

U.S. Army Corps of Engineers (USACE) TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE For use of this form, see ER 415-1-0; the proponent agency is CECW-CE	DATE 11/9/2022	TRANSMITTAL NO. 23 30 00-1.1
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SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO: 81st RSC Geographic District ROs 69A Hagood Avenue Charleston, SC 29403-5107	FROM: TEAM CONSTRUCTION 825 Gum Branch Rd. STE 128 JACKSONVILLE NC 28540-6312 USA	CONTRACT NO. W912HP21D6006 W912HP22F1176	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input checked="" type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL 23 30 00-1
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SPECIFICATION SEC. NO. (Covers only one section with each transmittal) 23 30 00-HVAC Air Distribution	PROJECT TITLE AND LOCATION 01 FY22 81st NC026 HEP Reset; W'ville, NC, Winterville, NC	THIS TRANSMITTAL IS FOR: (Check one) <input type="checkbox"/> FIO <input checked="" type="checkbox"/> GA <input type="checkbox"/> DA <input type="checkbox"/> CR <input type="checkbox"/> DA/CR <input type="checkbox"/> DA/GA
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ITEM NO. <small>(See Note 3)</small>	DESCRIPTION OF SUBMITTAL ITEM <small>(Type size, model number/etc)</small>	SUBMITTAL TYPE CODE <small>(See Note 8)</small>	NO. OF COPIES	CONTRACT DOCUMENT REFERENCE		CONTRACTOR REVIEW CODE	VARIATION <small>Enter "Y" if requesting a variation (See Note 6)</small>	USACE ACTION CODE <small>(Note 9)</small>
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.
18	Air Handling Units	03 - PRODUCT	1	2.10		A	No	

REMARKS	I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.		
	<table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;">NAME OF CONTRACTOR</td> <td style="width:50%; border: none;">SIGNATURE OF CONTRACTOR</td> </tr> </table>	NAME OF CONTRACTOR	SIGNATURE OF CONTRACTOR
NAME OF CONTRACTOR	SIGNATURE OF CONTRACTOR		

SECTION II - APPROVAL ACTION			
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ENCLOSURES RETURNED (List by Item No.)	NAME AND TITLE OF APPROVING AUTHORITY	SIGNATURE OF APPROVING AUTHORITY	DATE
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CROMWELL

SUBMITTAL REVIEW FORM

1300 EAST 6TH STREET
LITTLE ROCK, AR 72202
PHONE: 501-372-2900
FAX: 501-372-0482

Reviewing is only for conformance with the design concepts of the Project and compliance with the information given in the contract documents. The Contractor is responsible for dimensions to be confirmed or correlated at the site; for information that pertains solely to the fabrication process, or to the means, methods, techniques, sequences, and procedures of construction; and for coordination of the work of all other trades

JOB TITLE: 81st RSC Reset NC026 Winterville NC
JOB NO: 2020-147
SUBMITTAL NO: 233000-1.1 – HVAC Air
Distribution
BY: CRB
DATE: 11/29/22

Item No.	Description (See contractor transmittal for corresponding description)	No Exception Taken	Make Corrections Noted	Revise and Resubmit	Not Accepted	Comments
						Review of Team Construction Transmittal No. 23 30 00-1.1 dated 11/9/2022. This is a resubmittal.
	Item No. 18: Air Handling Units					Update: No resubmittal is required for “Make Correction Noted” items.
1	AH-01		X			<ul style="list-style-type: none"> • Provide minimum 18-gauge interior liner and floor. Update: Submitted gauge is acceptable per the specifications. • Submitted unit exceeds BOD unit length by 16”. Contractor shall verify additional length will not cause an issue with installation. Largest section must fit through the louver. Update: Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment. Resubmittal not required unless M.C. states unit will not work.

	AH-01 (Continued)					<ul style="list-style-type: none"> Submitted unit exceeds the maximum height indicated in Detail 1/M-501. Resubmit unit with maximum height or less. Update: Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment. Resubmittal not required unless M.C. states unit will not work. Provide a discharge opening closer to the BOD. The submitted opening will make for a difficult transition in a limited amount of space. Update: Revised discharge is acceptable. See "General Comments" below for more resubmittal requirements.
-	CC-AH01	X				<ul style="list-style-type: none"> Submitted flow (211.9 vs 208.0) is acceptable.
-	HC-AH01	X				<ul style="list-style-type: none"> Submitted WPD exceeds scheduled maximum WPD (1.9 vs. 0.7) but is acceptable.
2	AH-03				X	<ul style="list-style-type: none"> Provide minimum 18-gauge interior liner and floor. Update: Submitted gauge is acceptable per the specifications. Submitted unit exceeds BOD unit length by 17". Contractor shall verify additional length will not cause an issue with installation. Update: Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment. If possible, provide a discharge opening closer to the BOD to make for a better transition. Update: Revised discharge is acceptable. See "General Comments" below for more resubmittal requirements.
-	CC-AH03	X				<ul style="list-style-type: none"> Submitted flow (64.5 vs 62.1) is acceptable.
-	HC-AH03	X				<ul style="list-style-type: none"> Submitted WPD exceeds scheduled maximum WPD (0.8 v 0.2) but is acceptable.

3	DOAS-01		X			<ul style="list-style-type: none"> • Provide minimum 18-gauge interior liner and floor. Update: Submitted gauge is acceptable per the specifications. • Submitted fan greatly exceeds scheduled input power at design point (2.15 kW vs. 1.61). The submitted fan curve is not acceptable. Change fan type. Update: Re-submitted fan is acceptable. Coordinate electrical requirements with the Electrical Contractor (E.C.). • Why provide a smoke damper? Submit with standard low leakage damper. Update: Re-submitted Class 1A damper is acceptable. • Submitted unit greatly exceeds BOD unit length by 54" and will change the location of many connection points. Careful coordination with the Contractor will be required. Update: Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment. Revised discharge opening is acceptable.
-	CC-DOAS01		X			<ul style="list-style-type: none"> • Submitted coil greatly exceeds maximum APD (0.91" vs. 0.81"). Reselect coil with lower APD. Update: Re-submitted coil is acceptable. DOAS-01 still meets the ESP requirement taking into account the additional 0.21" pressure drop (actual scheduled APD is 0.60).
-	HC-DOAS01A		X			<ul style="list-style-type: none"> • Submitted coil is within tolerances, Higher WPD is acceptable.
-	HC-DOAS01B		X			<ul style="list-style-type: none"> • Submitted coil is within tolerances.
4	ERV-01_Coils		X			<ul style="list-style-type: none"> • Assembly length appears to be excessive. While a limit was not specified, the BOD is less than 36" vs. the 62" submitted. Update: Re-submitted assembly is still larger than the BOD, but is acceptable if M.C. agrees. Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment.
-	CCERV01		X			<ul style="list-style-type: none"> • APD is too high (0.58" vs. 0.29"). Resubmit. Update: Re-submitted performance is acceptable.

-	HCERV01	X				<ul style="list-style-type: none"> • APD is too high (0.22" vs. 0.1"). Resubmit. Update: Re-submitted performance is acceptable.
5	ERV-02_Coils		X			<ul style="list-style-type: none"> • Assembly length appears to be excessive. While a limit was not specified, the BOD is less than 36" vs. the 62" submitted. Update: Re-submitted assembly is still larger than the BOD, but is acceptable if M.C. agrees. Equipment provider has requested that the Mechanical Contractor (M.C.) verify fitment.
-	CCERV02		X			<ul style="list-style-type: none"> • APD is too high (0.69" vs. 0.0.27"). Resubmit. Update: Re-submitted APD is acceptable. Cooling performance and CHW flow exceed scheduled values. Reduce CHW flow to meet scheduled performance.
-	HCERV02	X				<ul style="list-style-type: none"> • APD is too high (0.22" vs. 0.1"). Resubmit. Update: Re-submitted performance is acceptable.
6	FCU-09			X		<ul style="list-style-type: none"> • Submitted fan greatly exceeds scheduled input power at design point (3.15 BHP vs. 1.81). Change fan type. Update: Resubmitted fan is acceptable. Coordinate electrical requirements with the E.C. • Chilled water coil WPD is acceptable.

	FCU-09 (Continued)			X		<ul style="list-style-type: none"> Submitted unit greatly exceeds BOD unit length by 54" and height by 25". Submit a unit closer in dimensions to the BOD to reduce conflicts and Contractor redesign. Update: Re-submitted unit length (109") is still much larger than the BOD length (55-1/8"), and height is still 25-1/4" taller. Refer to detail 3/M-501. Enlarged plan 3/M-401 already shows the length too short by 18" (filter section is missing) which will already require moving the return duct 18" from where it is currently located; the submitted unit will move it 72" from where it is shown. To submittal in its current form will require prior approval from the M.C. and a sketch indicating how everything will be rearranged to make it work.
7	General Comments – All Air Handling Units			X		<ul style="list-style-type: none"> Submit that filters shall be UL900 Listed, Class I or Class II. Update: Filters are acceptable. Submit that dampers are Leakage Class 1A. Update: Submitter states the dampers will be Class 1A. Submit VFDs with manual bypasses. Update: A bypass is a requirement of the USACE reviewer. Provide two VFDs, each with a bypass. Submit Base Rail gauge (10 ga. Minimum required). Update: Submitter statement that base rails meet the minimum gauge requirement to support the entire unit weight is acceptable. Submit case leakage rate for all units. Update: Submitted leakage rates are acceptable.



SUBMITTAL DATA SHEET

To:

Project:

Architect:

Engineer:

Product:


Supplier:

Spec Section:

Drawing:

Submittal Notes:

APPROVAL STAMPS

<p>East Bound Mechanical 3195-B Airport Blvd. Wilson, NC 27896</p>  <p>Reviewed - Furnish Pending A/E Approval/Review</p> <p>Notes Indicated</p> <p>Resubmittal - See Comments</p> <p>Reviewed By:</p> <p>Date:</p> <p>Review of this drawing and or data does not indicate approval of variations to the contract documents or coordination with other trades as may be required.</p>	<p>General Contractor</p>	<p>Architect/Engineer</p>
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SUBMITTAL FOR APPROVAL

PROJECT: NC026 Army Reserve Center Reset

LOCATION: Winterville, NC



AIR HANDLING UNITS

EQUIPMENT	Johnson Controls Solution XTI AHUs
UNIT TAGS	AH-01, AH-03, DOAS-01, ERV-01_COILS, ERV-02_COILS, FCU-09
QUANTITY	6

SOLD TO:
Eastbound Mechanical

ENGINEER:
Cromwell

PREPARED BY: JOHNSON
CONTROLS, INC.
Michael Trimberger
919-215-5426

DATE:
11/08/2022

REVISION:
02



Response to Comments REV 01

JOB: NC026 Army Reserve Center Reset

JCI responses are in red to Cromwell engineering comments in black.

1. AH-01

- Provide minimum 18-gauge interior liner and floor.
Per spec. section 23 30 00 2.10.1.1.a., the inner liner of the units are provided with 20 gauge galvanized steel, and the exterior liner is provided with 18 gauge galvanized steel.
- Submitted unit exceeds BOD unit length by 16". Contractor shall verify additional length will not cause an issue with installation. Largest section must fit through the louver.
Per drawing M-401, Detail 3, the submitted unit length of 224" looks to fit on the existing pad. AH-01 will ship in 3 sections using the 2 included shipping splits. JCI has confirmed the splits provided will allow the unit to be installed through the L-10 louver opening.

Mechanical contractor to confirm fitment and the installation path before release.
- Submitted unit exceeds the maximum height indicated in Detail 1/M-501. Resubmit unit with maximum height or less.
BOD AH-01 on Drawing M-501, Detail 1 is shown as 80" tall. JCI submitted unit is 84" tall.

Mechanical contractor to confirm the additional 4" of height does not affect the mechanical space.
- Provide a discharge opening closer to the BOD. The submitted opening will make for a difficult transition in a limited amount of space.
JCI has matched the BOD opening as shown on Drawing M-501, Detail 1. The new discharge opening is 84" wide by 32" long, and fan performance has been updated per the new discharge opening size.

- See “General Comments” below for more resubmittal requirements.
Noted.

CC-AH-01

- Submitted flow (211.9 vs 208.0) is acceptable.
Engineer has no exception.

HC-AH-01

- Submitted WPD exceeds scheduled maximum WPD (1.9 vs. 0.7) but is acceptable.
Engineer has no exception.

2. AH-03

- Provide minimum 18-gauge interior liner and floor.
Please see the response to this comment above in the AH-01 section.
- Submitted unit exceeds BOD unit length by 17”. Contractor shall verify additional length will not cause an issue with installation.
Per drawing M-401, Detail 2, the submitted unit length of 190” looks to fit on the existing pad. AH-03 will ship in 4 sections using the 3 included shipping splits. JCI has confirmed the splits provided will allow the unit to be installed through the width of the Mechanical Room 194 double doors.

Mechanical contractor to confirm fitment and the installation path before release.

- If possible, provide a discharge opening closer to the BOD to make for a better transition.
Per drawing M-501, Detail 4, the BOD discharge opening is roughly 40” wide by 22” long. The selection has been adjusted to these dimensions, and fan performance has been updated per the new discharge opening size.
- See “General Comments” below for more resubmittal requirements.
Noted.

CC-AH-03

- Submitted flow (64.5 vs 62.1) is acceptable.
Engineer has no exception.

HC-AH-03

- Submitted WPD exceeds scheduled maximum WPD (0.8 v 0.2) but is acceptable.
Engineer has no exception.

3. DOAS-01

- Provide minimum 18-gauge interior liner and floor.
Please see the response to this comment above in the AH-01 section.

- Submitted fan greatly exceeds scheduled input power at design point (2.15 kW vs. 1.61). The submitted fan curve is not acceptable. Change fan type.

Fan selection and fan curve have been updated. The BOD unit is selected with an EC motor. JCI is providing a direct drive motor/fan with VFD. EC motors have extended lead times of over 1 year. The new circuitry for DOAS-01 as shown on Drawing E-601 has a 20A fused circuit. As shown on the submitted performance report, the fan selection has a MOCP of 12A. The provided circuit has the input capability to power the submitted fan.

- Why provide a smoke damper? Submit with standard low leakage damper.

JCI updated the selection to a standard control, ultra-low leak, aluminum, parallel damper without an actuator or end switch.

- Submitted unit greatly exceeds BOD unit length by 54” and will change the location of many connection points. Careful coordination with the Contractor will be required.

Per drawing M-401, Detail 1, the submitted unit length of 227” looks to fit on the existing pad. DOAS-01 will ship in 2 sections using the 1 included shipping split. JCI has updated the base rail height from 6” to 4”. JCI has confirmed the splits and base rail provided will allow the unit to be installed through the L-04 louver.

Mechanical contractor to confirm fitment and the installation path before release.

Per drawing M-501, Detail 2, the BOD discharge opening is roughly 22” wide by 16” long. The selection has been adjusted to these dimensions, and fan performance has been updated per the new discharge opening size.

CC-DOAS-01

- Submitted coil greatly exceeds maximum APD (0.91” vs. 0.81”). Reselect coil with lower APD.
The coil has been reselected with an APD of 0.82”. Please review updated coil performance. The coil meets all leaving air conditions.

HC-DOAS-01A

- Submitted coil is within tolerances, Higher WPD is acceptable.
Engineer has no exception.

HC-DOAS-01B

- Submitted coil is within tolerances.
Engineer has no exception.

4. ERV-01 Coils

- Assembly length appears to be excessive. While a limit was not specified, the BOD is less than 36” vs. the 62” submitted.
JCI has reduced the overall unit length by reducing the access segment with door to 12”, and updating the cooling coil selection.

Before release, contractor to confirm the fitment and installation path of the submitted ERV-01_Coils unit. This unit ships in (1) 48” length.

CC-ERV-01

- APD is too high (0.58” vs. 0.29”). Resubmit.
Cabinet size has been updated to meet APD requirements. The coil has been reselected with an APD of 0.29”. Performance has been updated in the performance report.

HC-ERV-01

- APD is too high (0.22” vs. 0.1”). Resubmit.
Cabinet size has been updated to meet APD requirements. The coil has been reselected with an APD of 0.08”. Performance has been updated in the performance report.

5. ERV-02_Coils

- Assembly length appears to be excessive. While a limit was not specified, the BOD is less than 36” vs. the 62” submitted.
JCI has reduced the overall unit length by reducing the access segment with door to 12”.

Before release, contractor to confirm the fitment of the submitted ERV-02_Coils unit. This unit ships in (1) 50” length.

CC-ERV-02

- APD is too high (0.69” vs. 0.027”). Resubmit.
Cabinet size has been updated to meet APD requirements. The coil has been reselected with an APD of 0.29”.

Coil was selected with LWT locked in at 54F. GPM was required to be a variable. Please note GPM variance from schedule.

HC-ERV-02

- APD is too high (0.22” vs. 0.1”). Resubmit.
Cabinet size has been updated to meet APD requirements. The coil has been reselected with an APD of 0.06”. Performance has been updated in the performance report.

6. FCU-09

- Submitted fan greatly exceeds scheduled input power at design point (3.15 BHP vs. 1.81). Change fan type.
The new circuitry for FCU-09 as shown on Drawing E-601 has a 15A fused circuit. As shown on the submitted performance report, the fan selection has a MOCP of 12A. The provided circuit has the input capability to power the submitted fan. Please see the performance report for fan performance.
- Chilled water coil WPD is acceptable.
Engineer has no exception.
- Submitted unit greatly exceeds BOD unit length by 54” and height by 25”. Submit a unit closer in dimensions to the BOD to reduce conflicts and Contractor redesign.
BOD unit width is 71”. JCI selected unit width is only 57”.

In review of Drawing M-401, Detail 3, JCI believes there is adequate

space for the submitted unit length. Mechanical contractor to confirm that the unit height is sufficient to be installed in the mechanical space.

JCI has updated the discharge opening size to 38" x 20" to match the size shown on Drawing M-501, Detail 3.

7. General Comments – All Air Handling Units

- Submit that filters shall be UL900 Listed, Class I or Class II.
Filter media to comply with ANSI/UL 900 listed Class I or Class II. See the submitted specification.

- Submit that dampers are Leakage Class 1A
Dampers shall have a maximum leakage rate of 4 CFM/square foot at 1" w.g., and shall comply with ASHRAE 90.1. See the submitted specification.

- Submit VFDs with manual bypasses.
AH-03, DOAS-01, and FCU-09 include a VFD with manual bypass.

AH-01 includes 2 fans with a common VFD and MMP panel. With the installation of a MMP panel, bypass functionality is not possible for the common VFD.

- Submit Base Rail gauge (10 ga. Minimum required).
Base rail is constructed of formed steel to support the entire unit weight and meets minimum gauge requirements. Base rails are not included for the ERV-01 and ERV-02 coils as these are hung overhead in line with ductwork.

- Submit case leakage rate for all units.
Units shall conform to ASHRAE Standard 111 Class 6 for casing leakage no more than 1% of design airflow at 1.25 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections down to a minimum of 50 CFM measurable leakage or 5,000 design CFM. See the submitted specification.



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8. Long Term Storage Notice
9. Steps to Protect Warranty
10. Startup Checklist
11. Equipment Release Approval Form

Notes & Clarifications

1. Submittals based on the following:
 - Drawings and Specifications dated 04/28/2022

2. Unit General Notes:
 - Contractor/engineer to confirm all pertinent data before release, including (but not limited to the following):
 - a) **Unit quantities**
 - b) **Dimensions, weights, & clearances**
 - c) **Performance**
 - d) **Power requirements**
 - e) **Features, options, & accessories**
 - f) **Handing and orientation**



BILL OF MATERIAL DATA

EQUIPMENT	Solution XTI
UNIT TAGS	AH-01; AH-03; DOAS-01; ERV-01_COILS; ERV-02_COILS; FCU-09
QTY	6

Items Included

- (4) Indoor Solution AHUs with supply fans (AH-01, AH-03, DOAS-1, FCU-09)
 - Unit Options:
 - 2" Double Wall R13 Foam Insulated Panels
 - 18 Ga. G-90 Galvanized Exterior Liner
 - 20 Ga. G-90 Galvanized Interior/Floor Liner
 - 4" or 6" Base rail
 - Standard Warranty is 18 months parts and labor from date of shipment or 12 months from startup, whichever occurs first.
 - VFD startup
 - Mixing Box (AH-01, AH-03)
 - Airflow monitoring and control damper
 - Return air control damper
 - Inlet Plenum (DOAS-1)
 - Control damper
 - Filters
 - 4" Mini-Pleat MERV13, with 1 spare set
 - Magnehelic Filter Gauge
 - Hot Water Coil
 - SS bulkhead, coil support, and casing
 - Electrofin coating
 - Cooling Coil
 - SS bulkhead, coil support, and casing
 - Electrofin coating
 - SS IAQ Drain Pan
 - UV Light
 - Supply Fan
 - ABB VFD
 - Access doors with view ports

- (2) Indoor Solution AHU Coil Packages (ERV-01_COILS, ERV-02_COILS)
 - Unit Options:
 - 2" Double Wall R13 Foam Insulated Panels
 - 18 Ga. G-90 Galvanized Exterior Liner
 - 20 Ga. G-90 Galvanized Interior/Floor Liner
 - Standard Warranty is 18 months parts and labor from date of shipment or 12 months from startup, whichever occurs first.
 - Hot Water Coil
 - SS bulkhead, coil support, and casing
 - Electrofin coating
 - Access Section
 - Cooling Coil
 - SS bulkhead, coil support, and casing
 - Electrofin coating
 - SS IAQ Drain Pan

Items NOT Included

- Unit Startup and owner training
- Hauling/Rigging of equipment
- Extended warranty
- Curbs and pads
- Controls
- Spare materials not mentioned above

SOLUTION SEGMENT IDENTIFICATION

FAN SEGMENTS

- FS – Supply
 - Forward Curved
 - Airfoil
 - Industrial Airfoil
 - SWSI Plenum (Belt and Direct Drive)
- FR – Return
 - Forward Curved
 - Airfoil
 - Industrial Airfoil
 - SWSI Plenum (Belt and Direct Drive)
- FE – Exhaust
 - Forward Curved
 - Airfoil
 - Industrial Airfoil

COIL SEGMENTS

- CC – Cooling Coil
- HC – Heating Coil
- VC – Vertical Coil
- MZ - Multizone

HEAT SEGMENTS

- IC – Integral Face & Bypass Coil
- IG – Indirect Gas Fired Furnace
- EH – Electric Heater

ENERGY RECOVERY

- ER – Energy Recovery

FILTER SEGMENTS

- FF – Flat Filter (2" or 4")
- AF – Angle Filter (2" & 4")
- RF – High Efficiency Filter
 - Rigid Filter (12")
 - Bag Filter (21")
 - Mini-Pleat Filter (4")
- HF – HEPA Filter

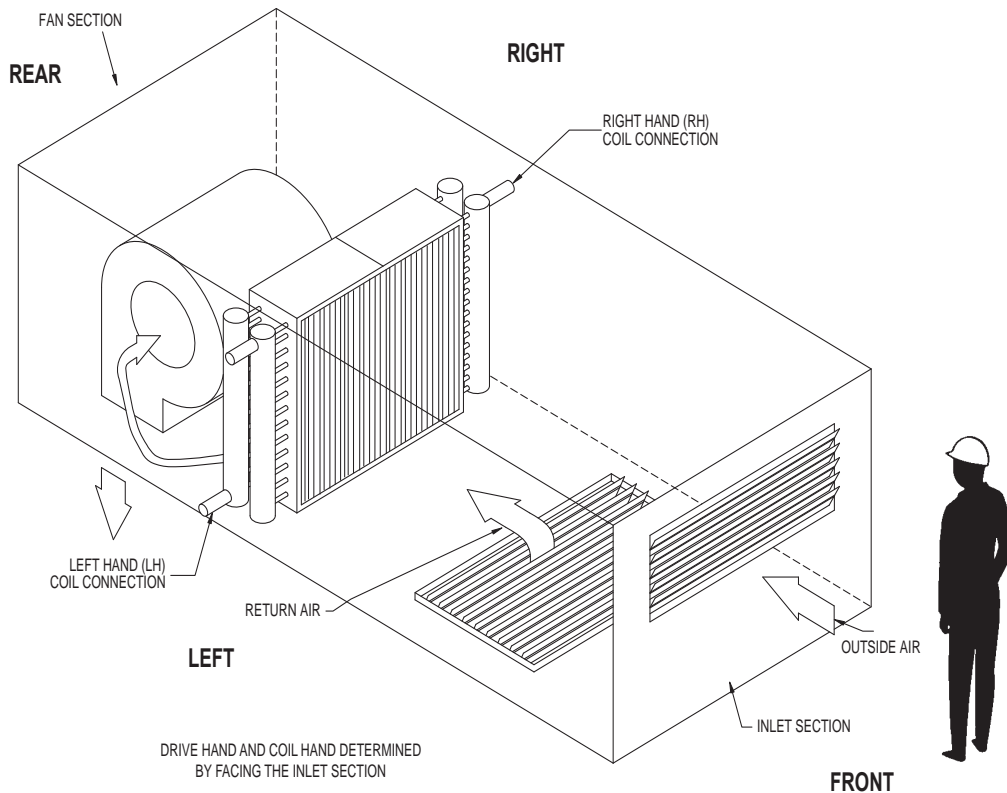
INLET SEGMENTS

- MB – Mixing Box
- FM – Filter/Mixing Box
- EF – Filter/Economizer
- EE – Economizer
- IP – Inlet Plenum
- VE – Vertical Economizer
- VF – Vertical Filter/Economizer

ACCESSORY SEGMENTS

- VP – Vertical Plenum
- DP – Discharge Plenum
- TN – Turning Plenum
- DI – Diffuser
- XA – Access segment
- AB- Air Blender
- EB – External Bypass
- IB – Internal Bypass
- FD – Face Damper
- AT – Attenuator
- HM - Humidifier
- UV - UVC Lamps

Unit & Coil Hand Identification



AH-01 Submittal Data



YORK® Solution™ Air Handling Unit Performance Report

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	AH-01		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-78x126	24,000	69	8,145

Segment Sequence

(FS)(CC XA-2)(HC XA-1 FM)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
FM , XA-1 , XA-2 , FS	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized
HC , CC	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel

Base Details

Segment(s)	Base		Floor				
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
FM , XA-1 , HC , XA-2 , CC , FS	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Unit Electrical

Circuit Details

Circuit #	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	Supply Fan Motor Control	460/3/60	48.0	54.0	70.0
2	UV-C Lamps 1	120/1/60	-	-	5.0

Electrical Details

Minimum Unit SCCR	5 kA rms Symmetrical	ETL Label (UL1995/NEC-2002)	Yes
Unit Light Type	Unit Light Switch		
-	-		

Supply Fan(s)

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	II	270-12	80	100	2	24,000	69	5.49	3.50	1,852	15.78

Project Name: NC026 Army Reserve Center - 1
Unit Folder: AH-01
Unit Tag(s): AH-01



Last Saved: 11/8/2022 11:33:40 AM
Report Version: 2022.1.4.743
Software Version: 21.4.6395.9970



YORK® Solution™ Air Handling Unit Performance Report

Performance Details												
Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Drive Type	Wheel Type	Blade Type	Wheel Material	Base Material	Fan Flow Isolation	AirFlow Monitoring	Isolation Type	Total Efficiency (%)	Outlet Velocity (ft/s)	Max Speed (RPM)	FEP (kW)	
Direct Drive	SWSI	Airfoil	Aluminum	Galvanized Steel	Back-Draft Counter Balance	Yes (K=4156.00)	1" Spring	65.61	4,494	2,035	25.80	

Motor Details										
Type	Manufacturer	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	Motor Speed (RPM)	Frame Size	Full Load Amps (Amps)	Efficiency	Location
ODP	Baldor	20.0	460/3/60	2	H	1,800	256	24.00	Premium	Direct Drive

At Motor Synchronous Details				
TSP (in w.g.)	Total Air Flow (CMF)	Fan Speed (RPM)	Motor Correction Factor(%)	Fan Power (BHP)
4.90	11,339	1,750	93.0	13.31

Notes
 Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Water Coil(s)

Performance ¹ Details																			
Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
CC	Water	8	8	4	1280	837	83.7	68.9	51.2	50.8	24,000	460	0.76	211.9	42.0	54.0	2.7	5.2	69

Construction Details												
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack			
	Coil Index ²	Connection					Qty	Size (in)				
CC	0	Left	0	Steel	0	MPT	2	3	-			
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)	
CC	2	Full	66.50	113	52.2	AL	.008	Sine	5/8	Copper	.020	
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)			
CC	Electrofin with UV Top Coat		1256	467	7.5	Copper	304 Stainless Steel	304 Stainless Steel	-			

Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- CC[1][0]: This coil is 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.

Glycol Coil(s)

Performance ¹ Details																				
Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
HC	Propylene	25%	1	9	2	351	351	25.6	-	55.5	-	10,000	264	0.05	22.4	140.0	107.4	1.6	1.9	69

Construction Details										
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack	
	Coil Index ²	Connection					Qty	Size		
HC	0	Left	0	Steel	0	MPT	1	1-1/2	-	

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
HC	1	75%	48.25	113	37.9	AL	.008	Sine	5/8	Copper	.020

Coil	Coil Coating	Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)
HC	Electrofin	183	47	0.7	Copper	304 Stainless Steel	-	-

Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
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Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel	Left	None

UV

Details						
Segment	Power (W)	Amps	Voltage (V)	Frequency (Hz)	Lamp Efficiency	Radiometer
CC	576	4.8	120	60	Surface Decontamination	-

Filter(s)

Details							
Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material
FM	Primary Filter	4" Mini-Pleat	Side	80-85% Eff, (MERV 13)	1	80-85% Eff, (MERV 13)	Galvanized
Sizes				Filter Gauge Details			
Segment	Filter	1 st Filter Size H x W (in)	1 st Qty	Location	Type	Range (in w.g)	
FM	Primary Filter	16x20	36	Door	Magnehelic	0 - 1	

Damper(s)

Details														
Segment	Air Path	H x W (in)	Qty	Total Face Velocity (ft/min)	Face Area	CFM	Minimum Allowable OA CFM	Damper Type	Damper Config	Model	Material	Blade Orientation	Actuator Type	Fail Position
FM	Return Air	26.75 x 108.00		1,196		24,000	-	Control	100%	CD60	Galvanized	Parallel	-	-
FM	Outside Air	26.75 x 108.00		1,196		24,000	8,025	Airflow Monitoring	100%	AMS60	Galvanized	Parallel	-	-

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
FM	Left	Outward	Upstream Side	72 x 40 x 2	STD Double Pane	-	-	Yes	-	-
XA-1, XA-2	Left	Outward	Upstream Side	72 x 24 x 2	STD Double Pane	-	-	Yes	-	-
CC	Left	Outward	Downstream Side	72 x 30 x 2	STD Double Pane	-	-	Yes	-	-
FS	Left	Outward	Upstream Side	72 x 24 x 2	STD Double Pane	-	-	Yes	Yes	-
FS	Right	Outward	Upstream Side	72 x 24 x 2	STD Double Pane	-	-	Yes	Yes	-

Motor Control(s)

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
FS	Common ABB VFD with MMP ABB AYK580	Yes	460/3/60	52.0/52.0	93 %	835	NEMA 1	-	Fused	Yes

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
Notes										
*Drives are rated for use below 3,000 ft and 104°F. Use Derating Charts in Air-Mod Engineering Guide Form 100.42-EGI (212) for use above these limits.										
Storage Temperature: -40°F to 158°F										
Humidity: MAX 95% RH non-condensing										
Altitude: 3,300 ft. without derate (1% derate for each additional 330 ft.)										
Overload Current Rating: 100% for 1 minute every 10 minutes.										
The Class 10 trip rating of the MMP device will not withstand an across-the-line start of a fan and should not be used with VFDs with bypass circuits.										
The customer must provide a platform or catwalk for accessing the power-disconnect.										
Copper Conductors Only.										
FS: Contains the following option: Swinging DC Line Choke (Equivalent to 5% Input Line Reactor)										

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
FM	Opening	20.1	24,000	1,196.00	0.24	0.00
FM	Airflow Monitoring Galvanized (AMS60)	2889.0	24,000	1,196.00	0.05	0.00
FM	4" Mini-Pleat 80-85% Eff, (MERV 13)	80.0	24,000	300.00	0.28	0.00
FM	Dirty Filter Allowance	0.0	24,000	0.00	0.28	0.00
HC	Heating 1 rows 9 fins	37.9	24,000	264.00	0.05	0.00
CC	Cooling 8 rows 8 fins	52.2	24,000	460.00	0.76	0.00
CC	UV Lamp Assembly	0.0	24,000	0.00	0.03	0.00
FS	Opening	18.7	24,000	1,286.00	0.18	0.00
FS	Backdraft Aluminum (CBD6)	0.0	24,000	0.00	0.12	0.00
FS	External Static - User Entered	0.0	24,000	0.00	3.50	0.00
Total					5.49	0.00

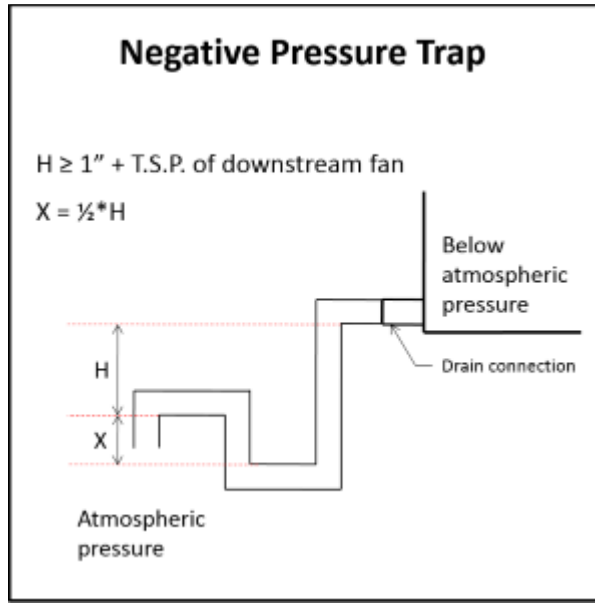
Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
FM	Filter / Mixing Box	46	126	78	1,132
XA-1	Variable Length Access	24	126	78	396
HC	Heating Coil	13	126	78	547
XA-2	Variable Length Access	24	126	78	451
CC	Variable Length Cooling Coil	56	126	78	2,357
FS	Supply Fan - SWSI	61	126	78	3,262
Overall³		224			8,145

Notes					
¹ The length includes bottom tier segments only					
² The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.					
³ Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.					

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	Supply Fan	5.49	Negative	6.49	3.25	9.74	6.50	9.75	6"



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.
 Refer to the Installation Manual of the IOM for more information.

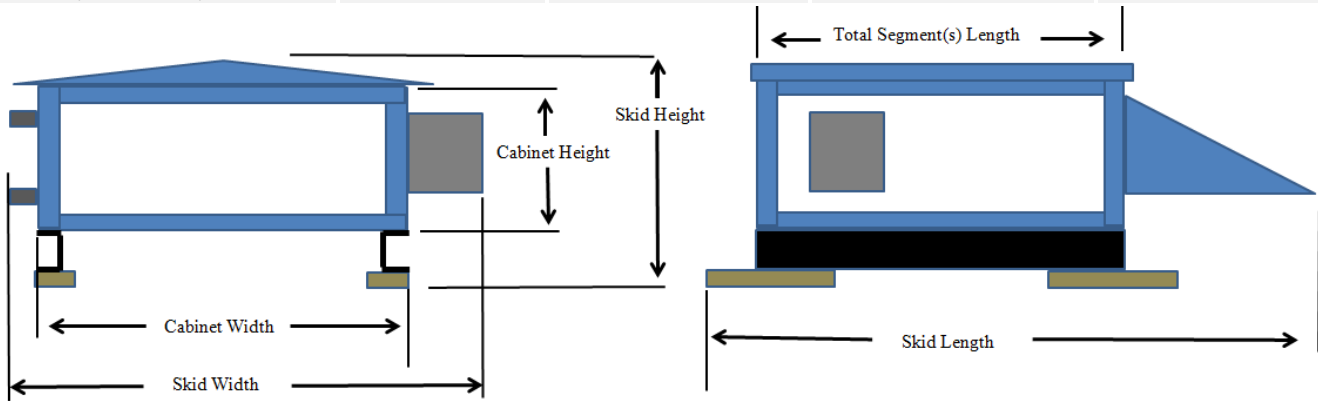
Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_{ds} \leq 0.43$. Units must be rigid mounted.
 The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.
 Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details
 Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(FS)	61	88	145	3,262
(CC XA-2)	80	88	134	2,809
(HC XA-1 FM)	95	88	131	2,075



Notes

Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outriggering extensions, isolation dampers, inlet baskets).

Special Quote(s)

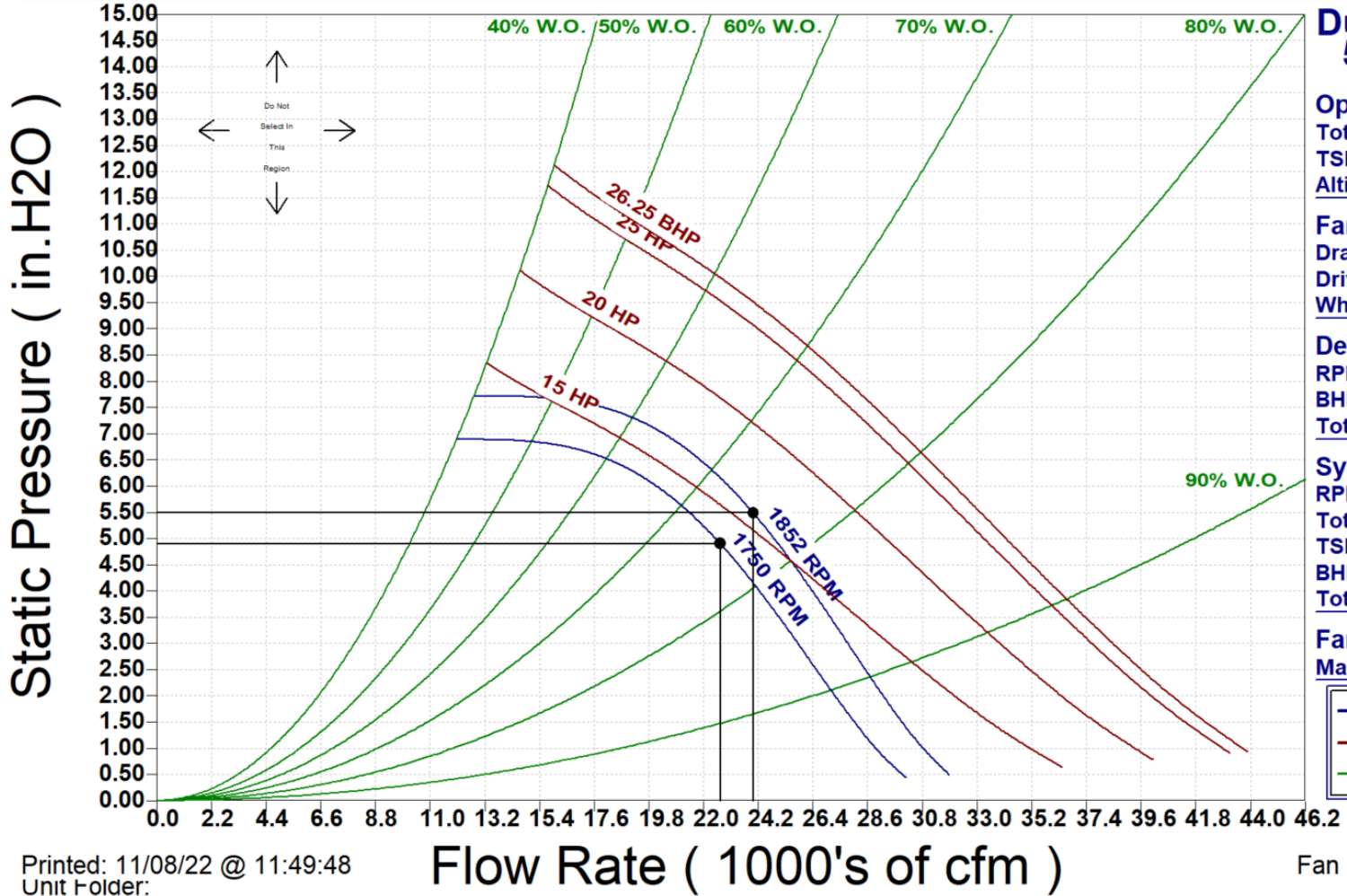
Details		
Segment	SQ Number	Resolution
FS	SQ22-017633-002	Grow FS segment Change access doors to 24"W
CC	SQ22-017633-003	Relocate UV panel to FS Reduce length of this segment
Unit	SQ22-017633-006	-



Supply Fan

Solution XT Fan Rating Curve

Project Name	Unit Tag	Qty	Model	Seg	Fan Type	Class	Size
026 Army Reserve Center - 1	AH-01	1	XTI-78x126	FS	PL-DDPG	2II	270-12-80



Dual Fans 50/50%

Operating Point
 Total Flow (24000)
 TSP (in.H2O):5.49
 Altitude (ft): 69

Fan Characteristics
 Draw 1Draw-Thru
 Drive Type:Direct
 Wheel Width:80%

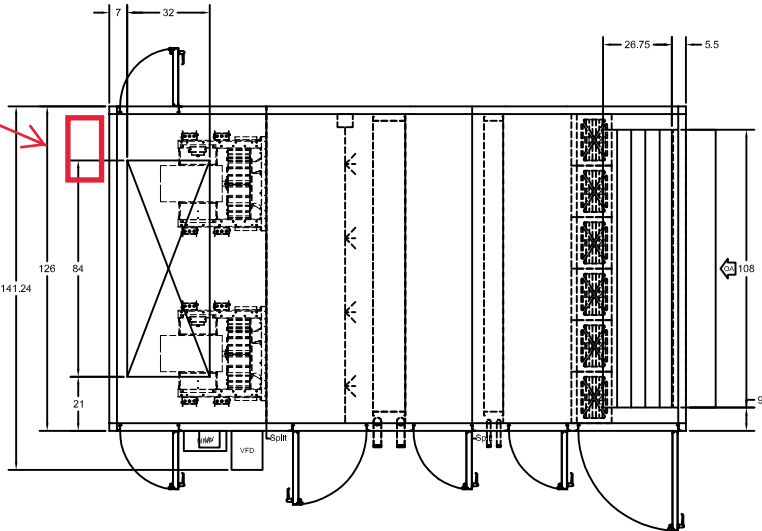
Design Speed
 RPM: 1852
 BHP: 15.78
 Total Effie:65.61

Synch Speed
 RPM: 1750
 Total Flow (22678)
 TSP (in H2O):4.90
 BHP: 13.31
 Total Eff.: 65.61

Fan Limits
 Max RPM2035.00

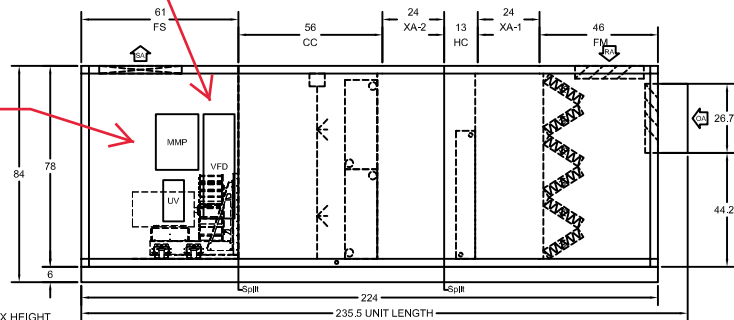
— RPM
 — HP
 — System

VFD for right fan



VFD for Left fan

Replace MMP with SSP



* NOTE: MAX HEIGHT

ELEVATION VIEW

UNIT CONSTRUCTION
 Model: Solution-XTI-78x126 Construction: Indoor
 Motor Location:
 Unit Weight: 8,146 lbs. (+/- 10%)

NOTES
 Units with a base rail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of base rail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable), base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond cabinet dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

⊖ - Designates Shipped Loose Items

PIPING CONNECTIONS
 (in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
HC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
CC	MPT	Left	1 Sup 1 Ret	3"	3"
CC	MPT	Left	1 Sup 1 Ret	3"	3"

Drain pan connection size 1 1/4" MPT SCH 40 (Connections on Left Side of unit)

SECTION LIST

SECT	DESCRIPTION
FM	Filter/Mixing Box
XA-1	Variable Length Access
HC	Heating Coil
XA-2	Variable Length Access
CC	Cooling Coil
FS	Supply Fan - Z70 - DDPG2

PRODUCT DRAWING
 SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-78x126
 NOT FOR CONSTRUCTION

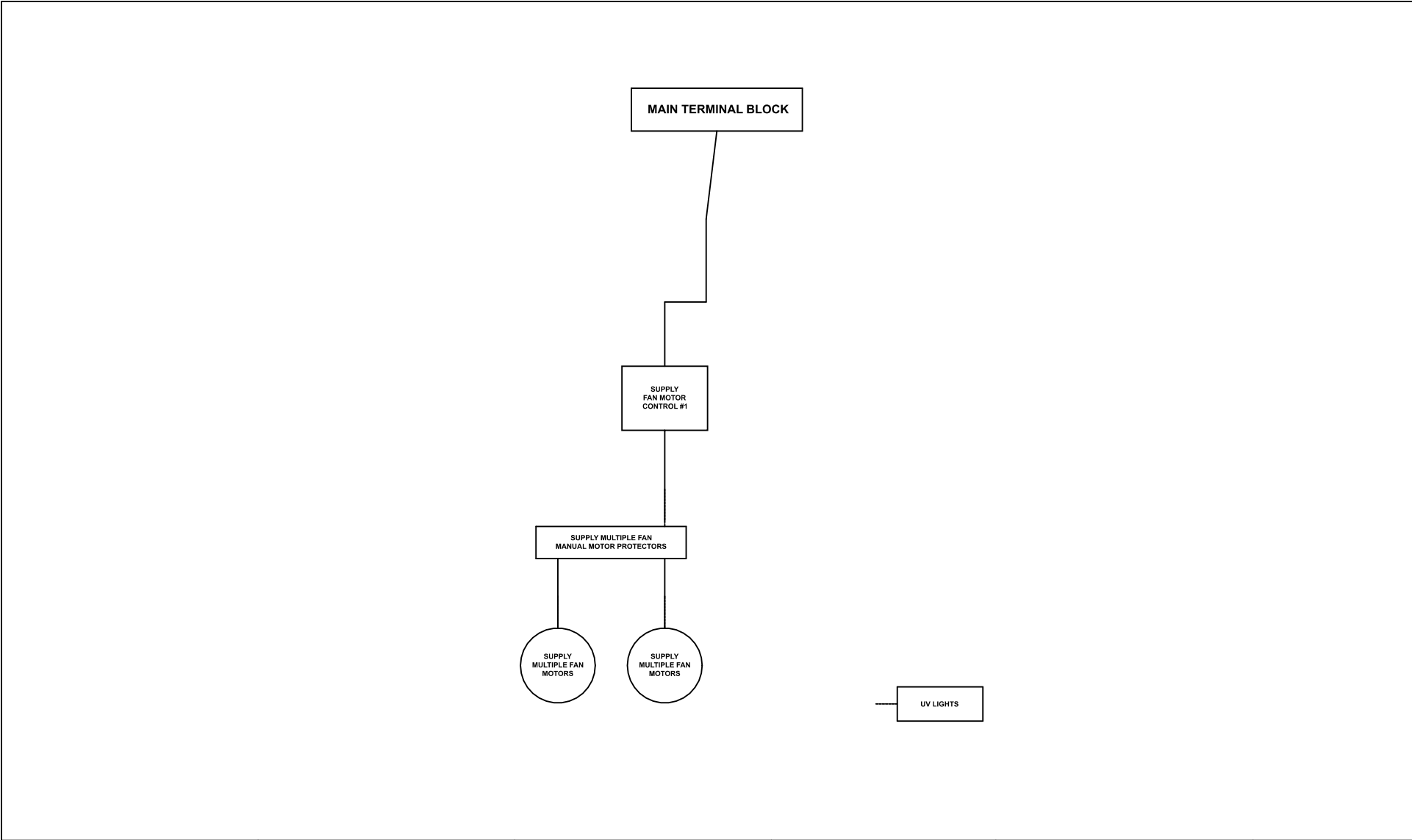
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 Location: ,
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT TAG: AH-01 - Sheet 1

Date:
 Version:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





PRODUCT DRAWING
 AHU Field Wiring
 MODEL:
NOT FOR CONSTRUCTION

Project Name: NC026 Army Reserve Center - 1
 Location:
 Engineer:
 Contractor:
 For:

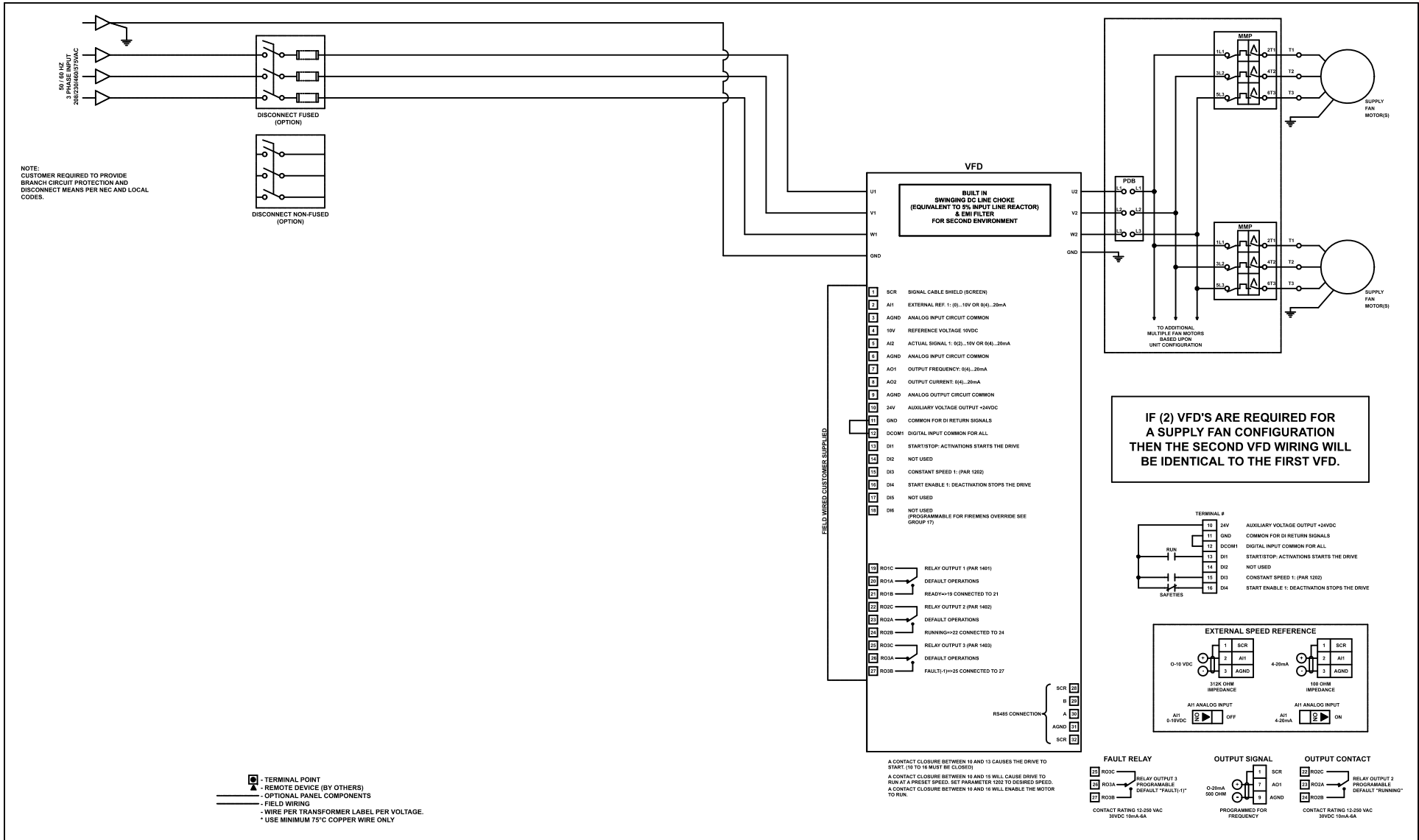
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 Contract#: 2N990405
 UNIT
 TAG: AH-01 - Sheet 1

Date: 11/8/2022 11:33:42
 Form No.: 100.09-EG1
 Dwg. Lev.: 12/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:



YORKworks Version: 21.06 Drawing Generator Version : 01.00.13067



PRODUCT DRAWING

AHU Field Wiring
 MODEL:
NOT FOR CONSTRUCTION

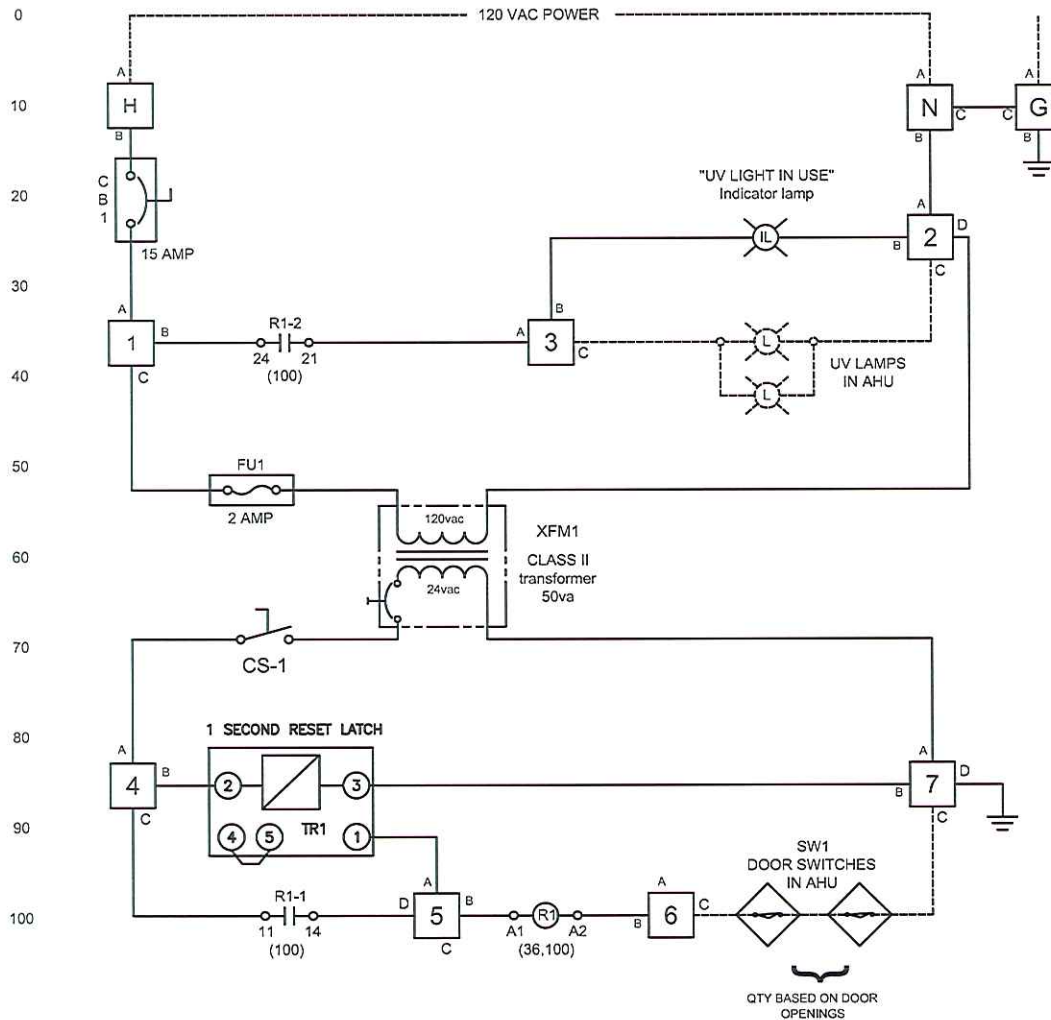
Project Name: NC026 Army Reserve Center - 1
 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT
 TAG: **AH-01 - Sheet 2**

Date: 11/8/2022 11:33:42
 Form No.: 100.09-EG1
 Dwg. Lev.: 12/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "R1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights. If all doors are closed, all the "SW1"s will allow "R1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the relay "R1". "R1" will energize and "seal-in" its coil via contact #1. After one second, "TDR-1" will de-energize, but "R1" will remain energized. Should any one door having "SW1" mounted, were to open, "R1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1 will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.

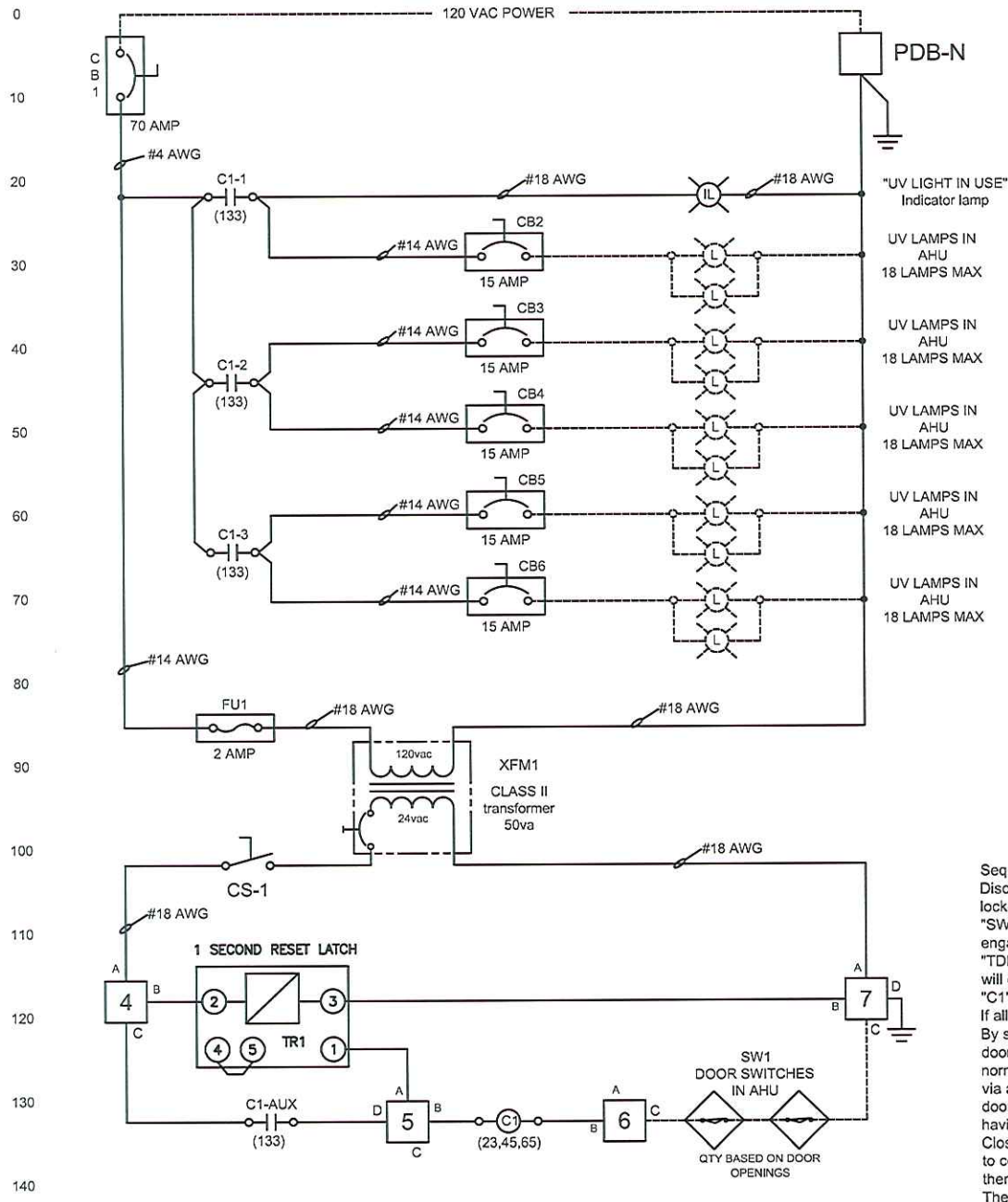


REV LEV	DATE	REVISION RECORD	DR.	CHG. NO.
A	11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-	6-24-08	NEW		08-1675

UNITS/DIMENSIONS ARE IN INCHES	UV CONTROL PANEL WIRING - 8A
TOLERANCES: PER ENG. SPEC. M-202	
WELDING: PER ENG. SPEC. M-202	

MATERIAL TYPE:	N/A	ENG. STD.
CUT SIZE:		
SIZE	DRAWING NUMBER	
A	085-013-001	
SCALE:	NTS	SHEET: 1 OF 1

ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER HEREON ARE RESERVED AND NO PERMISSION IS GRANTED TO REPRODUCE THIS POINT OR MIRROR OR IN ANY MANNER TO DISCLOSE ANY OF THE INFORMATION HEREON TO OTHERS WITHOUT WRITTEN RELEASE BY YORK INTERNATIONAL CORP.



Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "C1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights. If all doors are closed, all the "SW1"s will allow "C1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the contactor "C1". "C1" will energize and "seal-in" its coil via an auxiliary contact. After one second, "TDR-1" will de-energize, but "C1" will remain energized. Should any one door having "SW1" mounted, were to open, "C1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1" will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.



REV	LEV	DATE	REVISION RECORD	DR.	CHG. NO.
A		11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-		6-24-08	NEW		08-1675

UV CONTROL PANEL WIRING - >8A		MATERIAL TYPE: N/A	ENG. STD.
CUT SIZE:		DRAWING NUMBER	
SIZE	085-013-002		
A	SCALE: NTS	SHEET: 1 OF 1	



STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY: _____
Johnson Controls Selling Representative Print/Sign Date

APPROVED BY: _____
Johnson Controls Branch Manager or other authorized individual Print/Sign Date

ACCEPTED BY: _____
Customer Signature Date

AH-03 Submittal Data



YORK® Solution™ Air Handling Unit Performance Report

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	AH-03		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-45x72	7,300	69	4,113

Segment Sequence

(FS)(CC)(XA-2 HC XA-1)(FM)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
FM , XA-1 , XA-2 , FS	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized
HC , CC	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel

Base Details

Segment(s)	Base		Floor				
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
FM , XA-1 , HC , XA-2 , CC , FS	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Unit Electrical

Circuit Details

Circuit #	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	Supply Fan Motor Control	460/3/60	12.5	15.6	25.0
2	UV-C Lamps 1	120/1/60	-	-	1.3

Electrical Details

Minimum Unit SCCR	100 kA rms Symmetrical	ETL Label (UL1995/NEC-2002)	Yes
Unit Light Type		Unit Light Switch	
-		-	

Supply Fan(s)

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	II	222-9	120	100	1	7,300	69	4.69	2.50	1,832	7.77

Performance Details												
Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Drive Type	Wheel Type	Blade Type	Wheel Material	Base Material	Fan Flow Isolation	AirFlow Monitoring	Isolation Type	Total Efficiency (%)	Outlet Velocity (ft/s)	Max Speed (RPM)	FEP (kW)	
Direct Drive	SWSI	Airfoil	Aluminum	Galvanized Steel	None	Yes (K=2649.00)	2" Spring	68.99	4,033	2,454	6.57	

Motor Details										
Type	Manufacturer	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	Motor Speed (RPM)	Frame Size	Full Load Amps (Amps)	Efficiency	Location
ODP	Baldor	10.0	460/3/60	1	H	1,800	215	12.50	Premium	Direct Drive

At Motor Synchronous Details				
TSP (in w.g.)	Total Air Flow (CMF)	Fan Speed (RPM)	Motor Correction Factor(%)	Fan Power (BHP)
4.26	6,972	1,750	91.7	6.77

Notes
 Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Water Coil(s)

Performance ¹ Details																			
Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
CC	Water	8	8	6	387	252	83.9	69.2	51.7	51.5	7,300	490	0.87	64.5	42.0	53.9	2.2	5.6	69

Construction Details													
Coil	Location		Offset (in)	Connection Material ²	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack				
	Coil Index ²	Connection					Qty	Size (in)					
CC	0	Right	0	Steel	0	MPT	1	2	-				
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)		
CC	1	Full	36.25	59	14.9	AL	.010	Sine	5/8	Copper	.020		
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)				
CC	Electrofin with UV Top Coat		394	137	2.2	Copper	304 Stainless Steel	304 Stainless Steel	-				

Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- CC[1][0]: This coil is 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.

Glycol Coil(s)

Performance ¹ Details																				
Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
HC	Propylene	25%	1	8	4	86	86	24.8	-	60.7	-	2,300	205	0.03	5.9	140.0	109.7	1.7	.8	69

Construction Details											
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack		
	Coil Index ²	Connection					Qty	Size			
HC	0	Right	0	Steel	0	MPT	1	1-1/2	-		

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft ²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
HC	1	75%	27.25	59	11.2	AL	.010	Sine	5/8	Copper	.020

Coil	Coil Coating	Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft ³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft ² .°F/BTU)
HC	Electrofin	71	15	0.2	Copper	304 Stainless Steel	-	-

Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
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Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel	Right	None

UV

Details						
Segment	Power (W)	Amps	Voltage (V)	Frequency (Hz)	Lamp Efficiency	Radiometer
CC	144	1.2	120	60	Surface Decontamination	-

Filter(s)

Details							
Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material
FM	Primary Filter	4" Mini-Pleat	Side	80-85% Eff, (MERV 13)	1	80-85% Eff, (MERV 13)	Galvanized

Sizes						Filter Gauge Details		
Segment	Filter	1 st Filter Size H x W (in)	1 st Qty	2 nd Filter Size H x W (in)	2 nd Qty	Location	Type	Range (in w.g)
FM	Primary Filter	24x24	4	24x12	2	Door	Magnehelic	0 - 1

Damper(s)

Details														
Segment	Air Path	H x W (in)	Qty	Total Face Velocity (ft/min)	Face Area	CFM	Minimum Allowable OA CFM	Damper Type	Damper Config	Model	Material	Blade Orientation	Actuator Type	Fail Position
FM	Return Air	15.25 x 54.00		1,277		7,300	-	Control	100%	CD60	Galvanized	Parallel	-	-
FM	Outside Air	15.25 x 54.00		1,277		7,300	2,288	Airflow Monitoring	100%	AMS60	Galvanized	Parallel	-	-

Door(s)

Details											
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock	
FM	Right	Outward	Upstream Side	39 x 30 x 2	STD Double Pane	-	-	Yes	-	-	
XA-2	Right	Outward	Upstream Side	39 x 24 x 2	STD Double Pane	-	-	Yes	-	-	
CC	Right	Outward	Downstream Side	39 x 30 x 2	STD Double Pane	-	-	Yes	-	-	
FS	Right	Outward	Upstream Side	39 x 24 x 2	STD Double Pane	-	-	Yes	Yes	-	

Motor Control(s)

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
FS	ABB VFD ABB AYK580	-	460/3/60	14.0/14.0	92 %	228	NEMA 1	2 Contactor Bypass	Fused	Yes

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
Notes										
*Drives are rated for use below 3,000 ft and 104°F. Use Derating Charts in Air-Mod Engineering Guide Form 100.42-EGI (212) for use above these limits.										
Storage Temperature: -40°F to 158°F										
Humidity: MAX 95% RH non-condensing										
Altitude: 3,300 ft. without derate (1% derate for each additional 330 ft.)										
Overload Current Rating: 100% for 1 minute every 10 minutes.										
The Class 10 trip rating of the MMP device will not withstand an across-the-line start of a fan and should not be used with VFDs with bypass circuits.										
The customer must provide a platform or catwalk for accessing the power-disconnect.										
Copper Conductors Only.										
FS: Contains the following option: Swinging DC Line Choke (Equivalent to 5% Input Line Reactor)										

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
FM	Opening	5.7	7,300	1,277.00	0.27	0.00
FM	Airflow Monitoring Galvanized (AMS60)	823.5	7,300	1,277.00	0.10	0.00
FM	4" Mini-Pleat 80-85% Eff, (MERV 13)	20.0	7,300	365.00	0.37	0.00
FM	Dirty Filter Allowance	0.0	7,300	0.00	0.37	0.00
HC	Heating 1 rows 8 fins	11.2	7,300	205.00	0.03	0.00
CC	Cooling 8 rows 8 fins	14.9	7,300	490.00	0.87	0.00
CC	UV Lamp Assembly	0.0	7,300	0.00	0.03	0.00
FS	Opening	6.1	7,300	1,195.00	0.15	0.00
FS	External Static - User Entered	0.0	7,300	0.00	2.50	0.00
Total					4.69	0.00

Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
FM	Filter / Mixing Box	36	72	45	576
XA-1	Variable Length Access	6	72	45	155
HC	Heating Coil	10	72	45	267
XA-2	Variable Length Access	27	72	45	309
CC	Variable Length Cooling Coil	63	72	45	1,354
FS	Supply Fan - SWSI	48	72	45	1,452
Overall³		190			4,113

Notes

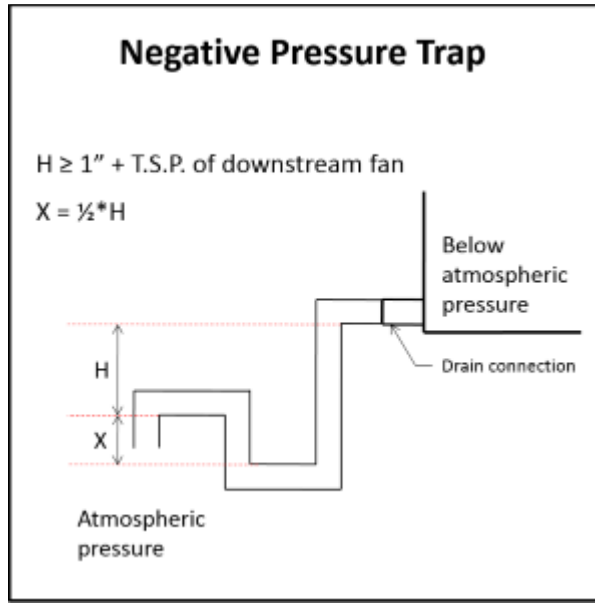
¹The length includes bottom tier segments only

²The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

³Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	Supply Fan	4.69	Negative	5.69	2.85	8.54	5.75	8.75	6"



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.

Refer to the Installation Manual of the IOM for more information.

Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_d \leq 0.43$. Units must be rigid mounted.

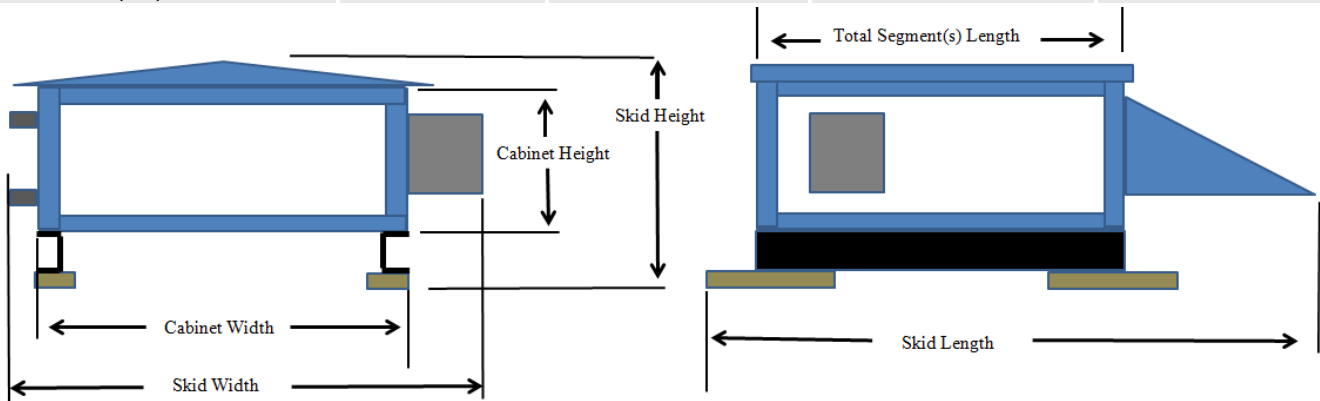
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.

Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details

Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(FS)	48	55	90	1,452
(CC)	63	55	79	1,354
(XA-2 HC XA-1)	43	55	78	731
(FM)	36	55	77	576



Notes

Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outrigger extensions, isolation dampers, inlet baskets).

Special Quote(s)

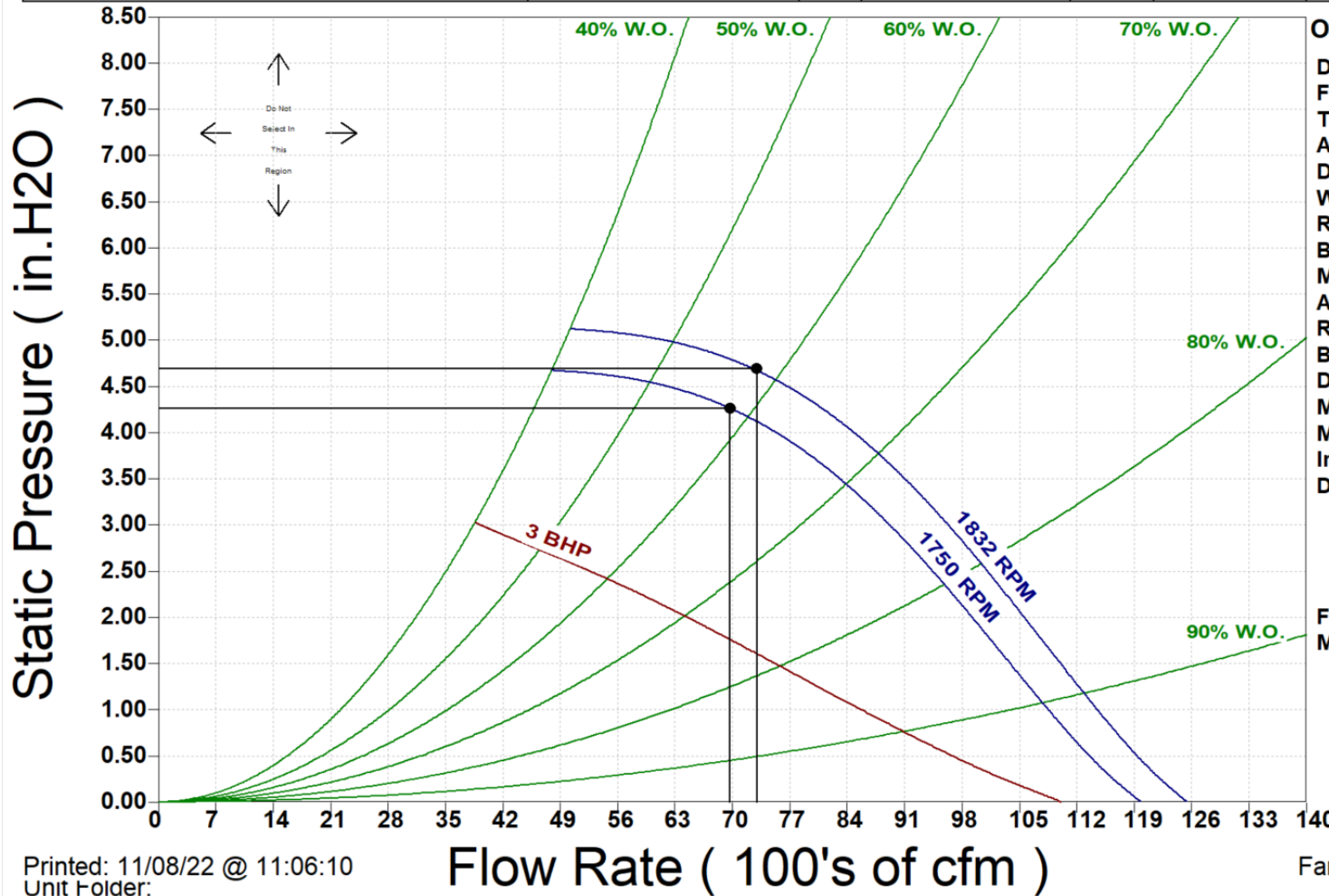
Details		
Segment	SQ Number	Resolution
FS	SQ22-017634-003	Grow FS segment Change access doors to 24"W
XA-1	SQ22-017634-006	Reduce length



Supply Fan

Solution XT Fan Rating Curve

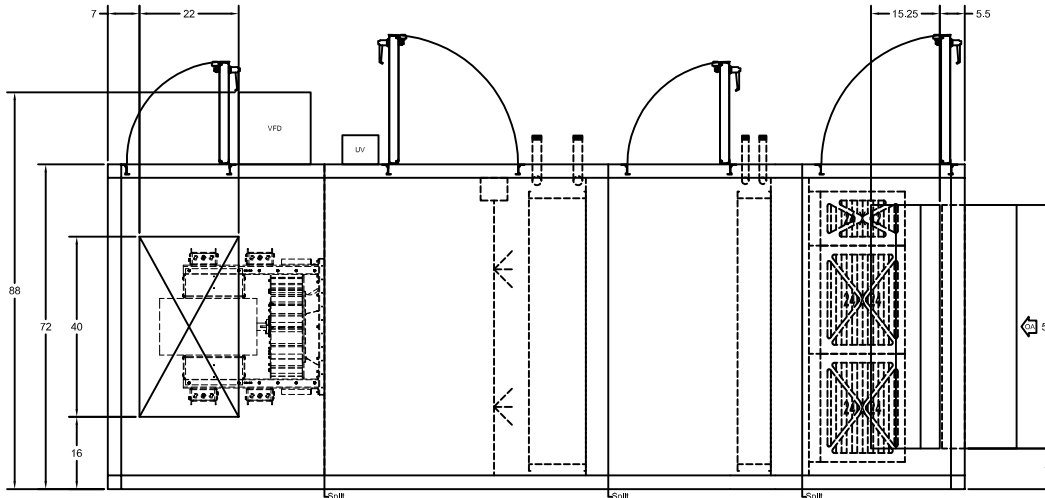
Project Name	Unit Tag	Qty	Model	Seg	Fan Type	Class	Size
026 Army Reserve Center - 1	AH-03	1	XTI-45x72	FS	PL-DDPG2II	222-9-120	



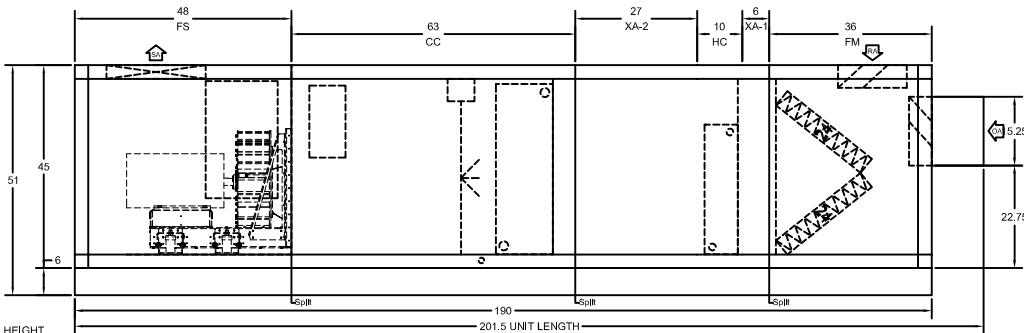
Operating Point
 Draw TDraw-Thru
 Flow (cfm): 7300
 TSP (in.H2O): 4.69
 Altitude (ft): 69
 Direct-Drive, at VFD:
 Wheel Width: 120%
 RPM: 1832
 BHP: 7.77
 MCF: 104.7%
 At Motor Synchronous:
 RPM: 1750
 BHP: 6.77
 DD Search Widths:
 Min: 0%
 Max: 0%
 Incr.: 0%
 DD Search RPMs:
 3450
 1750
 1150
 850
 Fan Limits:
 Max RPM: 2454

Printed: 11/08/22 @ 11:06:10
 Unit Folder:

Fan Rating Curve
 Page 1 of 1



PLAN VIEW



ELEVATION VIEW

UNIT CONSTRUCTION
 Model: Solution-XTI-45x72 Construction: Indoor
 Motor Location:
 Unit Weight: 4,023 lbs. (+/- 10%)

PLAN VIEW

NOTES
 Units with a baserail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of baserail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable) base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond cabinet dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

⊙ - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
 (in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
HC	MPT	Rght	1 Sup 1 Ret	1 1/2"	1 1/2"
CC	MPT	Rght	1 Sup 1 Ret	2"	2"

Drain pan connection size 1 1/4" MPT SCH 40 (Connections on Right Side of unit)

SECTION LIST

SECT	DESCRIPTION
FM	Filter/Mixing Box
XA-1	Variable Length Access
HC	Heating Coil
XA-2	Variable Length Access
CC	Cooling Coil
FS	Supply Fan - Z22 - DDPG2

PRODUCT DRAWING
 SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-45x72
 NOT FOR CONSTRUCTION

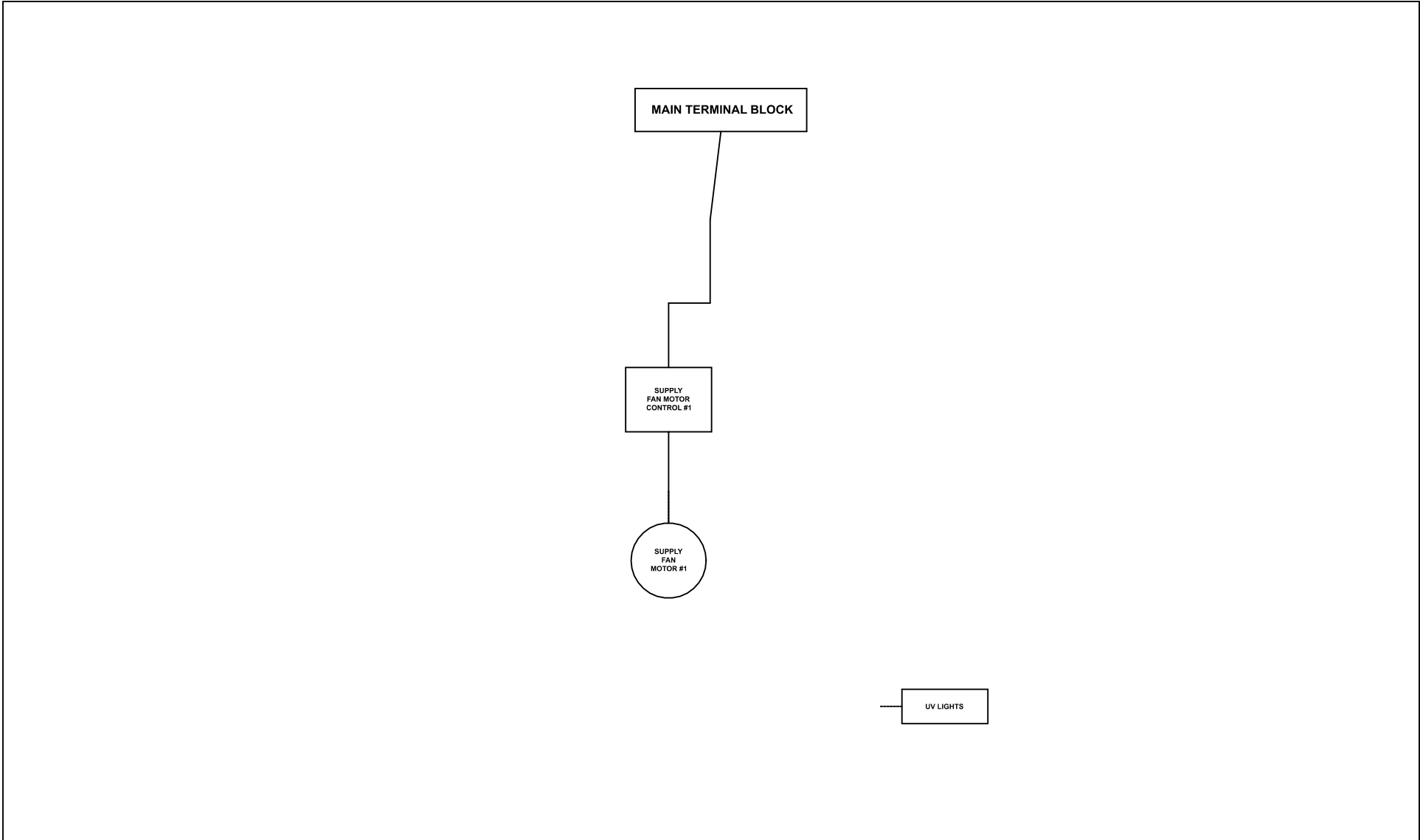
Project Name: NC026 Army Reserve Center - 1
 Location: ,
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT TAG: AH-03 - Sheet 1

Date:
 Version:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





PRODUCT DRAWING
 AHU Field Wiring
 MODEL:
NOT FOR CONSTRUCTION

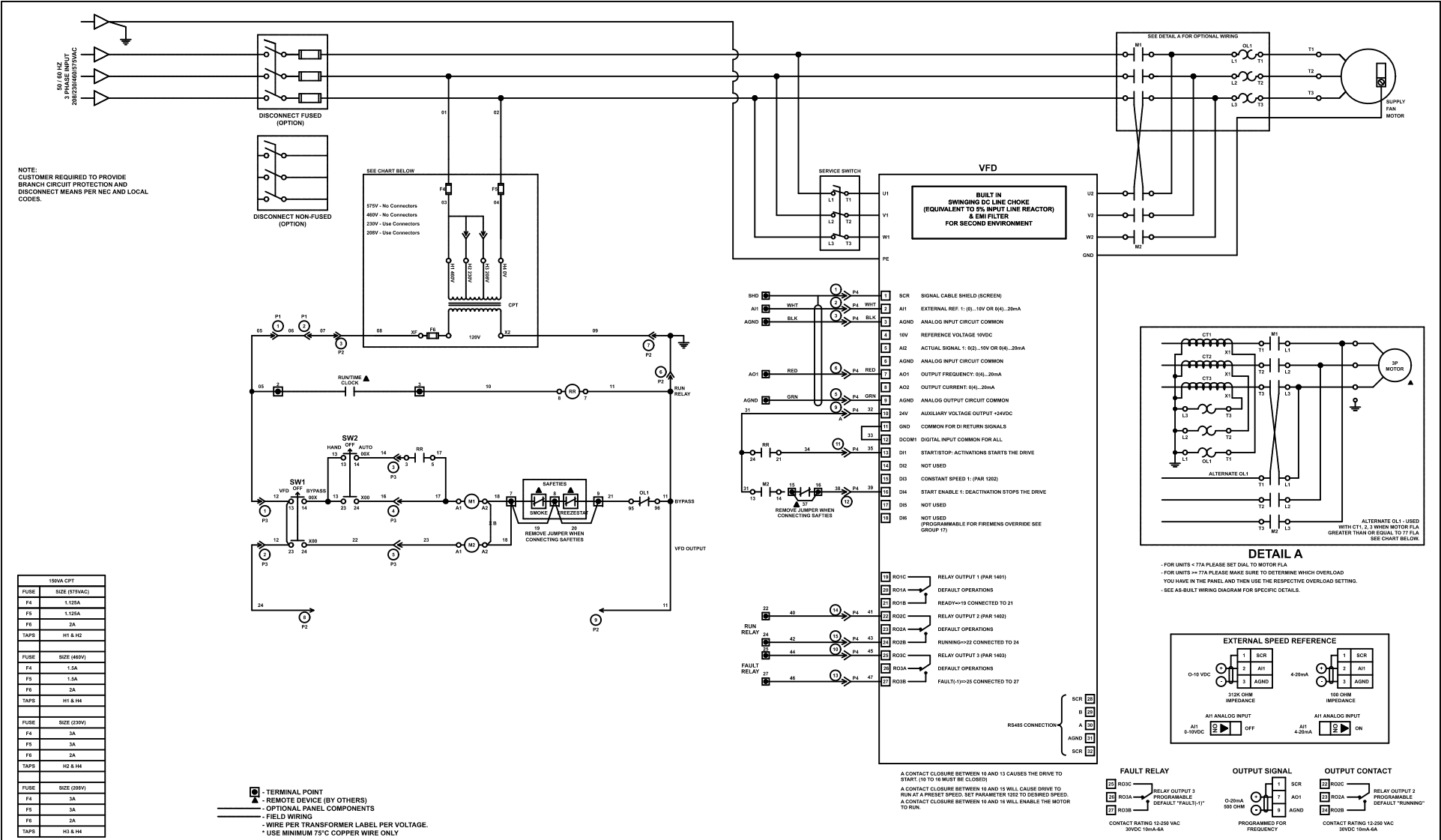
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 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
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 TAG: AH-03 - Sheet 1

Date: 11/7/2022 15:39:19
 Form No.: 100.09-EG1
 Dwg. Lev.: 12/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:

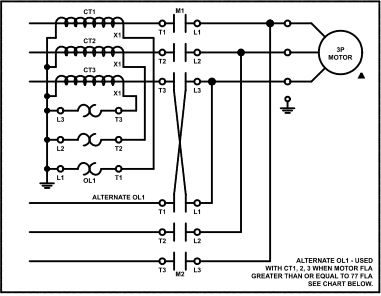




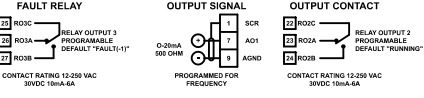
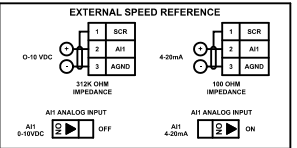
NOTE:
CUSTOMER REQUIRED TO PROVIDE
BRANCH CIRCUIT PROTECTION AND
DISCONNECT MEANS PER NEC AND LOCAL
CODES.

□ - TERMINAL POINT
 ▲ - REMOTE DEVICE (BY OTHERS)
 ○ - OPTIONAL PANEL COMPONENTS
 --- - FIELD WIRING
 --- - WIRE PER TRANSFORMER LABEL PER VOLTAGE.
 * USE MINIMUM 75°C COPPER WIRE ONLY

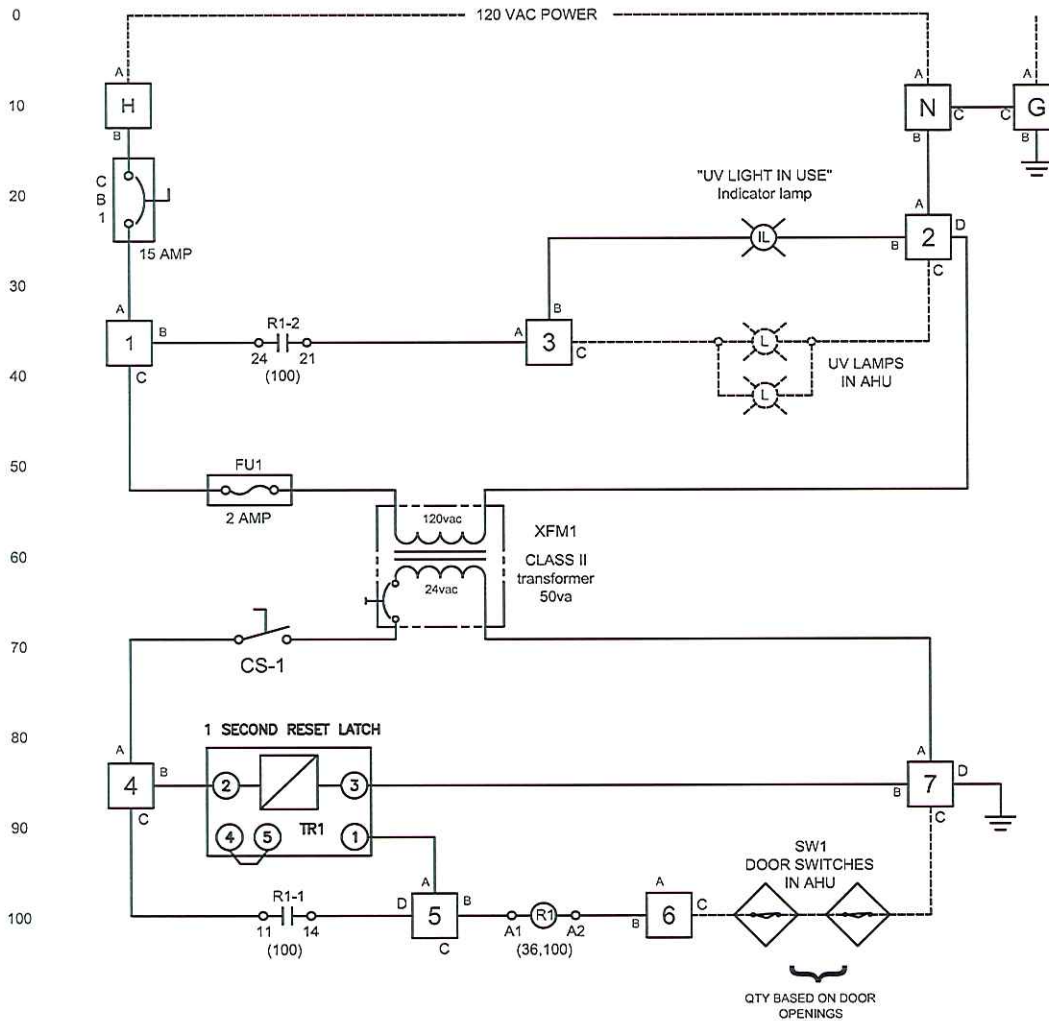
150VA CPT	
FUSE	SIZE (75VAC)
F4	1.25A
F5	1.25A
F6	2A
TAPS	H1 & H2
FUSE	SIZE (480V)
F4	1.5A
F5	1.5A
F6	2A
TAPS	H1 & H4
FUSE	SIZE (230V)
F4	3A
F5	3A
F6	2A
TAPS	H2 & H4
FUSE	SIZE (208V)
F4	3A
F5	3A
F6	2A
TAPS	H3 & H4



- FOR UNITS < 77A PLEASE SET DIAL TO MOTOR FLA
 - FOR UNITS > 77A PLEASE MAKE SURE TO DETERMINE WHICH OVERLOAD
 YOU HAVE IN THE PANEL AND THEN USE THE RESPECTIVE OVERLOAD SETTING.
 - SEE AS-BUILT WIRING DIAGRAM FOR SPECIFIC DETAILS.



PRODUCT DRAWING AHU Field Wiring MODEL: NOT FOR CONSTRUCTION	Project Name: NC026 Army Reserve Center - 1 Location: Engineer: Contractor: For:	Sold To: Cust Purch Order#: Contract#: 2N990405 UNIT TAG: AH-03 - Sheet 2	Date: 11/7/2022 15:39:19 Form No.: 100.09-EG1 Dwg. Lev.: 12/03 Dwg. Scale: NTS	Serial Number: SQ Database Number: YORKworks Release: Dwg. Name: Dwg. Location:	
	YORKworks Version: 21.06 Drawing Generator Version : 01:00:13067				



Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "R1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights. If all doors are closed, all the "SW1"s will allow "R1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the relay "R1". "R1" will energize and "seal-in" its coil via contact #1. After one second, "TDR-1" will de-energize, but "R1" will remain energized. Should any one door having "SW1" mounted, were to open, "R1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1 will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.



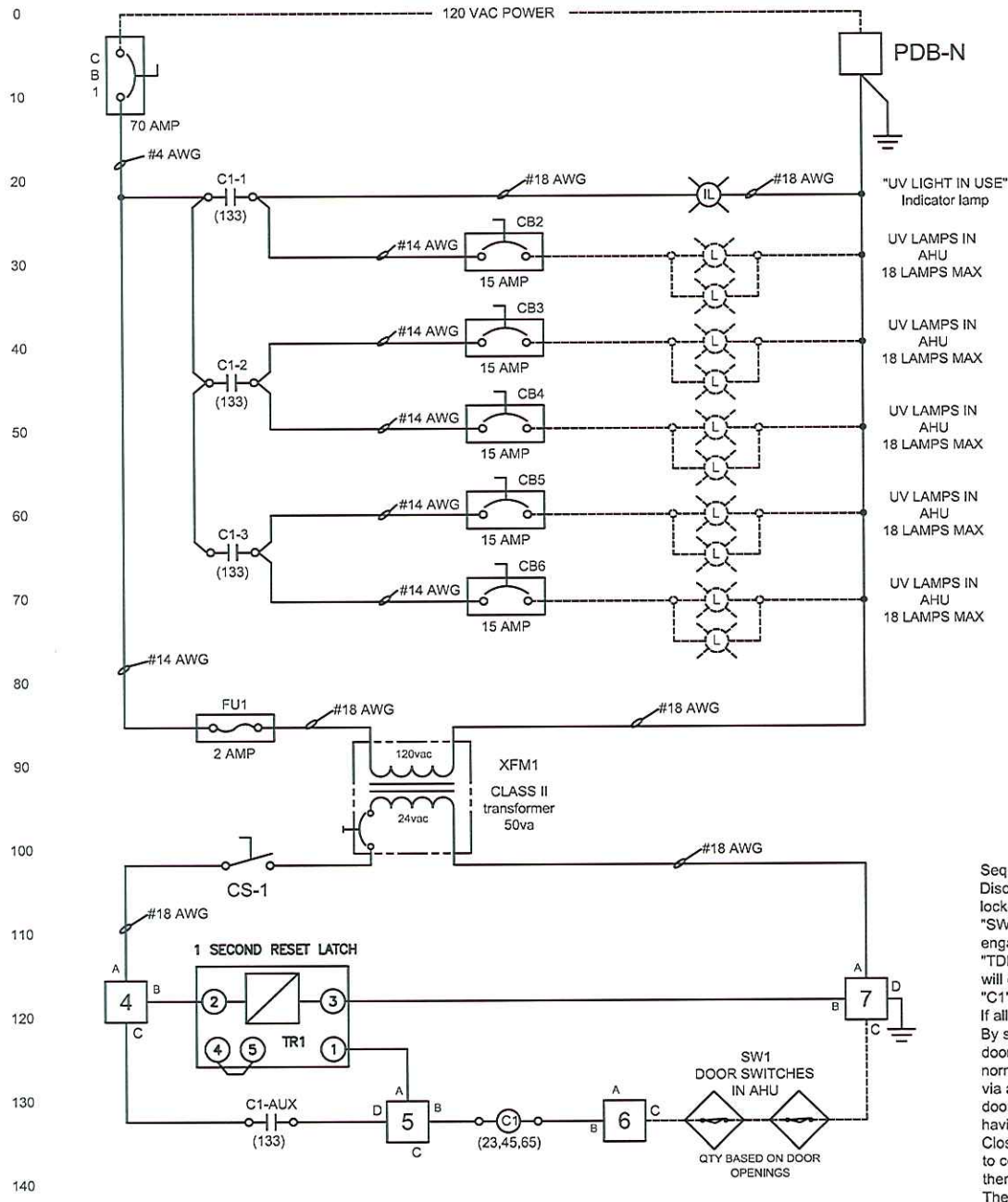
REV LEV	DATE	REVISION RECORD	DR.	CHG. NO.
A	11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-	6-24-08	NEW		08-1675

UNITS DIMENSIONS ARE IN INCHES
 TOLERANCES: PER ENCL. SPEC. M-202
 WELDING: PER ENCL. SPEC. M-201

UV CONTROL PANEL WIRING - 8A

ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER HEREON ARE RESERVED AND NO PERMISSION IS GRANTED TO REPRODUCE THIS POINT OR IN ANY MANNER OR TO DISCLOSE ANY OF THE INFORMATION HEREON TO OTHERS WITHOUT WRITTEN RELEASE BY YORK INTERNATIONAL CORP.

MATERIAL TYPE:	N/A	ENG. STD.
CUT SIZE:		
SIZE:	DRAWING NUMBER	
A	085-013-001	
SCALE:	NTS	SHEET: 1 OF 1



Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "C1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights. If all doors are closed, all the "SW1"s will allow "C1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the contactor "C1". "C1" will energize and "seal-in" its coil via an auxiliary contact. After one second, "TDR-1" will de-energize, but "C1" will remain energized. Should any one door having "SW1" mounted, were to open, "C1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1" will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.



REV	LEV	DATE	REVISION RECORD	DR.	CHG. NO.
A		11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-		6-24-08	NEW		08-1675

UV CONTROL PANEL WIRING - >8A		MATERIAL TYPE: N/A	ENG. STD.
CUT SIZE:		DRAWING NUMBER	
SIZE	085-013-002		
A	SCALE: NTS	SHEET: 1 OF 1	



STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY: _____
Johnson Controls Selling Representative Print/Sign Date

APPROVED BY: _____
Johnson Controls Branch Manager or other authorized individual Print/Sign Date

ACCEPTED BY: _____
Customer Signature Date

DOAS-01 Submittal Data



YORK® Solution™ Air Handling Unit Performance Report

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	DOAS-01		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-36x42	2,600	69	2,935

Segment Sequence

(FS XA-2 HC-2 CC)(XA-1 HC-1 AF IP)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
IP , AF , XA-1 , XA-2 , FS	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized
HC-1 , CC , HC-2	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel

Base Details

Segment(s)	Base			Floor			
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
IP , AF , HC-1 , XA-1 , CC , HC-2 , XA-2 , FS	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Unit Electrical

Circuit Details

Circuit #	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	Supply Fan Motor Control	460/3/60	5.9	7.4	12.0
2	UV-C Lamps 1	120/1/60	-	-	1.0

Electrical Details

Minimum Unit SCCR	100 kA rms Symmetrical	ETL Label (UL1995/NEC-2002)	Yes
Unit Light Type	Unit Light Switch		
-	-		

Supply Fan(s)

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	II	122-9	100	100	1	2,600	69	3.41	1.00	3,553	2.52

Performance Details												
Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Drive Type	Wheel Type	Blade Type	Wheel Material	Base Material	Fan Flow Isolation	AirFlow Monitoring	Isolation Type	Total Efficiency (%)	Outlet Velocity (ft/s)	Max Speed (RPM)	FEP (kW)	
Direct Drive	SWSI	Airfoil	Aluminum	Galvanized Steel	None	Yes (K=763.00)	2" Spring	55.26	4,643	4,425	2.31	

Motor Details										
Type	Manufacturer	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	Motor Speed (RPM)	Frame Size	Full Load Amps (Amps)	Efficiency	Location
ODP	Baldor	5.0	460/3/60	1	F	3,600	182	5.90	Premium	Direct Drive

At Motor Synchronous Details				
TSP (in w.g.)	Total Air Flow (CMF)	Fan Speed (RPM)	Motor Correction Factor(%)	Fan Power (BHP)
3.21	2,524	3,450	86.5	2.31

Notes
 Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Water Coil(s)

Performance Details																			
Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
CC	Water	6	9	12	188	111	93.0	75.1	52.7	52.3	2,600	473	0.82	31.2	42.0	53.9	3.9	8.7	69

Construction Details												
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack			
	Coil Index ²	Connection					Qty	Size (in)				
CC	0	Left	0	Steel	0	MPT	1	1-1/2	-			
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)	
CC	1	Full	27.25	29	5.5	AL	.010	Sine	5/8	Copper	.020	
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)			
CC	Electrofin with UV Top Coat		131	42	.7	Copper	304 Stainless Steel	304 Stainless Steel	-			

Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- CC[1][0]: This coil is 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.

Glycol Coil(s)

Performance Details																				
Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
HC-1	Propylene	25%	2	8	8	92	92	24.8	-	58.6	-	2,600	473	0.20	5.0	140.0	101.8	1.4	.7	69
HC-2	Propylene	25%	2	8	4	45	45	55.0	-	70.4	-	2,600	473	0.18	2.8	140.0	107.3	.4	.1	69

Construction Details										
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack	
	Coil Index ²	Connection					Qty	Size		
HC-1	0	Left	0	Steel	0	MPT	1	1-1/2	-	
HC-2	0	Left	0	Steel	0	MPT	1	1-1/2	-	

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
HC-1	1	Full	27.25	29	5.5	AL	.008	Sine	5/8	Copper	.020
HC-2	1	Full	27.25	29	5.5	AL	.008	Sine	5/8	Copper	.020

Coil	Coil Coating	Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)
HC-1	Electrofin	56	16	0.2	Copper	304 Stainless Steel	-	-
HC-2	Electrofin	58	17	0.3	Copper	304 Stainless Steel	-	-

Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- HC-1[1][0]: This coil is 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.ahrirectory.org.
- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- HC-2[1][0]: This coil is 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.ahrirectory.org.

Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel	Left	None

UV

Details						
Segment	Power (W)	Amps	Voltage (V)	Frequency (Hz)	Lamp Efficiency	Radiometer
CC	24	0.2	120	60	Surface Decontamination	-

Filter(s)

Details							
Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material
AF	Primary Filter	4" Mini-Pleat	Side	80-85% Eff, (MERV 13)	1	80-85% Eff, (MERV 13)	Galvanized
Sizes				Filter Gauge Details			
Segment	Filter	1 st Filter Size H x W (in)	1 st Qty	Location	Type	Range (in w.g)	
AF	Primary Filter	20x16	4	Door	Magnehelic	0 - 1	

Damper(s)

Details														
Segment	Air Path	H x W (in)	Qty	Total Face Velocity (ft/min)	Face Area	CFM	Minimum Allowable OA CFM	Damper Type	Damper Config	Model	Material	Blade Orientation	Actuator Type	Fail Position
IP	Inlet Air	15.25 x 20.00		1,228		2,600	-	Control	100%	CD60	Aluminum	Parallel	-	-

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
IP, XA-1	Left	Outward	Upstream Side	30 x 24 x 2	STD Double Pane	-	-	Yes	-	-
AF	Left	Outward	Upstream Side	30 x 23 x 2	STD Double Pane	-	-	Yes	-	-
CC	Left	Outward	Upstream Side	30 x 30 x 2	STD Double Pane	-	-	Yes	-	-
XA-2	Left	Outward	Downstream Side	30 x 24 x 2	STD Double Pane	-	-	Yes	-	-
FS	Left	Outward	Upstream Side	30 x 24 x 2	STD Double Pane	-	-	Yes	Yes	-

Motor Control(s)

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
FS	ABB VFD ABB AYK580	-	460/3/60	7.6/7.6	87 %	133	NEMA 1	2 Contactor Bypass	Fused	Yes

Notes

*Drives are rated for use below 3,000 ft and 104°F. Use Derating Charts in Air-Mod Engineering Guide Form 100.42-EGI (212) for use above these limits.

Storage Temperature: -40°F to 158°F

Humidity: MAX 95% RH non-condensing

Altitude: 3,300 ft. without derate (1% derate for each additional 330 ft.)

Overload Current Rating: 100% for 1 minute every 10 minutes.

The Class 10 trip rating of the MMP device will not withstand an across-the-line start of a fan and should not be used with VFDs with bypass circuits.

The customer must provide a platform or catwalk for accessing the power-disconnect.

Copper Conductors Only.

FS: Contains the following option: Swinging DC Line Choke (Equivalent to 5% Input Line Reactor)

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
IP	Opening	2.1	2,600	1,228.00	0.25	0.00
IP	Smoke 2 Position Aluminum (SD50)	0.0	2,600	0.00	0.29	0.00
AF	4" Mini-Pleat 80-85% Eff, (MERV 13)	8.9	2,600	292.00	0.26	0.00
AF	Dirty Filter Allowance	0.0	2,600	0.00	0.26	0.00
HC-1	Heating 2 rows 8 fins	5.5	2,600	473.00	0.20	0.00
CC	Cooling 6 rows 9 fins	5.5	2,600	473.00	0.82	0.00
CC	UV Lamp Assembly	0.0	2,600	0.00	0.03	0.00
HC-2	Heating 2 rows 8 fins	5.5	2,600	473.00	0.18	0.00
FS	Opening	2.4	2,600	1,064.00	0.12	0.00
FS	External Static - User Entered	0.0	2,600	0.00	1.00	0.00
Total					3.41	0.00

Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
IP	Inlet Plenum	30	42	36	309
AF	Angle Filter	23	42	36	170
HC-1	Heating Coil	10	42	36	224
XA-1	Variable Length Access	27	42	36	218
CC	Variable Length Cooling Coil	57	42	36	812
HC-2	Heating Coil	10	42	36	226
XA-2	Variable Length Access	24	42	36	177
FS	Supply Fan - SWSI	46	42	36	799
Overall³		227			2,935

Notes

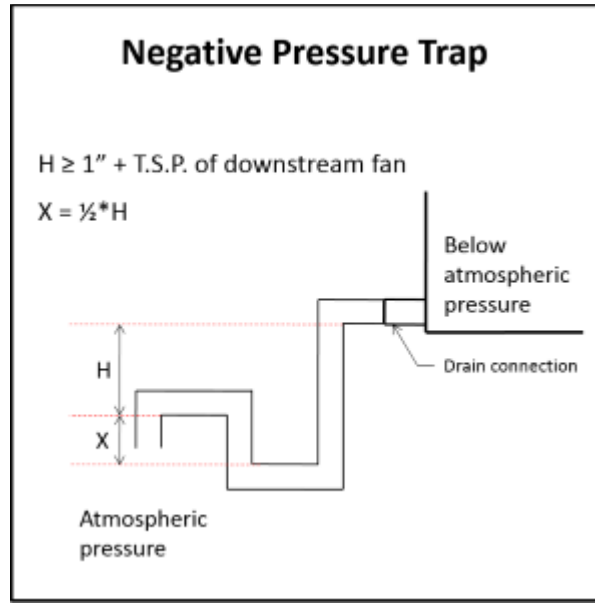
¹The length includes bottom tier segments only

²The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

³Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	Supply Fan	3.41	Negative	4.41	2.21	6.62	4.50	6.75	4"



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.

Refer to the Installation Manual of the IOM for more information.

Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_{ds} \leq 0.43$. Units must be rigid mounted.

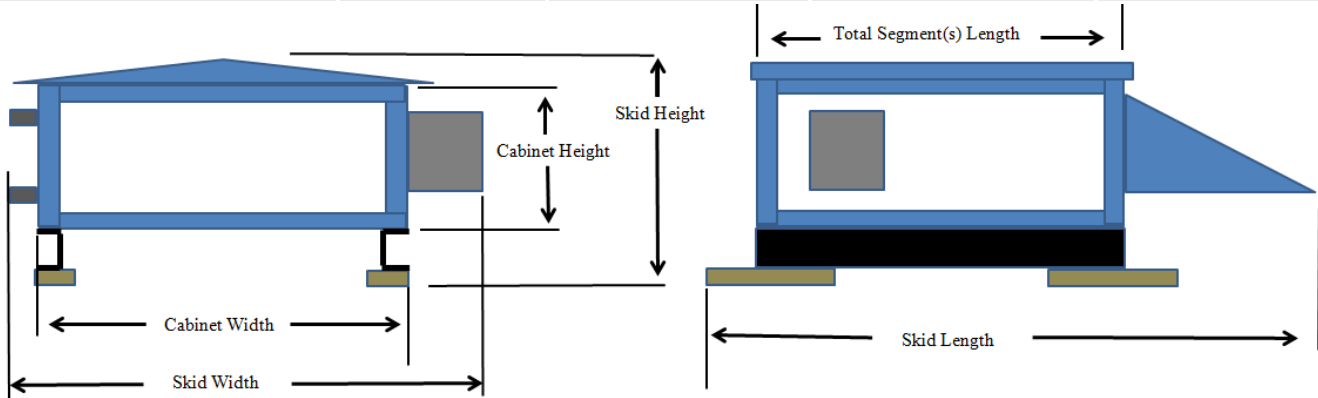
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.

Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details

Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(FS XA-2 HC-2 CC)	137	46	60	2,014
(XA-1 HC-1 AF IP)	90	46	48	921



Notes

Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outriggering extensions, isolation dampers, inlet baskets).

Special Quote(s)

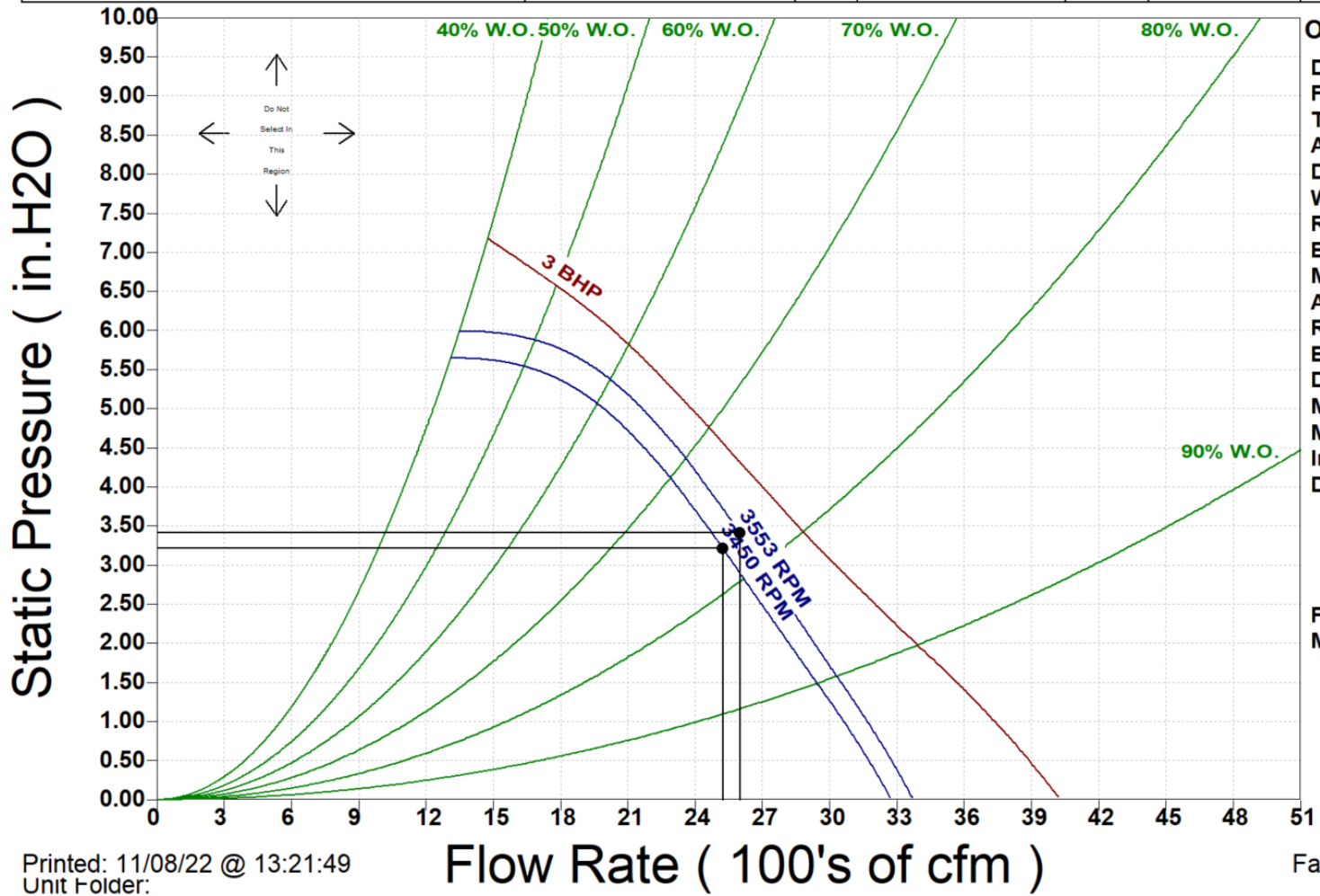
Details		
Segment	SQ Number	Resolution
FS	SQ22-023825-005	Grow FS segment Change access doors to 24"W
Unit	SQ22-023825-008	Provide and install a 4" baserail in lieu of YW selected. Utilize 3" baserail lifting lugs as required.
IP	SQ22-023825-009	Change damper from smoke damper to standard control damper



Supply Fan

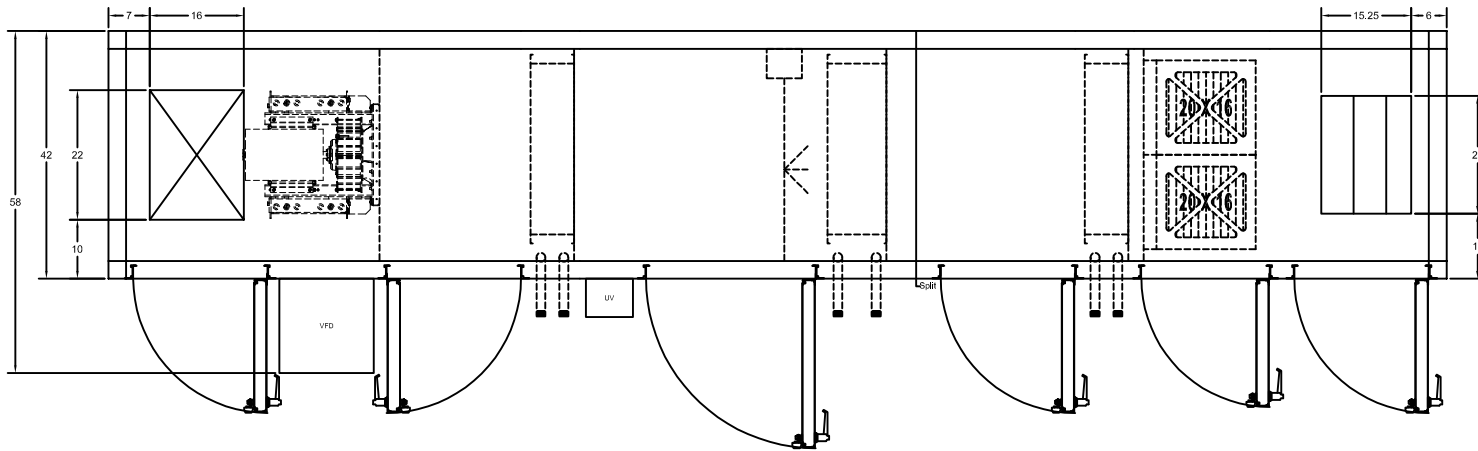
Solution XT Fan Rating Curve

Project Name	Unit Tag	Qty	Model	Seg	Fan Type	Class	Size
026 Army Reserve Center - 1	DOAS-01	1	XTI-36x42	FS	PL-DDPG2II	122-9-100	

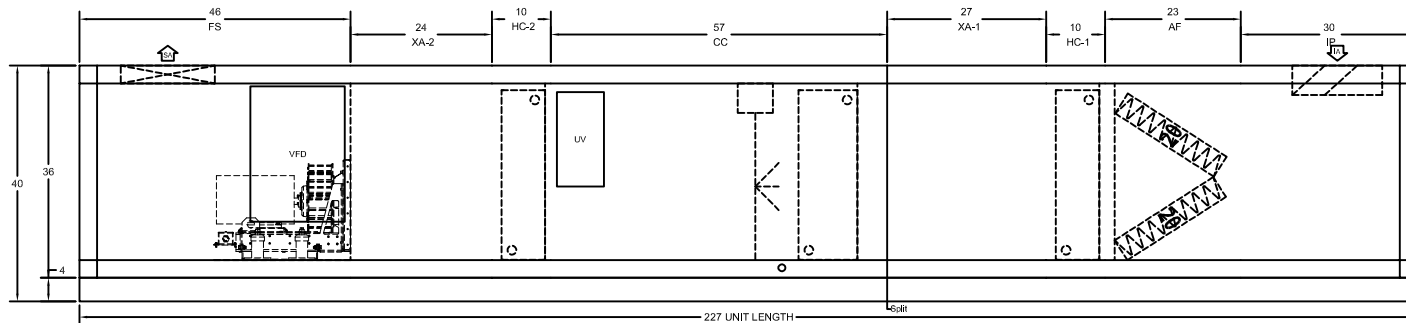


Printed: 11/08/22 @ 13:21:49
Unit Folder:

Fan Rating Curve
Page 1 of 1



PLAN VIEW



ELEVATION VIEW

* NOTE: MAX HEIGHT

UNIT CONSTRUCTION
 Model: Solution-XTI-36x42 Construction: Indoor
 Motor Location:
 Unit Weight: 2,824 lbs. (+/- 10%)

NOTES
 Units with a baserail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of baserail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable) base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

⊙ - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
(in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
HC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
CC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
HC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"

Drain pan connection size 1 1/4" MPT SCH 40 (Connections on Left Side of unit)

SECTION LIST

SECT	DESCRIPTION
IP	Inlet Plenum
AF	Angle Filter
HC-1	Heating Coil
XA-1	Variable Length Access
CC	Cooling Coil
HC-2	Heating Coil
XA-2	Variable Length Access
FS	Supply Fan - T22 - DDPG2

PRODUCT DRAWING
 SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-36x42
NOT FOR CONSTRUCTION

Project Name: NC026 Army Reserve Center - 1
 Location: ,
 Engineer:
 Contractor:
 For:

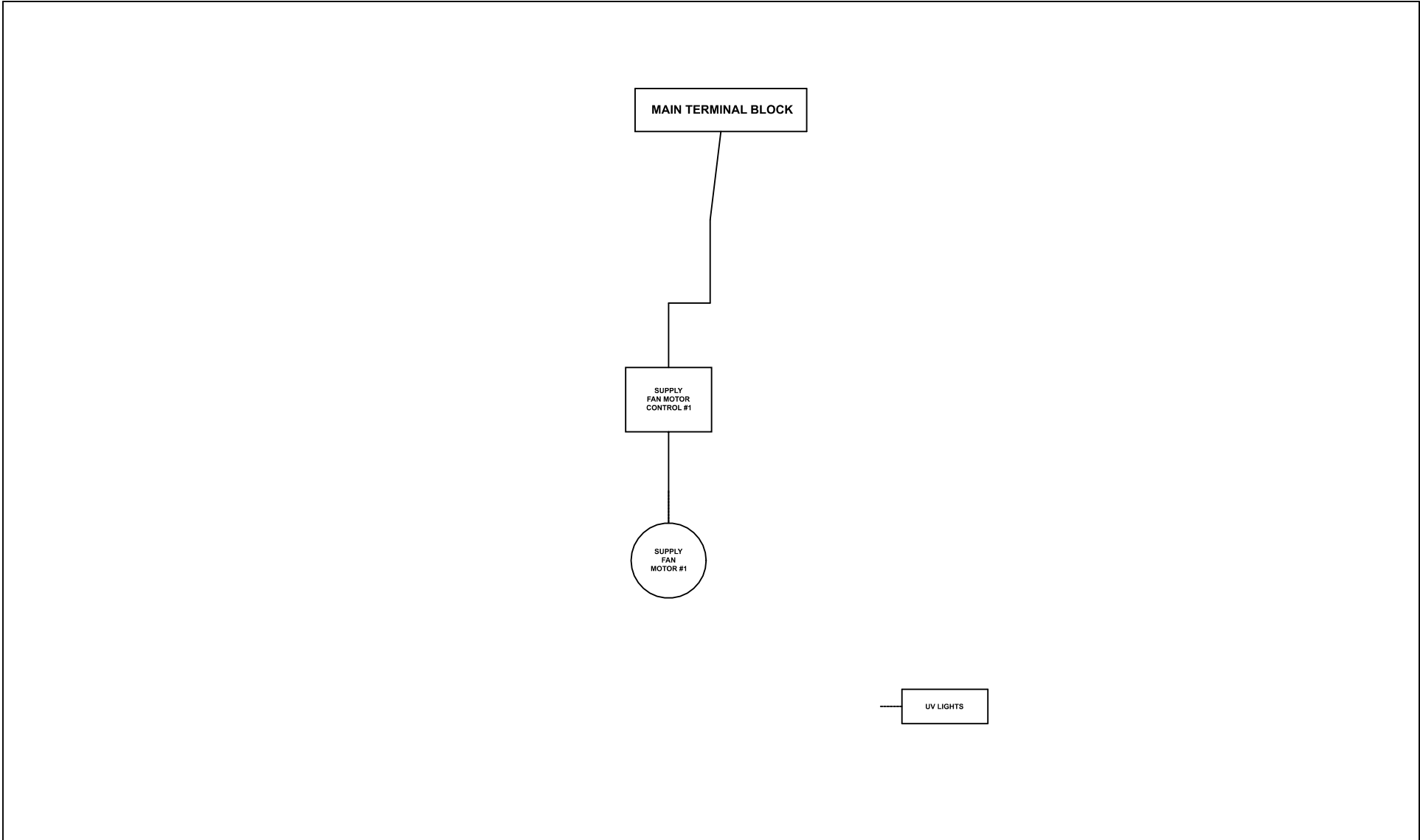
Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT TAG: DOAS-01 - Sheet 1

Date:
 Version:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:



YORKworks Version: 21.054 Drawing Generator Version: 010613067



PRODUCT DRAWING
 AHU Field Wiring
 MODEL:
NOT FOR CONSTRUCTION

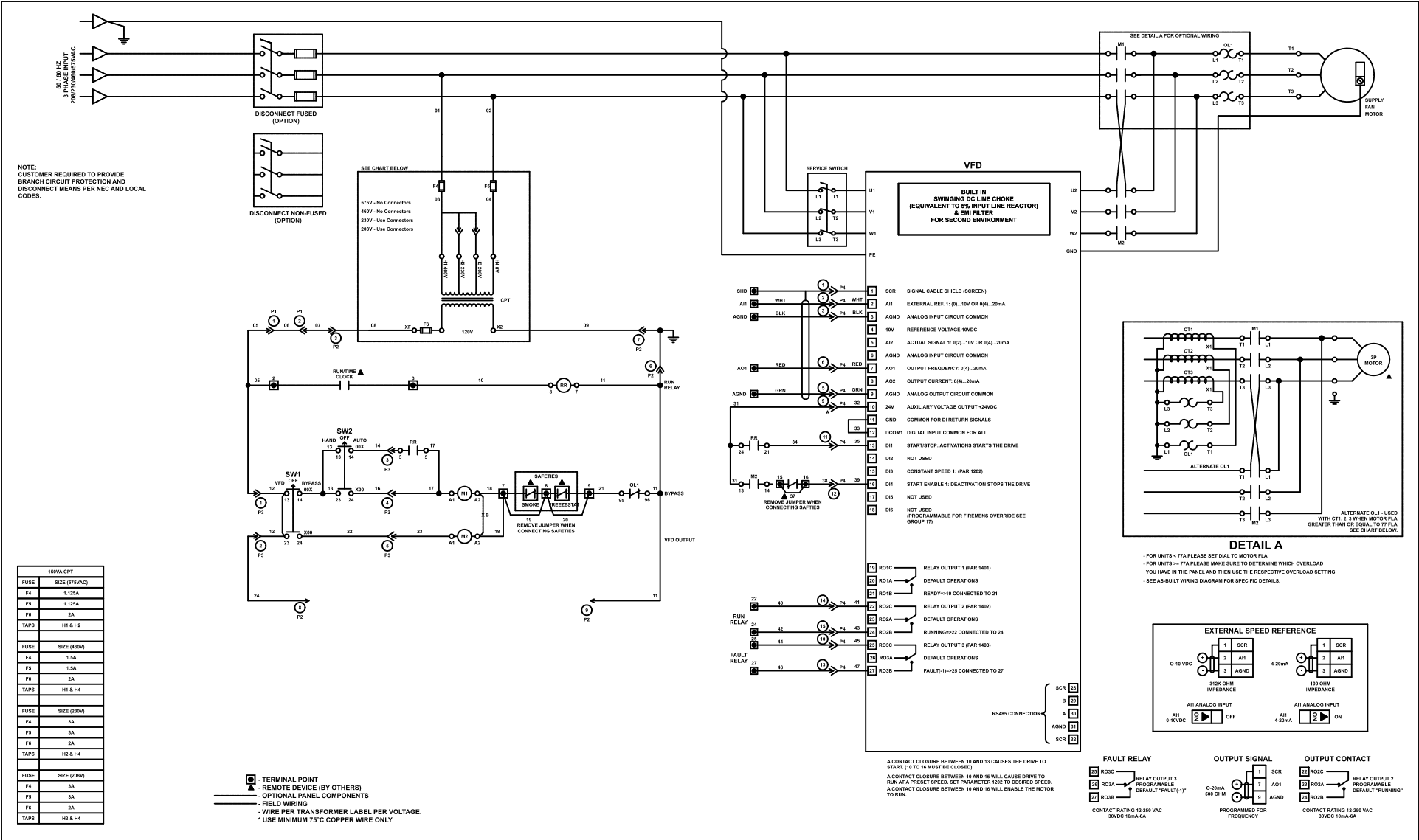
Project Name: NC026 Army Reserve Center - 1
 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT
 TAG: DOAS-01 - Sheet 1

Date: 11/7/2022 15:39:55
 Form No.: 100.09-EG1
 Dwg. Lev.: 12/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:



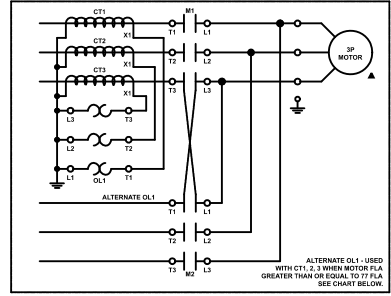


NOTE:
CUSTOMER REQUIRED TO PROVIDE
BRANCH CIRCUIT PROTECTION AND
DISCONNECT MEANS PER NEC AND LOCAL
CODES.

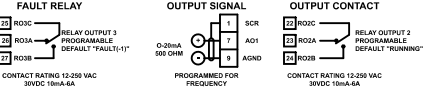
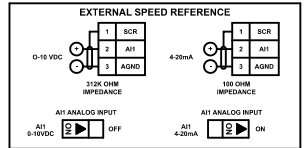
SEE CHART BELOW
270V - No Connectors
460V - No Connectors
230V - Use Connectors
208V - Use Connectors

190VA CPT	
FUSE	SIZE (75VAC)
F4	1.25A
F5	1.25A
F6	2A
TAPS	H1 & H2
FUSE	SIZE (480V)
F4	1.5A
F5	1.5A
F6	2A
TAPS	H1 & H4
FUSE	SIZE (230V)
F4	3A
F5	3A
F6	2A
TAPS	H2 & H4
FUSE	SIZE (208V)
F4	3A
F5	3A
F6	2A
TAPS	H3 & H4

- TERMINAL POINT
 - REMOTE DEVICE (BY OTHERS)
 - OPTIONAL PANEL COMPONENTS
 - FIELD WIRING
 - WIRE PER TRANSFORMER LABEL PER VOLTAGE.
 * USE MINIMUM 75°C COPPER WIRE ONLY

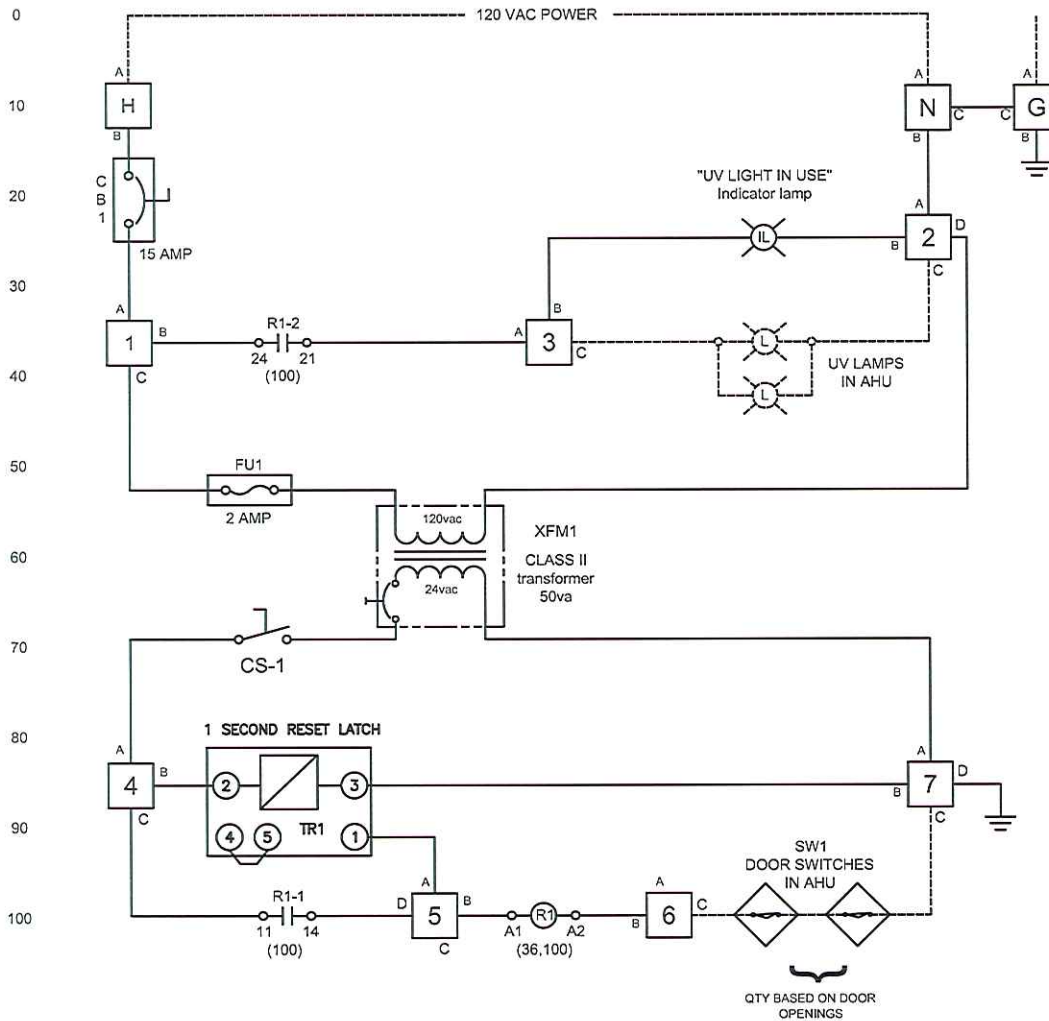


DETAIL A
 - FOR UNITS < 77A PLEASE SET DIAL TO MOTOR FLA
 - FOR UNITS > 77A PLEASE MAKE SURE TO DETERMINE WHICH OVERLOAD YOU HAVE IN THE PANEL AND THEN USE THE RESPECTIVE OVERLOAD SETTING.
 - SEE AS-BUILT WIRING DIAGRAM FOR SPECIFIC DETAILS.



A CONTACT CLOSURE BETWEEN 16 AND 13 CAUSES THE DRIVE TO START (16 TO 16 MUST BE CLOSED)
 A CONTACT CLOSURE BETWEEN 16 AND 15 WILL CAUSE DRIVE TO RUN AT A PRESET SPEED. SET PARAMETER 1202 TO DESIRED SPEED.
 A CONTACT CLOSURE BETWEEN 16 AND 16 WILL ENABLE THE MOTOR TO RUN.

PRODUCT DRAWING AHU Field Wiring MODEL: NOT FOR CONSTRUCTION	Project Name: NC026 Army Reserve Center - 1 Location: Engineer: Contractor: For:	Sold To: Cust Purch Order#: Contract#: 2N990405 UNIT DOAS-01 - Sheet 2	Date: 11/7/2022 15:39:55 Form No.: 100.09-EG1 Dwg. Lev.: 12/03 Dwg. Scale: NTS	Serial Number: SQ Database Number: YORKworks Release: Dwg. Name: Dwg. Location:	
	YORKworks Version: 21.06 Drawing Generator Version : 01:00:13067				



Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "R1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights.
 If all doors are closed, all the "SW1"s will allow "R1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the relay "R1". "R1" will energize and "seal-in" its coil via contact #1. After one second, "TDR-1" will de-energize, but "R1" will remain energized. Should any one door having "SW1" mounted, were to open, "R1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1 will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.



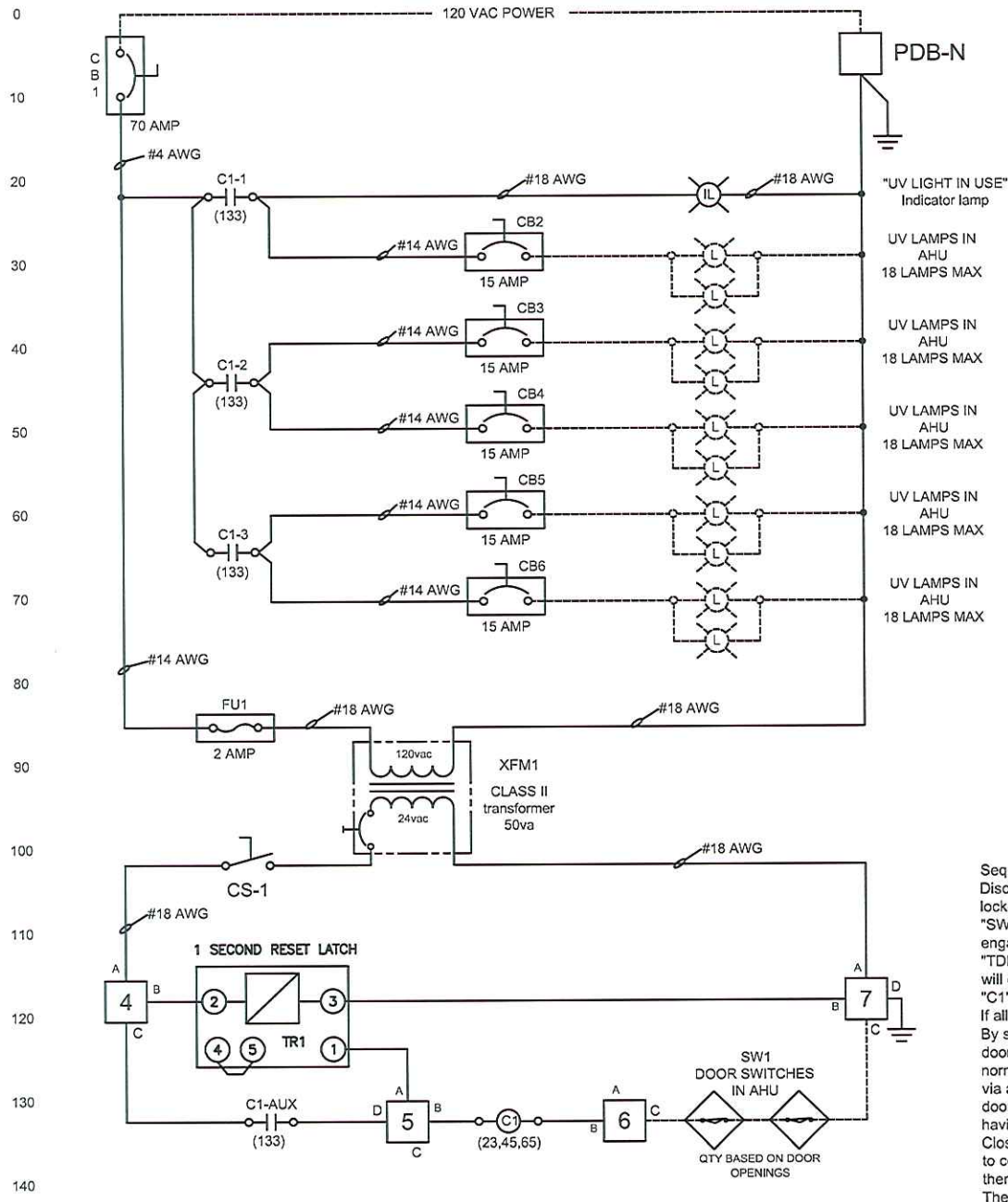
REV LEV	DATE	REVISION RECORD	DR.	CHG. NO.
A	11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-	6-24-08	NEW		08-1675

UNITS DIMENSIONS ARE IN INCHES
 TOLERANCES: PER ENCL. SPEC. M-202
 WELDING: PER ENCL. SPEC. M-201

UV CONTROL PANEL WIRING - 8A

ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER HEREON ARE RESERVED AND NO PERMISSION IS GRANTED TO REPRODUCE THIS POINT OR IN WHOLE OR IN PART OR TO DISCLOSE ANY OF THE INFORMATION HEREON TO OTHERS WITHOUT WRITTEN RELEASE BY YORK INTERNATIONAL CORP.

MATERIAL TYPE:	N/A	ENG. STD.
CUT SIZE:		
SIZE:	DRAWING NUMBER	
A	085-013-001	
SCALE:	NTS	SHEET: 1 OF 1



Sequence of Operation:
 Disconnecting Means of UV lighting will be accomplished by "CB1" internal to the panel. "CB1" is cable of being locked out by panel latching mechanism.
 "SW1" is a proximity switch with a magnet, which will close a set of normally open contacts. The magnet will engage the "SW1" contact whenever it is within 1/2" of the switch.
 "TDR1" is a one second (1sec) time delay relay having normally open contacts. When power is initiated, its contacts will close for one second then re-open. To reset, power must be removed from "TDR1"
 "C1" is a dpdt 24vac control relay, used to seal-in its coil and provide interlocking means to the UV lights. If all doors are closed, all the "SW1"s will allow "C1" to energize, as long as power is available.
 By selecting "CS-1" to the "on" position, the 24vac control power circuit will be energized. As long as all doors with door switches (SW1) are closed and upon detection of power to the 1 second time-delay relay (TDR-1), the "TDR-1" normally open contacts will close for one second, energizing the contactor "C1". "C1" will energize and "seal-in" its coil via an auxiliary contact. After one second, "TDR-1" will de-energize, but "C1" will remain energized. Should any one door having "SW1" mounted, were to open, "C1" will de-energize, deactivating the UV lamps.
 Closing all doors will not turn on UV lights. "CS-1" will be required, to be cycled "Off" then back "On" to allow the lights to come back on. If power is removed from the UV control panel and re-energized (such as when power fluctuates off then back on), the UV lights will reactivate automatically.
 The "IL" "UV LIGHT IN USE" indicator lamp will allow the User to know if the lights have been energized.



REV	DATE	REVISION RECORD	DR.	CHG. NO.
A	11-06-08	CHANGES BASED UPON PROTOTYPE REVIEW.		08-XXXX
-	6-24-08	NEW		08-1675

UV CONTROL PANEL WIRING - >8A		MATERIAL TYPE: N/A	ENG. STD.
CUT SIZE:		DRAWING NUMBER	
SIZE		085-013-002	
SCALE: NTS		SHEET: 1 OF 1	



STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY: _____
Johnson Controls Selling Representative Print/Sign Date

APPROVED BY: _____
Johnson Controls Branch Manager or other authorized individual Print/Sign Date

ACCEPTED BY: _____
Customer Signature Date

ERV-01_COILS Submittal Data

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	ERV-01_COILS		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-30x45	1,800	69	950

Segment Sequence

(CC XA HC)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
HC, CC	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel
XA	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized

Base Details

Segment(s)	Base		Floor				
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
HC, XA, CC	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Water Coil(s)

Performance Details

Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
CC	Water	3	12	6	66	44	83.4	69.6	60.6	58.1	1,800	391	0.29	10.7	42.0	54.3	2.3	2.2	69

Construction Details

Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack		
	Coil Index ²	Connection					Qty	Size (in)			
CC	0	Left	0	Steel	0	MPT	1	1-1/2	-		
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
CC	1	Full	20.00	33	4.6	AL	.010	Corrugated	1/2	Copper	.016

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)		
CC	Electrofin		65	15	.2	Copper	304 Stainless Steel	304 Stainless Steel	-		

Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- BDW Tube Spacing: 1.25 x 1.08
- CC[1][0]: This coil is 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.

Glycol Coil(s)

Performance Details

Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
HC	Propylene	25%	2	8	6	55	55	52.2	-	81.1	-	1,800	391	0.08	3.8	140.0	110.2	1.3	.7	69

Construction Details

Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack
	Coil Index ²	Connection					Qty	Size	
HC	0	Left	0	Steel	0	MPT	1	1-1/2	-

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)		
HC	1	Full	20.00	33	4.6	AL	.010	Corrugated	1/2	Copper	.016
HC	Electrofin		48	11	0.2	Copper	304 Stainless Steel	-	-		

Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
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- Coil DLL Version: 7.7M
- BDW Tube Spacing: 1.25 x 1.08
- HC[1][0]: This coil is 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.

Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel	Left	None

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
XA	Left	Outward	Upstream Side	24 x 12 x 2	None	-	-	Yes	-	-

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
HC	Heating 2 rows 8 fins	4.6	1,800	391.00	0.08	0.00
CC	Cooling 3 rows 12 fins	4.6	1,800	391.00	0.29	0.00
Total					0.37	0.00

Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
HC	Heating Coil	13	45	30	316
XA	Variable Length Access	12	45	30	86
CC	Variable Length Cooling Coil	23	45	30	548
Overall³		48			950

Notes

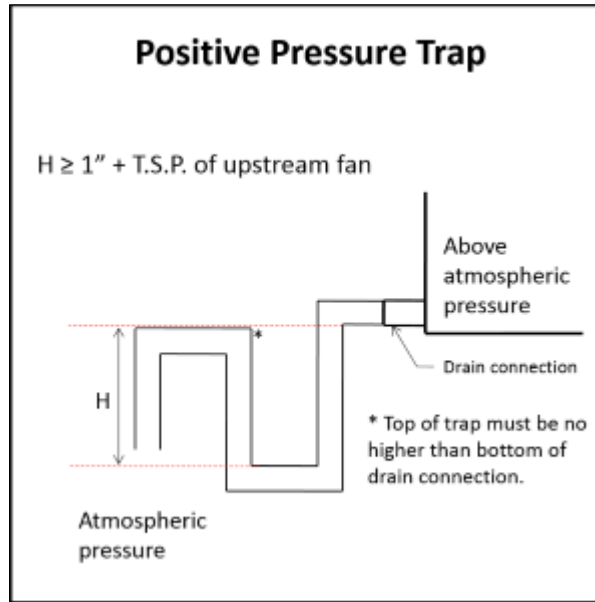
¹The length includes bottom tier segments only

²The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

³Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	-	-	Positive	.00	.00	.00	.00	.00	-



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.
Refer to the Installation Manual of the IOM for more information.

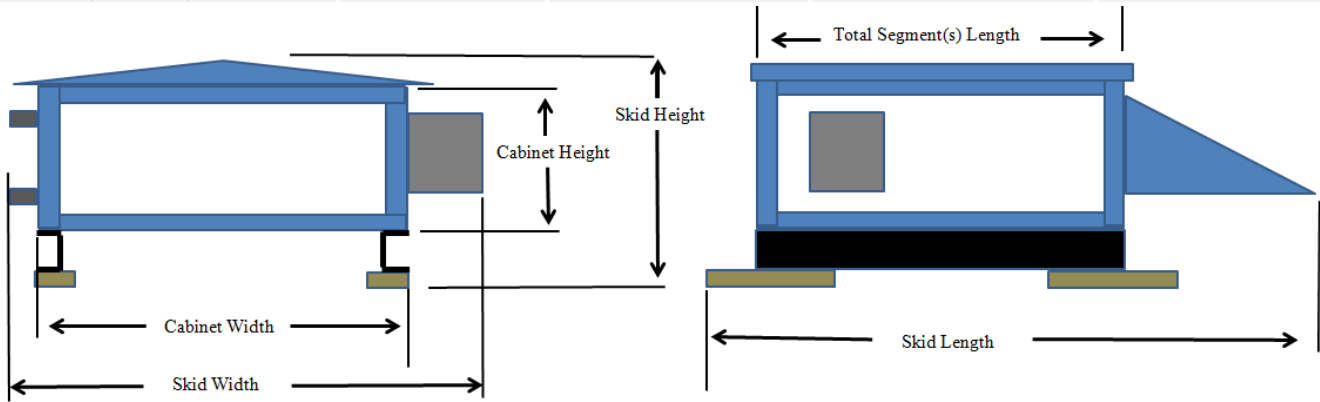
Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_d \leq 0.43$. Units must be rigid mounted.
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.
Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details
Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(CC XA HC)	48	40	51	949



Notes

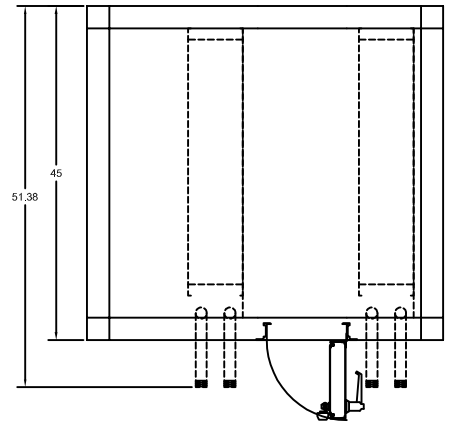
Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

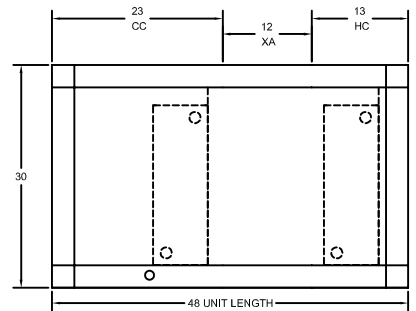
Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outriggering extensions, isolation dampers, inlet baskets).

Special Quote(s)

Details		
Segment	SQ Number	Resolution
Unit	SQ22-027899-001	Provide and install standard IAQ drain pan in lieu of YWX ETP drain pan. Delete baserails. NOTE: unit can not be suspended, structure required by others in the field. Original SQ Number: SQ22-017633-002
Unit	SQ22-027899-002	BTR Original SQ Number: SQ22-017633-004



PLAN VIEW



ELEVATION VIEW

* NOTE: MAX HEIGHT

UNIT CONSTRUCTION
 Model: Solution-XTI-30x45 Construction: Indoor
 Motor Location:
 Unit Weight: 949 lbs. (+/-10%)

Right
 Front (Return)
 Left
 Rear (Supply)
 AIRFLOW

NOTES
 Units with a base rail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of base rail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable,) base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond cabinet dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

⊙ - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
 (in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
HC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
CC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"

Drain pan connection size 1 1/4" MPT SCH 40
 (Connections on Left Side of unit)

SECTION LIST

SECT	DESCRIPTION
HC	Heating Coil
XA	Variable Length Access
CC	Cooling Coil

PRODUCT DRAWING
 SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-30x45
 NOT FOR CONSTRUCTION

Project Name: NC026 Army Reserve Center - 1
 Location: ,
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT TAG: ERV-01_COILS - Sheet 1

Date:
 Version:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY:

Johnson Controls Selling Representative Print/Sign

Date

APPROVED BY:

Johnson Controls Branch Manager or other authorized individual Print/Sign

Date

ACCEPTED BY:

Customer Signature

Date

ERV-02_COILS Submittal Data

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	ERV-02_COILS		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-30x36	1,100	69	890

Segment Sequence

(CC XA HC)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
HC, CC	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel
XA	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized

Base Details

Segment(s)	Base		Floor				
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
HC, XA, CC	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Water Coil(s)

Performance Details

Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
CC	Water	5	10	8	41	29	82.1	69.0	58.0	57.1	1,100	333	0.29	6.9	42.0	53.9	1.2	.8	69

Construction Details

Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack		
	Coil Index ²	Connection					Qty	Size (in)			
CC	0	Left	0	Steel	0	MPT	1	1-1/2	-		
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
CC	1	Full	20.00	24	3.3	AL	.010	Corrugated	1/2	Copper	.016

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
CC		Electrofin	70	18			.3	Copper	304 Stainless Steel	304 Stainless Steel	-

Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- BDW Tube Spacing: 1.25 x 1.08
- CC[1][0]: This coil is 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.

Glycol Coil(s)

Performance Details

Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
HC	Propylene	25%	2	9	8	33	33	55.8	-	83.0	-	1,100	333	0.06	2.3	140.0	110.0	1.0	.5	69

Construction Details

Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack
	Coil Index ²	Connection					Qty	Size	
HC	0	Left	0	Steel	0	MPT	1	1-1/2	-

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
HC	1	Full	20.00	24	3.3	AL	.008	Corrugated	1/2	Copper	.016

Coil	Coil Coating	Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)
HC	Electrofin	39	9	0.1	Copper	304 Stainless Steel	-	-

Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
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- HC[1][0]: This coil is 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.

Drain(s)

Details			
Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
CC	Stainless Steel	Left	None

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
XA	Left	Outward	Upstream Side	24 x 12 x 2	None	-	-	Yes	-	-

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
HC	Heating 2 rows 9 fins	3.3	1,100	333.00	0.06	0.00
CC	Cooling 5 rows 10 fins	3.3	1,100	333.00	0.29	0.00
Total					0.35	0.00

Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
HC	Heating Coil	13	36	30	281
XA	Variable Length Access	12	36	30	77
CC	Variable Length Cooling Coil	25	36	30	532
Overall³		50			890

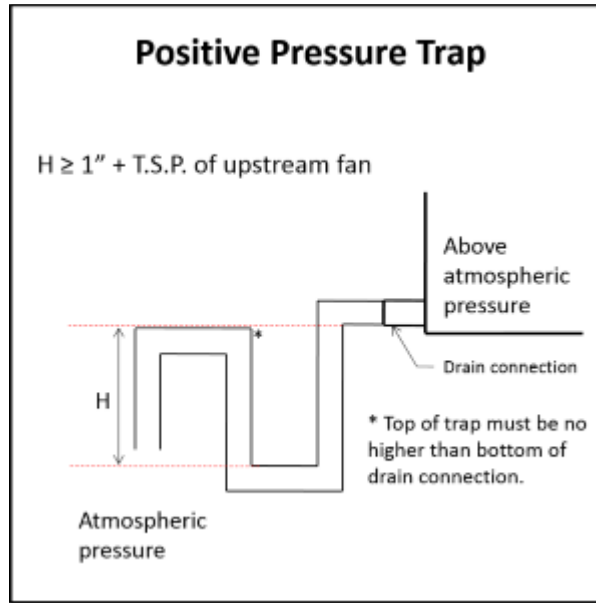
¹The length includes bottom tier segments only

²The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

³Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
CC	-	-	Positive	.00	.00	.00	.00	.00	-



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.
Refer to the Installation Manual of the IOM for more information.

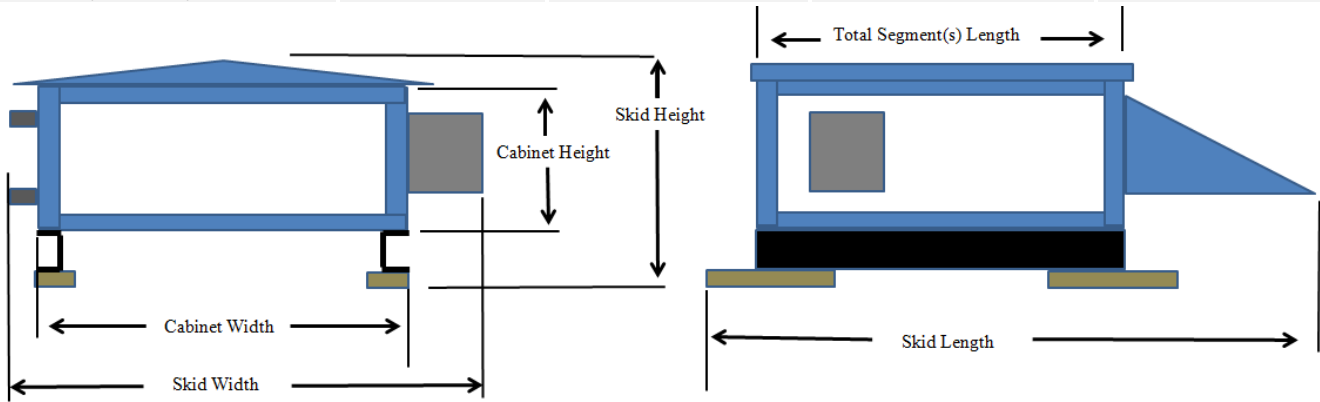
Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_{ds} \leq 0.43$. Units must be rigid mounted.
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.
Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details
Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(CC XA HC)	50	40	42	890



Notes

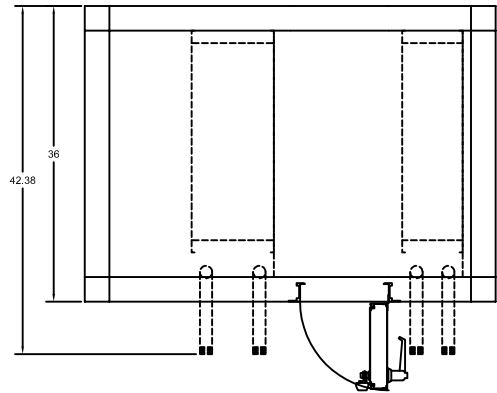
Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

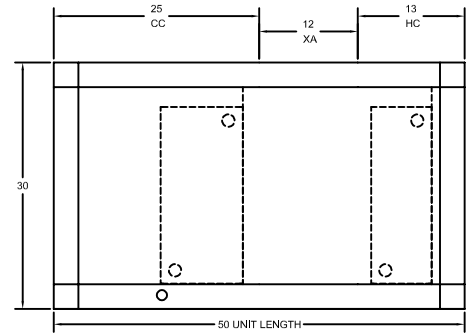
Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outrigging extensions, isolation dampers, inlet baskets).

Special Quote(s)

Details		
Segment	SQ Number	Resolution
Unit	SQ22-024077-001	Provide and install standard IAQ drain pan in lieu of YWX ETP drain pan. Delete baserails. NOTE: unit can not be suspended, structure required by others in the field.
Unit	SQ22-024077-003	BTR



PLAN VIEW



ELEVATION VIEW

* NOTE: MAX HEIGHT

UNIT CONSTRUCTION
 Model: Solution-XTI-30x36 Construction: Indoor
 Motor Location: Right
 Unit Weight: 890 lbs. (+/-10%)

NOTES
 Units with a base rail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of base rail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable,) base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond cabinet dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

⊙ - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
 (in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
HC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
CC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"

Drain pan connection size 1 1/4" MPT SCH 40
 (Connections on Left Side of unit)

SECTION LIST

SECT	DESCRIPTION
HC	Heating Coil
XA	Variable Length Access
CC	Cooling Coil

PRODUCT DRAWING

SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-30x36
 NOT FOR CONSTRUCTION

Project Name: NC026 Army Reserve Center - 1
 Location: ,
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT TAG: ERV-02_COILS - Sheet 1

Date:
 Verison:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

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Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

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Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY: _____
Johnson Controls Selling Representative Print/Sign Date

APPROVED BY: _____
Johnson Controls Branch Manager or other authorized individual Print/Sign Date

ACCEPTED BY: _____
Customer Signature Date

FCU-09 Submittal Data



YORK® Solution™ Air Handling Unit Performance Report

Job Summary

Project Name:	NC026 Army Reserve Center - 1		
Unit Tag(s):	FCU-09		
Quantity:	1	Environment:	Indoor



Unit Overview

Model	Airflow (CFM)	Altitude (ft)	Operating Weight (lbs)
XTI-42x57	4,800	69	3,345

Segment Sequence

(VC AF)(FS)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
AF , FS	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized
VC	2	None	18 Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Stainless Steel

Base Details

Segment(s)	Base			Floor			
	Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
AF , VC , FS	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	None

Unit Electrical

Circuit Details

Circuit #	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	Supply Fan Motor Control	460/3/60	6.2	7.8	12.0
2	UV-C Lamps 1	120/1/60	-	-	1.0

Electrical Details

Minimum Unit SCCR	100 kA rms Symmetrical	ETL Label (UL1995/NEC-2002)	Yes
Unit Light Type	Unit Light Switch		
-	-		

Supply Fan(s)

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Twin City	EPFN	II	182	100	100	1	4,800	69	2.61	0.75	1,885	2.92

Project Name: NC026 Army Reserve Center - 1
 Unit Folder: FCU-09
 Unit Tag(s): FCU-09





YORK® Solution™ Air Handling Unit Performance Report

Performance Details												
Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Drive Type	Wheel Type	Blade Type	Wheel Material	Base Material		Fan Flow Isolation	Isolation Type	Total Efficiency (%)	Outlet Velocity (ft/s)	Max Speed (RPM)	FEP (kW)	
Direct Drive	SWSI	Airfoil	Aluminum	-		None	2" Spring	0.73	0	2,930	2.59	
Motor Details												
Type	Manufacturer	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	Motor Speed (RPM)	Frame Size	Full Load Amps (Amps)	Efficiency	Location		
ODP	TECO	5.0	460/3/60	1	F	1,800	184	6.20	Premium	Direct Drive		
At Motor Synchronous Details												
TSP (in w.g.)		Total Air Flow (CMF)		Fan Speed (RPM)		Motor Correction Factor(%)		Fan Power (BHP)				
2.25		4,456		1,750		89.5		2.34				
Notes												
Certified by the AHRI Central Station Air-Handling Unit (AHU) Certification Program, which is based on AHRI Standard 430/431. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third-party verified. Certified units may be found in the AHRI Directory at www.ahridirectory.org .												

Water Coil(s)

Performance Details																			
Coil	Fluid Type	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
							DB	WB	DB	WB									
VC	Glycol	1	8	4	63	63	68.0	-	81.3	-	4,800	471	0.11	5.8	140.0	117.5	1.3	.4	69
VC	Water	6	8	6	138	110	75.0	63.0	53.8	53.0	4,800	471	0.59	30.4	42.0	51.0	1.5	3.3	69
Construction Details																			
Coil	Location		Offset (in)	Connection Material ³	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack										
	Coil Index ²	Connection					Qty	Size (in)											
VC	0	Left	0	Steel	0	MPT	1	1-1/2	-										
VC	1	Left	0	Steel	0	MPT	1	1-1/2	-										
Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)								
VC	1	Full	33.25	44	10.2	AL	.010	Sine	5/8	Copper	.020								
VC	1	Full	33.25	44	10.2	AL	.008	Sine	5/8	Copper	.020								
Coil	Coil Coating		Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)										
VC	Electrofin with UV Top Coat		66	15	.2	Copper	304 Stainless Steel	304 Stainless Steel	-										
VC	Electrofin with UV Top Coat		193	72	1.2	Copper	304 Stainless Steel	304 Stainless Steel	-										

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
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Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- VC[1][0]: This coil is 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.
- VC[1][1]: This coil is 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.

Glycol Coil(s)

Performance Details

Coil	Glycol Type	Glycol %	Rows	Fin Spacing (FPI)	TPC	TMBH	SMBH	EAT (°F)		LAT (°F)		Airflow (CFM)	FV (ft/min)	APD	Flow (GPM)	EWT (°F)	LWT (°F)	Fluid Vel. (ft/s)	WPD	Alt. (ft)
								DB	WB	DB	WB									
VC	Propylene	25%	1	8	4	63	63	68.0	-	81.3	-	4,800	471	0.11	5.8	140.0	117.5	1.3	.4	69
VC	None	0%	6	8	6	138	110	75.0	63.0	53.8	53.0	4,800	471	0.59	30.4	42.0	51.0	1.5	3.3	69

Construction Details

Coil	Location		Offset (in)	Connection Material ¹	Connection Rotation (degrees)	Connection Type	Supply Connection (Per Coil)		Coil Stack Rack
	Coil Index ²	Connection					Qty	Size	
VC	0	Left	0	Steel	0	MPT	1	1-1/2	-
VC	1	Left	0	Steel	0	MPT	1	1-1/2	-

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
VC	1	Full	33.25	44	10.2	AL	.010	Sine	5/8	Copper	.020
VC	1	Full	33.25	44	10.2	AL	.008	Sine	5/8	Copper	.020

Coil	Coil Coating	Dry Weight (lbs)	Fluid Weight (lbs)	Fluid Volume (ft³)	Header Material	Casing Material	Intermediate Drain Pan Material	Fouling Factor (hr.ft².°F/BTU)
VC	Electrofin with UV Top Coat	66	15	0.2	Copper	304 Stainless Steel	304 Stainless Steel	-
VC	Electrofin with UV Top Coat	193	72	1.2	Copper	304 Stainless Steel	304 Stainless Steel	-

Coil	# of Coils High	Face Type	Total Fin Height (in)	Fin Length (in)	Coil Face Area (ft²)	Fin Material	Fin Thickness (in)	Fin Type	Tube Diameter (in)	Tube Material	Tube Wall Thickness (in)
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Coil Notes

- ¹Performance is shown for the entire coil bank. Performance is not per coil.
- ²Coil index indicates position in segment. Example: CC-1, index 0; Spacer, index 1; CC-2, index 2
- ³Johnson Controls suggests using red brass or copper connectors when the coil is to be attached to a copper or brass piping system.
- All coils are rated with a fouling factor of 0.00000 hr.ft².°F/BTU unless otherwise noted
- Ratings are for coils manufactured by Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202.
- Coil DLL Version: 7.7M
- CDW Tube Spacing: 1.50 x 1.30
- VC[1][0]: This coil is 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.ahrirectory.org.

Drain(s)

Details

Segment	Drain Pan		
	Liner Material	Connection Location	Liner Coating
VC	Stainless Steel	Left	None

UV

Details

Segment	Power (W)	Amps	Voltage (V)	Frequency (Hz)	Lamp Efficiency	Radiometer
VC	120	1.0	120	60	Surface Decontamination	-

Filter(s)

Details

Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material
AF	Primary Filter	4" Mini-Pleat	Side	80-85% Eff, (MERV 13)	1	80-85% Eff, (MERV 13)	Galvanized

Sizes

Filter Gauge Details

Segment	Filter	1 st Filter Size H x W (in)	1 st Qty	Location	Type	Range (in w.g)
AF	Primary Filter	12x24	8	Door	Magnehelic	0 - 1

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
AF	Left	Outward	Upstream Side	36 x 20 x 2	STD Double Pane	-	-	Yes	-	-
VC	Left	Outward	Downstream Side	36 x 30 x 2	STD Double Pane	-	-	Yes	-	-
FS	Left	Outward	Upstream Side	36 x 24 x 2	STD Double Pane	-	-	Yes	Yes	-

Motor Control(s)

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
FS	ABB VFD ABB AYK580	-	460/3/60	7.6/7.6	90 %	133	NEMA 1	2 Contactor Bypass	Fused	Yes

Notes

*Drives are rated for use below 3,000 ft and 104°F. Use Derating Charts in Air-Mod Engineering Guide Form 100.42-EGI (212) for use above these limits.

Storage Temperature: -40°F to 158°F

Humidity: MAX 95% RH non-condensing

Altitude: 3,300 ft. without derate (1% derate for each additional 330 ft.)

Overload Current Rating: 100% for 1 minute every 10 minutes.

The Class 10 trip rating of the MMP device will not withstand an across-the-line start of a fan and should not be used with VFDs with bypass circuits.

The customer must provide a platform or catwalk for accessing the power-disconnect.

Copper Conductors Only.

FS: Contains the following option: Swinging DC Line Choke (Equivalent to 5% Input Line Reactor)

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
AF	4" Mini-Pleat 80-85% Eff, (MERV 13)	16.0	4,800	300.00	0.28	0.00
AF	Dirty Filter Allowance	0.0	4,800	0.00	0.28	0.00
VC	Heating 1 rows 8 fins	10.2	4,800	471.00	0.11	0.00
VC	Cooling 6 rows 8 fins	10.2	4,800	471.00	0.59	0.00
VC	Turning Air	0.0	4,800	0.00	0.01	0.00
VC	UV Lamp Assembly	0.0	4,800	0.00	0.03	0.00
FS	Opening	5.3	4,800	909.00	0.14	0.00
FS	Cabinet Effect	0.0	4,800	0.00	0.42	0.00
FS	External Static - User Entered	0.0	4,800	0.00	0.75	0.00
Total					2.61	0.00

Dimensions and Weight

Details					
Segment	Description	Length ¹ (in)	Width ² (in)	Height (in)	Weight (lbs)
AF	Angle Filter	23	57	42	339
VC	Vertical Coil	70	57	42	1,221
FS	Supply Fan	53	57	51	1,785
Overall³		88			3,345

Notes

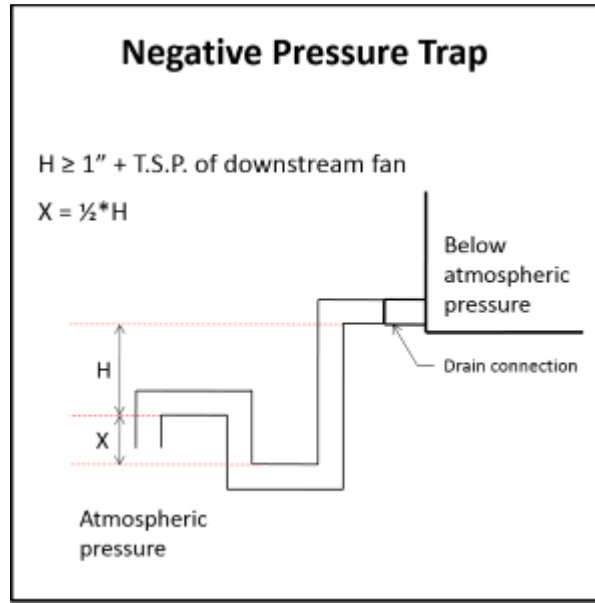
¹The length includes bottom tier segments only

²The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

³Unit level and other loose components may be excluded from segment weights and overall segment weights. For total unit weight reference Unit Overview.

Recommended Trap Height

Details									
Segment	Applicable Fan	Fan TSP (in w.g.)	Positive or Negative	Calculated Dimensions (in)			Recommended Dimensions (in)		Base Rail Height (in)
				H	X	H + X	H	H + X	
VC	Supply Fan	2.61	Negative	3.61	1.81	5.42	3.75	5.75	6"



Notes

Formulas and calculations are recommendations only. Contractor shall determine actual dimensions required for each trap based on jobsite conditions, and application requirements.

Refer to the Installation Manual of the IOM for more information.

Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment ($I_p = 1.0$) for locations with design spectral response $S_{ds} \leq 0.43$. Units must be rigid mounted.

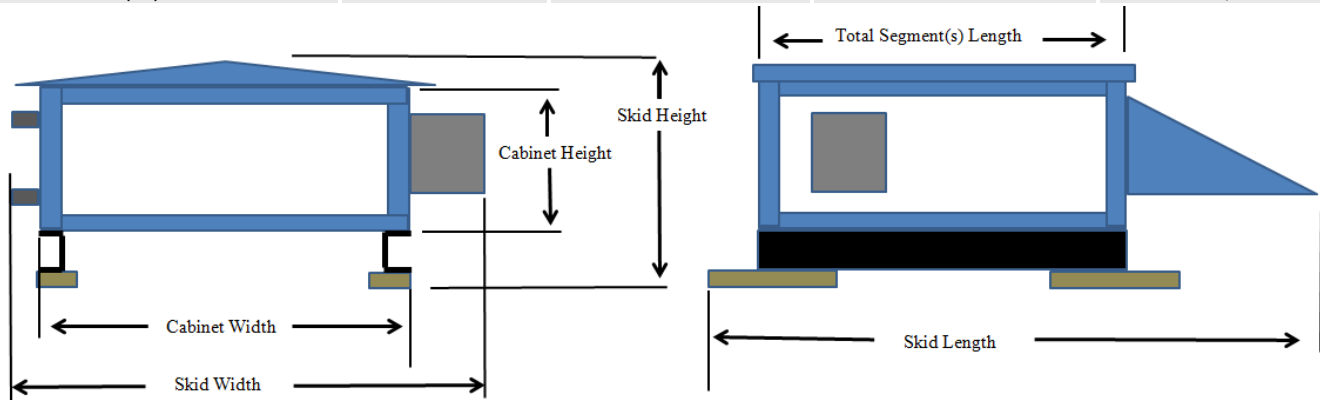
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.

Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details

Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs)
(VC AF)	109	52	63	1,560
(FS)	53	55	75	1,785



Notes

Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outriggering extensions, isolation dampers, inlet baskets).

Special Quote(s)

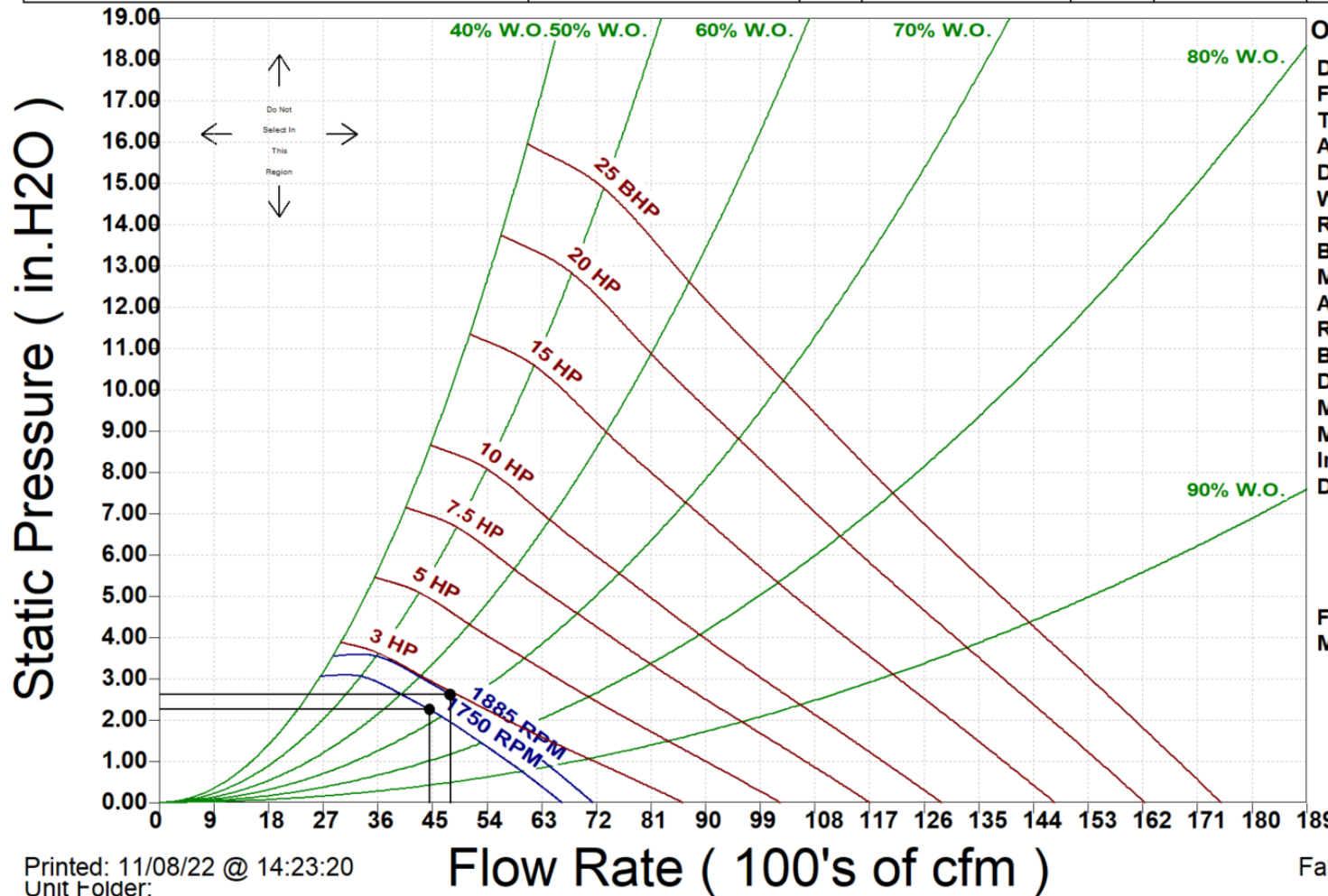
Details		
Segment	SQ Number	Resolution
VC	SQ22-024315-001	Relocate UV panel to rear end of VC
FS	SQ22-024315-003	Change FS access door to 24"W
FS	SQ22-024315-004	Relocate FS VFD to rear end of bottom tier VC Locate 6" from LH vertical raceway
FS	SQ22-024315-005	Provide and install a vertical TCF 182 DD plenum fan in lieu of YW selection. Change top tier FS cabinet to 51"H and 53"L (DOA). Center fan arrangement in segment width and length. Modify fan skid as required. Note fan to have spring brackets. Provide and install a front end and a floor panel. Maintain top discharge size and location. Extend VC segment 5", making it 70"L. Provide a 37" "no panel" opening in the top of VC segment, starting at rear end raceway. Ref. submittal drawing for layout.
Unit	SQ22-024315-007	BTR



Supply Fan

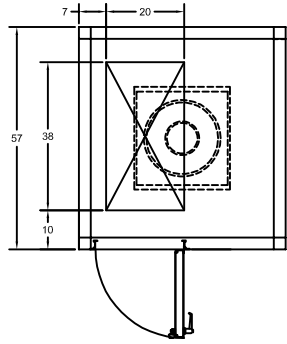
Solution XT Fan Rating Curve

Project Name	Unit Tag	Qty	Model	Seg	Fan Type	Class	Size
026 Army Reserve Center - 1	FCU-09	1	XTI-42x57	FS	PL-EPFN	II	182

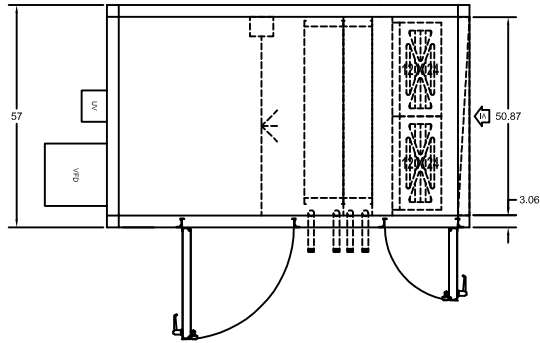


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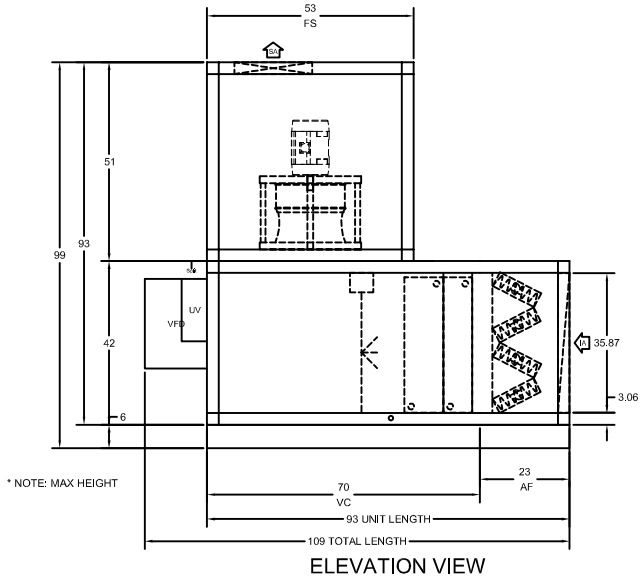
Fan Rating Curve
 Page 1 of 1



PLAN VIEW
TIER 2



PLAN VIEW
TIER 1



ELEVATION VIEW

UNIT CONSTRUCTION
 Model: Solution-XTI-42x57 Construction: Indoor
 Motor Location:
 Unit Weight: 2,700 lbs. (+/- 10%)

NOTES
 Units with a baserail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of baserail.

Refer to performance report for shipping split details.
 Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable), base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Mill (+/- 1/2"); Piping (+/- 2")

⊙ - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
(in order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return
VC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"
VC	MPT	Left	1 Sup 1 Ret	1 1/2"	1 1/2"

Drain pan connection size 1 1/4" MPT SCH 40
(Connections on Left Side of unit)

SECTION LIST

SECT	DESCRIPTION
AF	Angle Filter
VC	Vertical Coil
FS	Supply Fan - 182EPFN

PRODUCT DRAWING
 SOLUTION XT AIR HANDLING UNIT DETAIL
 MODEL: Solution-XTI-42x57
NOT FOR CONSTRUCTION

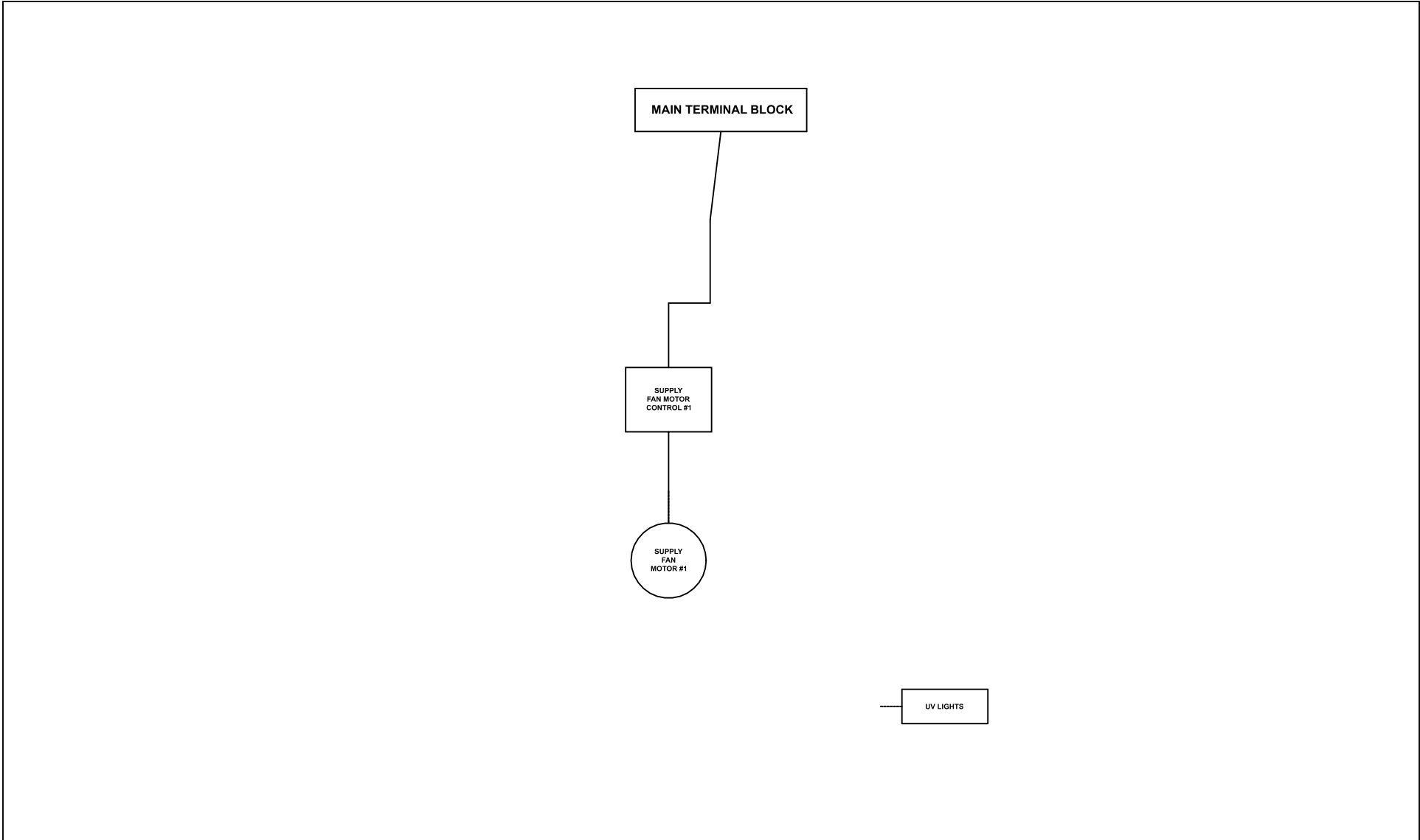
Project Name: NC026 Army Reserve Center
 Location: ,
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#:
 UNIT
 TAG: FCU-09 - Sheet 1

Date:
 Version:
 Form No.:
 Dwg. Lev.: 5/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





PRODUCT DRAWING
 AHU Field Wiring
 MODEL:
NOT FOR CONSTRUCTION

Project Name: NC026 Army Reserve Center - 1
 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#: 2N990405
 UNIT
 TAG: FCU-09 - Sheet 1

Date: 11/7/2022 15:41:23
 Form No.: 100.09-EG1
 Dwg. Lev.: 12/03
 Dwg. Scale: NTS

Serial Number:
 SQ Database Number:
 YORKworks Release:
 Dwg. Name:
 Dwg. Location:





STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Supersedes: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger.
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.



**STANDARD PARTS & LABOR LIMITED WARRANTY
YORK® SOLUTION™ XTO/XTI
JOHNSON CONTROLS**

PRODUCT TYPE: YORK® SOLUTION™ XTO/XTI
YORK CONTRACT NO.:
UNIT MODEL NUMBER:
UNIT SERIAL NUMBER:
UNIT TAG ID:
UNIT LOCATION:

STARTUP DATE:
SHIPPING DATE:

PROJECT NAME:
INSTALLATION
ADDRESS:

LIMITED WARRANTY

Subject to the terms, conditions, exclusions, and other limitations set forth in the Standard Limited Warranty for Engineered Systems Equipment (50.05-NM2), when properly endorsed, this protection plan between Johnson Controls, Inc. ("Seller") and the undersigned Customer ("Buyer") warrants that that each new Engineered Systems Equipment manufactured by Seller and materials, or installation or start-up services performed by Johnson Controls in connection therewith, are free from defects in material and workmanship for eighteen (18) months from the date of shipment from Seller's facility or twelve (12) months from startup, whichever occurs first. When properly endorsed, this protection plan between the Seller and Buyer, warrants, to the customer named herein, labor for the entire air handling unit. Labor repairs must be performed in accordance with instructions issued by Johnson Controls.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIALS OR EQUIPMENT INVOLVED. NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING, BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS' SUPPLIERS AND SUBCONTRACTORS.

Notification of defect and any warranty claim must be made in writing, postage paid, with a brief written description of the problem to Buyer's local Johnson Controls' sales/service office. Nothing herein is intended to provide warranty coverage to lessees or anyone other than Buyer and no third-parties are intended to be beneficiaries of this warranty.

BRANCH SERVICE OFFICE:

OFFERED BY: _____
Johnson Controls Selling Representative Print/Sign Date

APPROVED BY: _____
Johnson Controls Branch Manager or other authorized individual Print/Sign Date

ACCEPTED BY: _____
Customer Signature Date

Additional Information

YORK SOLUTION INDOOR AIR HANDLER GUIDE SPECIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Indoor air handling units and components as scheduled and shown on drawings.
- B. Motor disconnects, motor starters, and variable frequency drives.

1.02 RELATED SECTIONS

- A. The requirements of the General Conditions, Supplementary Conditions, Division 1, equipment schedules, and drawings apply.

1.03 REFERENCES

- A. AMCA 99 – Standard Handbook
- B. AMCA 210 – Laboratory Methods of Testing Fans for Rating Purposes
- C. AMCA 500 – Test Methods for Louvers, Dampers, and Shutters
- D. AMCA 611-95 – Methods of Testing Airflow Measurement Stations for Rating
- E. ANSI/AFBMA 9 – Load Ratings and Fatigue Life for Ball Bearings
- F. ANSI/UL 900 – Test Performance of Air Filter Units
- G. AHRI 260 – Sound Rating of Ducted Air Moving and Conditioning Equipment
- H. AHRI 410 – Forced-Circulation Air Cooling and Air Heating Coils
- I. ANSI/AHRI 430 – Performance Rating of Central-Station Air Handling Units
- J. ASHRAE 52.1/52.2 – Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size
- K. ASHRAE 62 – Ventilation for Acceptable Indoor Air Quality
- L. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
- M. ASTM-C 1338 – Standard Test Method for Determining Fungi Resistance of Insulation Material and Facings.
- N. NFPA 70 – National Electric Code (conductors, equipment and raceways)
- O. NFPA 90A – Installation of Air Conditioning and Ventilation Systems

- P. SMACNA – HVAC Duct Construction Standards
- Q. UL-181 – Mold Growth and Humidity Test
- R. UL-1995 – Standard for Safety for Heating and Cooling Equipment

1.04 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of 25 years of experience in designing, manufacturing, and servicing air-handling units.
- B. The design indicated on the schedules and shown on the drawings is based upon the products of the named manufacturer. Alternate equipment manufacturers are acceptable if equipment meets scheduled performance requirements and dimensional requirements.

1.05 COORDINATION

- A. The Mechanical Contractor shall be responsible for costs incurred by the General Contractor, Subcontractors, and Consulting Engineers to accommodate units furnished by a manufacturer other than manufacturer named as basis of design.

1.06 RATINGS AND CERTIFICATIONS

- A. Unit shall conform to AMCA 210 for fan performance ratings.
- B. Unit shall conform to E.T.L. standards. Unit shall be ETL listed.
- C. Unit sound ratings shall be reported in accordance with AHRI 260 for inlet and discharge sound power levels.
- D. Unit casing radiated sound ratings shall be reported in accordance with ISO 9614 parts 1&2 and ANSI S12.12.
- E. Unit shall conform to AHRI 410 for capacities, pressure drops, and selection procedures of air coils.
- F. Unit shall have airflow performance certified to ANSI/AHRI 430.
- G. Motors covered by the Federal Energy Policy Act (EPACT) shall meet EPACT requirements.
- H. Damper performance shall comply with AMCA 500.
- I. Airflow Monitoring Stations shall be rated in accordance with AMCA 611-95 and bear a Certified Ratings Seal for Airflow Measurement Performance.
- J. Units shall be ISO 9001 certified.
- K. Units shall be manufactured in an ISO 9002 certified facility.
- L. Filter media to comply with ANSI/UL 900 listed Class I or Class II.
- M. Control Wiring comply with NEC codes & ETL requirements.
- N. Units shall comply with energy use AHSRAE 90.1.

1.07 SUBMITTAL DOCUMENTATION REQUIRED

- A. Furnish fan performance ratings and fan curves with specified operating point clearly plotted.
- B. Furnish drawings indicating unit dimensions, required clearances, field connection locations, wiring diagrams, shipping drawings, and curb drawings.
- C. Furnish performance report showing unit level performance data including: fan(s), motor(s), coil(s) and other functional components. Performance report shall also include unit casing performance.
- D. Furnish operation and maintenance data, including instructions for lubrication, filter replacement, motor and drive replacement, and condensate pan cleaning; spare parts lists, and wiring diagrams.
- E. Adjust and report performance ratings for the proper altitude of operation.
- F. Report air-handling unit performance ratings in accordance with ANSI/AHRI-430 (static pressure, airflow, fan speed, and fan brake horsepower).
- G. Report static pressure profiles by component section.
- H. Report coil ratings in accordance with AHRI-410 (capacities and pressure drops).
- I. Report unweighted octave band AHU sound power for inlets and outlets rated in accordance with AHRI Standard 260. Provide eight data points, the first for the octave centered at 63 Hz, and the eighth centered at 8,000 Hz. Manufacturer shall not use sound estimates based on bare fan data (AMCA ratings), nor use calculations like the substitution method based on AHRI 260 tests of other AHU products. Provide data for inlets and outlets as scheduled. Report unweighted casing radiated sound power over the same 8 octave bands in accordance with ISO 9614 Parts 1&2 and ANSI S12.12.
- J. Airflow measuring device performance shall be certified and rated in accordance with AMCA-611. Report data in accordance with AMCA-611. Provide AMCA Certified Rating Seal for Airflow Measurement Performance.
- K. Report panel deflection at +/-8" w.g., stated in terms of 'L/X' where 'L' is the casing panel length and 'X' is a constant provided by the AHU manufacturer.
- L. Report casing leakage rate at +/-8" w.g., specified in terms of percentage of design airflow.
- M. Report weight loads and distributions by component section.
- N. Report product data for filter media, filter performance data, filter assembly, and filter frames.
- O. Report electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory-installed and field-installed wiring.
- P. Report motor electrical characteristics.

1.08 DELIVERY, STORAGE AND HANDLING

- Q. Comply with ASHRAE 62, Section 5 (mold and corrosion resistant casings, filters upstream of wetted surfaces, and drain pan design).
- R. Comply with ASHRAE 62, Section 7 (practices to be followed during construction and startup). Protect equipment from moisture by appropriate in-transit and on-site procedures.
- S. Follow manufacturer's recommendations for handling, unloading and storage.
- T. Protect, pack, and secure loose-shipped items within the air-handling units. Include detailed packing list of loose-shipped items, including illustrations and instructions for application.
- U. Protect, pack and secure controls devices, motor control devices and other electronic equipment. Do not store electronic equipment in wet or damp areas even when they are sealed and secured.
- V. Enclose and protect control panels, electronic or pneumatic devices, and variable frequency drives. Do not store equipment in wet or damp areas even when they are sealed and secured.
- W. Seal openings to protect against damage during shipping, handling and storage.
- X. Wrap indoor units with a tight sealing membrane. Wrapping membrane shall cover entire AHU during shipping and storage. Cover equipment, regardless of size or shape. Alternatively AHU must be tarped for shipment and storage.
- Y. Wrap equipment, including electrical components, for protection against rain, snow, wind, dirt, sun fading, road salt/chemicals, rust and corrosion. Keep equipment clean and dry.
- Z. Clearly mark AHU sections with unit tag number, segment sequence number, and direction of airflow. Securely affix safety-warning labels.

1.09 WARRANTY

- A. Provide warranty for 18 months from date of shipment. Warranty shall cover manufacturer defects. Warranty work shall be performed by manufacturer's factory-trained and factory-employed technician.
- B. Include factory-provided controls in the parts warranties.
- C. Parts associated with routine maintenance, such as belts and air filters shall be excluded.

1.10 SYSTEM STARTUP

- A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.
- B. Comply with manufacturer's start-up requirements to ensure safe and correct operation and integrity of warranty.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Basis-of-Design Product: provide product indicated on schedule as **YORK Solution** by Johnson Controls Inc.

2.02 GENERAL DESCRIPTION

- A. Air Handling Unit(s) (AHU) shall consists of a structural base, insulated casing, access doors, fans, motors, motor controls, coils, filters, dampers, controls, components, and accessories.
- B. Provide AHU to meet the specified levels of performance for scheduled items including airflow, static pressure, cooling capacity, heating capacity, electrical characteristics, sound, casing leakage, panel deflection and casing thermal performance.
- C. AHU shall maintain structural integrity when wall panels are removed.
- D. Provide internal components and accessories as specified and scheduled. Components and accessories shall be installed by the AHU manufacturer in an ISO-9002 certified facility.
- E. Unit[s] shall be ship in one piece. Split unit(s) only where necessary for shipping and installation.
- F. For AHU segments that must be broken down for rigging and installation: segment shall be disassembled and reassembled by manufacturer's factory-trained service personnel.

2.03 STANDARDS COMPLIANCE

- A. Manufacturer shall comply with ratings and certifications referenced in this specification.
- B. Manufacturers who do not comply with ANSI/AHRI-430 shall factory test EACH unit to verify brake horsepower rating, airflow performance and total static pressure performance. See specification Section 2.27 (VERIFICATION OF PERFORMANCE) for testing requirements.
- C. Manufacturers who do not conform to requirements of AHRI 260 for ducted discharge and return air sound shall submit EACH unit to an independent sound test laboratory for AHRI 260 testing. The test laboratory shall conform to AHRI 260, Section 4.4, Test Equipment and Facilities.

2.04 BASE RAIL

- A. Unit(s) shall be provided with structural base rail under the full perimeter of the unit, formed from mill galvanized steel.
- B. Structural steel shall be installed providing clearance for proper external trapping of drain pans and steam condensate.
- C. Unit(s) shall be provided with base rail and lifting lug system that does not require additional support for rigging. Include base rail lifting lugs at unit corners.

2.05 CASING

- A. Casing construction shall not rely on the casing panels for structural integrity.
- B. Casing panels shall be 2" double-wall construction with thermal break. Thermal break shall be between interior and exterior liner of the panel assembly, and between the panel and casing framework.
- C. Provide casing with minimum thermal resistance (R-value) of 13 hr-ft²-°F/BTU. Exposed insulation is not acceptable.
- D. Casing panel insulation shall be injected polyurethane foam. Foam insulation shall be manufactured by EcoMate®. Rigid foam board panels shall not be used.
- E. All exterior and interior casing panels (roof, wall, floor, access door) shall be made of galvanized steel.
- F. Panel assembly shall meet UL standard 1995 for fire safety. Panel insulation shall comply with the requirements of NFPA 90A.
- G. Insulation system provided shall be resistant to mold growth in accordance with a standardized test method such as UL 181 or ASTM C 1338.
- H. Encapsulate insulation with sheet metal so that air does not contact insulation. Solid lined double-walled panels insulated with injected foam shall be hermetically sealed at each corner and around their entire perimeter to eliminate airflow through the panel and to eliminate microbial growth potential within the casing wall.
- I. Unit shall conform to ASHRAE Standard 111 Class 6 for casing leakage no more than 1% of design airflow at 1.25 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections down to a minimum of 50 CFM measurable leakage or 5,000 design CFM.
- J. Provide wall panels and access doors that deflect no more than L/240 when subjected to 1.5 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections. 'L' is the panel-span length and 'L/240' is the deflection at panel midpoint.
- K. Provide floors and roofs that deflect no more than L/240 when subjected to a 300 lb static load at mid-span. 'L' is the panel-span length and 'L/240' is the deflection at panel midpoint.

2.06 ACCESS DOORS

- A. Provide double wall access door(s) that meet requirements for the AHU casing.
- B. Provide industrial-style stainless steel hinges that permit 180 degrees of door swing.
- C. Provide latches with roller cam mechanisms that ensure a tight seal. Rotating knife-edge or "paw" latches are not acceptable.
- D. Provide access doors with a locking hasp to accommodate a lockout device.

2.07 COILS: HEATING AND COOLING

2.07.01 ACCEPTABLE MANUFACTURER

- A. AHU manufacturer, except where noted in contract documents.

2.07.02 GENERAL DESCRIPTION

- B. Coils shall be provided with performance certified in accordance with AHRI Standard 410 for coil capacity and pressure drop, wherever applicable. Coils circuits shall be designed such that the fluid velocity is within the range of certified rating conditions at design flow.
- C. Cooling coil shall be provided with drain pan that is sufficient to contain coil condensate.
- D. Coil segment casing shall accommodate full-face or reduced-face coils.
- E. Access doors shall be located to provide clearance for pipe insulation, connectors, and accessories. Space shall allow a minimum of 90 degrees of door swing.
- F. Coils shall be built in their own full perimeter frame. Tube sheets on each end shall have fully drawn collars to support and protect tubes. Horizontal coil casing and support members shall allow moisture to drain. Casing and support members shall not block finned area.
- G. Individual coils shall be removable from the side of the AHU.
- H. Gap between coil stub out connection and AHU casing, shall be insulated with a spool-shaped sleeve grommet. Adhesive rings applied to the casing walls shall not be acceptable.
- I. Water and glycol coils shall be operable at 325 psig working pressure and up to 250 deg F. Factory test water and glycol coils with 325 psig compressed air under water. Water coils shall conform to Subsection 12.3, "Water-Containing Parts," of UL-207, "Standard for Safety: Refrigerant – Containing Components and Accessories, Nonelectrical."
- J. Water, glycol and DX coils shall be provided with a tube OD of 1/2" or 5/8". Mechanically expand tubes shall form fin bond and provide burnished, work-hardened interior surface.
- K. Water, glycol and steam coil headers shall be made of seamless copper or brass tubing. Pipe connections shall be steel or red brass. Header connections (tubes and piping connections) shall be silver-brazed or TIG welded.
- L. Continuous aluminum or copper fins shall be provided for coils with die-formed fins. Fins shall have fully drawn collars to accurately space fins and protect tubes.
- M. Coil coatings shall be provided as scheduled or indicated on drawings.

2.08 PRIMARY DRAIN PANS

- A. Unit(s) shall be provided with a drain pans under each cooling coil and humidifier.
- B. Provide drain pan under the complete width and length of cooling coil and humidifier sections. Drain pan shall be full width, and extend a minimum of 6" downstream of cooling coil.

- C. Drain pans for cooling coils and humidifiers shall meet the requirements of ASHRAE 62.
- D. Drain connection shall be made of same material as drain pan. Dissimilar metals shall not be used to mitigate risk of galvanic corrosion. Drain connection shall be welded to the drain pan.
- E. Drain pan shall be double wall with an insulation R-value of 6.25 hr-ft²-°F/ (BTU-in).
- F. Drain pan shall allow visual inspection and physical cleaning on 100% of the pan surface without removal of the coil or humidifier.
- G. Provide a minimum of 1" clearance between the drain pan and any coil casing, coil support or any other obstruction.
- H. Provide drain pan that allows the design rate of condensate drainage regardless of fan status.
- I. Provide drain pan sloped in at least two planes by at least 1/8" per foot toward a single drain. Locate drain connection at the lowest point of the pan. Pan shall have no horizontal surfaces.

2.09 FANS

2.09.01 GENERAL DESCRIPTION

- A. Unit[s] shall be provided with fans as shown on equipment schedule and drawings.
- B. The fan section shall be provided with an access door on the drive side of the fan.
- C. Mount the fan and motor assembly on a common adjustable base. This common base shall attach to vibration isolators, which mount to structural support channels. These channels shall span the AHU floor and mount directly to the AHU frame. Manufacturers not complying with this requirement must submit detailed structural and weight data to a licensed structural engineer for review and stamped certification. The mechanical engineer shall review these engineers' final reports prior to submittal approval.
- D. Provide horizontal thrust restraints between AHU casing and fan housings with end discharge. This requirement applies to the following cases:
SWSI fans operating at greater than 3" of total static pressure
- E. Bearings shall be offered either with sealed bearings (permanent lubrication) or with serviceable bearings to facilitate periodic relubrication. Bearings requiring relubrication shall offer grease lines extended from the bearing to an accessible location on the fan-support bracket on the drive side of the fan.

2.09.02 BEARINGS AND DRIVES

- A. Unit[s] fans shall be provided with bearings complying with ANSI/AFBMA 9 for fatigue life ratings and with an average life L10 of at least 200,000 hours, as scheduled.
- B. Fans shall be provided drives selected with a 1.5 service factor.

2.09.03 Direct-Drive Fans (Single or Dual)

- A. Plenum (SWSI) Fan
Plenum fan wheel shall be single-width, single-inlet
Plenum fan blades shall be aluminum backward-inclined airfoil.
Plenum fan shall be direct-driven.

2.10 ELECTRICAL MOTORS

- A. Fan motors shall be built in accordance and comply with the latest standards of the NEMA and IEEE.
- B. AHU and fan motors shall comply with ASHRAE 90.1.
- C. Fan motors shall be provided with the following characteristics:
Voltage, Frequency and Phase, as scheduled.
Motor RPM, as scheduled
Minimum service factor of 1.15
Premium efficiency, or as required to meet ASHRAE 90.1
NEMA design ball bearing type
Rated for continuous duty at full load in a 104°F [40°C] ambient
Open drip proof (ODP) or totally enclosed, fan cooled (TEFC).
Suitable for use in variable frequency application, per NEMA MG-1 Part 30
Premium Efficiency Inverter ready per NEMA STD MG1 PART 31.4.4.2

2.11 FAN-MOTOR DISCONNECTS

- A. Manufacturer shall provide UL or ETL listed fan-motor disconnects and associated components, as scheduled and shown on drawings. Disconnects shall comply with applicable provisions of the National Electric Code.
- B. Fused disconnects shall be provided in NEMA 1 enclosures.
- C. Disconnect shall be suitable for use as an OSHA lockout/tagout disconnect when applied in accordance with part IV, Department of Labor OSHA 29 CFR Part 1910, Control of Hazardous Energy Source (lockout/tagout): final rule.
- D. Disconnect handles shall be lockable in the “off” position with up to three padlocks. Switch mechanism shall be directly lockable in the “off” position via padlock when door is open.

2.12 FAN-MOTOR VARIABLE FREQUENCY DRIVES (VFDS)

- A. Manufacturer shall provide UL or ETL listed VFDS and associated components, as scheduled and shown on drawings. VFDS shall comply with applicable provisions of the National Electric Code.
- B. VFDS shall be mounted in a dedicated NEMA 1 compartment located on the primary access side of its associated fan section and wire VFD to motor, unless otherwise indicated on drawings.
- C. After unit installation, VFD shall be started and programmed by a factory trained and employed service technician. Refer to Section 3.05.
- D. Unit(s) shall be provided with following VFD disconnect and bypass optional:
Non-Fused, Fused main disconnect
2 contactor VFD bypass with VFD service input switch and Non-Fused, Fused main disconnect
- E. Unit(s) shall be provided with harmonic distortion feedback protection:
Equivalent 5% impedance input line reactor
Integral RFI/EMI filtering to meet EMC EN61800-3 for First Environment
- F. Unit(s) shall be provided with a user interface consisting of following features:
30 Character multi-lingual alphanumeric display
Parameter set-up and operating data
Display data shall include:
 - a) output frequency (Hz)
 - b) speed (RPM)
 - c) motor current
 - d) calculated % motor torque
 - e) calculated motor power (kW)
 - f) DC bus voltage
 - g) output voltage
 - h) heat sink temperature
 - i) elapsed time meter (re-settable)
 - j) kWh (re-settable)
 - k) input / output terminal monitor
 - l) PID actual value (feedback) & error
 - m) fault text
 - n) warning text
 - o) scalable process variable display
- G. VFD shall be provided with the following protection circuits:
 - 1. over current
 - 2. ground fault
 - 3. over voltage
 - 4. under voltage

5. over temperature
 6. input power loss of phase
 7. loss of reference/feedback
 8. adjustable current limit regulator
- H. VFD shall be UL 508C approved for electronic motor overload (12t).
- I. VFD shall be provided with features for high input transient protection and surge suppression, such as
1. 4 MOVs ahead of diode bridge
 2. 120 Joule rated 1600V diode module
 3. Compliant with UL 1449 / ANSI 61.4
- J. VFD shall be provided with the following communication features:
1. Two programmable analog inputs
 2. Six programmable digital inputs
 3. Two programmable analog output
 4. Three programmable digital relay outputs
 5. Modbus RTU Communications protocol
 6. Adjustable filters on analog inputs and outputs
 7. Input speed signals, including 4-20 mA and 0-10 VDC
 8. Accel/Decel contacts [floating point control]
 9. Auto restart [customer selectable and adjustable]
 10. Start/Stop options
 11. Integrated control interface for Siemens FLN, Johnson N2, Modbus RTU, BACnet MS/TP or LONWorks over RS-485.
- K. VFD shall consist of the following functions:
1. Pre-magnetization on start
 2. DC braking/hold at stop
 3. Ramp or coast to stop
 4. Seven preset speeds
 5. Three critical frequency lockout bands

6. Start function shall include ramp, flying start, automatic torque boost, and automatic torque boost with flying start

2.13 FILTERS

- A. Unit[s] shall be provided with filter segments consisting of filters and frames as scheduled.
- B. Side or front loading filters for filter segments located upstream of coil segment(s) shall be provided with an access door on the drive side through which filters can be easily loaded.
- C. Class 2 or Class 1 filter media shall be provided per U.L. 900 and as required by local codes.
- D. Filter types, efficiencies, and nominal depths shall be as follows:
 1. Rigid filters – 4” mini pleated with efficiencies of [80-85% ,MERV 13]
- E. Flush mounted, factory installed differential pressure gage on the drive side of unit shall be provided to measure pressure drop across filters. Manufacturer shall provide fully functional gauges, complete with tubing.

2.14 DAMPERS

- A. Dampers provided shall be tested in accordance with AMCA 500.
- B. Factory-installed dampers shall be provided.
- C. Dampers shall have airfoil blades, extruded vinyl edge seals, and flexible metal compressible jamb seals.
- D. Dampers shall have a maximum leakage rate of 4 CFM/square foot at 1" w.g., and shall comply with ASHRAE 90.1.
- E. Damper blades shall be parallel acting unless otherwise indicated.
- F. Damper blades shall be galvanized steel or aluminum.

2.15 UVC FIXTURES

- A. Fixtures have been tested, listed and labeled as UL/C-UL under Category Code ABQK (Accessories, Air Duct Mounted), UL Standards: 153, 1598 & 1995 respectively.
- B. Fixtures meet the “UL” drip proof design and each fixture is equipped with an electrical interlock.
- C. Each lamp contains no more than 5.5 milligrams of mercury consistent with current environmental practices while producing the specified output at 500 fpm in temperatures of 55-135° F.
- D. Useful lamp life shall be 9000 hours with no more than a 20% output loss at the end of one year of continuous use. They are constructed with UVC proof metal bases and shall not produce ozone.

2.16 AIRFLOW MONITORING STATIONS

- A. Optional airflow monitoring stations shall be provided on air inlets.
- B. Airflow monitoring stations shall bear the AMCA Certified Ratings Seal for Airflow Measurement Performance.
- C. Airflow monitoring station dampers shall comply with leakage rates per ASHRAE 90.1.
- D. Airflow monitoring stations shall be accurate within 5% of actual airflow between 300 FPM and 3000 FPM free area velocity.

2.17 APPURTENANCES

- A. Steel base rails suitable for rigging and lifting shall be provided.
- B. Safety grates over bottom openings shall be provided, as shown on drawings. Safety grates shall be capable of supporting a 300 lb. center load.
- C. Lifting lugs shall be provided where required.

2.18 EXTERIOR FINISHES

- A. Manufacturer shall clean the exterior surfaces of units prior to application of exterior protective coating.
- B. Unpainted air-handling units constructed of galvanized steel shall show a breakdown of less than 1/8" on either side of a scribed line when subjected to ASTM B117 220 hour, 5% salt spray conditions. This is equivalent to an ASTM D1654 rating of '6.' Also, per ASTM D610, degree of rusting to meet #8-G and per ASTM D714 degree of blister to meet #6 medium.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment per industry standards, applicable codes, and manufacturer's instructions.
- B. AHUs shall not be used for temporary heating, cooling or ventilation prior to complete inspection and startup performed per this specification.
- C. Install AHUs on a concrete pad or structural steel base, as shown on drawings.
- D. Install AHUs with manufacturer's recommended clearances for access, coil pull, and fan removal.
- E. Install AHU plumb and level. Connect piping and ductwork according to manufacturer's instructions.
- F. Install seismic restraints and anchors per applicable local building codes. Refer to specification Section 230548 (15240 / 15070) for product and installation requirements.

- G. Insulate plumbing associated with drain pan drains and connections.
- H. Install insulation on all staggered coil piping connections, both internal and external to the unit.

3.02 **FIELD QUALITY CONTROL**

- A. AHU shall be stored as per manufacturer's written recommendations.
- B. AHUs shall be stored indoors in a warm, clean, dry place where unit(s) will be protected from weather, construction traffic, dirt, dust, water and moisture. If unit(s) to be stored for more than 6 months, manufacturer's instruction for long-term storage shall be followed.
- C. Rig and lift units shall be according manufacturer's instructions.

3.03 **FIELD PERFORMANCE VERIFICATION**

- A. Leakage: Pressurize casing to maximum operating static pressure [up to +/-8" w.g.] and measure leakage. If leakage exceeds 1% of design airflow, seal leakage points with a permanent solution. Repeat test. If the AHU still does not pass, contact the manufacturer to seal unit.
- A. Submit a field test report with testing data recorded. Include description of corrective actions taken.

3.04 **CLEANING**

- A. Clean unit interior prior to operating. Remove tools, debris, dust and dirt.
- B. Clean exterior prior to transfer to owner.

END OF SECTION

RECEIVING / RIGGING INSTRUCTIONS

The installing contractor is responsible to provide Johnson Controls / YORK with a contact to coordinate the delivery of the equipment in this submittal. Please fill out the information requested in the Submittal Approval Form section in the back of this submittal.

It is the installing contractor's responsibility to verify the following prior to signing the bill of lading presented by the transportation company:

- Ensure everything on the bill of lading was delivered.
- Visually perform a thorough inspection of all equipment for any signs of shipping damage

Any short-shipments or shipping damage must be noted on the bill of lading prior to signing.

The transportation company will provide you with instructions for filing a claim. It is the installing contractor's responsibility to work directly with the transportation company to resolve any shipping claims.

Section 3 - Handling, storage, and installation

Delivery and storage

To ensure consistent quality and maximum reliability, all AHUs are tested and inspected before leaving the factory.

Short term



Indoor AHUs: Under no circumstances should outdoor storage be used.

- **Remove ventilate wrapping to prevent condensation.**

Outdoor AHUs: Recover AHUs after inspection or use tarps during storage.

Short term storage is six months or less from date of shipment. Storage maintenance during this time is usually limited to the following:

- Rotate fans every four weeks, starting on the delivery date to prevent moisture from damaging the bearing.

- If the AHUs are going to be stored out-of-doors, prior to installation, special care must be taken to cover and protect the AHUs from:

- Dust
- Rain and snow
- Rodents
- Construction vehicles and personnel.
- Condensation / Ventilation required

- Protect all parts and porous materials from rain and other sources of moisture. Decontaminate or replace parts as needed to make sure microbial growth is not introduced to the AHU.

- Store the AHU on a firm, flat surface to prevent distortion. Block the AHU off the ground to protect components from water or ground moisture.

WARNING

Failure to follow these instructions could result in death, serious injury or equipment damage.

Follow all warnings and instructions in the unit's Manual(s).

<p>EN Installation Instructions for the technician / fitter</p> <p>PL Instrukcja instalacji dla technika / monter</p> <p>SV Installationsguide för installatör / montör</p> <p>CS Pokyny k instalaci pro techniky a montéry</p>	<p>IT Istruzioni d'installazione per il personale specializzato</p> <p>NL Installatiehandleiding voor de vakman / monteur</p> <p>DE Installationsanleitung für die Fachkraft / Monteur</p> <p>ES Instrucciones de instalación para el técnico / contratista especializado</p>	<p>JA 一般仕様・取扱説明書</p> <p>FR Manuel d'installation pour le spécialiste / monteur</p> <p>RU Инструкция по установке для техника/монтажника</p> <p>ZH 适用于技术人员与安装人员的 安装说明书</p>
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1. Follow all applicable regulations and safety practices during rigging and lifting.
2. Prepare and follow written rigging and lifting plan.
3. Rigging must be directed by trained professional rigger.
4. Spreader bars must be used and be long enough to prevent rigging from contacting unit.
5. Use all and only designated lift points according to units manual(s).
6. Locate center of gravity through trial lifts to account for possible variations in unit configuration.
7. Use rigging and lifting techniques that keep unit stable and level.
8. Keep clear of unit when lifted.

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Rigging and lifting must only be done by a professional rigger in accordance with a written rigging and lifting plan. The most appropriate rigging and lifting method will depend on job specific factors, such as the rigging equipment available and site needs. Therefore, a professional rigger must determine the rigging and lifting method to be used, and it is beyond the scope of this manual to specify rigging and lifting details.

Protecting the roof membrane



Ensure that all traffic, ladders, screws, and sharp objects are securely installed. Unsecured items may damage the roof.



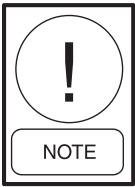
Do not use wire brushes, metal scrapers, and sharp-edged tools on the roof membrane.



Do not use a top strap during transport as it may damage the roof membrane.



Do not store self-adhesive seam tape on its edge as it will adhere to whatever it is sitting on and may cause damage to the product upon removal.



The roof membrane load limit is 20 lbs per square inch. Items supported by the roof membrane must have a rubber isolation pad between the material and the membrane to prevent wear and tear.



Do not use citrus based soaps or cleaners on the roof membrane as they may stain or damage the product.



Do not use chemicals with a petroleum ingredient on the roof as they may attack or stain membrane roofing. This includes:

- *paint thinner*
- *mineral spirits*
- *turperntine*
- *acetone*
- *citrus products.*

Long term

Long term storage is more than six months from the date of shipment. If long term storage is anticipated, contact the Johnson Controls sales representative for the correct instructions and requirements.

It is mandatory that a detailed record be maintained during this long term period, such as, but not limited to the following:

- Correct sealing of the cabinet,
- Rotation of the blowers and bearings, and
- Protection of all motors from moisture.

Refer to *Long Term Storage Requirement - Field Preparation (Form 50.20-NM3)* and *Long Term Storage Periodic Checklist and Logs (Form 50.20-CL3)* for more information.



Failure to fulfill the long term storage requirements will void the warranty.

Receiver's Responsibility

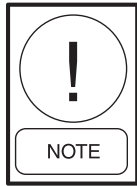
The receiver is solely responsible for noting the freight bill and filling out the freight claims IMMEDIATELY. In addition, the receiver must:

- Note the visible damage on the signed and dated bill of lading with a request that the carrier inspect the damage within 72 hours of notification.
- Remove the shipping wrapper, and replace it with a tarp or similar protective covering. Any concealed damage reported after 15 days will compromise a claim settlement.
- Request inspections by telephone or in person, but confirm in writing. If assistance is needed with the claim process, contact a Johnson Controls sales representative and refer to the shipping damage form.

Inspection, damage, and shortage

Check the AHU shipment on arrival to make sure that all major pieces, boxes, and crates are received. Check each AHU on the trailer or rail car when received, before unloading, for any visible signs of damage. Report any damage or signs of possible damage to the transportation company immediately for its inspection.

After inspecting the AHU for damage, open all containers and check the contents against the packing list. Report any material shortage to Johnson Controls immediately.



Johnson Controls is not responsible for any damage or loss of parts in shipment or at job site. Refer to Shipping Damage Claims (Form 50.15-NM).

Preventive maintenance before long term storage

Take the following precautions prior to extended storage:

- Grease the fan and motor bearings per the manufacturer's specifications.
- Protect the motors and sheaves from free moisture or high humidity, which may be accomplished by:
 - Spraying components with an anti-rust solution (P/N 026-37707-000).
 - Disconnecting the belts. Wrapping the sheaves and motor and sealing them with plastic. Inserting a desiccant to absorb moisture that may penetrate the plastic protection.
- Meg the fan motor windings and record for comparison before placing the AHU in service.
- If the fan housing was supplied with a drain connection, remove the plug to prevent moisture from accumulating in this part of the fan during storage.

Periodic fan check

On a monthly basis, perform the following tasks:

- Rotate the fan and motor several times to replenish the bearing surfaces with fresh grease.
- Turn the fan impeller 180° from the previous month's position to prevent the belts from taking a set position.

Monthly log sheet

It is the customer's responsibility to submit a monthly log sheet from the *Long Term Storage Periodic Checklist and Logs (Form 50.20-CL3)* that shows the condition of the AHU and to note any discrepancies. Send a copy of the log sheet to the Johnson Controls Field Service Office for its records.

Check Solution doors and latches

Refer to the service manual for adjusting and replacing the doors.

Solution doors are shipped with metal shipping spacers glued onto the edges of each door. They are located on three edges of each door. The spacers should be left in place until the AHU is placed in its final location and multiple skid AHUs are fully assembled. After AHU installation, use a channel lock pliers or a screwdriver to remove the spacers. Do not damage the metal door panel. Slight impressions left on the door gasket by the spacers rebound in approximately a week.



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Figure 9 - Metal spacers on Solution doors

Indoor AHUs

It is Johnson Controls' intention that a shipping wrapper be applied to unpainted indoor AHUs for protection from weather, road dirt, etc. during inland transit. Remove the wrapper at the time of delivery to allow for a thorough inspection, both inside and out. Under no circumstances must the unit be stored outside.

Outdoor AHUs

Generally, outdoor AHUs are not fully wrapped. Exposed openings are covered for protection from weather, road dirt, and other factors during inland transit. Conduct a thorough inspection, inside and out, at the time of delivery.

Access - All AHU doors have a small clip, which is located on the door frame, and crosses over the edge of the door. This clip is a safety device to prevent injury when the AHU is operating. Remove the clip to inspect the AHU, and replace it when inspection is completed.

Occasionally, an outdoor Solution AHU may be entirely wrapped in plastic. This plastic must not be removed until the Solution AHU is installed in order to prevent damage from job site dirt and various weather conditions. If the Solution AHU is covered with plastic, cut

the wrap in the outline of the doors, and proceed to access the Solution AHU using the above information. Close the cut with duct tape.

Shipped loose parts

Check the packing list, which notes the number and types of parts, for non-mounted shipped loose parts in all segments of the AHU. Report shortages within 10 days after receipt of the order. For more information about the shipped loose parts, refer to *Figure 22 on page 39* through *Figure 37 on page 42*.

Lifting weights

AHU section weights are furnished on the job submittal form. Due to the variance in weight of each AHU design, it is not possible to list AHU weights in these instructions. Refer to the job submittal form when selecting a crane for rigging and figuring out roof weight loads. Weights can also be found on skid ID label for each section. Contact a Johnson Controls sales representative, if there are questions regarding the AHU weights.

Moving the AHU

Prior to moving the AHU, make sure that the installation site is suitable for installing the AHU, and is easily capable of supporting the weight of the AHU and all associated services.

Rigging

Some AHUs are shipped completely assembled. When large AHUs are ordered with multi-zone (MZ) segments in rear discharge location (end of the AHU), the AHUs will ship with the top section (hot deck) separated. In these cases, the complete MZ damper assembly, hot and cold decks, ship loose.

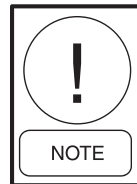


All lifting points must be used to avoid personal injury, death, or damage to the equipment.

Use all lifting lugs to avoid damage to the AHU. If the AHU is not equipped with lifting lugs, use bottom corner connectors as shown in *Figure 12 on page 31*, and raceway lifting lugs as shown in *Figure 14 on page 31*. Do not use top corner connectors. Use come-alongs as shown in *Figure 11 on page 31*.

An experienced and reliable rigger must handle the unloading and final placement of the AHU, and must be advised of the following:

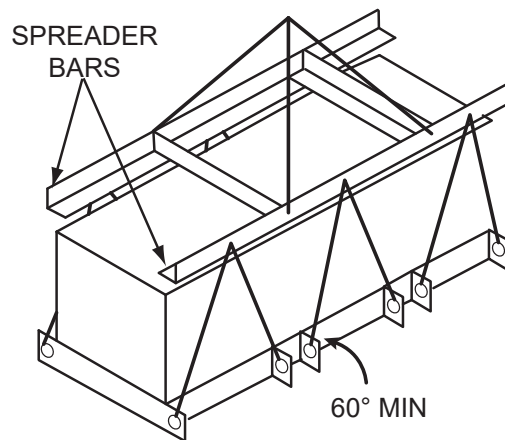
- AHU contains internal components and should be handled in an upright position.
- Care must be exercised to avoid twisting the equipment structure.
- Prevent unnecessary jarring or rough handling.



Correct rigging and handling of the equipment is mandatory during unloading and setting it into position to prevent voiding the warranty.

Use the correct spreader bars and hoisting lines when rigging to prevent damage to the AHU casing.

When lifting long AHUs, a special system must be used to ensure a minimum 60° angle between the lifting lugs and spreader bar and frame.



LD13765b

Figure 10 - Recommended lifting with multiple points

Using forklift in special circumstances

Forklifts must not be used to off-load AHUs except in special circumstances. If moving an AHU with a forklift or similar equipment becomes necessary, make sure the lifting forks are long enough to reach from the fork truck to the opposite side and slightly beyond the AHU. Leave the shipping blocks attached to the bottom of the AHU until it is moved to its final location. There is no structural support under the equipment except what is visible from the perimeter.

Come-A-Longs (power pulls)

If the AHU has multiple sections, use come-a-longs, also known as power pulls, as shown in *Figure 11* on page 31 to pull the sections or skids together.



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Figure 11 - Come-A-Longs

Correct lifting with shackles

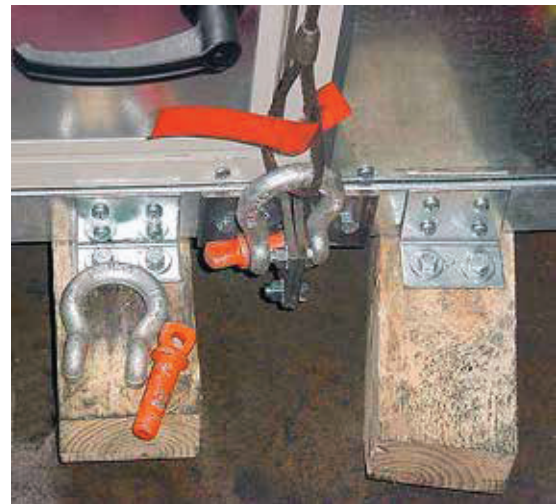
Fasten shackles to a sling or chain and use them to safely lift and lower the sections of a tiered AHU. Refer to the following figures for correct lifting:

- *Figure 12* on page 31 for correct lifting with a hook and shackle at the corners.
- *Figure 13* on page 31 for correct lifting with a hook and shackle at the lifting lugs.
- *Figure 14* on page 31 for lifting with a base rail.



LD13767

Figure 12 - Correct lifting with shackle with connector corners



AL13768

Figure 13 - Correct lifting with shackle at lifting lug



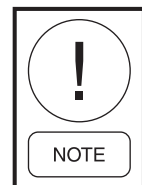
LD13766

Figure 14 - Correct lifting with base rail

Preparing the site



Do not weld or use torches on the exterior or interior of the AHU housing. The housing contains polyurethane insulation, which, under combustion, produces harmful, toxic gases which may result in personal injury or death.



Never use silicone caulk or sealant in or on any AHU.



If the AHU has HEPA filters, the filter frames, bulkheads, and segment panels are factory sealed, and must remain sealed to prevent air bypass.

Clearance for outdoor AHUs

Locate the AHU away from building flue stacks or exhaust ventilators to prevent the possible introduction of contaminated air through the outside air intakes. See *Figure 15 on page 33*.

To ensure that the AHU fits correctly into the selected location, use the following instructions.

- Allow sufficient space around the AHU to remove the access panels and various parts.
- Provide a minimum clearance equal to the width of the AHU plus 6 in. on one side to remove the coil or fan assembly. Consider the coil access panel for coil removal.
- Add the dimensions of the pipe chase, air hoods, ducts, control/electrical panels, etc. to meet minimum clearances.
- Allow any additional clearances as required by local and national electrical codes (NEC).

Mounting the outdoor AHU

Install AHUs to provide enough elevation for correctly designed condensation traps as discussed under *Drains and Traps on page 109* in this section.

The area of the roof that you are installing the curb on must be structurally adequate to support the combined weight of curb, AHU, and system fluids. With these combined weights in place, you must ensure the resting surface for the AHU is flat and level.

If the concrete pads are not flat, you may need to shim or grout them to ensure that the AHU is on a flat plan.

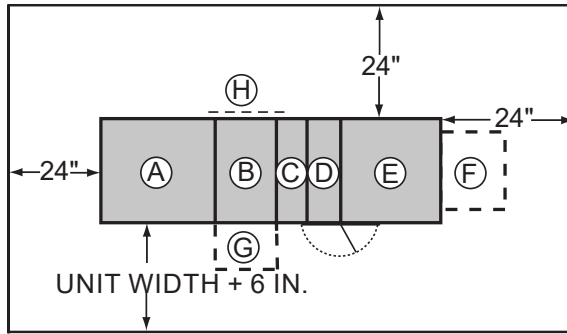
Cleaning the Solution outdoor membrane roof

To clean the outdoor membrane roof, complete the following steps:

1. Remove loose debris such as sand, loose items, or metal shavings from the roof.
2. Apply full-strength, non-citrus dish soap to the dirty area.
3. Scrub the area with a medium brush until all of the heavy dirt is loosened or removed.
4. Add a small amount of clear water to the area you are cleaning. Using the medium brush, scrub the solution over the stain in a circular pattern.
5. Once the stain is removed, rinse the area thoroughly with clear running water, a spray hose, a sponge, or a mop.

Repairing the Solution outdoor membrane roof

For detailed instructions on repairing the outdoor roof, refer to *Service Information Document SI0412*.



MIN. CLEARANCE DIMENSIONS

- Ⓐ Fan Section
- Ⓑ Coil Section
- Ⓒ Face and Bypass Damper Section
- Ⓓ Filter Section - Door should open 180°
- Ⓔ Inlet Section
- Ⓕ Rain Hood (add unit width or length)
- Ⓖ Pipe Chase Enclosure (add to unit width)
- Ⓗ Coil Access Panel on Outdoor Unit (allow clearance = to unit width)

LD6326-4

Figure 15 - Minimum service clearances

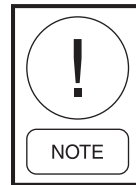
Assembling the Johnson Controls provided curb

The curb that supports the AHU is shipped unassembled, and requires assembly on the job site. Assembly drawings and a hardware package, which includes a nailer and gasket, are shipped with each curb. All other parts such as wood or fiber cant strips, roofing felts and material, caulking, and curb-to-roof fasteners are field supplied.

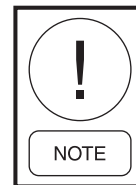
If you have questions concerning the number of curb parts or how to assemble the curb, notify a Johnson Controls Field Service Office immediately.

Use the following instructions to assemble the curb:

1. Unpack the shipping package. Lay the parts out according to the exploded views.
2. Lay out all channel pieces as shown in *Figure 10 on page 30*. Ensure that all channel tabs are located on the inside of the mating channel. Prior to assembly, straighten all curb walls, accessories, and flanges, as they may have become distorted in handling.
3. Attach the curb walls together to form a rectangular perimeter as shown in *Figure 10 on page 30*, leaving the bolts loose. After you set the curb in place, ensure that you give correct consideration to the air duct openings through the roof.
4. The curb installation drawing in *Figure 10 on page 30* shows a gasket that is mounted between the curb and the unit. This gasket ships with the curb parts. Install the curb gasket before setting the AHU on the curb.



The gasket forms an air seal between the AHU and the curb and serves as a dampener, preventing metal-to-metal contact between the AHU and curb. However, the gasket should not be used as a vibration isolator where the prevention of noise and vibration transmission into the building is critical.



When the AHU is shipped in skids, replace the curb gasket with the caulk provided by contractor.

5. After verifying the curb is square and level, tighten all bolts, and then anchor appropriately. Do not tighten the bolts after anchoring because the curb will be pulled, twisted, and torqued out of square.
6. Mark the exact location for the pipe chase curb.
7. The job submittal drawing package contains a curb drawing that shows the dimensions of the curb and pipe chase. Consult this package when drilling and assembling the pipe chase curb.
8. Insulate and roof the curb as required. Refer to Sheet Metal and Air Conditioning Contractors National Association (SMACNA) for counter flash information.

Steel frame and curb support

When a steel frame is used to support the AHU, it must be level, flat and without uneven steel frame joints, and support the AHU around the full perimeter. Place cross members at each shipping split or spans greater than 90 in. See details below.

Clearance and mounting for indoor AHUs

It is recommended that you locate the AHU in an air-conditioned space. A number of suggested installations are shown on *page 37*.

Ensure that the floor and housekeeping pads are flat and level. Allow sufficient space around the AHU to remove the access panels and various parts. Provide a minimum clearance equal to the width of the AHU plus 6 in. on one side of the AHU to remove the coil or fan assembly.

If the concrete pads are not flat, you may need to shim or grout them to ensure that the AHU is on a flat plan.

Mounting indoor AHU

Install the AHUs so that there is enough elevation for correctly designed condensation traps as discussed in *Drains and Traps on page 109*.

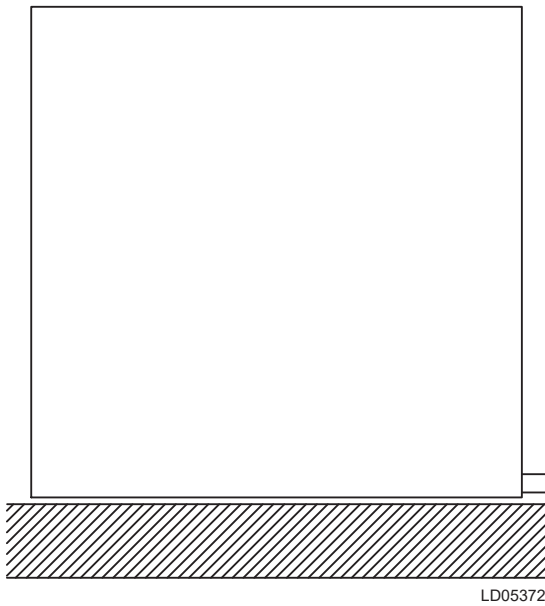


Figure 19 - Solution no base rail - Housekeeping pad required to accommodate trap height

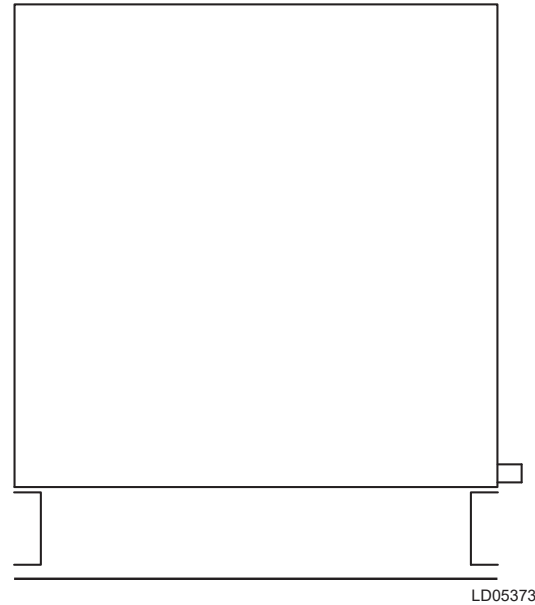


Figure 20 - No housekeeping pad - Solution base rail required to accommodate trap height

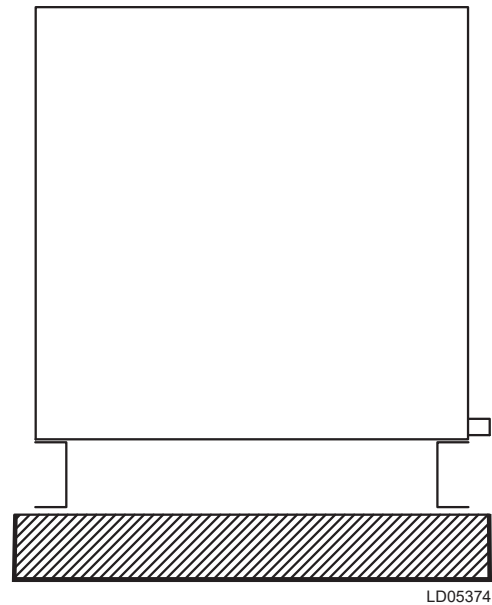


Figure 21 - With base or base rail and housekeeping Pad

Installing ceiling suspended AHUs



It is recommended that support is structurally engineered to prevent flexing, sagging, or twisting of the AHUs.

Use the following instructions to prepare the site for ceiling suspended AHUs. Refer to *Figure 22 on page 38* for instructions related to the direction of airflow and the positioning of the AHU.

Structure positioned in direction of airflow

The AHU base must be supported continuously on both sides.

Structure positioned perpendicular to airflow

You must ensure that the AHUs are supported in at least the following locations:

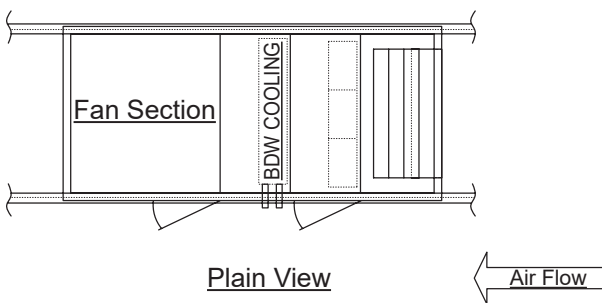
- Both ends
- At each shipping split, if applicable
- Upstream and downstream of each cooling coil segment
- Under heavy components like fans, attenuators, and the heating segment.

As a general rule, place cross members every 96 in., in addition to each shipping split.



Do not obstruct the door operation, filter access, piping, electrical or control connections with suspension members.

STRUCTURE PARALLEL TO AIRFLOW
(units under 60" wide)



STRUCTURE PERPENDICULAR TO AIRFLOW
(units over 60" wide)

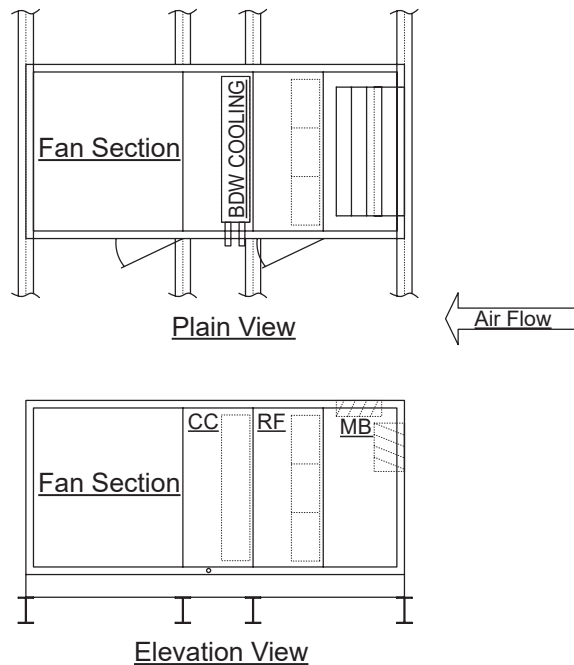



Figure 22 - Ceiling suspended AHU on structural steel

 YORK[®] INSTALL CONFIDENCE	LONG-TERM STORAGE REQUIREMENTS GENERAL	
SERVICE POLICY & PROCEDURES	Supersedes: 50.20-NM1 (910)	Form 50.20-NM1 (418)

Failure to comply with these requirements will render any written or implied Johnson Controls/YORK warranty null and void.

I. PURPOSE

The purpose of Long-Term Storage Requirements is to ensure that equipment manufactured by Johnson Controls does not sustain any damage or degradation due to being in a dormant state for extended periods of time. The proper implementation and adherence to the Long-Term Storage Requirements will ensure that when the equipment is started and operated it will be in the intended condition. This will benefit the customer by providing equipment with the maximum service life.

II. DEFINITION OF LONG-TERM STORAGE

In General, all equipment manufactured by Johnson Controls that meets any, some, or all of the conditions below shall be prepared for Long-Term Storage.

- A. Equipment not “started” within 6 months of leaving the Johnson Controls factory.
- B. Equipment being stored within 5 miles of a body of salt water (time independent).
- C. Equipment being shipped on a body of salt water (time independent).

“Start-up” is defined as useful operation of equipment in cooling, heating, moving air, and/or ventilation for Testing, Charge and/or Adjustment (TCA).

Condition "A" is based upon the unit being stored indoors in a vibration-free, non-corrosive environment. Special provisions may be necessary for environmental conditions outside these parameters. Please contact Johnson Controls for further instructions if storage is subject to non-standard environmental changes/conditions even for periods less than 6 months.

Failure to adhere to the Long-Term Storage Requirements as outlined can and will render any written or implied Johnson Controls warranty null and void.

III. RESPONSIBILITIES

A. SALES

The Sales Engineer shall determine the estimated Start-up date and shipping methodology for the equipment prior to completing the sale. The Sales Engineer shall inform the Customer of the requirement to provide for Long-Term Storage, the specific Long-Term Storage Requirements (including the Customer’s responsibilities), the associated costs for each piece of equipment, and the estimated shipping dates. The Sales Engineer shall notify the Customer when the equipment is actually shipped and request an updated estimated Start-up date at this time. Note that depending on the actual start-up date, customer may be required to purchase Delayed Start-Up Warranty as well. Delayed Startup Warranty must be purchased prior to units shipping from the factory.

If an estimated Start-up date is within a 4 to 6 month post-shipment window, the sales engineer shall notify the owner of the potential need for Long-Term Storage Requirements and the associated costs if the Start-up becomes delayed. If the local Johnson Controls Service office has not started the equipment after 4 months, the Sales Engineer shall contact the Customer to request a revised Start-up estimate.

In the event that equipment has an unplanned delayed Start-up, the Sales Engineer shall notify Johnson Controls Product Technical Support for instructions to proceed. Every effort shall be made by all parties to make this determination and notification as soon as possible. Any delay in the process will hinder Johnson Control's ability to provide Warranty Services to the customer in a cost effective way.

B. MANUFACTURING

It shall be Manufacturing's responsibility, upon receipt of an order requiring Long-Term Storage, to inspect and protect vendor-supplied components upon receipt and before mounting in shop. Manufacturing shall carry out the instructions detailed in the factory order form, per Engineering in regards to long term storage, and the requirements there of regarding in-shop preparation of units for Long-Term Storage, and document the status of the unit prior to shipment.

C. SERVICE

The Johnson Controls Service Office shall receive and review the Long-Term Storage Periodic Check Lists and Logs that were completed by the customer. The Johnson Controls Service Office shall notify the Customer in writing of any discrepancies and any required corrective action(s) prior to Start-up and within 10 working days of receiving the completed Periodic Checklist and Logs from the Customer. At the time of Start-up, the Johnson Controls Service Office shall inspect all equipment that has been prepared for Long-Term Storage to ensure that its condition at Start-up corresponds with all documentation and what is expected for each specific piece of equipment.

D. CUSTOMER

It is the Customer's responsibility to ensure that the necessary procedures described have been completed. It will be the responsibility of the Customer to submit completed log sheets showing the condition of the unit and noting any discrepancies. The logs shall be sent to the Johnson Controls Service Office having eventual supervision.

If after 4 months from shipment, the equipment has not been started and/or in the event that Start-up is delayed, the Customer shall notify the Sales Engineer as soon as possible.

In the event there is an unplanned delayed Start-up, the Customer shall notify the Sales Engineer in writing with as much information on the new schedule and the site and equipment conditions. Every effort shall be made by all parties to make this determination and notification as soon as possible. Any delay in the process will hinder Johnson Controls ability to provide Warranty Services to the customer in a cost effective way. The Customer shall be responsible for the cost of any Long-Term Storage actions that Johnson Controls determines are necessary to provide for the proper life of the equipment and subsequent ability to provide any written or implied Warranty Services.

The appropriate Long-Term Storage Preparation (Section IV) and Long-Term Storage Periodic Checklist and Logs (Section V) are listed below and can be obtained from the Sales Engineer or the local Johnson Controls Service Office.

IV. LONG-TERM STORAGE PREPARATION

For specific instructions on preparing YORK equipment for long-term storage in the field (equipment that was not prepared at the factory), refer to the following documents. Long-term storage preparation in the field shall be provided by Johnson Controls factory certified technicians.

Packaged Roof Top Units.....	Form 50.20-NM2
Air Handling Units.....	Form 50.20-NM3
Absorption Chillers.....	Form 50.20-NM4
Centrifugal Chillers.....	Form 50.20-NM5
Air Cooled Screw/Scroll Chillers.....	Form 50.20-NM7
L-Series Water-Cooled Self-Contained Units.....	Form 50.20-NM8
Screw Chillers.....	Form 50.20-NM9

V. LONG-TERM STORAGE PERIODIC CHECK LISTS AND LOGS

For specific instructions on YORK equipment long-term storage inspections and procedures, refer to the following documents:

Packaged Roof Top Units.....	Form 50.20-CL2
Air Handling Units.....	Form 50.20-CL3
Absorption Chillers.....	Form 50.20-CL4
Centrifugal Chillers.....	Form 50.20-CL5
Air Cooled Screw/Scroll Chillers.....	Form 50.10-CL7
L-Series Water-Cooled Self-Contained Units.....	Form 50.10-CL8
Screw Chillers.....	Form 50.20-CL9

VI. WARRANTY CLAIMS

No warranty claims will be accepted for damage resulting from improper long-term storage.

VII. SIGN-OFFS

Customer Acknowledgement/Date

YORK Sales Engineer/Date

YORK Service Representative/Date



STEPS TO PROTECT NEW EQUIPMENT WARRANTY

PROTECT YOUR NEW EQUIPMENT WARRANTY PRIOR TO START-UP

CUSTOMER: _____ JOB NAME: _____
 ADDRESS: _____ LOCATION: _____
 PHONE: _____ CUSTOMER ORDER NO: _____
 JCI TEL NO: _____ JCI ORDER NO: _____ JCI CONTRACT NO: _____

UNIT MODEL NO: _____ UNIT SERIAL NO: _____

The work (as checked below) is in process and will be completed by: _____ / _____ / _____
 Month Day Year

The following work must be completed in accordance with installation instructions:

1. Storage of this equipment MUST be on a flat surface and protected from the weather.
- DO NOT OPERATE DOORS WHEN UNIT IS NOT ON A FLAT SURFACE.**
2. Protect this equipment from damage, construction dirt, debris and water.
3. Isolate this equipment from pressure testing of water, steam, gas and air piping.
4. Do not test, clean and flush piping through coils in this equipment.
5. Isolate this equipment from temporary building power.
6. Contact local Johnson Controls Service for purchase of Startup Service with two weeks advance notice.
7. To perform a careful and thorough startup, first verify the following:
 - Reliable power will be available for startup.
 - Duct work is complete.
 - Controls are complete.
 - Shipping splits completely re-assembled, sealed and wired.
 - Filters are installed and secured.
 - All shipping materials have been removed.
8. Door edge spacers are to remain in place until installation is completed.
9. Temporary use of this Air Handler requires Startup performed according to that outlined in the Operation and Maintenance Manual provided.
10. A qualified startup technician must complete the AIR HANDLING UNITS START-UP CHECK LIST and file a copy at the local Johnson Controls Service Office. This form is provided in the information package with each air handler.
11. This document is part of the official bill of lading. ...

METAL TAB USED TO SECURE DOOR IS A SAFETY DEVICE. DO NOT DISCARD IT.





BY JOHNSON CONTROLS

AIR HANDLING UNITS

START-UP CHECKLIST

Supersedes: 100.00-CL1 (909)

Form 100.00-CL1 (313)

AIR HANDLER START-UP CHECKLIST

OFFICE LOCATION _____	UNIT TAG # _____
QUALIFIED TECHNICIAN _____	UNIT MODEL # _____
JOB NAME _____	UNIT SERIAL # _____
YORK JOB ID OR CONTRACT # _____	START DATE _____
JOB SITE LOCATION _____	
JOB SITE CONTACT AND PHONE # _____	

IMPORTANT SAFETY REQUIREMENT: FOLLOW THE LATEST "LOCK OUT TAG OUT" PROCEDURE.

PRE START-UP

GENERAL UNIT INSPECTION

Identify and perform appropriate "lock out/tag out" and safety rules. For details on points below see appropriate section of the Installation Instruction provided with each air handler.

For VFD equipped air handlers, refer to the VFD forms for additional requirements.



Serious damage to the AHU and/or system is eminent if the AHU is operated under any of the following conditions:

- **Without proper control of dampers.**
- **With smoke dampers closed.**
- **During a fire alarm or smoke purge test.**
- **Any airflow restriction greater than normal.**

Solution	AH Units	Form	102.20-OM1	Air Modulator	VFD Quick Start	Form	100.42-NO1
Custom	AH Units	Form	100.31-NOM1				

<input type="checkbox"/> Equipment received as ordered.	<input type="checkbox"/> Unit installed with proper clearances.
<input type="checkbox"/> Unit checked for damage to interior and exterior.	<input type="checkbox"/> Visually inspect roof curb for tight seal around unit.
<input type="checkbox"/> Unit installed on flat and level surface. Outdoor unit mounted within roof slope limitations where applicable.	<input type="checkbox"/> All penetrations MUST be sealed. All conduits MUST be sealed internally.
<input type="checkbox"/> Terminal screws and wiring connections secure in control, electric and Air Modulator panels.	<input type="checkbox"/> Clean air filters installed properly and secured.
<input type="checkbox"/> Air hoods installed properly.	<input type="checkbox"/> Filter gauge set to zero.
<input type="checkbox"/> Condensate drain properly trapped.	<input type="checkbox"/> All field wiring complete and inspected.
<input type="checkbox"/> All wiring and tubing connections made at shipping splits.	<input type="checkbox"/> All shipping splits sealed and secured properly.
<input type="checkbox"/> All field piping connections complete.	<input type="checkbox"/> Pipe chase floor sealed at penetrations.
<input type="checkbox"/> All shipped loose parts installed.	<input type="checkbox"/> All shipping bolts and other material have been removed. (Fan, VIFB, Energy Recovery Wheel, Damper).
<input type="checkbox"/> Installer has cleaned out interior.	<input type="checkbox"/> Damper linkage is tight and in correct "power off" position.
<input type="checkbox"/> Verify all plug-ins and wire connections are tight on UV equipment.	<input type="checkbox"/> Controls installation complete.
<input type="checkbox"/> Verify Energy Recovery Wheel turns freely and wheel segments are fully engaged.	<input type="checkbox"/> Verify all spacers removed from door edges.
<input type="checkbox"/> Verify all ductwork is complete and available for full air flow.	<input type="checkbox"/> Verify correct piping of split system. Reference Section 2 of Solution IOM & Split System Application Guide (050.40-ES3).

FAN INSPECTION	
<input type="checkbox"/> Check bearings and locking collars for properly tightened setscrews, bolts and nuts.	<input type="checkbox"/> Fan wheel properly aligned, tight on shaft and freely moving.
<input type="checkbox"/> Sheaves properly aligned and tight on shaft.	<input type="checkbox"/> Check fan base isolators and thrust restraints for proper adjustment. Note: Do not remove functional bolts from seismic isolators.
<input type="checkbox"/> Belt tension adjusted properly per drive pkg. label on fan.	
<input type="checkbox"/> Check fan alignment with unit discharge. Adjust with isolation.	<input type="checkbox"/> Fan bearings have been re-lubricated properly.

START-UP

PERFORM THE FOLLOWING STEPS IN ORDER:

Refer to safety standards. Ensure all door latches are secured before starting.

<input type="checkbox"/> 1. With all Electric Power off, all disconnect switches open and fuses removed, check each circuit with an Ohm meter to ground observing no continuity. Reinstall fuses.	<input type="checkbox"/> 8. Immediately check current draw of each leg of each motor.
<input type="checkbox"/> 2. Energize power to the unit disconnect switch.	<input type="checkbox"/> 9. VFD, refer to manufactures start up guide
<input type="checkbox"/> 3. Verify correct voltage, phase and cycles.	<input type="checkbox"/> 10. Check doors and latches for air leaks.
<input type="checkbox"/> 4. Energize fan motor(s) briefly (bump) and check for correct fan rotation.	<input type="checkbox"/> 11. Check for obvious audible leaks.
<input type="checkbox"/> 5. Check operation of dampers. Insure unit will not operate with all dampers closed.	<input type="checkbox"/> 12. Apply steam to cold coils slowly to prevent damage.
<input type="checkbox"/> 6. Energize fan motor(s). Observe fan(s) for smooth operation.	<input type="checkbox"/> 13. Observe energy recovery wheel rotation is correct.
<input type="checkbox"/> 7. Check motor nameplate Full Load Amp rating.	<input type="checkbox"/> 14. Purge on energy recovery wheel is set to specification.

RECORD DATA

POWER SUPPLY: Unit Nameplate V___ PH___ CYC, ___ Verify V _____ / _____ / _____

DATA

	SUPPLY FAN MOTOR	EXHAUST/RETURN FAN MOTOR
Nameplate	Volts _____ Amps _____	Volts _____ Amps _____
Run Amps	_____ / _____ / _____	_____ / _____ / _____
Catalog Number	_____	_____
Spec Number	_____	_____
Horse Power	_____	_____
RPM	Nameplate _____ Actual _____	Nameplate _____ Actual _____
Frame size	_____	_____
Service Factor	_____	_____
Jump (Skip) Frequencies	_____ / _____ / _____	_____ / _____ / _____
	SUPPLY FAN	EXHAUST/RETURN FAN
Manufacture Name	_____	_____
Type or Model Number	_____	_____
Code or Shop Order Number	_____	_____
Serial Number	_____	_____
	SUPPLY FAN DRIVE KIT	EXHAUST/RETURN FAN DRIVE KIT
Belts (Qty & ID#)	_____	_____
Belt Tension	Tag _____ Actual _____	Tag _____ Actual _____
Fan RPM (DN)	Tag _____ Actual _____	Tag _____ Actual _____

OTHER UTILITIES

Steam Pressure	Heating Coils _____ PSI,	Humidifier _____ PSI
Hot Water Pressure/Temp.	Supply _____ PSI, _____ °F,	Return _____ PSI, _____ °F
Chilled Water Pressure/Temp.	Supply _____ PSI, _____ °F,	Return _____ PSI, _____ °F
Potable Water Pressure	_____ PSI,	Pneumatic Air Pressure _____ PSI

MAINTENANCE

Upon completion of start-up the customer assumes responsibility for periodic maintenance of this equipment in order to continue warranty. Refer to the Installation Operation and Maintenance Manual (Form 102.20-OM1).

Customer's agent signature: _____ **Date:** _____



Equipment Release Approval Form

Product Type: Solution XTI AHUs

Unit Tags: AH-01, AH-03, DOAS-01, ERV-01_COILS, ERV-02_COILS, FCU-09

The following table must be completed prior to releasing the equipment for fabrication. Please initial the column indicating the information contained in this submittal has been verified, or indicate to refer to a marked-up page.

SUBMITTAL VERIFICATION	
	Purchaser Initials
Unit quantities and tag designations are correct.	
Equipment dimensions (length, width, and height) and weights have been verified to comply with jobsite conditions and rigging requirements.	
Electrical voltage and electrical connections are compatible with jobsite requirements.	
Unit handing/orientation is suitable for installation based on mechanical system and jobsite spatial constraints. This includes (but is not limited to) unit piping/ductwork connections and enclosure/access door locations.	

Important Notes:

- 1) Actual fabrication release cannot commence until this form is signed by the customer and returned to JCI along with a release notification with date and ship to address.
- 2) Equipment "lead-time" does not start until confirmed release documentation is received, and the order is actually released to the factory.
- 3) Modifications to equipment configurations after fabrication release may impact cost and lead-time.



4) Attached configurations are as shown in the approved equipment submittals or as defined in superseding customer correspondence.

5) "Side" / "Hand" orientation is relative to a person standing inside a unit with air hitting the back of the head.

6) Note that once this document is confirmed, the equipment configurations defined by this document take precedence over all other documents.

7) "Want date" and/or "ship to address" changes made after this document is confirmed may impact cost and lead-time.

Please fill out the following table and refer to the receiving/rigging instructions in this submittal to help ensure a smooth delivery and installation of the equipment.

DELIVERY INFORMATION	
	Please fill out information below
Contact name for coordinating delivery of equipment with transportation company:	
Contact phone number:	
Advance notice required from transportation company prior to delivering equipment (typically 48 hours):	
Ship to address:	
Other special shipping instructions or requirements:	

FILTER DELIVERY INFORMATION

Instructions: Please fill out the following table for timely delivery of the filters and ensure they are not lost or damaged until it is time for unit startup.

Please fill out information below:	
Primary contact name, number, and email for coordinating delivery of filters with transportation company	
Alternate delivery contact name, phone number, and email (if applicable)	
Advance notice required from transportation company prior to delivery (typically 48 hours)	
Ship-to address	
Requested delivery date (NOTE: Subject to factory lead time)	
Other special shipping instructions or requirements	
Has the site agreed to accept the delivery of the filters? (YES or NO)	
Will the delivery truck be required to have a lift gate? (YES or NO)	

CUSTOMER APPROVAL:

Customer Name: _____

Signature (*) _____

Date: _____