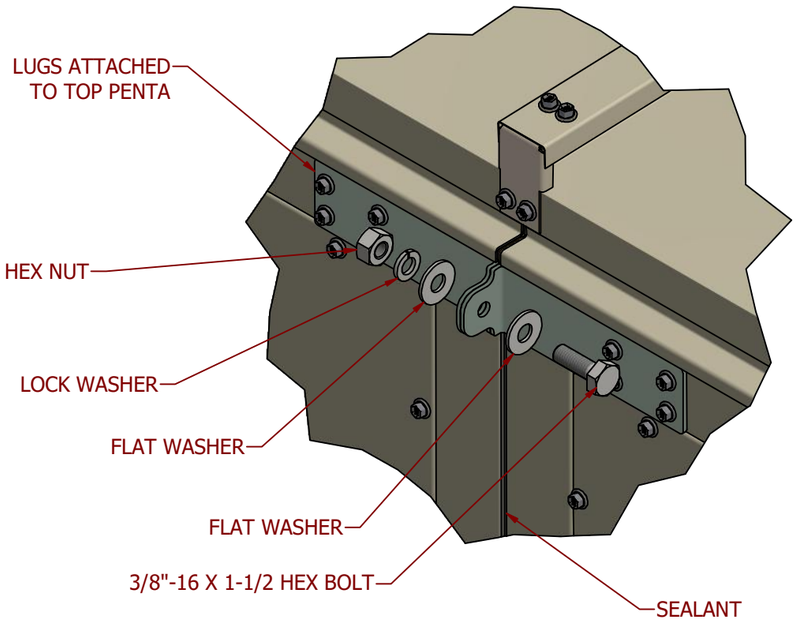
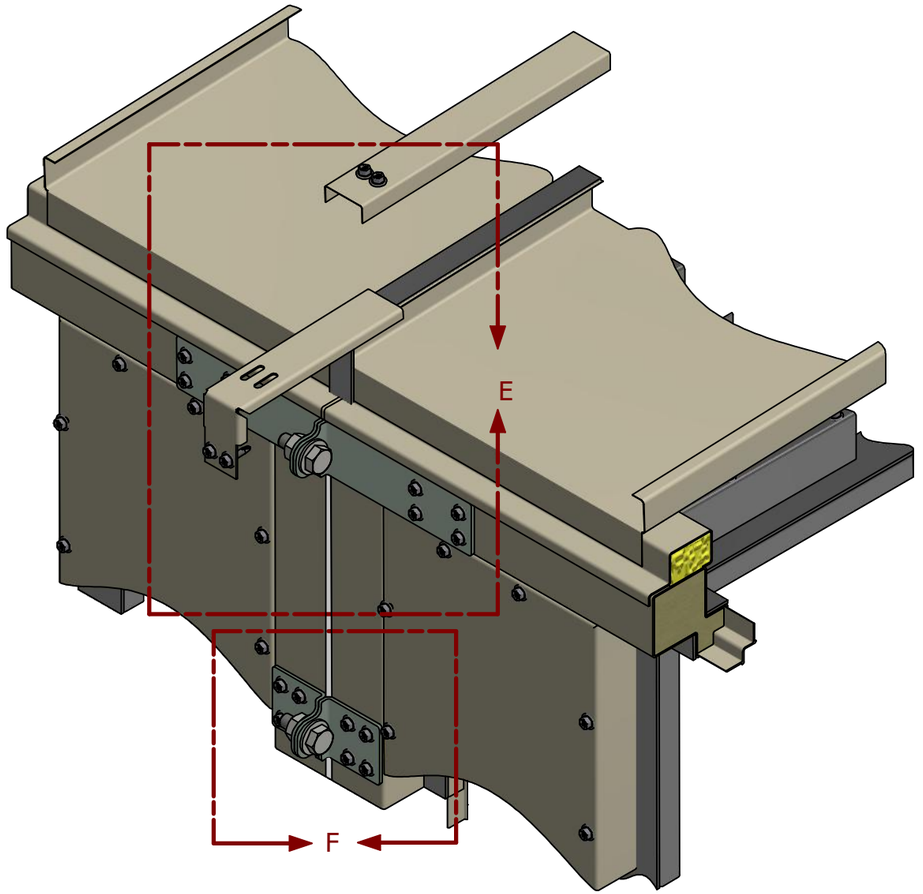
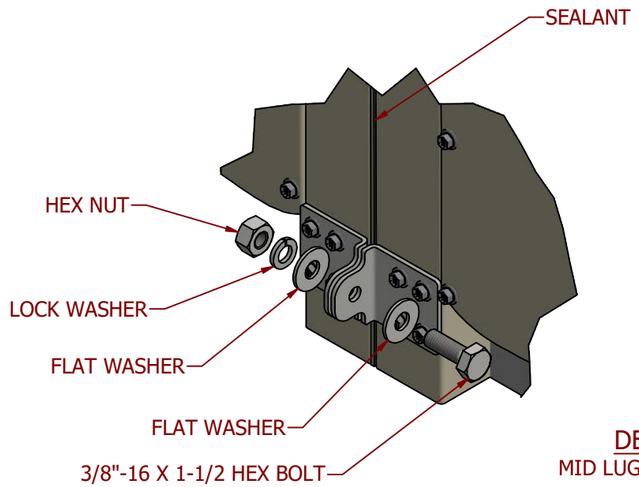
TITLE:
DETAIL, DEMOUNT, OUTDOOR, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000016383	1 OF 3	-

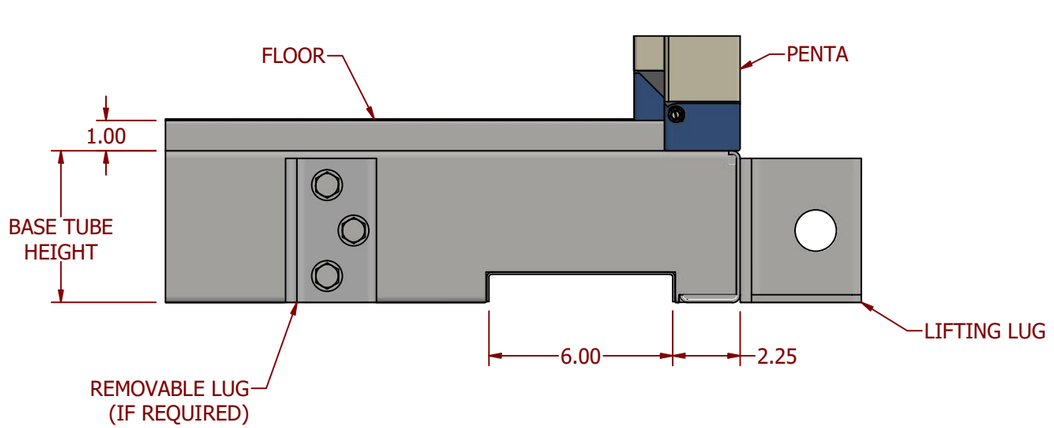


DETAIL E
TOP LUG ATTACHMENT

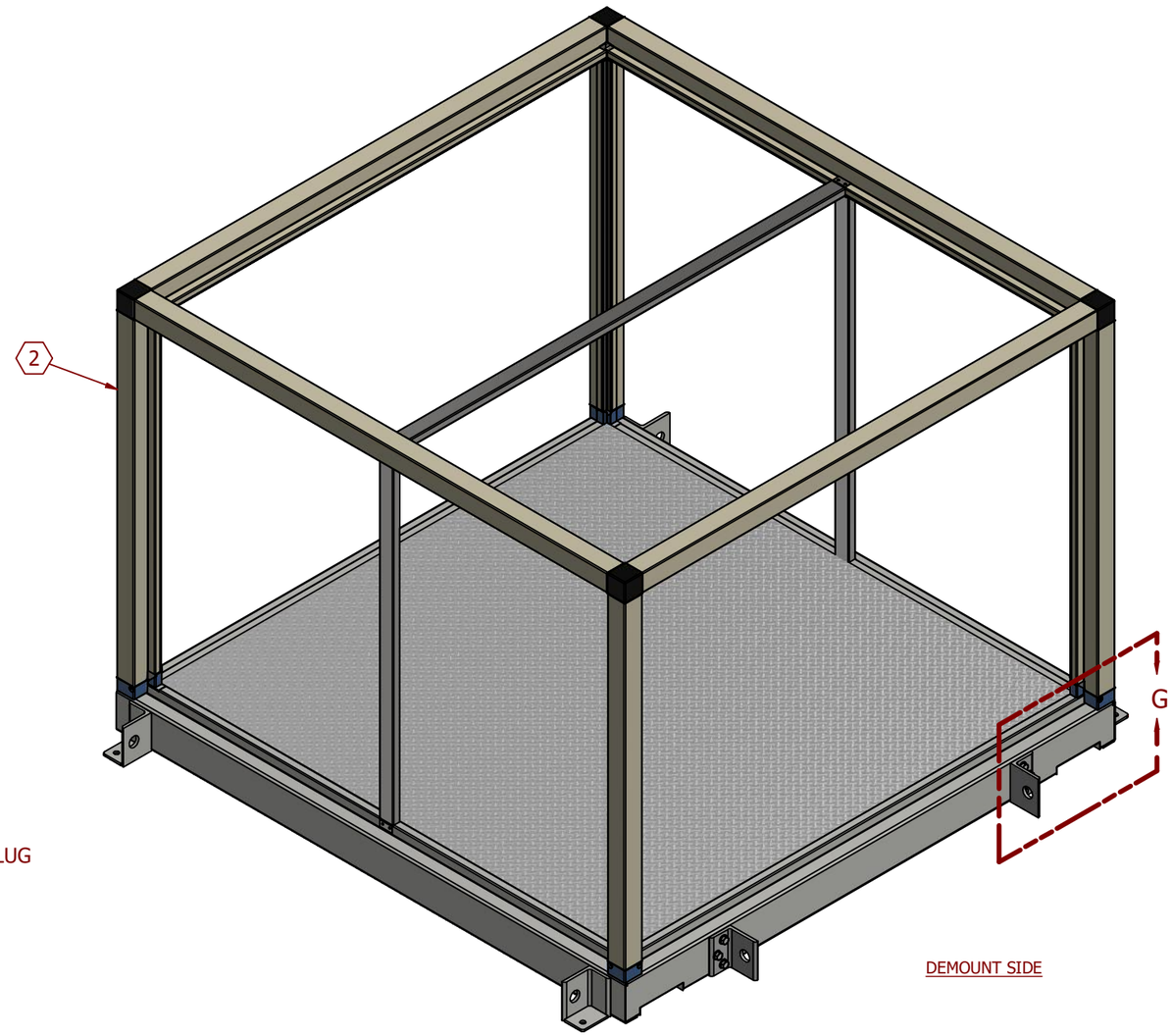




DETAIL F
MID LUG ATTACHMENT



DETAIL G
TYPICAL BOTH ENDS OF DEMOUNT

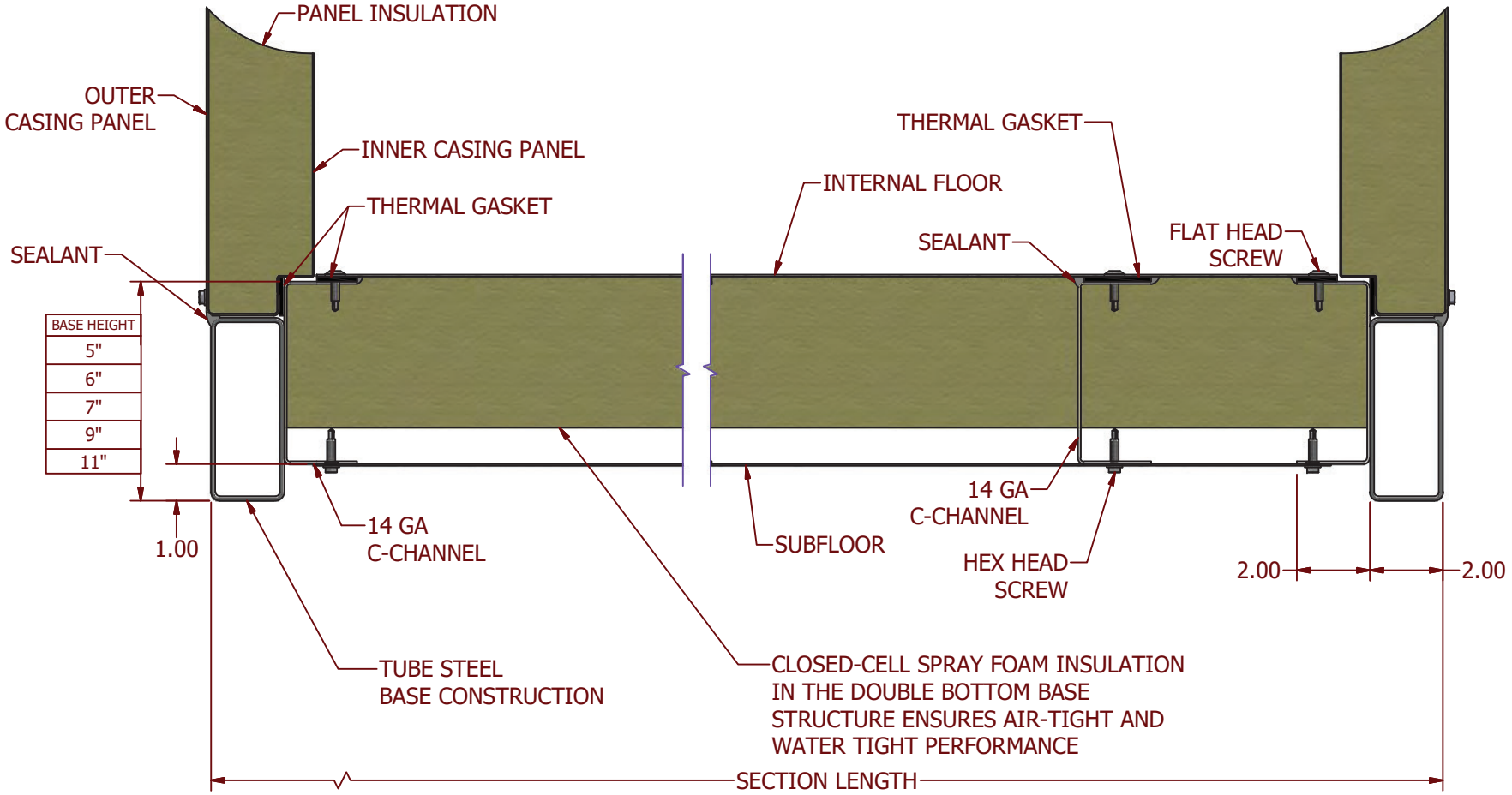


DEMOUNT SIDE

DEMOUNT

NOTES

1. DOCUMENT PREVIOUSLY RELEASED AS 221.00075



NORTEK AIR SOLUTIONS

106 N. INDUSTRIAL BLVD.
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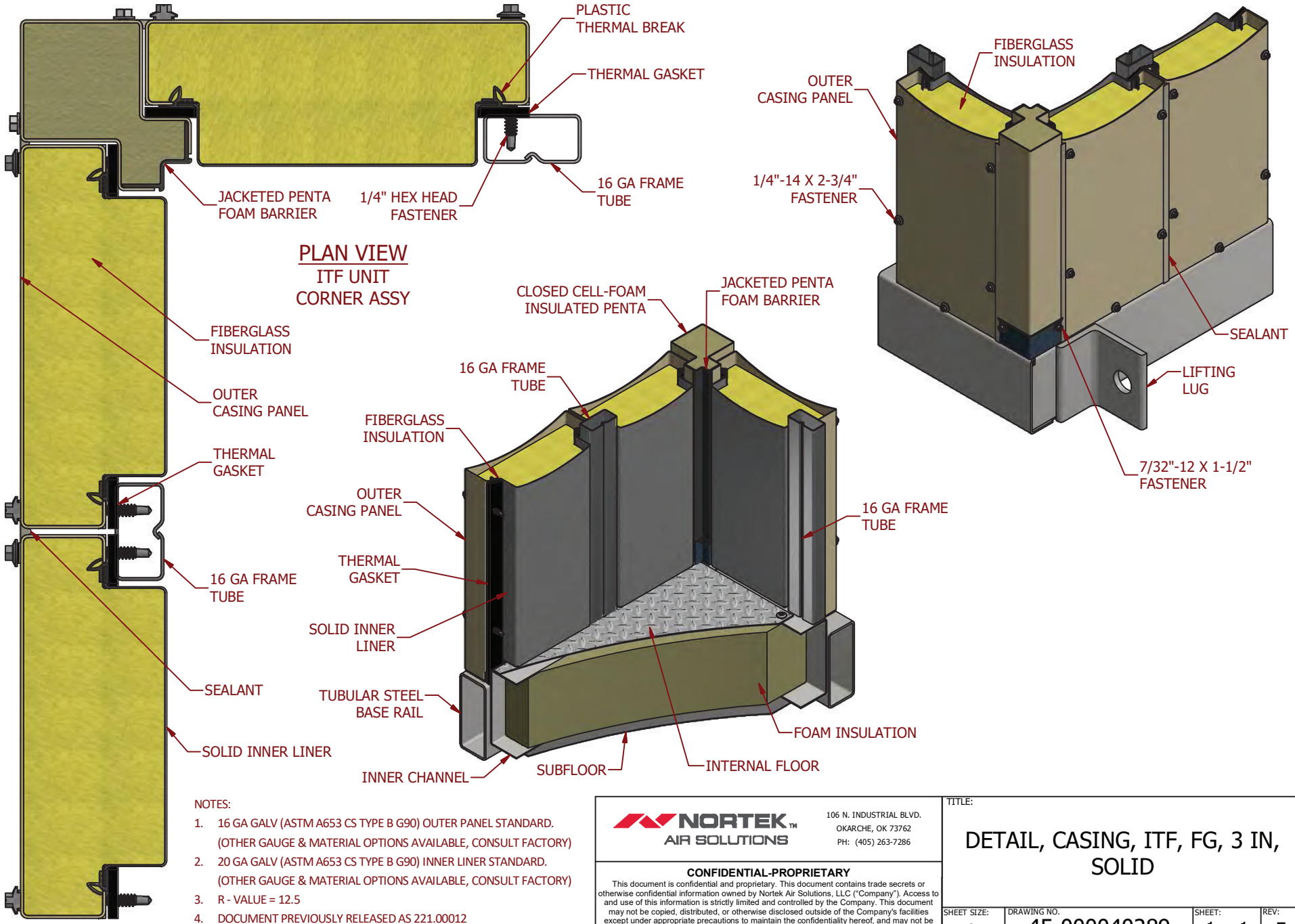
TITLE:

DETAIL, BASE, 3IN CASING, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000040401	1 OF 1	A



NOTES:

1. 16 GA GALV (ASTM A653 CS TYPE B G90) OUTER PANEL STANDARD. (OTHER GAUGE & MATERIAL OPTIONS AVAILABLE, CONSULT FACTORY)
2. 20 GA GALV (ASTM A653 CS TYPE B G90) INNER LINER STANDARD. (OTHER GAUGE & MATERIAL OPTIONS AVAILABLE, CONSULT FACTORY)
3. R - VALUE = 12.5
4. DOCUMENT PREVIOUSLY RELEASED AS 221.00012

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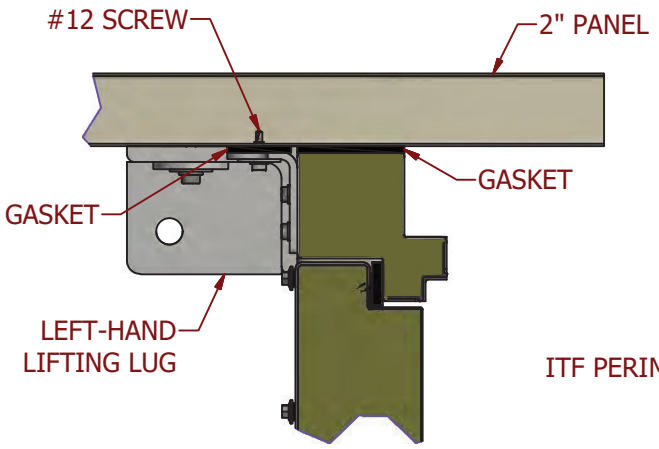
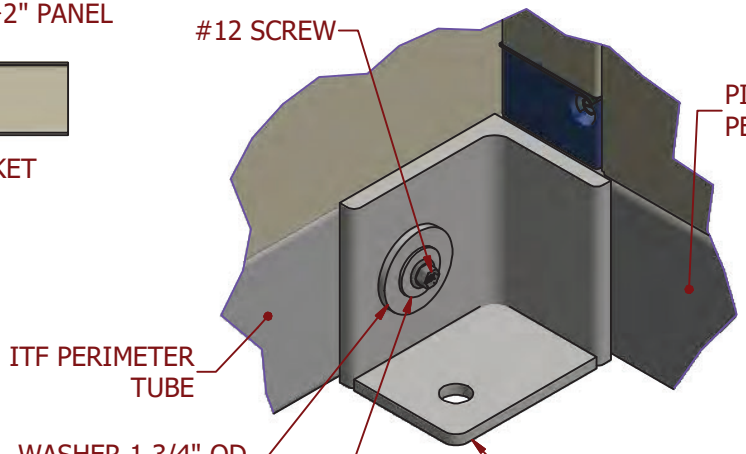
TITLE:

DETAIL, CASING, ITF, FG, 3 IN, SOLID

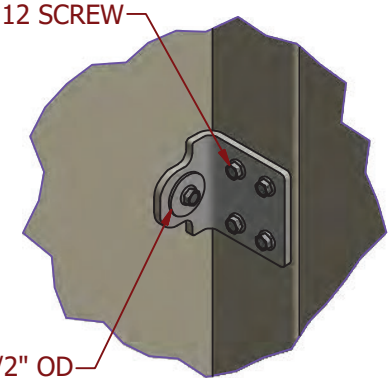
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000040289	1 OF 1	E



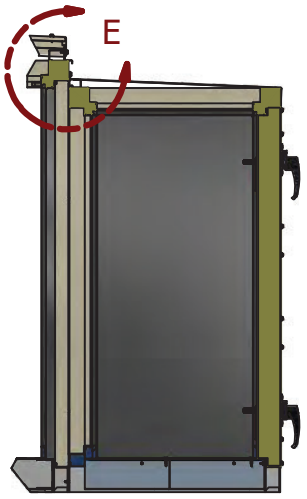
SECTION C-C



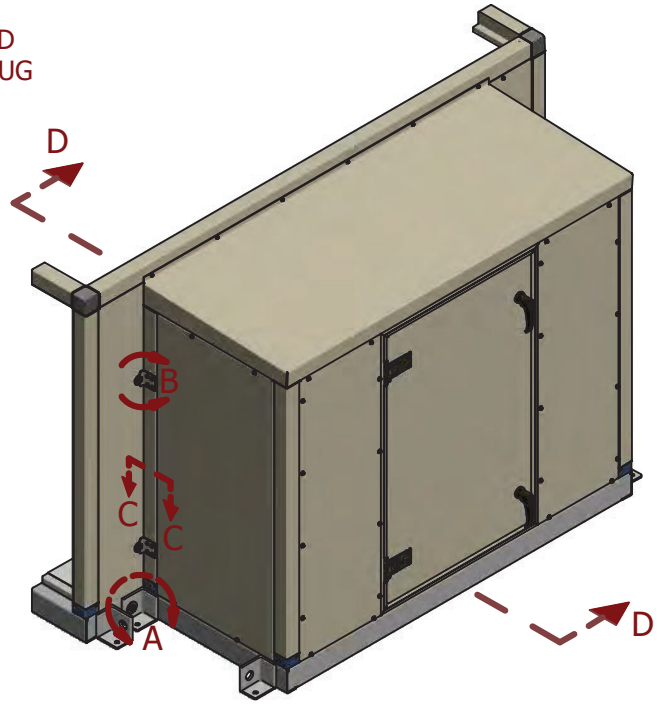
DETAIL A

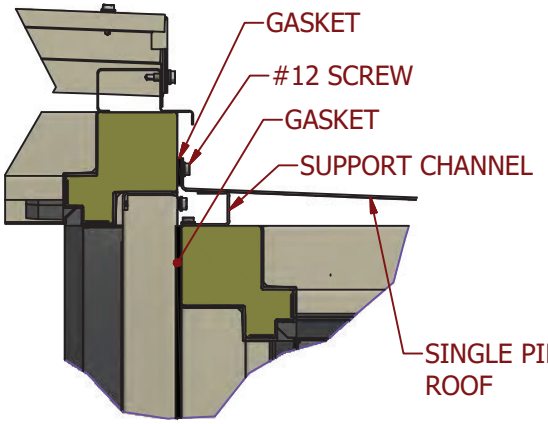


DETAIL B



SECTION D-D





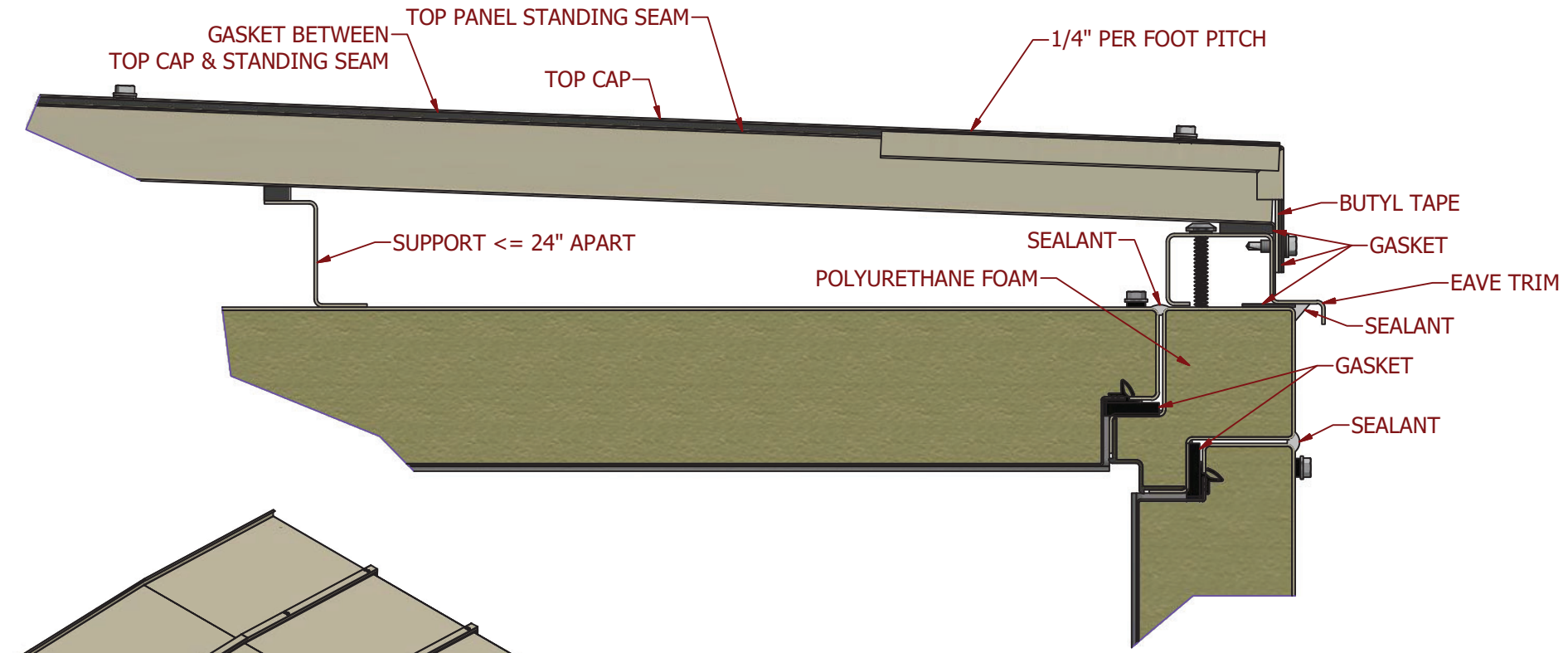
DETAIL E

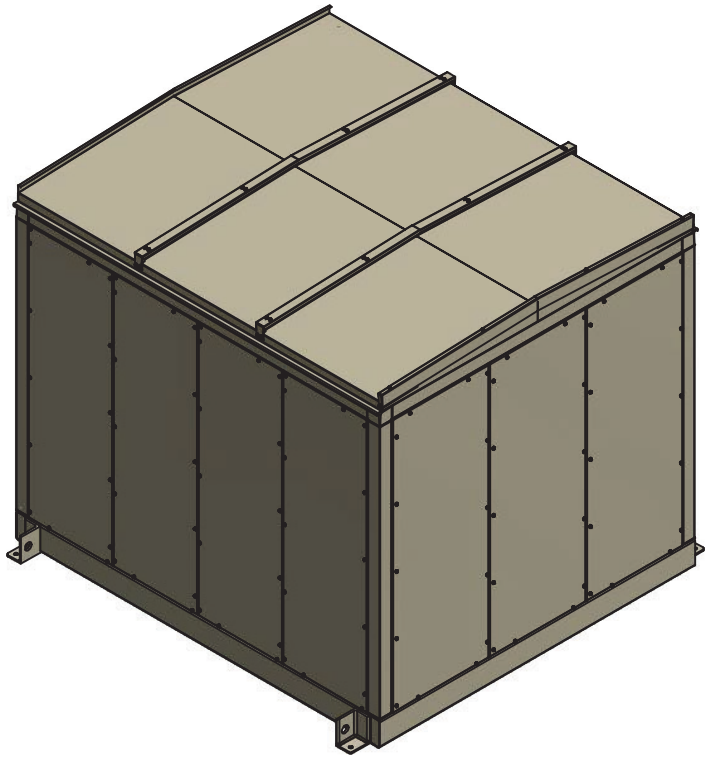
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

DETAIL, PENTA PIPE HOUSE, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000016635	1 OF 1	





NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

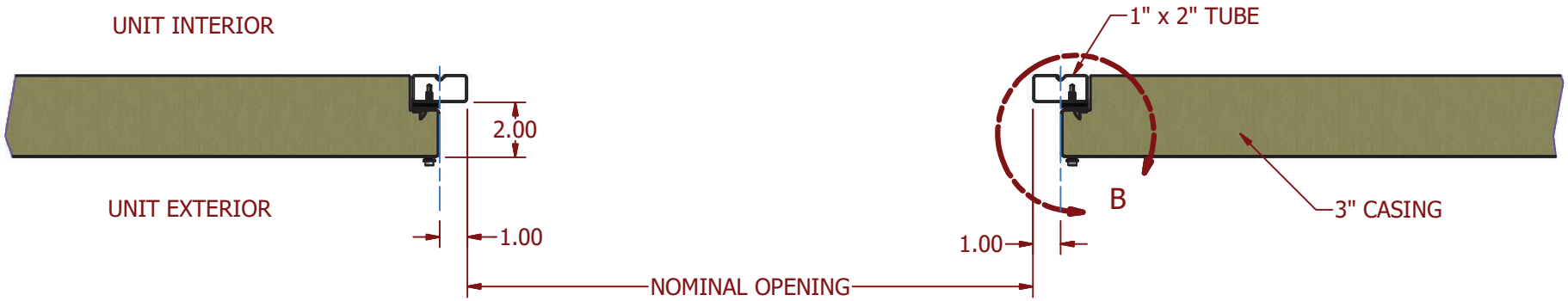
TITLE:

DETAIL, SECTION, ROOF, ITF

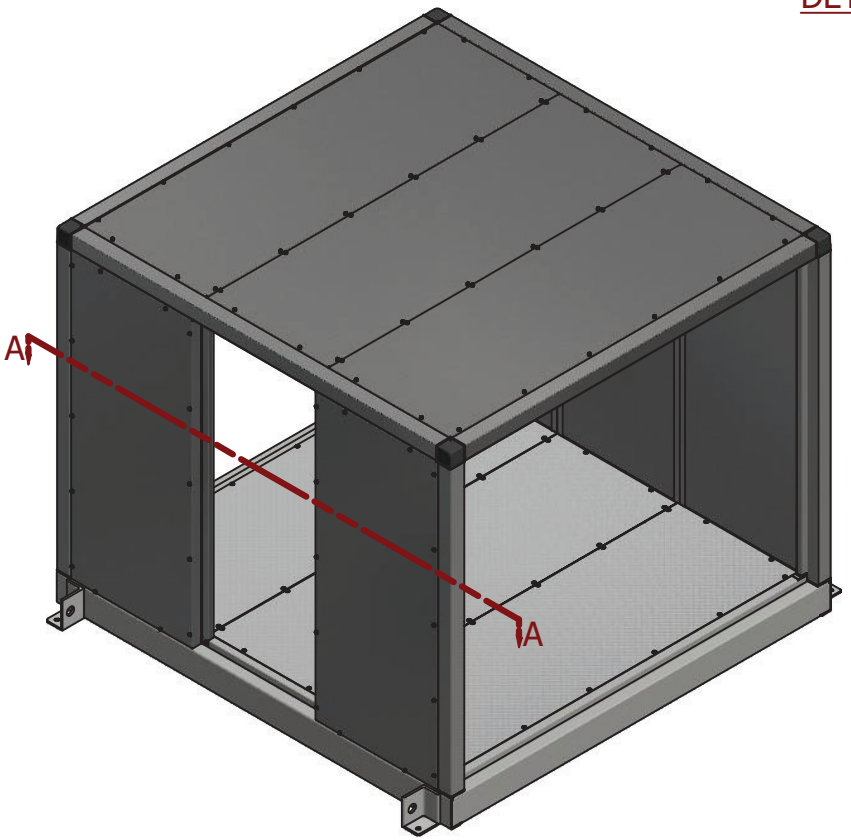
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000013450	1 OF 1	C

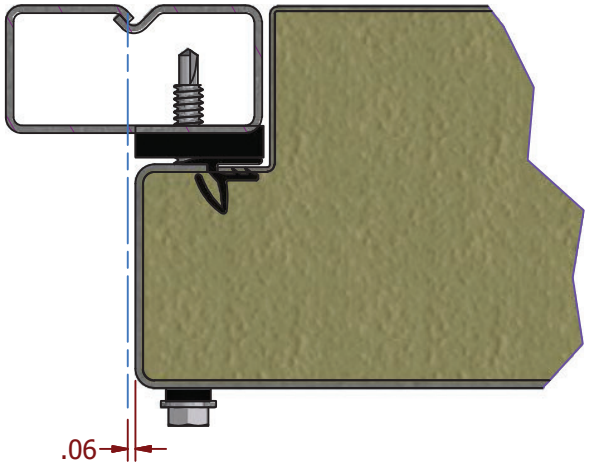
NOTE:

1. THIS DOCUMENT REPLACES 221.00165 WHICH IS OBSOLETE.



DETAIL A-A





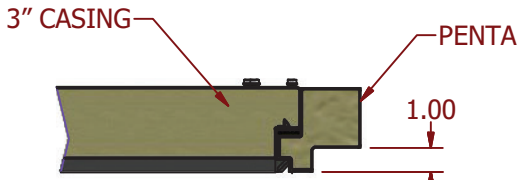
DETAIL B

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

DETAIL
OPENING, CASING, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000020518	1 OF 5	

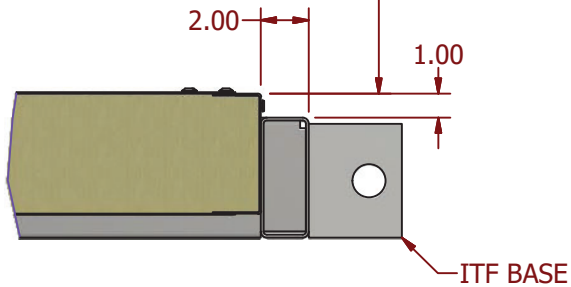


1.00

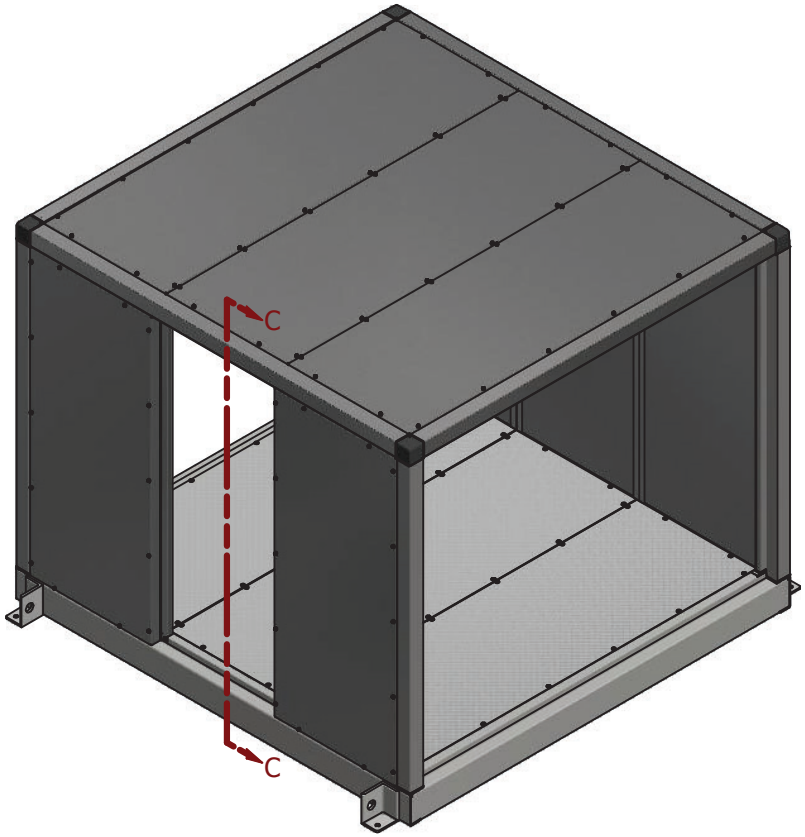
UNIT INTERIOR

UNIT EXTERIOR

NOMINAL OPENING



DETAIL C-C



NORTEK AIR SOLUTIONS

106 N. INDUSTRIAL BLVD.
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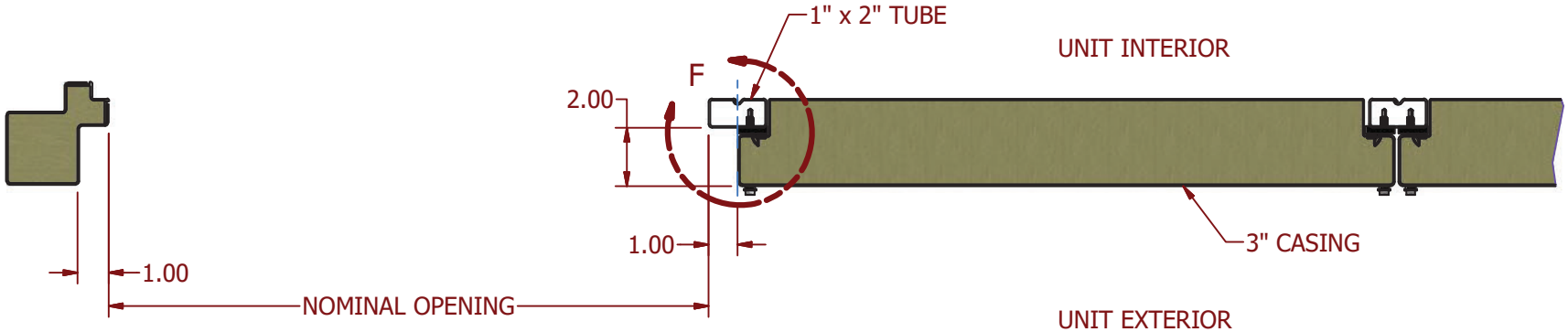
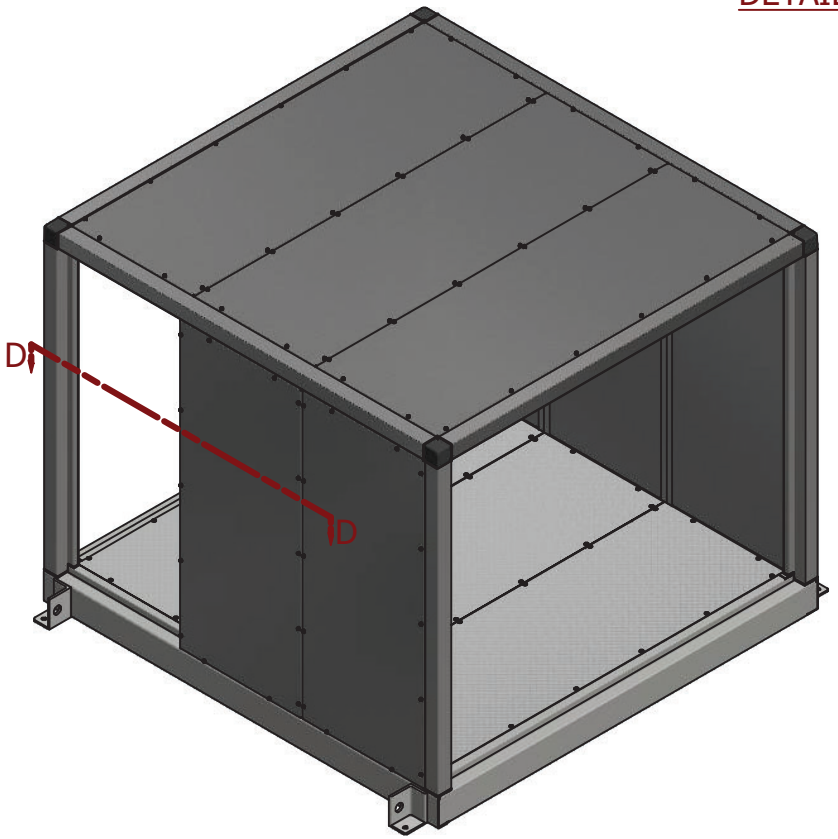
TITLE:

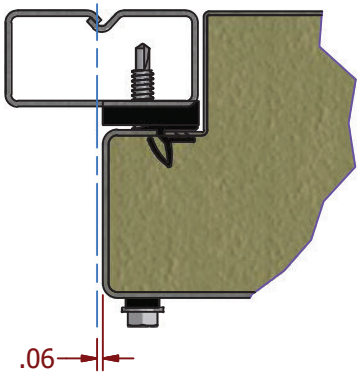
DETAIL
OPENING, CASING, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000020518	2 OF 5	



DETAIL D-D



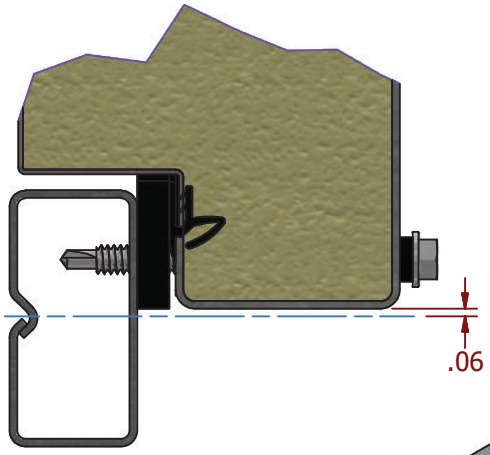


DETAIL F

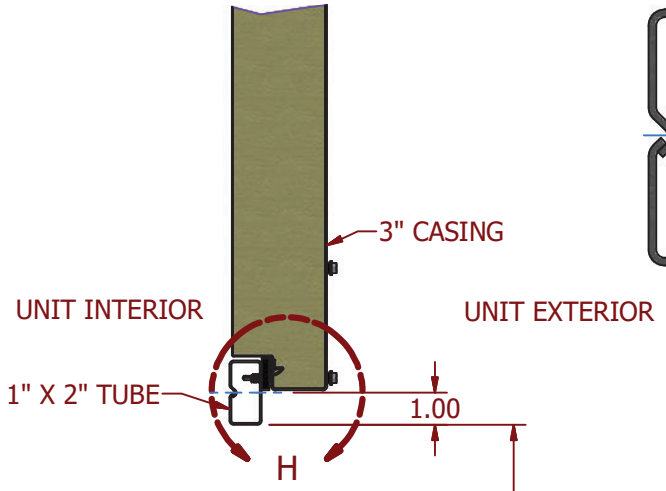
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

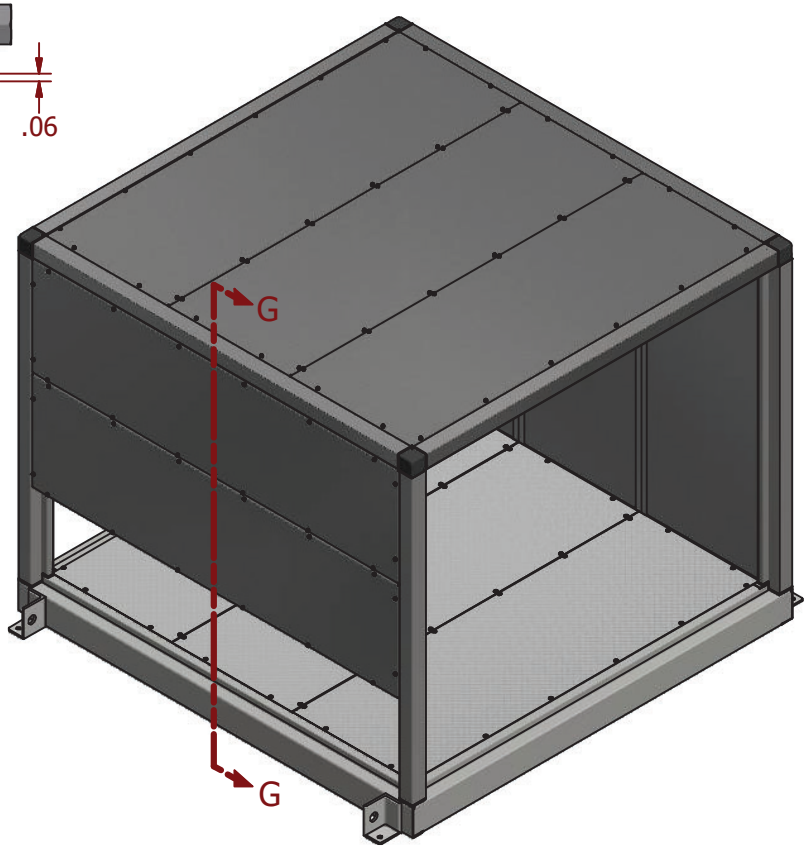
TITLE:
DETAIL
OPENING, CASING, ITF

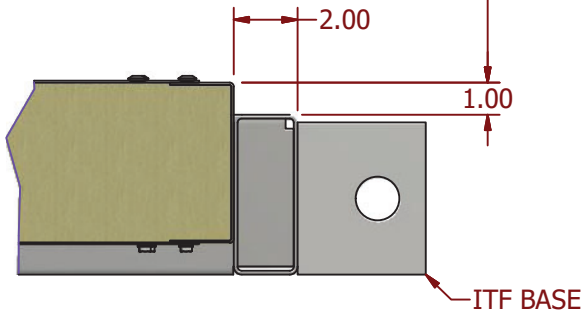
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000020518	3 OF 5	



DETAIL H







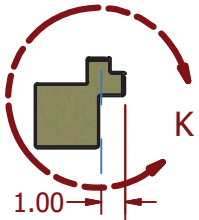
DETAIL G-G

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

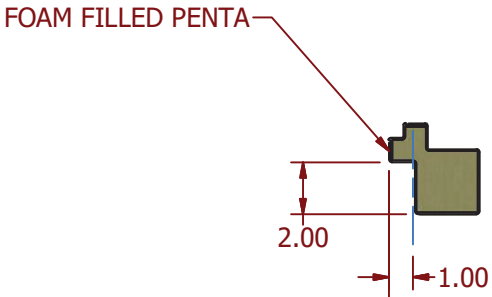
TITLE:

DETAIL
OPENING, CASING, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000020518	4 OF 5	



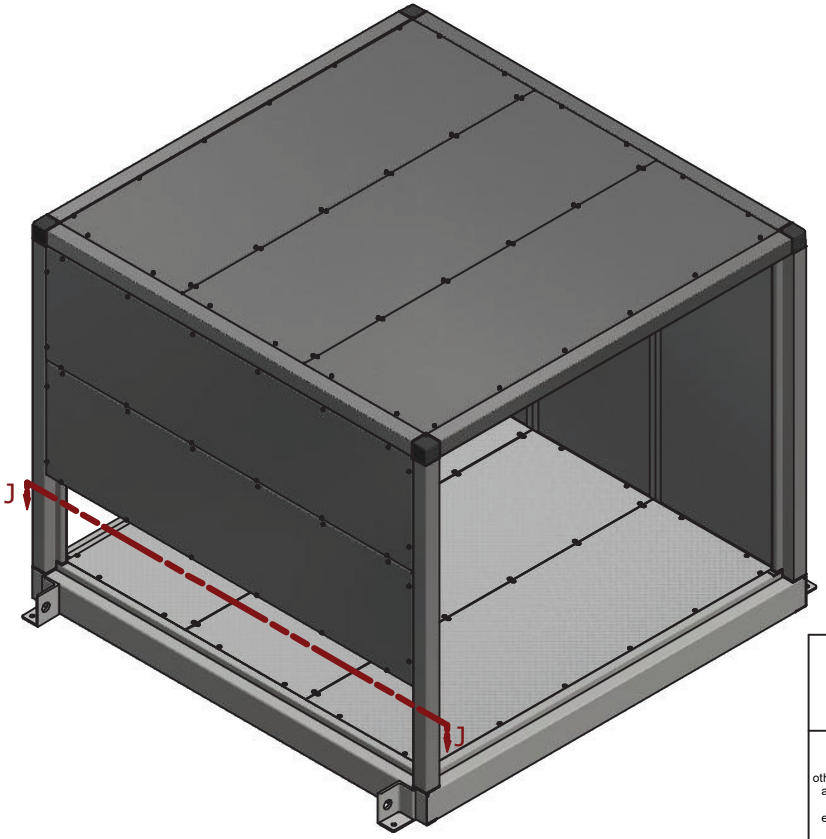
UNIT INTERIOR

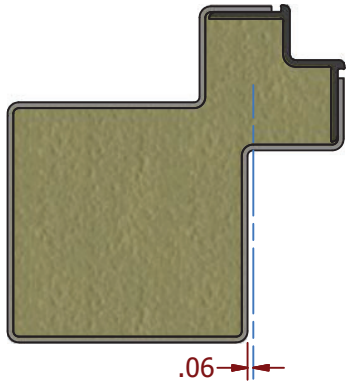


NOMINAL OPENING

UNIT EXTERIOR

DETAIL J-J





DETAIL K

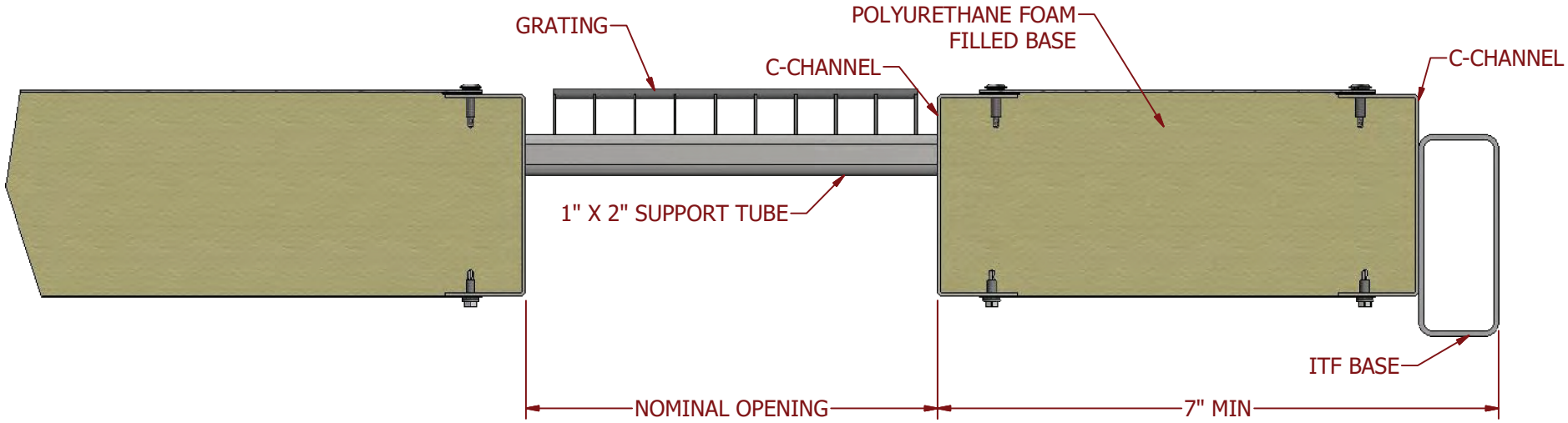
NORTEK AIR SOLUTIONS

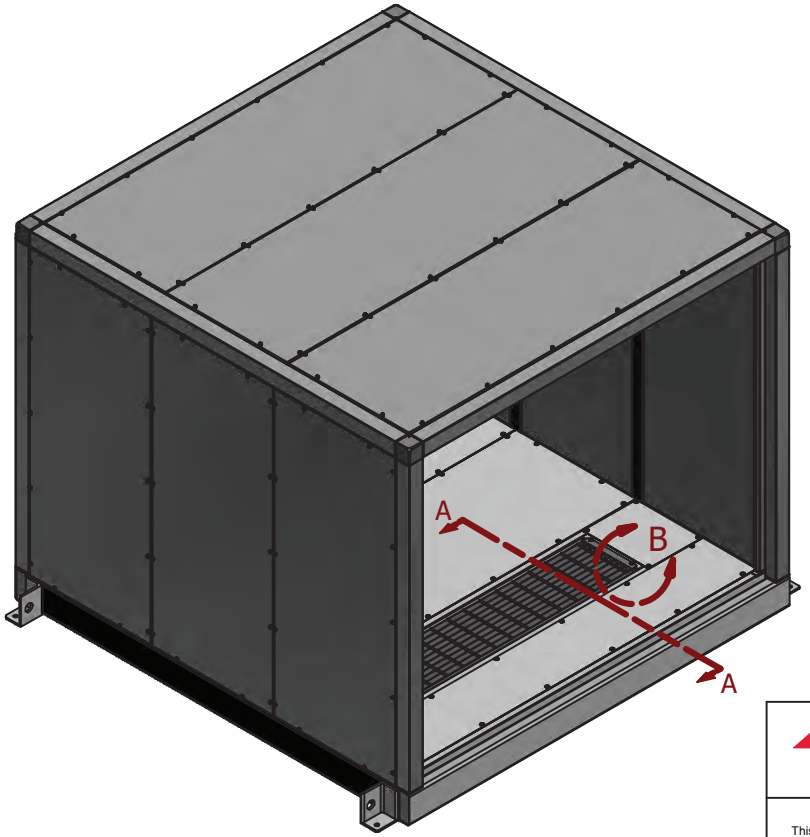
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

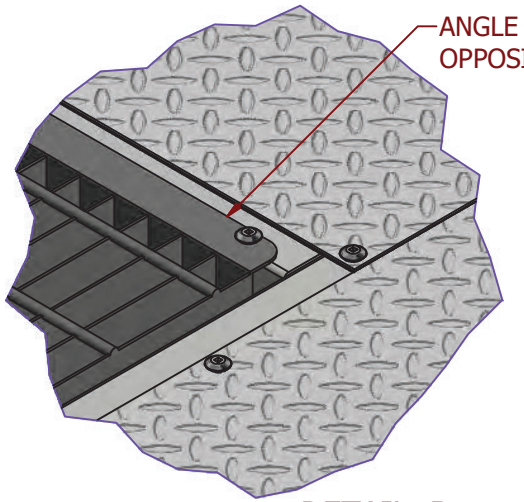
DETAIL
OPENING, CASING, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000020518	5 OF 5	





SECTION A-A



DETAIL B

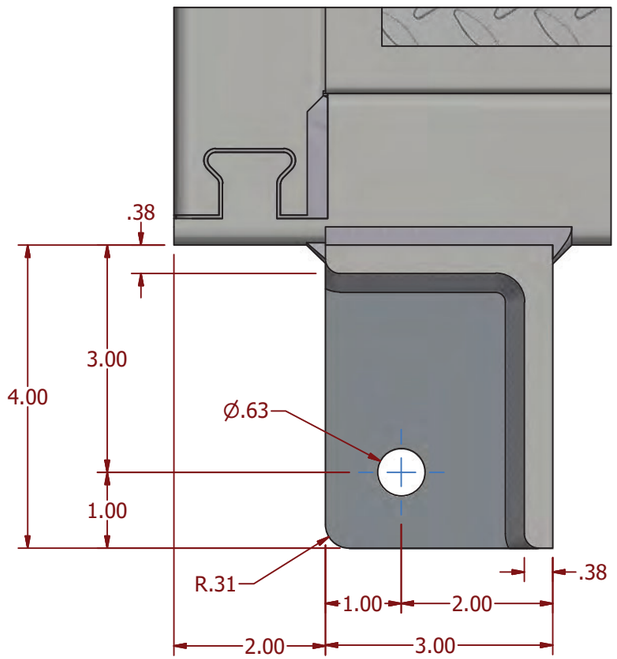
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE: DETAIL, OPENING, BASE, ITF

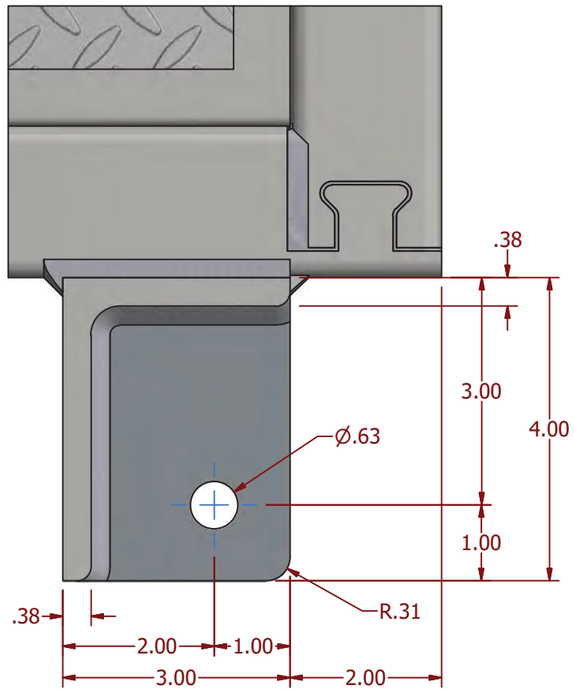
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000013770	1 OF 1	A

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

Lifting Lugs

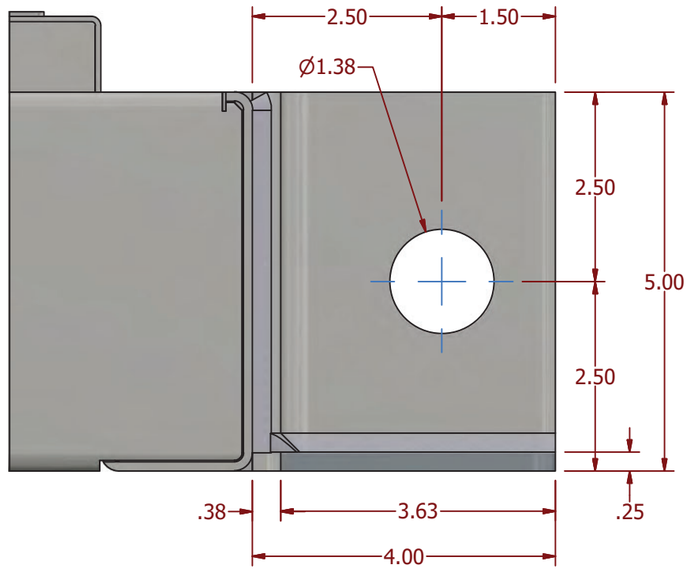


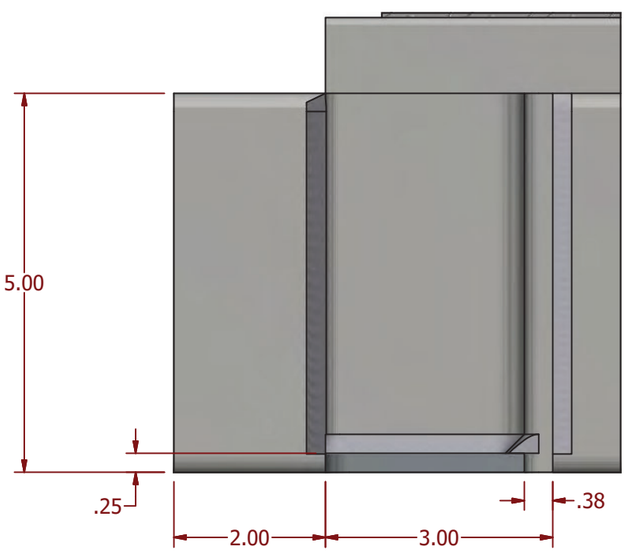
TOP VIEW
RIGHT HAND



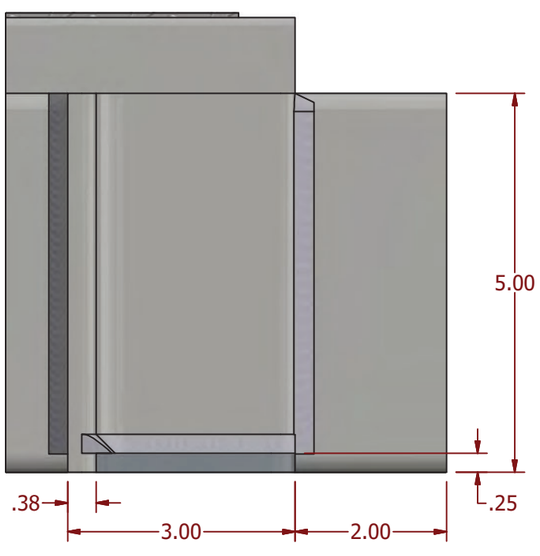
TOP VIEW
LEFT HAND

DEMOUNTED UNITS

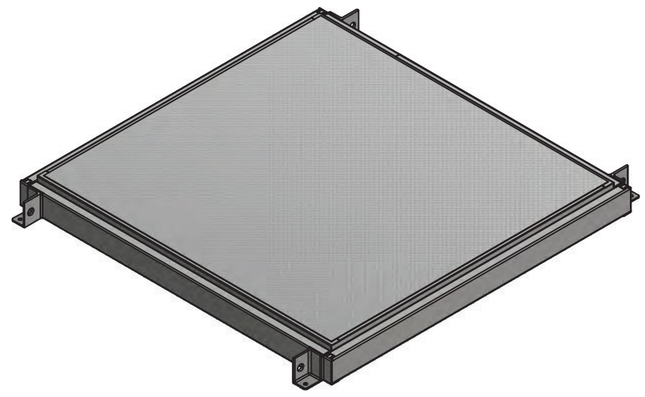




FRONT VIEW
RIGHT HAND



FRONT VIEW
LEFT HAND



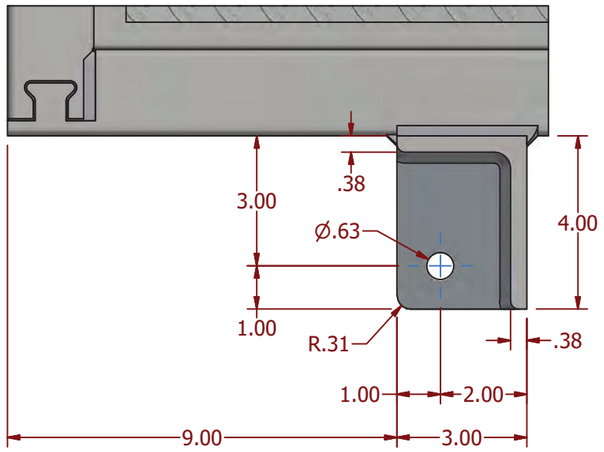
NOTE:

1. THIS DOCUMENT REPLACES 221.00212 WHICH IS OBSOLETE.

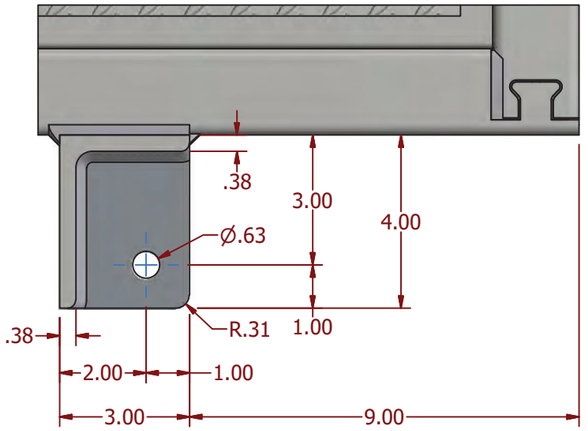
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE: DETAIL, LIFTING LUG LOCATION, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000018383	1 OF 2	-

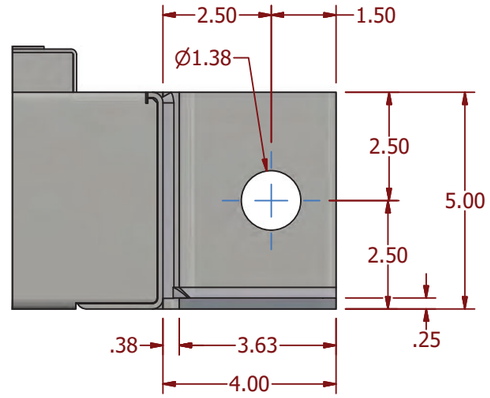


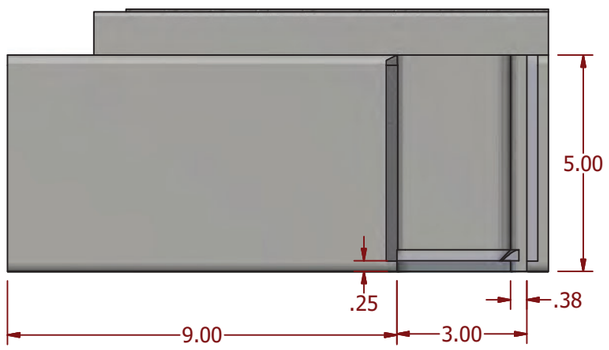
TOP VIEW
RIGHT HAND



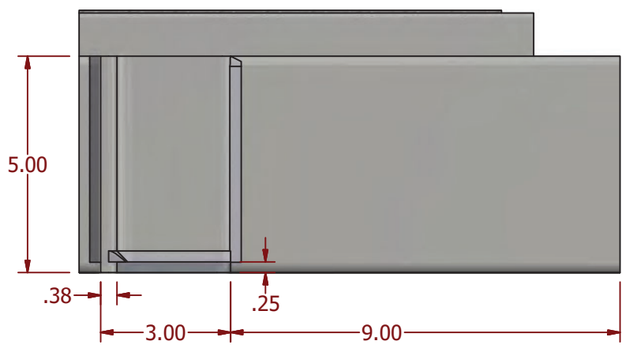
TOP VIEW
LEFT HAND

SINGLE PIECE UNIT

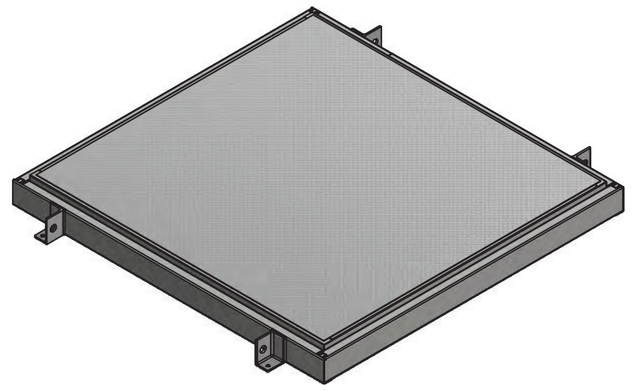




FRONT VIEW
RIGHT HAND



FRONT VIEW
LEFT HAND



NORTEK AIR SOLUTIONS™
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

CONFIDENTIAL-PROPRIETARY

TITLE:

DETAIL, LIFTING LUG LOCATION, ITF

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000018383	2 OF 2	-

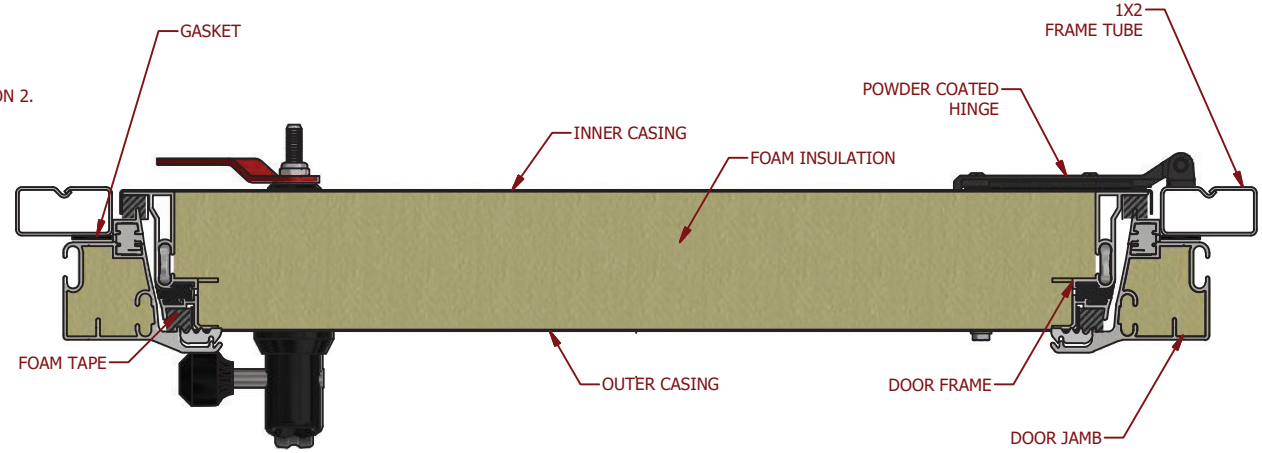
NORTEK AIR SOLUTIONS TEMTROL

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

Component Details

AVAILABLE OPTIONS:

1.) DUAL THERMAL PANE, UV RATED SAFETY GLASS OR FACTORY FABRICATED LOUVER. REFER TO UNIT DRAWING IF SPECIFIED.
2.) TEST PORT.
3.) PREVIOUSLY RELEASED AS 221.00044

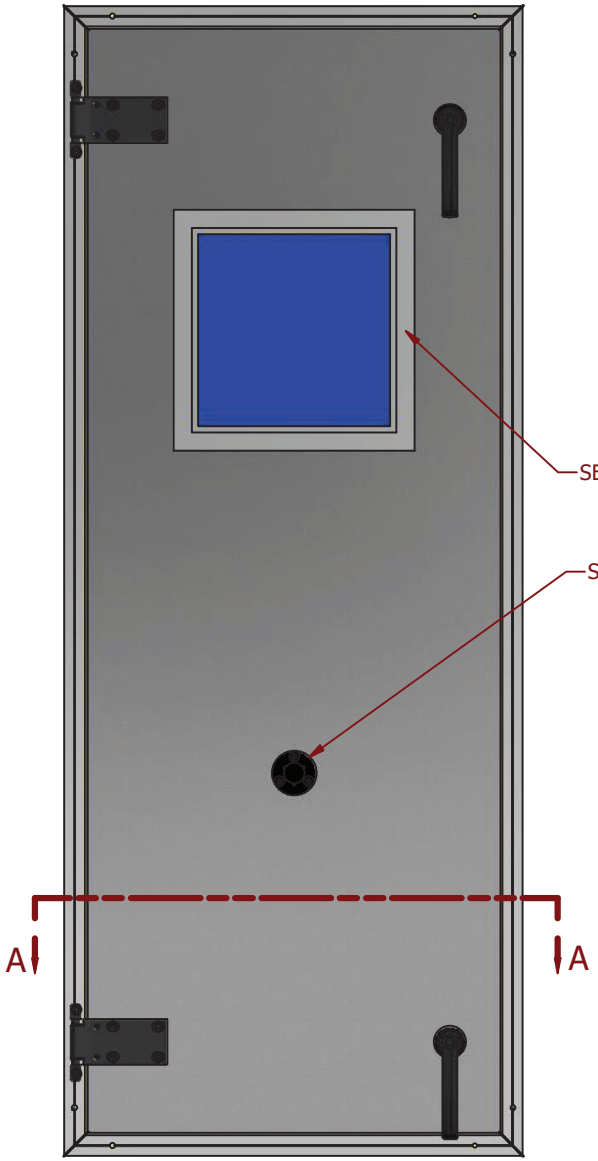


SECTION A-A

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

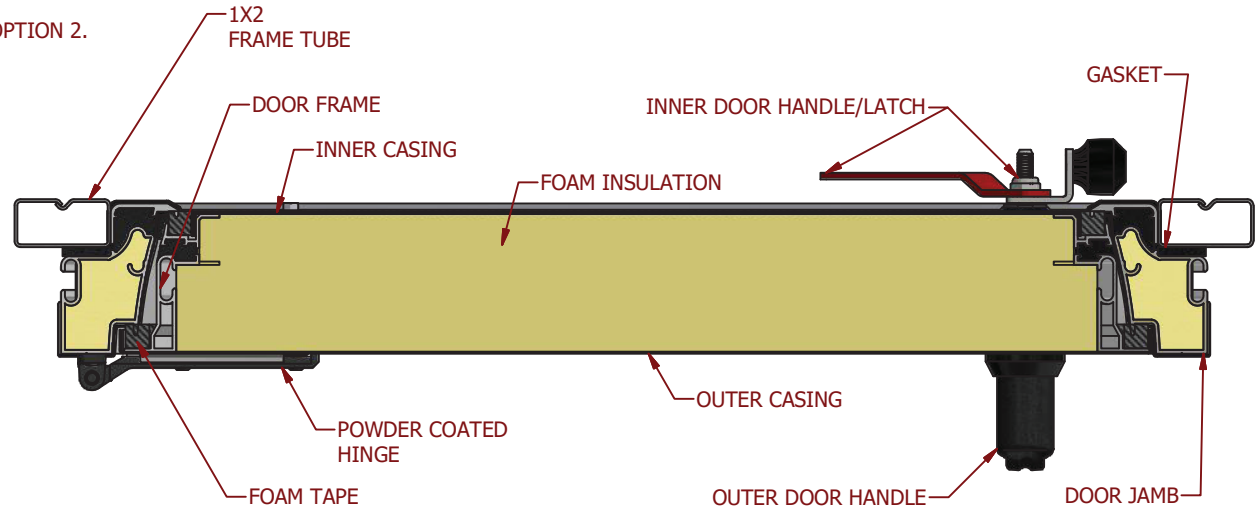
TITLE: DETAIL ACCESS DOOR, FOAM, IS, 3 INCH

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000012406	1 OF 1	-



AVAILABLE OPTIONS:

1. DUAL THERMAL PANE, UV RATED SAFETY GLASS OR FACTORY FABRICATED LOUVER. REFER TO UNIT DRAWING IF SPECIFIED.
2. TEST PORT.

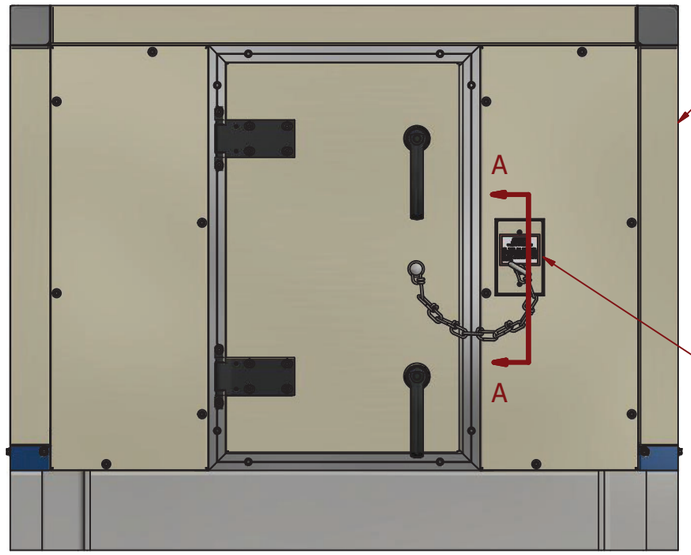


NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

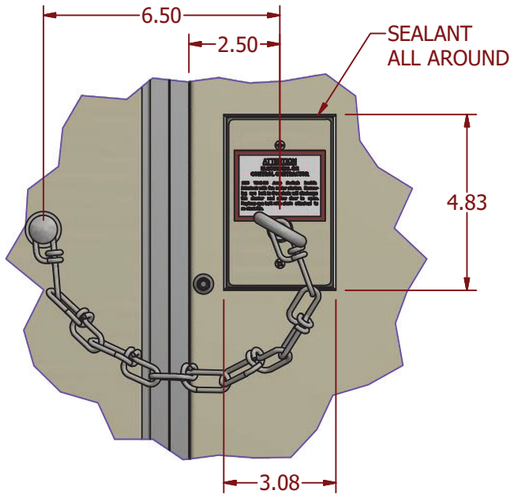
TITLE:

DETAIL, ACCESS DOOR, FOAM, OS, 3 INCH

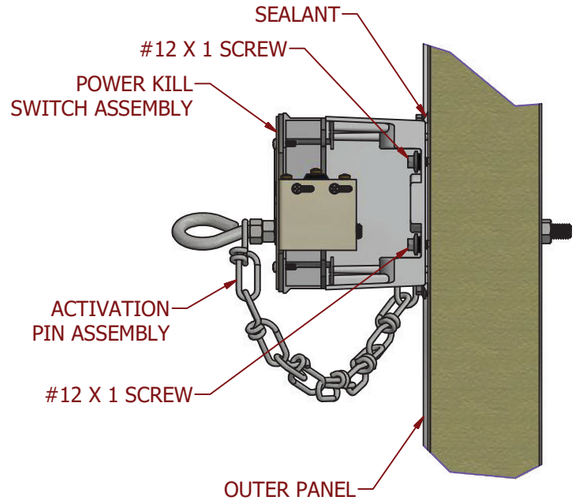
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000010325	1 OF 1	-



OUT-SWING DOOR CONFIGURATION

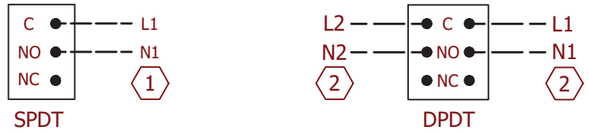


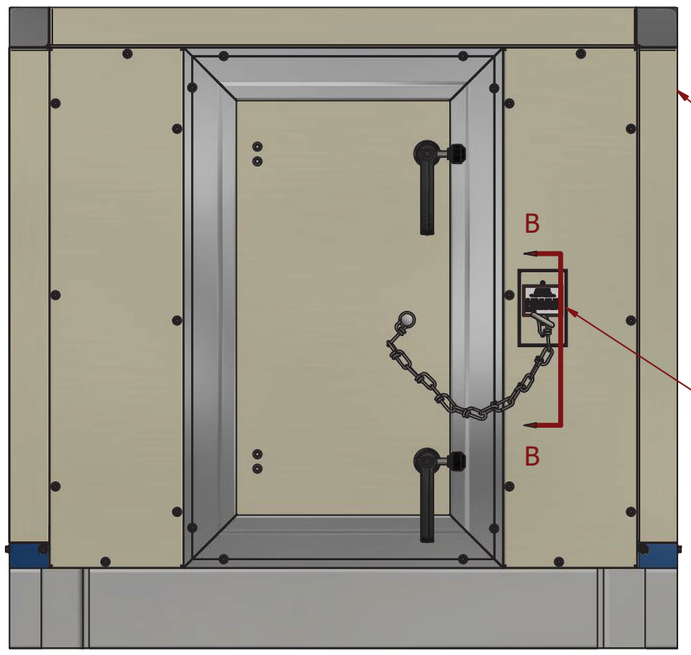
OUT-SWING DOOR



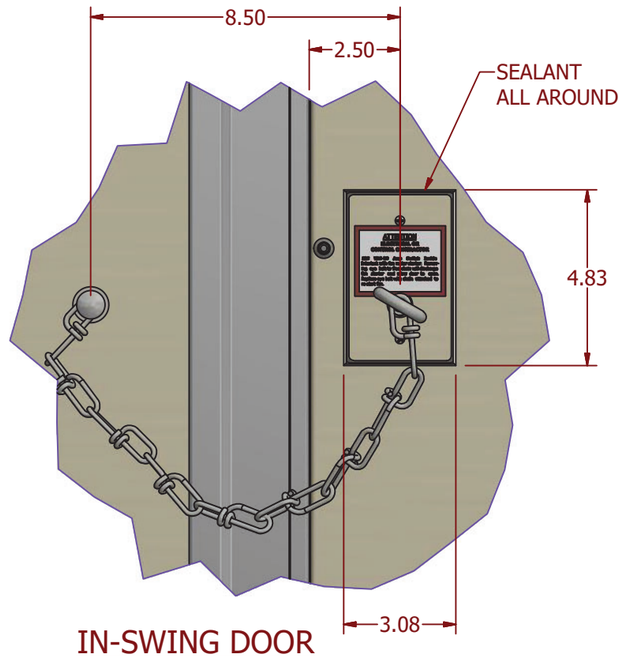
SECTION A-A/B-B

SPDT AND DPDT MICRO SWITCH ELECTRICAL DIAGRAM:





IN-SWING DOOR CONFIGURATION



IN-SWING DOOR

MICRO SWITCH SPECIFICATIONS:

SPDT MICRO SWITCH RATING:	DPDT MICRO SWITCH RATING:
20A @ 125, 250, OR 480VAC	10A @ 125 OR 250VAC
10A @ 125VAC (TUNGSTEN)	2A @ 480VAC
1/2A @ 125VDC/1 HP @ 125VAC	1/2A @ 125VDC/1/8 HP @ 125VAC
1/4A @ 250VDC/2 HP @ 250VAC	1/4A @ 250VDC/1/4 HP @ 250VAC

(1) SINGLE MOTOR CONTROL CIRCUIT OR SINGLE POWER SUPPLY CIRCUIT

(2) DUAL MOTOR CONTROL CIRCUIT OR DUAL POWER SUPPLY CIRCUIT

MECHANICAL PROTECTION REQUIREMENTS:

UL 1995, SECTION 11 REQUIRES ALL MOVING PARTS CAPABLE OF CAUSING BODILY INJURY TO BE GUARDED. ACCEPTABLE MEANS FOR PROTECTION INCLUDE:

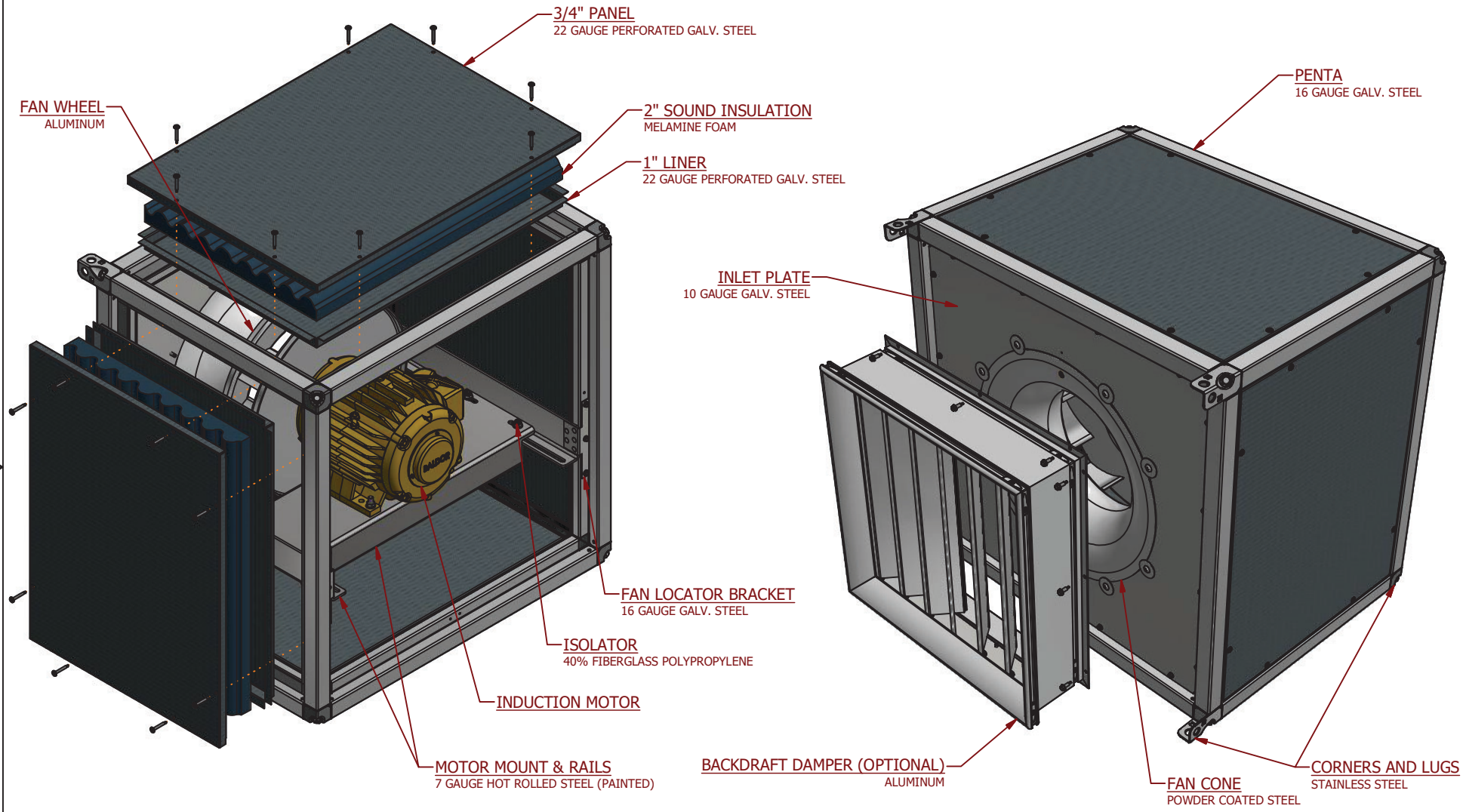
- ENCLOSURES ACCESSIBLE ONLY WITH THE USE OF TOOLS SUCH AS UNIT CABINET EQUIPPED WITH TOOLED OPERATED DOOR LATCHES.
- INTERLOCKING MECHANISM TO DE-ENERGIZE DRIVE MOTOR POWER IF ACCESS IS OPENED.
- SCREEN REQUIRING TOOLS FOR REMOVAL OR PERMANENTLY ATTACHED.

AIR HANDLERS MANUFACTURED BY TEMTROL/GOVERNAIR/VENTROL ARE ETL LISTED AND ARE THEREFORE IN COMPLIANCE WITH UL 1995, SECTION 11.

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE: DETAIL, ACCESS DOOR WITH POWER KILL SWITCH (PKS)

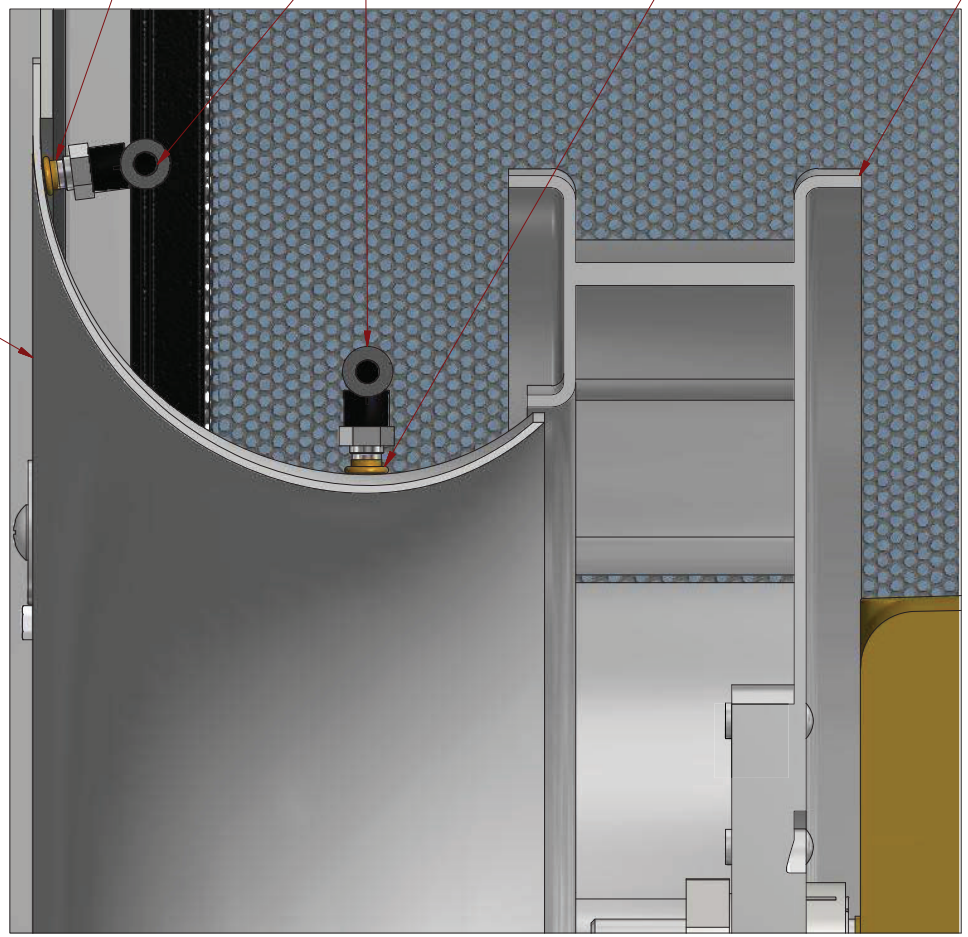
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000017550	1 OF 1	



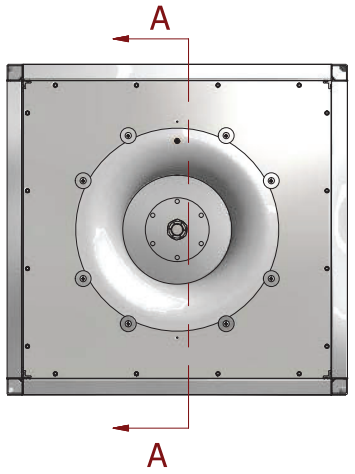
NORTEK™ AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:
DETAIL, FANCELL, STANDARD CONSTRUCTION, ALUMINUM WHEEL, INDUCTION MOTOR

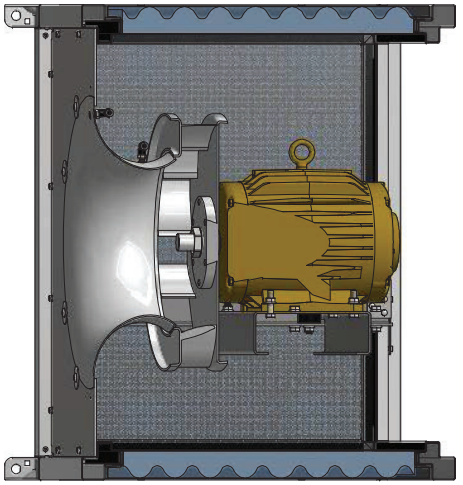
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000013390	1 OF 1	



SECTION A-A



FRONT VIEW



NORTEK AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

File Saved: 11:09am 01-16-2014

Title:

DETAIL, INLET CONE AIR MONITOR, ALUMINUM WHEEL, FANWALL

DRAWING NO.

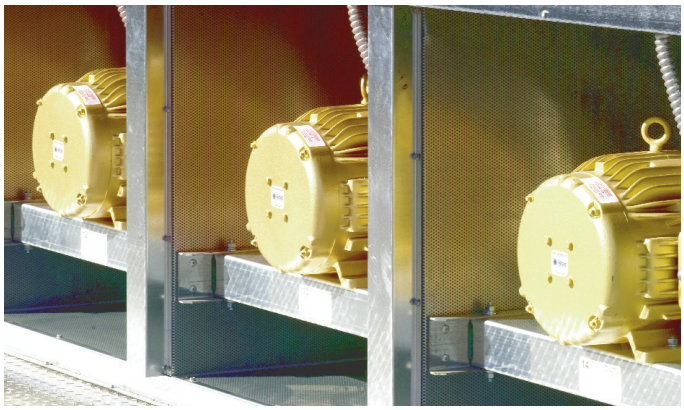
221.00185

Backdraft Damper for Air Handlers with FANWALL TECHNOLOGY®

Model FBD

Delivering Quality One Unit at a Time

New Backdraft Control Device



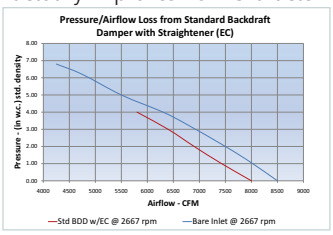
Why Temtrol

Since 1955, Temtrol, LLC. has earned a reputation for the manufacturing of innovative custom air handling equipment of the highest quality for commercial, institutional, and industrial applications. When you seek a manufacturer with flexibility in construction, products designed for long life, and one that delivers performance without compromise, specify Temtrol®.

Revolutionary Backflow Control Device

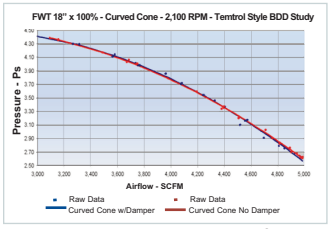
Air handlers are critical components in a building's air conditioning system. The redundancy of fan components in a multi-fan array adds to an air-handling unit's reliability. If you were to disable a fan or fans in a FANWALL® system during operation, how would you handle the backflow of air that would occur? The answer is the new patent pending model FBD backdraft damper.

The model FBD backdraft damper has a revolutionary new blade profile that laminarizes incoming air and actually improves flow characteristics. To illustrate this advantage, Graph 1 shows the significant system effect penalty associated with the addition of typical backdraft dampers (blue top line represents without damper, red bottom line represents with damper).



Graph 1 - Traditional backdraft damper system effect impact shown in red line.

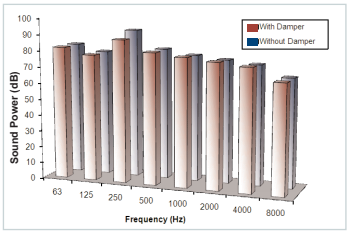
In striking contrast, Graph 2 illustrates the model FBD backdraft damper, which amazingly imposes near ZERO net effect on the system. The resulting performance of this remarkable new innovation is truly nothing short of revolutionary!



Graph 2 - Model FBD backdraft damper performance showing near zero system effect impact.

Acoustical Benefits

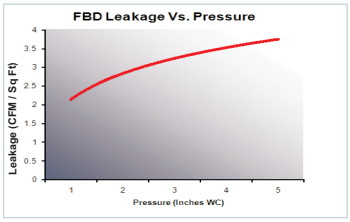
This laminarizing effect has a significant impact on the acoustical performance of the system as well. Graph 3 shows the acoustical comparison between a FANWALL cube using a FBD backdraft damper and again with a conventional backdraft damper. The acoustical performance is either essentially identical or significantly **improved** in every band.



Graph 3 - Sound comparison, by octave band, of FANWALL cube with model FBD backdraft damper (red front bars) and without backdraft damper (blue back bars).

Low Leakage Performance

The new model FBD backdraft damper has a "world class" low leakage rate of only two cfm/sq. ft. at one-inch of static pressure. This far exceeds requirements for a 1A class rating for control dampers. It is also nearly **nine times** less than the industry standard backdraft damper, which has a reported leakage of 17.5 cfm/sq. ft. at the same static pressure!

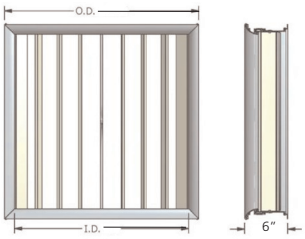


Graph 4 - Model FBD leakage rate test showing low leakage.

Important Features

- Non-corrosive extruded aluminum frame and blades
- Santoprene blade seals
- Low friction sealed metal ball bearings for long life and continuous operation

Three Sizes Cover Every Application

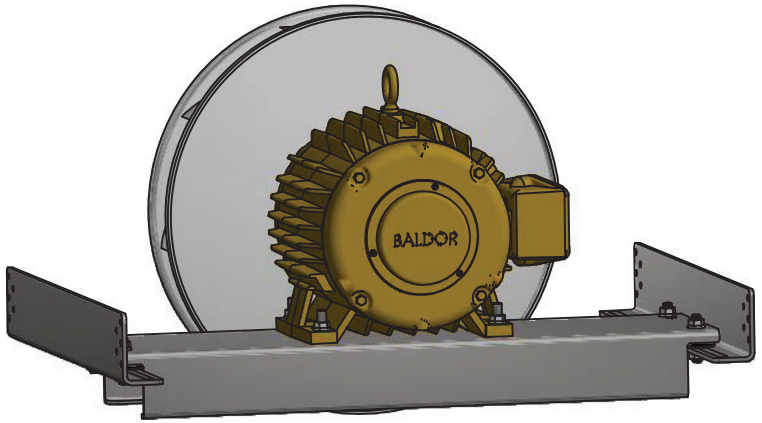


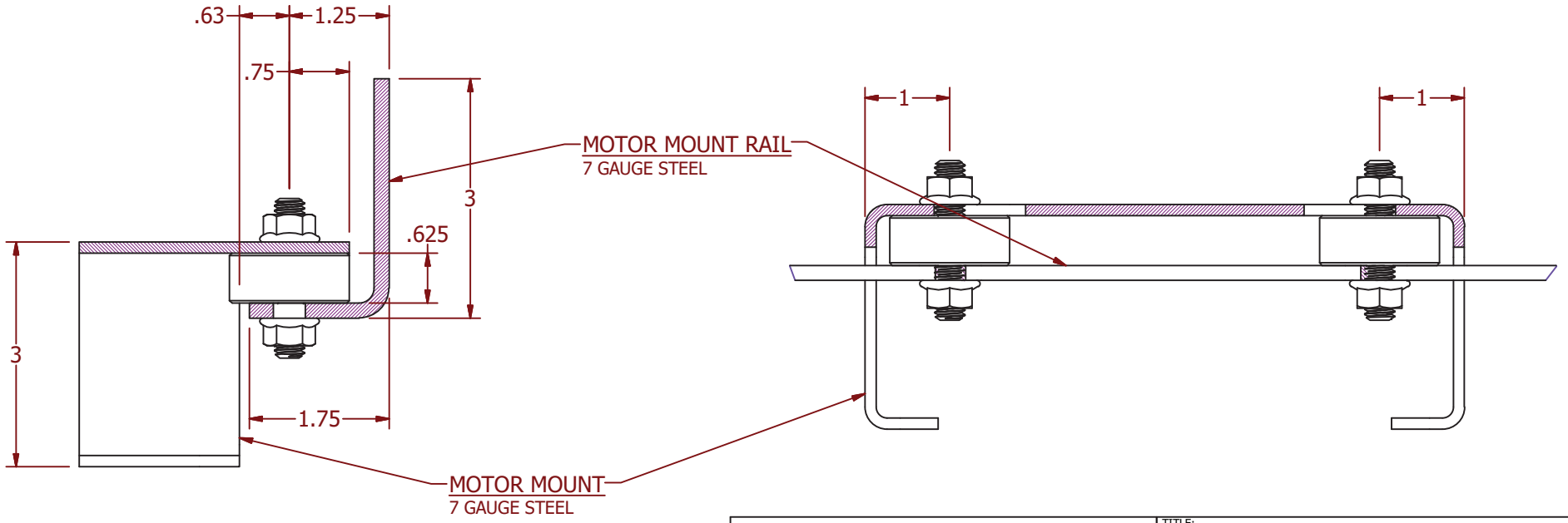
Model	Wheel / Cone Size							O.D.	I.D.	MAX TSP
	10"	12"	14"	16"	18"	20"	22"			
FBD-4	X							14.75	12"	12"
FBD-6		X	X	X				20.75	18"	12"
FBD-8					X	X	X	26.75	24"	12"

Contact your local CES Group Representative to learn more about the model FBD backdraft damper.

Temtrol®
A CES Group® Company

www.temtrol.com
temtrol@temtrol.com



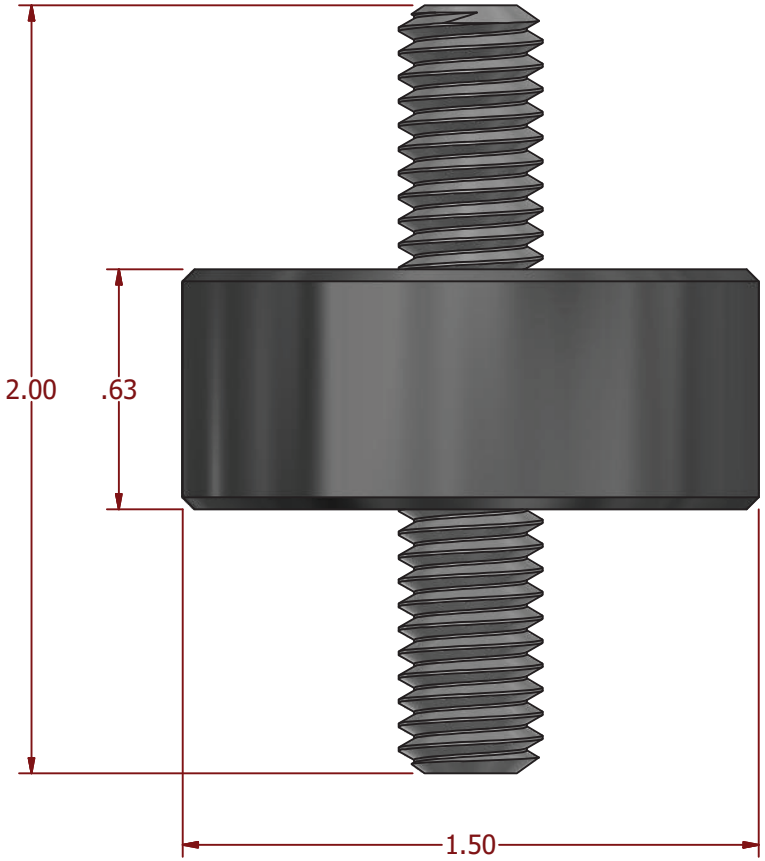


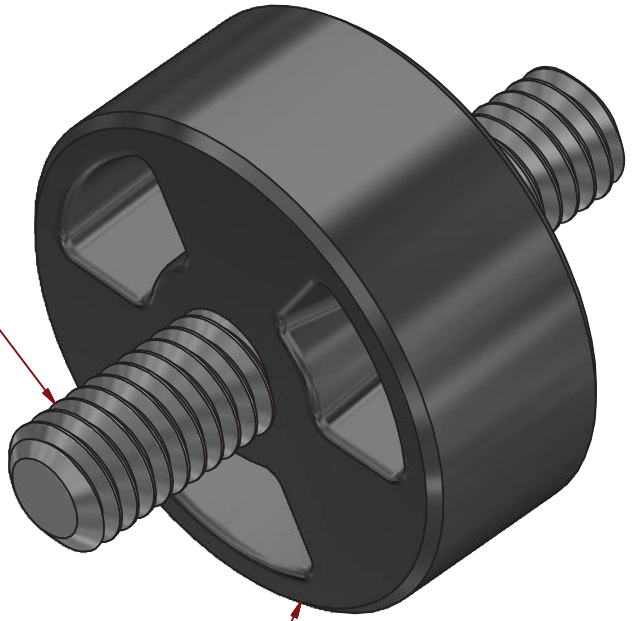
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

DETAIL, FANWALL MOTOR ISOLATION

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000064052	1 OF 1	-





NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

DETAIL, ISOLATOR, MOTOR MOUNT, FANWALL

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000064041	1 OF 1	-

Chilled or Hot Water Coil

Type WC

Primary Surface

Round seamless copper tubes are mechanically expanded into the fin collars of the secondary surface. The mechanical expansion provides a permanent metal-to-metal bond for efficient heat transfer. Tubes are staggered in the direction of airflow.

Secondary Surface

Corrugated aluminum or copper plate type fin that is die-formed. Fin collars are full-drawn to provide accurate control of fin spacing and maximum contact with tubes.

Headers

Seamless copper with die-formed holes that provide a parallel surface to the coil tube for strong brazing joints. Standard 1/8" brass female pipe thread (FPT) vent and drain with optional 1/2" or 3/4". All circuiting is designed to gravity-drain with the coil mounted vertically and tubes running horizontally.

Connections

Red Brass Schedule 40 male pipe thread (MPT) std. with optional copper female pipe thread (FPT), sweat and Victaulic Red Brass available.

Casing

Casing is die-formed with 1½" flanges to permit easy stacking and mounting. Intermediate tube supports are supplied on coils over 44" fin length with an additional support every 42".

Testing and Performance

All coil assemblies are leak tested under water with nitrogen at 315 PSIG. Standard construction is suitable for 250 PSIG and up to 300 degrees F.

Performance is AHRI Certified™ to Air-Cooling and Air-Heating Coils AHRI Standard 410. Coil performance ratings are calculated using Temtrol AHRI Certified™ selection software.

Coil Options

Rows	Fin Height	Fin Length	Fin Spacing	Fin Thickness ALUMINUM	Fin Thickness COPPER	Tube O.D.Tube Thickness	Tube Spacing Face x Row	Casing	Max. Std. Operating Conditions
1,2, 3,4,5, 6,8, 10,12	6" to 60"	12" to 240"	1/2" 8 to 14 fins per inch 5/8" 6 to 14 fins per inch	1/2" 0.006" 5/8" 0.008" 0.010"	1/2" 0.006" 5/8" 0.006" 0.008" 0.010"	1/2" 0.017" 0.025" 5/8" 0.020" 0.025" 0.035" 0.049"	1/2" 1.25"x1.083" 5/8" 1.50"x1.299"	16 or 14 GA Galvanized Steel 304, 316 Stainless Steel	250 PSIG 300° F

AHRI CERTIFIED™ www.ahridirectory.org Air-Cooling and Air-Heating Coils AHRI Standard 410

NORTEK™ AIR SOLUTIONS TEMTROL

Specifications and illustrations subject to change without notice and without incurring obligation.

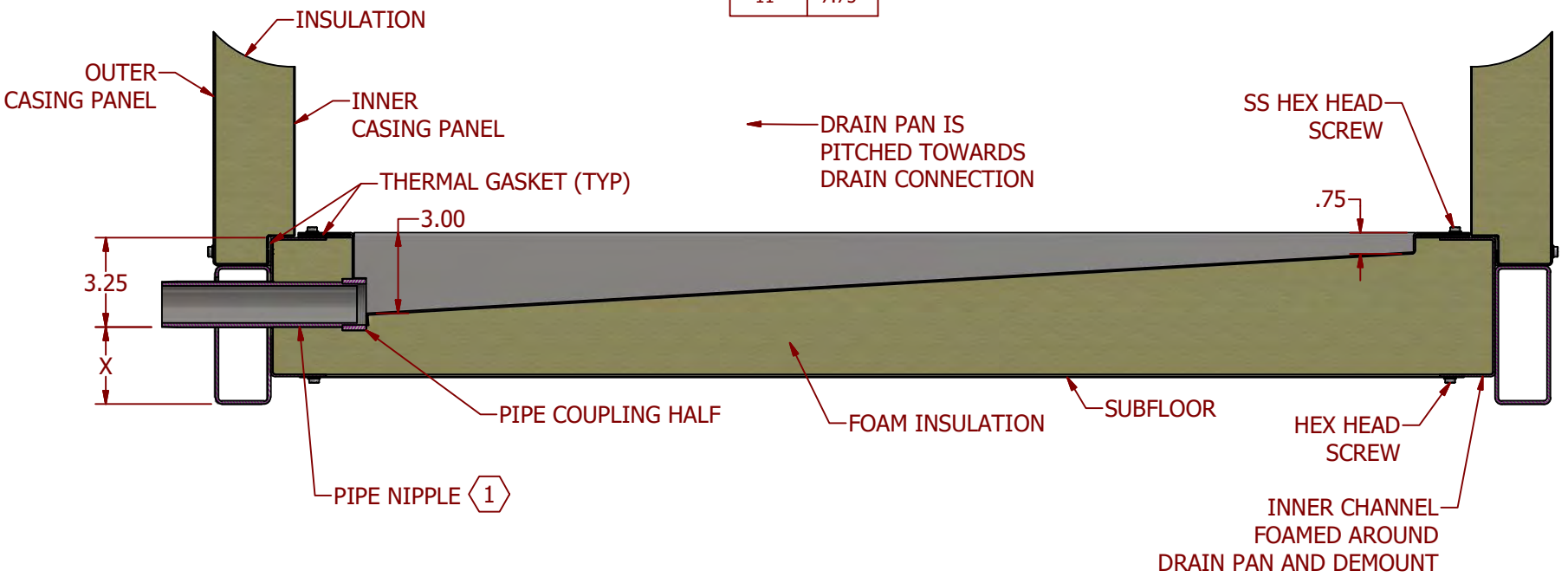
www.nortekair.com
nortekairinfo@nortek.com

172F-0519 (Replaces 172F-0418)

NOTES

1. 304/304L STAINLESS STEEL PIPE WITH HIGH CORROSION PROTECTION.
2. DOCUMENT PREVIOUSLY RELEASED AS 221.00071

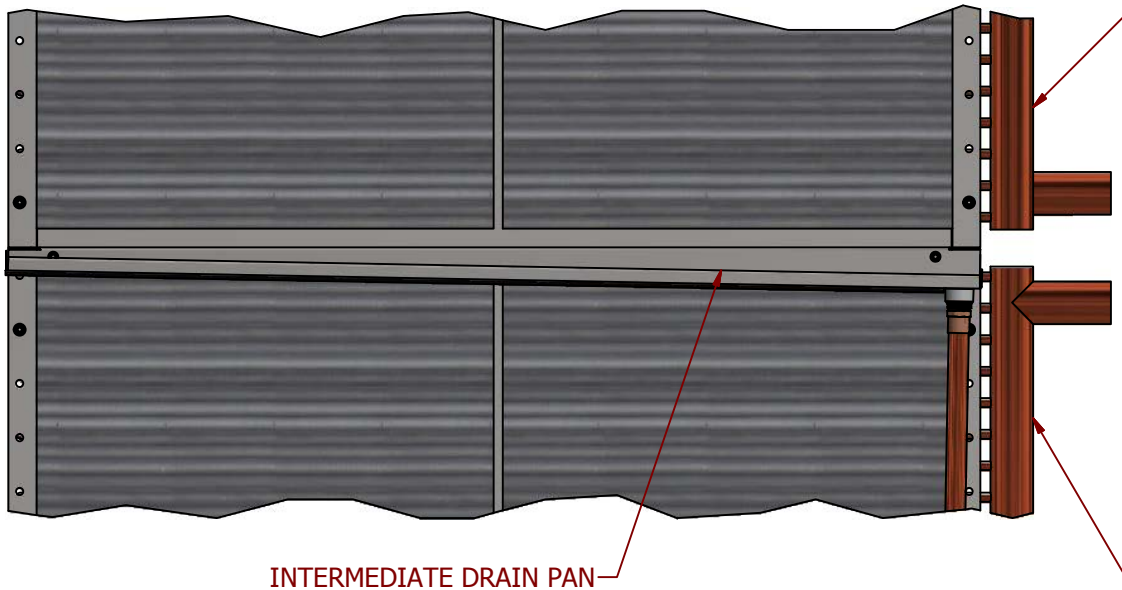
BASE	X
5"	1.75"
6"	2.75"
7"	3.75"
□	5.75"
11"	7.75"

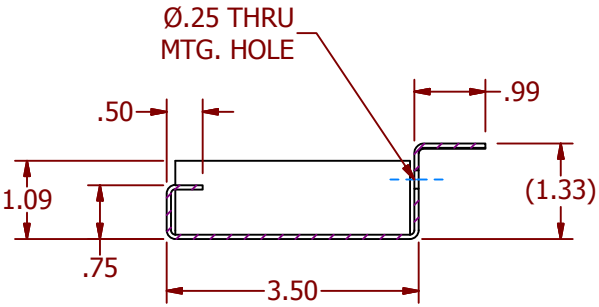


NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

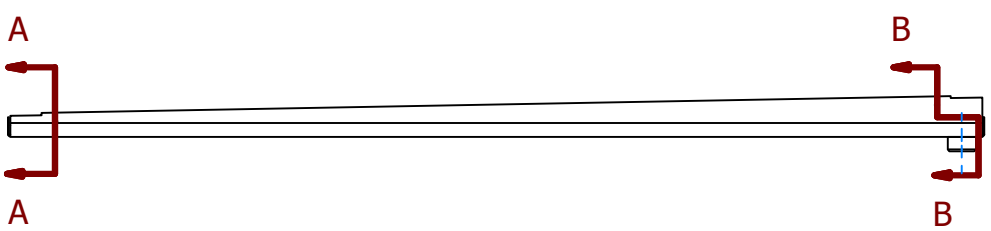
TITLE: DETAIL, DRAIN PAN, .75 IN TO 3 IN, BASE, ITF

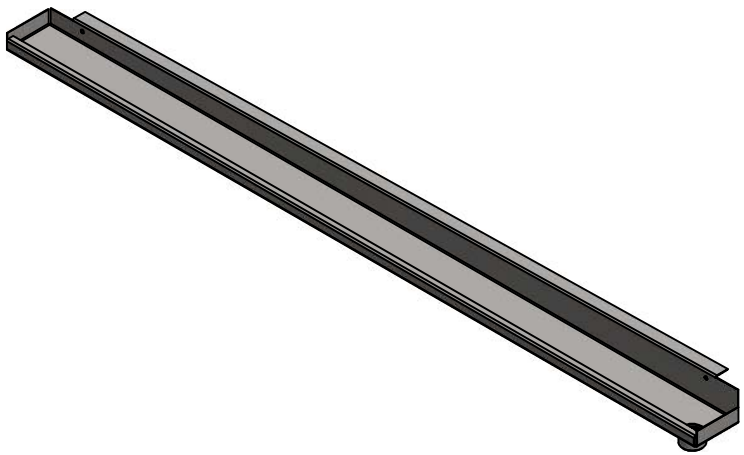
SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000040□76	1 OF 1	-

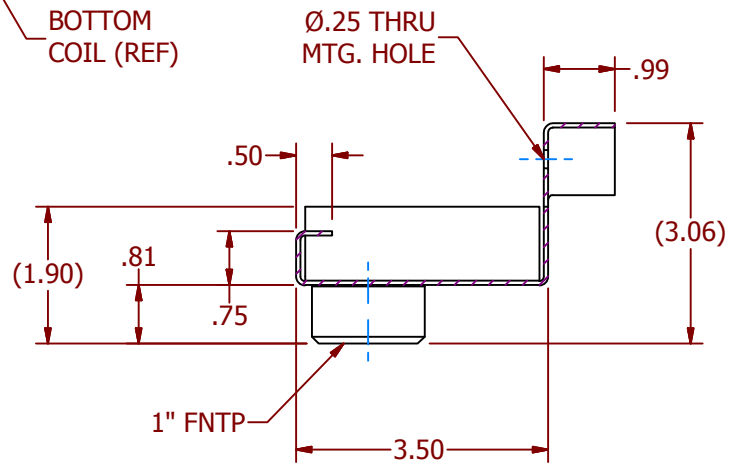




SECTION A-A







SECTION B-B

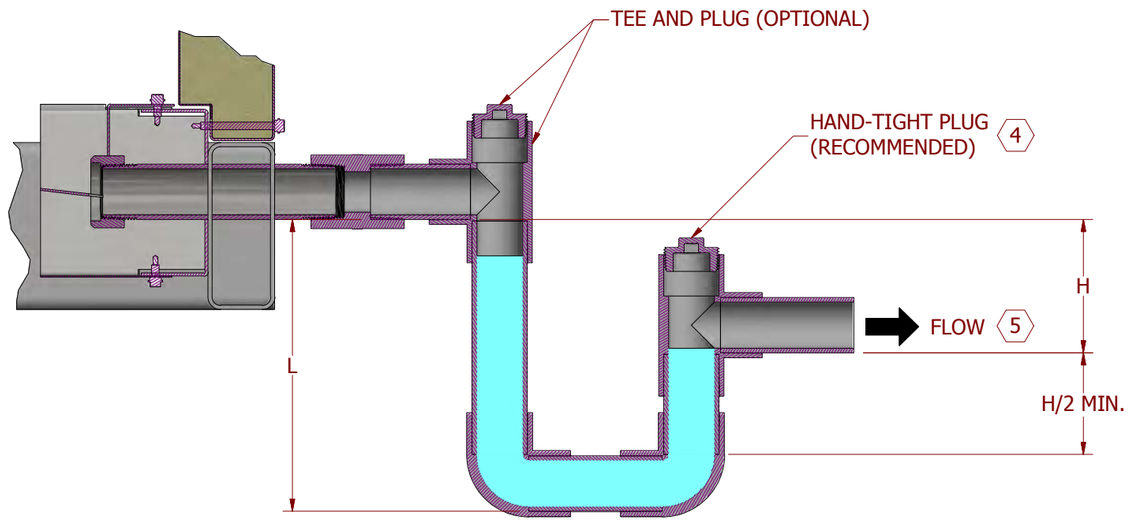
NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

TITLE:

DETAIL, DRAIN PAN, INTERMEDIATE, 3.5" WIDE

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
A	45-000024148	1 OF 1	B

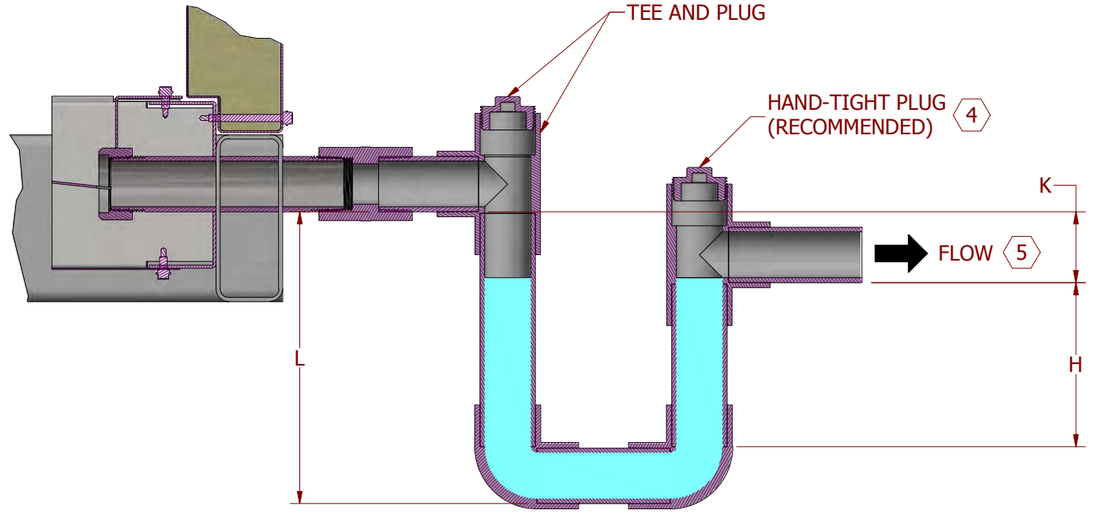
NEGATIVE (-) STATIC PRESSURE



L = H + H/2 + PIPE DIAMETER

H = STATIC PRESSURE IN DRAIN PAN SECTION (in. W.C.) + 1 INCH

POSITIVE (+) STATIC PRESSURE



L = H + K + PIPE DIAMETER

K = 1/2 INCH (MIN)

H = STATIC PRESSURE IN DRAIN PAN SECTION (in. W.C.) + 1/2 in (MIN)

1. ALL UNIT DRAIN CONNECTIONS TO BE TRAPPED SEPARATELY.
2. ALL CONDENSATE AND FLOOR DRAIN TRAP COMPONENTS TO BE FIELD SUPPLIED BY OTHERS AND CONSTRUCTED IN THE FIELD BY OTHERS.
3. IMPROPERLY TRAPPED DRAINS WILL RESULT IN FLOODING OF DRAIN PANS AND FLOOR DRAINS CAUSING POTENTIAL WATER DAMAGE TO AIR HANDLING UNIT AND OTHER BUILDING FACILITIES.
4. TRAPS TO BE PRIMED (WATER ADDED TO DOWN-STREAM SIDE OF TRAP) PRIOR TO UNIT START-UP. LIQUID SEAL TO BE MAINTAINED DURING UNIT OPERATION.
5. CONSULT LOCAL CODES FOR AIR GAP REQUIREMENTS.

REV	ECN #	DESCRIPTION	BY	APPVD	DATE
-					

REVISION HISTORY

DESCRIPTION	NUMBER

DOCUMENT REFERENCE

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL		
	FLAT		FINISHED
.X = ±.05	.X = ± .031	±	.125
.XX = ±.01	.XX = ± .015	±	.093
.XXX = ±.005	.XXX = ± .005	±	.060
ANGLES = ±1°			

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS

File Saved: 14:23:39 5/5/2016

NORTEK AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	4/15/2016
CHECKED:	WHEM	5/6/2016
APPROVED:	KRIM	5/9/2016

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

SCALE:

TITLE:

DESIGN STANDARD, TRAP, CONDENSATE AND FLOOR DRAINS

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	310.00082	1 OF 1	-

RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

CD60

AMCA CLASS 1A LEAKAGE RATED, HIGH PERFORMANCE CONTROL DAMPER

APPLICATION

Ruskin model CD60 incorporates an exclusive one-piece steel frame construction, making it the engineer's preferred frame design with no fasteners required. Frame corners are internally braced and machine staked. Exclusive one-piece aerodynamic dual skin airfoil blades are suitable for medium and high pressure velocity applications. Blade edge seals are mechanically fastened to ensure years of sustainable performance and reliability. Frame and blade construction, in concert with compression type chambered jamb seals, ensures leakage performance on par with requirements of the International Energy Conservation Code (IECC). Factory mounted and commissioned actuators are among the available options.

STANDARD CONSTRUCTION

FRAME
5" x 1" x 16 gauge (127 x 25 x 1.6) hot dipped galvanized steel hat channel reinforced with corner braces.

BLADES
Galvanized steel, one piece airfoil shaped, construction of 14 gauge (2.0) equivalent thickness, typically 6" (152) wide, maximum 8 5/8" wide. Opposed blade action standard, parallel blade action optional.

AXLES
1/2" (13) plated steel hex.

BEARINGS
Oil impregnated, self-lubricating, stainless steel sleeve.

BLADE SEALS
Ruskiprene blade edge seals mechanically fastened to blades.

JAMB SEALS
300 Series stainless steel cambered compression type.

LINKAGE
Shake proof Swedgelock™ plated steel assembly, concealed out of airstream.

CONTROL SHAFT
1/2" (13) dia. x 6" (152) long plated steel shaft on single section units.
1/2" (13) dia. jackshaft on multi-section assemblies up to 12 1/2 ft² (1.16 m²) and 1" (25) dia. jackshaft multi-section assemblies over 12 1/2 ft² (1.16 m²)

MAX PRESSURE
Up to 13 inches w.g. (see Performance Data on page 2).

MAX VELOCITY
Up to 6000 FPM (see Performance Data on page 2).

LEAKAGE
Class 1A (see Performance Data on page 2).

TEMPERATURE LIMITS
-72°F (-58°C) minimum and +275°F (+135°C) maximum.

MINIMUM SIZE
Single blade – 8"w x 6"h (203 x 152).
Two blades, opposed or parallel action: 8"w x 10"h (203 x 254).

MAXIMUM SIZE
Single section – 60"w x 72"h (1524 x 1829).
Multiple section assembly – Unlimited size.
(Units over 60"w or 72"h (1524 x 1829) are built in multiple equal size sections)

ESTIMATED SHIPPING WEIGHT
7 lbs. (3.2kg) per square foot.

CERTIFICATE NUMBER AJA07/11923

FEATURES

- One-piece airfoil blade for low pressure drop.
- One-piece interlocking frame design to reduce racking.
- Positive lock axles, noncorrosive bearings and shake proof linkage for low maintenance operation.

VARIATIONS

Ruskin model CD60 is available with the following variations at additional charge.

- Factory mounted and commissioned electric and pneumatic actuators, chain pull devices and manual locking handles.
- Front, rear or double flange frame with or without bolt holes.
- Stainless steel axles and linkage.
- SP100 switch package to remotely indicate damper blade position.
- Factory mounted sleeves with optional round or oval transitions.
- Enamel and epoxy finishes.
- Silicone blade edge seals.

NOTES

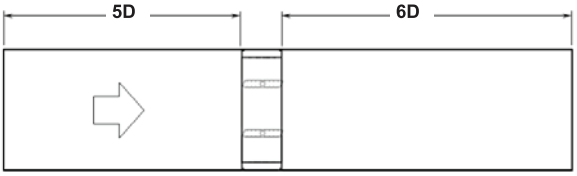
* Value shown in parenthesis ( ) are millimeters unless otherwise indicated.
* Units furnished approximately 1/4" (6) smaller than given opening dimensions.

AMCA LICENSED PERFORMANCE DATA

Pressure Drop Data

CD60 air performance testing is performed in accordance with AMCA Standard 500-D configuration 5.3 as illustrated below. All data are corrected to standard air density of .075 lb/ft³ (1.201 kg/m³).

$$D = \sqrt{\frac{4\,(W)\,(H)}{3.14}}$$



AMCA figure 5.3 was established to represent a fully ducted damper with straight duct upstream and downstream. With entrance and exit losses minimized by this straight duct arrangement, this configuration has the lowest pressure drop of all three configurations.

12" x 12" (305 x 305)		24" x 24" (610 x 610)		36" x 36" (914 x 914)		12" x 48" (305 x 1219)		48" x 12" (1219 x 305)	
Velocity (fpm)	Pressure Drop (in.wg)	Velocity (fpm)	Pressure Drop (in.wg)	Velocity (fpm)	Pressure Drop (in.wg)	Velocity (fpm)	Pressure Drop (in.wg)	Velocity (fpm)	Pressure Drop (in.wg)
499	0.02	506	0.005	517	0.005	508	0.005	509	0.01
869	0.06	998	0.03	1007	0.02	1002	0.03	1005	0.04
1417	0.17	1514	0.06	1404	0.03	1519	0.06	1523	0.08
1980	0.34	2012	0.11	1949	0.05	2019	0.10	2024	0.16
2986	0.79	2867	0.22	3004	0.12	2883	0.21	2884	0.32

Leakage Data

Air Leakage testing is performed in accordance with ANSI/AMCA Standard 500-D, figure 5.5.

Data are based on a torque of 7 in-lbs/ft² (.56 N.m./m²) applied to close and seat the damper during the test.

Air Leakage is based on operation between 32°F - 120°F (0°C - 49°C).

CD60	LEAKAGE CLASS*			
Maximum Damper Width	1" w.g. (0.25 kPa)	4" w.g. (1 kPa)	8" w.g. (2 kPa)	10" w.g. (2.5 kPa)
60" (1524)	1A	1	NA	NA

*** Leakage Class Definitions**

As defined by AMCA, the maximum allowable leakage is as follows:

Leakage Class 1A (is only defined @ 1" wg)
- 3 cfm/ft² (.92 cmm/m²) @ 1" wg (0.25 kPa)

Leakage Class 1
- 4 cfm/ft² (1.22 cmm/m²) @ 1" wg (0.25 kPa)
- 8 cfm/ft² (2.44 cmm/m²) @ 4" wg (1 kPa)
- 11.3 cfm/ft² (3.45 cmm/m²) @ 8" wg (2 kPa)
- 12.6 cfm/ft² (3.85 cmm/m²) @ 10" wg (2.5 kPa)

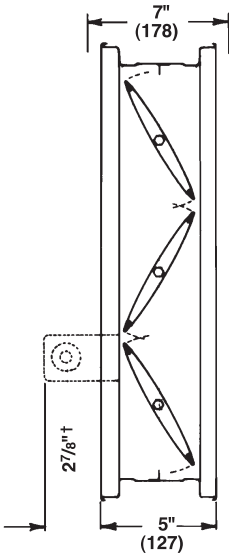
Maximum System Velocity and Pressure

The CD60 may be used in systems with total pressures exceeding 3.5" w.g. (.09 kPA) and velocities exceeding 3000 fpm (15.2 m/s) by reducing damper section width as indicated below:

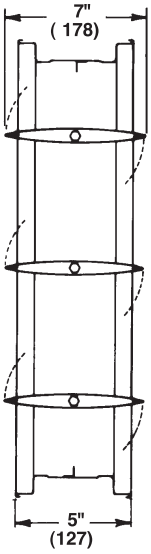
VELOCITY AND PRESSURE DATA		
DAMPER WIDTH INCHES	MAXIMUM SYSTEM PRESSURE In. wg (kPa)	MAXIMUM SYSTEM VELOCITY FPM (m/s)
60" (1524)	3.5" (0.9)	3000 (15.2)
48" (1219)	6.2" (1.5)	4000 (20.3)
36" (914)	8.5" (2.1)	4000 (20.3)
24" (610)	10.8" (2.7)	5000 (25.4)
12" (305)	13.0" (3.25)	6000 (30.5)

Ruskin Company certifies that model CD60 shown herein is licensed to bear the AMCA seal. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program.

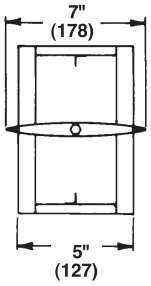
DIMENSIONAL INFORMATION



OPPOSED BLADE



PARALLEL BLADE



Low profile frame illustrated is typical for units under 12" (305) high.

CD60 SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans, or in accordance with schedules AMCA certified, low leakage airfoil control dampers meeting the following minimum construction standards. Control dampers shall be produced in an ISO9001 certified factory. Frame shall be one-piece uniframe construction of 16 ga. (1.6) galvanized steel roll formed hat channel structurally equivalent to a minimum 13 ga. (2.4) frame. Blades shall be 14 ga. (2.0) equivalent galvanized steel, roll-formed airfoil type for low pressure drop and low noise generation. Blade edge seals shall be Ruskiprene™ TPV type or equivalent mechanically locked into the blade edge. Adhesive or clip-on type seals are unacceptable. Jamb seals shall be stainless steel chambered compression type to prevent leakage between blade end and damper frame. Blade end overlapping frame is unacceptable. Multiple section dampers must have factory installed jackshafts unless clearly eliminated by engineer. Bearings shall be 304 stainless steel, oil impregnated, and self-lubricating sleeve type with a 450 pound (204 kg) minimum radial crush load. Bearings shall turn in extruded holes in the damper frame. Axles shall be hexagonal positively locked into the damper blade. Linkage shall be concealed out of airstream, within the damper frame to reduce pressure drop and noise. Temperature limits shall be -72°(-58°C) to +275°F (+135°C). Submittal must include leakage, maximum air flow and maximum pressure ratings based on AMCA Publication 500. Damper shall be tested and licensed in accordance with AMCA 511 for Air Performance and Air Leakage. Damper widths from 12" to 60" (305 to 1524) wide shall not leak any greater than 3 cfm/sq.ft. at 1" w.g. (15.2 l/s-m^2 at .25 kPa). Dampers shall be equivalent in all respects to Ruskin Model CD60.

RUSKIN®

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AMS050
AIR MEASURING STATION WITH INTEGRAL DAMPER

APPLICATION

The AMCA certified AMS050 combines an air measuring station with an ultra low-leak, high performance control damper. The complete assembly is tested to provide effective setpoint monitoring and adjustment. The unit is class 1A leakage and performance rated and includes a honeycomb airflow straightener, pressure sensing station and a high performance glass-on-silicone pressure transducer. The sensing blades are extruded aluminum with a clear anodize finish. The AMS050 can be used with any building automation system. Multiple control options are available.

STANDARD CONSTRUCTION

SLEEVE
15" (381mm) long x 16 gauge (1.6) galv. G60 (for slip-fit duct connection).

AIR FLOW STRAIGHTENER
.50" (13mm) Honeycomb Cell x 3" (76mm) 3000 series aluminum alloy.

SENSOR BLADE
6063T6 extruded aluminum, clear anodize finish.

SENSOR PORT FITTINGS
Brass.

PRESSURE TRANSDUCER:
RU-274-R2-VDC, 0-5 or 0-10 VDC output (field selectable).
Output signal is proportional to flow.

ACCURACY
3% Deviation Average Across Measurement Range.

POWER REQUIREMENTS
12-40 VDC or 12-35 VAC.

DAMPER BLADES
6" (152mm) wide, 6063T6 extruded aluminum, airfoil shape.

SEALS
Ruskiprene blade edge seals and stainless jamb seals.

BEARINGS
Molded synthetic.

LINKAGE
Plated steel, concealed in frame.

AXLES
.50" (13mm) plated steel hex.

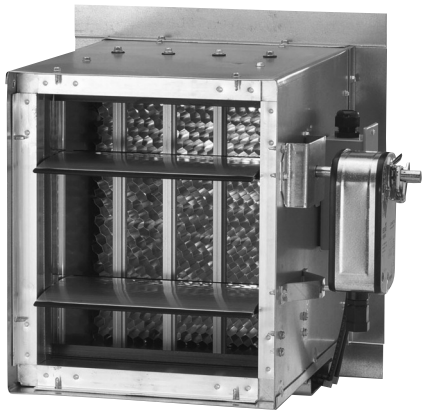
MINIMUM SIZE
Single-6"w x 6"h (152mm x 152mm).

MAXIMUM SIZE
Single section - 60"w x 72"h (1524mm x 1829mm).
Multiple section assembly - unlimited.

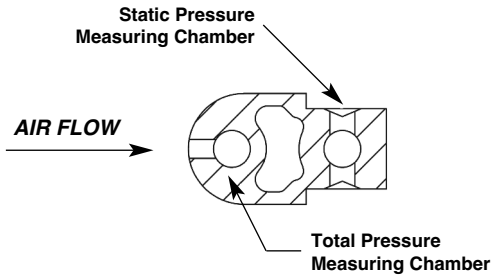
VELOCITY REQUIREMENTS
Product Range - 300 to 5000 FPM (1.5 to 25 m/s).
Operating Range - 300 to 2,000 FPM (1.5 to 10.2 m/s).
-Standard units with RU274-R2-VDC (1.5 to 25 m/s).
Operating Range - 300 to 5,000 FPM.
-Units with Ruskin's VAFB24-BAC RAMS Air Measurement BACnet actuator/controller and/or AMS810 or AMS810 (high pressure) transducer.

OPERATING TEMPERATURE
-22° F to +140° F standard (-30°C to 60°C).

Ruskin Company certifies that the AMS050 Air Monitoring Station shown herein is licensed to bear the AMCA Certified Rating Seal - Airflow Measuring Station Performance. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 611 and comply with requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to airflow measurement performance only.



AMS050 shown with External Right Hand Construction (Standard)



FEATURES

- Low-leak Class 1A Damper
- Honeycomb airflow straightener
- Anodized aluminum sensing blades
- Factory piped low pressure transducer with 0-10 VDC output

Ruskin AMS050 helps satisfy the requirements for minimum outside air as required by the following.
- ASHRAE 62.1, 90.1 and 189.1.
- California Title 24
- International Mechanical Code (IMC)
- International Energy Conservation Code (IECC)

VARIATIONS

The AMS050 is available with several options to fit your specific application.
- Stainless steel axle bearings
- Stainless steel linkage (includes axles, tie bars & control arms)
- Special material, flanged or extended sleeve
- AMS810 pressure transducer with LCD display
- Ruskin's VAFB24-BAC RAMS Air Measurement BACnet actuator/controller

Package includes factory calibration of control module and air measurng station in a complete turnkey assembly (reference VAFB24-BAC RAMS data sheet)

Notes:

1. Values shown in ( ) indicate metric units.
2. Refer to installation manual for additional details
3. To order, send completed Order Process Sheet with purchase order.

AIR PERFORMANCE

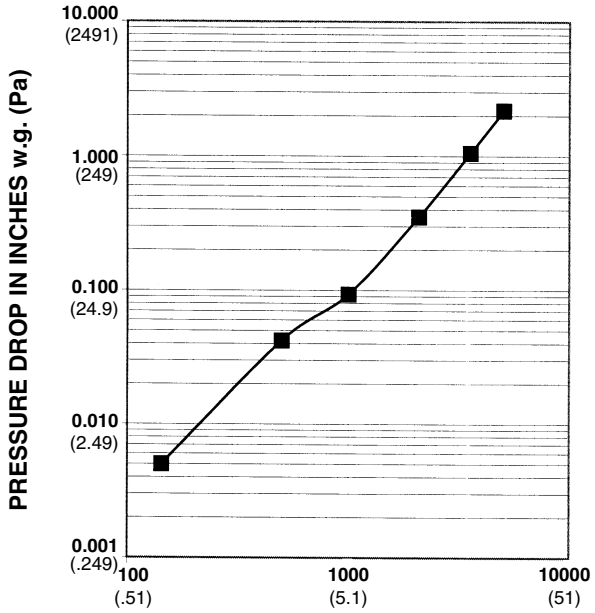
AMCA TEST FIGURE 1									AMCA TEST FIGURE 2								
PAMS		Reference Volume		Reference Velocity		Indicated Volume		% Deviation Average = 2.09%	PAMS		Reference Volume		Reference Velocity		Indicated Volume		% Deviation Average = 2.09%
In. W.G.	Kpa	CFM	l/s	FPM	m/s	CFM	l/s	2.09%	In. W.G.	Kpa	CFM	l/s	FPM	m/s	CFM	l/s	-0.759%
AIR PERFORMANCE SIZE 12" x 12" (305mm x 305mm)																	
4.190	1.004	5,070	2,393	5,070	25.76	5,199	2,454	2.55%	4.040	1.006	5,008	2,364	5,008	25.44	5,104	2,049	1.93%
2.010	0.501	3,563	1,682	3,563	18.10	3,585	1692	0.62%	2.260	0.563	3,791	1,789	3,791	19.26	3,804	1,795	0.35%
0.650	0.162	2,074	979	2,074	10.54	2,025	956	-2.37%	0.670	0.167	2,163	1,021	2,163	10.99	2,056	970	-4.94%
0.150	0.037	995	470	995	5.05	964	455	-3.12%	0.190	0.047	1,085	512	1,085	5.51	1,087	513	0.14%
0.045	0.011	498	235	498	2.53	524	247	5.25%	0.040	0.010	548	25	548	2.78	494	233	-9.89%
0.005	0.001	143	67	143	0.73	172	81	20.55%	0.005	0.001	143	67	143	0.73	172	81	20.6%
AIR PERFORMANCE SIZE 24" x 24" (610mm x 610mm)																	
4.070	1.014	20,030	9,453	5,008	25.44	20,669	9,755	3.19%	3.75	0.934	20,174	9,521	5,044	25.62	19,924	9,403	-1.24%
1.905	0.475	13,888	6,554	3,472	17.64	13,902	9,894	0.10%	1.77	0.441	14,094	6,652	3,524	17.90	13,659	6,446	-3.09%
0.610	0.152	7,925	3,740	1,981	10.06	7,669	3,619	-3.23%	0.54	0.135	8,056	3,802	2,014	10.23	7,518	3,518	-6.67%
0.170	0.042	4,017	1,896	1,004	5.10	3,934	1,857	-2.06%	0.14	0.035	4,006	1,891	1,002	5.09	3,813	1,800	-4.81%
0.100	0.025	3,004	1,418	751	3.82	2,982	1,407	-0.74%	0.13	0.032	3,983	1,880	996	5.06	3,674	1,734	-7.77%
0.018	0.004	1,183	558	296	1.50	1,217	574	2.90%	0.04	0.0101	1,996	942	499	2.53	2,031	959	1.75%
AIR PERFORMANCE SIZE 36" x 36" (914mm x 914mm)																	
3.790	0.944	45,485	21,467	5,054	25.67	48,031	22,668	5.60%	0.894	1.006	45,100	21,285	5,011	25.46	46,707	22,043	3.56%
1.780	0443	31,557	14,893	3,506	17.81	32,532	15,353	3.09%	0.428	0.563	31,650	14,937	3,517	17.87	31,962	1,5084	0.99%
0.570	0.142	18,158	8,570	2,018	10.25	18,086	8,536	-0.40%	0.135	0.167	18,193	8,586	2,021	10.27	17,589	8,301	-3.32%
0.150	0.037	9,052	4,272	1,006	5.11	9,087	4,289	0.39%	0.032	0.047	8,774	4,141	975	495	8,441	3,984	-3.79%
0.140	0.05	8,757	4,133	973	4.94	8,770	4,139	0.15%	0.010	0.010	4,491	2,120	499	2.53	4,597	2,170	2.37%
0.015	0.004	2760	1,303	307	1.56	2,773	1309	0.46%	0.004	0.001	2,763	1,304	307	1.56	2,773	1,309	0.35%

Pressure Drop		VolumeCFM		Velocity	
in WG	Pa	CFM	l/s	FPM	m/s
AIR FLOW RESISTANCE 12" x 12" (305mm x 305mm)					
2.174	541.5	5,040	2,378	5,040	25.60
1.052	148.2	3,562	1,681	3,562	18.10
0.352	51.1	2,082	982	2,082	10.58
0.093	17.4	1,000	472	1,000	5.08
0.042	10.0	500	236	500	2.54
0.005	2.5	144	68	144	0.73
AIR FLOW RESISTANCE 24" x 24" (610mm x 610mm)					
1.235	307.6	20,762	9,799	5,191	26.37
0.595	148.2	14,173	6,689	3,543	18.00
0.205	51.1	7,994	3,773	1,999	10.15
0.070	17.4	4,204	1,984	1,051	5.34
0.040	10.0	3,220	1,520	805	4.09
0.010	2.5	1,359	641	339	1.73
AIR FLOW RESISTANCE 36" x 36" (914mm x 914mm)					
0.643	160.2	45,176	21,320	5,020	25.50
0.307	76.5	31,469	14,851	3,497	17.76
0.113	28.	18,153	8,567	2,017	10.25
0.036	9.0	9,051	4,272	1,006	5.11
0.031	7.7	8,763	4,136	974	4.95
0.010	2.5	4,486	2,117	498	2.53
0.005	1.2	2,760.	1,303	307	1.56
0.000	0.0	1,372	647	152	0.77

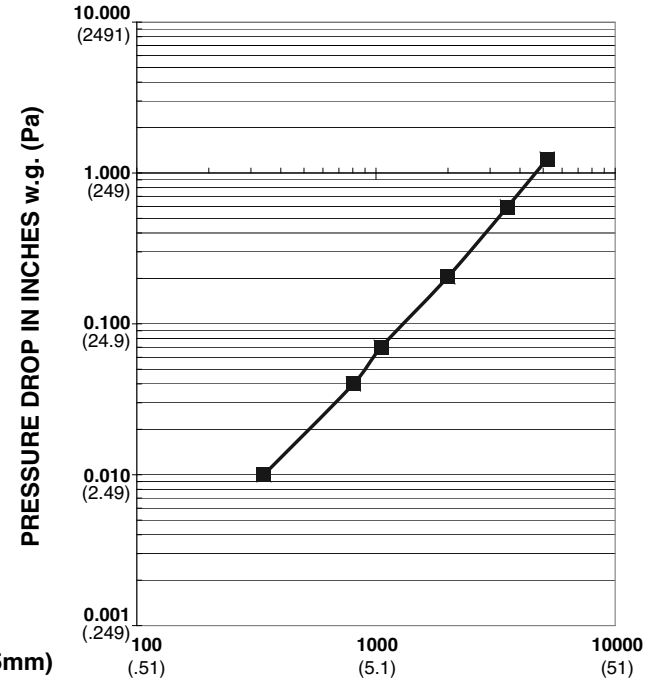
CFM = (K) x (PAMS^M)		
SIZE	**K**	**M**
12" x 12" (304mm x 305mm)	2518 (784.05)	0.5061
24" x 24" (610mm x 610mm)	9928 (2825.5)	0.5224
36" x 36" (914mm x 914mm)	24166 (7142.2)	0.51555

Ruskin Company certifies that the AMS050 Air Monitoring Station shown herein is licensed to bear the AMCA Certified Rating Seal - Airflow Measuring Station Performance. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 611 and comply with requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to airflow measurement performance only.

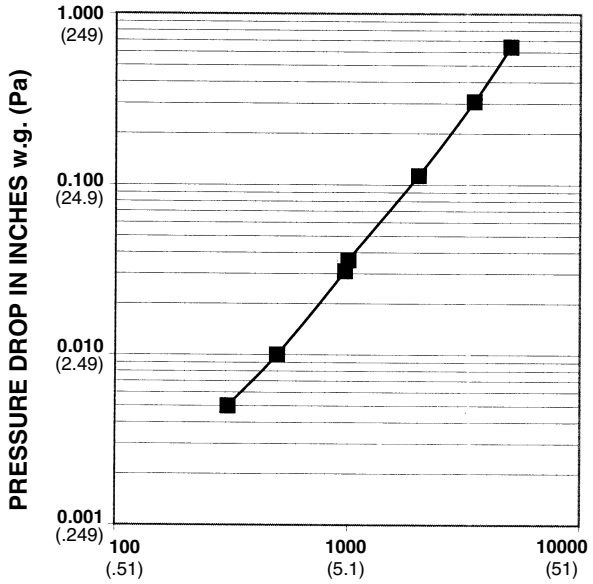
AIR PERFORMANCE



FACE VELOCITY - FEET MINUTE (m/s)
PRESSURE DROP of AMS050 SIZE 12" x 12" (305mm x 305mm)



FACE VELOCITY - FEET MINUTE (m/s)
PRESSURE DROP of AMS050
SIZE 24" x 24" (610mm x 610mm)



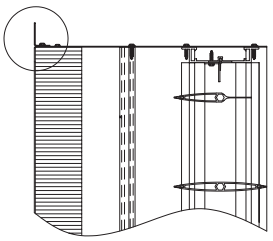
FACE VELOCITY - FEET MINUTE (m/s)
PRESSURE DROP of AMS050 SIZE 36" x 36" (305mm x 305mm)

Ruskin Company certifies that the AMS050 Air Monitoring Station shown herein is licensed to bear the AMCA Certified Rating Seal - Airflow Measuring Station Performance. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 611 and comply with requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to airflow measurement performance only.

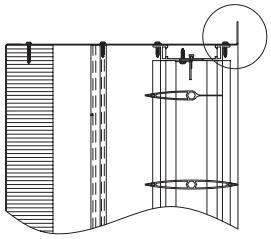
NOTES

1. Ratings are based on AMCA Standard 610-93 Test Setup figure 1 using differential pressure output.
2. Performance of the AMS050 will be ±3% of curve shown for AMCA 610-93 Test Fig. 1 applications.
3. Size and shape tested include 12" x 12", 24" x 24" (305mm x 305mm, 610mm x 610mm) and 36" x 36" (914mm x 914mm) rectangular. Rated sizes from .5 square feet to 18 square feet ($1.67m^2$).
4. Indicated volumes = *(K) (PAMS^M)*

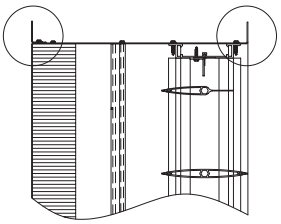
MOUNTING FLANGE OPTIONS



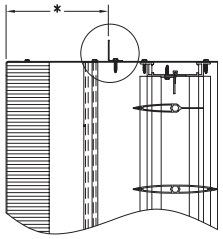
FRONT FLANGE



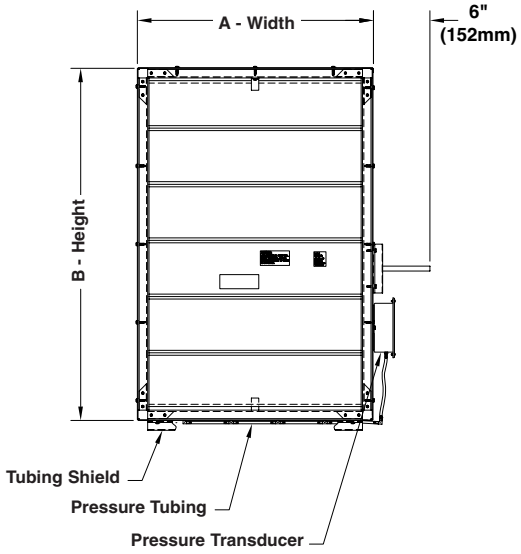
REAR FLANGE

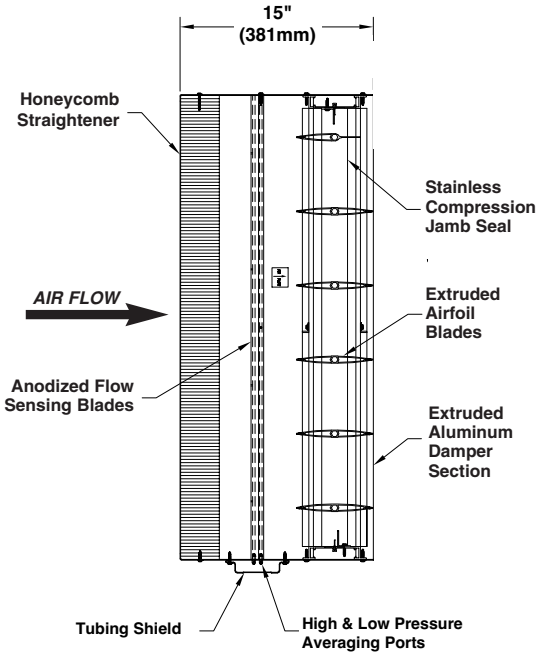


DOUBLE (FRONT & REAR) FLANGE



OFFSET FLANGE
Specify Dimensions





SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans or as in accordance with schedules, an air measuring station with integral pressure transducer and class 1a leakage extruded aluminum control damper. The complete air measuring package shall be factory assembled into one turnkey product and calibrated for the specific job requirements. Unit shall have a measuring range from 300 to 2,000 FPM (1.5 to 10.2 m/s). The Air measuring station shall consist of .50" x 3" (13mm x 76mm) 3000 series aluminum alloy honeycomb, 6063T6 extruded aluminum sensing blades with anodized finish and a glass-on-silicone GL-Si capacitance sensor pressure transducer capable of measuring up to six field selectable pressure ranges up to 1" water column (249 Pa). The transducer shall be accurate to ±1% of full scale and be contained in a NEMA 4 (IP-65) painted steel enclosure.

Transducer shall be factory mounted and piped to high and low brass pressure fittings from the sensor averaging ports. All sensor tubing shall terminate in solid brass barbed fittings. Tubing and associated fittings to be contained in a formed steel protective tubing shield to protect pressure station during transit. The damper section shall consist of 6063T6 extruded aluminum frame and blades. Blade edge seals shall be extruded TPR double edge design with inflatable pocket to enable air pressure to assist in seal-off and shall be mechanically locked in extruded blade slots. Adhesive or clip-on type seals are not acceptable. Axle bearings shall be non-corrosive molded synthetic and shall be molded to fit the hexagonal damper shaft to reduce leakage. Linkage shall be concealed in a linkage chase with dust cover to prevent collection of airborne particles to accumulate on the mechanical parts. Complete assembly shall be constructed, piped and commissioned in an ISO 9001 certified facility. Air Measuring Stations accuracy shall be 3% deviation average across the entire range. The damper and measuring station assembly shall be tested as a complete assembly and shall be licensed to bear the AMCA Certified Ratings Seal for Airflow Measurement Stations. Turnkey assembly shall be, in all respects, equivalent to Ruskin Model AMS050.

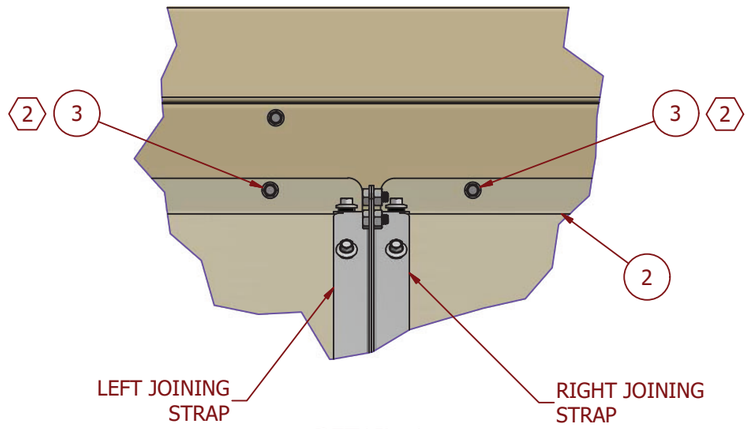
RUSKIN

3900 Dr. Greaves Rd.
Kansas City, MO 64030
(816) 761-7476
FAX (816) 765-8955
www.ruskin.com

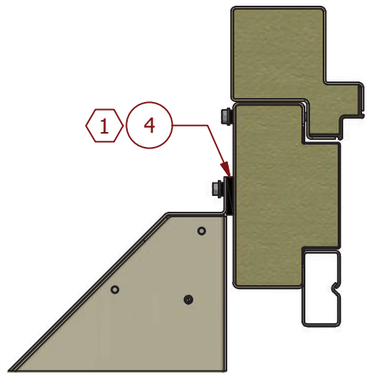
PARTS LIST					
QTY	NO.	ITEM NUMBER	DESCRIPTION	MATERIAL/REFERENCE	REMARKS
	1		ASSEMBLY, UNIT SECTION WALL		
2	2		ASSEMBLY, SIDE BY SIDE, HOOD	200.00103	
AR	3	FNSC0031	SCREW, HEX HEAD, RUBBER WASHER, TEK #12-14 X 1", SELF-DRILL, SELF-TAP		SEE NOTE 2
AR	4	GKFM0185	TAPE, FOAM, 1/4" X 1", TEM 25, SCE41		SEE NOTE 1

NOTES:

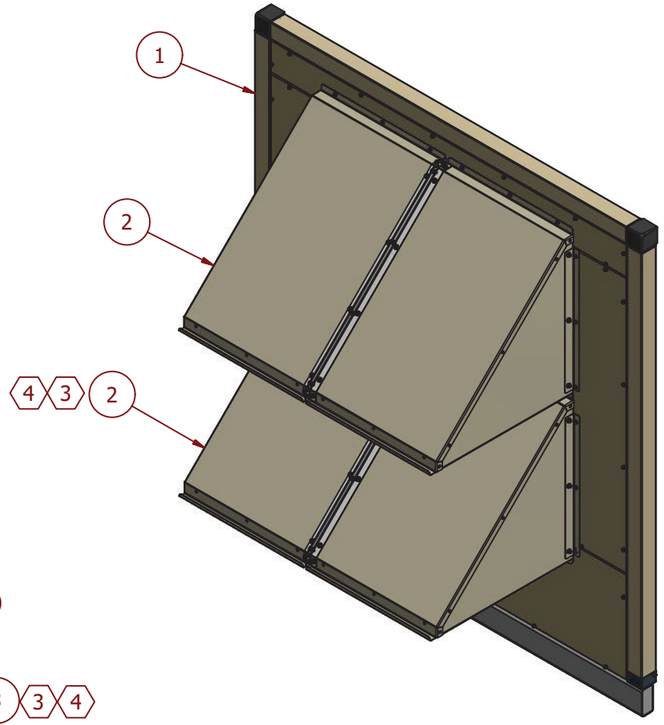
1. MOUNTING BRACKETS TO BE MASKED WITH FOAM TAPE (ITEM 4) PRIOR TO INSTALLING HOODS.
2. TO MOUNT MULTIPLE HOODS TO BE MOUNTED TO UNIT SECTION USING HEAD HEX SCREWS (ITEM 3) AS SHOWN
3. BOTTOM HOOD TO BE INSTALLED FIRST IN MULTIPLE HOOD CONFIGURATION
4. IF TOP AND BOTTOM HOOD ASSEMBLIES ARE DIFFERENT SIZES, SMALLER HOOD ASSEMBLY IS ALWAYS INSTALLED ON THE BOTTOM

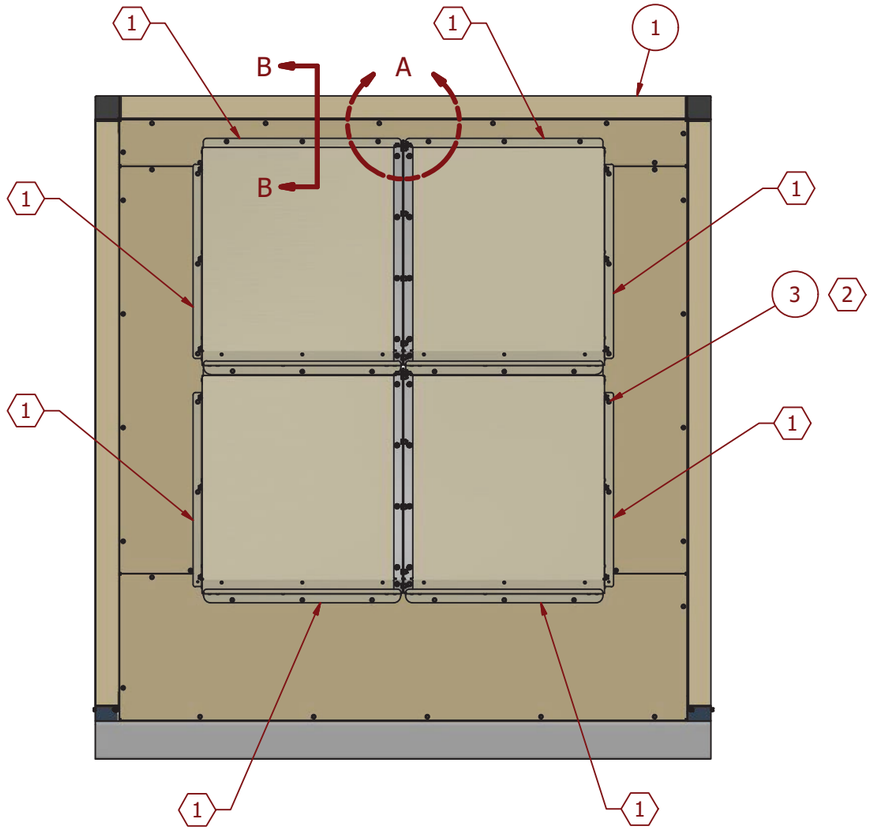


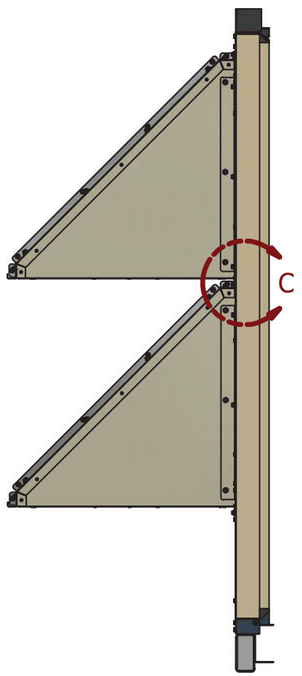
DETAIL A

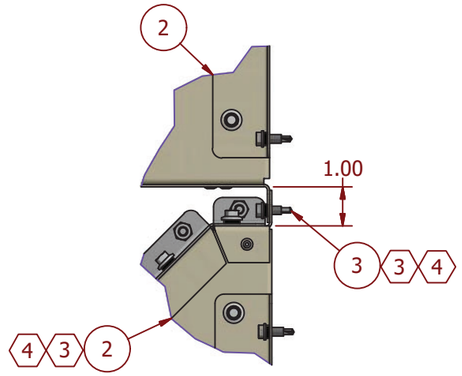


SECTION B-B









DETAIL C

C		ITEM 3 WAS FNSC0035.	REYJ	KRIM	6/2/17	DESIGN STANDARD, HOOD, MULTIPLE	310.00078
REV	ECN #	DESCRIPTION	BY	APPVD	DATE	DESCRIPTION	NUMBER
REVISION HISTORY						DOCUMENT REFERENCE	

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
.X = ±.05	FLAT	FINISHED
.XX = ±.01	.X = ± .031	± .125
.XXX = ±.005	.XX = ± .015	± .093
ANGLES = ±1°	.XXX = ± .005	± .060

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS

File Saved: 08:42:06 10/19/2022

NORTEK AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	5/20/2016
CHECKED:	WHEM	7/1/2016
APPROVED:	KRIM	7/8/2016

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING | SCALE: -

TITLE: INSTALLATION, HOOD, MULTIPLE

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	251.00012	1 OF 1	C

Better Air is Our Business®

AmericanAirFilter®
Type A-8 Filter Holding Frames and Latches

Type A-8 Filter Holding Frames

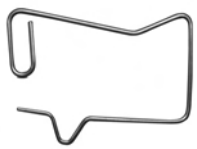
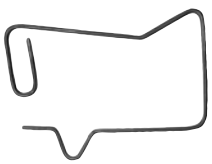
Type A-8 Filter Holding Frames

The Type A-8 filter holding frame comes in seven standard sizes that can be used individually or may be combined to fit virtually any size filter bank. Each frame includes closed cell gaskets to ensure a proper seal between the frame and filter to minimize dirty air bypass. Frames are also available without gaskets or with dovetail gaskets. Also available are Type A-8 latches designed to hold the filter in place and create a positive seal. Type A-8 frames are constructed of galvanized steel and 304 stainless steel, and also available in 316 stainless steel.

Size	Part Number 16 ga. Galv	Part Number 18 ga. 304SS
12 x 24 x 3	312-600-600	312-600-100
16 x 20 x 3	312-600-001	316-600-101
16 x 25 x 3	312-600-002	316-600-102
20 x 20 x 3	312-600-003	312-600-103
20 x 24 x 3	312-600-004	312-600-104
20 x 25 x 3	312-600-005	312-600-105
24 x 24 x 3	312-600-606	312-600-106

Type A-8 Latches

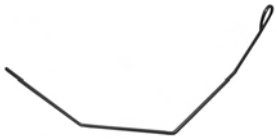
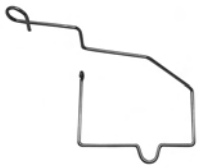
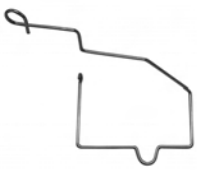
AAF offers a variety of Type A-8 latches to secure disposable panel filters or 12" box style high efficiency filters (with or without a prefilter) into a Type A-8 filter holding frame. The Type A-8 latches attach to one of two sets of knockouts on the Type A-8 frame. Simply attach the appropriate latch that best fits the depth of the filter. It is recommended to use 4 latches per frame.

AAF Part Number	Material	Application	Farr Model	Picture
315-004-000	Galvanized Steel	Secures a 4" filter, or a 2" filter with a single header filter in an A-8 frame	C-86	
315-004-100	Stainless Steel	Secures a 4" filter, or a 2" filter with a single header filter in an A-8 frame	C-86S	
315-004-001	Galvanized Steel	12" spring latch with 7/8" Tang to secure 12" deep double header AAF filter	C-80	

Continued on back page

AmericanAirFilter®

Type A-8 Filter Holding Frames and Latches

AAF Part Number	Material	Application	Farr Model	Picture
315-004-101	Stainless Steel	12" spring latch with 7/8" Tang to secure 12" deep double header AAF filter	C-80S	
315-004-002	Galvanized Steel	6" spring latch with 7/8" Tang to secure 6" deep double header AAF filter	C-90	
315-004-003	Stainless Steel	Secures a 1" or 2" prefilter or a single header filter in an A-8 frame	C-70S	
315-004-006	Galvanized Steel	Secures a 4" prefilter in same frame with a single header filter	C-89	
315-004-106	Stainless Steel	Secures a 4" prefilter in same frame with a single header filter	C-89S	
315-004-007	Galvanized Steel	2" deep filter as a prefilter to a single header filter	C-77	
315-004-107	Stainless Steel	2" deep filter as a prefilter to a single header filter	C-77S	
315-003-002	Galvanized Steel	Holds a 2" prefilter on the face of a double header AAF filter	N/A	
315-003-004	Galvanized Steel	Holds a 4" prefilter on the face of a double header AAF filter	N/A	

AAF® INTERNATIONAL
10300 Ormsby Park Place Suite 600
Louisville, Kentucky 40223-6169

www.aafintl.com
Customer Service 888.AAF.2003
Fax 888.223.6500

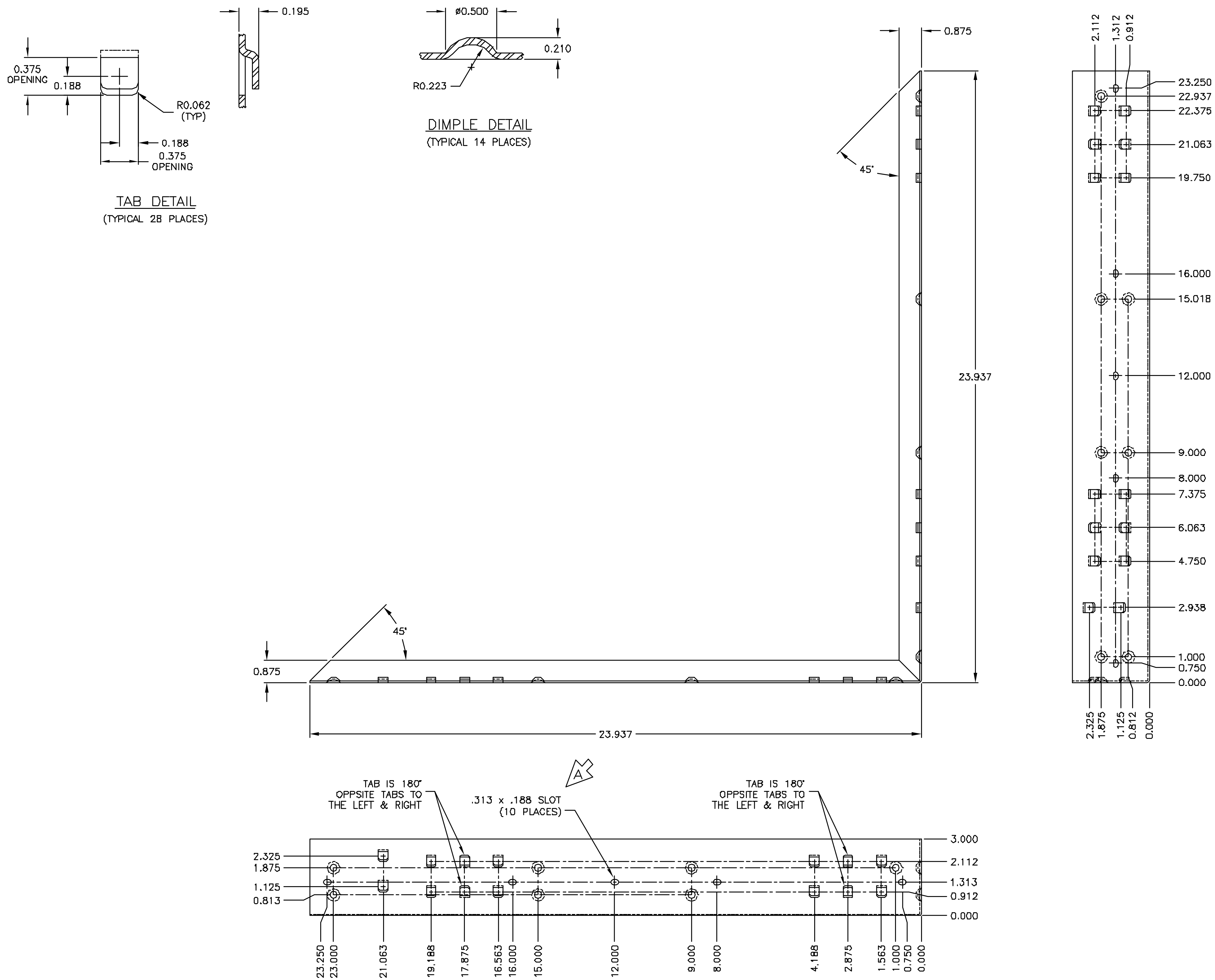
AFP-1-171 APR '09

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

ISO Certified Firm

LTR.	CHANGE	CK'D	DATE	APPR	DATE
A	SLOT CHANGED; WAS .50 x .375 GAC 3AUG04	R.L.S.	3AUG04		

U105-3013588 A



NOTE:

1. MATERIAL: #16 GA (.0635) GALVANNEALED STEEL

NEXT ASSEMBLY

Tolerance Unless Otherwise Specified ±1/32	Material NOTED		Confidential Property of AAF International P.O. Box 35690 Louisville, Ky. 40232-5690
	Scale ----	Ckd. R.L.S. Date 20 JUL04	
	Dwn. GAC Date 20 JUL04	Appr. --- Date ---	

FRAME, LEG FILTER (24 x 24 x 3)

SHEET SIZE D — SECTION NO. U105 — 3013588

FORM 1250 REV 7/00

Dwyer

SERIES 2000

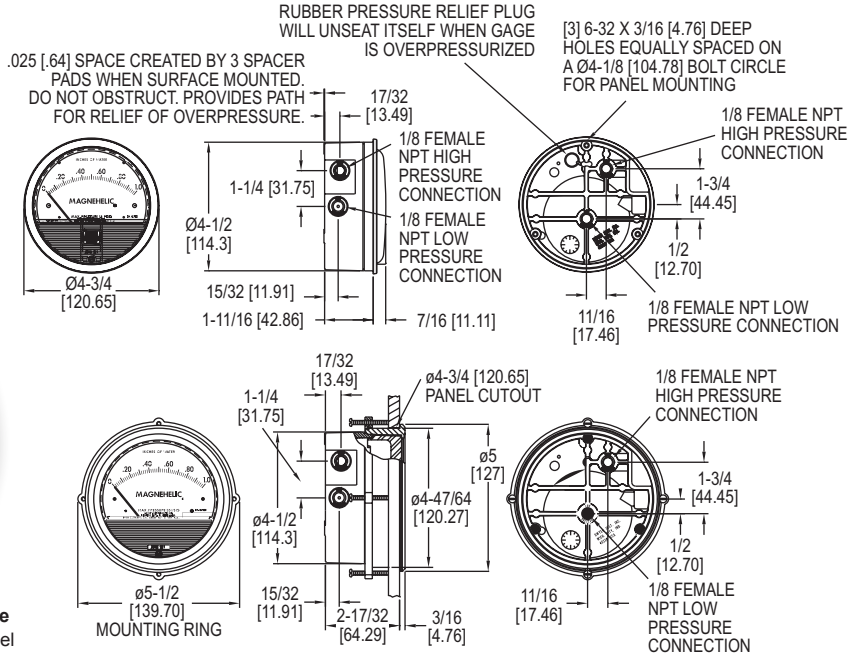
MAGNEHELIC® DIFFERENTIAL PRESSURE GAGES

Indicate Positive, Negative or Differential, Accurate within 1%

5 YEAR LIMITED WARRANTY

Standard Magnehelic® Gage

High Accuracy Magnehelic® Gage
Note: Shown with optional -SS bezel



VIDEO ONLINE

Select the **SERIES 2000** Magnehelic® Gage for a versatile low differential pressure gage with a wide choice of 81 models and 27 options to choose from. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates air or non-corrosive gas pressures--either positive, negative (vacuum) or differential. The design resists shock, vibration, over-pressures and is weatherproof to IP67.
Select the –HA High Accuracy Magnehelic® gage option for an accuracy within 1% of full scale. Also included with the –HA option at no extra cost are a mirrored scale overlay and a 6 point calibration certificate.

FEATURES/BENEFITS

- Easy to read gage through undistorted plastic face permits viewing from far away
- Patented design provides quick response to pressure changes means no delay in assessing critical situations
- Durable and rugged housing and high-quality components combine to provide long-service life and minimized down-time
- High accuracy option is twice as accurate as the standard Magnehelic® gage

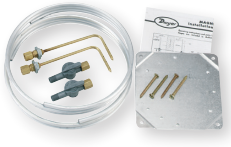
APPLICATIONS

- Filter monitoring
- Air velocity with Dwyer pitot tube
- Blower vacuum monitoring
- Fan pressure indication
- Duct, room or building pressures
- Clean room positive pressure indication

ACCESSORIES	
Model	**Description**
A-432	Portable kit; combine carrying case with any Magnehelic® gage of standard range, except high pressure connection. Includes 9 ft (2.7 m) of 3/16″ ID rubber tubing, standhang bracket and terminal tube with holder
A-605	Air filter gage accessory kit; adapts any standard Magnehelic® gage for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft (1.5 m) lengths of 1/4″ aluminum tubing, two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves
A-605B	Air filter gage accessory kit; air filter kit with two plastic open/close valves, two 4″ steel static tips, plastic tubing and mounting flange
A-605C	Air filter gage accessory kit; air filter kit with two plastic open/close valves, two plastic static tips, plastic tubing and mounting flange

SPECIFICATIONS	
Service: Air and non-combustible, compatible gases (natural gas option available). **Note:** May be used with hydrogen. Order a Buna-N diaphragm. Pressures must be less than 35 psi. **Wetted Materials:** Consult factory. **Housing:** Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test. **Accuracy:** ±2% (-HA model ±1) of FS (±3% (-HA ±1.5%) on -0, -100PA, -125PA, -10MM and ±4% (-HA ±2%) on -00, -60PA, -6MM ranges), throughout range at 70°F (21.1°C). **Pressure Limits:** -20 in Hg to 15 psig (-0.677 to 1.034 bar); MP option: 35 psig (2.41 bar); HP option: 80 psig (5.52 bar). **Enclosure Rating:** IP67. **Overpressure:** Relief plug opens at approximately 25 psig (1.72 bar), standard gages only.❶	**Temperature Limits:** 20 to 140°F* (-6.67 to 60°C). -20°F (-28°C) with low temperature option. **Size:** 4″ (101.6 mm) diameter dial face. **Mounting Orientation:** Diaphragm in vertical position. Consult factory for other position orientations. **Process Connections:** 1/8″ female NPT duplicate high and low pressure taps - one pair side and one pair back. **Weight:** 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (963 g). **Standard Accessories:** Two 1/8″ NPT plugs for duplicate pressure taps, two 1/8″ pipe thread to rubber tubing adapter, and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for three adapters in MP & HP gage accessories.) **Agency Approvals:** Meets the technical requirements of EU Directive 2011/65/EU (RoHS II). **Note:** -SP models not RoHS approved.
Note: For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options.	
*Low temperature models available as special options.	

A-432



A-605

❶Over Protection Note: See page 21 (Series 2000)

Dwyer

SERIES 2000

MAGNEHELIC® DIFFERENTIAL PRESSURE GAGES

Indicate Positive, Negative or Differential, Accurate within 1%

Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

Precision litho-printed scale is accurate and easy to read.

Calibrated range spring is flat spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

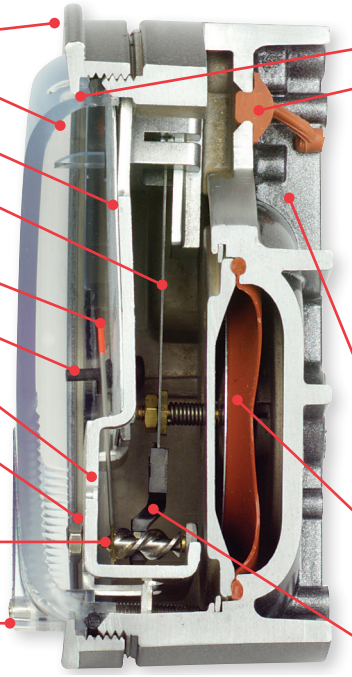
Pointer stops of molded rubber prevent pointer over-travel without damage.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Jeweled bearings are shock-resistant mounted; provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Helix is precision made from an alloy of high magnetic permeability. Mounted in jeweled bearings, it turns freely, following the magnetic field to move the pointer across the scale.

Zero adjustment screw is conveniently located in the plastic cover, and is accessible without removing cover. O-ring seal provides pressure tightness.



O-ring seal for cover assures pressure integrity of case.

OVERPRESSURE PROTECTION
Blowout plug is comprised of a rubber plug on the rear which functions as a relief valve by unseating and venting the gage interior when over pressure reaches approximately 25 psig (1.7 bar). To provide a free path for pressure relief, there are four spacer pads which maintain 0.023″ clearance when gage is surface mounted. Do not obstruct the gap created by these pads.
The blowout plug is not used on models above 180″ of water pressure, medium or high pressure models, or on gages which require an elastomer other than silicone for the diaphragm.
The blowout plug should not be used as a system overpressure control. High supply pressures may still cause the gage to fail due to over pressurization, resulting in property damage or serious injury. Good engineering practices should be utilized to prevent your system from exceeding the ratings of any component.

Die cast aluminum case is precision made and iridite-dipped to withstand 168 hour salt spray corrosion test. Exterior finished in baked dark gray hammerloid. One case size is used for all standard pressure options, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded O-ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Samarium Cobalt magnet mounted at one end of range spring rotates helix without mechanical linkages.

MODEL CHART

Model	Range, Inches of Water
2000-00N†••	.05-0-.2
2000-00†••	0-.25
2000-0†•	0-.50
2001	0-1.0
2002	0-2.0
2003	0-3.0
2004	0-4.0
2005	0-5.0
2006	0-6.0
2008	0-8.0
2010	0-10
2012	0-12
2015	0-15
2020	0-20
2025	0-25
2030	0-30
2040	0-40
2050	0-50
2060	0-60
2080	0-80
2100	0-100
2120	0-120
2150	0-150
2160	0-160
2180*	0-180
2250*	0-250
Zero Center Ranges	
2300-00†••	0.125-0-0.125
2300-0†•	.25-0-.25
2301	.5-0-.5
2302	1-0-1
2304	2-0-2
2310	5-0-5
2320	10-0-10
2330	15-0-15

Model	Range, PSI
2201	0-1
2202	0-2
2203	0-3
2204	0-4
2205	0-5
2210*	0-10
2215*	0-15
2220*	0-20
2230**	0-30

Model	Range, CM of Water
2000-15CM	0-15
2000-20CM	0-20
2000-25CM	0-25
2000-50CM	0-50
2000-80CM	0-80
2000-100CM	0-100
2000-150CM	0-150
2000-200CM	0-200
2000-250CM	0-250
2000-300CM	0-300
Zero Center Ranges	
2300-4CM	2-0-2
2300-10CM	5-0-5
2300-30CM	15-0-15

Model	Range, MM of Water
2000-6MM†••	0-6
2000-10MM†•	0-10
2000-15MM	0-15
2000-25MM	0-25
2000-30MM	0-30
2000-50MM	0-50
2000-80MM	0-80
2000-100MM	0-100
2000-125MM	0-125
2000-150MM	0-150
2000-200MM	0-200
2000-250MM	0-250
2000-300MM	0-300
Zero Center Ranges	
2300-6MM†••	3-0-3
2300-10MM†•	5-0-5
2300-20MM†•	10-0-10

Model	Range, Pa
2000-60NPA†••	10-0-50
2000-60PA†••	0-60
2000-100PA†•	0-100
2000-125PA†•	0-125
2000-250PA	0-250
2000-300PA	0-300
2000-500PA	0-500
2000-750PA	0-750
2000-1000PA	0-1000
Zero Center Ranges	
Model	**Range, Pa**
2300-60PA†••	30-0-30
2300-100PA†•	50-0-50
2300-120PA	60-0-60
2300-200PA	100-0-100
2300-250PA	125-0-125
2300-300PA	150-0-150
2300-500PA	250-0-250
2300-1000PA	500-0-500

Model	Range, kPa
2000-0.5KPA	0-0.5
2000-1KPA	0-1
2000-1.5KPA	0-1.5
2000-2KPA	0-2
2000-2.5KPA	0-2.5
2000-3KPA	0-3
2000-4KPA	0-4
2000-5KPA	0-5
2000-8KPA	0-8
2000-10KPA	0-10
2000-15KPA	0-15
2000-20KPA	0-20
2000-25KPA	0-25
2000-30KPA	0-30
Zero Center Ranges	
2300-1KPA	.5-0-.5
2300-2KPA	1-0-1
2300-2.5KPA	1.25-0-1.25
2300-3KPA	1.5-0-1.5

Dual Scale Air Velocity Units
For use with pitot tube

Model	Range, in w.c./ Velocity F.P.M.
2000-00AV†••	0-.25/ 300-2000
2000-0AV†•	0-.50/ 500-2800
2001AV	0-1.0/ 500-4000
2002AV	0-2.0/ 1000-5600
2005AV	0-5.0/ 2000-8800
2010AV	0-10/ 2000-12500

Dual Scale English/Metric Models

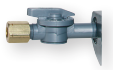
Model	Range, in w.c.	Range, Pa or kPa
2000-00D†••	0-.25	0-62 Pa
2000-0D†•	0-0.5	0-125 Pa
2001D	0-1.0	0-250 Pa
2002D	0-2.0	0-500 Pa
2003D	0-3.0	0-750 Pa
2004D	0-4.0	0-1.0 kPa
2005D	0-5.0	0-1.25 kPa
2006D	0-6.0	0-1.5 kPa
2008D	0-8.0	0-2.0 kPa
2010D	0-10	0-2.5 kPa
2015D	0-15	0-3.7 kPa
2020D	0-20	0-5 kPa
2025D	0-25	0-6.2 kPa
2050D	0-50	0-12.4 kPa
2060D	0-60	0-15 kPa

†These ranges calibrated for vertical scale position • Accuracy ±3% •• Accuracy ±4% *MP option standard **HP option standard

VELOCITY AND VOLUMETRIC FLOW UNITS
Scales are available on the Magnehelic® gage that read in velocity units (FPM, m/s) or volumetric flow units (SCFM, m^3/s, m^3/h). Stocked velocity units with dual range scales in inches w.c. and feet per minute are shown above. For other ranges contact the factory.
When ordering volumetric flow scales please specify the maximum flow rate and its corresponding pressure.
Example: 0.5 in w.c. = 16,000 CFM.

ACCESSORIES

Model	Description
A-321	Safety relief valve
A-448	3-piece magnet kit for mounting Magnehelic® gage directly to magnetic surface
A-135	Rubber gasket for panel mounting
A-401	Plastic carry case
A-310A	3-way vent valves. In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

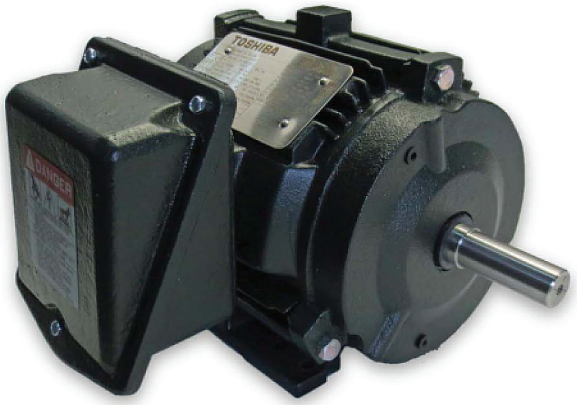


A-310A

TOSHIBA EQP Global™ SD

With Hybrid Ceramic Bearings (208, 230, 460 Volt)

Efficiency, Quality & Performance (EQP)



The TOSHIBA EQP Global SD premium efficient motor are suited for the FANWALL® applications. Motors are balanced to vibration levels at half the allowable NEMA limits. The totally enclosed air over (TEAO) design runs quiet, is very compact and is a superior enclosure for any application, including dirty or wet environments.

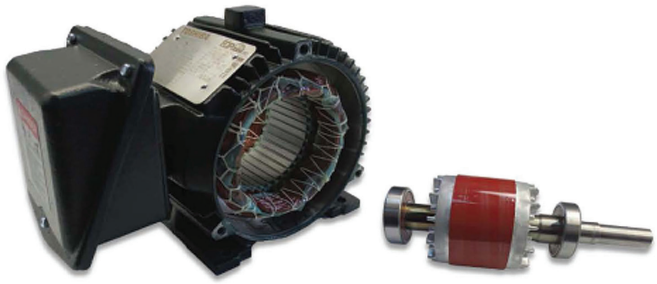
The insulation system in a motor is designed to handle the sum of three temperatures: an ambient design temperature 40°C / 104°F; the temperature rise in the motor under load; and a 10°C hot spot allowance. For example, a NEMA Class B rated motor can have a maximum motor temperature rise during operation of 80°C. This results in a total motor temperature rating of 130°C (40°C ambient temp. + 80°C motor temp. rise + 10°C hot spot temp.). A NEMA Class F rating allows for a motor temperature rise of 105°C yielding a total motor temperature rating of 155°C. A NEMA Class F ratings allows for a 125°C motor temperature rise for a total motor temperature rating of 180°C. Additionally, NEMA allows the motor temperature rating limit to increase by 10°C for motors rated with a 1.15 service factor. TOSHIBA EQP motors provided for FANWALL systems incorporate Class F rated wire and Class F rated varnish as part of the insulation system.

Testing: Through manufacturers testing the TOSHIBA EQP motors are suitable for continuous duty in ambient temperatures from –25°C to 40°C in 100% humidity. The increased airflow over the motor fins, produced by the Coplanar Silencer® design in FANWALL systems, helps to keep the motor windings cooler and well below a Class F 180°C [356°F] rating. This unique cooling design makes available a significantly greater number of motor horsepower increments that can be selected to more closely match brake horsepower requirements. These incremental horsepower motors carry a full factory warranty, maintain a 1.15 service factor, are constructed for 120 Hz continuous operation, and are readily available from Nortek Air Solutions LLC stock inventory.

Frame mounting dimensions are industry standard for readily available replacement. The motors utilize an insulation system which meets the requirements of NEMA MG1 Part 31.4.4.2 for VFD use, and is considered inverter ready. Cast iron motor construction is rigid, durable and quiet. The motors have double sealed hybrid ceramic ball bearings that exceed a L-10 life of 150,000 hours in direct coupled applications. These hybrid ceramic bearings prevent electrical arcing that damages traditional bearings.

The TOSHIBA motors are in accordance with the latest revisions of the applicable sections of the NEMA MG1, NEC, CSA, UL, IEEE and CE standards. The nominal efficiency is stamped on the nameplate of the motor. The nameplate and fasteners surpass a 720 hour salt spray (fog) test for corrosion resistance per ASTM B117/IEEE 841 A.4.

All efficiency testing and labeling are done in accordance with the NEMA MG1 standard. The motors are dynamically balanced to 0.10 inches per second peak velocity and vibration testing is per NEMA MG1 Part 7. All motors are painted with a corrosion-resistance, severe duty, alkyd resin primer paint with an acrylic enamel finish.



NORTEK™ AIR SOLUTIONS

TOSHIBA EQP Global™ SD With Hybrid Ceramic Bearings (208, 230, 460 Volt)

Efficiency, Quality & Performance (EQP) 1800 RPM MOTORS

1800 RPM Motors										
						FLA				
HP	Part #	Toshiba Spec #	RPM @ 60Hz with slip	FRAME	EFF	460V	230V	208V	LBS	Max RPM
1	200.0789	4OA001L1ZVS210	1760	143T	85.5	1.7	3.4	3.3	53	3600
1.5			1745			2.1	4.2			
2	200.0790	4OA002L1ZVS210	1750	145T	86.5	3.0	6.0	6.1	58	3600
2.5			1730		84.0	3.5	7.0			2700
3	200.0791	4OA003L1ZVS210	1760	182T	89.5	4.0	8.0	8.6	92	3600
3.5			1750		88.5	4.5	9.0			3150
4			1740		87.5	5.1	10.2			2700
4.5			1735		87.5	5.7	11.4			2400
5	200.0792	4OA005L1ZVS210	1755	184T	89.5	6.4	12.8	13.8	104	3600
5.5			1750		88.5	6.9	13.8			3300
6			1745		88.5	7.5	15.0			3000
6.5			1740		87.5	8.1	16.2			2850
7			1735		87.5	8.8	17.6			2700
7.5	200.0793	4OAY75L1ZVS210	1760	213T	91.7	9.8	19.6	21.0	175	3600
8			1760		91.0	10.1	20.2			3450
8.5			1760		91.0	10.7	21.4			3300
9			1760		91.0	11.2	22.4			3000
9.5			1755		91.0	11.8	23.6			2850
10	200.0794	4OA010L1ZVS210	1760	215T	91.7	13.0	26.0	28.0	190	3600
10.5			1760		91.0	13.3	26.6			3000
11			1760		91.0	13.9	27.8			2850
11.5			1760		91.0	14.5	29.0			2700
12			1755		91.0	15.1	30.2			2250
15	200.0795	4OA015L1ZVS210	1770	254T	92.4	19.0	38.0	42.0	289	3600
20	200.0796	4OA020L1ZVS210	1770	256T	93.0	25.0	50.0	55.0	331	2550

TOSHIBA EQP Global™ SD With Hybrid Ceramic Bearings (208, 230, 460 Volt)

Efficiency, Quality & Performance (EQP) 3600 RPM MOTORS

3600 RPM Motors										
						FLA				
HP	Part #	Toshiba Spec #	RPM @ 60Hz with slip	FRAME	EFF	460V	230V	208V	LBS	Max RPM
1	200.0797	2OAY15L1ZVS210	3525	143T	82.5	1.5	3.0		50	4800
1.5			3490		84.0	2.0	4.0	4.4		
2	200.0798	2OA002L1ZVS210	3490	145T	85.5	2.6	5.2	5.7	53	4800
2.5			3455		82.5	3.1	6.2			
3	200.0799	2OA003L1ZVS210	3500	182T	86.5	3.7	7.4	8.0	80	4800
3.5			3480		85.5	4.2	8.4			
4			3460		84.0	4.8	9.6			
4.5			3440		82.5	5.5	11.0			
5	200.0800	2OA005L1ZVS210	3500	184T	88.5	5.8	11.6	13.0	95	4800
5.5			3480		87.5	6.3	12.6			
6			3465		86.5	6.9	13.8			
6.5			3455		86.5	7.6	15.2			
7			3440		85.5	8.2	16.4			
7.5	200.0801	2OAY75L1ZVS210	3500	213T	89.5	9.0	18.0	20.0	159	4800
8			3490		89.5	9.4	18.8			
8.5			3485		89.5	10.0	20.0			
9			3475		88.5	10.6	21.2			
9.5			3470		88.5	11.2	22.4			
10	200.0802	2OA010L1ZVS210	3510	215T	90.2	11.8	24.0	26.0	177	4800
10.5			3500		89.5	12.3	24.6			
11			3495		89.5	12.9	25.8			
11.5			3490		88.5	13.4	26.8			
12			3485		88.5	14.1	28.2			
15	200.0803	2OA015L1ZVS210	3530	254T	91.0	18.0	36.0	40.0	274	4800
20	200.0804	2OA020L1ZVS210	3520	256T	91.0	24.0	48.0	53.0	292	4800

Specifications and illustrations subject to change without notice and without incurring obligation.

503F-0521 (Replaces 503F-0919)

Please recycle

NORTEK™
AIR SOLUTIONS

www.nortekair.com
nortekairinfo@nortek.com

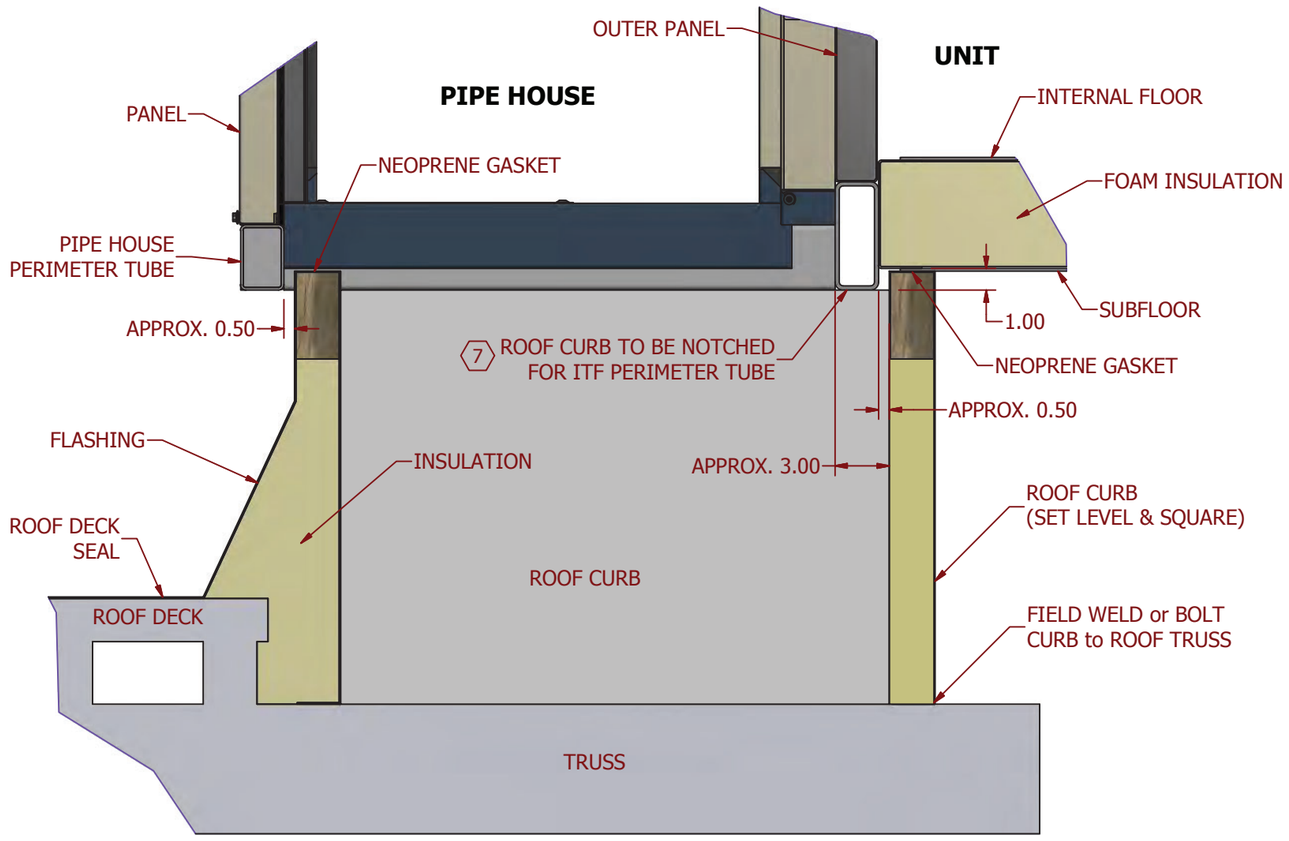
NORTEK AIR SOLUTIONS TEMTROL

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

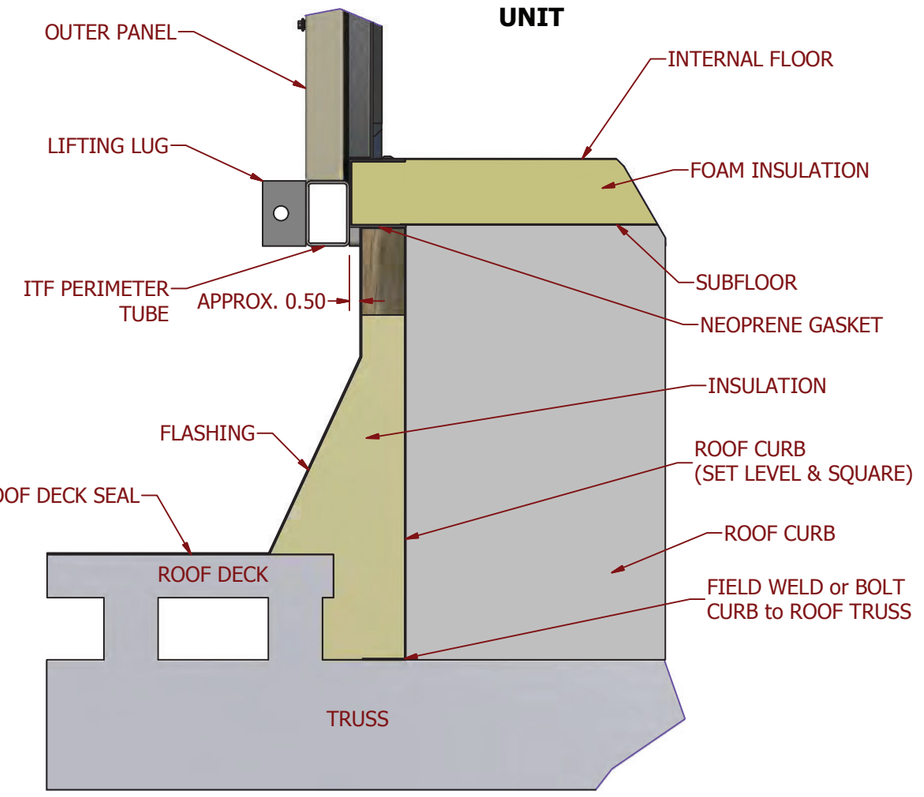
Roof Curb Sizing

NOTES:

1. ROOF CURB LENGTH/WIDTH = UNIT LENGTH/WIDTH - 5" (NON INSULATED CURB)
2. ROOF CURB LENGTH/WIDTH = UNIT LENGTH/WIDTH -6" (INSULATED CURB)
3. ROOF CURB PIPE HOUSE LENGTH = PIPE HOUSE LENGTH - 5" (INSULATED OR NON INSULATED CURB)
4. ROOF CURB PIPE HOUSE DEPTH = PIPE HOUSE DEPTH (NON INSULATED CURB)
5. ROOF CURB PIPE HOUSE DEPTH = PIPE HOUSE DEPTH + .5" (INSULATED CURB)
6. FLOORING AVAILABLE FOR VFD COMPARTMENTS AND LARGER PIPE HOUSES. CONSULT FACTORY.
7. NOTCH FOR PIPE HOUSE = 3" WIDE X 1" DEEP
8. ROOF CURB IS TO FULLY SUPPORT EACH SECTIONS PERIMETER TUBE. THIS INCLUDES ALL DEMOUNTS.



ITF DETAIL W/ PIPE HOUSE
ROOF CURB ASSEMBLED AT JOBSITE



ITF DETAIL
ROOF CURB ASSEMBLED AT JOBSITE

REV	ECO #	DESCRIPTION	REV APPRV DATE
A	000396	ADDED NOTE 8; UPDATED TITLE	12/10/2018

REVISION HISTORY

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
.X = ±0.1
.XX = ±0.03
.XXX = ±0.010
(.XX) = REFERENCE
FRACTIONS = ± 1/32"
ANGLES = ± 0.5°

NORTEK AIR SOLUTIONS
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

	BY	DATE
DRAWN:	JONC	12/29/2015
CHECKED:	WHEM	2/11/2016
APPROVED:	KRIM	2/11/2016

THIRD ANGLE PROJECTION

TITLE: DESIGN STANDARD, UNIT ROOF CURB, SIZING, ATTACHMENT, ITF

PART NO.

DRAWING NOT TO SCALE

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000029212	1 OF 1	A

NORTEK AIR SOLUTIONS TEMTROL

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

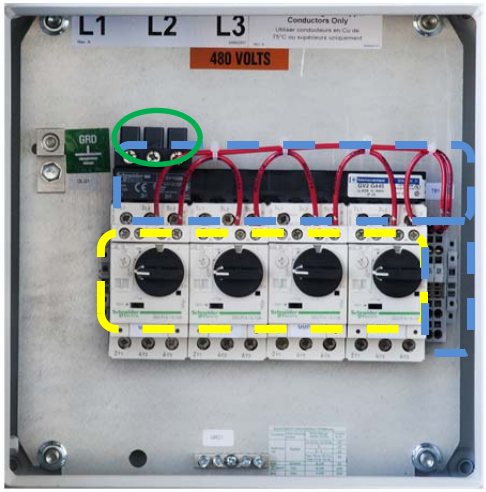
Electrical

Motors for FANWALL® systems are wired to a factory furnished manual starter overload panel as a standard for individual motor overload protection

Motor Overload Panel with Aux Contacts

NEMA 4, UL listed enclosure is constructed of cold rolled 16 gauge steel (14 gauge if 36"H x 30"W or larger) that is dip-coated primed and powder coated.

Panel is provided with carbon steel hinges, foamed in place gasket and zinc plated back plate.



- Power block for VFD output wiring.
- Auxiliary contacts wired in series for optional field wiring to a remote powered pilot light or alarm. (Terminals 51 & 52)
- IECC manual starters with rotary type operator.

CATALOG

ABB drives for HVAC

ACH580 series
Leading the way in HVAC drives

Comfort. It's something we take for granted in the buildings we live and work in. But comfort requires efficient systems to control heating, ventilation, and air conditioning (HVAC) to ensure the air we breathe is pure and the temperature is comfortable. We also need to ensure air quality and safety in the most energy-efficient and cost-effective way in both normal and mission-critical situations.

For half a century, ABB has been leading the way in optimizing HVAC systems using drive control to ensure that you can take comfort for granted. The new ACH580 series of variable-frequency drives (VFDs) provides the quality, reliability, and energy savings you expect, and are easy to use and safe to maintain. All you need to do is to set the drive up, and then focus on what counts.

Contents

The next step in HVAC drives

The new ACH580 drives come with a range of advanced features, such as a new primary settings menu that makes commissioning the drives much easier and faster. Optional Bluetooth connectivity offers improved accessibility for drives in remote areas and increases safety by letting users stay out of arc flash zones.

Simple to select, install and use
All the essentials – such as chokes, EMC filters, cabling clamps, certified BACnet communication, and enclosures from UL (NEMA) Type 1 to UL (NEMA) Type 12 – are a standard part of the drive, simplifying selection, installation, and commissioning.

Safe maintenance
The packaged disconnect solution provides a main disconnect switch, further increasing safety for people working on air-handling units.

Motor control options to meet your application needs
ACH580 drives can be integrated with several types of AC motors, even high-efficiency permanent magnet (PM) and synchronous reluctance (SynRM) motors. Using these motors can reduce your energy costs even more.

Additional I/O options
Take advantage of the added flexibility and accessibility – never be without back-up I/O points at the job site again.

ACH580 drives are ideal for HVAC fans, pumps, compressors, air-handling units, and chillers. These are used in hospitals, data centers, shopping centers, tunnel ventilation, factories, office buildings, and more.

Intuitive control panel
The drive's HVAC-specific software, intuitive control panel with customizable text, and menu-driven programming simplify setup and operation of even the most complex applications. You can customize the view so that it only shows the information you need, and it automatically saves a backup of your most recent configuration so that it's always available.

Optional Bluetooth® capability
ABB's new HVAC Bluetooth control panel lets you commission the drive remotely, safely outside the arc flash boundary. The Drivetune smartphone app allows you to commission and tune the drive from a distance, giving you access to the same primary settings and other menus available on the drive's HVAC control panel.

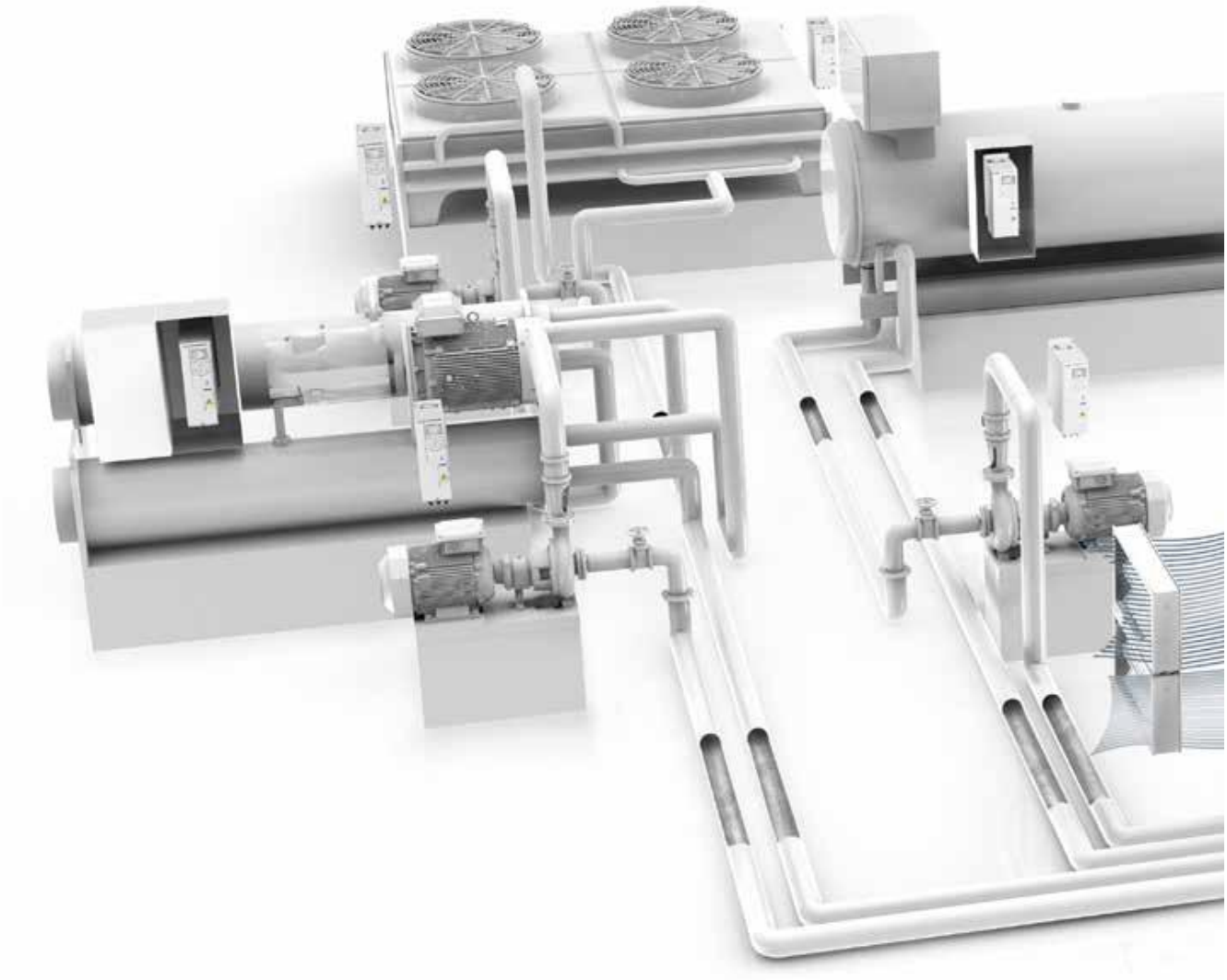
Reliable communication
BACnet MS/TP, Modbus RTU and Johnson Controls N2 are embedded in every ACH580. In addition, a wide range of optional fieldbus adapters are available to enable connectivity with all major building automation and control systems.

Harmonic mitigation
The drive provides reduced harmonics with built-in, optimized DC choke in a small and lightweight design.

Ultra-low harmonic (ULH) drive for a clean network
The revolutionary ACH580 ultra-low harmonic drive is designed specifically for the HVAC market, minimizing the effect of harmonics on your system. This all-in-one solution is fully integrated within the ACH580 platform and leverages the same programming tools, user settings, options, and functions, while providing superior harmonic performance.

Premier air handling

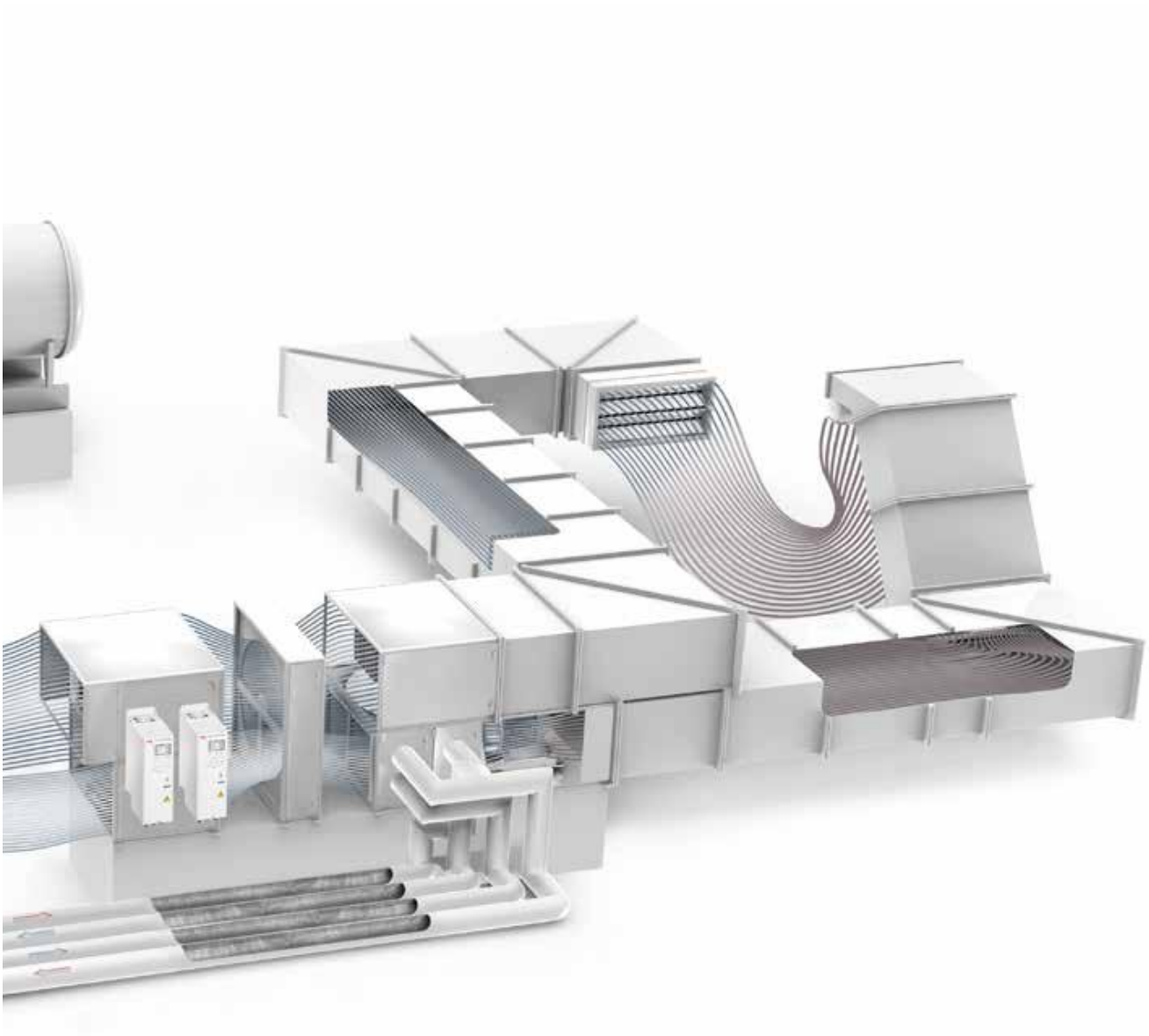
We understand the complexity of air handling systems and the need to produce high levels of comfort, control, and safety. Regardless of the season or external conditions, we help make your system efficient, safe, and informative.



Effortless system startup
The ACH580 ensures a smooth, coordinated start to your HVAC system. Embedded interlock logic enables the drive to confirm that equipment such as dampers are in the right position and sensors are showing the correct status before operations begin. The control panel's Primary Settings menu and built-in assistants streamline commissioning, allowing basic setup to be completed in minutes. The Drive Composer PC tool simplifies the customization of the drive.

Increased energy savings
Increase energy savings by using the appropriate motor and drive combination. The ACH580 drive works with a variety of motors, such as induction, PM, or SynRM, enabling high efficiencies.

Improved safety
Built-in safety functionality, such as override mode, enables your system to override all non-essential faults during emergencies to maintain air quality in the fire exit paths.



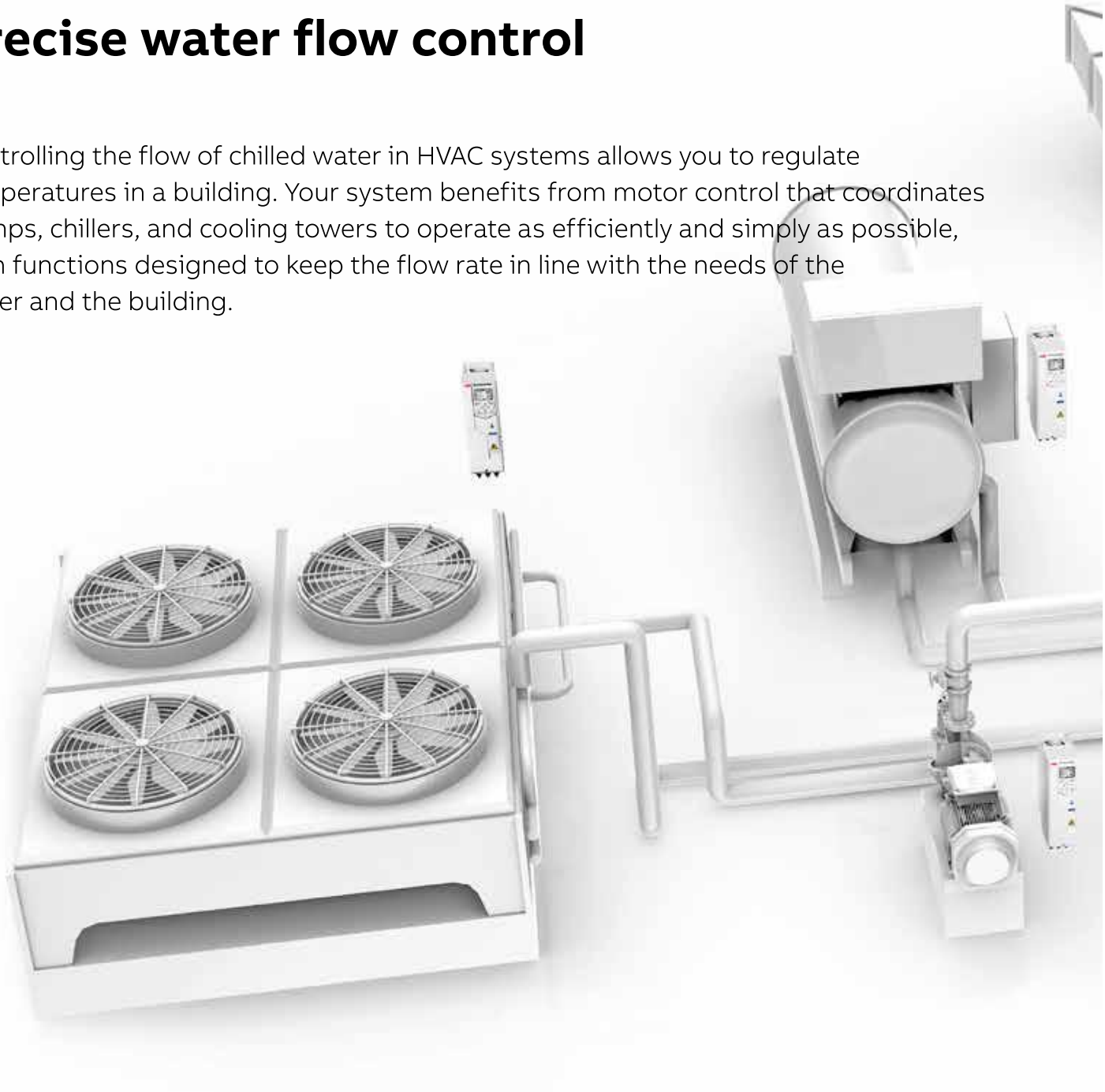
The control panel's optional Bluetooth capability provides an extra level of safety for commissioning and troubleshooting.

Reduced costs
The ACH580 reduces costs by eliminating dependencies on external controllers. The drive can use its internal PID loops to maintain a pressure setpoint by checking the active pressure and adjusting the fan speed accordingly.

Improved monitoring and maintenance
Leverage advanced system monitoring, giving you access to data on all aspects of the operation. Use this information to plan maintenance based on the actual needs of the application. With built-in monitoring, the drive lets you know when it’s time to take action if a fan stalls, a belt breaks, a filter clogs, and more.

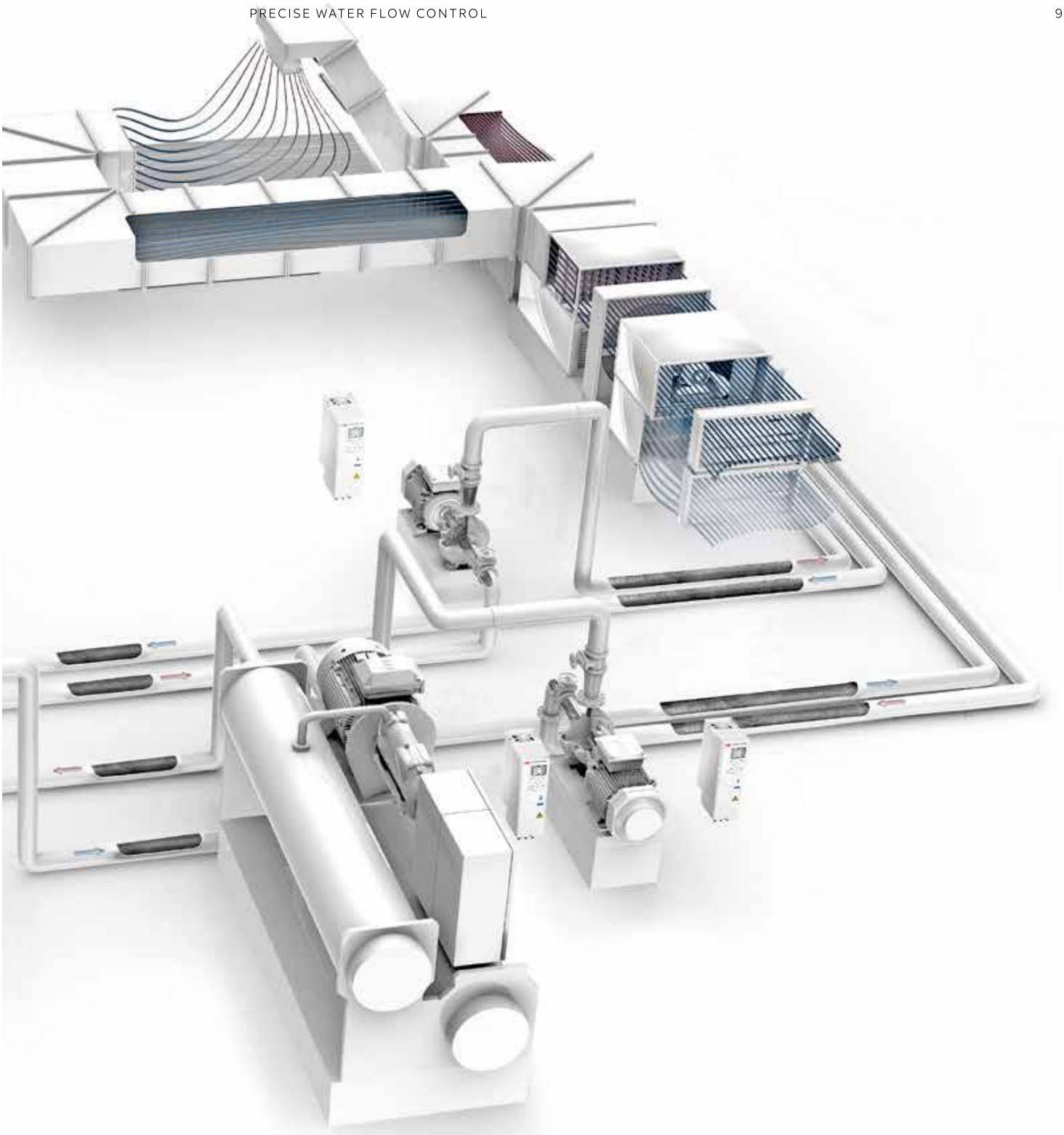
Precise water flow control

Controlling the flow of chilled water in HVAC systems allows you to regulate temperatures in a building. Your system benefits from motor control that coordinates pumps, chillers, and cooling towers to operate as efficiently and simply as possible, with functions designed to keep the flow rate in line with the needs of the chiller and the building.



Motor monitoring prevents problems
Protect your investment with onboard monitoring. Monitor and show trends of key attributes for preventative maintenance.

Protect your equipment
Extend the life of your pipes, motors, valves, and pumps with intelligent motor control. By starting the pumping system smoothly and precisely managing flow and pressure, you protect the system from pressure surges.



Energy savings through intelligent control
Intelligent motor control replaces throttle and bypass valves, enabling better control of flow, and resulting in energy savings. In addition, fewer mechanical parts means minimal wear and tear on the system.

System optimization
As demand fluctuates during the day, the system automatically adjusts. The ACH580 provides optimal pressure when needed, and goes into sleep mode when it's not.

ACH580 drives offering

All ACH580 drives offer ease of use, scalability, and reliability and comes in a variety of packages. They can be equipped with an intuitive Bluetooth control panel, allowing the drive to be configured directly via the control panel or via the Drivetune app. A robust HVAC firmware package provides drive, motor, and application protection features. The drive includes BACnet MS/TP, Modbus RTU, and Johnson Controls N2. Additional protocols, such as BACnet/IP and LonWorks, are available with optional fieldbus adapters.

Wall-mounted drives, ACH580-01
ACH580-01 wall-mounted drives are available in UL (NEMA) Type 1 to UL (NEMA) Type 12 protection class with a power range up to 350 hp and offer side-by-side, flange, and horizontal mounting options. The UL (NEMA) Type 12 variants are designed for applications exposed to dust, moisture, vibration, and other harsh conditions. The ACH580-01 is a six-pulse drive that includes an optimized DC link choke for harmonic mitigation.

Ultra-low harmonic drives, ACH580-31
ACH580-31 ultra-low harmonic drives help to keep the power network clean. The ACH580 ultra-low harmonic (ULH) drive provides an unprecedented compact design that delivers unity power factor with a 3% or less THDi. By meeting the most stringent requirements of the IEEE519 recommendations, the ACH580 ULH drive reduces any risk of electrical disturbance when operating on a back-up generator.

E-Clipse bypass drive, ACH580-VCR, ACH580-VDR, ACH580-BCR, ACH580-BDR
The ACH580 with ABB E-Clipse bypass has an integrated UL (NEMA) Type 1, 12 or 3R enclosure with a bypass motor starter and is available from 1 to 350 hp at 230/460/575 V. The ACH580 with ABB E-Clipse bypass provides an input disconnect switch or circuit breaker with door mounted and interlocked switch (padlockable in the OFF position), a bypass starter, electronic motor overload protection, a door mounted control panel with graphical display for local control, provisions for external control connections, and serial communications capability.

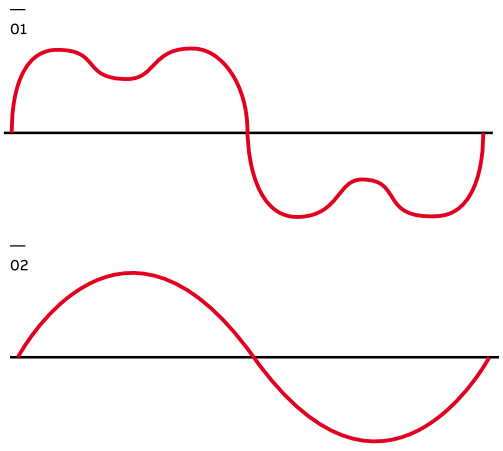
Packaged drive with disconnect means, ACH580-PCR, ACH580-PDR
The ACH580 Packaged Drive includes an ACH580 drive in a UL (NEMA) Type 1, 12 or 3R enclosure with either an input disconnect switch and fast acting fuses or an input circuit breaker. It is available from 1 to 350 hp at 230/460/575 V. The ACH580 Packaged Drive provides a door-mounted input disconnect switch (padlockable in the OFF position), electronic motor overload protection, a door mounted control panel with graphical display for local control, provisions for external control connections, and serial communications capability.

The entire ACH580 product family provides a consistent user interface and features, making it easy for you to install, commission and use throughout your facility.

ACH580 ultra-low harmonic (ULH) drive

What are harmonics?
In an ideal case the current in an AC grid is a pure sine wave and does not contain harmonics. In reality the current deviates from this pure sine wave and contains harmonics. Harmonics are typically measured as a percentage value, called total harmonic distortion (THD).

Harmonics can cause damage to sensitive electronic equipment, interference to communication equipment, tripping of circuit breakers, blowing of fuses and capacitor failures. The effects can also include overheating of cables, light ballast, motors, overloading of transformers, generator failure and power factor capacitor damage.



01
Diode supply

02
Active supply

Complete HVAC functionality
The ACH580 ULH comes standard with an intuitive control panel used to configure, control, and monitor the drive. An optional Bluetooth control panel allows the drive to be configured via the control panel or the DriveTune app.

A robust HVAC firmware package provides drive, motor, and application protection features. Application specific features, such as accepting four separate start interlocks (safeties), along with broken belt detection, are also included. The drive includes BACnet MS/TP, Modbus RTU, and Johnson Controls N2 as standard.

Savings in total cost of ownership
Installation costs are reduce with the simple 3 wires in and 3 wires out design. Maintenance costs are lowered as compared to other harmonic mitigation solutions like passive filters, multi-pulse and active filters there are less components to maintain and stock as spares.

Using the ACH580 ULH allows your engineer to design your electrical system and backup generators to the right size and not oversizing for the harmonics in the network.

Reliability for your building
Harmonics in the network could cause problems with other electrical equipment in the same electrical network. In the worst case it might cause your sensitive electrical equipment to fail.

Harmonics can cause problems also in retrofit projects. In such projects, a transformer might not be able to meet the harmonic levels caused by non-linear loads such as standard 6-pulse drives, so there is a risk of overloading the transformer.

In addition to problems caused by harmonics, also weak network can cause troubles to your systems. Weak electrical networks that have sags in line voltage may cause motors to overheat, trip or fail.

The ACH580 ULH drive offers a reliable solution to overcome these challenges as it is able to lower the harmonic content so that sensitive equipment stay running and transformers or generators don't fail. Also the ACH580 ULH can boost output voltage so that motor always runs with nominal voltage despite the fluctuations in line voltage.

Optimized size and performance
ACH580 ULH has all the harmonic mitigation technology in the drive. With a THDi of 3% or less, there is no need for external components to install with the drive for reducing harmonics, this drive doesn't create the harmonics to fix.

ACH580 ultra-low harmonic packaged drives with disconnect
The ACH580 ultra-low harmonic (ULH) packaged drive is an ACH580 ULH variable frequency drive enclosed with either an input disconnect switch and fast acting fuses (ACH580-3PDR) or an input circuit breaker (ACH580-3PCR). The ACH580 packaged drive provides a door-mounted input disconnect operator (padlockable in the OFF position), electronic motor overload protection, a door mounted control panel with graphical display for local control, provisions for external control connections, and serial communications capability.

ACH580 ultra-low harmonic drive E-Clipse bypass
The ACH580 ultra-low harmonic (ULH) drive with ABB E-Clipse bypass is an ACH580 HVAC drive in an integrated UL (NEMA) Type 1, 12 or 3R enclosure with a bypass motor starter. The ACH580 ULH drive with ABB E-Clipse bypass provides an input disconnect switch or circuit breaker with door mounted and interlocked operator (padlockable in the OFF position), a bypass starter, electronic motor overload protection, a door mounted control panel with graphical display for local control, provisions for external control connections, and serial communications capability. Configurations with the +F267 option include a drive service switch.

Technical details and documentation
PDF, BIM, CAD Drawings and 3D models are available for planning your building.

Common characteristics of the ACH580 drives family

ACH580 series

HVAC control panel with primary settings
- Primary settings makes commissioning the drive easier than ever before
- The optional Bluetooth-enabled control panel allows easy smartphone connection and remote support capability
- Easily available USB interface for PC and tool connection
- Help button for problem-solving

HVAC communication protocols
- The most common HVAC communication protocols – BACnet MS/TP, Johnson Controls N2 and Modbus RTU – are standard
- BACnet/IP with optional fieldbus adapter

Ingress protection
- ACH580 drives are available in multiple different UL/NEMA classes. Check the details at the end of this catalog.

Suitable for various HVAC applications
- Suitable not only for variable-torque applications like fans and pumps, but also for basic constant-torque applications like compressors
- Support for induction, premanent magnet and synchronous reluctance motors

Reliability and quality
- All units are tested under full load at maximum allowed ambient temperature to verify quality
- Printed circuit boards have an extra coating to protect against humid and harsh environments

Harmonic mitigation options
- The ACH580-01 has optimized DC chokes standard for harmonic mitigation.
- Compliant with IEC/EN61000-3-12
- The ACH580-31 ultra-low harmonic drive results in harmonic current as low as 3 percent at the input terminals of the drive, meeting even the most stringent IEEE519 requirements.

Shared features of the ABB all-compatible drives portfolio

Drivetune smartphone app
- The Drivetune smartphone app together with the Bluetooth-enabled control panel allow you to set up and commission the drive remotely from a safe and comfortable location, using the same primary settings menu that is available on the control panel on the drive.

Energy efficiency calculators
- Optimize energy efficiency with features that help you to save and manage energy. You can monitor the hourly, daily cumulative, last hour, last day and last month energy consumption via kWh counters.

Diagnostic menu
- Analyze and resolve issues with the control panel's diagnostics menu. You can quickly analyze why the drive is performing as it is; running, stopped or running at the present speed.

Embedded load analyzers
- Analyze and optimize the application with the load profile log, which shows how the drive has been operating.

EMC/RFI category C2
- The EMC category C2 level design allows installation in commercial and residental buildings.

Reduced motor noise
- User-selectable switching frequencies to manage audible noise.

Integrated process control
- Reduce costs with built-in PID controllers, allowing drives to self-govern, limiting the need for external controllers.

Flexibility in programming
- Align the drive to the needs of your application and users with customized home screens and adaptive programming.

Extensive I/O capabilities
- ABB HVAC drives have an extensive number of I/O terminals in standard configuration
- Color-coded terminals and clear terminal marking significantly ease drive wiring process
- I/O status can be monitored via the I/O menu
- I/O can be forced on or off to verify the drive's programming

Same PC tools for ABB all-compatible drives
- Drive composer entry available for free at www.abb.com
- Same parameter structure makes the all-compatible platform easy to use

Connectivity
- ABB's F-series fieldbus adapters can be used throughout the all-compatible platform
- Fieldbus settings are made easy with the Primary Settings menu
- Bluetooth connectivity to apple and android devices

Technical data for the ACH580-01 and ACH580-31

Product compliance (complete list on following page)	
ACH580-01, ACH580-31	CE, UL, cUL, and EAC
Supply connection	
Input voltage (U_1)	
ACH580-xx-xxxA-2	208/240V
ACH580-xx-xxxA-4	480V
ACH580-xx-xxxA-6	600V
Input voltage tolerance	+10% / -15%
Phase	3-phase (1-phase, 240 V)
Frequency	48 to 63 Hz
Line Limitations	Max ±3% of nominal phase to phase input voltage
Power Factor (cos φ) at nominal load	
ACH580-01	0.98
ACH580-31	1.0
Efficiency at rated power	
ACH580-01	98.0%
ACH580-31	96.5%
Power Loss	Approximately 2% of rated power
Motor connection	
Supported motor control	Scalar and vector
Supported motor types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Voltage	3-phase, from 0 to supply voltage
Frequency	0 to 500 Hz
Short Term Overload Capacity Variable Torque	110% for 1 min/10min
Peak Overload Capacity Variable Torque	1.35 for 2 second (2 sec / 10 min)
Switching Frequency	2, 4, 8 or 12 kHz Automatic fold back in case of overload
Acceleration/ Deceleration Time	0 to 1800 s
Short Circuit Current Rating (SCCR)	100 kA with fusing

Inputs and outputs (drive)	
2 analog inputs	Selection of Current/Voltage input mode is user programmable.
Voltage reference	0 (2) to 10 V, R_{in} > 200 kΩ
Current reference	0 (4) to 20 mA, R_{in} = 100 Ω
Potentiometer reference value	10 V ±1% max. 20 mA
2 analog outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage reference	0 to 10 V, R_{load}: > 100 kΩ
Current reference	0 to 20 mA, R_{load}: < 500 Ω
Applicable potentiometer	1 kΩ to 10 kΩ
Internal auxiliary voltage	24 V DC ±10%, max. 250 mA
Accuracy	+/- 1% full scale range at 25°C (77°F)
Output updating time	2 ms
6 digital inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input. PNP or NPN connection (5 DIs with NPN connection). Programmable
Input Updating Time	2 ms
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. Programmable, Form C
Contact material	Silver Tin Oxide ($AgSnO_2$)
PTC, PT100 and PT1000	Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors.
Adjustable filters on analog inputs and outputs	
All control inputs isolated from ground and power	
Operation	
Air temperature	-15 to +50 °C (5 to 122 °F). -15 to 0 °C (5 to 32 °F): No frost allowed. Output derated above +40 °C (104 °F)
Installation site altitude	0 to 4000 m (13123 ft) above sea level Output derated above 1000 m (3281 ft)
Relative humidity	5 to 95%: No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Vibration	Risk category IV Certified (IBC 2018)

Environmental protections	
Chemical Gasses	Class 3C2
Solid Particles	Class 3S2 No conductive dust allowed
Pollution degree (IEC/EN 61800-5-1)	Pollution degree 2
Product compliance	
Standards and directives	Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC 60721-3-3: 2002 60721-3-1:1997 Quality assurance system ISO 9001 and Environmental system ISO 14001 CE, UL, cUL, and EAC approvals Galvanic isolation according to PELV RoHS2 (Restriction of Hazardous Substances) EN 61800-5-1: 2007; IEC/EN 61000-3-12; EN61800-3: 2017 + A1: 2012 Category C2 (1st environment restricted distribution); Safe torque off (EN 61800-5-2) BACnet Testing Laboratory (BTL) Seismic (IBC, OSHPD) Plenum rated
EMC (according to EN61800-3)	ACH580-01 and ACH580-31 class C2 (1st environment restricted distribution)
Storage (in Protective Shipping Package)	
Air Temperature	-40 to +70 °C (-40 to +158 °F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Chemical Gasses	Class 1C2
Solid Particles	Class 1S2 Contact ABB regarding Class 1S3
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres
Vibration (ISTA)	
R1…R4	In accordance with ISTA 1A
R5…R9	In accordance with ISTA 3E

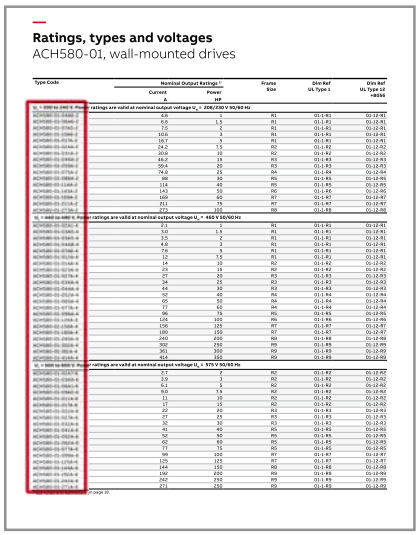
Transportation (in Protective Shipping Package)	
Air Temperature	-40° to 70°C (-40° to 158°F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric Pressure	60 to 106 kPa (8.7 to 15.4 PSI) 0.6 to 1.05 atmospheres
Free Fall	R1: 76 cm (30 in) R2: 61 cm (24 in) R3: 46 cm (18 in) R4: 31 cm (12 in) R5: 25 cm (10 in)
Chemical Gasses	Class 2C2
Solid Particles	Class 2S2
Shock/ Drop (ISTA)	
R1…R4	In accordance with ISTA 1A
R5…R9	In accordance with ISTA 3E
Vibration (ISTA)	
R1…R4	In accordance with ISTA 1A
R5…R9	In accordance with ISTA 3E

How to select a drive

This is how you build up your own ordering code using the type designation key.

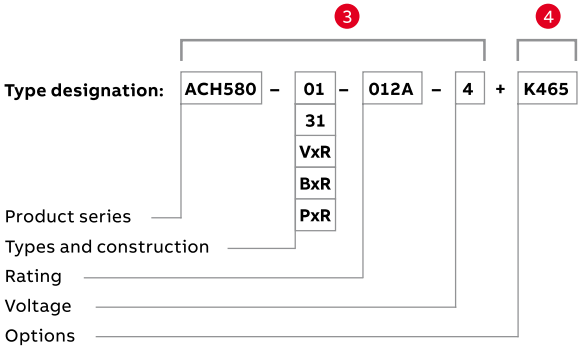
Start by identifying your supply voltage.
This tells you what rating table to use.
See pages 19-26.

Select your drive's order code from the rating table based on the nominal current rating of your motor.

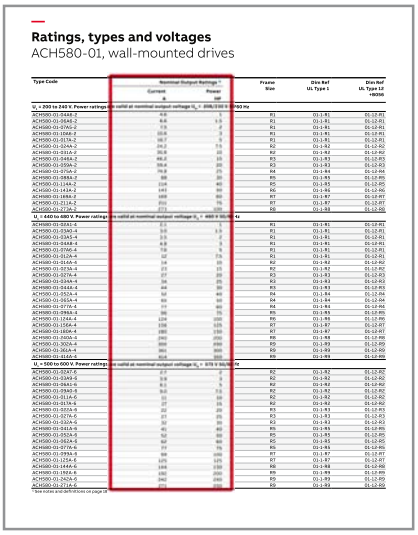

Ratings, types and voltages
ACH580-01, wall-mounted drives

Pages 19-26

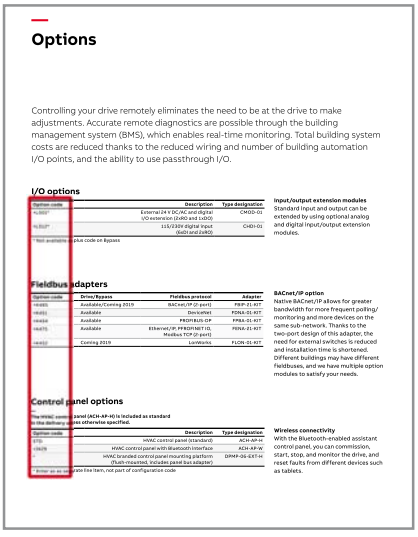
Choose your options (on page 36) and add the option codes to the drive's order code. Remember to use a "+" sign before each option code.



Choose the power and current rating of your motor from the ratings tables on pages 19-26.


Ratings, types and voltages
ACH580-01, wall-mounted drives

Pages 19-26


Options

Controlling your drive remotely eliminates the need to be at the drive to make adjustments. Accurate remote diagnostics are possible through the building management system (BMS), which enables real-time monitoring. Total building system costs are reduced thanks to the reduced wiring and number of building automation I/O points, and the ability to use passthrough I/O.

I/O options

Input/output extension modules
Standard input and output can be extended by using optional analog and digital input/output extension modules.

Fieldbus adapters

BACnet/IP option
Native BACnet/IP allows for greater bandwidth for more frequent polling/monitoring and more devices on the same sub-network. Thanks to the two-port design of this adapter, the need for external switches is reduced and installation time is shortened. Different buildings may have different fieldbuses, and we have multiple option modules to satisfy your needs.

Control panel options

Wireless connectivity
With the Bluetooth-enabled assistant control panel, you can commission, start, stop, and monitor the drive, and reset faults from different devices such as tablets.

Page 26

Note: Ratings apply at an ambient temperature of 40°C (104°F) unless otherwise noted.
To achieve the rated motor power given in the table, the rated current of the drive must be higher than or equal to the rated motor current.

Definitions:
I Continuous rms output current allowing 110% overload for 1 minute every 10 minutes.
P Typical motor power
U_N Nominal output voltage of the drive
U_1 Input voltage range

Ratings, types and voltages
ACH580-01, wall-mounted drives

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056
	Current A	Power HP			
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz					
ACH580-01-04A6-2	4.6	1	R1	01-1-R1	01-12-R1
ACH580-01-06A6-2	6.6	1.5	R1	01-1-R1	01-12-R1
ACH580-01-07A5-2	7.5	2	R1	01-1-R1	01-12-R1
ACH580-01-10A6-2	10.6	3	R1	01-1-R1	01-12-R1
ACH580-01-017A-2	16.7	5	R1	01-1-R1	01-12-R1
ACH580-01-024A-2	24.2	7.5	R2	01-1-R2	01-12-R2
ACH580-01-031A-2	30.8	10	R2	01-1-R2	01-12-R2
ACH580-01-046A-2	46.2	15	R3	01-1-R3	01-12-R3
ACH580-01-059A-2	59.4	20	R3	01-1-R3	01-12-R3
ACH580-01-075A-2	74.8	25	R4	01-1-R4	01-12-R4
ACH580-01-088A-2	88	30	R5	01-1-R5	01-12-R5
ACH580-01-114A-2	114	40	R5	01-1-R5	01-12-R5
ACH580-01-143A-2	143	50	R6	01-1-R6	01-12-R6
ACH580-01-169A-2	169	60	R7	01-1-R7	01-12-R7
ACH580-01-211A-2	211	75	R7	01-1-R7	01-12-R7
ACH580-01-273A-2	273	100	R8	01-1-R8	01-12-R8
U_1 = 440 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz					
ACH580-01-02A1-4	2.1	1	R1	01-1-R1	01-12-R1
ACH580-01-03A0-4	3.0	1.5	R1	01-1-R1	01-12-R1
ACH580-01-03A5-4	3.5	2	R1	01-1-R1	01-12-R1
ACH580-01-04A8-4	4.8	3	R1	01-1-R1	01-12-R1
ACH580-01-07A6-4	7.6	5	R1	01-1-R1	01-12-R1
ACH580-01-012A-4	12	7.5	R1	01-1-R1	01-12-R1
ACH580-01-014A-4	14	10	R2	01-1-R2	01-12-R2
ACH580-01-023A-4	23	15	R2	01-1-R2	01-12-R2
ACH580-01-027A-4	27	20	R3	01-1-R3	01-12-R3
ACH580-01-034A-4	34	25	R3	01-1-R3	01-12-R3
ACH580-01-044A-4	44	30	R3	01-1-R3	01-12-R3
ACH580-01-052A-4	52	40	R4	01-1-R4	01-12-R4
ACH580-01-065A-4	65	50	R4	01-1-R4	01-12-R4
ACH580-01-077A-4	77	60	R4	01-1-R4	01-12-R4
ACH580-01-096A-4	96	75	R5	01-1-R5	01-12-R5
ACH580-01-124A-4	124	100	R6	01-1-R6	01-12-R6
ACH580-01-156A-4	156	125	R7	01-1-R7	01-12-R7
ACH580-01-180A-4	180	150	R7	01-1-R7	01-12-R7
ACH580-01-240A-4	240	200	R8	01-1-R8	01-12-R8
ACH580-01-302A-4	302	250	R9	01-1-R9	01-12-R9
ACH580-01-361A-4	361	300	R9	01-1-R9	01-12-R9
ACH580-01-414A-4	414	350	R9	01-1-R9	01-12-R9
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz					
ACH580-01-02A7-6	2.7	2	R2	01-1-R2	01-12-R2
ACH580-01-03A9-6	3.9	3	R2	01-1-R2	01-12-R2
ACH580-01-06A1-6	6.1	5	R2	01-1-R2	01-12-R2
ACH580-01-09A0-6	9.0	7.5	R2	01-1-R2	01-12-R2
ACH580-01-011A-6	11	10	R2	01-1-R2	01-12-R2
ACH580-01-017A-6	17	15	R2	01-1-R2	01-12-R2
ACH580-01-022A-6	22	20	R3	01-1-R3	01-12-R3
ACH580-01-027A-6	27	25	R3	01-1-R3	01-12-R3
ACH580-01-032A-6	32	30	R3	01-1-R3	01-12-R3
ACH580-01-041A-6	41	40	R5	01-1-R5	01-12-R5
ACH580-01-052A-6	52	50	R5	01-1-R5	01-12-R5
ACH580-01-062A-6	62	60	R5	01-1-R5	01-12-R5
ACH580-01-077A-6	77	75	R5	01-1-R5	01-12-R5
ACH580-01-099A-6	99	100	R7	01-1-R7	01-12-R7
ACH580-01-125A-6	125	125	R7	01-1-R7	01-12-R7
ACH580-01-144A-6	144	150	R8	01-1-R8	01-12-R8
ACH580-01-192A-6	192	200	R9	01-1-R9	01-12-R9
ACH580-01-242A-6	242	250	R9	01-1-R9	01-12-R9
ACH580-01-271A-6	271	250	R9	01-1-R9	01-12-R9

[1] See notes and definitions on page 18.

Ratings, types and voltages

ACH580-VCR, vertical E-Clipse bypass drive with circuit breaker

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type1
	Drive Current A	Package Power HP		
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz				
ACH580-VCR-04A6-2	4.6	1	R1	Vx1-1
ACH580-VCR-06A6-2	6.6	1.5	R1	Vx1-1
ACH580-VCR-07A5-2	7.5	2	R1	Vx1-1
ACH580-VCR-10A6-2	10.6	3	R1	Vx1-1
ACH580-VCR-017A-2	16.7	5	R1	Vx1-1
ACH580-VCR-024A-2	24.2	7.5	R2	Vx1-2
ACH580-VCR-031A-2	30.8	10	R2	Vx1-3
ACH580-VCR-046A-2	46.2	15	R3	Vx1-4
ACH580-VCR-059A-2	59.4	20	R3	Vx1-4
ACH580-VCR-075A-2	74.8	25	R4	Vx1-4
U_1 = 440 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz				
ACH580-VCR-02A1-4	2.1	1	R1	Vx1-1
ACH580-VCR-03A0-4	3.0	1.5	R1	Vx1-1
ACH580-VCR-03A5-4	3.5	2	R1	Vx1-1
ACH580-VCR-04A8-4	4.8	3	R1	Vx1-1
ACH580-VCR-07A6-4	7.6	5	R1	Vx1-1
ACH580-VCR-012A-4	12	7.5	R1	Vx1-1
ACH580-VCR-014A-4	14	10	R2	Vx1-2
ACH580-VCR-023A-4	23	15	R2	Vx1-2
ACH580-VCR-027A-4	27	20	R3	Vx1-3
ACH580-VCR-034A-4	34	25	R3	Vx1-3
ACH580-VCR-044A-4	44	30	R3	Vx1-3
ACH580-VCR-052A-4	52	40	R4	Vx1-4
ACH580-VCR-065A-4	65	50	R4	Vx1-4
ACH580-VCR-077A-4	77	60	R4	Vx1-4
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz				
ACH580-VCR-02A7-6	2.7	2	R2	Vx1-2
ACH580-VCR-03A9-6	3.9	3	R2	Vx1-2
ACH580-VCR-06A1-6	6.1	5	R2	Vx1-2
ACH580-VCR-09A0-6	9.0	7.5	R2	Vx1-2
ACH580-VCR-011A-6	11	10	R2	Vx1-2
ACH580-VCR-017A-6	17	15	R2	Vx1-2
ACH580-VCR-022A-6	22	20	R3	Vx1-3
ACH580-VCR-027A-6	27	25	R3	Vx1-3
ACH580-VCR-032A-6	32	30	R3	Vx1-3

[1] See notes and definitions on page 18.

Ratings, types and voltages

ACH580-VDR, vertical E-Clipse bypass drive with non-fused disconnect switch

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1
	Drive Current A	Package Power HP		
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz				
ACH580-VDR-04A6-2	4.6	1	R1	Vx1-1
ACH580-VDR-06A6-2	6.6	1.5	R1	Vx1-1
ACH580-VDR-07A5-2	7.5	2	R1	Vx1-1
ACH580-VDR-10A6-2	10.6	3	R1	Vx1-1
ACH580-VDR-017A-2	16.7	5	R1	Vx1-1
ACH580-VDR-024A-2	24.2	7.5	R2	Vx1-2
ACH580-VDR-031A-2	30.8	10	R2	Vx1-3
ACH580-VDR-046A-2	46.2	15	R3	Vx1-4
ACH580-VDR-059A-2	59.4	20	R3	Vx1-4
ACH580-VDR-075A-2	74.8	25	R4	Vx1-4
U_1 = 440 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz				
ACH580-VDR-02A1-4	2.1	1	R1	Vx1-1
ACH580-VDR-03A0-4	3.0	1.5	R1	Vx1-1
ACH580-VDR-03A5-4	3.5	2	R1	Vx1-1
ACH580-VDR-04A8-4	4.8	3	R1	Vx1-1
ACH580-VDR-07A6-4	7.6	5	R1	Vx1-1
ACH580-VDR-012A-4	12	7.5	R1	Vx1-1
ACH580-VDR-014A-4	14	10	R2	Vx1-2
ACH580-VDR-023A-4	23	15	R2	Vx1-2
ACH580-VDR-027A-4	27	20	R3	Vx1-3
ACH580-VDR-034A-4	34	25	R3	Vx1-3
ACH580-VDR-044A-4	44	30	R3	Vx1-3
ACH580-VDR-052A-4	52	40	R4	Vx1-4
ACH580-VDR-065A-4	65	50	R4	Vx1-4
ACH580-VDR-077A-4	77	60	R4	Vx1-4
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz				
ACH580-VDR-02A7-6	2.7	2	R2	Vx1-2
ACH580-VDR-03A9-6	3.9	3	R2	Vx1-2
ACH580-VDR-06A1-6	6.1	5	R2	Vx1-2
ACH580-VDR-09A0-6	9.0	7.5	R2	Vx1-2
ACH580-VDR-011A-6	11	10	R2	Vx1-2
ACH580-VDR-017A-6	17	15	R2	Vx1-2
ACH580-VDR-022A-6	22	20	R3	Vx1-3
ACH580-VDR-027A-6	27	25	R3	Vx1-3
ACH580-VDR-032A-6	32	30	R3	Vx1-3

[1] See notes and definitions on page 18.

Ratings, types and voltages

ACH580-BCR, E-Clipse bypass drive with circuit breaker

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056	Dim Ref NEMA 3R +B058
	Drive Current A	Package Power HP				
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz						
ACH580-BCR-04A6-2	4.6	1	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-06A6-2	6.6	1.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-07A5-2	7.5	2	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-10A6-2	10.6	3	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-017A-2	16.7	5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-024A-2	24.2	7.5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-031A-2	30.8	10	R2	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-046A-2	46.2	15	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-059A-2	59.4	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-075A-2	74.8	25	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-088A-2	88.0	30	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BCR-114A-2	114	40	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BCR-143A-2	143	50	R6	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-169A-2	169	60	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-211A-2	211	75	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-248A-2	248	100[2]	R8	Bx1-3	Bx12-3	Bx3R-5
U_1 = 440 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz						
ACH580-BCR-02A1-4	2.1	1	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-03A0-4	3.0	1.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-03A5-4	3.5	2	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-04A8-4	4.8	3	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-07A6-4	7.6	5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-012A-4	12	7.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-014A-4	14	10	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-023A-4	23	15	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-027A-4	27	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-034A-4	34	25	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-044A-4	44	30	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-052A-4	52	40	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-065A-4	65	50	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-077A-4	77	60	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-096A-4	96	75	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BCR-124A-4	124	100	R6	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-156A-4	156	125	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-180A-4	180	150	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BCR-240A-4	240	200	R8	Bx1-3	Bx12-3	Bx3R-5
ACH580-BCR-302A-4	302	250	R9	Bx1-6	Bx12-6	Bx3R-6
ACH580-BCR-361A-4	361	300	R9	Bx1-6	Bx12-6	Bx3R-6
ACH580-BCR-414A-4	414	350	R9	Bx1-6	Bx12-6	Bx3R-6
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz						
ACH580-BCR-02A7-6	2.7	2	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-03A9-6	3.9	3	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-06A1-6	6.1	5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-09A0-6	9.0	7.5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-011A-6	11	10	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-017A-6	17	15	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BCR-022A-6	22	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-027A-6	27	25	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-032A-6	32	30	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BCR-041A-6	41	40	R5	Bx1-3	Bx12-3	-
ACH580-BCR-052A-6	52	50	R5	Bx1-3	Bx12-3	-
ACH580-BCR-062A-6	62	60	R5	Bx1-3	Bx12-3	-
ACH580-BCR-077A-6	77	75	R5	Bx1-3	Bx12-3	-
ACH580-BCR-099A-6	99	100	R7	Bx1-3	Bx12-3	-
ACH580-BCR-125A-6	125	125	R7	Bx1-3	Bx12-3	-
ACH580-BCR-144A-6	144	150	R8	Bx1-3	Bx12-3	-

[1] See notes and definitions on page 18.

[2] 100 HP at 230 V

Ratings, types and voltages

ACH580-BDR, E-Clipse bypass drive with non-fused disconnect switch

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056	Dim Ref NEMA 3R +B058
	Drive Current A	Package Power HP				
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz						
ACH580-BDR-04A6-2	4.6	1	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-06A6-2	6.6	1.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-07A5-2	7.5	2	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-10A6-2	10.6	3	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-017A-2	16.7	5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-024A-2	24.2	7.5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-031A-2	30.8	10	R2	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-046A-2	46.2	15	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-059A-2	59.4	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-075A-2	74.8	25	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-088A-2	88.0	30	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BDR-114A-2	114	40	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BDR-143A-2	143	50	R6	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-169A-2	169	60	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-211A-2	211	75	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-248A-2	248	100[2]	R8	Bx1-3	Bx12-3	Bx3R-5
U_1 = 440 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz						
ACH580-BDR-02A1-4	2.1	1	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-03A0-4	3.0	1.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-03A5-4	3.5	2	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-04A8-4	4.8	3	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-07A6-4	7.6	5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-012A-4	12	7.5	R1	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-014A-4	14	10	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-023A-4	23	15	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-027A-4	27	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-034A-4	34	25	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-044A-4	44	30	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-052A-4	52	40	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-065A-4	65	50	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-077A-4	77	60	R4	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-096A-4	96	75	R5	Bx1-3	Bx12-3	Bx3R-3
ACH580-BDR-124A-4	124	100	R6	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-156A-4	156	125	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-180A-4	180	150	R7	Bx1-3	Bx12-3	Bx3R-4
ACH580-BDR-240A-4	240	200	R8	Bx1-3	Bx12-3	Bx3R-5
ACH580-BDR-302A-4	302	250	R9	Bx1-6	Bx12-6	Bx3R-6
ACH580-BDR-361A-4	361	300	R9	Bx1-6	Bx12-6	Bx3R-6
ACH580-BDR-414A-4	414	350	R9	Bx1-6	Bx12-6	Bx3R-6
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz						
ACH580-BDR-02A7-6	2.7	2	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-03A9-6	3.9	3	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-06A1-6	6.1	5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-09A0-6	9.0	7.5	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-011A-6	11	10	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-017A-6	17	15	R2	Bx1-1	Bx12-1	Bx3R-1
ACH580-BDR-022A-6	22	20	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-027A-6	27	25	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-032A-6	32	30	R3	Bx1-2	Bx12-2	Bx3R-2
ACH580-BDR-041A-6	41	40	R5	Bx1-3	Bx12-3	-
ACH580-BDR-052A-6	52	50	R5	Bx1-3	Bx12-3	-
ACH580-BDR-062A-6	62	60	R5	Bx1-3	Bx12-3	-
ACH580-BDR-077A-6	77	75	R5	Bx1-3	Bx12-3	-
ACH580-BDR-099A-6	99	100	R7	Bx1-3	Bx12-3	-
ACH580-BDR-125A-6	125	125	R7	Bx1-3	Bx12-3	-
ACH580-BDR-144A-6	144	150	R8	Bx1-3	Bx12-3	

[1] See notes and definitions on page 18.

[2] 100 HP at 230 V

Ratings, types and voltages

ACH580-PCR, packaged drive with disconnect means with circuit breaker

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056	Dim Ref NEMA 3R +B058
	Current A	Power HP				
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz						
ACH580-PCR-04A6-2	4.6	1	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-06A6-2	6.6	1.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-07A5-2	7.5	2	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-10A6-2	10.6	3	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-017A-2	16.7	5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-024A-2	24.2	7.5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-031A-2	30.8	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-046A-2	46.2	15	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-059A-2	59.4	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-075A-2	74.8	25	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PCR-088A-2	88.0	30	R5	PxB1-3	PxB12-3	PxB3R-3
ACH580-PCR-114A-2	114	40	R6	PxB1-3	PxB12-3	PxB3R-3
ACH580-PCR-143A-2	143	50	R6	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-169A-2	169	60	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-211A-2	211	75	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-248A-2	248	100[2]	R8	PxB1-3	PxB12-3	PxB3R-4
U_1 = 380 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz						
ACH580-PCR-02A1-4	2.1	1	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-03A0-4	3.0	1.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-03A5-4	3.5	2	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-04A8-4	4.8	3	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-07A6-4	7.6	5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-012A-4	12	7.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PCR-014A-4	14	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-023A-4	23	15	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-027A-4	27	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-034A-4	34	25	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-044A-4	44	30	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-052A-4	52	40	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PCR-065A-4	65	50	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PCR-077A-4	77	60	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PCR-096A-4	96	75	R5	PxB1-3	PxB12-3	PxB3R-3
ACH580-PCR-124A-4	124	100	R6	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-156A-4	156	125	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-180A-4	180	150	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-240A-4	240	200	R8	PxB1-3	PxB12-3	PxB3R-4
ACH580-PCR-302A-4	302	250	R9	PxB1-6	PxB12-6	PxB3R-5
ACH580-PCR-361A-4	361	300	R9	PxB1-6	PxB12-6	PxB3R-5
ACH580-PCR-414A-4	414	350	R9	PxB1-6	PxB12-6	PxB3R-5
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz						
ACH580-PCR-02A7-6	2.7	2	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-03A9-6	3.9	3	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-06A1-6	6.1	5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-09A0-6	9.0	7.5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-011A-6	11	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-017A-6	17	15	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PCR-022A-6	22	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-027A-6	27	25	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-032A-6	32	30	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PCR-041A-6	41	40	R5	PxB1-3	PxB12-3	-
ACH580-PCR-052A-6	52	50	R5	PxB1-3	PxB12-3	-
ACH580-PCR-062A-6	62	60	R5	PxB1-3	PxB12-3	-
ACH580-PCR-077A-6	77	75	R5	PxB1-3	PxB12-3	-
ACH580-PCR-099A-6	99	100	R7	PxB1-3	PxB12-3	-
ACH580-PCR-125A-6	125	125	R7	PxB1-3	PxB12-3	-
ACH580-PCR-144A-6	144	150	R8	PxB1-3	PxB12-3	-

[1] See notes and definitions on page 18.

[2] 100 HP at 230 V

Ratings, types and voltages

ACH580-PDR, packaged drive with disconnect means with non-fused disconnect switch

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056	Dim Ref NEMA 3R +B058
	Current A	Power HP				
U_1 = 200 to 240 V. Power ratings are valid at nominal output voltage U_N = 208/230 V 60 Hz						
ACH580-PDR-04A6-2	4.6	1	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-06A6-2	6.6	1.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-07A5-2	7.5	2	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-10A6-2	10.6	3	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-017A-2	16.7	5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-024A-2	24.2	7.5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-031A-2	30.8	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-046A-2	46.2	15	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-059A-2	59.4	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-075A-2	74.8	25	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PDR-088A-2	88.0	30	R5	PxB1-3	PxB12-3	PxB3R-3
ACH580-PDR-114A-2	114	40	R5	PxB1-3	PxB12-3	PxB3R-3
ACH580-PDR-143A-2	143	50	R6	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-169A-2	169	60	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-211A-2	211	75	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-248A-2	248	100[2]	R8	PxB1-3	PxB12-3	PxB3R-4
U_1 =380 to 480 V. Power ratings are valid at nominal output voltage U_N = 460 V 60 Hz						
ACH580-PDR-02A1-4	2.1	1	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-03A0-4	3.0	1.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-03A5-4	3.5	2	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-04A8-4	4.8	3	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-07A6-4	7.6	5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-012A-4	12	7.5	R1	Px1-1	Px12-1	PxB3R-1
ACH580-PDR-014A-4	14	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-023A-4	23	15	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-027A-4	27	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-034A-4	34	25	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-044A-4	44	30	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-052A-4	52	40	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PDR-065A-4	65	50	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PDR-077A-4	77	60	R4	Px1-4	Px12-4	PxB3R-2
ACH580-PDR-096A-4	96	75	R5	PxB1-3	PxB12-3	PxB3R-3
ACH580-PDR-124A-4	124	100	R6	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-156A-4	156	125	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-180A-4	180	150	R7	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-240A-4	240	200	R8	PxB1-3	PxB12-3	PxB3R-4
ACH580-PDR-302A-4	302	250	R9	PxB1-6	PxB12-6	PxB3R-5
ACH580-PDR-361A-4	361	300	R9	PxB1-6	PxB12-6	PxB3R-5
ACH580-PDR-414A-4	414	350	R9	PxB1-6	PxB12-6	PxB3R-5
U_1 = 500 to 600 V. Power ratings are valid at nominal output voltage U_N = 575 V 60 Hz						
ACH580-PDR-02A7-6	2.7	2	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-03A9-6	3.9	3	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-06A1-6	6.1	5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-09A0-6	9.0	7.5	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-011A-6	11	10	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-017A-6	17	15	R2	Px1-2	Px12-2	PxB3R-1
ACH580-PDR-022A-6	22	20	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-027A-6	27	25	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-032A-6	32	30	R3	Px1-3	Px12-3	PxB3R-2
ACH580-PDR-041A-6	41	40	R5	PxB1-3	PxB12-3	-
ACH580-PDR-052A-6	52	50	R5	PxB1-3	PxB12-3	-
ACH580-PDR-062A-6	62	60	R5	PxB1-3	PxB12-3	-
ACH580-PDR-077A-6	77	75	R5	PxB1-3	PxB12-3	-
ACH580-PDR-099A-6	99	100	R7	PxB1-3	PxB12-3	-
ACH580-PDR-125A-6	125	125	R7	PxB1-3	PxB12-3	-
ACH580-PDR-144A-6	144	150	R8	PxB1-3	PxB12-3	-

[1] See notes and definitions on page 18.

[2] 100 HP at 230 V

Ratings, types and voltages
ACH580-31, ultra-low harmonic drives

Type Code	Nominal Output Ratings [1]		Frame Size	Dim Ref UL Type 1	Dim Ref UL Type 12 +B056
	Current A	Power HP			
U_1 = 380 to 480 V. Power ratings are valid at nominal output voltage 460 V 60 Hz					
ACH580-31-07A6-4	7.6	5	R3	31-1-R3	31-12-R3
ACH580-31-012A-4	12	7.5	R3	31-1-R3	31-12-R3
ACH580-31-014A-4	14	10	R3	31-1-R3	31-12-R3
ACH580-31-023A-4	23	15	R3	31-1-R3	31-12-R3
ACH580-31-027A-4	27	20	R6	31-1-R6	31-12-R6
ACH580-31-034A-4	34	25	R6	31-1-R6	31-12-R6
ACH580-31-044A-4	44	30	R6	31-1-R6	31-12-R6
ACH580-31-052A-4	52	40	R6	31-1-R6	31-12-R6
ACH580-31-065A-4	65	50	R6	31-1-R6	31-12-R6
ACH580-31-077A-4	77	60	R6	31-1-R6	31-12-R6

[1] See notes and definitions on page 18.

Option compatibility
Descriptions

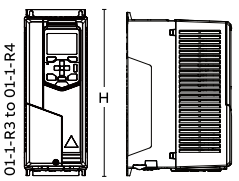
Constructions												Option	Option Code	Description
01	VCR	VDR	BCR	BDR	PCR	PDR	31	3BCR	3BDR	3PCR	3PDR			
•	•	•	•	•	•	•	•	•	•	•	•	UL (NEMA) Type 1	-	Indoor use primarily to provide a degree of protection against limited amounts of falling dirt.
•			•	•	•	•	•	•	•	•	•	UL (NEMA) Type 12	+B056	Indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping non-corrosive liquids. Does not protect against contamination from salt-laden air
			•	•	•	•		•	•	•	•	UL (NEMA) Type 3R	+B058	Either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, and snow; and that will be undamaged by the external formation of ice on the enclosure.
			•	•	•	•		•	•	•	•	UL (NEMA) Type 3R Stainless Steel	+B058+C165	Either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, and snow; and that will be undamaged by the external formation of ice on the enclosure. Enclosure is made of Stainless Steel grade 304. Internal heating strips and cooling fans regulate the internal temperature of the enclosure.
			•	•	•	•		•	•	•	•	UL (NEMA) Type 4	+B057	Either indoor or outdoor use to provide a degree of protection against falling dirt, windblown dust, rain, sleet, snow, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure. Enclosure is made of powder coated galvanized steel. An air conditioner is mounted on the side of the enclosure for cooling of the VFD.
			•	•	•	•		•	•	•	•	UL (NEMA) Type 4X	+B063+C165	Either indoor or outdoor use to provide a degree of protection against falling dirt, windblown dust, rain, sleet, snow, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure. Enclosure is made of Stainless Steel grade 304. A stainless steel air conditioner made of 304 grade steel is mounted on the side of the enclosure for cooling of the VFD.
	•	•	•	•				•	•			Service Switch	+F267	Provides a means to manually disconnect power to the drive.
			•	•	•	•						Line Reactor	+E213	A line reactor provides additional line side impedance for power conditioning. In some applications the line reactor will prevent nuisance drive trips and slightly reduce overall harmonic current.
			•	•	•	•						Passive Filter	+E211	A passive harmonic filter (inductive-capacitive) style is installed and wired in series with the drive. For power factor control, the contactor drops out the tuning reactor and capacitors during light loading. This filter is designed to limit current distortion to less than 5%.
			•	•				•	•			Softstart Bypass	+G390	The Softstarter is installed in the bypass circuit ahead of the Bypass Contactor power contacts. Softstarter operation is initiated by means of a control circuit interlock contact on the Bypass Contactor. Softstarter UP-TO-SPEED and FAULT signals (contact closures) are available at the Softstarter terminal block.
					•	•						Redundant	+C170	The redundant drive control option has two drives installed into a single enclosure to act as a backup for critical applications. The control scheme automatically switches from selected Lead Drive to secondary drive upon a fault on the selected Lead Drive. Each drive equipped with Drive Fuses and electrically interlocked drive output contactors.
			•	•	•	•						MMPs	+xG405+M6xx	Control multiple motors with a single drive. Size the drive based on the combined power rating of all of the loads that will be controlled by the drive. ABB Manual Motor Protectors (MMPs) are sized based on each individual load are installed on the output of the VFD.

Adding these options may change the dimensions of the enclosure.
Contact ABB for available configuration requirements.

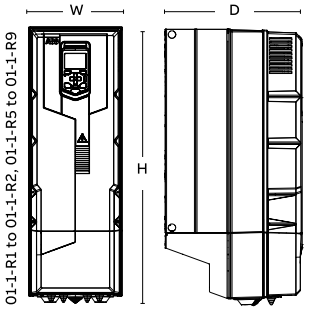
Dimensions
ACH580-01

ACH580-01, wall-mounted UL Type 1

Dim Ref	Height		Width		Depth		Weight	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lb)	(kg)
01-1-R1	14.69	373	4.92	125	8.78	223	10.1	4.6
01-1-R2	18.62	473	4.92	125	9.02	229	14.6	6.6
01-1-R3	19.29	490	7.99	203	9.02	229	26.0	11.8
01-1-R4	25.04	636	7.99	203	10.12	257	41.9	19.0
01-1-R5	28.82	732	7.99	203	11.61	295	62.4	28.3
01-1-R6	28.62	727	9.92	252	14.53	369	93.5	42.4
01-1-R7	34.65	880	11.18	284	14.57	370	119.1	54.0
01-1-R8	37.99	965	11.81	300	15.47	393	152.2	69.0
01-1-R9	37.60	955	14.96	380	16.46	418	213.9	97.0



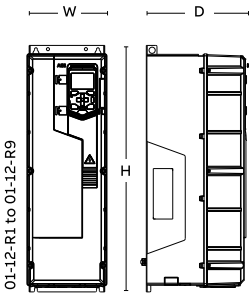
ACH580-01 with integrated conduit box (R3-R4)



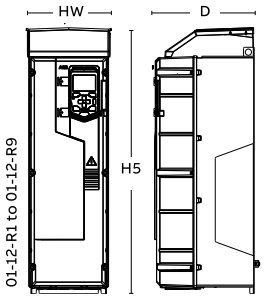
ACH580-01 with removeable conduit box (R1-R2, R5-R9)

ACH580-01, wall-mounted UL Type 12 (option +B056)

Dim Ref	Height		Height (H5)		Width (W)		Width (HW)		Depth (D)		Weight	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lb)	(kg)
01-12-R1	15.87	403	17.78	452	5.04	128	5.09	129	9.17	233	10.6	4.8
01-12-R2	19.80	503	21.49	546	5.04	128	5.10	130	9.41	239	15.0	6.8
01-12-R3	19.29	490	20.93	532	8.11	206	8.16	207	9.33	237	28.7	13.0
01-12-R4	25.04	636	27.03	686	7.99	203	8.59	218	10.43	265	44.1	20.0
01-12-R5	28.82	732	32.01	813	7.99	203	8.58	218	12.60	320	63.9	29.0
01-12-R6	28.62	727	34.81	884	9.92	252	11.46	291	14.96	380	94.8	43.0
01-12-R7	34.65	880	40.86	1038	11.18	284	13.00	330	15.00	381	123.5	56.0
01-12-R8	37.99	965	44.23	1123	11.81	300	13.80	351	17.80	452	169.8	77.0
01-12-R9	37.60	955	46.75	1188	14.96	380	16.95	431	18.78	477	227.1	103.0



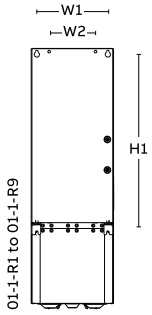
ACH580-01 without hood with integrated conduit box (R1-R9)



ACH580-01 with hood with integrated conduit box (R1-R9)

ACH580-01, mounting dimensions UL Type 1 and UL Type 12

Dim Ref	Height (H1)		Width (W1)		Width (W2)	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
01-1-R1/01-12-R1	12.48	317	3.86	98	-	-
01-1-R2/01-12-R2	16.42	417	3.86	98	-	-
01-1-R3/01-12-R3	18.62	473	6.30	160	-	-
01-1-R4/01-12-R4	24.37	619	6.30	160	3.86	98
01-1-R5/01-12-R5	22.87	581	6.30	160	3.86	98
01-1-R6/01-12-R6	20.91	531	8.37	213	6.30	160
01-1-R7/01-12-R7	22.95	583	9.65	245	6.30	160
01-1-R8/01-12-R8	25.91	658	10.33	263	8.43	214
01-1-R9/01-12-R9	25.91	658	13.58	345	7.87	200

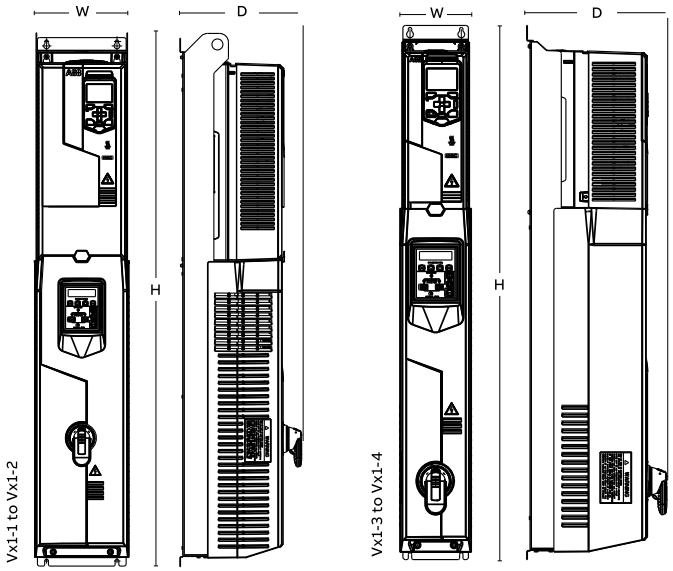


Standard configuration dimensions for reference only.

Dimensions
ACH580-VCR and ACH580-VDR

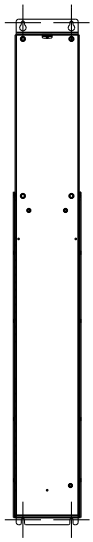
ACH580-VCR and ACH580-VDR, vertical
E-Clipse bypass drives UL Type 1

Dim Ref	Height		Width		Depth		Weight	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lb)	(kg)
Vx1-1	40.18	1021	5.39	137	10.55	268	30.0	13.6
Vx1-2	44.10	1120	5.39	137	10.77	274	50.7	23.0
Vx1-3	47.70	1212	8.44	214	10.90	277	59.5	27.0
Vx1-4	56.82	1443	8.44	214	12.00	305	86.0	39.0



ACH580-VCR and ACH580-VDR, vertical
E-Clipse bypass drives UL Type 1, mounting dimensions

Dim Ref	Height (H1)		Width (W1)		Width (W2)	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
Vx1-1	39.51	1004	4.93	125	3.86	98
Vx1-2	43.43	1103	4.93	125	3.86	98
Vx1-3	46.47	1180	8.19	208	6.30	160
Vx1-4	55.70	1415	8.19	208	6.30	160



Standard configuration dimensions for reference only.

Dwyer

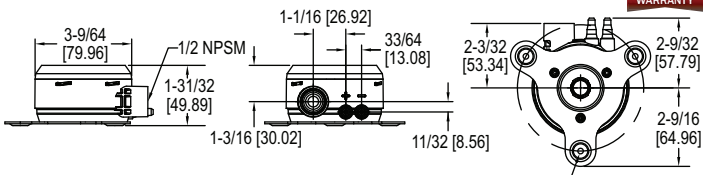
SERIES MSX

MAGNESENSE® DIFFERENTIAL PRESSURE TRANSMITTER

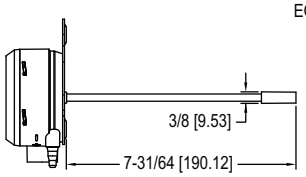
Monitors Differential Pressure, Air Velocity, and Volumetric Flow

5 YEAR LIMITED WARRANTY

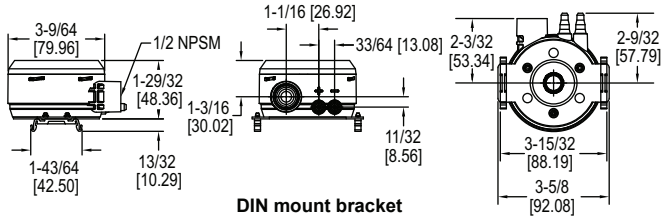
VIDEO ONLINE



Wall mount bracket



Duct mount bracket



DIN mount bracket

The **Series MSX Magnesense® Differential Pressure Transmitter** combines the stability and versatility of the original Series MS2 Magnesense® II transmitter for use in building control applications. The MSX simplifies the ordering process to deliver the desired configuration, which reduces product setup time. Pressure ranges are available in Pa, mm w.c., and in w.c. All pressure ranges can be configured in unidirectional or bidirectional modes, providing a total of 32 ranges. The MSX transmitter can provide a linear pressure output or a linear velocity output with the square root extraction from the transmitter. Additional parameters have been included to expand the square root capability for calculating flow. Dual voltage and milliamp output signals can be used to provide both control and equipment output signal verification.

BENEFITS/FEATURES

- Read LCD values easier with rotatable 180° display
- Quick and easy wiring via the optional toolless terminal block
- Add safety to variety of applications with UL94 V-0 and plenum ratings

APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical/semiconductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: ±1% FSO.
Stability: ±1% FSO/year.
Temperature Limits: -4 to 158°F (-20 to 70°C).
Pressure Limits: Ranges 0 and 1: 3.6 psi max operation, 6 psi burst; Ranges 2, 3 and 4: 6 psi max operation, 6 psi burst.
Power Requirements: 10-36 VDC (2-wire), 17-36 VDC or isolated 21.6-33 VAC (3-wire).
Output Signals: 4-20 mA (2-wire); 0-10 V or 0-5 V selectable (3-wire).
Response Time: Instantaneous (default) or 3 s (selectable).
Zero and Span Adjustments: Digital push-button.
Loop Resistance: Current output: 0-1250 Ω max; Voltage output: min. load resistance 1 kΩ.
Current Consumption: 21 mA max continuous.
Electrical Connections: 4-wire removable European style terminal block for 16 to 26 AWG.
Electrical Entry: 1/2″ NPS thread.
Display (optional): 4 digit LCD.
Process Connections: 1/8″, 3/16″, 1/4″, 5 mm, and 6 mm ID flexible tubing.
Enclosure Rating: NEMA 4X (IP66), UL 2043 (Plenum), UL94 V-0.
Mounting Orientation: Pressure sensor measurement unaffected by orientation.
Weight: 8.0 oz (230 g).
Compliance: CE.

OPTIONS

Range	in w.c.	Pa low	Pa high	mm w.c.
Range 0	0.1 0.15 0.25 0.5*	25 30 40 50	60 75 100 125*	2.5 5 10 12*
Range 1	0.1 0.25 0.5 1*	25 40 50 60	100 150 160 250*	2.5 5 10 25*
Range 2	1 2 3 5*	250 300 400 500	600 750 1000 1250*	25 50 100 125*
Range 3	10 15 25 28*	1000 1500 2000 2500	3000 4000 5000 7000*	250 350 500 700*
Range 4	1 5 10 15*	250 300 400 500	1000 2000 3000 4000*	25 125 250 400*

*Indicated values are the positive full-scale output values per range.
Note: Ranges indicated in the table are the high end of the set range. All ranges have a low end pressure value of 0.

MODEL CHART

Example	MSX	-W	1	3	-IN	-LCD	MSX-W13-IN-LCD
Series	MSX						Magnesense® differential pressure transmitter
Mounting		W U N					Wall mount Universal (wall or duct) mount DIN rail mount
Direction			1 2				Unidirectional Bidirectional
Range				0 1 2 3 4			.5 in w.c., 125 Pa, 12.5 mm w.c. 1 in w.c., 250 Pa, 25 mm w.c. 5 in w.c., 1250 Pa, 125 mm w.c. 28 in w.c., 7000 Pa, 700 mm w.c. 15 in w.c., 4000 Pa, 400 mm w.c.
Pressure Unit					IN PA MM		Inches water column Pascal Millimeters water column
Options						A481 COM FC FP GLD LCD NIST STX TT WO	Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1m) of PVC tubing BACnet/Modbus® communications Factory calibration certificate Filtered pickup with barb Liquid tight cable gland fitting Liquid crystal display NIST traceable calibration certificate Two (2) plastic static pressure tips Toolless terminal block LCD cover without LCD display

ACCESSORIES

Model	Description
A-480	Plastic static pressure tip
A-481	Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-MSX-LCD	Replacement display for the Series MSX

Modbus® is a registered trademark of Schneider Electric USA, Inc.

SINCE 1945 KEYSTONE LIGHT MADE EASY®

ESSENTIAL SERIES
GENERAL PURPOSE LED BULBS

KT-LED14A19-O-8XX-ND-CS
REPLACEMENT LAMP

DESCRIPTION
14W A19 Lamp | 2700–5000K | ≤80 CRI | Omni-Directional

RoHS Compliant | 3 YEAR WARRANTY

- **LAMP TYPE:** A19
- **BASE TYPE:** E26 (Medium)
- **WATTAGE:** 14W
- **COLOR TEMPERATURE:** 2700–5000K
- **COLOR RENDERING INDEX (CRI):** ≤80
- **WARRANTY:** 3 Years
- **RATED LIFE:** L70 (11,000 Hours)

TYPICAL APPLICATIONS
- Table, Desk, and Floor Lamps
- Wall Sconces
- Surface Mount Ceiling Fixtures
- General Lighting
- Pendant Lights

PRODUCT FEATURES
- Energy Efficient, 80%+ Energy Savings over Legacy Equivalents
- Lower Heat Generation than Legacy Equivalents
- PF >0.50
- Complies with Part 15 of FCC
- Durable Plastic housing lowers the risk for breakage
- ANSI compliant construction ensures fitment for intended applications
- Operating temperature range –4°F/–20°C to 95°F/35°C
- Long Life minimizes replacement and maintenance costs
- UL Listed
- Smooth diffused lens for comfortable glare free performance
- Rated for open, recessed, and enclosed fixtures
- Non-dimming
- Suitable for damp locations

ELECTRICAL AND PERFORMANCE SPECIFICATIONS

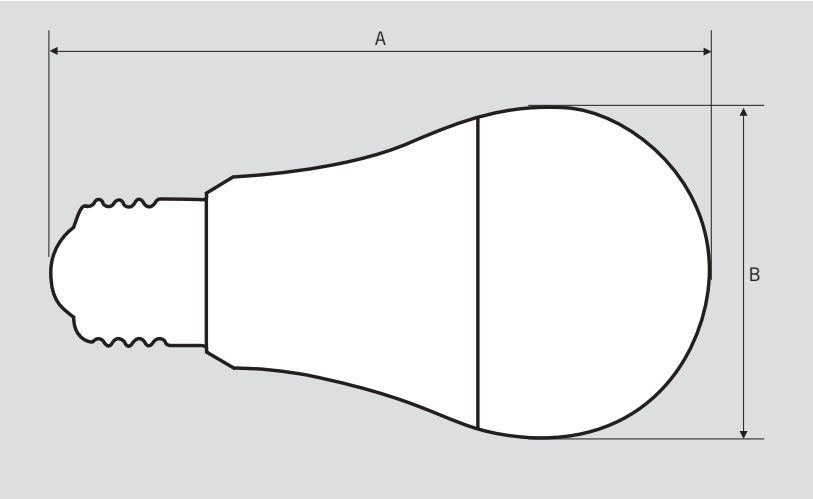
Keystone Catalog Number	Description	Color Temp	Input Voltage	Rated Lamp Wattage	Legacy Equivalent Wattage	Base Type	Lumens	CRI	Beam Angle	Dimmable	Efficacy
KT-LED14A19-O-827-ND-CS	A19 bulb. Omni-Directional, non-dimmable	2700K	120V	14W	100W	E26	1500	≤80	200°	No	114 lm/W
KT-LED14A19-O-830-ND-CS	A19 bulb. Omni-Directional, non-dimmable	3000K	120V	14W	100W	E26	1500	≤80	200°	No	114 lm/W
KT-LED14A19-O-835-ND-CS	A19 bulb. Omni-Directional, non-dimmable	3500K	120V	14W	100W	E26	1500	≤80	200°	No	114 lm/W
KT-LED14A19-O-840-ND-CS	A19 bulb. Omni-Directional, non-dimmable	4000K	120V	14W	100W	E26	1500	≤80	200°	No	114 lm/W
KT-LED14A19-O-850-ND-CS	A19 bulb. Omni-Directional, non-dimmable	5000K	120V	14W	100W	E26	1500	≤80	200°	No	114 lm/W

KEYSTONE SINCE 1945 LIGHT MADE EASY®

ESSENTIAL SERIES
GENERAL PURPOSE LED BULBS

KT-LED14A19-O-8XX-ND-CS
REPLACEMENT LAMP

PHYSICAL CHARACTERISTICS



PACKAGING

Carton Quantity	60 pcs
Carton Dimensions	24.61" × 14.76" × 5.31"
Carton Weight	9.74 lbs

LAMP DIMENSIONS

A (Length)	4.57"
B (Diameter)	2.36"

BASE TYPE: E26 (Medium)

ORDERING INFORMATION

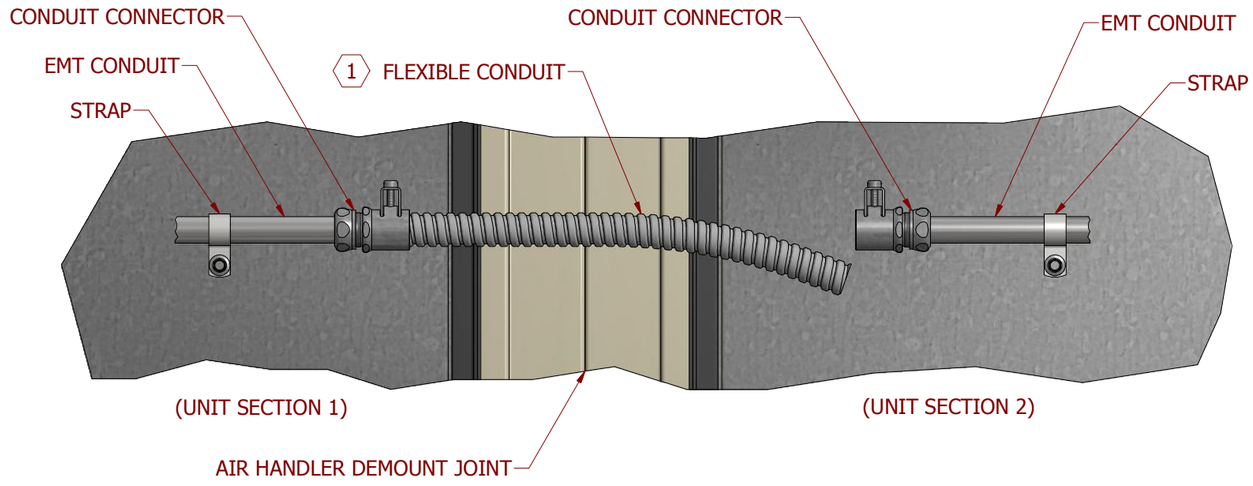
CATALOG NUMBER	CARTON QUANTITY	EASY CODE	UPC
KT-LED14A19-O-827-ND-CS	60 pcs	VDT-15	843654130095
KT-LED14A19-O-830-ND-CS	60 pcs	NVC-18	843654130101
KT-LED14A19-O-835-ND-CS	60 pcs	UIP-05	843654130118
KT-LED14A19-O-840-ND-CS	60 pcs	DZA-55	843654130125
KT-LED14A19-O-850-ND-CS	60 pcs	SPB-77	843654130132

CATALOG NUMBER BREAKDOWN

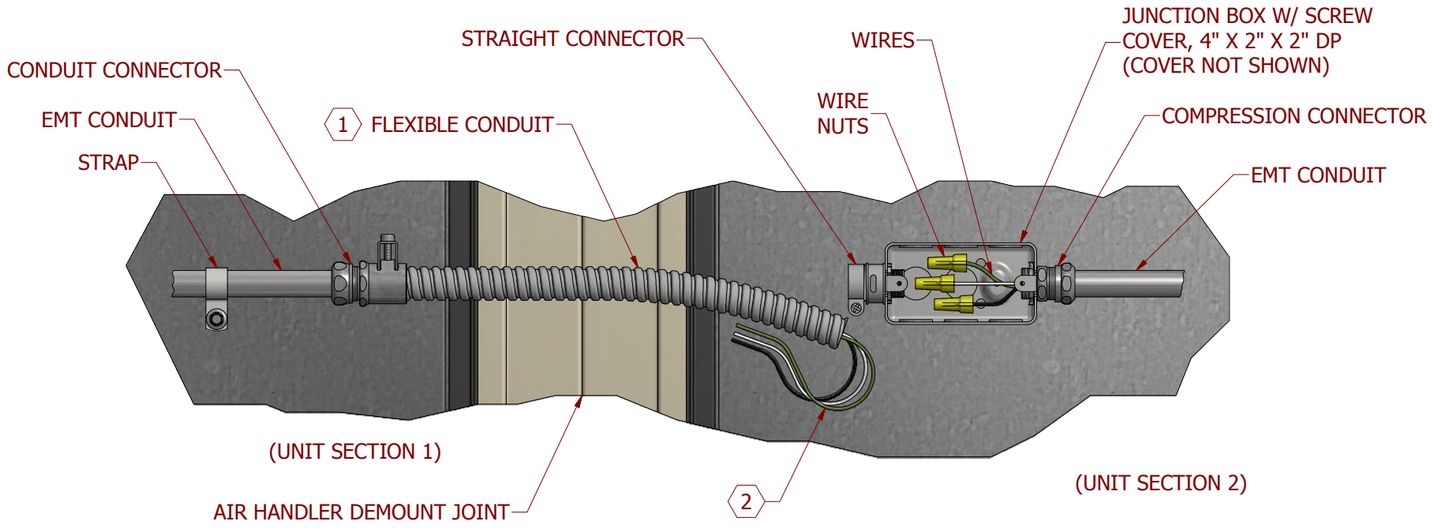
KT-LED14A19-O-8XX-ND-CS

1 2 3 4 5 6 7 8 9

1 **Keystone Technologies**
2 **LED Lamp**
3 **Wattage**
4 **Lamp Shape**
5 **Omni-Directional**
6 **800 Series**
7 **Color Temperature**
8 **Non Dimming**
9 **Contractor Series**



EMPTY CONDUIT RUN DETAIL
CONDUIT 1/2" DIA



WIRE SPLIT DETAIL
120VAC / ≤ 16A
CONDUIT 1/2" DIA

INSTALLATION INSTRUCTIONS:

1. FOR SHIPPING PURPOSES, FLEXIBLE METAL CONDUIT MAY HAVE BEEN SECURED TO UNIT CASING WITH A CONDUIT STRAP. REMOVE AND DISCARD STRAP TO FREE CONDUIT.
2. REMOVE ELECTRICAL TAPE, CUT WIRES TO LENGTH NEEDED AND STRIP INSULATION 1/2 INCH.
3. REMOVE ELECTRICAL TAPE, CUT WIRES TO LENGTH NEEDED AND STRIP INSULATION 3/8 INCH.
4. REMOVE ELECTRICAL TAPE, CUT WIRES TO LENGTH NEEDED AND STRIP INSULATION PER TABLE.
5. IF WIRE CONNECTOR IS "IT" MODEL, REMOVE RUBBER PLUGS TO ACCESS SET SCREWS. ONCE WIRE IS INSERTED, TORQUE SET SCREW PER TABLE. INSTALL RUBBER ACCESS PLUGS AND SECURE WITH ELECTRICAL TAPE (SEE CONNECTOR TORQUE CHART).

5 CONNECTOR TORQUE (INCH-POUND)

CONNECTOR MODEL		IT-4	IT-1/0	IT-3/0	IT-250
4 WIRE STRIP LENGTH		11/16"	7/8"	1"	1-1/4"
WIRE SIZES	#14 - #10	35	35	---	---
	#8	40	75	---	---
	#6 - #4	45	110	110	110
	#1 - #3	---	150	150	150
	1/0	---	180	180	180
	2/0	---	---	180	180
	3/0	---	---	250	250
	4/0	---	---	---	250
	250	---	---	---	360

WIRES MUST BE TORQUED AND INSULATION STRIPPED AS SHOWN. WIRE INSULATION ON A PROPERLY INSTALLED WIRE MUST BE INSIDE INSULATED CONNECTOR CONDUCTOR PORT NO LESS THAN 3/8 INCH. INSTALL ACCESS PLUGS AND SECURE PLUGS WITH AT LEAST TWO WRAPS OF ELECTRICAL TAPE ACROSS PLUGS AND AROUND CONNECTOR BODY.

NOTES:

TRADES DOING INSTALLATION OR RE-CONNECTIONS SHALL BE IN COMPLIANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS. FOR FURTHER INFORMATION, PLEASE CONTACT LOCAL AUTHORITIES FOR CLARIFICATION AND REQUIREMENTS WHERE EQUIPMENT IS TO BE INSTALLED AND OPERATED.

REV	ECN #	DESCRIPTION	BY	APPVD	DATE
-					

REVISION HISTORY

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
	FLAT	FINISHED
.X = ±.05	.X = ± .031	± .125
.XX = ±.01	.XX = ± .015	± .093
.XXX = ±.005	.XXX = ± .005	± .060
ANGLES = ±1°		

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS
File Saved: 08:54:01 11/11/2016

NORTEK AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	9/2/2016
CHECKED:	WHEM	11/11/2016
APPROVED:	KRIM	11/17/2016

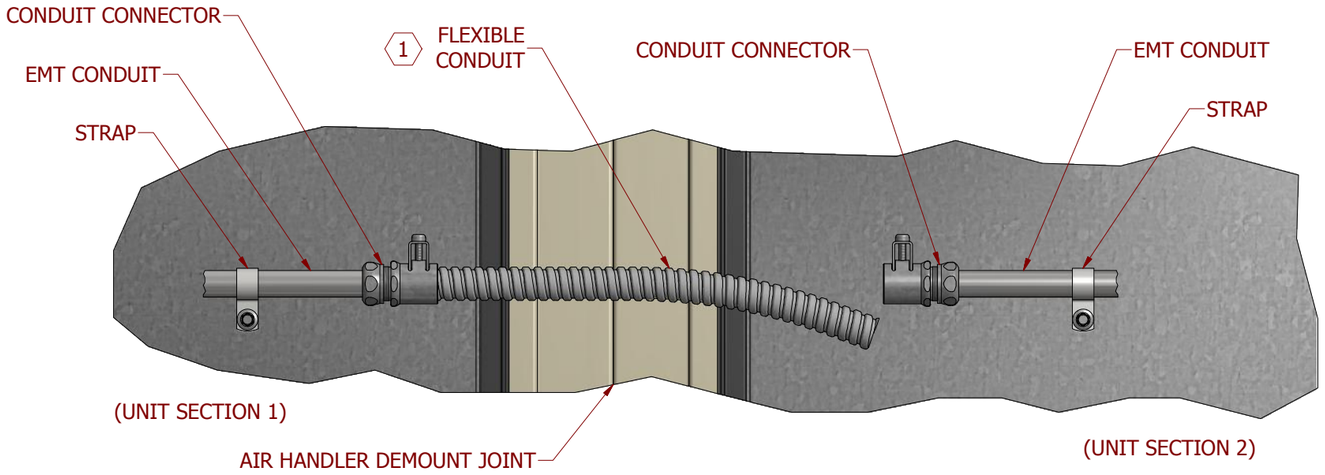
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING | SCALE: 1/4 | SHEET SIZE: B | DRAWING NO. 251.00013 | SHEET: 1 OF 5 | REV: -

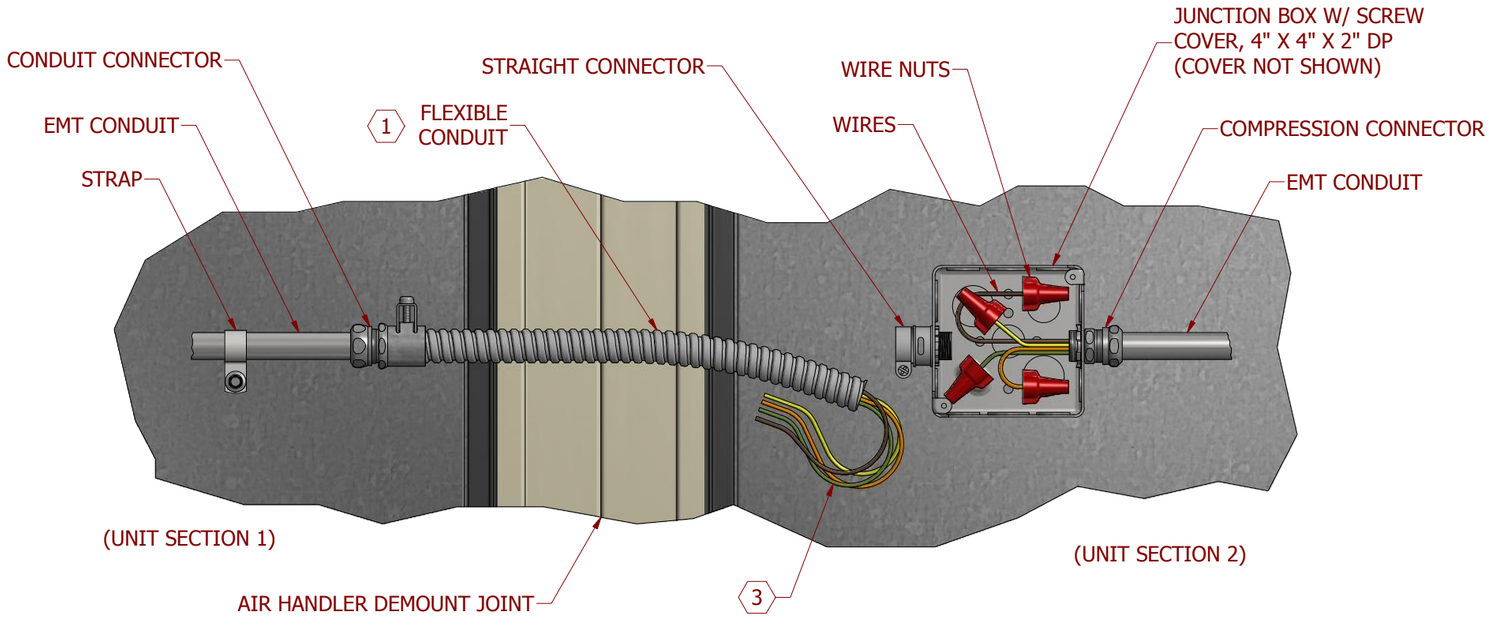
INST. DEMOUNTED ELECT. CONNECTIONS	250.00078
DESCRIPTION	NUMBER
DOCUMENT REFERENCE	

TITLE:

INSTALLATION, DEMOUNTED ELECTRICAL CONNECTIONS



EMPTY CONDUIT RUN DETAIL
CONDUIT 1/2" DIA



WIRE SPLIT DETAIL
208-230-460VAC / ≤ 24A
CONDUIT 1/2" DIA

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
	FLAT	FINISHED
.X = ±.05	.X = ± .031	± .125
.XX = ±.01	.XX = ± .015	± .093
.XXX = ±.005	.XXX = ± .005	± .060
ANGLES = ±1°		

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS
File Saved: 08:54:01 11/11/2016

NORTEK™ AIR SOLUTIONS
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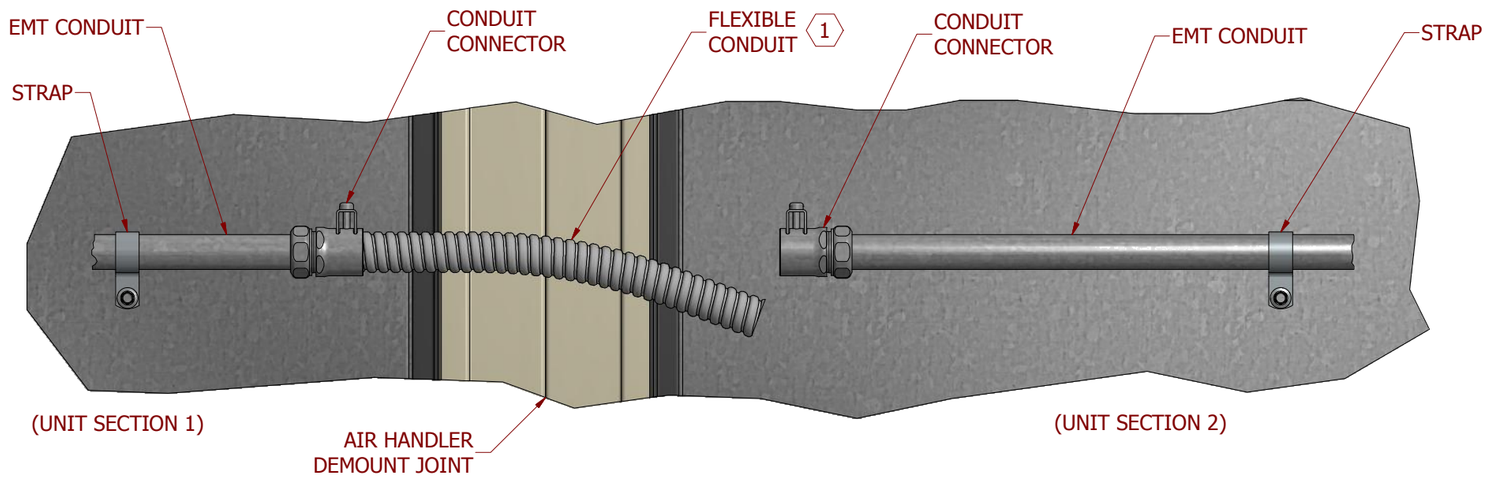
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	9/2/2016
CHECKED:	WHEM	11/11/2016
APPROVED:	KRIM	11/17/2016

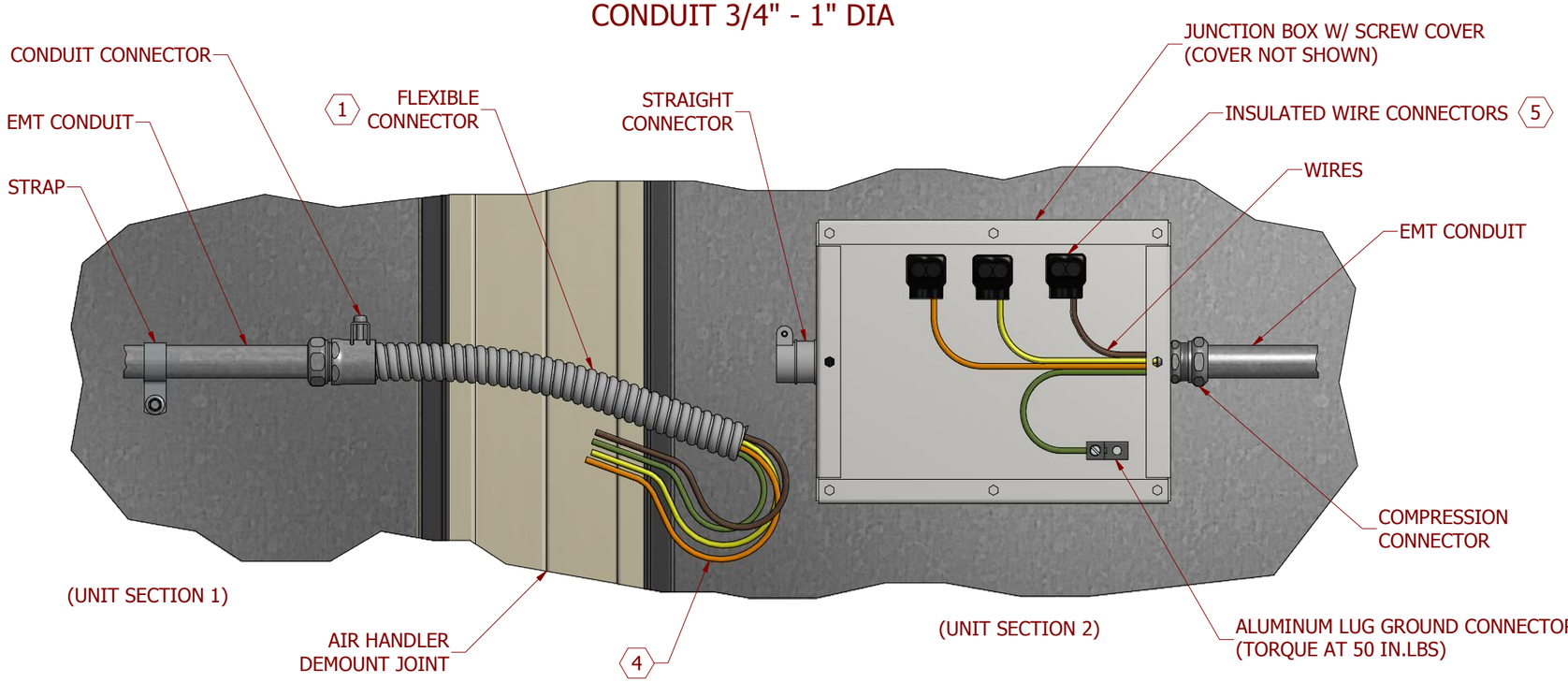
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING | SCALE: 1/4 | SHEET SIZE: B | DRAWING NO. 251.00013 | SHEET: 2 OF 5 | REV: -

TITLE: INSTALLATION, DEMOUNTED ELECTRICAL CONNECTIONS



EMPTY CONDUIT RUN DETAIL
CONDUIT 3/4" - 1" DIA



WIRE SPLIT DETAIL
208-230-460VAC / 25A-68A
CONDUIT 3/4" - 1" DIA

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
	FLAT	FINISHED
.X = ±.05	.X = ± .031	± .125
.XX = ±.01	.XX = ± .015	± .093
.XXX = ±.005	.XXX = ± .005	± .060
ANGLES = ±1°		

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS
File Saved: 08:54:01 11/11/2016

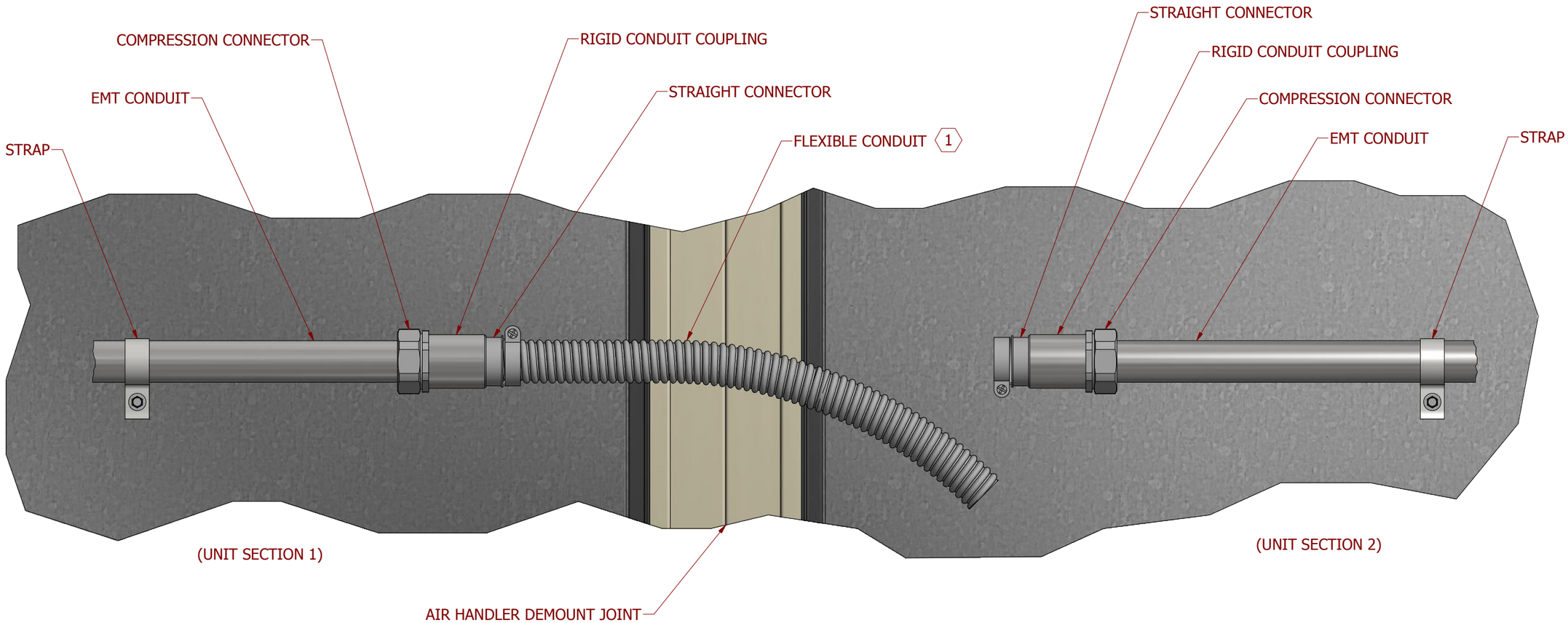
NORTEK AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	9/2/2016
CHECKED:	WHEM	11/11/2016
APPROVED:	KRIM	11/17/2016

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING | SCALE: 1/4 | SHEET SIZE: B | DRAWING NO. 251.00013 | SHEET: 3 OF 5 | REV: -

TITLE: INSTALLATION, DEMOUNTED ELECTRICAL CONNECTIONS



EMPTY CONDUIT RUN DETAIL
CONDUIT ≥ 1-1/4" DIA

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
	FLAT	FINISHED
.X = ±.05	.X = ± .031	± .125
.XX = ±.01	.XX = ± .015	± .093
.XXX = ±.005	.XXX = ± .005	± .060
ANGLES = ±1°		

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS
File Saved: 08:54:01 11/11/2016

NORTEK™ AIR SOLUTIONS
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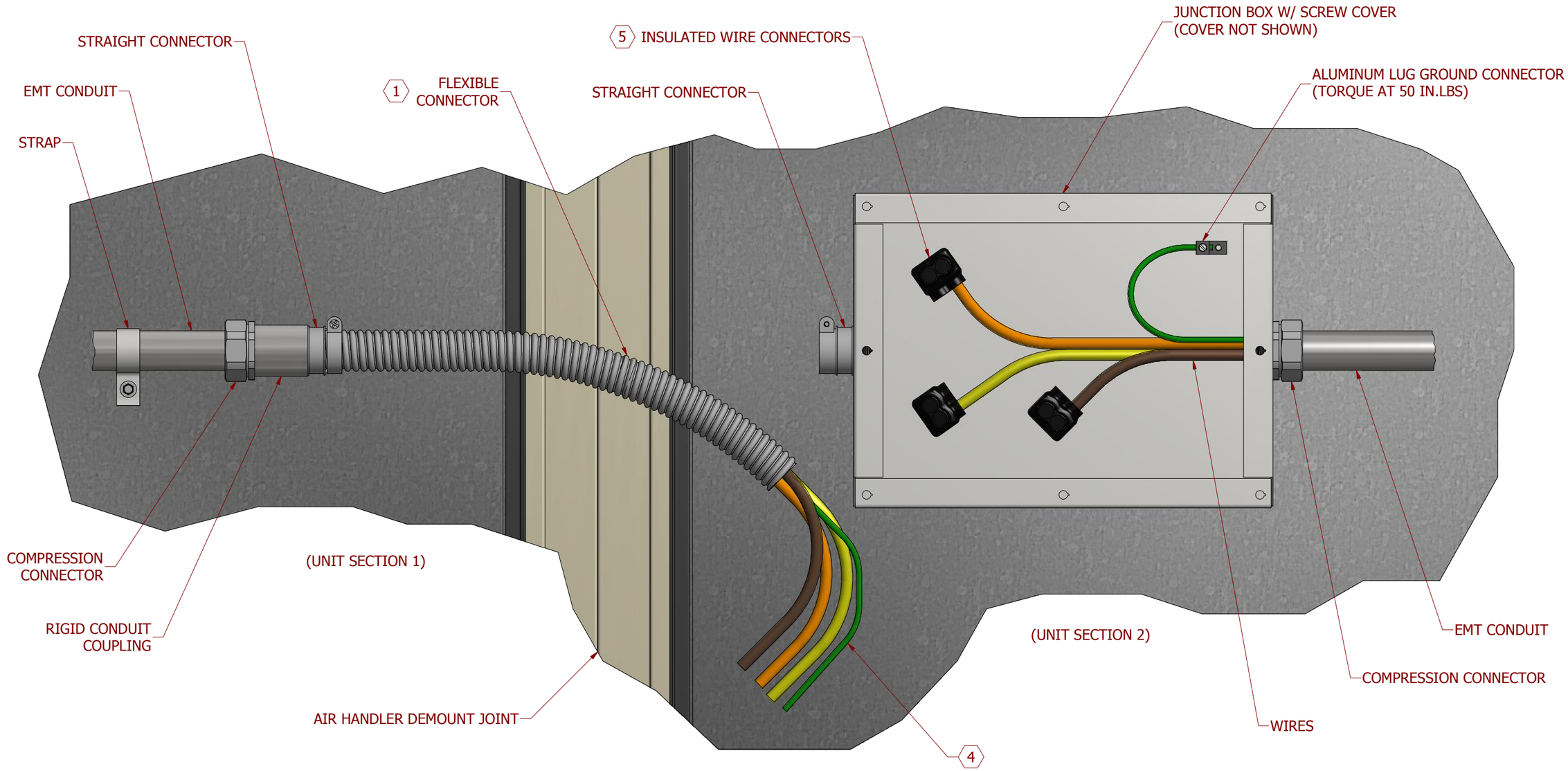
	BY	DATE
DRAWN:	REYJ	9/2/2016
CHECKED:	WHEM	11/11/2016
APPROVED:	KRIM	11/17/2016

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING | SCALE: 1/4 | SHEET SIZE: B | DRAWING NO. 251.00013 | SHEET: 4 OF 5 | REV: -

TITLE: INSTALLATION, DEMOUNTED ELECTRICAL CONNECTIONS



WIRE SPLIT DETAIL
208-230-460VAC / ≥ 69A
CONDUIT ≥ 1-1/4" DIA

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
BENDS UTILIZE STANDARD BEND ALLOWANCE
TOLERANCES PER BELOW

MECHANICAL	SHEET METAL	
	FLAT	FINISHED
.X = ±.05	.X = ± .031	± .125
.XX = ±.01	.XX = ± .015	± .093
.XXX = ±.005	.XXX = ± .005	± .060
ANGLES = ±1°		

FRACTIONS = ± 1/32" ANGLES = ± 1°
125 √ SURFACE FINISH BREAK ALL SHARP CORNERS
File Saved: 08:54:01 11/11/2016

NORTEK™ AIR SOLUTIONS
Temtrol GOVERNAIR Ventrol
106 N. INDUSTRIAL BLVD. OKARCHE, OK 73762
PH: (405) 263-7286 FAX: (405) 263-4924

	BY	DATE
DRAWN:	REYJ	9/2/2016
CHECKED:	WHEM	11/11/2016
APPROVED:	KRIM	11/17/2016

THIRD ANGLE PROJECTION

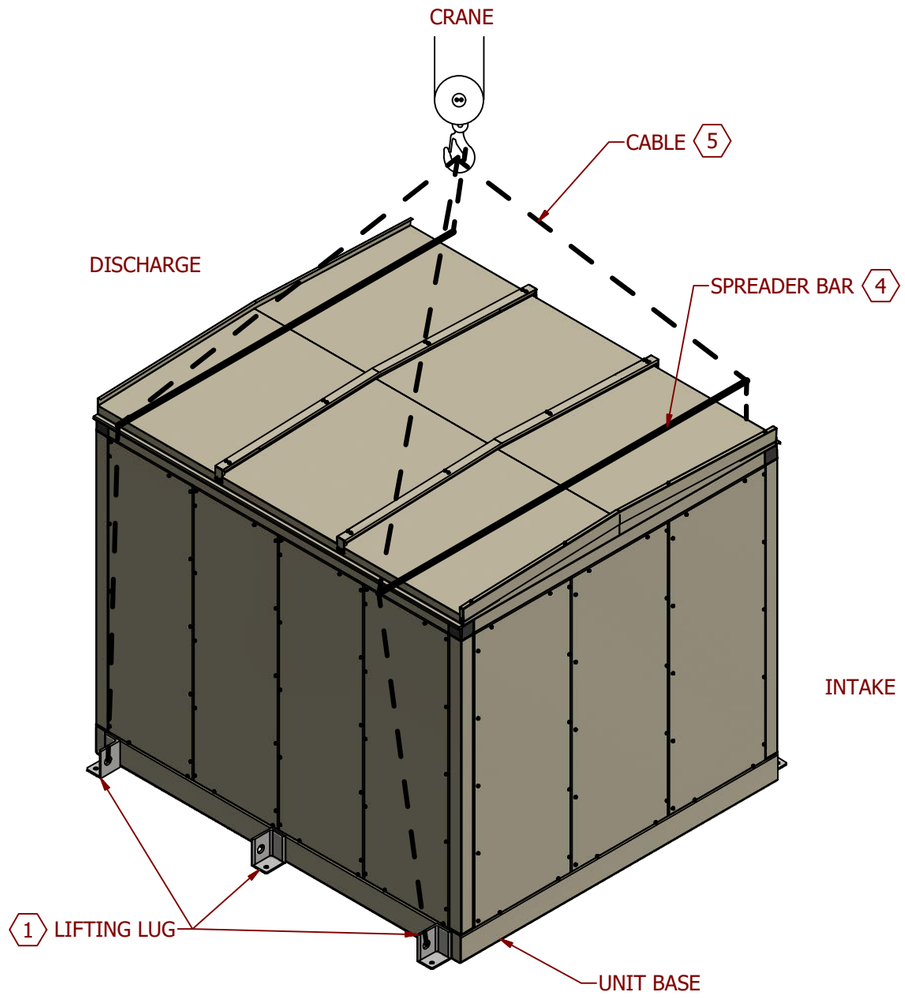
TITLE: INSTALLATION, DEMOUNTED ELECTRICAL CONNECTIONS

DO NOT SCALE DRAWING	SCALE: 1/4	SHEET SIZE: B	DRAWING NO. 251.00013	SHEET: 5 OF 5	REV: -

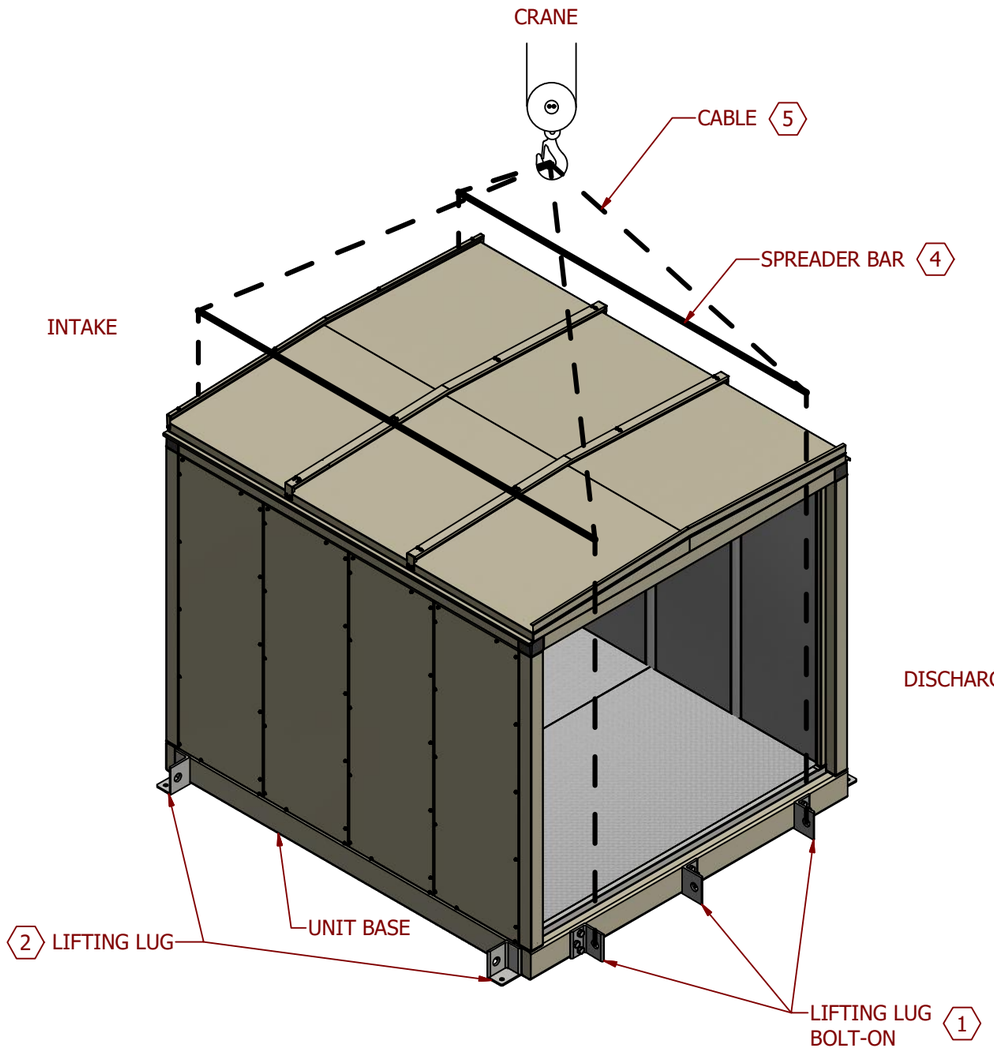
NORTEK AIR SOLUTIONS TEMTROL

PROJECT	UCA Snow Fine Arts
SALES ORDER #	N003312
QUOTE #	23-1950

Lifting and Rigging



SINGLE SECTION ≤ 140" WIDE



SINGLE SECTION > 140" WIDE

1. ALL LIFTING LUGS MUST BE USED WHEN RIGGING/LIFTING UNIT.
   CENTER LUG IS ONLY PRESENT WHEN DISTANCE BETWEEN LUGS BECOME GREATER THAN 144"
2. LIFTING LUGS FOR SECTION JOINING ONLY. NOT TO BE USED TO LIFT SECTION
3. CABLE TENSION/LEVELING MAY REQUIRE USE OF CHAIN FALL EQUIPMENT (FURNISHED BY OTHERS IN THE FIELD).
4. LOAD SPREADING EQUIPMENT (FURNISHED BY OTHERS IN THE FIELD) REQUIRED TO PREVENT UNIT CASING DAMAGE.
5. CAUTION: TO PREVENT DAMAGE, CABLE/CHAINS MUST NOT CONTACT DOOR HANDLES, ELECTRICAL PANELS, FILTER GAUGES, HOODS, ETC.
6. DOCUMENT PREVIOUSLY RELEASED AS 221.00251

MATERIAL NO.:

MATERIAL:

UNLESS OTHERWISE NOTED:
DIMENSIONS ARE IN INCHES
.X = ±0.1
.XX = ±0.03
.XXX = ±0.010
(.XX) = REFERENCE
FRACTIONS = ± 1/32"
ANGLES = ± 0.5°

NORTEK AIR SOLUTIONS™
106 N. INDUSTRIAL BLVD.
OKARCHE, OK 73762
PH: (405) 263-7286

	BY	DATE
DRAWN:	STOT	5/1/2017
CHECKED:	WHEM	5/15/2017
APPROVED:	KRIM	5/24/2017

THIRD ANGLE PROJECTION

DRAWING NOT TO SCALE

TITLE: DETAIL
LIFTING AND RIGGING, UNIT

PART NO.

SHEET SIZE:	DRAWING NO.	SHEET:	REV:
B	45-000017456	1 OF 1	C