IU072- ENG Science & Technology
Replace AHU-0 East

Indiana University Indianapolis
723 W. Michigan St.
Indianapolis, Indiana
IU 20250575

ADDENDUM NO. 1

HEAPY PROJECT NO. 2025-06079

February 12, 2026

GENERAL

ITEM NO. 1 Issue Pre-Bid Meeting Agenda and Information

ITEM NO. 2 Issue Pre-Bid Meeting Sign in Form

ITEM NO. 3 Issue Johnson Controls Drawings

ITEM NO. 4 Issue AHU submittal for reference

ITEM NO. 5 Issue SL Basement Overlay – HVAC – For Reference

ITEM NO. 6 Demolition of the existing AHU can begin on June 1, 2026

SPECIFICATIONS

ITEM NO. 1 23 05 04 BASIC HVAC MATERIALS AND METHODS

A. Modify paragraph 1.1.B to read as follows:

A. "B. Cover all supply duct openings with temporary roll filter (blue) media. Stop fans during heavy dust generating operations. Before turning the system over to the Owner, clean duct interiors and interior surfaces and components of the air handling equipment."

ITEM NO. 2 23 31 13 HVAC DUCTWORK

A. Modify paragraph 2.6.D to read as follows:

A. "D. FG-1403 or FG-1404 tape duct joint sealer equal to that manufactured by Hardcast, Inc."

ITEM NO. 3 23 73 23 CUSTOM AIR HANDLING UNITS

A. Modify paragraph 1.2 to read as follows:

A. "1.2 Units shall be pre-purchased by the owner and installed by the contractor. Contractor is responsible to coordinate delivery, receiving, unloading, logistics, etc. for shipping and installation of the air handling units. The AHU be shipped/delivered to the IU Indy CS4 building (address is 1830 W. 16th St,

Indianapolis, IN 46202. The contractor shall be responsible for moving the AHU from CS4 to the jobsite."

ATTACHMENTS

Pre Bid Meeting Agenda and Information.

Pre Bid Meeting Sign in Form.

Johnson Controls Drawings.

AHU Shop Drawing for reference.

SL Basement Overlay – HVAC – For Reference.

Pre-Bid Meeting Agenda And Information

Heapy Project No. 2025-06079

Project: IN072 - ENG SCIENCE & TECHNOLOGY - Replace AHU-0 East
IU #20250575

Date: January 29, 2026, 11:00 A.M.

Project Introductions

MEP: Heapy Engineering

Garrett Mize (PM)	Email gdmize@heapy.com
Ehren Lohrmann (Mechanical)	Email eelohrmann@heapy.com
Mat Root (Electrical)	Email maroot@heapy.com

Indiana University

Ken McKnight	Email kmcknigh@iu.edu
Tim Fettig	Email gtfettig@iu.edu

Sign In Sheet

Pre- Bid: All interested parties must sign in prior to the end of the meeting.

Bidding Documents

Bidding documents are available. Contact Eastern Engineering Distribution Department, 9901 Allisonville Road, Fishers, IN 46038. Phone 317-598-0661, www.iuplanroom.com for deposit and purchase information.

3850 Priority Way South Dr. Ste 204
Indianapolis, IN 46240
(317) 571-8795 www.heapy.com

Bid Date and Procedure

IU 20222125 - Bids will be received until 2:00 PM (local time) on Thursday February 19, 2026

Via electronic bid submission on www.iuplanroom.com Bidders must be registered on the plan room, and signed in to the plan room, in order to submit a bid.

Bids will be electronically opened via Zoom:
https://iu.zoom.us/j/82623978895
Meeting ID: 826 2397 8895
Join By Telephone: 312-626-6799

Sub and Product List

Subs and Products list to be submitted within 48 hours of bid opening

Questions

All questions and comments regarding this project must be directed, in writing to Garrett Mize, gdmize@heapy.com Please submit all questions for the project no later than the end of the day on February 10, 2026, for inclusion in an Addendum.

Addenda

Addendum #1 to be issued on February 12, 2026

An addendum can be issued up to 48 hours prior to bid

Basic Scope

Removal of existing air handling unit

Installation of owner provided air handling unit, contractor is required to coordinate with the manufacturer for delivery and provide complete installation per manufacturer's instructions.

Ductwork and piping as shown

Electrical as shown

Temperature controls as shown

Testing and balancing

Schedule

Construction – Summer 2026

Air Handling Unit Delivery – Approximately June 15, 2026 to July 1, 2026, contractor is required to coordinate with the manufacturer for delivery.

Completion – August 21, 2026

Construction Schedule

Detailed construction schedule is required at the beginning of construction to coordinate phasing, installation, dates and times.

Restrictions / Limitation / Challenges

1. All areas outside the project limits will be occupied during construction
    a. Control air quality (construction dust / debris / welding)
        i. Provide negative air pressure / filters during indoor construction activities.
    b. Noise control
2. Shutdowns
    a. To be coordinated, provide a minimum of 72 hour notice

Abatement

Abatement will be handled by university forces. If suspicious material is encountered, stop work immediately and contact the owner for clearance or removal.

Additional Site Visits

Contact

Tim Fettig Email gtfettig@indiana.edu

Questions / Comments

Walk Through

HEAPY

ATTENDANCE SHEET

Project No.: 2025-06079

Date: January 29, 2026

Project: IN072 Engineering, Science, & Technology Bldg – Replace AHU-0E

IU# 20250575

Purpose: Pre-Bid Meeting

PLEASE PRINT CLEARLY

	Name	Company	E-Mail
1.	KEN MCKNIGHT	IU	kmcknigh@iu.edu
2.	Boo Tormoehlen	IU	wtormoeh@iu.edu
3.	Aaron Johnson	HFI	ajohnson@harrell-fish.com
4.	MIKE WISE	IRISH	MWISE@IRISHMECHANICALSERVICES.COM
5.	Tom Hall	IRISH	THall@IRISHMechanicalServises.com
6.	Charles Rigdon	TP Mechanical	Charles.rigdon@tpmechanical.com
7.	Craig Wilson	Koontz Wagner	cwilson@kwservices.com
8.	David Moroz	Indiana Electrical Services	dmoroz@indyelectric.net
9.	Dave VanHart	SEXSON MECHANICAL	DVANHART@SEXSONMECHANICAL.COM
10.			

3850 Priority Way South Dr. Ste 204
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(317) 571-8795 www.heapy.com

IU Indy SL AHU-0E

IU#20250575 JCI#6N200479

Page	***Description***
0.0	Title Page Drawing
0.1	Riser Communications Drawing
1.1	SL AHU-0E - Flow Layout
1.2	SL AHU-0E - BOM Drawing
1.3	SL AHU-0E - Sequence Drawing
1.4	SL AHU-0E - Panel Detail
1.5	SL AHU-0E - Point Schedule
1.6	SL AHU-0E - Wiring Details 1
1.7	SL AHU-0E - Wiring Details 2
1.8	SL AHU-0E - Wiring Details 3
1.9	SL AHU-0E - Wiring Details 4
R.1	SL AHU-0E - RAC Schedule
V.1	SL AHU-0E - Valve Schedule
AFMS.1	SL AHU-0E - AFMS Schedule

LEGEND

- S / 20 — Main Air Supply Tube at 20 PSIG
- D-N / 15-20 — Dual Air Supply Tube at 15/20 PSIG Day=15, Night=20
- S / 80 — High Pressure Air Supply Tube at 80 PSIG
- Air line or Electrical Wire
- Connected Lines or Wires
- Crossing Lines or Wires, Not Connected
- In-Line Restrictor
- 7 — Pneumatic Tube indicating Tube Number
- 2/18 — Wire Symbol indicating: number of wires and size (E.G. 2 #18 wires)
- 3 — 2/18 — Wire Symbol indicating: Cable Destination (DA-T), Cable number (3), Number of wires and size (E.G. 2 #18 wires)
- 1 — Electrical Wire Terminal with Appropriate Number
- Item Located on Panel Face
- 1 — Drawing Revision Symbol with Appropriate Number
- NO — Opposed Blade Damper
- NO — Parallel Blade Damper
- Filter
- Air Flow Measuring Station
- Humidifier
- Fan
- Pump
- H / C — Heating or Cooling Coil
- Ductwork or Piping with Flow Direction Shown
- Gage
- Device
- Bulb Type Temperature Sensing Element Located under Shield in Outside air
- Humidity Sensing Element Located under Shield in Outside air
- Bulb Type Temperature Sensing Element Located inside Separable Socket/Well
- Strap-on Bulb Type Temperature Sensing Element
- Combination Bulb Type Temperature Sensing Element and Humidity Sensor (Duct Mount)
- Bulb Type Temperature Sensing Element
- Pressure Sensing Device
- Paddle Type Flow Switch
- Vapor Tension Temperature Sensing Element (Hi Limit)
- Vapor Tension Temperature Sensing Element (Low Limit)
- Current Sensing Switch or Combination Current Sensing switch & Command Relay
- Duct Detector (Smoke, CO, CO2)
- 2-Way Valve with Actuator — NC
- 3-Way Valve with Actuator — C, NC, NO

Johnson Controls

Creating a better climate for business.

- ☐ **Environmental Control System**
- ■ **Facility Management System**
- ☐ **Air and Water System Balancing**
- ☐ **Fire Management System**
- ☐ **Security System**
- ☐ **Lighting Services**
- ☐ **Instrumentation System Installation**
- ☐ **Building Operations Management**
- ☐ **Energy Conservation Control**
- ☐ **Training Programs**
- ☐ **Performance Contracting**
- ☐ **Planned Service Agreements**

Air Conditioning
Heating
Diagnostic Services
Coil Cleaning
Refrigeration
Automatic Temperature Controls
Facility Management Systems
Fire Management
Security Management
Building Operations and Management
Water Treatment
Electrical Equipment
Emergency Generator / Lighting Equipment
Industrial Controls / Recording / Indication Equipment

PROJECT TITLE
IU Indy SL AHU-0E
IU# 20250575

ARCHITECT	ENGINEER
, **Phone:**	, **Phone:**
MECHANICAL CONTRACTOR	**ELECTRICAL CONTRACTOR**
, **Phone:**	, **Phone:**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive Suite #130,
Indianapolis, Indiana 46250
Phone:

SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DATE	CONTRACT NUMBER
JG	JB	DG	1/23/2026	6N20-0479

COMMUNICATIONS RISER

NAE-2 SL

EXISTING MSTP TRUNK

SYSTEM	BUS	ADDRESS
SL AHU-0E	FC-2	5

Drawing Title

Riser Drawing

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/23/2026	BY DATE

Project Title

IU Indy SL AHU-0E
IU#20250575

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER

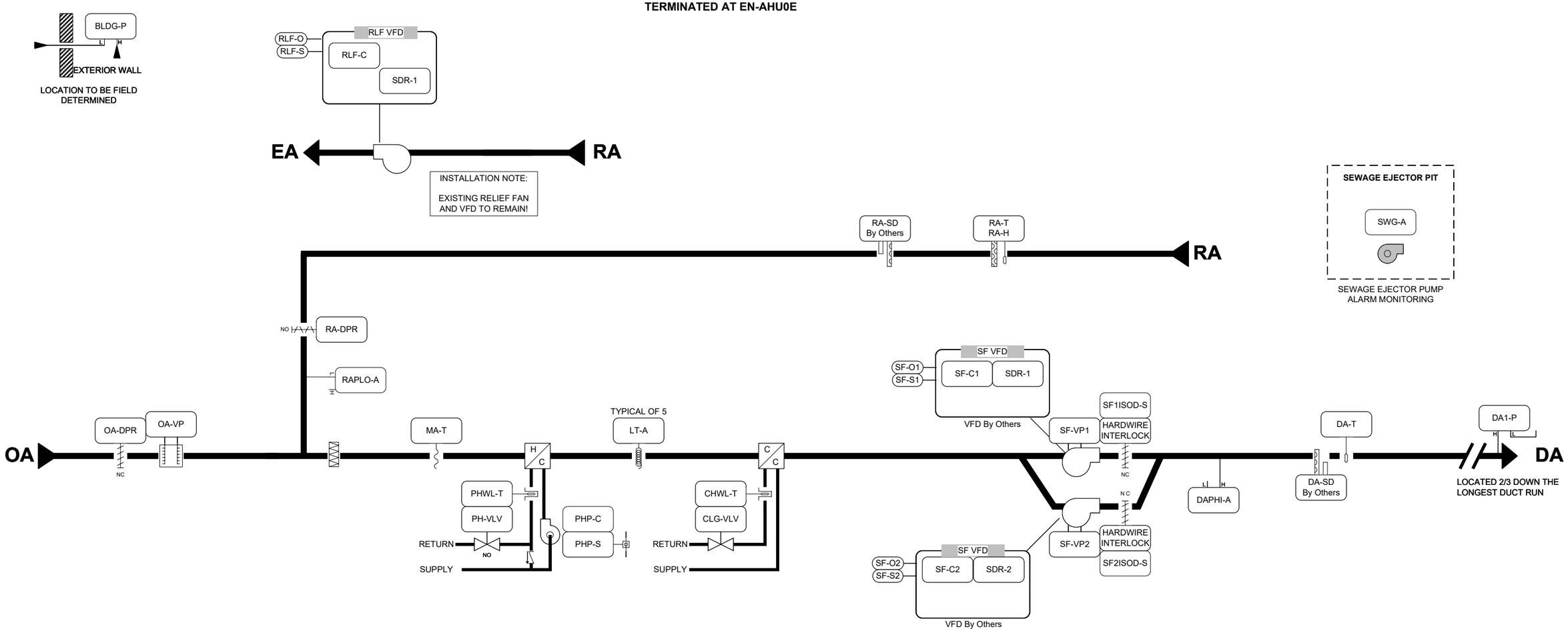
6N200479

DRAWING NUMBER

0.1

SL AHU-0E – FLOW LAYOUT

LOCATED IN BASEMENT MECHANICAL ROOM
TERMINATED AT EN-AHU0E



Drawing Title

SL AHU-0E - Flow Layout

Project Title

IU Indy SL AHU-0E
IU#20250575

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/23/2026	BY DATE

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
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46250
Phone: 3176387611

CONTRACT NUMBER
6N200479

DRAWING NUMBER
1.1

BILL OF MATERIAL

DESIGNATION	QTY.	CODE NUMBER.	DESCRIPTION
FIELD MOUNTED			
CLG-VLV	1	VALVE	SEE VALVE SCHEDULE
PH-VLV	1	VALVE	SEE VALVE SCHEDULE
OA-DPR, -VP	1	AFMS	SEE AFMS SCHEDULE
BLDG-P	1	DP140X25B21C	BIDIRECTIONAL + OR -0.25IN. W.C. 24 VDC / 4 TO 20 MA
	1	A-306-K	Outdoor Air Static
	1	RPS	STAINLESS STEEL ROOM PRESSURE SENSOR WITH 1/4 INCH BARB FITTING
	1	SD-01	SURGE DAMPENER
CHWL-T, PHWL-T	2	DVUT35	WEISS SOLAR TEMP TRANSMITTER
	2	TE-6300W-103	THERMOWELL, 6 THREADLESS ADAPTER MOUNT
DA1-P	1	DP140005U21C	UNIDIRECTIONAL 0 TO 5IN. W.C. 24 VDC / 4 TO 20 MA
	1	FTG18A-600R	SENSING TUBE KIT FOR P32
DAPHI-A	1	AFS-460	DIFFERENTIAL PRESSURE SWITCH, 0.06-12 WC, ADJUSTABLE, SPST (NC)
	1	FTG18A-600R	SENSING TUBE KIT FOR P32
	1	RIB24P	ENCLOSED RELAY 20 AMP DPDT WITH 24 VAC/DC COIL
DA-T	1	TE-6351M-1	DUCT MOUNT SENSOR 1K OHM PLATINUM 8 IN. PROBE METAL ENCLOSURE
LT-A	2	A70HA-1C	15/55F, DIFF 5 FIXED,1NO/1NC MAIN OPEN LOW,1/8 X 20' BULB,
	2	TE-6001-8	AVER ELEMENT HLDR QTY =10
MA-T	1	TE-6328P-1	20', W/TE-6001-8ELEMENTHOLDER
	1	TE-6001-8	AVER ELEMENT HLDR QTY =10
PHP-C	1	RIBU1C	ENCLOSED PILOT RELAY 10 AMP SPDT WITH 10-30 VAC
PHP-S	1	CSDSC-C50100L0	CURR SW SELF CAL CLMP 0.50A-100A
PH-T	1	TE-6328P-1	20', W/TE-6001-8ELEMENTHOLDER
	1	TE-6001-8	AVER ELEMENT HLDR QTY =10
RA-DPR	1	M9220-GGA-3	20 NM SR DPR ACT 0(2) TO 10 VDC 24 VAC 50/60 HZ 24 VDC
RA-T, -H	1	HE69530NP-0	DUCT PROBE, 3%RH, PT TEMP
RAPLO-A	1	AFS-460	DIFFERENTIAL PRESSURE SWITCH, 0.06-12 WC, ADJUSTABLE, SPST (NC)
	1	FTG18A-600R	SENSING TUBE KIT FOR P32
	1	RIB24P	ENCLOSED RELAY 20 AMP DPDT WITH 24 VAC/DC COIL
RLF-C	1	RIBU1C	ENCLOSED PILOT RELAY 10 AMP SPDT WITH 10-30 VAC
SDR-n	3	RIBU1C	ENCLOSED PILOT RELAY 10 AMP SPDT WITH 10-30 VAC
SF-Cn	2	RIBU1C	ENCLOSED PILOT RELAY 10 AMP SPDT WITH 10-30 VAC
SF-VPn	2	DP140005U21C	UNIDIRECTIONAL 0 TO 5IN. W.C. 24 VDC / 4 TO 20 MA

Drawing Title

SL AHU-0E - BOM

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/23/2026	BY DATE

Project Title

IU Indy SL AHU-0E
IU#20250575

Johnson Controls

Branch Information
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CONTRACT NUMBER

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DRAWING NUMBER

1.2

SEQUENCE OF OPERATION

ADAPTIVE OPTIMAL START MODE:
The DDC utilizes space temperature, outdoor air temperature, and applicable OCCUPIED heating and cooling setpoints and occupancy schedule to continuously adapt itself using a learning process to calculate the most optimal start up time, up to 4 hours (adj) prior to scheduled occupancy time, to allow the average building space temperature to reach the OCCUPIED space temperature setpoint determined by the heating or cooling mode. The control learning algorithm at a minimum is a function of the difference between zone temperature and occupied setpoints and the amount of time prior to scheduled occupancy. The algorithm adjusts start times based on past histories and times to obtain setpoints at similar outside air temperatures.
During an optimal start warm-up cycle, the outside air dampers remain closed, return air dampers fully open, relief dampers are fully closed, and associated general exhaust fans are off. This mode continues until the exterior zones (only) reach their occupied heating setpoints. If the system is still in its warm-up cycle 30 minutes after the scheduled occupied start time, end the warm-up cycle and alarm the BAS of the zone(s) that did not hit their occupied heating setpoint. When the warm-up cycle ends, the economizer dampers are positioned to minimum and the respective exhaust fans are enabled. Economizer damper control is delayed 2 minutes during startup to prevent cabinet heat from false loading the system.
During an optimal start cool-down cycle, outside air is used for cooling first unless the economizer is locked out. If the economizer is inactive, the associated relief and outside air dampers remain closed, and chilled water system is made available. This mode continues until all zones reach their occupied cooling setpoints. If the system is still in its cool-down cycle 30 minutes after the schedule occupied start time, end the cool-down cycle and alarm the BAS of the zone(s) that did not hit their occupied cooling setpoint. When the cool-down cycle ends, the economizer dampers are positioned to minimum and the respective exhaust fans are enabled.

SUPPLY FAN CONTROL:
The lead variable speed supply fan (SFx-C) will be started based on occupancy schedule (OCC-SCHEDULE). When either supply fan status (SFx-S) indicates a fan started, the control sequence will be enabled. The supply fan (SF-O) will modulate to maintain the discharge static pressure (DA-P) at setpoint (DAP-SP) initially set at 1.0"WC. When the fan output (SFx-O) exceeds a maximum output setpoint (SFSTG-SP, 55Hz for 5 minutes)) the lag fan will start and run in conjunction with the lead fan. Upon a loss of airflow (SFx-S) on either fan, the lead fan will stop and the lag fan will be commanded on. When the parallel fans are operating at 25Hz or less for more than 10 minutes, the lag fan is commanded off. After a minimum time of 10 minutes, the lag fan is allowed to restart, if needed. When a fan is enabled, its isolation damper opens via a hardwired interlock. When a fan is disabled, its isolation damper closes. Lead fan will be rotated every 168 hours.

SUPPLY AIR STATIC PRESSURE SETPOINT RESET:
The supply air static pressure setpoint is reset by polling all VAV box damper positions. If all VAV box dampers are below 80% of full open, reset the supply duct static pressure setpoint downward 0.05"WC every 10 minutes until at least one VAV box damper is 85% of full open. If any box damper is more than 90% of full open, reverse the sequence (reset the static setpoint upward 0.05"WC every 5 minutes until all VAV box dampers are less than 90% of full open. Low limit of the setpoint shall be 0.50"WC and high limit setpoint shall be 1.20"WC. The zones that may be excessively driving the reset logic is automatically detected and an alarm is generated at the operator workstation.

ECONOMIZER CONTROL:
When the enthalpy of the outdoor air is less than the return air (ECON-AVAILABLE), the economizer will act as the initial stage of cooling, working in sequence with the cooling coil. When the outside air enthalpy is higher than the return air enthalpy, or when the outside air temperature is greater than 75°F, the economizer is disabled.
During the economizer cycle, the amount of outside air damper modulates to maintain the unit discharge air temperature setpoint.
Economizer mode is delayed 2 minutes during start-up to prevent cabinet heat from false loading the system.

MINIMUM OA CONTROL:
The OA damper (OAD-O) will modulate to maintain the building pressure (BLDG-P) at setpoint (0.020"wc, adj). If, upon the outside air damper being fully open, the building pressure requirement is NOT met, the return air damper will modulate closed to maintain the building pressure setpoint.

RELIEF FAN CONTROL:
When the average of the building's two (2) building static pressure sensors is above 0.030"wc (adj), the lead relief fan (RLFn-O) is commanded on at a preset speed (RLFn-O)(30%, adj). Once the average building static pressure is below 0.022"wc (adj), the lead relief fan is commanded off. Upon an unexpected loss of lead relief fan status (RLFn-S), an alarm will be sent to the operator workstation and the lag relief fan is started.

TEMPERATURE CONTROL:
The discharge air temperature setpoint (DAT-SP) will be 70°F during warm-up cycles and 48°F during cool-down cycles. During occupied mode, the discharge air temperature setpoint is 48°F except reset as follows:
-All zone associated with this unit are polled every 15 minutes and the zone furthest from its cooling setpoint governs. As the worst-case zone deviation from its cooling setpoint decreases, the discharge air setpoint is reset upwards toward an upper limit of 58°F. If all zones are in heating and/or in deadband, the discharge air setpoint is reset to the upper limit of 58°F. Those zones that may be excessively driving the reset logic are automatically detected and an alarm is generated at the operator workstation.
-If the return air relative humidity rises above 58%RH, the reset schedule is deactivated. After 60 minutes, re-activate the reset schedule if the return air humidity falls below 55%RH.
-As the outside air temperature falls from 30°F to 10°F, the discharge air temperature setpoint resets from 58°F to 65°F, to prevent low limit trips.

OCCUPIED MODE:
The occupancy mode will be controlled via a network input (OCC-SCHEDULE). Time of day scheduling to be coordinated with Owner.

UNOCCUPIED HEATING MODE:
When the unit is UNOCCUPIED and any zone temperature falls 3°F below the zone unoccupied heating setpoint, the unit cycles on, except the outside air dampers remain closed and the interlocked exhaust fans remain off. When all zone temperatures are at or above their zone unoccupied heating setpoint, the unit cycles off.

SEQUENCE OF OPERATION (CONT.)

UNOCCUPIED COOLING MODE:
When the unit is UNOCCUPIED and any zone temperature rises 3°F above the zone unoccupied cooling setpoint, or when space RH rises above 60%, the unit cycles on for cooldown, except that the interlocked exhaust fans remain off.
During cooldown, outside air is used for cooling first unless the economizer is locked out. If the economizer is inactive, the associated relief remains off and the outside air damper remain closed, and chilled water system is made available. When all zone temperature are at or below their zone unoccupied cooling setpoint the unit cycles off.

OVERRIDE MODE:
The unit will be put in OCCUPIED when any of the following occur:
- Initiated through a manual override of the UNOCCUPIED mode at the operator workstation
- Initiated through a zone override device. A zone override device is a manually operated button or switch or occupancy sensor as defined within or on the drawings.

Whenever a zone or system is specified to have an occupancy sensor or sensors, if one or more of the zone or system occupancy sensors detects movement and heat changes, the associated zone or system OCCUPIED mode is enabled. If movement and heat changes are not detected for 20 minutes (adj), the zone or system OCCUPIED mode is disabled.

PREHEAT COIL:
If the AHU fan system is on and the chilled water valve is closed and economizer is off and the AHU supply air temperature falls 2°F below setpoint, the preheat (PH-O) will modulate to maintain the temperature setpoint. Upon a drop in the outdoor air temperature (OA-T) below the low outdoor air temperature setpoint (OALT-SP, 45°F), the coil pump (PHP-C) will be started. Upon a loss of preheat coil pump status (PHP-S), an alarm will be generated at the operator workstation. When the unit is shutdown, the preheat coil will be commanded to a preset position should the mixed air temperature (MA-T) fall below the low outdoor air temperature setpoint (OALT-SP).
When the AHU fan system is off under normal operation, the preheat valve modulates to maintain a preheat coil water leaving temperature of 70°F.

COOLING COIL:
If the AHU fan system is on and the economizer is active, the outside air dampers are fully open, and the AHU discharge air temperature is above setpoint, the cooling coil (CLG-O) will modulate to maintain the temperature setpoint. If the AHU fan system is on, the economizer is NOT active, and the AHU discharge air temperature is above setpoint, the chilled water valves modulates to maintain the supply air setpoint. When the unit is shutdown, the cooling coil will be commanded closed should the outdoor air temperature (OA-T) fall below the low outdoor air temperature setpoint (OALT-SP).

UNIT PROTECTION:
The following safeties are provided to stop the unit and position control devices to their fail safe positions, ie, outside and relief dampers close, return dampers open, heating valves 25% open.
- Low Temperature Alarm (LT-A) - When in "Alarm", the control sequence will stop running, the valve(s) will open and the fan(s) will be disabled via a hard wired shutdown circuit.
- Discharge Air High Duct Pressure Alarm (DAPHI-A) - When in "Alarm", the control sequence will stop running and the fan(s) will be disabled via a hard wired shutdown circuit.
- Discharge Air Smoke Detector (DA-SD) - Disables the fan(s) via a hard wired shutdown circuit.
- Return Air Low Duct Pressure Alarm (RAPLO-A) - When in "Alarm", the control sequence will stop running and the fan(s) will be disabled via a hard wired shutdown circuit.

ADDITIONAL POINTS MONITORED BY THE FMS:

- Chilled Water Leaving Temperature (CHLW-T)
- Prefilter Status (PFILT-S)
- Final Filter Status (FFILT-S)
- Discharge Air Smoke Alarm (DA-SD)
- Sewage Ejector Pump Alarm (SWG-A)

ZONE HEATING AND COOLING SETPOINTS:
Zone heating and cooling setpoints are as follows except as specified otherwise. All setpoints are adjustable.
Occupied Zone Cooling Setpoint: 76°F
Occupied Zone Heating Setpoint: 6°F below Occupied Zone Cooling Setpoint
Unoccupied Zone Cooling Setpoint: 6°F above Occupied Zone Cooling Setpoint but not warmer than 82°F
Unoccupied Zone Heating Setpoint: 10°F below Occupied Zone Heating Setpoint, but no lower than 60°F.

Drawing Title
SL AHU-0E - Sequence

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/23/2026	BY DATE

Project Title
**IU Indy SL AHU-0E
IU#20250575**

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER
6N200479

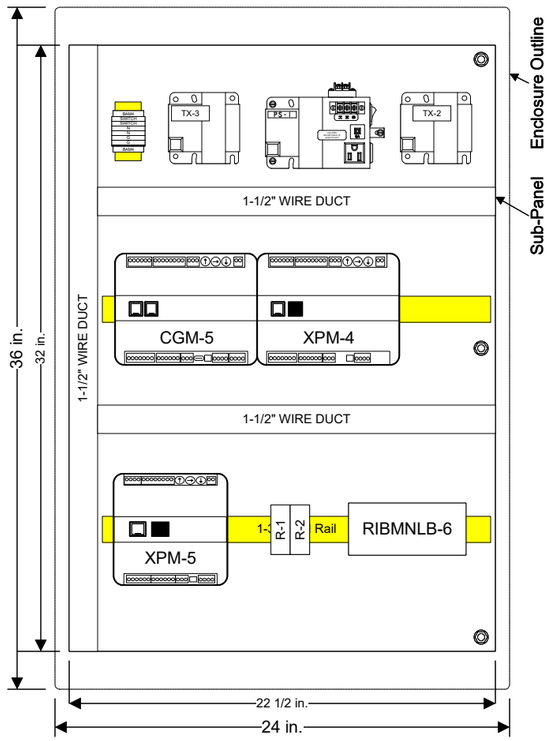
DRAWING NUMBER
1.3

BILL OF MATERIALS

Designation	Qty	Part Number	Description
ENCLOSURE	1	P2DAN-BAHB2Y01	PANEL, M4-CGM09090-0, M4-XPM09090-0, 24 X 36 X 6.5, and 96VA XFRMR, TERM BLK
FIELD INSTALL:			
R-1,-2	2	SH2B-05	RELAY SOCKET DIN MOUNT SCREW TERMINAL USED WITH RH2B
SAFETY	1	RIBMNLB-6	2.75 TRACK MOUNT AHU FAN SAFETY ALARM AND GENERAL PURPOSE LOGIC CIRCUIT
XPM-5	1	M4-XPM18000-0	GEN4 I/O EXP MODULE, 18 PTS
TX-3	1	PAN-96VAXFR-0	PANEL, 96VA TRANSFORMER K

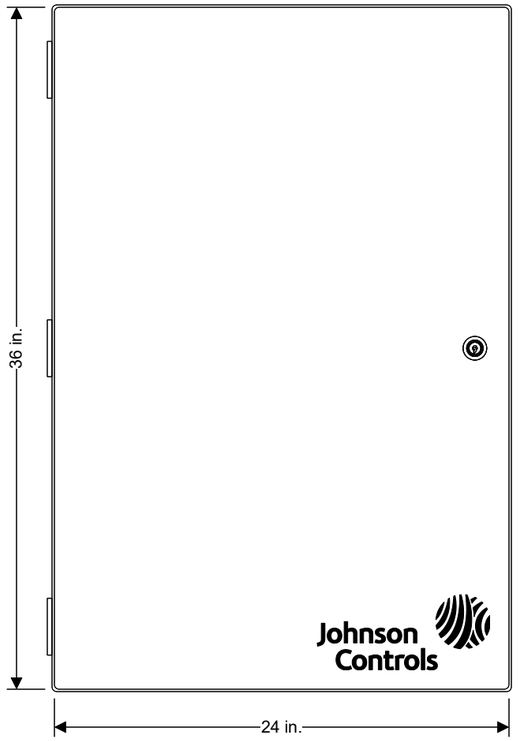
PANEL LAYOUT

SCALE: 1/8" = 1"



FACE LAYOUT

SCALE: 1/8" = 1"



Drawing Title							
SL AHU-0E - Panel Layout							
	REFERENCE DRAWING		NO.	REVISION-LOCATION	ECN	DATE	BY
	Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
	JG	JB	DG	BY DRG DATE 1/23/2026		BY DATE	
Project Title				Branch Information		CONTRACT NUMBER	
IU Indy SL AHU-0E **IU#20250575**	Johnson Controls			BSNA - INDIANAPOLIS, IN 5920 Castleway West Dr, Indianapolis, Indiana 46250 Phone: 3176387611		**6N200479**	
						DRAWING NUMBER	
						1.4	

SL AHU-0E - POINT SCHEDULE

Electrician/Fitter		Point Information			Controller Information							Intermediate Device				Field Device			
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Wiring /Tubing	Termination In	Device	Termination Out	Wiring /Tubing	Termination In	Device	Ref Detail Shape
		AHU			CGM09090														
		AHU			CGM09090	MS/TP	1	4											
	UI IN-1	AHU	DA-T	Discharge Air Temperature	CGM09090	MS/TP	1	4	UI IN-1		IN1, ICOM1					2/22	2-Wire	TE	F131
	UI IN-2	AHU	DA1-P	Discharge Air Static Pressure 1	CGM09090	MS/TP	1	4	UI IN-2		IN2, +15V					2/22	-, +	DPT2xxx (mA)	F106
	UI IN-3	AHU	MA-T	Mixed Air Temperature	CGM09090	MS/TP	1	4	UI IN-3		IN3, ICOM3					2/22	2-Wire	TE	F131
	UI IN-4	AHU	RA-T	Return Air Temperature	CGM09090	MS/TP	1	4	UI IN-4		IN4, ICOM4					2/22	TEMP, TEMP	HE-6900(Duct Mnt) - TE	F160
	UI IN-5	AHU	RA-H	Return Air Temperature	CGM09090	MS/TP	1	4	UI IN-5		IN5, ICOM5, +15V					3/22	OUT,GND,PWR	HE-6900(Duct Mnt) - HE	F160
	UI IN-6	AHU	PHWL-T	Preheat Water Leaving Temperature	CGM09090	MS/TP	1	4	UI IN-6		IN6, +15V					2/22	See wiring detail	Current Input (2 Wire)	F106
	UI IN-7	AHU	CHWL-T	Chilled Water Leaving Temperature	CGM09090	MS/TP	1	4	UI IN-7		IN7, +15V					2/22	See wiring detail	Current Input (2 Wire)	F106
	BI IN-1	AHU	SF1-S	Supply Fan 1 Status	CGM09090	MS/TP	1	4	BI IN-1		IN1, ICOM1	2/22	OUT, COM	Current Relay	Motor Lead	Motor Lead	See wiring detail	Motor Status (Contact)	F307
	BI IN-2	AHU	SF2-S	Supply Fan 2 Status	CGM09090	MS/TP	1	4	BI IN-2		IN2, ICOM2	2/22	OUT, COM	Current Relay	Motor Lead	Motor Lead	See wiring detail	Motor Status (Contact)	F307
	BO OUT-1	AHU	SF1-C	Supply Fan 1 Command	CGM09090	MS/TP	1	4	BO OUT-1		OUT1, 24V COM	2/22	COIL-,COIL+	Relay	COM, NO	2/14	See wiring detail	VFD (w/ Safety) (Sw Hi, EXT)	F1042
	BO OUT-2	AHU	SF2-C	Supply Fan 2 Command	CGM09090	MS/TP	1	4	BO OUT-2		OUT2, 24V COM	2/22	COIL-,COIL+	Relay	COM, NO	2/14	See wiring detail	VFD (w/ Safety) (Sw Hi, EXT)	F1042
	BO OUT-3	AHU			CGM09090	MS/TP	1	4	BO OUT-3										
	CO OUT-1	AHU	SF-O1	Supply Fan 1 Output	CGM09090	MS/TP	1	4	CO OUT-1		OUT1, OCOM1					2/22	See VFD Detail	VFD Speed Control (Vdc)	F267
	CO OUT-2	AHU	SF-O2	Supply Fan 2 Output	CGM09090	MS/TP	1	4	CO OUT-2		OUT2, OCOM2					2/22	See VFD Detail	VFD Speed Control (Vdc)	F267
	CO OUT-3	AHU			CGM09090	MS/TP	1	4	CO OUT-3		OUT3, OCOM3								
	CO OUT-4	AHU			CGM09090	MS/TP	1	4	CO OUT-4		OUT4, OCOM4								
	AO OUT-1	AHU	PH-VLV	Preheat Valve Output	CGM09090	MS/TP	1	4	AO OUT-1		OUT1, OCOM1,24VAC ,COM					2/22 / 2/18	Gray, Black, Red	VA9203-GGA-2Z (Vdc) (Ext Source)	F268
	AO OUT-2	AHU	CLG-VLV	Cooling Valve Output	CGM09090	MS/TP	1	4	AO OUT-2		OUT2, OCOM2,24VAC, COM					2/22 / 2/18	GRY, BLK/BLK, RED	M92xx-GGx-x (Vdc) (Ext Source)	F267
		AHU			XPM09090														
		AHU			XPM09090	SA Bus	1	4											
	UI IN-1	AHU	SF-VP1	Supply Fan 1 Velocity Pressure	XPM09090	SA Bus	1	4	UI IN-1		IN1, +15V					2/22	-, +	DPT2xxx (mA)	F106
	UI IN-2	AHU	SF-VP2	Supply Fan 2 Velocity Pressure	XPM09090	SA Bus	1	4	UI IN-2		IN2, +15V					2/22	-, +	DPT2xxx (mA)	F106
	UI IN-3	AHU	OA-VP	Outdoor Air Velocity Pressure	XPM09090	SA Bus	1	4	UI IN-3		IN3, +15V					2/22	-, +	DPT2xxx (mA)	F106
	UI IN-4	AHU	BLDG-P	Building Static Pressure	XPM09090	SA Bus	1	4	UI IN-4		IN4, +15V					2/22	-, +	DPT2xxx (mA)	F106
	UI IN-5	AHU			XPM09090	SA Bus	1	4	UI IN-5		IN5, ICOM5								
	UI IN-6	AHU			XPM09090	SA Bus	1	4	UI IN-6		IN6, ICOM6								
	UI IN-7	AHU			XPM09090	SA Bus	1	4	UI IN-7										
	BI IN-1	AHU	RLF-S	Relief Fan Status	XPM09090	SA Bus	1	4	BI IN-1		IN1, ICOM1	2/22	OUT, COM	Current Relay	Motor Lead	Motor Lead	See wiring detail	Motor Status (Contact)	F307
	BI IN-2	AHU	PHP-S	Preheat Pump Status	XPM09090	SA Bus	1	4	BI IN-2		IN2, ICOM2					2/22	See wiring detail	Dry Contact	F301
	BO OUT-1	AHU	RLF-C	Relief Fan Command	XPM09090	SA Bus	1	4	BO OUT-1		OUT1, 24V COM	2/22	COIL-,COIL+	Relay	COM, NO	2/14	See wiring detail	VFD (w/ Safety) (Sw Hi, EXT)	F1042
	BO OUT-2	AHU	PHP-C	Preheat Pump Command	XPM09090	SA Bus	1	4	BO OUT-2		OUT2, 24V COM	2/22	COIL-,COIL+	Relay	COM, NO	2/14	See wiring detail	Motor (Single Phase)	F1030
	BO OUT-3	AHU			XPM09090	SA Bus	1	4	BO OUT-3										
	CO OUT-1	AHU	RA-DPR	Return Air Damper	XPM09090	SA Bus	1	4	CO OUT-1		OUT1, OCOM1,24VAC, COM					2/22 / 2/18	GRY, BLK/BLK, RED	M92xx-GGx-x (Vdc) (Ext Source)	F267
	CO OUT-2	AHU	OA-DPR	Outdoor Air Damper	XPM09090	SA Bus	1	4	CO OUT-2		OUT2, OCOM2,24VAC, COM					2/22 / 2/18	GRY, BLK/BLK, RED	M92xx-GGx-x (Vdc) (Ext Source)	F267
	CO OUT-3	AHU			XPM09090	SA Bus	1	4	CO OUT-3										
	CO OUT-4	AHU			XPM09090	SA Bus	1	4	CO OUT-4										
	AO OUT-1	AHU	RLF-O	Relief Fan Output	XPM09090	SA Bus	1	4	AO OUT-1		OUT1, OCOM1					2/22	See VFD Detail	VFD Speed Control (Vdc)	
	AO OUT-2	AHU			XPM09090	SA Bus	1	4	AO OUT-2										
		AHU			XPM18000														
		AHU			XPM18000	SA Bus	1	5											
	BI IN-1	AHU	LT-A	Low Temperature Alarm	XPM18000	SA Bus	1	5	BI IN-1		IN1, ICOM1					2/22 / '2/22 (Unit Shutdown)	LINE, M1, (LINE,M2)	A70 (NO)	F302
	BI IN-2	AHU	RAPLO-A	Return Air Low Duct Pressure	XPM18000	SA Bus	1	5	BI IN-2		IN2, ICOM2					2/22 / '2/22 (Unit Shutdown)	See Detail	AFS-460 (NC)	F303
	BI IN-3	AHU	DAPHI-A	Discharge Air High Duct Pressure	XPM18000	SA Bus	1	5	BI IN-3		IN3, ICOM3					2/22 / '2/22 (Unit Shutdown)	See Detail	AFS-460 (NC)	F303
	BI IN-4	AHU	DA-SD	Discharge Air Smoke Detector	XPM18000	SA Bus	1	5	BI IN-4		IN4, ICOM4					2/22	See wiring detail	Dry Contact	F301
	BI IN-5	AHU	RA-SD	Return Air Smoke Detector	XPM18000	SA Bus	1	5	BI IN-5		IN5, ICOM5					2/22	See wiring detail	Dry Contact	F301
	BI IN-6	AHU	SF1ISOD-S	SF-1 Isolation Damper Status	XPM18000	SA Bus	1	5	BI IN-6		IN6, ICOM6					2/22	See wiring detail	Dry Contact	F301
	BI IN-7	AHU	SF2ISOD-S	SF-2 Isolation Damper Status	XPM18000	SA Bus	1	5	BI IN-7		IN7, ICOM7					2/22	See wiring detail	Dry Contact	F301
	BI IN-8	AHU	SWG-A	Sewage Ejector Pump Alarm	XPM18000	SA Bus	1	5	BI IN-8		IN8, ICOM8					2/22	See wiring detail	Dry Contact	F301
	BI IN-9	AHU			XPM18000	SA Bus	1	5	BI IN-9										
	BI IN-10	AHU			XPM18000	SA Bus	1	5	BI IN-10										
	BI IN-11	AHU			XPM18000	SA Bus	1	5	BI IN-11										
	BI IN-12	AHU			XPM18000	SA Bus	1	5	BI IN-12										
	BI IN-13	AHU			XPM18000	SA Bus	1	5	BI IN-13										
	BI IN-14	AHU			XPM18000	SA Bus	1	5	BI IN-14										
	BI IN-15	AHU			XPM18000	SA Bus	1	5	BI IN-15										
	BI IN-16	AHU			XPM18000	SA Bus	1	5	BI IN-16										
	BI IN-17	AHU			XPM18000	SA Bus	1	5	BI IN-17										
	BI IN-18	AHU			XPM18000	SA Bus	1	5	BI IN-18										

Drawing Title

SL AHU-0E - Point Schedule

Project Title

IU Indy SL AHU-0E
IU#20250575

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

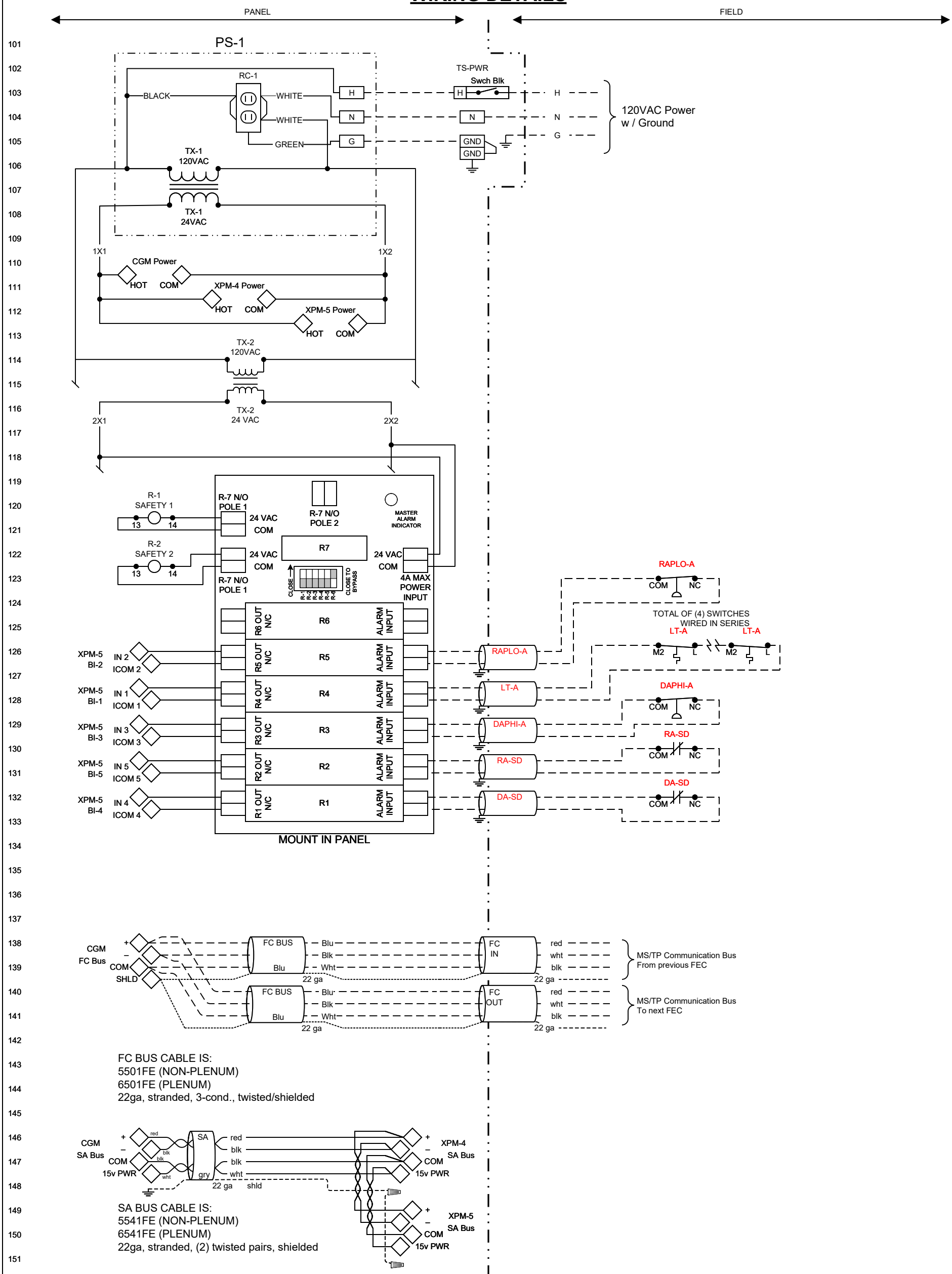
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/23/2026	BY DATE

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER
6N200479

DRAWING NUMBER
1.5

WIRING DETAILS



DRAWING NUMBER **1.6**

CONTRACT NUMBER **6N20479**

APPROVED BY

DATE

DRAWING TITLE
SL AHU-0E - Wiring Details 1

NO.	REVISION-LOCATION	ECN	DATE	BY

FILENAME	REVISION DATE/TIME	SLW	SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DRAWN BY	DRAWN DATE
1.6 SL AHU-0E - WIRING DETAILS 1.VSDX	01/28/26 3:39 PM		JG	JB	DG	DRG	1/23/2026

PROJECT NAME
IU Indy SL AHU-0E
IU#20250575

Johnson Controls

BRANCH INFORMATION
Johnson Controls
5920 Castleway Drive Suite #130,
Indianapolis, Indiana 46250
Phone: 3176387611

Wiring Notes

nn — Terminal in DDC controller.
nn indicates terminal number.

nn — Shielded cable.
Terminate & ground shield within 2 inches of entry into enclosure. Continue shield to last device and tape back.
nn indicates cable number (labeled at both ends of cable).

nn — Cable-no shield.
nn indicates cable number (labeled at both ends of cable).

—nnn— Indicates field-installed wiring.
nnn indicates wire number (labeled at both ends of wire).

—nnn— Indicates factory wiring.
nnn indicates wire number (labeled at both ends of wire).

nnn — Terminal in JCI panel.
nnn indicates terminal number.

WIRING DIAGRAM

PANEL | FIELD

2X1 — 24VAC From TX-2 — 2X2

CGM CO-1 OUT 1 / OCOM 1 → SF-O1

CGM BO-1 OUT 1 / OCOM 1 [JUMPER] [EXT -] → SF-C1

R-1 SAFETY1 9 5 → SDR-1

XPM-5 BI-6 IN6 / ICOM6 → SF1ISOD-S

CGM BI-1 IN 1 / ICOM 1 → SF-S1

ISOD-S1

XPM-4 UI-1 +15V / IN 1 / ICOM 1 → SF-VP1

XPM-4 UI-2 +15V / IN 2 / ICOM 2 → SF-VP2

CGM CO-2 OUT 2 / OCOM 2 → SF-O2

CGM BO-2 OUT 2 / OCOM 2 [JUMPER] [EXT -] → SF-C2

R-2 SAFETY2 12 8 → SDR-2

XPM-5 BI-7 IN 7 / ICOM 7 → SF2ISOD-S

XPM-4 BI-2 IN2 / ICOM2 → SF-S2

ISOD-S2

2X1 — 2X2

SF-C1: wht/blu, wht/yel; blu, yel, org

SDR-1: wht/blu, wht/yel; blu, yel, org

SF1ISOD-S: blu, yel, org; wht/blu, wht/yel

ISOD-S1: Com 1, CW 2, n/a 3; S1 10°: NC 21, 22; NO 23, 24; NO 24, 25; NC 25, 26; S2 80°

SF-VP1: + / −

SF-VP2: + / −

SF-C2: wht/blu, wht/yel; blu, yel, org

SDR-2: wht/blu, wht/yel; blu, yel, org

SF2ISOD-S: blu, yel, org; wht/blu, wht/yel

ISOD-S2: Com 1, CW 2, n/a 3; S1 10°: NC 21, 22; NO 23, 24; NO 24, 25; NC 25, 26; S2 80°

SUPPLY FAN 1

X1 I/O Control Board

1	SCR Connect Shield
2	Analog Input 1
3	Analog Common 1
4	10VDC Ref for AI-1
5	Analog Input 2
6	Analog Common 2

X2 Elec Byps Ctrl Board

1	+24VDC
2	+24VDC
3	Digital Input Common
4	GND
5	Digital Input-1 Start / Stop
6	Digital Input-2 Run Permissive
7	Digital Input-3 Start Interlock 1
8	Digital Input-4 Interlock 2
9	Digital Input-5
10	Digital Input-6 Smoke Control
11 / 12 / 13	RO1 (Bypass Not Fault)
14 / 15 / 16	RO2 (System Run)
17 / 18 / 19	RO3 (System Started)
20 / 21 / 22	RO4 (Bypass Selected)
23 / 24 / 25	RO5 (Bypass Auto)

ABB ACH580-US with E-Bypass – Run Permissive

VFD PROVIDED BY OTHERS

ACTUAL VFD TERMINATIONS TO BE FIELD DETERMINED

SUPPLY FAN 2

X1 I/O Control Board

1	SCR Connect Shield
2	Analog Input 1
3	Analog Common 1
4	10VDC Ref for AI-1
5	Analog Input 2
6	Analog Common 2

X2 Elec Byps Ctrl Board

1	+24VDC
2	+24VDC
3	Digital Input Common
4	GND
5	Digital Input-1 Start / Stop
6	Digital Input-2 Run Permissive
7	Digital Input-3 Start Interlock 1
8	Digital Input-4 Interlock 2
9	Digital Input-5
10	Digital Input-6 Smoke Control
11 / 12 / 13	RO1 (Bypass Not Fault)
14 / 15 / 16	RO2 (System Run)
17 / 18 / 19	RO3 (System Started)
20 / 21 / 22	RO4 (Bypass Selected)
23 / 24 / 25	RO5 (Bypass Auto)

ABB ACH580-US with E-Bypass – Run Permissive

VFD PROVIDED BY OTHERS

ACTUAL VFD TERMINATIONS TO BE FIELD DETERMINED

DRAWING NUMBER 1.7

CONTRACT NUMBER 6N20479

DRAWING TITLE
SL AHU-0E - Wiring Details 2

NO.	REVISION-LOCATION	ECN	DATE	BY

FILENAME	REVISION DATE/TIME	SLW	SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DRAWN BY	DATE
1.7 SL AHU-0E - WIRING DETAILS 2.VSDX	01/28/26 3:39 PM	0000040	JG	JB	DG	DRG	1/23/2026

PROJECT NAME
IU Indy SL AHU-0E
IU#20250575

Johnson Controls

BRANCH INFORMATION
Johnson Controls
5920 Castleway Drive Suite #130,
Indianapolis, Indiana 46250
Phone: 3176387611

Wiring Notes

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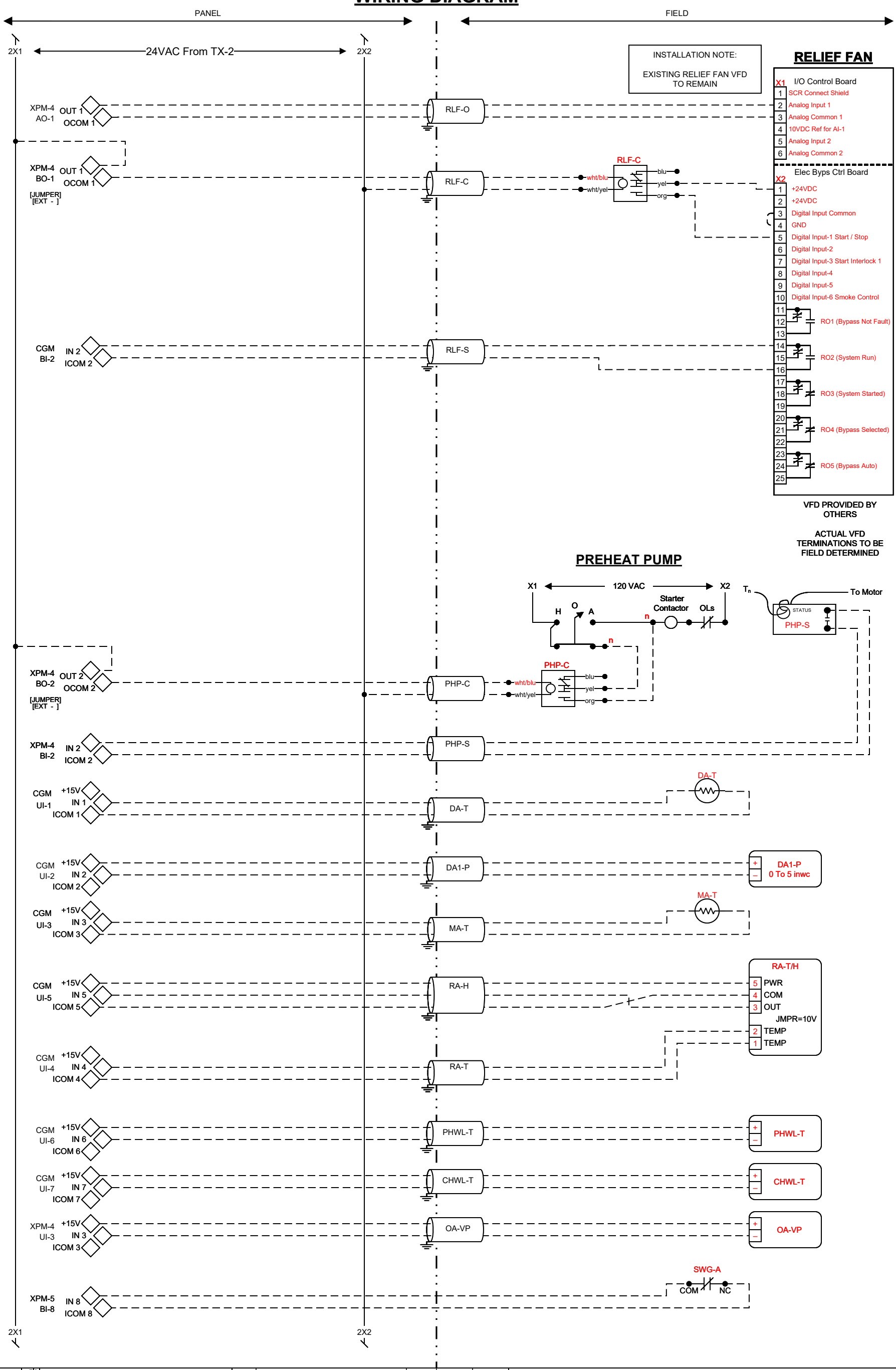
nn indicates cable number (labeled at both ends of cable).

—nnn— Indicates field-installed wiring.
nnn indicates wire number (labeled at both ends of wire).

—nnn— Indicates factory wiring.
nnn indicates wire number (labeled at both ends of wire).

nnn — Terminal in JCI panel.
nnn indicates terminal number.

WIRING DIAGRAM



DRAWING NUMBER 1.8

CONTRACT NUMBER 6N200479

APPROVED BY

DATE

DRAWING TITLE
SL AHU-0E - Wiring Details 3

NO.	REVISION-LOCATION	ECN	DATE	BY

FILENAME	REVISION DATE/TIME	SLW	SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DRAWN BY	DRAWN DATE
1.8 SL AHU-0E - WIRING DETAILS 3.VSDX	01/28/26 3:39 PM	0000040	JG	JB	DG	DRG	1/23/2026

PROJECT NAME
IU Indy SL AHU-0E
IU#20250575

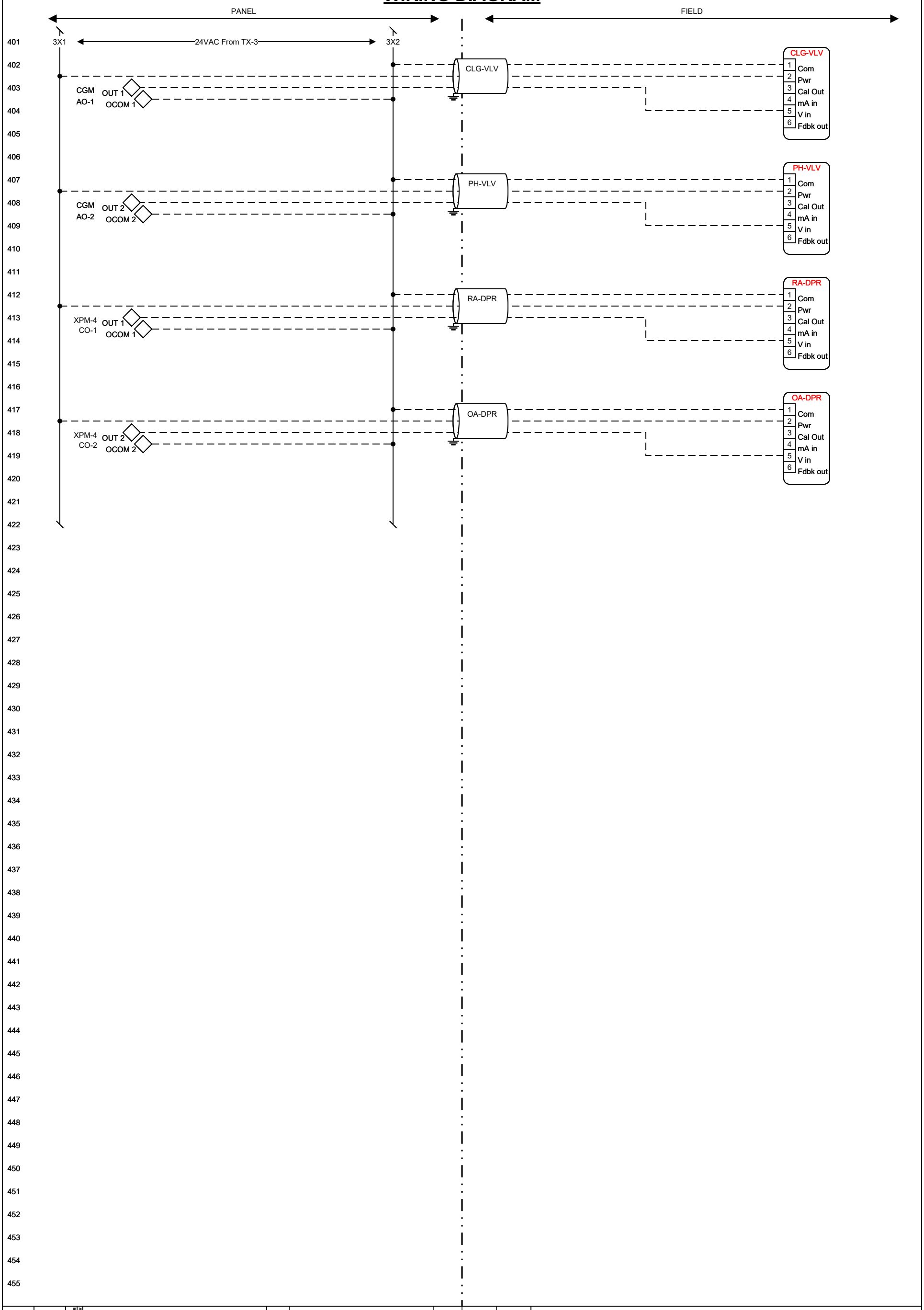
Johnson Controls

BRANCH INFORMATION
Johnson Controls
5920 Castleway Drive Suite #130,
Indianapolis, Indiana 46250
Phone: 3176387611

Wiring Notes

- nn — Terminal in DDC controller. nn indicates terminal number.
- nn — Shielded cable. Terminate & ground shield within 2 inches of entry into enclosure. Continue shield to last device and tape back. nn indicates cable number (labeled at both ends of cable).
- nn — Cable-no shield. nn indicates cable number (labeled at both ends of cable).
- nnn — Indicates field-installed wiring. nnn indicates wire number (labeled at both ends of wire).
- nnn — Indicates factory wiring. nnn indicates wire number (labeled at both ends of wire).
- nnn — Terminal in JCI panel. nnn indicates terminal number.

WIRING DIAGRAM



DRAWING NUMBER **1.9**

CONTRACT NUMBER **6N20479**

APPROVED BY / DATE

DRAWING TITLE
SL AHU-0E - Wiring Details 4

NO.	REVISION-LOCATION	ECN	DATE	BY

FILENAME	REVISION DATE/TIME	SLW	SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DRAWN BY	DRAWN DATE
1.9 SL AHU-0E - WIRING DETAILS 4.VSDX	01/28/26 3:39 PM	0000040	JG	JB	DG	DRG	1/23/2026

PROJECT NAME
IU Indy SL AHU-0E
IU#20250575

Johnson Controls

BRANCH INFORMATION
Johnson Controls
5920 Castleway Drive Suite #130,
Indianapolis, Indiana 46250
Phone: 3176387611

Wiring Notes

Terminal in DDC controller.
nn indicates terminal number.

Shielded cable.
Terminate & ground shield within 2 inches of entry into enclosure. Continue shield to last device and tape back.
nn indicates cable number (labeled at both ends of cable).

Cable-no shield.
nn indicates cable number (labeled at both ends of cable).

Indicates field-installed wiring.
nnn indicates wire number (labeled at both ends of wire).

Indicates factory wiring.
nnn indicates wire number (labeled at both ends of wire).

Terminal in JCI panel.
nnn indicates terminal number.

SL AHU-0E - RAC SCHEDULE

Space Information			Network / Equipment Tree Information						Network Information (MSTP and IP)													
Site/Building/Floor (Required)	Room Number (Optional)	Leaf Space (e.g. Room) (Required)	Device Name (Required)	Device FQR Reference (Required)	Device Description (Optional)	Equipment Name (Required)	Served By Equipment Name (Optional)	Controller Part # (Optional)	Engine Name (Required)	Trunk Name (Required)	Controller Host Name (Future)	JCI MAC Address	IP Controller Number	ZIGBEE PAN Offset	Instance # (BACoid)	N2Address	DHCP Enabled	IP Address	Subnet Mask	IP Router	ETH-1 (Optional)	ETH-2 (Optional)
			Attribute ID																			
			Attribute Type																			
IU Indy / IN072 / Basement		Mechanical Room	AHU-0E	AHU-0E	AHU	AHU-0E		M4-CGM09090-0	SL AHU-0E	FC-2		5										

Drawing Title

SL AHU-0E - RAC Schedule

Project Title

IU Indy SL AHU-0E
IU#20250575

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/27/2026	BY DATE

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER

6N200479

DRAWING NUMBER

R.1

SL AHU-0E - VALVE SCHEDULE

Tag					Valve Information															Actuator Information			
Item	System	Designation	Qty	Ref. Dwg.	Code Number	Valve Family	Configuration	Fail Position	Inlet Pipe Size	Valve Size	Medium	Flow (gpm [US])	Design Delta P (psig)	Valve Delta P (psig)	Design Coefficient (Cv)	Valve Coefficient (Cv)	Design Close Off (psig)	Valve Close Off (psig)	Trim Material	Connection	Code Number	Actuator Control	Piping Detail	Comments
1	AHU-0E	PH-VLV	1		VG1241CN+923GGA	Ball Valve	2-Way	Valve Open		1	Water	18.00	5.00	2.37	8.05	11.70	0.00	200.00	Brass	Threaded	VA9203-GGA-2Z	0-10VDC PROP		
2	AHU-0E	CLG-VLV	1		VG12A5KU+94NGGA	Ball Valve	2-Way	Valve Closed		2-1/2	Water	178.61	5.00	2.37	79.88	116.00	0.00	100.00	Stainless Steel	Flanged	M9220-GGA-3	0-10VDC PROP		

Drawing Title

SL AHU-0E - Valve Schedule

Project Title

IU Indy SL AHU-0E
IU#20250575

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/27/2026	BY DATE

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER

6N200479

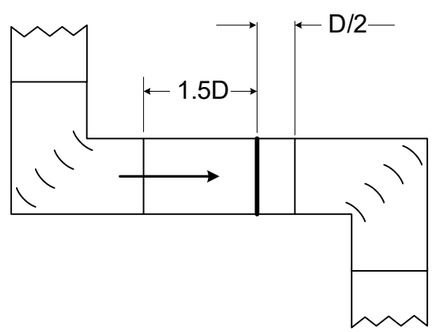
DRAWING NUMBER

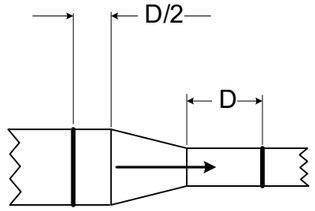
V.1

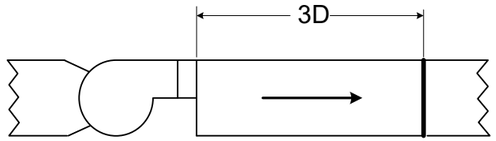
SL AHU-0E - AFMS SCHEDULE

Tag					Airflow Measuring Station Information														
						Duct Size										Pressure Transducer			
Item	System	Designation	Qty	Ref Dwg	Code Number	Diameter / Width	Height	Area (ft^2)	Design Flow Min (cfm)	Design Flow Max (cfm)	Design Velocity Min (ft/m)	Design Velocity Max (ft/m)	K Factor	Number of Probes	DP at Flow Min (in wg)	DP at Flow Max (in wg)	Range	Output	Probe Location Distance (D) See Chart Below (in)	Comments
	AFMS	OA-DPR,-VP	1		APESW-096X028	0 in	0 in	0.00		9000.00	0.00	482.14								

DUCT DIMENSIONS TO BE FIELD VERIFIED

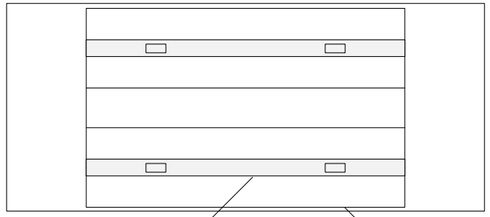


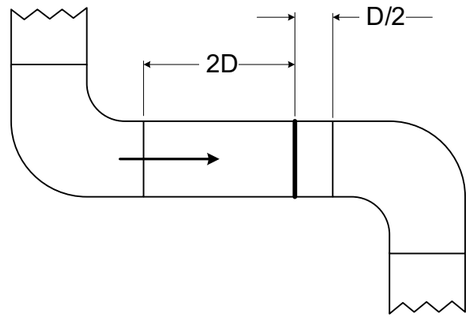


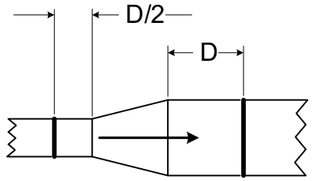


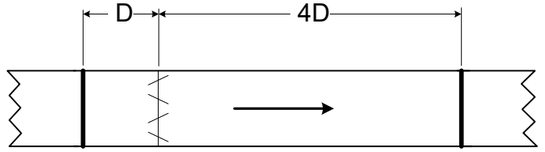
Distance (D) Rectangular = 2(Width * Height) / (Width + Height)

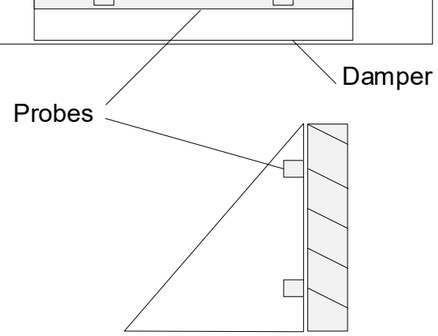
Distance (D) Round = Diameter











Please refer to individual Product Bulletins for mounting instructions and restrictions.

Drawing Title
SL AHU-0E - AFMS Schedule

Project Title
IU Indy SL AHU-0E
IU#20250575

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JG	JB	DG	BY DRG DATE 1/27/2026	BY DATE

Johnson Controls

Branch Information
Johnson Controls
5920 Castleway Drive
Suite #130,
Indianapolis, Indiana
46250
Phone: 3176387611

CONTRACT NUMBER
6N200479

DRAWING NUMBER
AFMS.1

validated
custom solutions

Validated Custom Solutions
905 North Capitol Ave, Ste 200
Indianapolis, IN 46204
317-259-7604

For Approval

PROJECT:
IN072 Engineering, Science, and Technology Building
SL Building
Replace AHU-0 East

CONSULTING ENGINEER: HEAPY

EQUIPMENT SUBMITTAL:

CUSTOM AIR HANDLING UNIT BY: HAAKON

UNITS TAGGED: AHU-0 East

SUBMITTED BY:	VALIDATED CUSTOM SOLUTIONS
SUBMITTED TO:	Indiana University
SUBMITTAL DATE:	January 26, 2026
SPECIFICATION NUMBER:	237323
REVISION:	1

---

1. Submittal Rev 1 incorporates Baldor Critical Cooling Motors; motor data sheets have been added at the end of this submittal

2. Please advise site restrictions for getting ahu “kit” pieces to the mechanical room

Largest piece of the it unit must be able to fit through a 44" wide x 83" high opening. - EL

REVIEWED BY HEAPY

FOR GENERAL CONFORMANCE WITH INFORMATION PRESENTED IN THE CONTRACT DOCUMENTS ONLY.

APPROVED AS SUBMITTED

BY: LIESL M CARTER DATE: 1/30/26

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  - Coil Selections
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  - Fan Curves and Data Sheet
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OVERALL DESCRIPTION OF AIR HANDLING UNITS

ITEM: A. ***Haakon*** **Indoor Custom AHU's** **QTY: 1**

INCLUDING

CASING, FLOOR, BASE, LIGHTING & SERVICES:

- 2.25" casing construction with 2" foam insulation; R Value: 13
- 16 Ga. exterior steel liner (for best thermal conductivity performance), 18 Ga. interior aluminum liner except stainless steel liner is provide in the cooling coil section
- Structural C-channel base, primed & painted & continuously welded
- 3" spray foam insulation under entire base with G90 galv. steel liner under insulation
- ALL Access doors are 2.25" thick to match unit casing with 12" round windows, SS door hinges
- 0.1875" polished aluminum safety treadplate floor, continuously welded at all seams (0.25" thick at treads)
- 1.5" high collar at the perimeter of the floor in each section, **continuously welded (no drive screws, bolts or caulk are used for a permanent attachment to the floor)** to the floorplate to form a watertight pan
- Thermal break casing panels
- Wash-down interior liner with overlapping seams to allow for IAQ cleaning (**overlaps floor dam to allow for pressure washing and true wash-down construction)**
- Wash-down drains, welded into the floor plate, and factory piped and capped thru the unit base rail
- (2) LED lights in fan section; one light in every other section, one hour light switch timer
- Field convenience outlet on exterior of unit
- Exterior paint color – Haakon Gray

- **Unit is a "Kit Unit" – Unit will be fully assembled at the factory with pictures, then tagged, taken apart, pallatized, shrink wrapped and shipped on pallets.**

- **5 days, straight time, of Haakon factory authorized supervision of site re-assembly is included**

- **All lights, fan non-fused disconnects, conduit, timer switch, GFCI, airflow display – all ship loose for installation by others**

- **Check, test, and start-up assistance**
- 2 year warranty

FACTORY AND FIELD TESTING:

- Factory fan vibration test - performance to exceed BV-4 criteria
- Field leak test at 1% leakage and +/- 8" static pressure
- Testing blank-off panels ship loose as part of the kit unit to accommodate the field casing leak test

FILTER SECTION:

- (2) Sets of 2" MERV8 pre-filters, front loadin
- (2) Sets of 12" MERV13 intermediate filters Low Pressure Drop V-Bank Filters, front loading
- Magnehelic filter gauge flush mounted in casing; one gauge for each filter bank

PRE-HEAT COIL SECTION:

- Hot water coils with non-ferrous headers, red brass connections, 0.035" tube wall thickness and 0.0075" fin thickness, galvanized steel casing & 0.035" return bends
- Galvanized steel heating coil rack
- Connections extended to unit exterior of casing & sealed at AHU wall

CHILLED WATER COIL SECTION:

- Chilled water coils with non-ferrous headers, red brass connections, 0.035" tube wall thickness and 0.0075" fin thickness, stainless steel casing; 0.035" return bends
- Stainless steel cooling coil rack
- Stainless steel downspouts from intermediate drain pans to main drain pans
- Stainless steel flashing
- Stainless steel IAQ drain pan and stainless steel connection
- ***Coils are individually racked for independent coil pull***
- All coil connections extended to the exterior of the unit

SUPPLY AIR FAN SECTION:

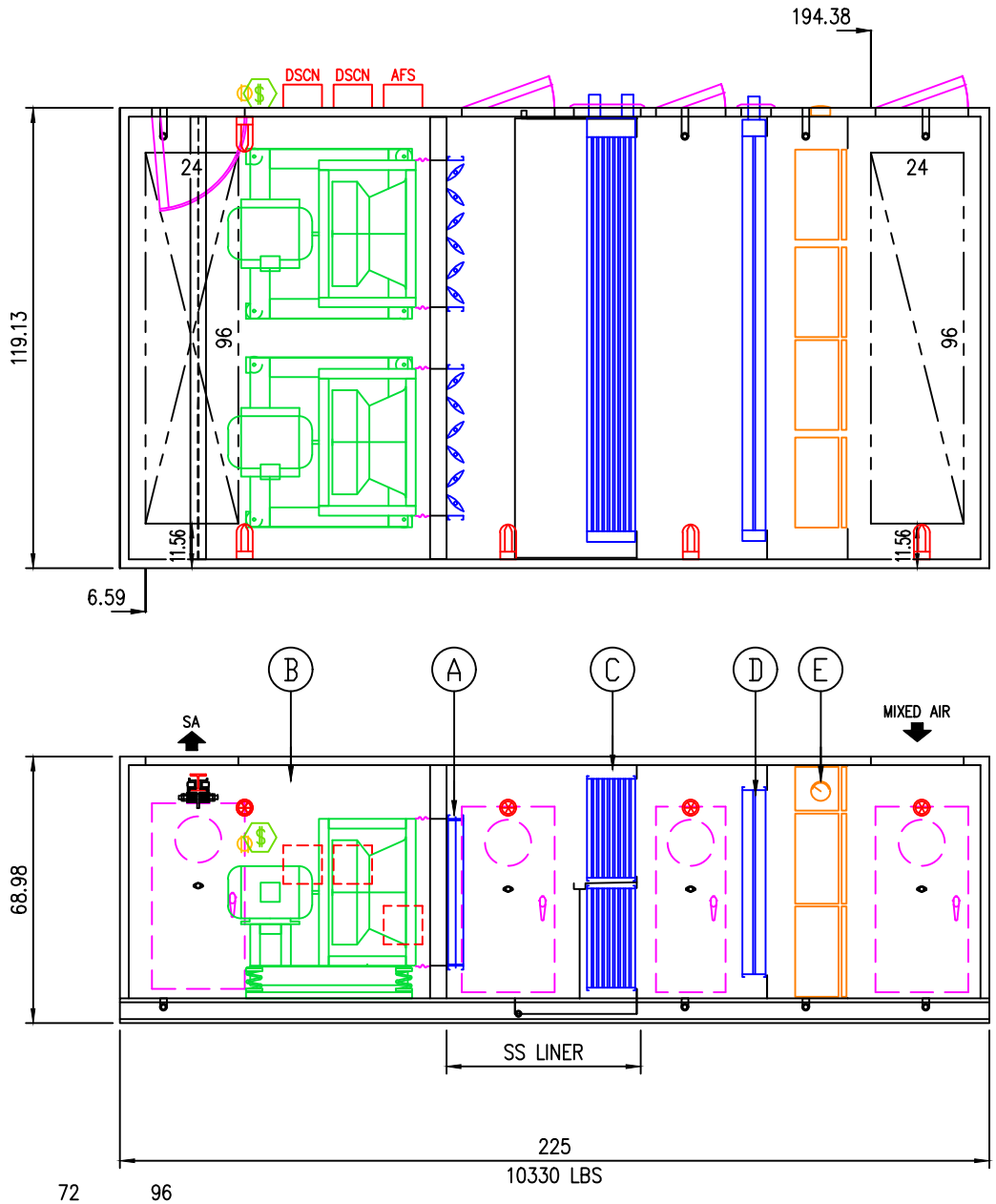
- Direct drive plenum fans with continuously welded blades & fully screened for safety
- AMCA certified and labeled fans for performance and sound
- Baldor Critical Cooling TEFC motors with hybrid ceramic motor bearings, VFD rated
- Motor bearings come with a lifetime parts warranty against failure due to electrical shaft currents
- **External Non-fused Disconnect Switches included and ship loose for field installation**
- Motor removal I beam & extension arm trolley
- Concrete Inertia fan base with 2" spring isolators, earthquake restraints ***(fan supports are welded to the base to ensure NO FLOOR PENETRATIONS)***
- ***Concrete is factory poured, leveled and painted with each fan inertia base***
- Piezometer rings installed on each individual fan with Airflow Display and BACnet output (Display ships loose for field installation)
- Fan Inlet Isolation Dampers – TAMCO 1000 – actuators and end switches are field provided and installed by the TCC contractor.

NOT INCLUDING:

- Equipment storage, unload, reload and delivery
- Assembly
- Installation of filter media – (ships upon request)
- Installation of filter clips
- Factory or field storage
- Shipment to more than 1 location
- Controls & damper actuators
- Spares unless otherwise noted above
- VFD'S
- Liquidated damages
- Rigging during the warranty period
- ETL label since all electrical is field installed by others

NOTES:

- Removal and disposal of factory test blank-off panels is to be by the contractor.
- Contractor to keep units dry and free from condensation on the inside by using dehumidifiers or heat and ventilation during construction.
- Tarp units if they are exposed to weather; if moisture is present under the shrink wrap, remove the shrink wrap and re-tarp.
- Contractor to manually rotate the fans once month while units are on the jobsite
- Contractor to inspect all shipping sections for damage and note any damage on the bill of lading and notify VCS immediately



(A) FAN INLET DAMPER : OPPOSED BLADES
MAKE : T.A. Morrison 1000
SIZE : 2 @ 40 X 40 [SL]

(B) Service : SF
Fan: (SF) 2 @ 27" TwinCity EPFN SW, 66% Width, Arrangement-4
Class: 2 Max RPM: 1981
OP. PT1
A.F.(cfm): 9000
TSP(inWC): 5.50
ESP(inWC): 3.00
RPM: 1750
Fans: 2
Tot CFM: 18000
FEI: 1.35
MOTOR : 15 HP, TEFC Prem-Eff, 460/3/60
RPM : 1750
ISOLATORS : OS DEF : 2 in
(Concrete Inertia Base – Concrete by Haakon)
FEG80 η_{pt}: 78% η_t / η_{pt} : 93%

(C) COOLING COIL
TYPE : AEROFIN(W) 1-1/3 CIR, 8 ROW
SIZES : 2 @ 25.5 X 102
CONN : LEFT PULL : LEFT
DRAIN : LEFT VEL : 499 FPM

(D) PREHEAT COIL
TYPE : AEROFIN (HW), 1 ROW
SIZES : 1 @ 48 X 102
CONN : LEFT PULL : LEFT
VEL : 530 FPM

(E) FILTERS : LIFT-OUT UPSTREAM
VELOCITY : 450 FPM
TYPE : 2" (MERV 8)
12" (MERV 13)
SIZES : 8 @ 24 X 24 4 @ 24 X 12

UNIT MOUNTING
The unit is designed to be mounted on a concrete pad.

Note : Calculated unit weights are shipping weights and do not reflect operating conditions, items which are field installed or ship loose.

Note : Unit shipped as kit for reassembly on site

SDG VER: Dec 23 2025

PROJECT

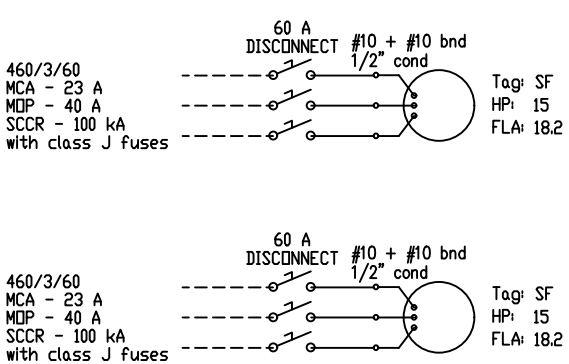
IUPUI AHU-0E

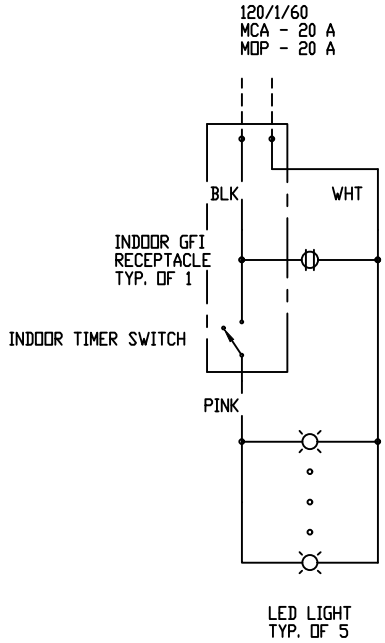
OPENINGS AND DIMENSIONS MAY VARY FROM CONTRACT DOCUMENTS. RETURN OF APPROVED DRAWINGS CONSTITUTES ACCEPTANCE OF THESE VARIANCES.

JOB NO.	8804C	DRAWN BY	HL	DWG NO.	8804CU01SD01	ACCESS SIDE	LEFT	DWG UNITS	IN
TAG	AHU-0E	DATE	JAN 21/26	TYPE	INDOOR	15:06		SCALE	N.T.S.

SALES OFFICE	V.C.S.
SALES ENGINEER	MIKE MARTIN

HAAKON INDUSTRIES.
11851 DYKE ROAD, RICHMOND, B.C. CANADA V7A 4X8





NOTE:

The customer is responsible for obtaining the local inspection authority having jurisdiction to approve the installation.

Because this is a field built-up kit unit, we are unable to put our regular ETL label on this unit. But the motors and each electrical component, wiring, conduit and fitting supplied is certification labeled and sized to meet the code requirements.

MOTOR LOADS ARE PRELIMINARY

——— SUPPLIED BY FACTORY,FIELD INSTALLED BY OTHERS

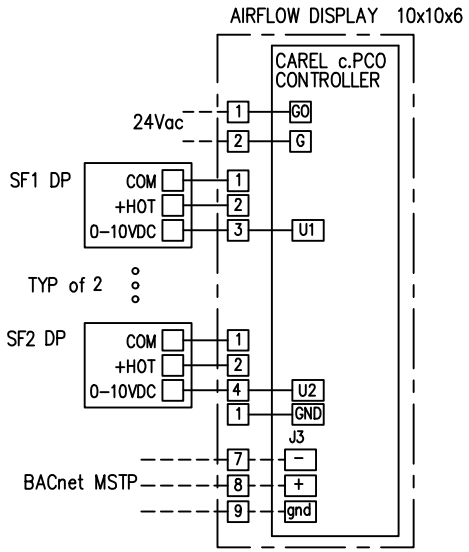
- - - - - WIRING BY OTHERS

Final SCCR will be determined during design.

PROJECT	IUPUI AHU-0E		
JOB NO.	DRAWN BY	DWG NO. 70767U01CS01	CERTIFICATION: NONE
TAG AHU-0E	DATE DEC 18/25	UNIT: INDOOR, NEMA3R INSIDE	CONDUIT: EMT

REVISIONS		
NO	DATE	BY
1		
2		
3		

HAAKON INDUSTRIES.
11851 DYKE ROAD, RICHMOND, B.C. CANADA V7A 4X8



N O T E :

The customer is responsible for obtaining the local inspection authority having jurisdiction to approve the installation.

Because this is a field built-up kit unit, we are unable to put our regular ETL label on this unit. But the motors and each electrical component, wiring, conduit and fitting supplied is certification labeled and sized to meet the code requirements.

MOTOR LOADS ARE PRELIMINARY

——— SUPPLIED BY FACTORY,FIELD INSTALLED BY OTHERS

– – – – – WIRING BY OTHERS

Final SCCR will be determined during design.

PROJECT	IUPUI AHU-0E		
JOB NO.	DRAWN BY	DWG NO. 70767U01CS02	CERTIFICATION: NONE
TAG AHU-0E	DATE DEC 18/25	UNIT: INDOOR, NEMA3R INSIDE	CONDUIT: EMT

REVISIONS		
NO	DATE	BY
1		
2		
3		

HAAKON INDUSTRIES.
11851 DYKE ROAD, RICHMOND, B.C. CANADA V7A 4X8

AEROFIN
Heat Transfer Products

Validated Custom Solutions
905 North Capitol Ave
Indianapolis,IN 46204

Phone: 317-259-7604

Date: 1/5/2026
Job Name: IUI SL 72
System ID: CC-0E

Model No.	Qty. In Face	NTL INCH	Total Weight LBS.
W-7.5AS-25.5 X 102.0-8-1.333	2	102.00	1,298

Coil Type: W
Totals: 2 1,298

Coil Hand: Right
Tube: 0.625 inch X 0.035 inch Copper Seamless , Belled
TF: 17
Fin Material: Aluminum Star
Thickness: 0.0075 IN.
Row: 8
Csg Material: 3/4" Leg with 304 Stainless Casings
Fin: 7.5 / IN
Connection: Red Brass, 2.5" (Center) Threaded, Extended 3 inches
Circuit: 1-1/3
Hdr Material: Standard Copper, Brazed Joints

Misc: - Pneumatic Test - Air Flow: Horizontal

Dwg: CA-W-109-6

Performance V **Inputs =** ☒

Pressure: 29.92 IN HG Elevation: Sea Level

	Airflow:	18,000.0	SCFM		Flow Rate:	178.61	GPM
	System Face Area:	36.1	FT²		Entering Temp:	45.0	°F
	Standard Face Velocity:	498.3	FPM	☒	Leaving Temp:	55.0	°F
☒	Entering Dry Bulb Temp:	83.0	°F		Tube Velocity:	4.6	FPS
☒	Entering Wet Bulb Temp:	69.0	°F		Inside Surface Fouling:	0.0000	HR·FT²·°F/BTU
	Leaving Dry Bulb Temp:	53.6	°F				
☒	Leaving Wet Bulb Temp:	53.0	°F				
	Outside Surface Fouling:	0.0000	HR·FT²·°F/BTU				
	Sensible Heat Load:	572.1	MBH				
	Total Heat Load:	893.0	MBH				

Losses

Air Pressure Drop:	0.61	IN H2O	Fluid Pressure Drop: 15.3 FT H2O

Comments:

Notes & Warnings:

56 Rated in accordance with AHRI Standard 410.
13 Pressure drop shown is based on belled tube ends.

1-800-AEROFINwww.Aerofin.com 4621 Murray Place, Lynchburg, VA 24502 (434) 528-6242(Fax)

AEROFIN
Heat Transfer Products

Validated Custom Solutions
905 North Capitol Ave
Indianapolis,IN 46204

Phone: 317-259-7604

Date: 1/5/2026
Job Name: IUI SL 72
System ID: PHC-0E

Model No.	Qty. In Face	NTL INCH	Total Weight LBS.
HW-5.0AS-48.0 X 102.0-1-0.25	1	102.00	182

Coil Type: HW
Coil Hand: Right
TF: 32
Row: 1
Fin: 5 / IN
Circuit: 1/4

Totals: 1 182

Tube: 0.625 inch X 0.035 inch Copper Seamless, Orificed Tubes , Belled
Fin Material: Aluminum Star **Thickness:** 0.0075 IN.
Csg Material: 3/4" Leg with Galvanized Casings
Connection: Red Brass, 1.5" (Center) Threaded, Extended 5 inches
Hdr Material: Standard Copper, Brazed Joints

Misc: - Pneumatic Test - Air Flow: Horizontal

Dwg: CA-HW-103

Performance V **Inputs =** ☒

Pressure: 29.92 IN HG Elevation: Sea Level

30% Propylene Glycol

	Airflow:	18,000.0	SCFM	☒	Flow Rate:	18.00 GPM
	System Face Area:	34.0	FT²		Entering Temp:	200.0 °F
	Standard Face Velocity:	529.4	FPM		Leaving Temp:	169.8 °F
☒	Entering Dry Bulb Temp:	40.0	°F		Tube Velocity:	2.6 FPS
					Inside Surface Fouling:	0.0000 HR·FT²·°F/BTU
☒	Leaving Dry Bulb Temp:	53.0	°F			
	Outside Surface Fouling:	0.0000	HR·FT²·°F/BTU			
	Sensible Heat Load:	252.6	MBH			
	Total Heat Load:	252.6	MBH			

Losses
Air Pressure Drop: 0.04 IN H2O
Fluid Pressure Drop: 4.5 FT H2O

Comments:

Notes & Warnings:

56 Rated in accordance with AHRI Standard 410.
46 Total surface not used. Check rows calculated. Reduce fluid flow, rows, or fins per inch.
13 Pressure drop shown is based on belled tube ends.

1-800-AEROFINwww.Aerofin.com 4621 Murray Place, Lynchburg, VA 24502 (434) 528-6242(Fax)

70767 IUPUI AHU-0E

Unit # AHU-0E

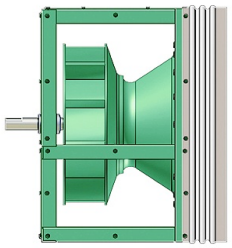
PRESSURE DROP SUMMARY

AHU-0E Supply	
E.S.P	3 (in.wc)
COOLING	0.61
FAN INLET SF	0.05
Final Filter	1
MIXED AIR	0.1
PREHEAT	0.04
Pre Filter	0.6
SA	0.05
T.S.P	5.45

Fan Performance

AHU-0E
SF

FAN	
MODEL	27TCEPFN
FAN CLASS	2
WHEEL DIAMETER	27 in
WIDTH	SWSI
WHEEL WIDTH %	66
FAN BLADE QUANTITY	9
QUANTITY OF FANS	2



OPERATING POINT	OP. PT1	
TOTAL AIRFLOW	18000	ft^3/min
NUMBER OF FANS OPERATING	2	
AIRFLOW PER FAN	9000	ft^3/min
TOTAL STATIC PRESSUE	5.50	in wg
EXTERNAL STATIC PRESSURE	3.00	in wg
ELEVATION	0	ft
TEMPERATURE USED FOR DENSITY	70	°F
AIR DENSITY	0.075	lb/ft^3
AIR MASS FLOW RATE	675	lb/hr
FAN SPEED	1750	rev/min
MAXIMUM SPEED FOR FAN CLASS	1981	rev/min
TIP SPEED	12370	ft/min
MOTOR SPEED AT OPERATING POINT	1750	rev/min
VFD HZ AT DESIGN SPEED	60	hz
FAN POWER CONSUMPTION AT OP POINT	10.7	hp
MOTOR POWER CAPABILITY AT OP POINT	15.0	hp
FAN TORQUE AT OPERATING POINT	32	lbl-ft
MOTOR TORQUE CAPABILITY AT OP POINT	45	lbl-ft
FAN STATIC EFFICIENCY	72.9	%
FAN TOTAL EFFICIENCY	72.9	%
FAN PEAK TOTAL EFFICIENCY	78.2	%
FAN EFFICIENCY GRADE RATING	80.0	%
TOTAL EFF/PEAK TOTAL EFF	93.2	%
BLADE PASSAGE FREQUENCY	262	hz
TEMPERATURE RISE ACROSS FAN	3.0	°F
FAN EFFICIENCY INDEX	1.35	

MOTOR DATA		
MOTOR RATED HP	15	hp
MOTOR FULL LOAD CURRENT	18.1	A
MOTOR EFFICIENCY	92.4	%
MOTOR SHAFT GROUNDING	NO	
MOTOR FRAME SIZE	254T	
ENCLOSURE TYPE	TEFC	
SYNCHRONOUS MOTOR SPEED AT 60HZ	1750	rev/min
VOLTAGE/PHASE/HZ	460/3/60	

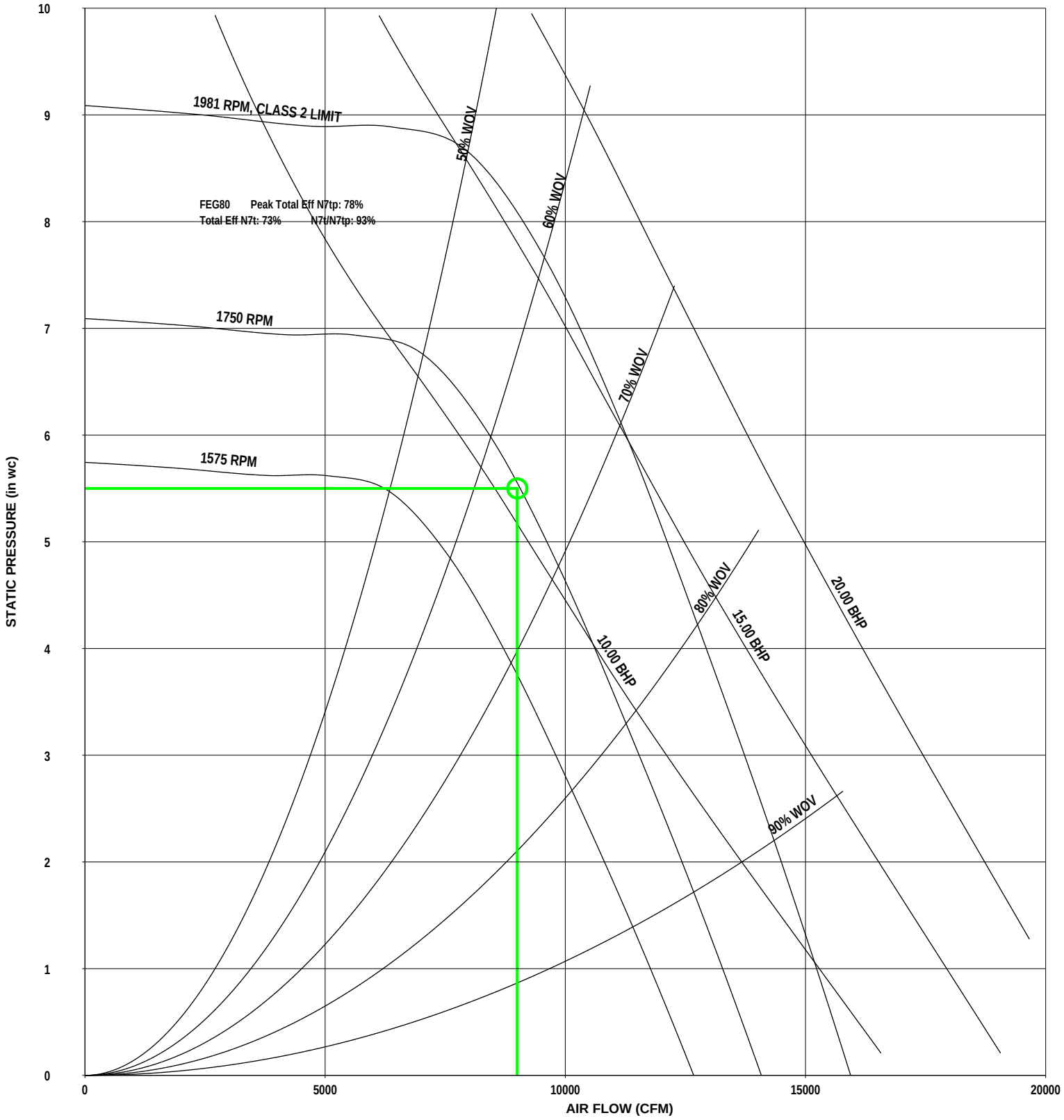
OPERATING POINT	SOUND POWER LEVELS (dB re 10^{-12} Watts)								
	OCTAVE BAND	1	2	3	4	5	6	7	8
OP. PT1	INLET	80	89	99	85	80	74	71	69
	OUTLET	88	92	97	93	88	81	77	72
	INLET								
	OUTLET								
	INLET								
	OUTLET								
	INLET								
	OUTLET								

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	8804C	DWG NO	8804CDT17		
DATE	2026-01-21	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES

AHU-0E
SF

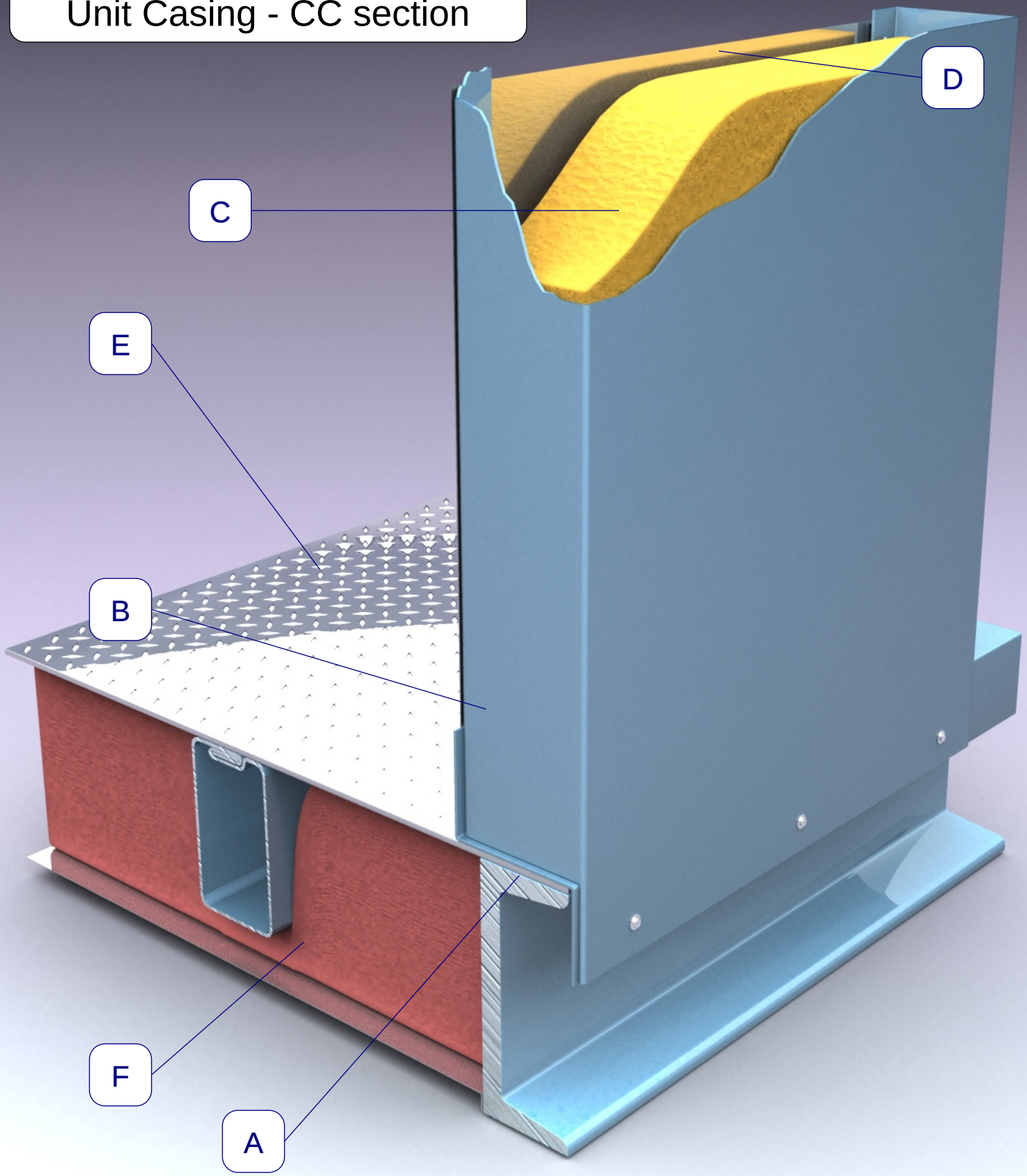


PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	8804C	DWG NO	8804CDT17		
DATE	2026-01-21	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES

Unit Casing - CC section

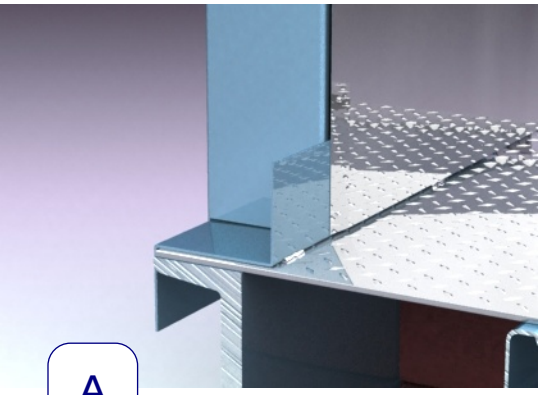


TAG: AHU-0E SS

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT01
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

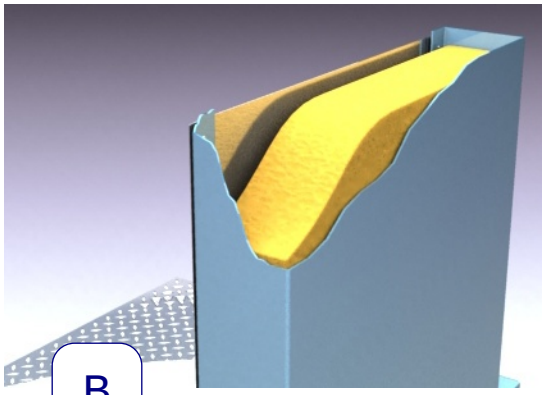
HAAKON INDUSTRIES



A

Z-bar

This 1.5" collar is installed around the perimeter of the unit floor to ensure that the unit is internally watertight.The collar is continuously welded to the unit base.



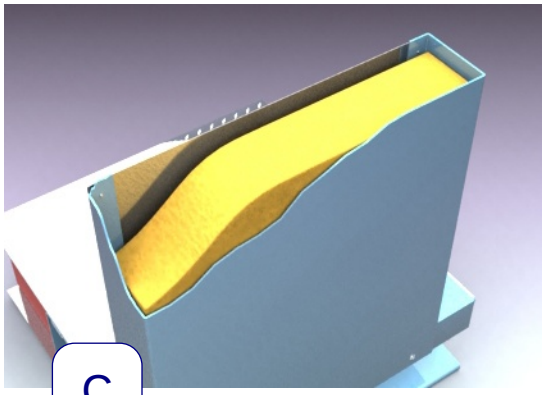
B

Casing

Wall and roof panels are constructed out of 16 ga. satin coat galvanized steel. Wall panels are 2" thick. Wall seams are turned inward to provide a clean flush exterior finish. All panel seams are caulked and sealed during assembly to produce an airtight unit. The permanently joined flanged panel surfaces are sealed with an individual strip of 1/8" x 3/8" tape sealer.

The unit is painted with a 2 part Acrylic Enamel paint:
--> THICKNESS : 1.5 mil
--> COLOUR : STD. HAAKON GRAY

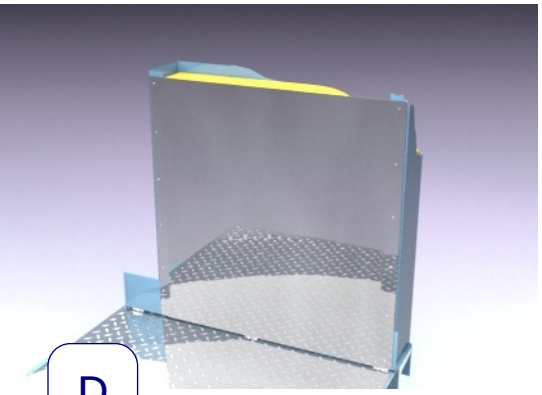
over a 2 part epoxy primer.



C

Insulation

Walls are insulated with 2" thick, 4.0 lbs/cu. ft density rigid fibre insulation .The insulation has a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50.



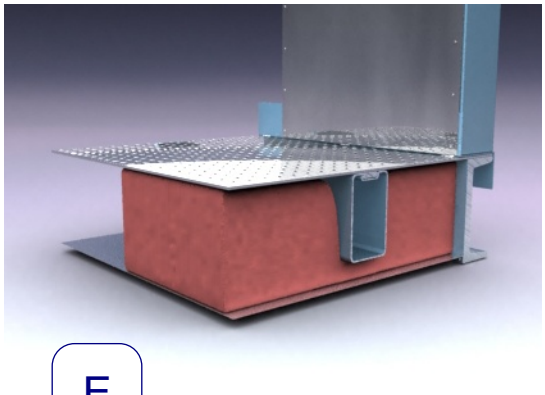
D

Overlapping Liner

A 20 ga. 304 Stainless Steel metal liner is provided to protect the insulation. The Liner is installed over the z-bar and screwed to the panel flanges.

Washdown liner: The liner overlap is sealed with a bead of silicone.

Thermal break: A 1/8" x 2" neoprene tape is installed between the liner and the return flanges of the casing.



E

Floor

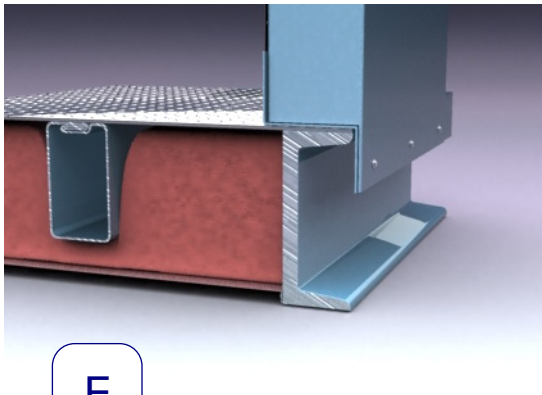
A 0.19" aluminum checkerplate floor is installed on the base. Floor seams are continuously welded.

The base is insulated with 3" thick, SPRAY FOAM.

The floor is standard mill finish.

The base is painted with acrycote paint:
--> THICKNESS : 1.5 mil

over zero induction epoxy primer.



F

Base Construction

The base is constructed from a C6 x 8.2 perimeter channel iron frame with intermediate structural box sections.

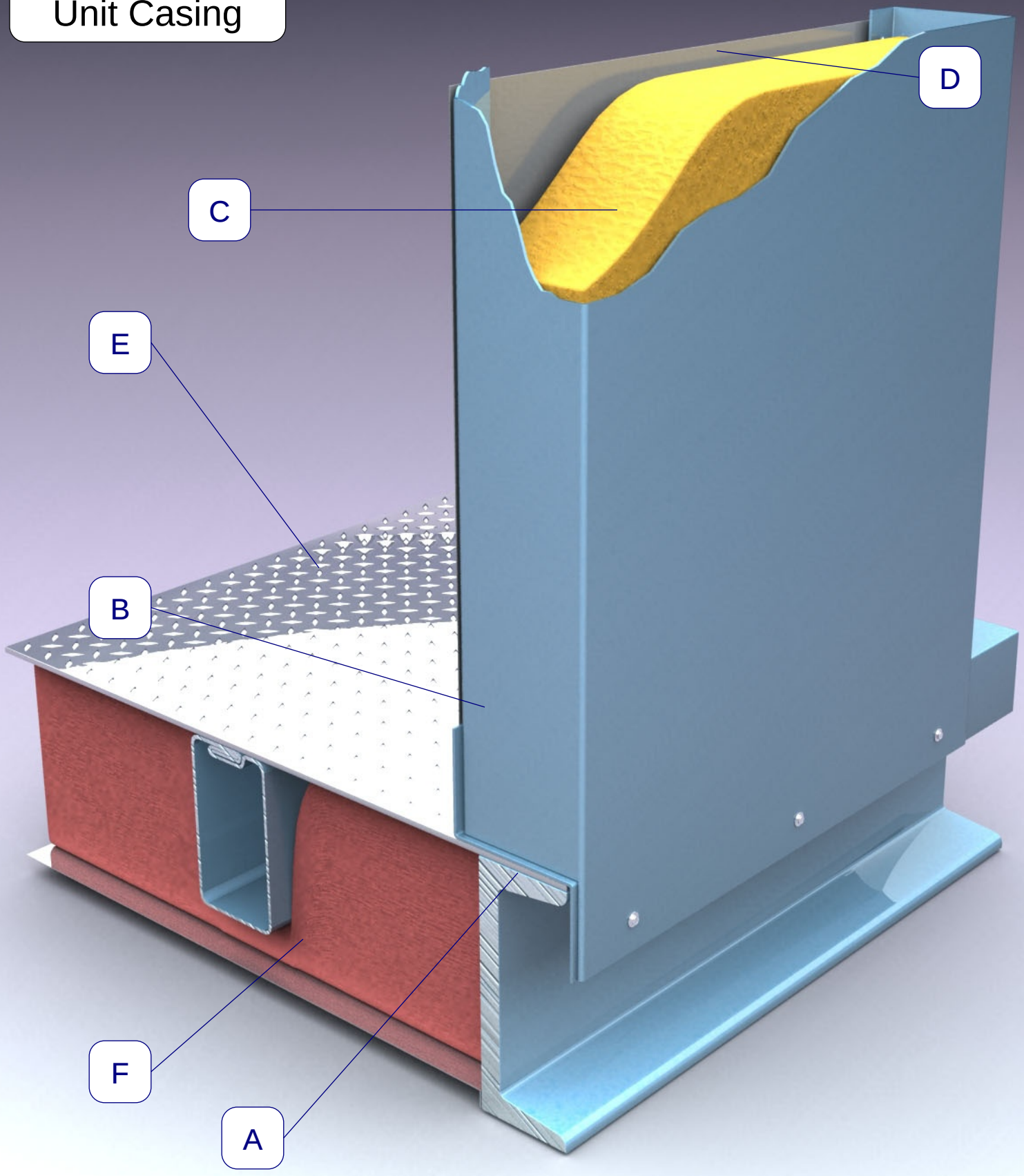
A 22 ga. galvanized steel metal liner is provided to protect the insulation. The base liner is broken and tack welded to the underside of the base.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT02
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

Unit Casing

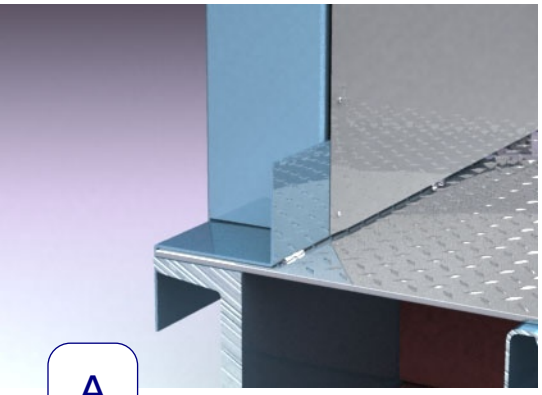


TAG: AHU-0E

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT03
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

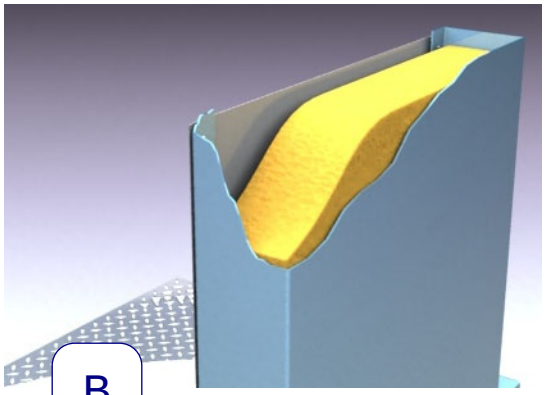
HAAKON INDUSTRIES



A

Z-bar

This 1.5" collar is installed around the perimeter of the unit floor to ensure that the unit is internally watertight.The collar is continuously welded to the unit base.



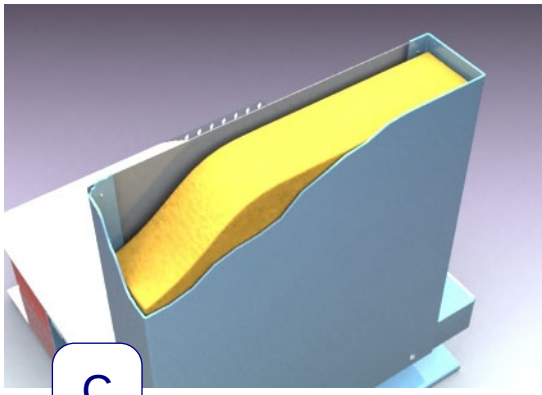
B

Casing

Wall and roof panels are constructed out of 16 ga. satin coat galvanized steel. Wall panels are 2" thick. Wall seams are turned inward to provide a clean flush exterior finish. All panel seams are caulked and sealed during assembly to produce an airtight unit. The permanently joined flanged panel surfaces are sealed with an individual strip of 1/8" x 3/8" tape sealer.

The unit is painted with a 2 part Acrylic Enamel paint:
--> THICKNESS : 1.5 mil
--> COLOUR : STD. HAAKON GRAY

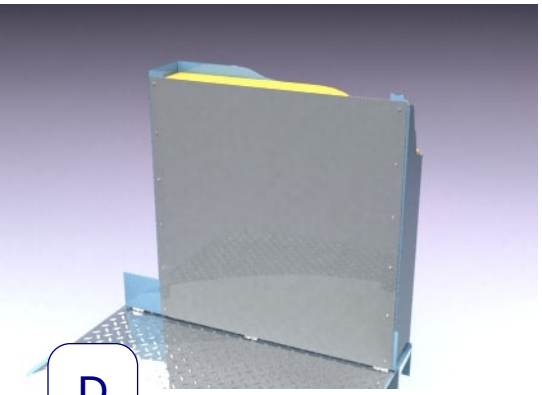
over a 2 part epoxy primer.



C

Insulation

Walls are insulated with 2" thick, 4.0 lbs/cu. ft density rigid fibre insulation .The insulation has a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50.



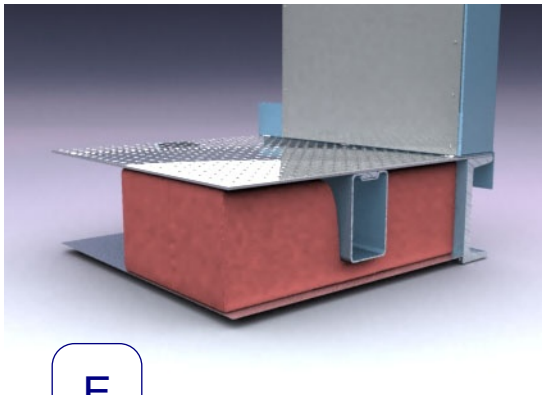
D

Overlapping Liner

A 18 ga. Al - Plastic coated metal liner is provided to protect the insulation. The Liner is installed over the z-bar and screwed to the panel flanges.

Washdown liner: The liner overlap is sealed with a bead of silicone.

Thermal break: A 1/8" x 2" neoprene tape is installed between the liner and the return flanges of the casing.



E

Floor

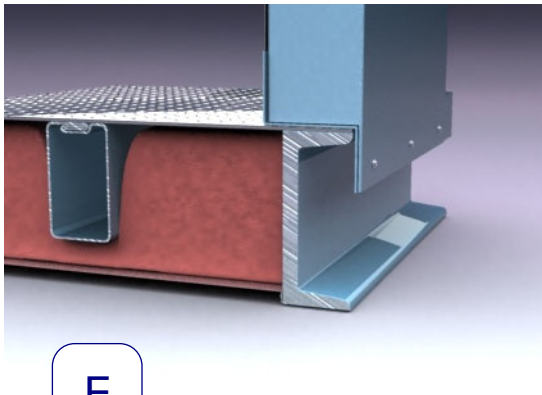
A 0.19" aluminum checkerplate floor is installed on the base. Floor seams are continuously welded.

The base is insulated with 3" thick, SPRAY FOAM.

The floor is standard mill finish.

The base is painted with acrycote paint:
--> THICKNESS : 1.5 mil
--> COLOUR : GRAY

over zero induction epoxy primer.



F

Base Construction

The base is constructed from a C6 x 8.2 perimeter channel iron frame with intermediate structural box sections.

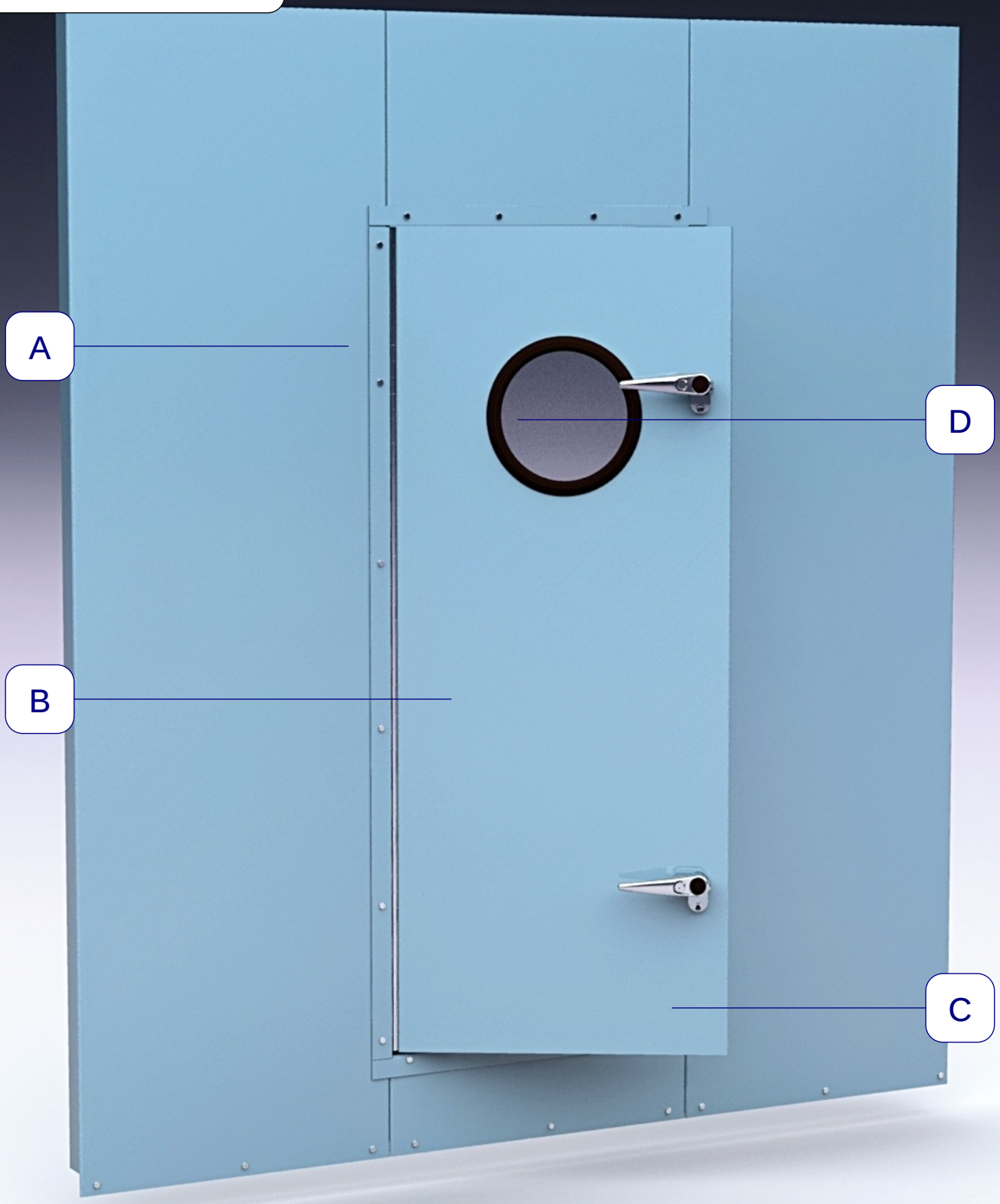
A 22 ga. galvanized steel metal liner is provided to protect the insulation. The base liner is broken and tack welded to the underside of the base.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT04		
DATE	2025-12-18	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES

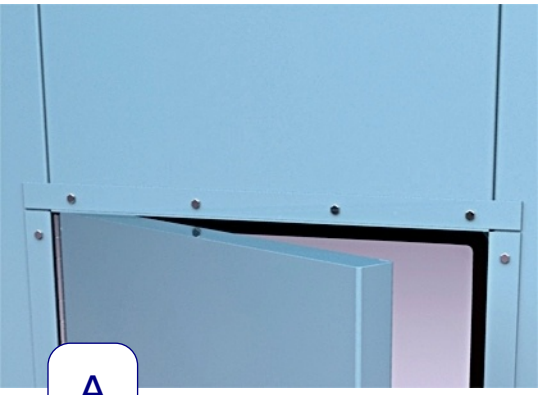
Standard Door



TAG: AHU-0E

PROJECT:	IUPUI AHU-0E						
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT05		
DATE	2025-12-18	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES



A Frame, Hinge & Seal

Door Frame
Door frames are made from 16 ga. satin coat galvanized steel and continuously welded for rigidity.

Door Hinge
Continuous piano hinges are made of ~stainless steel.

Door Seal
Close cell EPDM bulb type seal is used around the door to prevent air leakage.

B Material & Insulation

Door Material
Doors are manufactured from 16 ga. satin coat galvanized steel. Doors are 2" thick.

Insulation
Doors are insulated with 2", 4.0 lbs/cu. ft density rigid fibre insulation . A 18 ga. Al - Plastic coated liner is provided to protect the insulation.

C Handles

Heavy duty cast handles of a non-corrosive alloy of zinc and aluminum are installed on both sides of the door for easy access. (Doors 48" and under in height have only one handle.)

D Viewing Port

A 12" round double glazed tempered glass hermetically sealed window is provided.

E Test Port

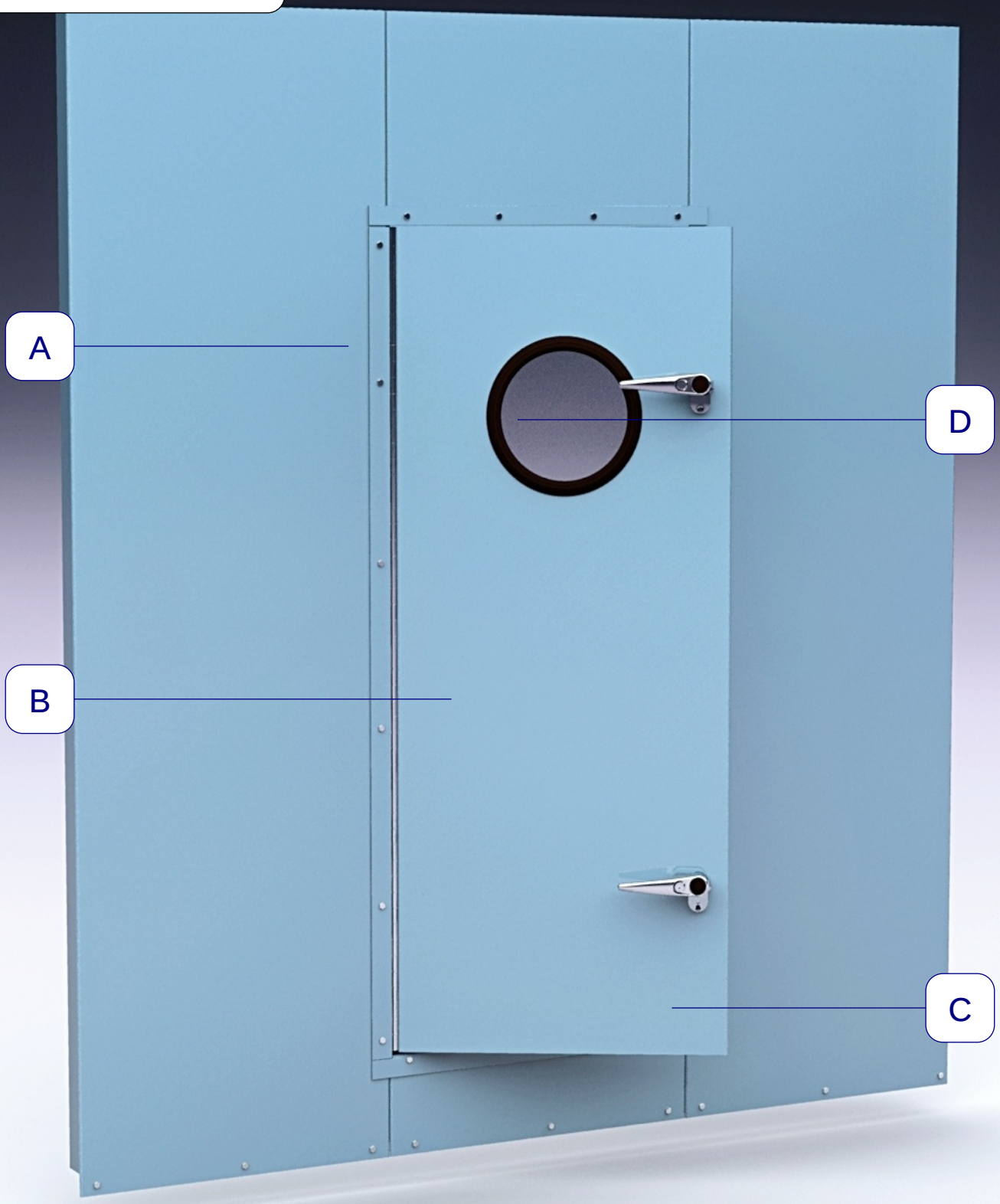
A Durodyne IP test port is located in each door.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT06
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

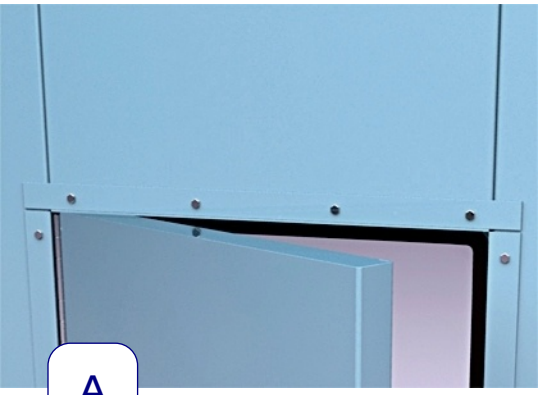
Standard Door



TAG: AHU-0E

PROJECT:	IUPUI AHU-0E					
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT07	
DATE	2025-12-18	UNITS	IMPERIAL	REVISION		

HAAKON INDUSTRIES



A Frame, Hinge & Seal

Door Frame
Door frames are made from 16 ga. satin coat galvanized steel and continuously welded for rigidity.

Door Hinge
Continuous piano hinges are made of ~stainless steel.

Door Seal
Close cell EPDM bulb type seal is used around the door to prevent air leakage.

B Material & Insulation

Door Material
Doors are manufactured from 16 ga. satin coat galvanized steel. Doors are 2" thick.

Insulation
Doors are insulated with 2", 4.0 lbs/cu. ft density rigid fibre insulation . A 20 ga. 304 Stainless Steel liner is provided to protect the insulation.

C Handles

Heavy duty cast handles of a non-corrosive alloy of zinc and aluminum are installed on both sides of the door for easy access. (Doors 48" and under in height have only one handle.)

D Viewing Port

A 12" round double glazed tempered glass hermetically sealed window is provided.

E Test Port

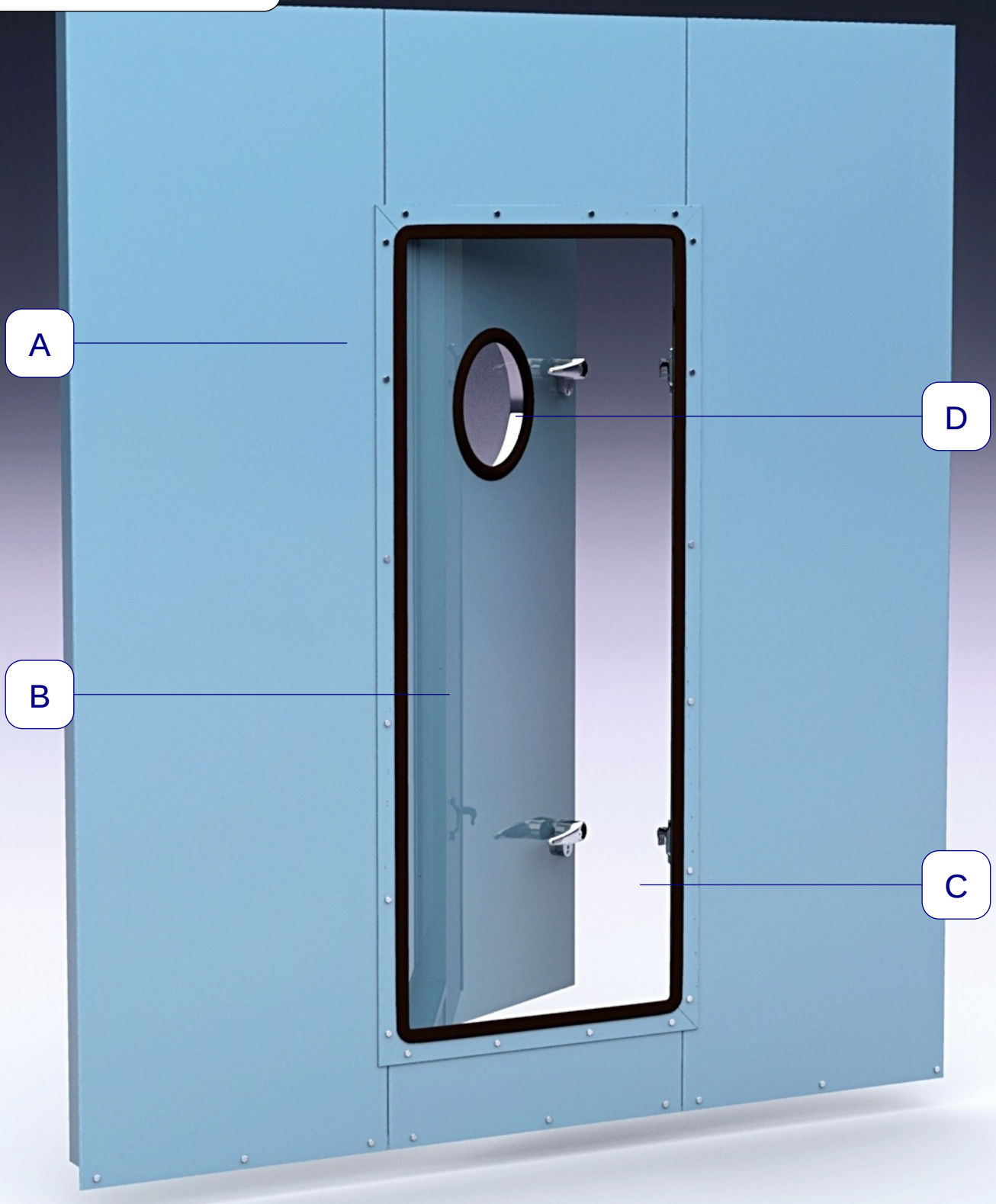
A Durodyne IP test port is located in each door.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT08
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

Pressure Door



TAG: AHU-0E

PROJECT:	IUPUI AHU-0E						
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT09		
DATE	2025-12-18	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES

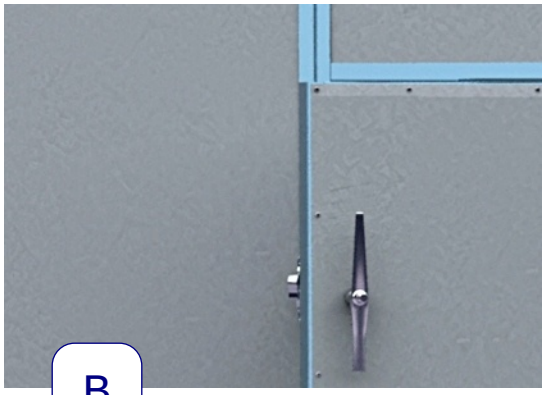
A

Frame, Hinge & Seal

Door Frame
Door frames are made from 12 ga. satin coat galvanized steel and continuously welded for rigidity.

Door Hinge
Continuous piano hinges are made of ~stainless steel.

Door Seal
Close cell EPDM bulb type seal is used around the door to prevent air leakage.



B

Material & Insulation

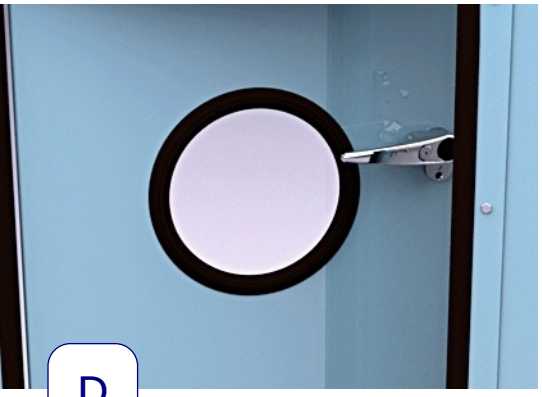
Door Material
Doors are manufactured from 16 ga. satin coat galvanized steel. Doors are 2" thick.

Insulation
Doors are insulated with 2", 4.0 lbs/cu. ft density rigid fibre insulation . A 18 ga. Al - Plastic coated liner is provided to protect the insulation.

C

Handles

Heavy duty cast handles of a non-corrosive alloy of zinc and aluminum are installed on both sides of the door for easy access. (Doors 48" and under in height have only one handle.)



D

Viewing Port

A 12" round double glazed tempered glass hermetically sealed window is provided.

E

Test Port

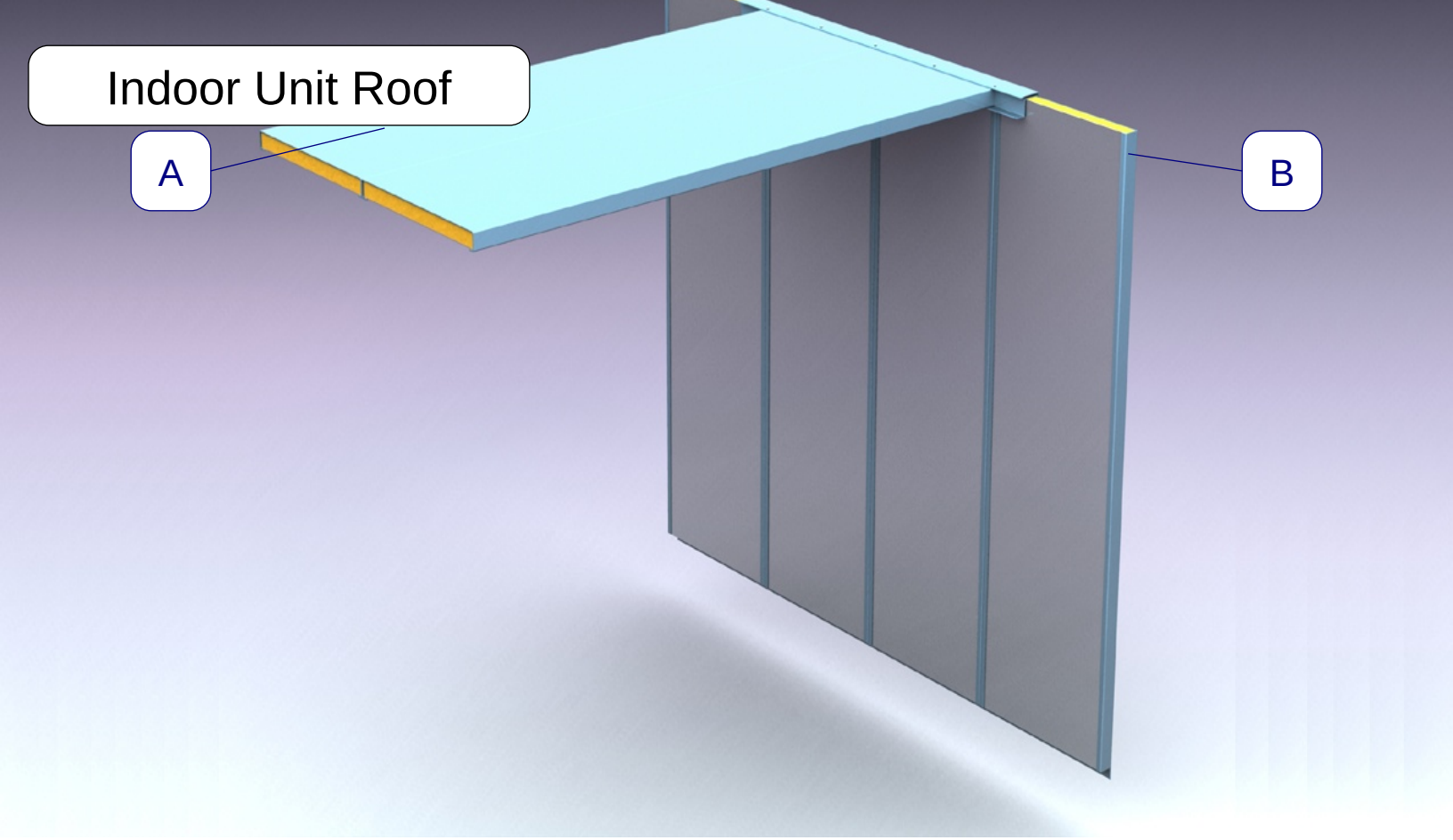
A Durodyne IP test port is located in each door.

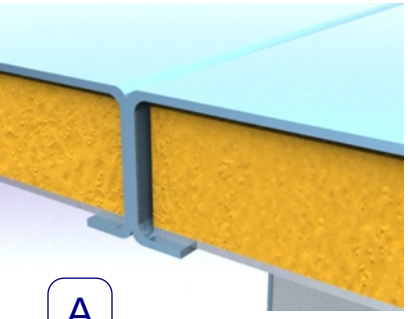
PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT10
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

Indoor Unit Roof

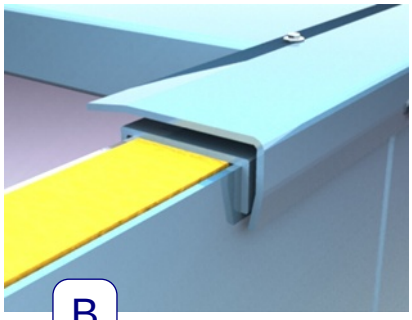




A

Panel

Unit roof is constructed with same material and insulation as casing panels. Roof seams are turned inward to provide a clean flush exterior finish.



B

Trim

A full perimeter 16 ga. wall trim is provided to secure and seal roof to casing. Wall trim is caulked and tek screwed to unit casing and roof to produce an airtight unit.

TAG: AHU-0E

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT11
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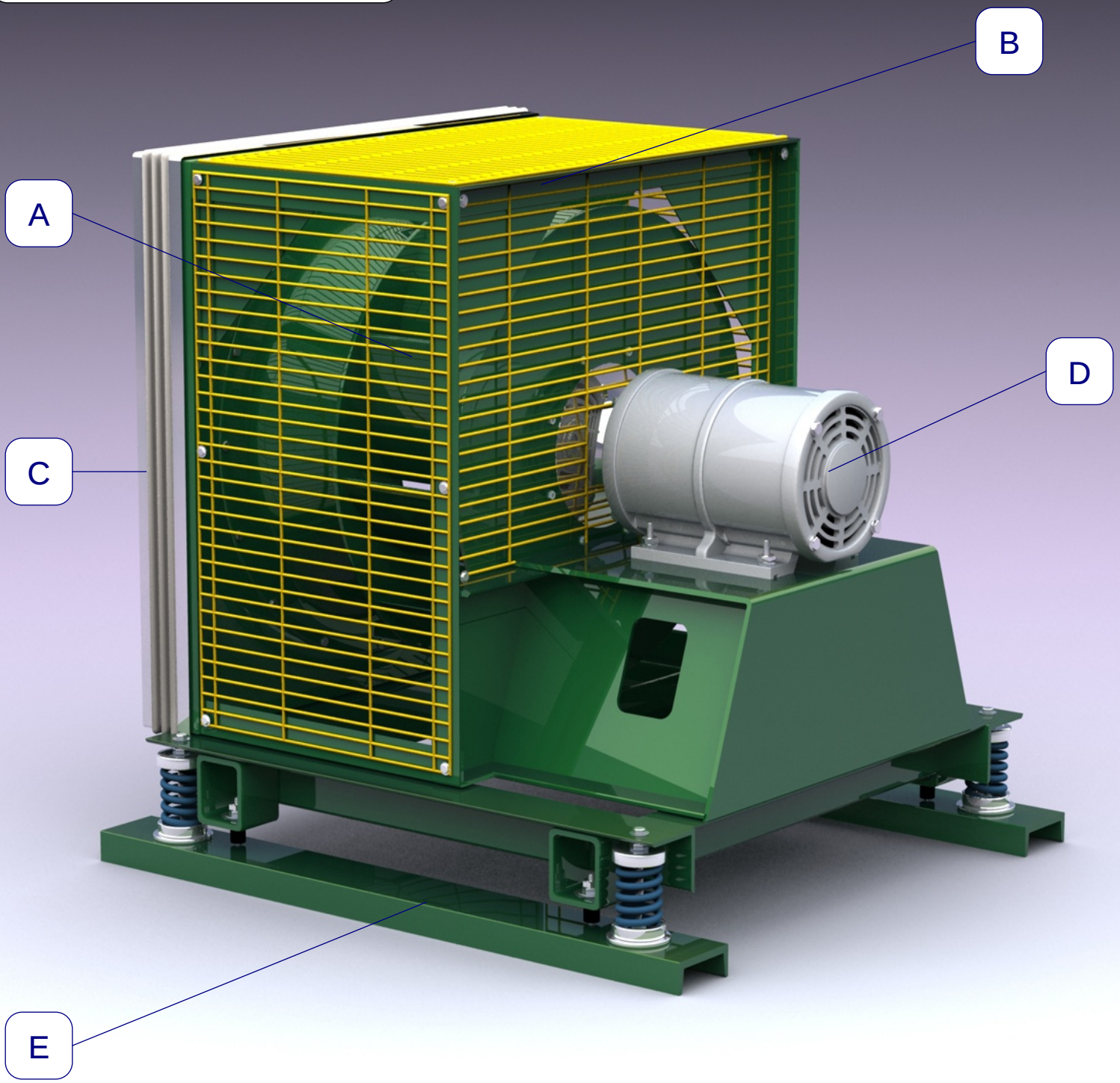
HAAKON INDUSTRIES

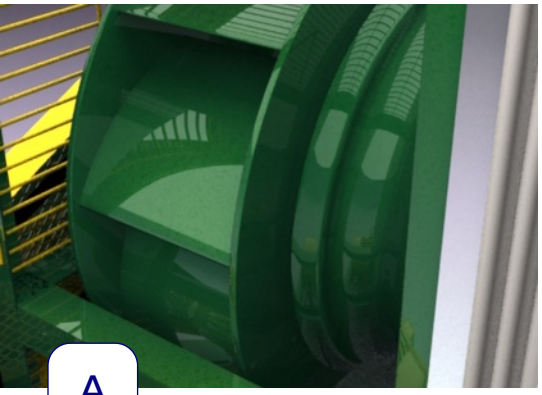
Fan Construction



TAG: AHU-0E SF

PROJECT:	IUPUI AHU-0E				
DRAWN BY	HL	JOB NO.	8804C	DWG NO	8804CDT14
DATE	2026-01-21	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

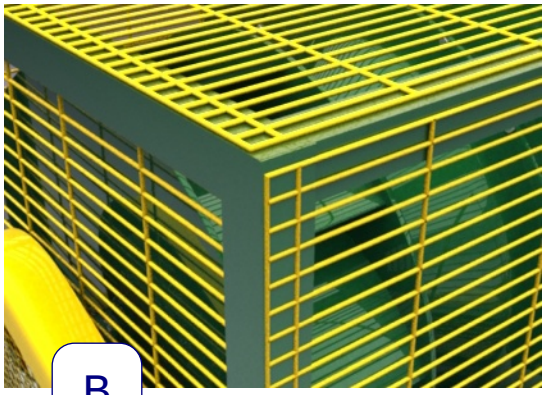


A

Wheel

Wheels are precision spun, flat inlet cone to allow higher efficiencies over the performance range of the fan. Hollow airfoil-shaped blades are made from Aluminum , continuously welded around all edges, and statically and dynamically balanced on precision electronic balancers to a Balance Quality Grad G6.3 per ANSI/AMCA 204 or better.

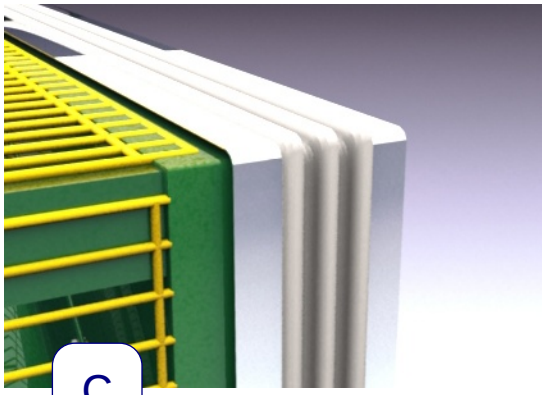
Inlet cone is steel and the entire fan is thoroughly degreased and deburred before application of a rust-preventative primer. Completed assembly is coated with Polyester Powder. Aluminum parts are not painted.



B

Screening

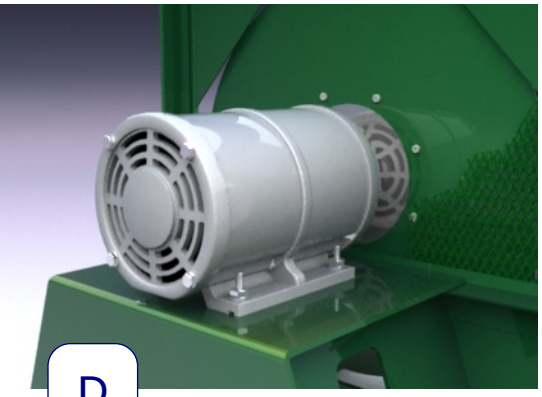
Protective enclosures are made of powder coated mild steel.



C

Flex

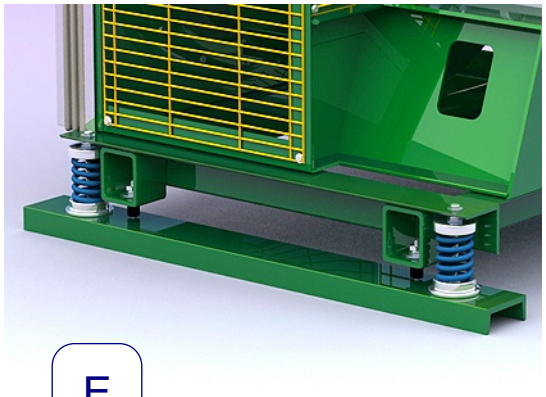
Fan discharges have heavy glass fabric, double-coated with neoprene, connection. Flex connection is resistant to abrasion and damage from flexing and is air-tight, water-tight, and fire retardant. Flex connection is provided with GLV trim.



D

Motor

Motors are mounted on a pedestal. The motors are premium efficiency, Totally Enclosed Fan Cooled industrial grade T frame, as manufactured by BALDOR, suitable for VFD operation. Motors will have an insulation class of F.
Motor Service Factor: 1.15



E

Isobase

Fans and motors are mounted on concrete inertia type isolation bases designed to weigh 1 times the weight of the fan and motor. Concrete is to be factory installed. (See inertia base detail). The base is supported on four open spring isolators.

Fans tested in accordance with AMCA 211 and AMCA 311 test codes for air moving devices and licensed to bear the AMCA certified ratings seal for both sound and air.

TAG: AHU-0E SF

FreeFlo Sensing Ring

The FreeFlo display converts the pressure drop through the fan inlet cone, as measured by the FreeFlo ring, into cfm. The CFM is displayed on the front LCD screen. The display is equipped with BACnet MSTP communication protocol. The display is programmed to output an airflow reading between 10% and 120% of the design airflow. The pressure transducers are 0.5% of full scale of the pressure range.

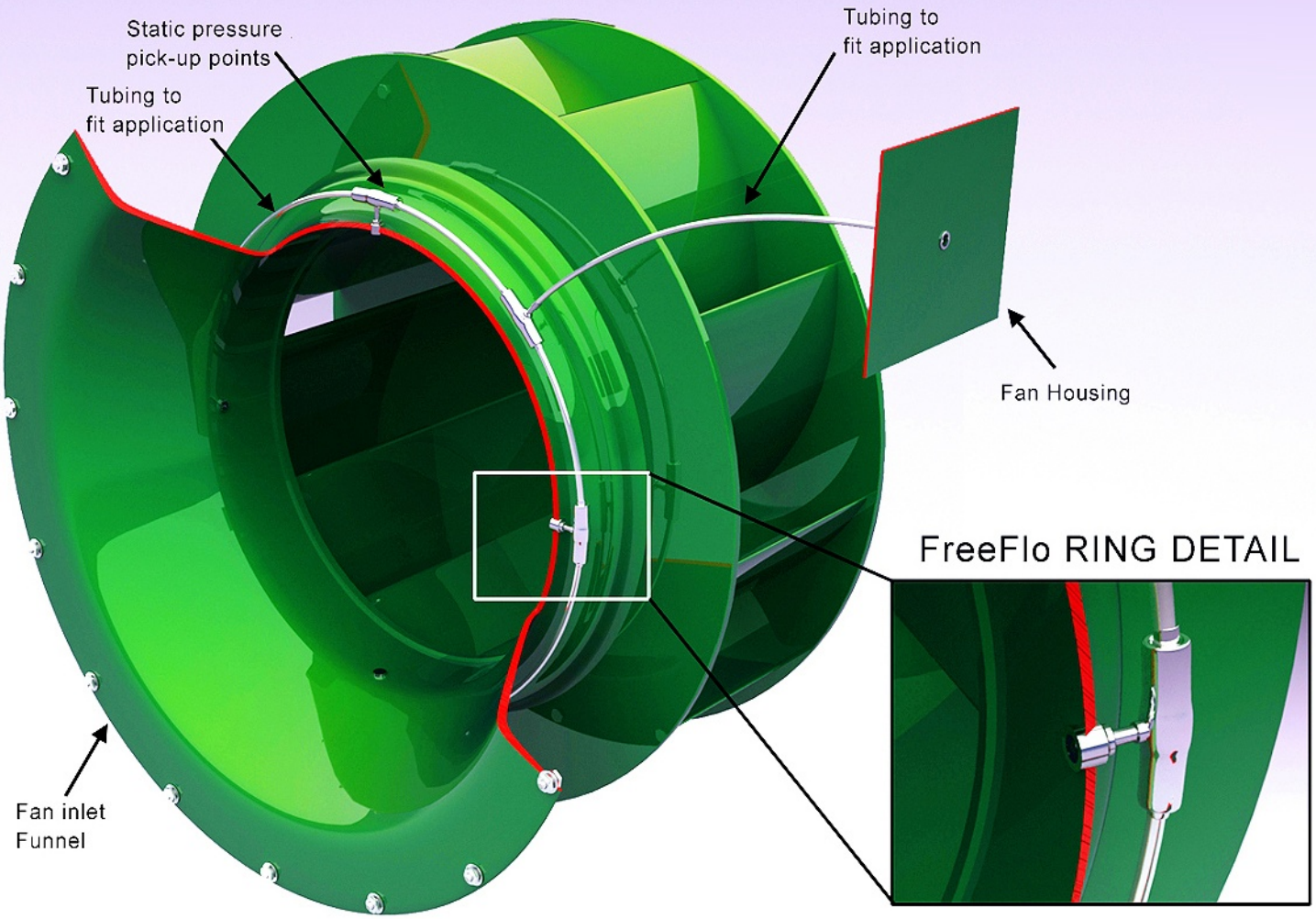
Display is installed in an enclosure, surface mounted on the unit casing.

Each display can simultaneously transmit the unobstructed CFM for individual fans plus total airflow for multiple fans.

Specifications

Supply Voltage : 24VAC
Power required : 40VA
Output Signal : BACnet MSTP

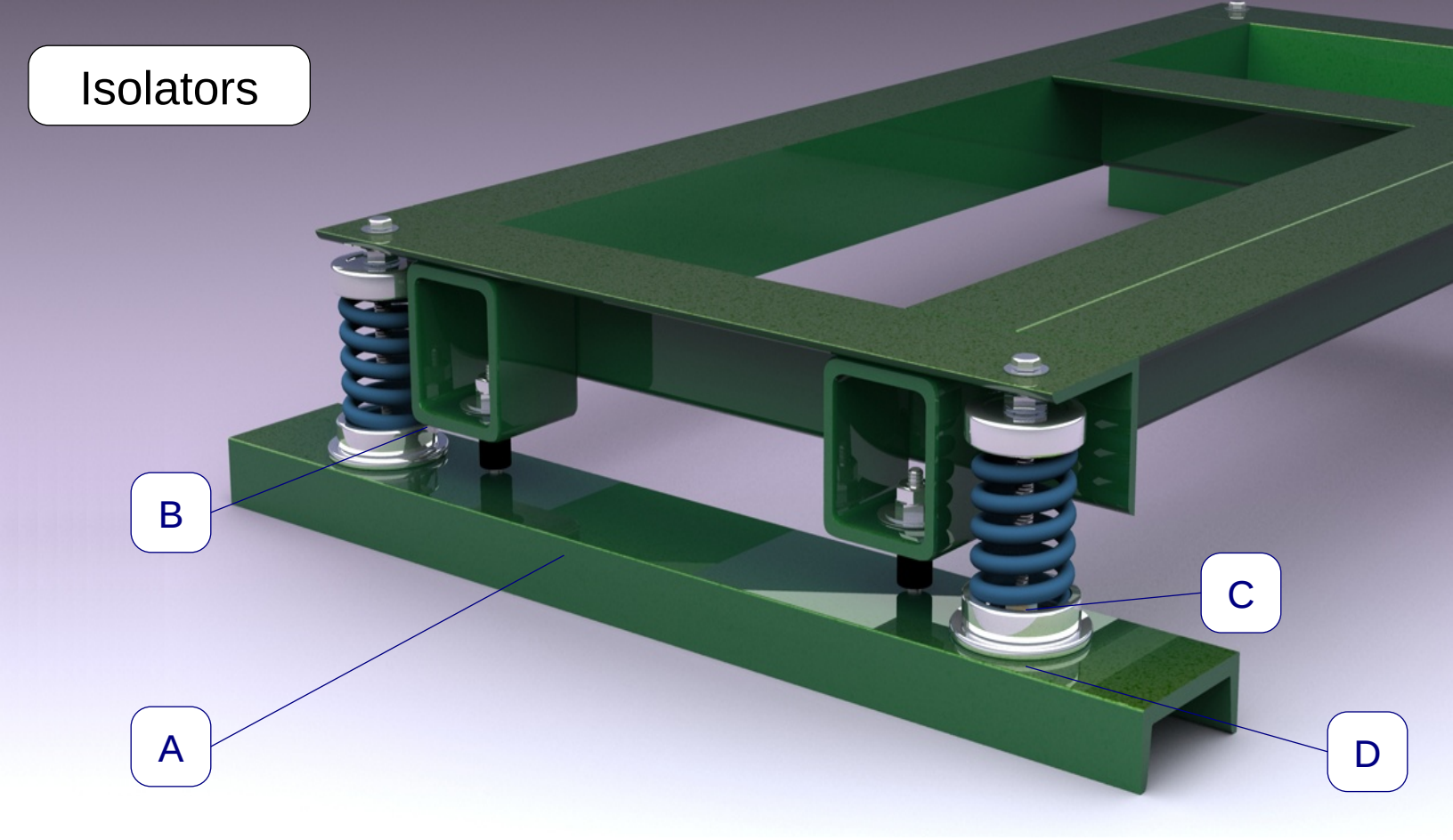
FreeFlo Sensing Ring

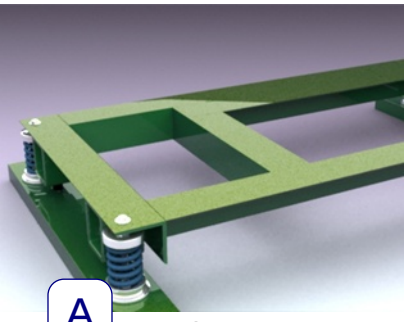


TAG: AHU-0E SF

PROJECT:	IUPUI AHU-0E					
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT19	HAAKON INDUSTRIES
DATE	2025-12-18	UNITS	IMPERIAL	REVISION		

Isolators

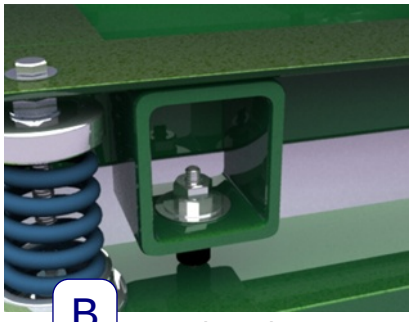




A

Fanbase

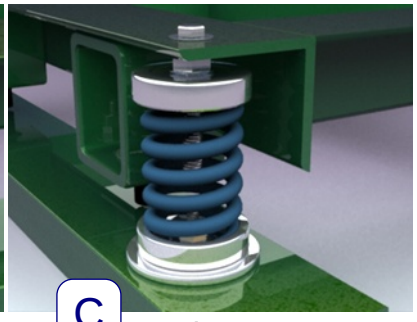
Motors are mounted on industrial grade T frame slide bases. Fans and motor bases are mounted on heavy duty isolation bases. Bases are fabricated out of structural angle.



B

Earthquake Restraint

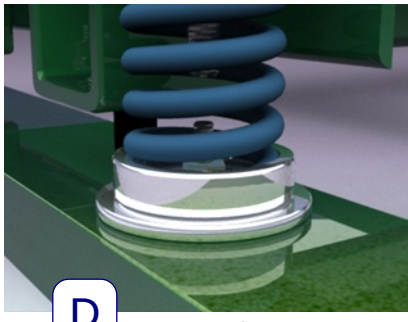
Isolation base comes complete with earthquake restraints designed to inhibit the fanbase from coming off of the isolators. EQ restraints are provided with rubber sleeves to eliminate metal to metal contact, and are designed in accordance with IBC 2006/ASCE 7-05. (EQ. restraints are designed to double as shipping restraints.) Restraints are mounted on structural channel to avoid any penetration into the unit base.



C

Isolators

Fanbase is supported on four open spring isolators. Horizontal stiffness is equal to vertical stiffness. Static deflection is 2". Isolators are mounted on a structural channel to avoid any penetration into the unit base.



D

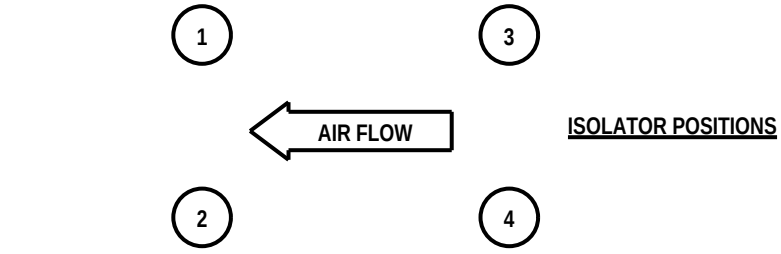
Iso Pad

A non-skid neoprene acoustical isolation pad is supplied.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT20		
DATE	2025-12-18	UNITS	IMPERIAL	REVISION			

HAAKON INDUSTRIES



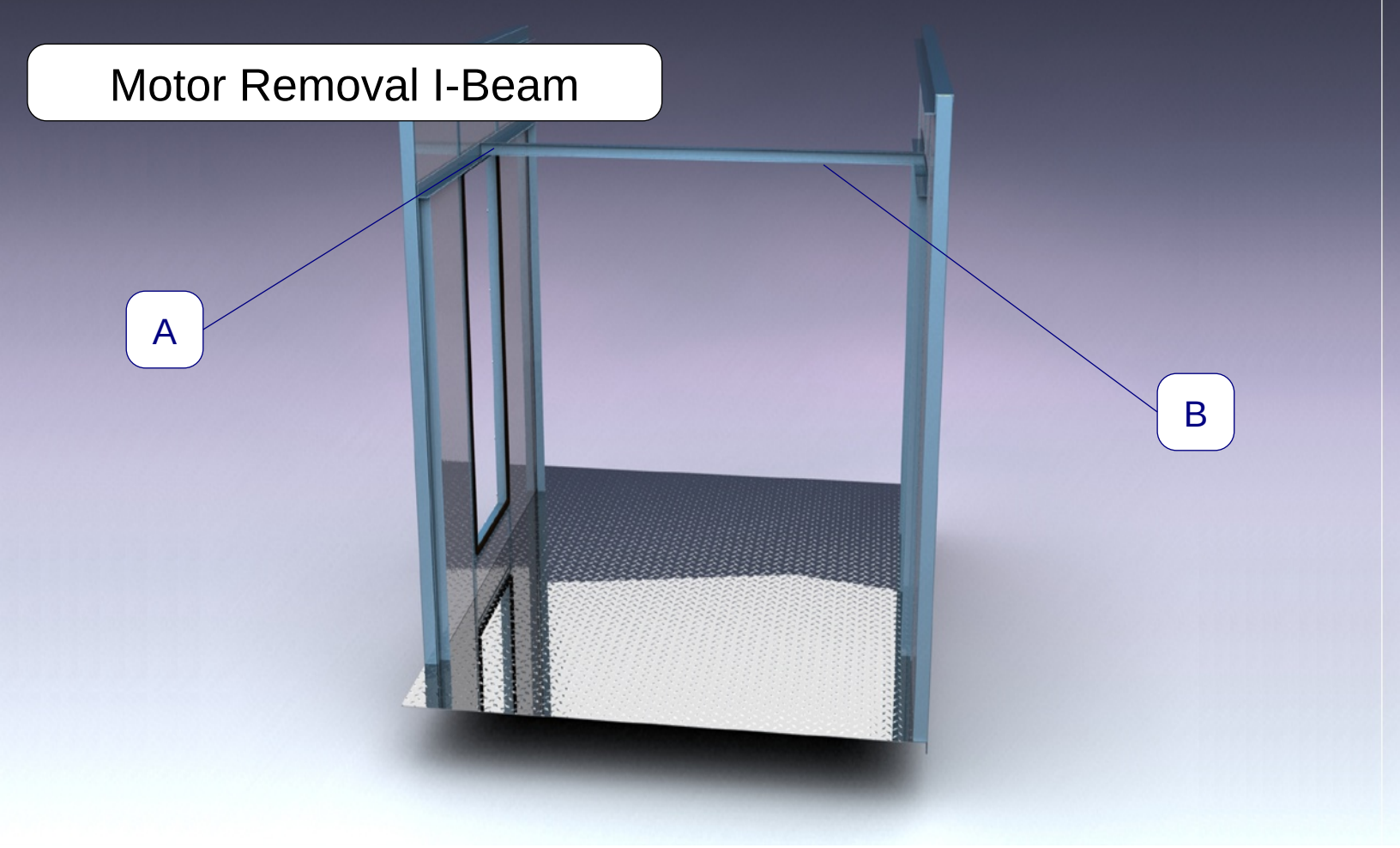
ISOLATOR TABLE

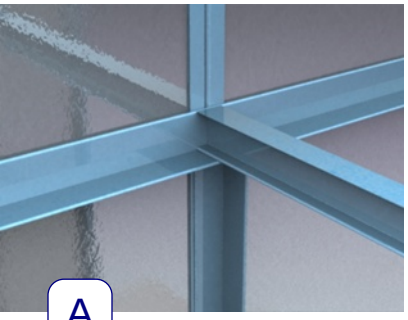
TAG	ISOLATORS												OPERATING HEI (In.)
	1			2			3			4			
	RATED CAP. (LBS)	RATED DEF. (In.)	COLOUR	RATED CAP. (LBS)	RATED DEF. (In.)	COLOUR	RATED CAP. (LBS)	RATED DEF. (In.)	COLOUR	RATED CAP. (LBS)	RATED DEF. (In.)	COLOUR	
AHU-0E SF	500	2	GREEN	500	2	GREEN	500	2	GREEN	500	2	GREEN	6.5

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT21	HAAKON INDUSTRIES
DATE	2025-12-18	UNITS	IMPERIAL	REVISION		

Motor Removal I-Beam

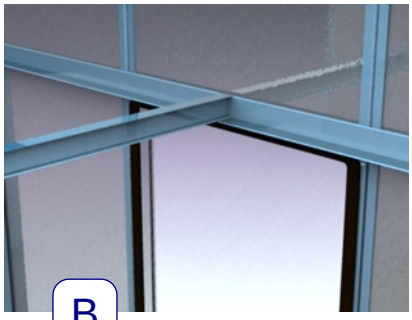




A

I-Beam Frame

Structural steel frame is provided to support motor removal I-beam.



B

Motor Removal I-Beam

Structural steel I-beam traverses along air tunnel width and is provided for easy motor removal.

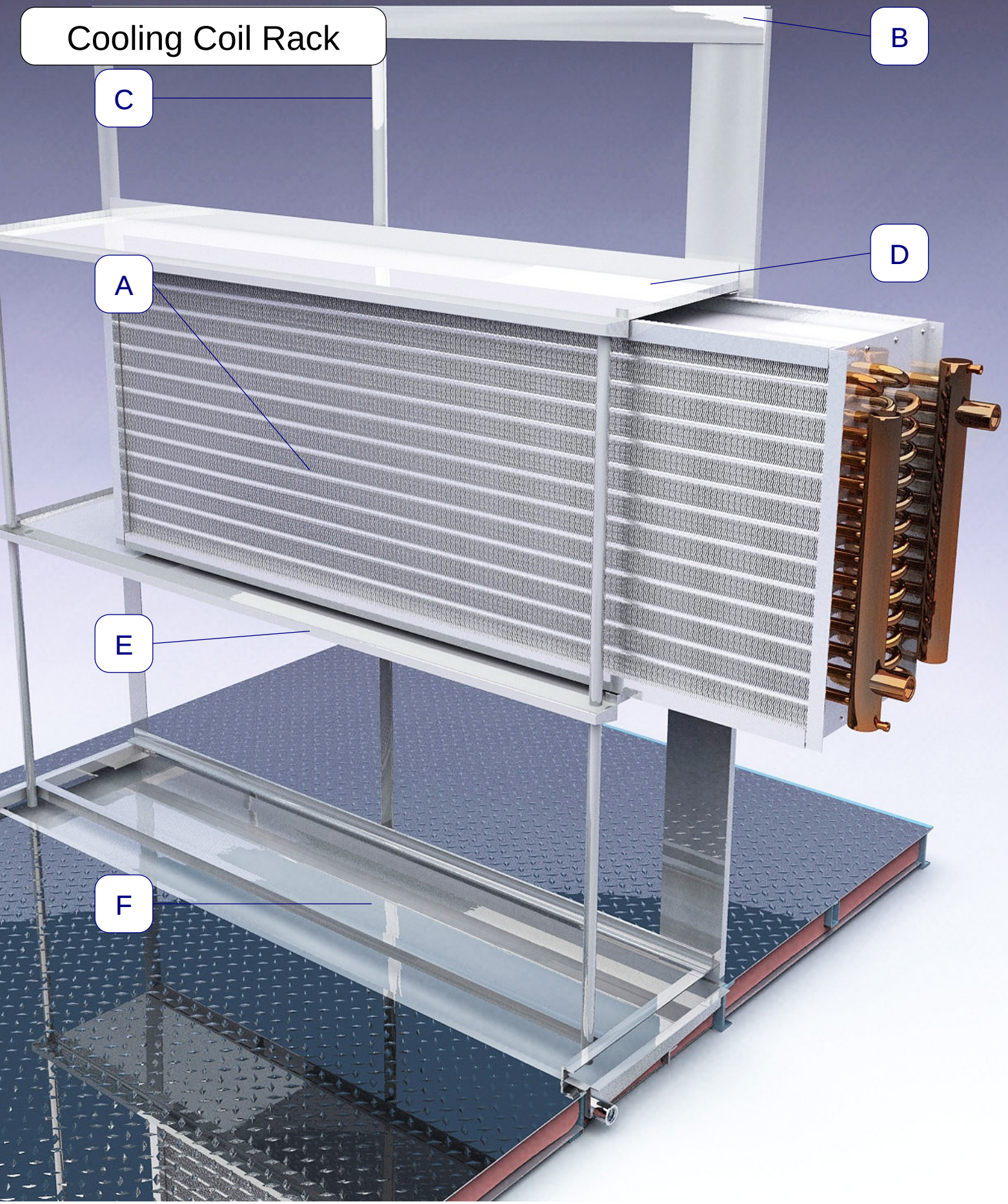
TAG: AHU-0E SF

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT24
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

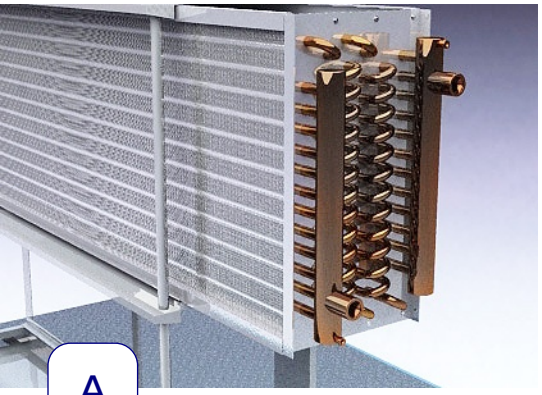
Cooling Coil Rack



TAG: AHU-0E COOLING

PROJECT:	IUPUI AHU-0E				
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT23
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

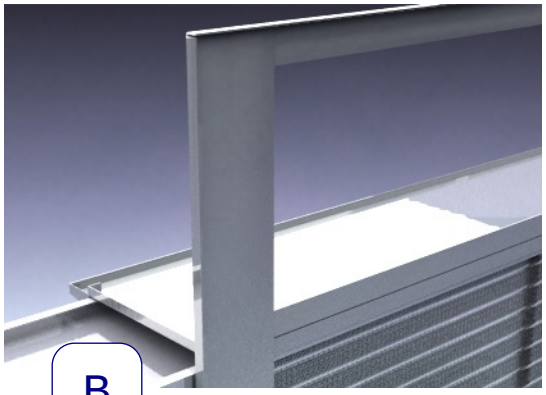
HAAKON INDUSTRIES



A

Coils

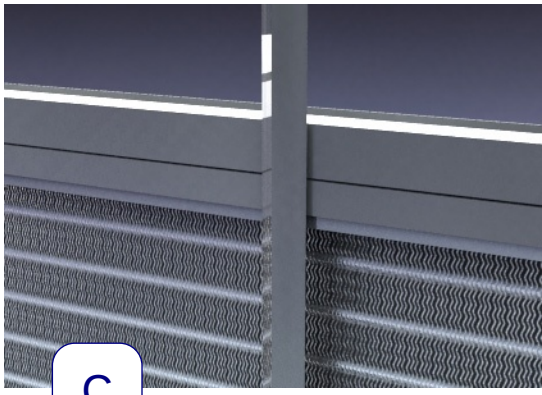
Cooling coil racks are designed to allow each coil to be individually removed. Coils are fully enclosed within the unit casing.



B

Blank-off

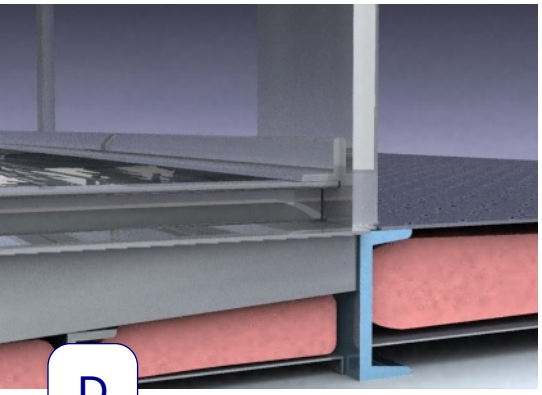
Coil rack blank-off and frame support is fabricated out of 16 ga. 304 Stainless Steel.



C

V-Brace

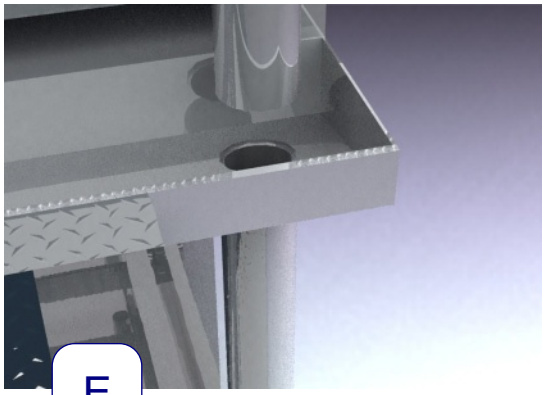
A 'V-Brace' fabricated out of 16 ga. 304 Stainless Steel is tack welded to the coil rack frame for extra rigidity.



D

Coil Rack Frame

Coil rack frame is constructed of 12 ga. 304 Stainless Steel.

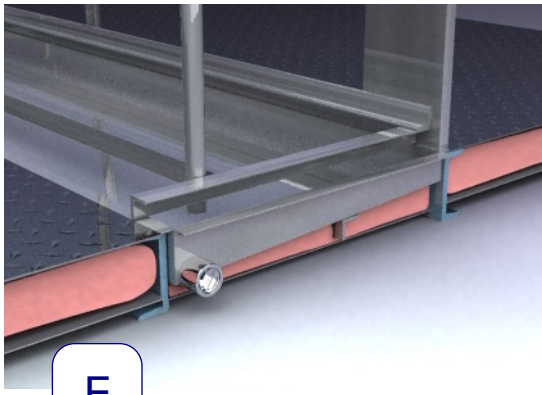


E

Extra Drain Pans

Intermediate drain pans are provided for multi-coil racks. Intermediate drain pans are fabricated from the same material as the main drain pan.

Intermediate drain pans are interconnected with 1" 304 Stainless Steel drain lines.



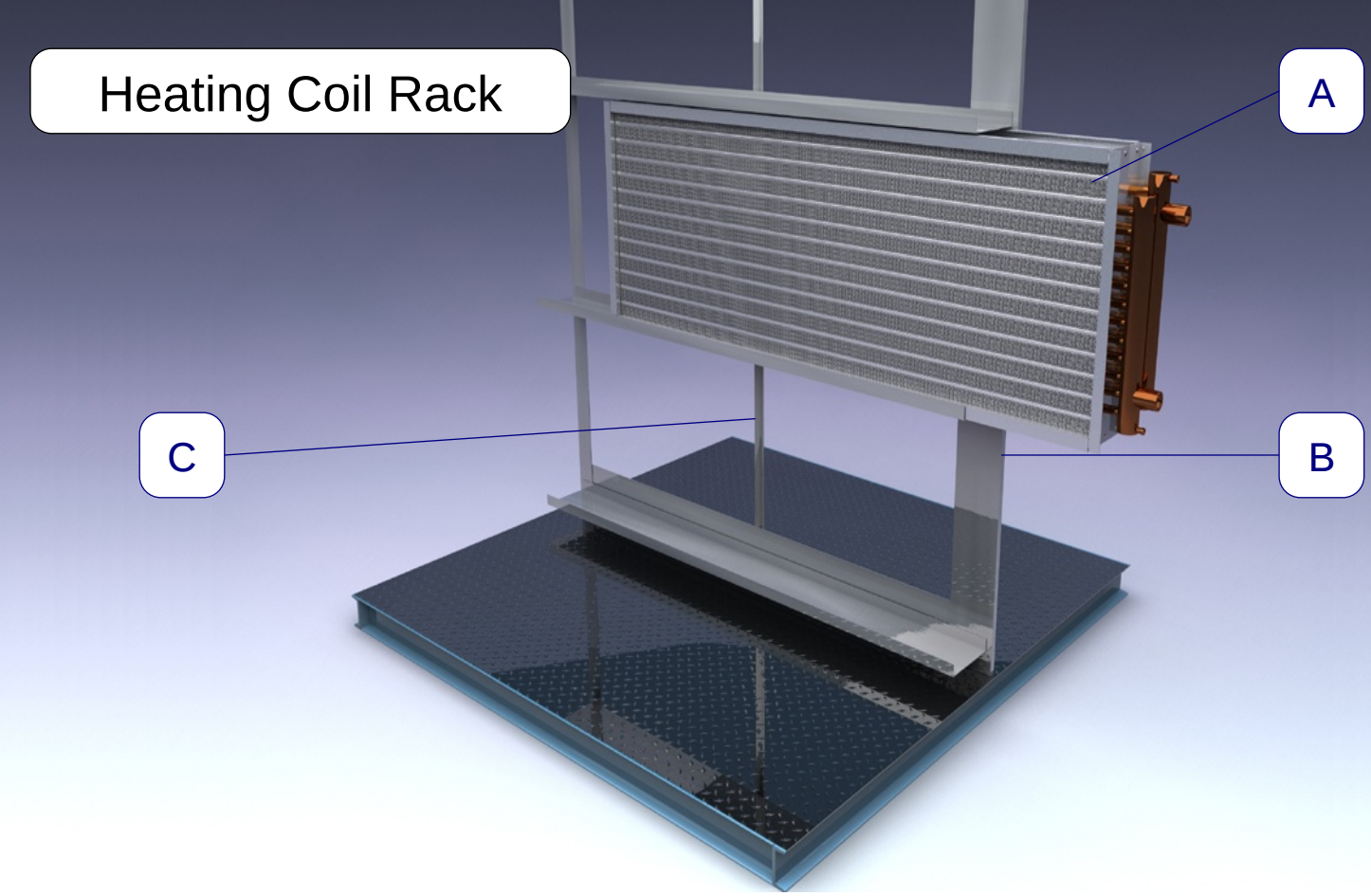
F

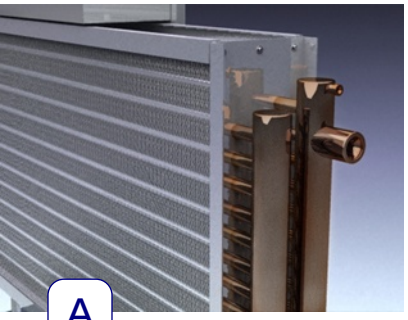
Drain Pan

Drain pans are fabricated out of 16 ga. 304 Stainless Steel, and continuously welded to ensure that they are watertight. A FPT 304 Stainless Steel drain fitting is also provided on the drain pan end. Drain pan height and extension downstream of the cooling coil's air exiting face are tabulated below. Drain pan is sloped both in the direction of airflow and towards the drain connection.

Tag	Pan Hei	Pan Ext	Drain Size
AHU-0E COOLING	**4 5/8**	**18**	**1 1/4**

Heating Coil Rack

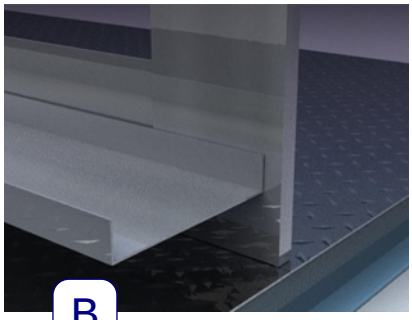




A

Coils

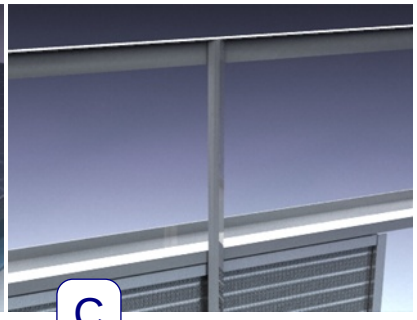
Heating coil racks are designed to allow each coil to be individually removed. Coils are fully enclosed within the unit casing.



B

Coil Rack Frame

Coil rack frame and blank-offs are fabricated out of 16 ga. galvanized steel.



C

V-Brace

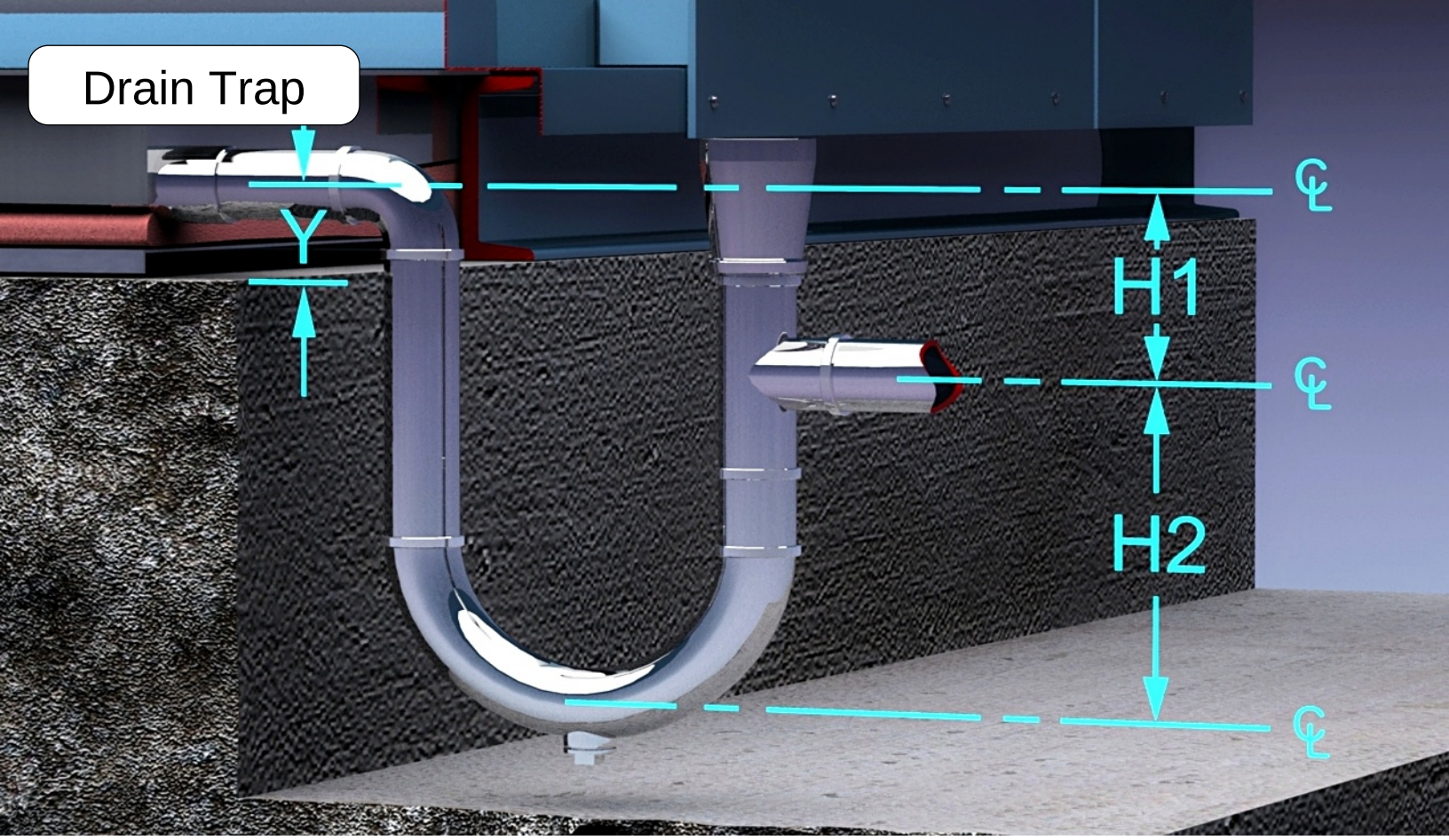
A 'V-Brace' fabricated out of 16 ga. galvanized steel is tack welded to the coil rack frame for extra rigidity.

TAG: AHU-0E PREHEAT

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT25
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES



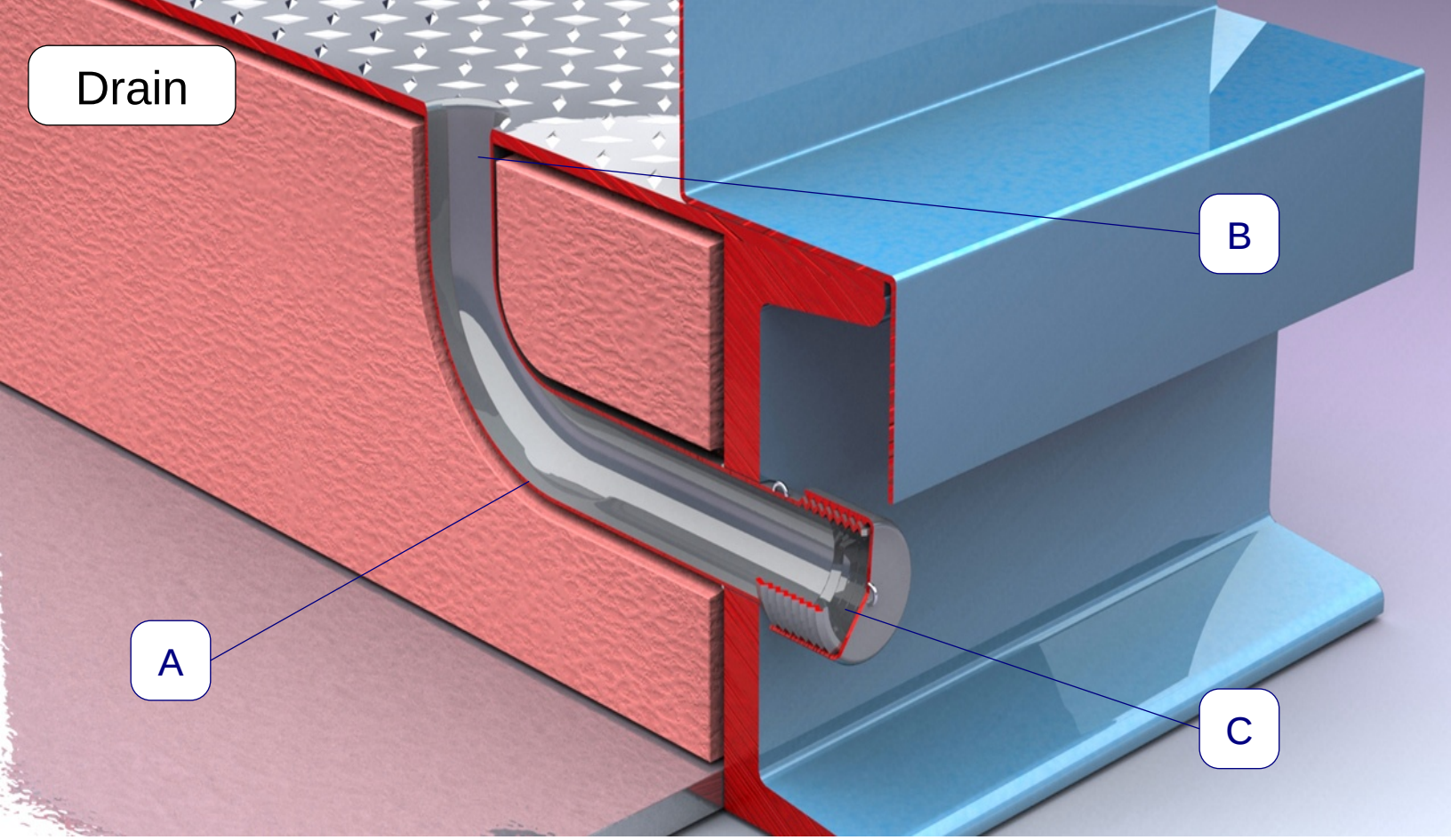
Draw Thru Drain Trap

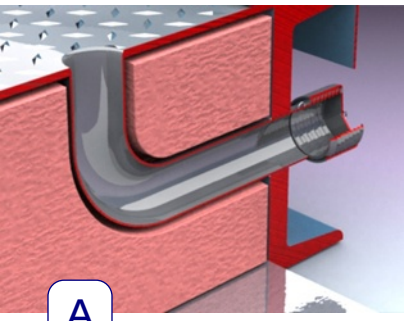
DRAIN TRAPS ARE BY OTHERS : Trap all drains as shown on the drawing. Values H1 and H2 are referenced in the table below for each coil.

Tag	Plenum Press. (in wc)	Y (in)	H1 (in)	H2 (in)	Drain Size (in)
AHU-0E COOLING	3.00	2 5/8	4	2 1/2	1 1/4

TAG: AHU-0E COOLING

Drain

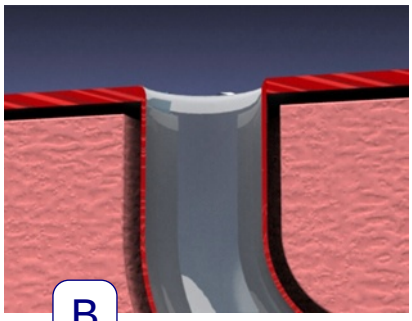




A

Drain

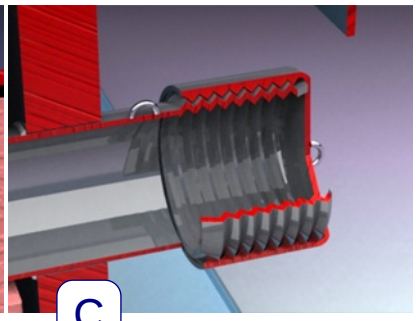
1.25" Standard Drain drains are provided at the locations shown on the drawings and are insulated with base insulation.



B

Inlet

A 1.25" drain pipe is continuously welded to unit floor.



C

Discharge

A 1.25" diameter drain connection terminates out the side of the unit.

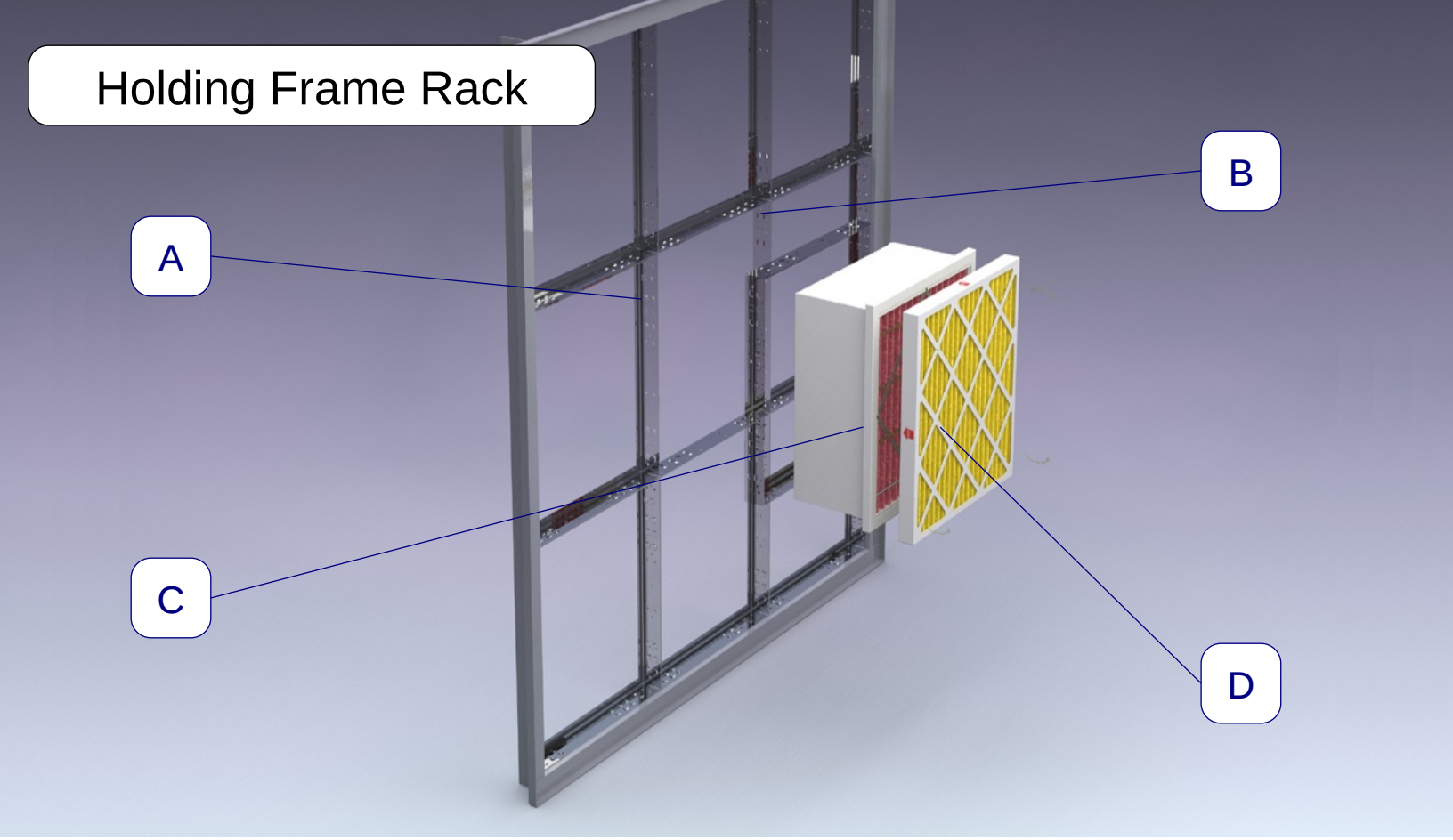
TAG: AHU-0E

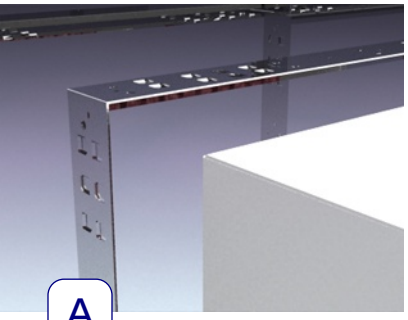
PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT27
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

Holding Frame Rack

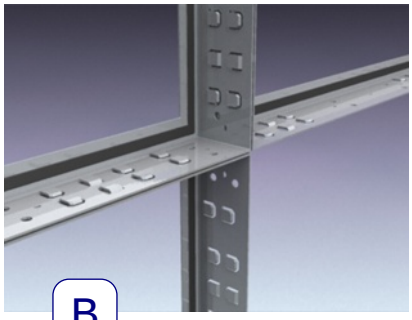




A

Rack

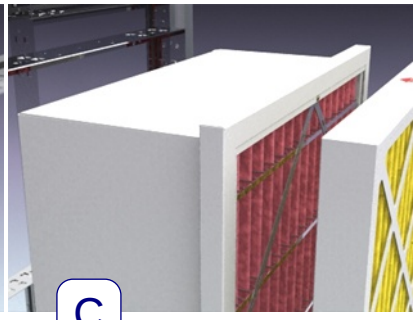
16 ga. galvanized steel holding frame.



B

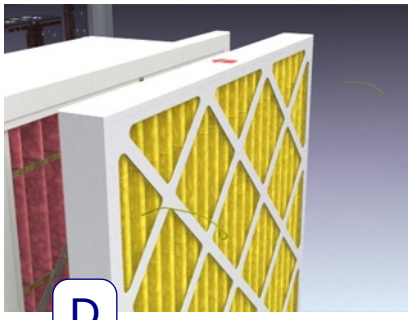
Foam Tape

Open cell foam tape keeps air from bypassing filters.



C

12" PH Filter (MERV 13)



D

2" Box Filter (MERV 8)

TAG	COMPONENT	CLIP TYPE
AHU-0E		C-70 FASTENER
		C-86 FASTENER

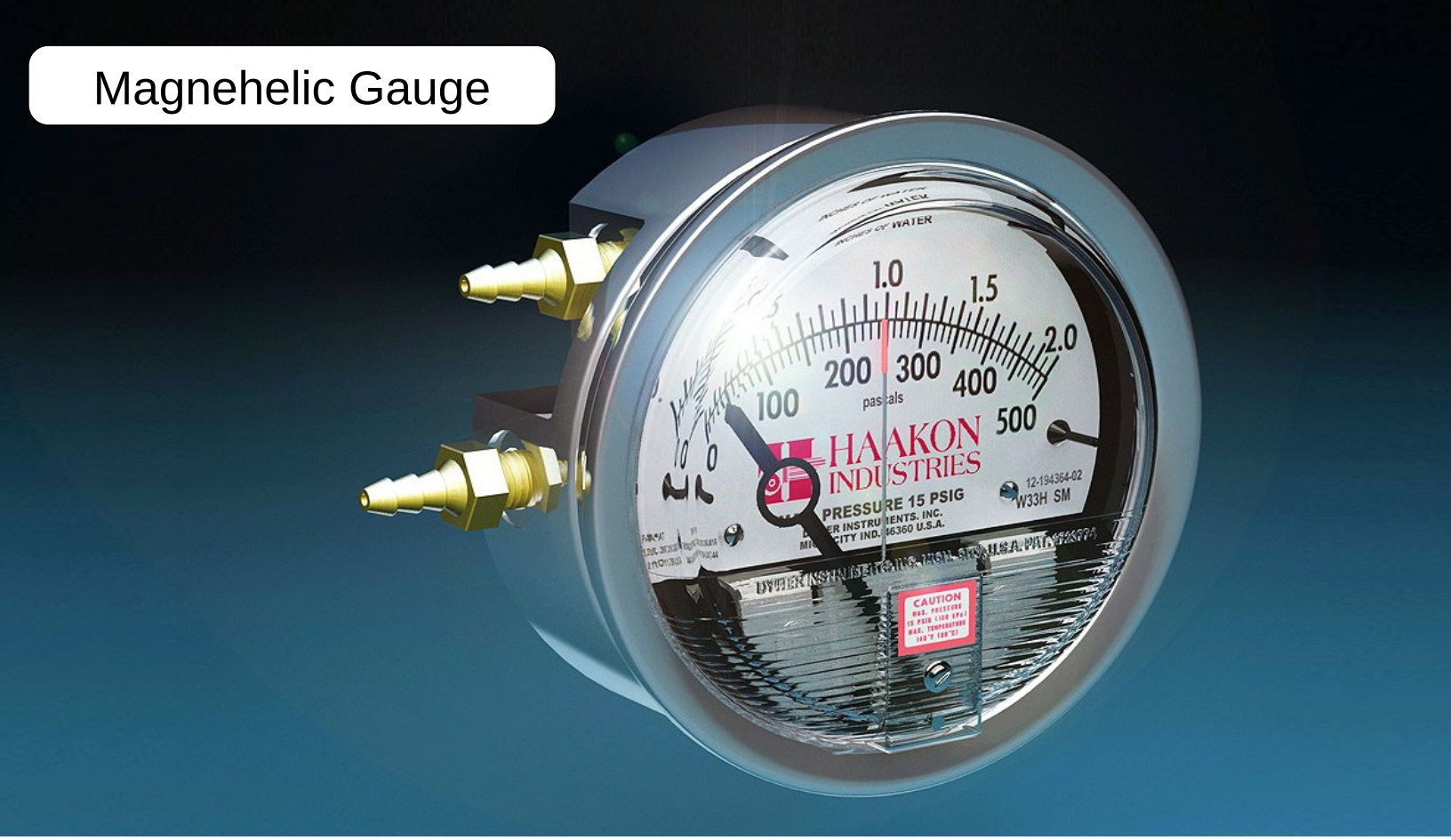
TAG: AHU-0E

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT28
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

Magnehelic Gauge



Magnehelic Gauge

A Magnehelic differential pressure gauge is installed to provide a visual indication of the air pressure drop across the filter bank. The gauge has a die cast aluminum case and acrylic cover. Accuracy is +-2% of full scale. The gauge is suitable for use between -20F and 140F. An adjustable flag is provided to indicate change out pressure. The gauge is installed recessed into the air handling unit casing. No power wiring is required.

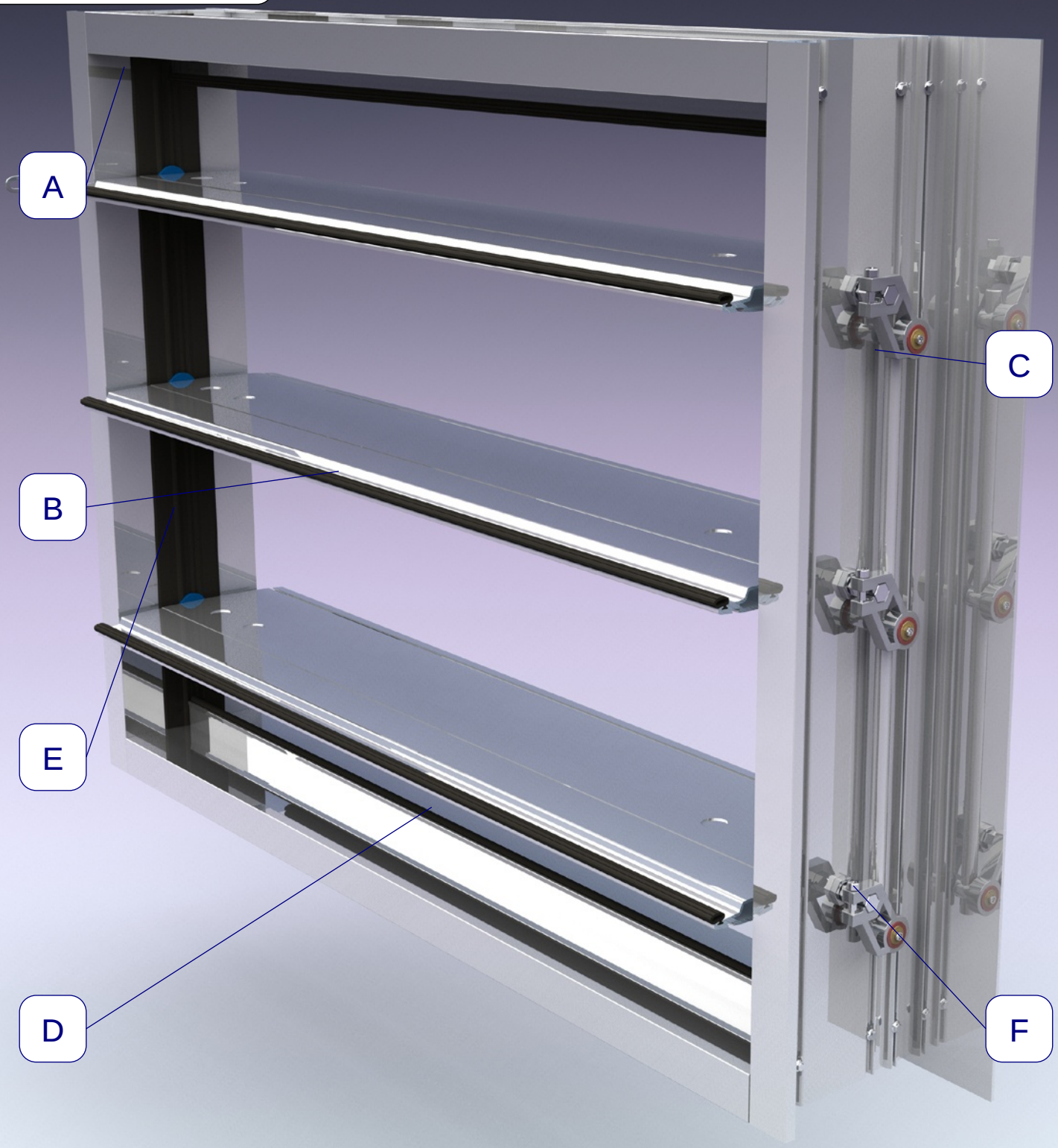
FILTER GAUGE TABLE	
TAG	**RANGE**
AHU-0E ALL	**0-2in and 0-500Pa MAGNEHELIC**

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT29
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

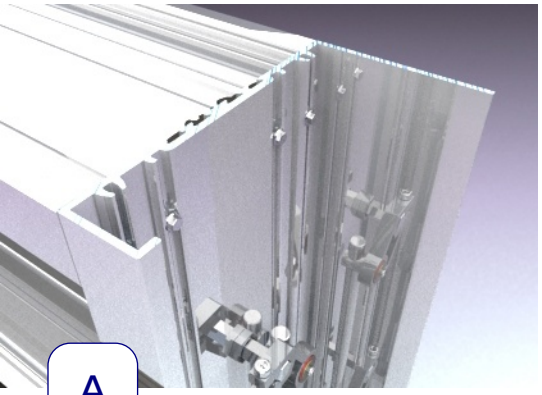
TAMCO 1000



TAG: AHU-0E SF

PROJECT:	IUPUI AHU-0E				
DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT30
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

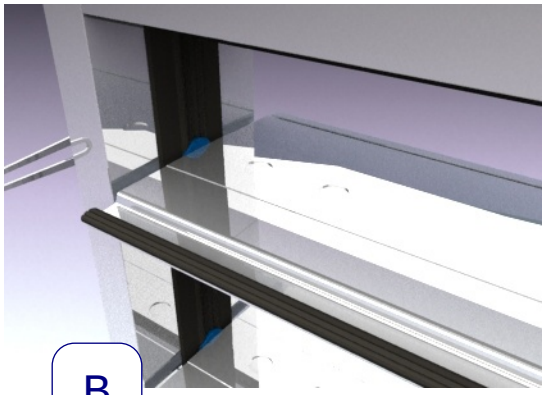
HAAKON INDUSTRIES



A

Frame

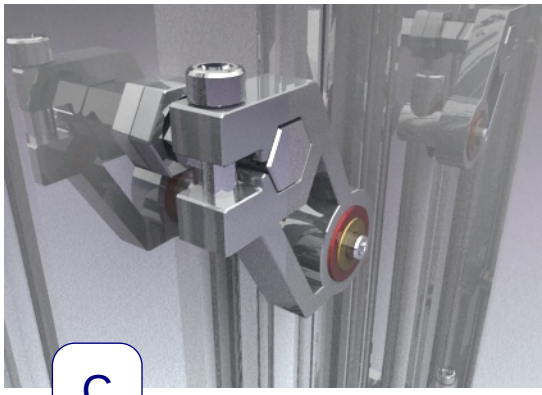
Frame is constructed of minimum 0.081" extruded aluminum. Dampers are designed such that leakage does not exceed 3 CFM/sqft at 1" W.C. static pressure differential.



B

Blades

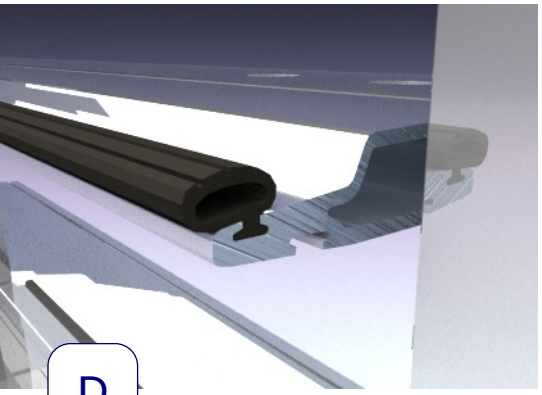
Minimum 0.081" extruded aluminum airfoil.



C

Linkage

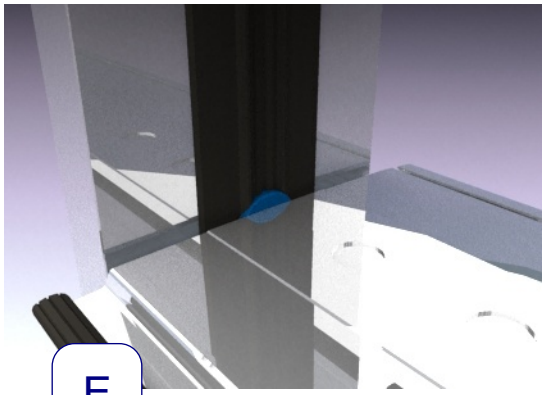
The blade linkage hardware is installed in the frame out of the air-stream.



D

Blade Seal

Continuous EPMD blade seal.



E

Jamb Seal

Frame seals shall be extruded silicone. Gaskets to be secured in an integral slot within the aluminum extrusion.

F

Axles

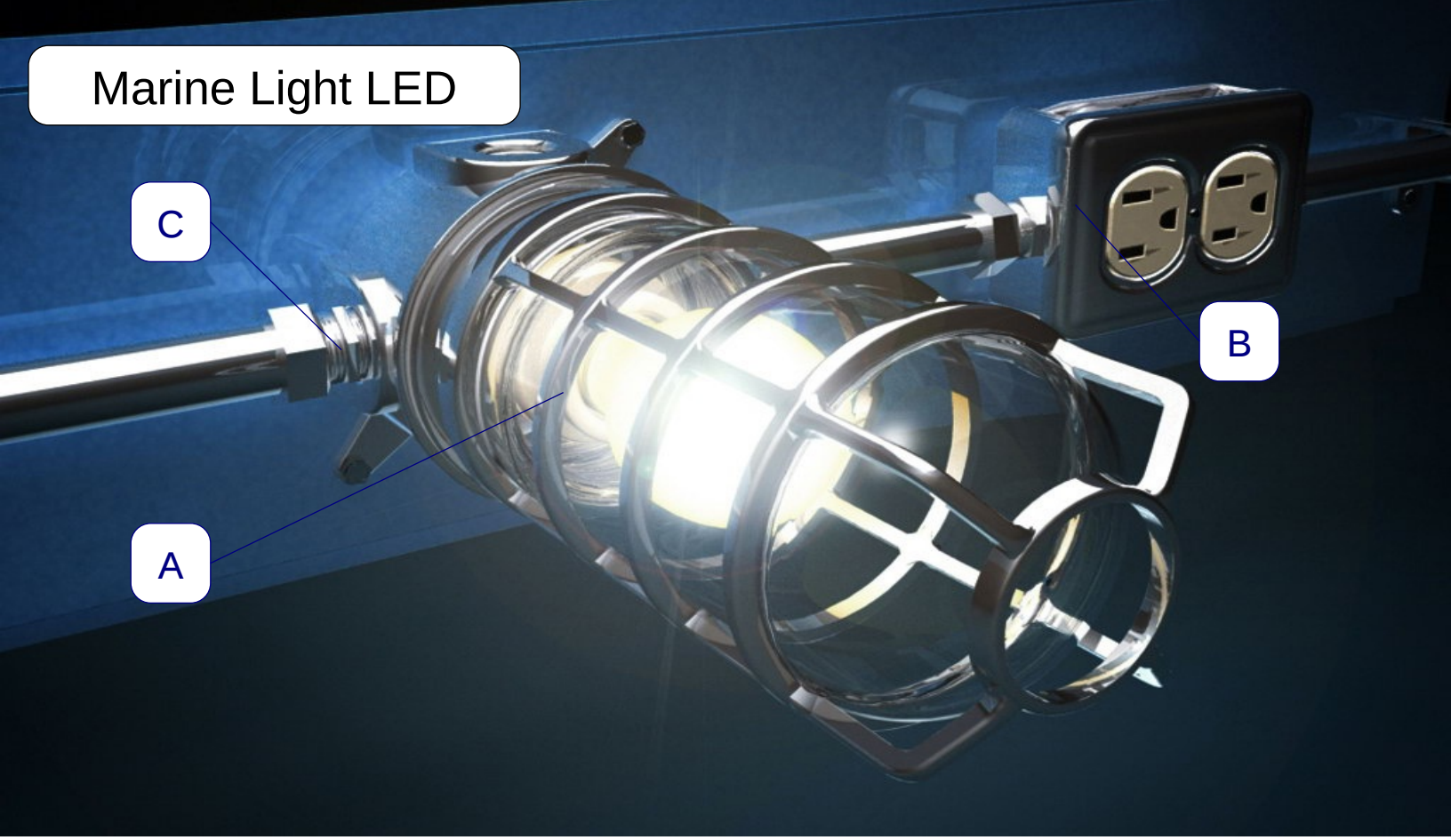
Aluminum 7/16" hexagon pivot rods.

TAMCO "Double-Sealed" bearings, with a Celcon inner bearing fixed on hexagon rod rotates within a Polycarbonate outer bearing inserted in frame.

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT31	HAAKON INDUSTRIES
DATE	2025-12-18	UNITS	IMPERIAL	REVISION		

Marine Light LED



A

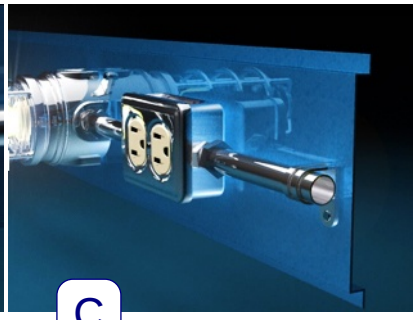
LED Marine Light

LED marine lights with protective metal cage and glass seals are supplied in the locations shown on the drawings. All lights are wired to a single junction box with a switch and indicator light.

B

Duplex Receptacle

Duplex receptacles are provided only in the fan sections.



C

Conduit

All wiring is done in EMT conduit with raintight fittings.

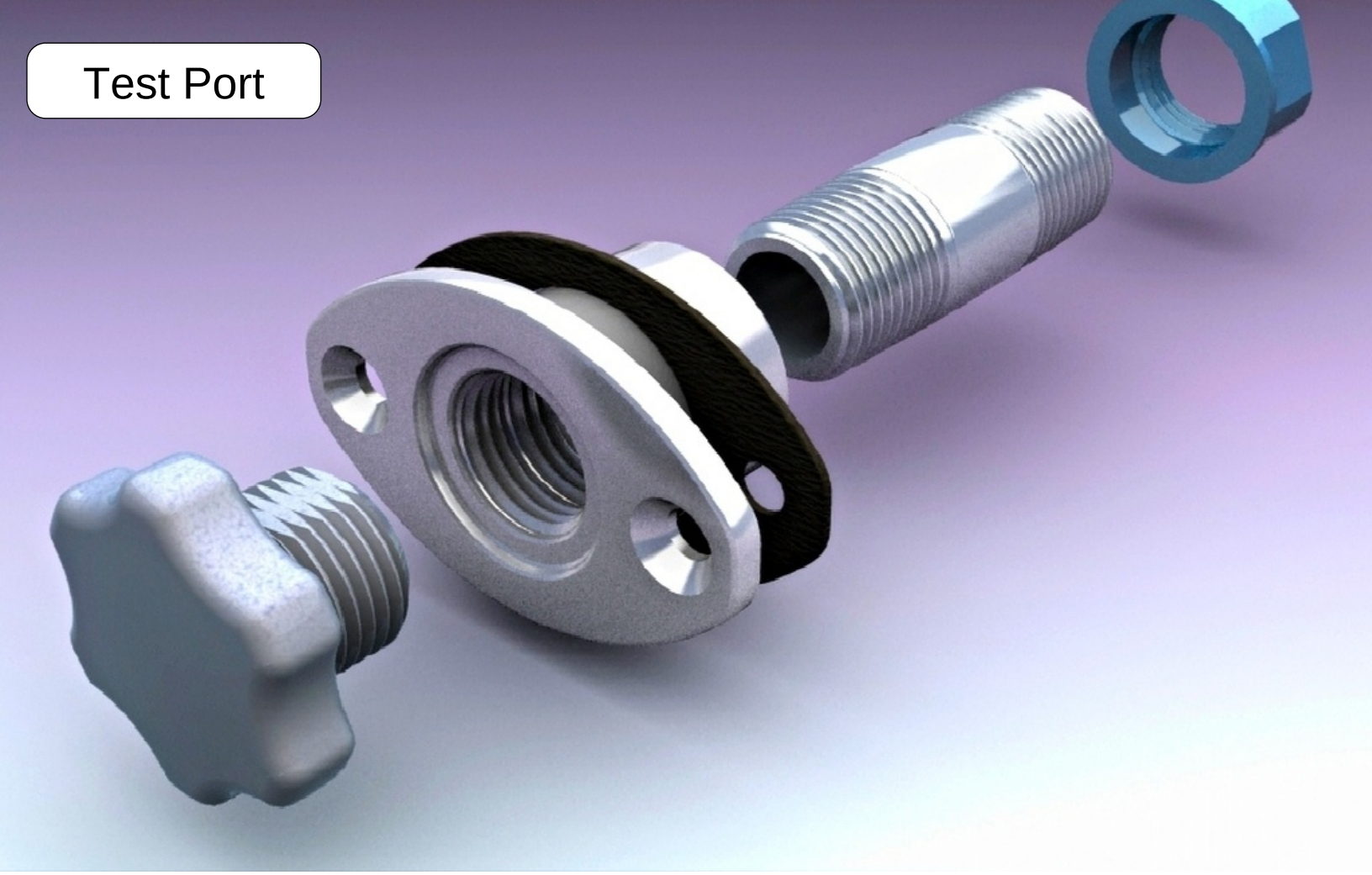
TAG: AHU-0E

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT32
DATE	2025-12-18	UNITS	IMPERIAL	REVISION	

HAAKON INDUSTRIES

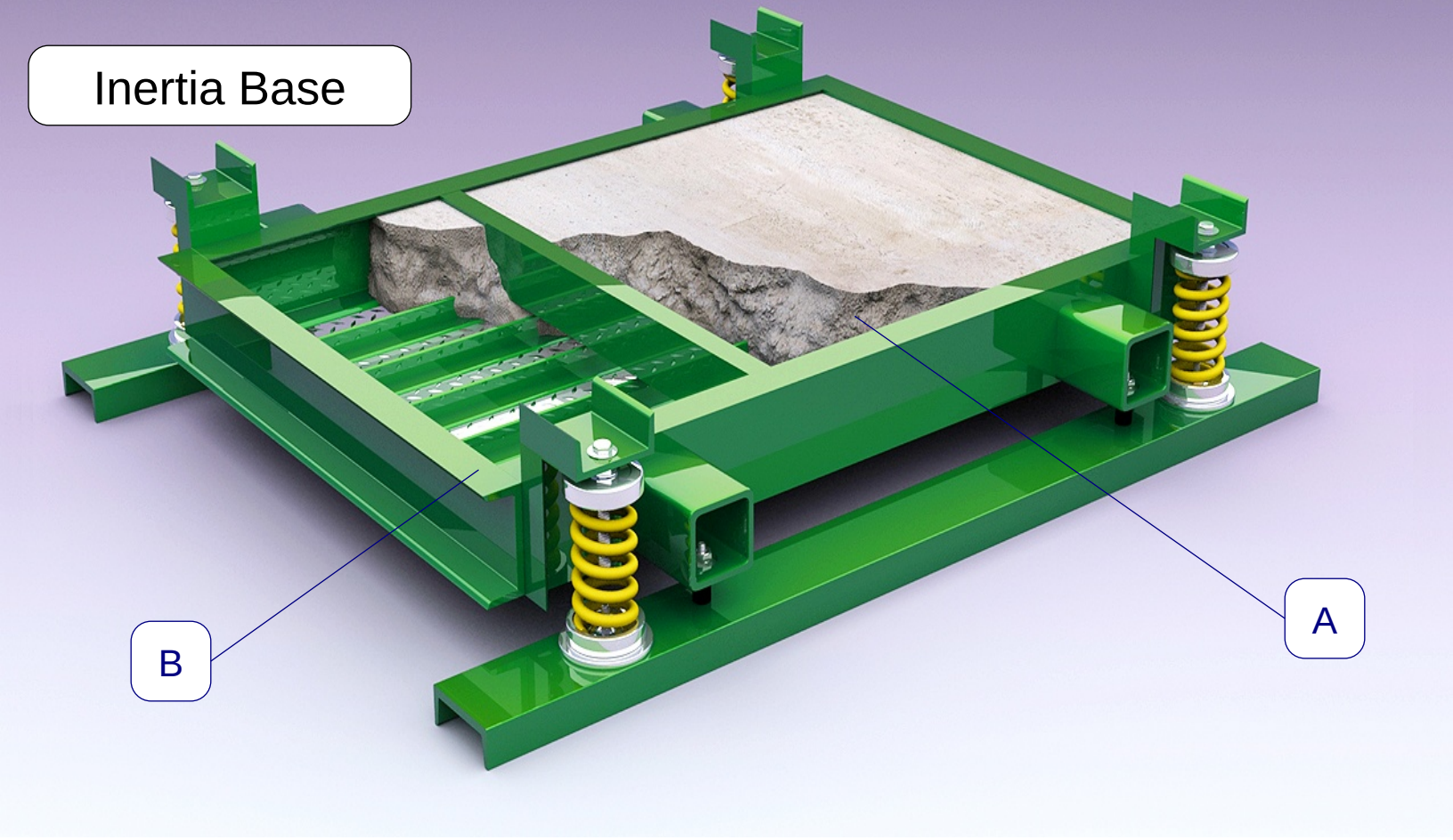
Test Port



Testports

Test Ports are supplied for unit air stream testing. The inside diameter of the test port is 0.55".

Inertia Base



Concrete

Concrete inertia bases are supplied for the fan/motor bases indicated in the fan/motor detail. Concrete is to be factory installed.

Stiffeners

Structural angles are used to stiffen the concrete inertia base.

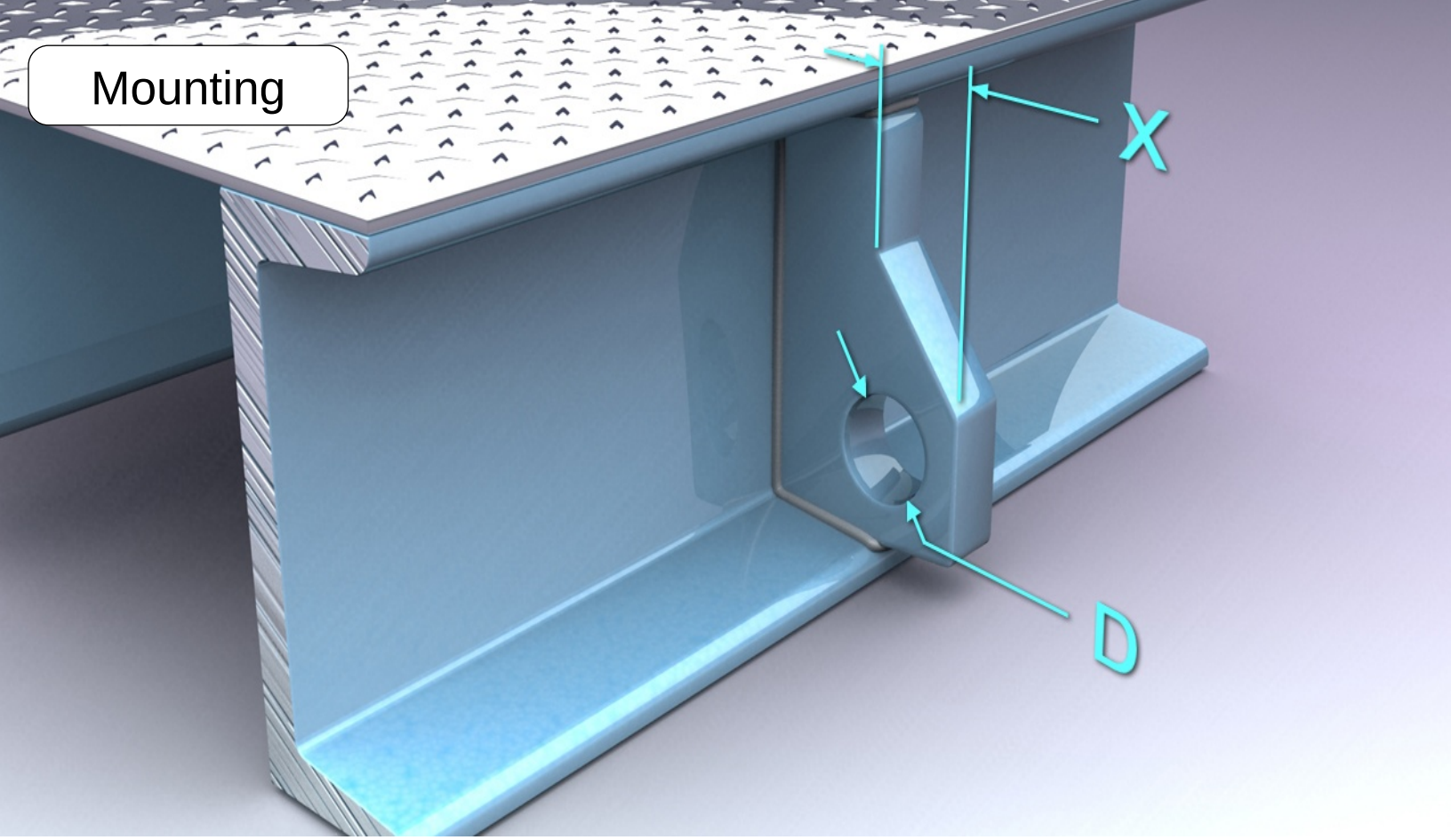
CONCRETE WEIGHT (LB):	
AHU-0E SF	450.463

TAG: AHU-0E SF

PROJECT: IUPUI AHU-0E

DRAWN BY	HL	JOB NO.	70767	DWG NO	70767DT34	HAAKON INDUSTRIES
DATE	2025-12-18	UNITS	IMPERIAL	REVISION		

Mounting

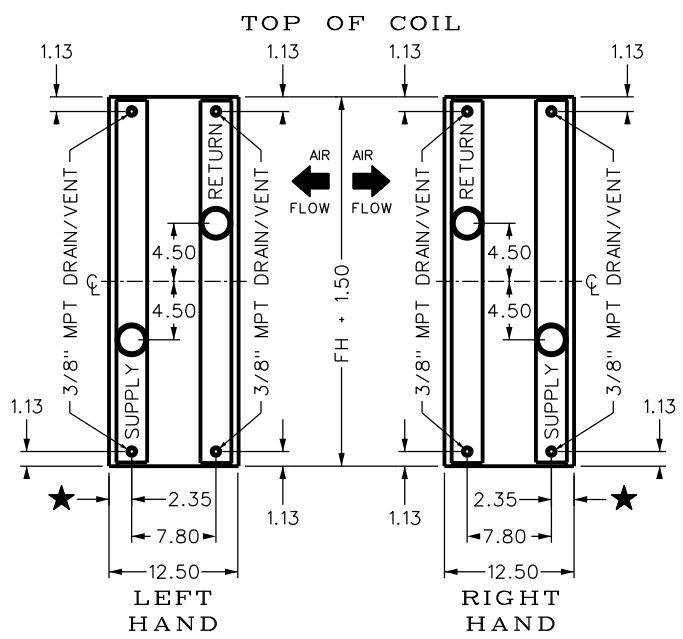


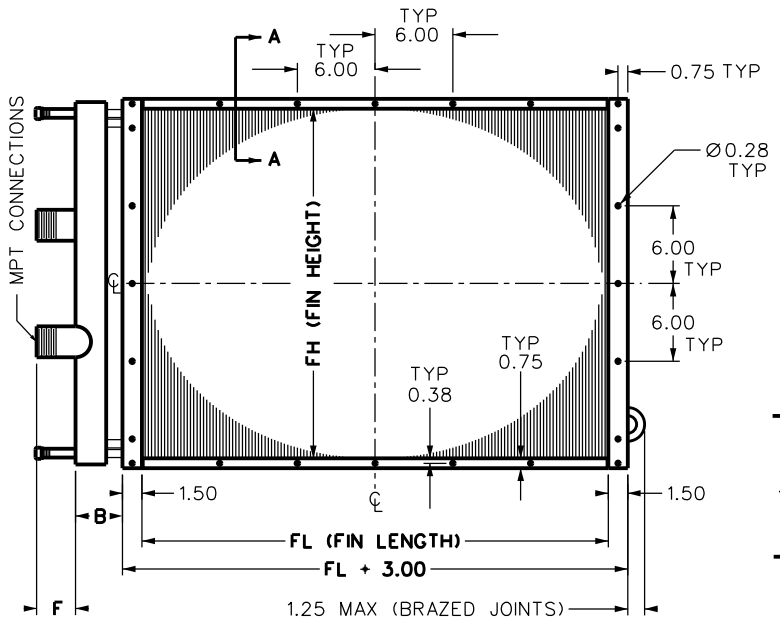
The unit is designed to be mounted on a concrete pad. Unit to be installed level and continuously supported around the perimeter and at all splits.

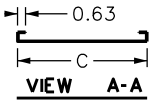
Lifting lugs are provided on the base rail to facilitate lifting. A minimum of 4 lugs are provided per section. The quantity and location of the lugs are dependant on the size and weight distribution of the section.

CHANNEL SIZE	"X"	"D"
4"	1.29"	1.125"
6"	1.23"	1.25f"
8"	1.46"	1.25f"
10"	1.14"	1.25f"
12"	2.09"	1.25f"

TAG: AHU-0E







MOUNTING HOLES
(ONLY IF SPECIFIED ON ORDER)

NOTES:

1. HORIZONTAL & VERTICAL AIR FLOW.
2. COIL "HAND" MUST BE SPECIFIED.
3. BRAZED JOINTS ONLY.
4. COILS FOR VERTICAL AIR FLOW ARE BUILT RIGHT HAND, PIPE FOR COUNTER FLOW.

SPECIAL CONN. NOTE:

★ 1. IF CONN. RADIUS (ACTUAL) EXCEEDS "E" DIM. - HEADER WILL PROTRUDE PAST COIL CASINGS.

TABLE 1

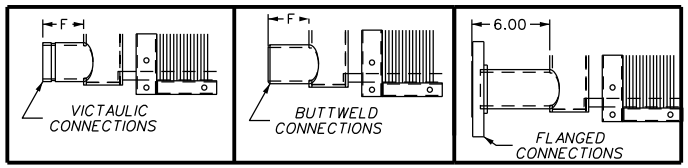
TUBE FACE			
FIN HGT	TF	FIN HGT	TF
		37.5	25
		39.0	26
21.0	14	40.5	27
22.5	15	42.0	28
24.0	16	43.5	29
25.5	17	45.0	30
27.0	18	46.5	31
28.5	19	48.0	32
30.0	20	49.5	33
31.5	21	51.0	34
33.0	22	52.5	35
34.5	23	54.0	36
36.0	24	——	—

TABLE 2

FIN HT	STANDARD SIZE CONN'S			OVER SIZED CONN'S		
	CONN SIZES	MAX GPM	B	CONN SIZES	MAX GPM	B
21.0 THRU 43.5	2-1/2"	160	3.75	3"	250	4.19
45.0 THRU 54.0	3"	250	4.19	4"	475	4.69

TABLE 3

EXTENDED CONN'S		
F		
STD	3" EXT	5" EXT
3.00	6.00	8.00



TITLE:

TYPE "W" PLATE FIN COIL
1-1/3 CIRCUIT
CENTER CONNECTIONS
OPTIONAL 3/4" SIDE CSG FLGS

8 ROW, 12" THRU 54"
FIN HGT (1.50 INCREMENTS),
24" THRU 180" FIN LENGTH.

NO	REVISION	DATE	DR	ENG
D				
C	CHG 22429	03-18-13	jsc	
B	17306	12-02-05	jsc	
A	CHECKED	2/24/00	RTP	

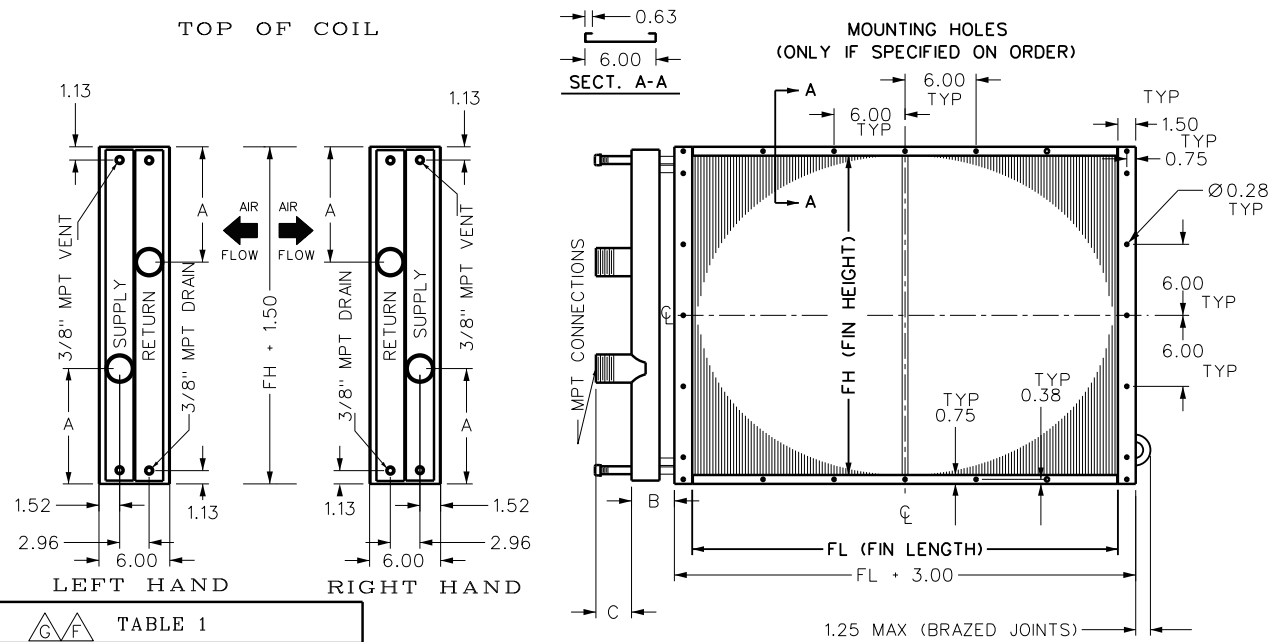
NO	REVISION	DATE	DR	ENG
H				
G				
F				
E				

TOLERANCE
1. CONNECTION & HEADER LOCATIONS = ± .250
2. CASING DIMENSIONS = ± .125
(ALL DIMENSIONS ARE IN INCHES)

ENERGY FLOW by AEROFIN

SUBDWGS\W\CA-W-109-6

DWG NO. CA-W-109-6



NOTES:

1. STANDARD 1 ROW COIL IS HALF CIRCUIT. STANDARD 2 ROW COIL IS FULL CIRCUIT.
2. HORIZONTAL OR VERTICAL AIR FLOW.
3. COIL "HAND" MUST BE SPECIFIED.
4. COILS MUST BE DRAINED THRU BOTTOM OF BOTH HEADERS.
5. BRAZED JOINTS ONLY.
6. INSTALL WITH CASING LEVEL.

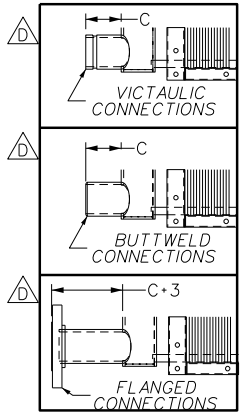


TABLE 1 (G, F)

FIN HGT	TF	A	FIN HGT	TF	A
21.0	14	6.75	40.5	27	16.5
22.5	15	7.5	42.0	28	17.25
24.0	16	8.25	43.5	29	18.0
25.5	17	9.0	45.0	30	18.75
27.0	18	9.75	46.5	31	19.5
28.5	19	10.5	48.0	32	20.25
30.0	20	11.25	49.5	33	21.0
31.5	21	12.0	51.0	34	21.75
33.0	22	12.75	52.5	35	22.5
34.5	23	13.5	54.0	36	23.25
36.0	24	14.25	55.5	37	24.0
37.5	25	15.0	57.0	38	24.75
39.0	26	15.75	58.5	39	25.5
			60.0	40	26.25

TABLE 2

ROW	STANDARD SIZE CONN'S			OVER SIZED CONN'S		
	CONN SIZES	MAX GPM	B MAX	CONN SIZES	MAX GPM	B MAX
ONE	1-1/2"	50	3.25	2"	80	3.50
TWO	2"	80	3.50	2-1/2"	125	3.75

TABLE 3 (B, H)

ROW	CIRCUIT
ONE	1/2 & 1/4
TWO	FULL, 1/2, 1/3 & 1/4

TABLE 4

EXTENDED CONN'S C		
STD	3" EXT	5" EXT
3.00	6.00	8.00

TOLERANCE
1. CONNECTION & HEADER LOCATIONS = ± .250
2. CASING DIMENSIONS = ± .125
(ALL DIMENSIONS ARE IN INCHES)

NO	REVISION	DATE	DR	ENG
H	CHG. 30293	11/02/23	WLL	
G	CHG. 26633	05/11/18	SRF	
F	CHG. 23973	06/09/15	WLL	

ENERGY FLOW by AEROFIN

TITLE: **TYPE "HW" PLATE FIN COIL CENTER CONNECTIONS FULL & FRACTIONAL CIRC 1 & 2 ROW OPTIONAL 3/4" SIDE CSG FLGS**

DWG.NO. CA-HW-103

THE WORLD LEADER IN CLEAN AIR SOLUTIONS

PerfectPleat® SC M8

EXTENDED SURFACE PLEATED PANEL FILTERS

Engineering Data

Supplement to Bulletin AFP-1-202

Product Information—Standard Sizes

Nominal Sizes (Inches) (W x H x D)	Actual Sizes (Inches) (W x H x D)	Rated Airflow Capacity (SCFM)			SC M8 2″		SC M8 4″	
		300 FPM	500 FPM	600 FPM	Pleats Per Filter	Media Area (Sq. Ft.)	Pleats Per Filter	Media Area (Sq. Ft.)
10 x 20 x 2	9½ x 19½ x 1¾	400	700	850	8	3.9		
12 x 20 x 2	11½ x 19½ x 1¾	500	850	1050	10	4.9		
12 x 24 x 2	11⅜ x 23⅜ x 1¾	600	1000	1250	10	5.9		
14 x 25 x 2	13½ x 24½ x 1¾	750	1200	1500	11	6.8		
15 x 20 x 2	14½ x 19½ x 1¾	650	1050	1300	12	5.9		
15 x 25 x 2	14½ x 24½ x 1¾	800	1300	1650	12	7.4		
16 x 16 x 2	15½ x 15½ x 1¾	550	900	1100	13	5.1		
16 x 20 x 2	15½ x 19½ x 1¾	650	1100	1400	13	6.4		
16 x 24 x 2	15⅜ x 23⅜ x 1¾	800	1350	1650	13	7.6		
16 x 25 x 2	15½ x 24½ x 1¾	850	1400	1750	13	8.0		
18 x 24 x 2	17⅜ x 23⅜ x 1¾	900	1500	1900	15	8.8		
18 x 25 x 2	17½ x 24½ x 1¾	950	1550	1950	15	9.3		
20 x 20 x 2	19½ x 19½ x 1¾	850	1400	1750	17	8.3		
20 x 24 x 2	19⅜ x 23⅜ x 1¾	1000	1650	2100	17	10.0		
20 x 25 x 2	19½ x 24½ x 1¾	1050	1750	2150	17	10.5		
24 x 24 x 2	23⅜ x 23⅜ x 1¾	1200	2000	2500	20	11.8		
25 x 25 x 2	24½ x 24½ x 1¾	1300	2150	2700	21	13.0		
12 x 24 x 4	11⅜ x 23⅜ x 3¾	600	1000	1250			8	10.4
16 x 20 x 4	15⅜ x 19⅜ x 3¾	650	1100	1400			11	11.8
16 x 25 x 4	15⅜ x 24⅜ x 3¾	850	1400	1750			11	14.8
18 x 24 x 4	17⅜ x 23⅜ x 3¾	900	1500	1875			12	15.6
20 x 20 x 4	19⅜ x 19⅜ x 3¾	850	1400	1750			14	15.0
20 x 25 x 4	19⅜ x 24⅜ x 3¾	1050	1750	2150			14	18.9
24 x 20 x 4	23⅜ x 19⅜ x 3¾	1000	1650	2100			14	18.1
24 x 24 x 4	23⅜ x 23⅜ x 3¾	1200	2000	2500			17	22.0
25 x 29 x 4	24⅜ x 28⅜ x 3¾	1500	2500	3150			21	28.4

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

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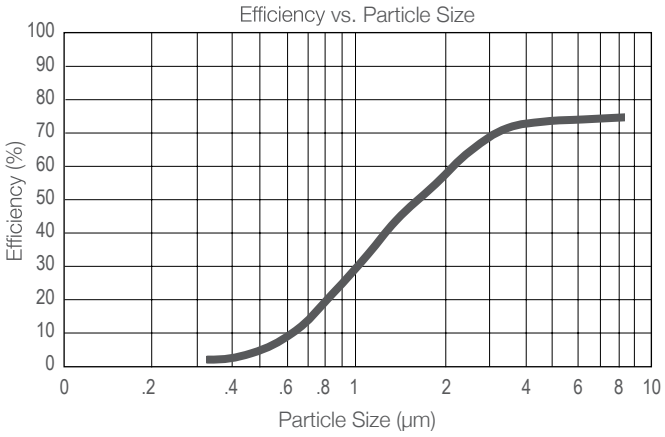
PerfectPleat® SC M8 Filters

Product Information

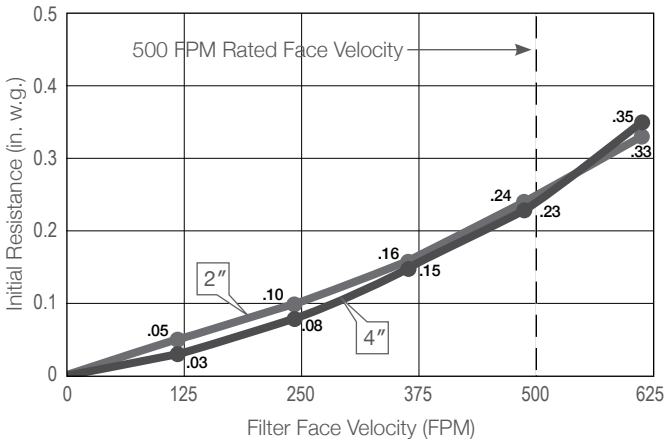
Filter	Pleats Per Linear Foot	Rated Initial Resistance (in. w.g.) 300 FPM	500 FPM	Final 625 FPM	Recommended Resistance (in. w.g.)	MERV	Continuous Operating Temperature Limit
PerfectPleat SC M8 2"	10	.13	.24	.33	1.0	8	150°F (66°C)
PerfectPleat SC M8 4"	9	.11	.23	.35	1.0	8	200°F (93°C)

Performance Data

Composite Minimum Efficiency Curve



Initial Resistance vs. Filter Face Velocity



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888.223.2003 Fax 888.223.6500 I aafintl.com

ISO Certified Firm

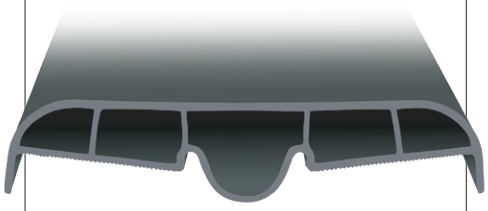
AFP-7-206B 12/23

THE WORLD LEADER IN CLEAN AIR SOLUTIONS

VariCel® VXLS

HIGH-EFFICIENCY SUPPORTED PLEAT FILTERS

- Available in MERV 15, MERV 13, and MERV 11
- Excellent performance in humid environments
- Lightweight and easy to install
- Fully incinerable
- Superior durability
- Reduced energy costs
- Made in USA



Double-walled cross sectional support adds reinforced strength to the filter.

The VariCel VXLS filter is an 8-panel high efficiency filter designed for use in commercial and industrial HVAC installations. The filter delivers the desired air quality when used in systems with difficult operating conditions, such as turbulent airflow, repeated fan shutdown, or high humidity. The performance of the VariCel VXLS filter is not affected by difficult operating conditions, as it maintains a steady pressure drop throughout the life of the filter. The low initial resistance of the VariCel VXLS filter means less energy is required to maintain airflow.

Construction

The header and cell sides provide a sturdy construction that resists damage during shipping, handling, and operation. Constructed of plastic, the VariCel VXLS filter is fully incinerable and rust free. The media packs are sealed to the frame with polyurethane sealant.

Durable Self-Supported Media

The VariCel VXLS filter employs a highly uniform and durable media that helps resist tearing, abrasion, and handling damage. The gradient density construction offers low resistance to airflow and higher dust holding capacity than competing grades of synthetic media. The media is heat set during the pleating process, resulting in V-shaped pleats in a self-supported media pack.

Specifications

Maximum Operating Temperature: 176˚F/80˚C

Media: Gradient density synthetic composite formed into pleats.

Cell Sides: The molded end panels are made of high impact polystyrene (HIPS). The extruded vertical components are made of acrylonitrile butadiene styrene (ABS).

Sealant: Polyurethane

Underwriters Laboratories Classification: UL Classified. Testing was performed according to UL Standard 900.

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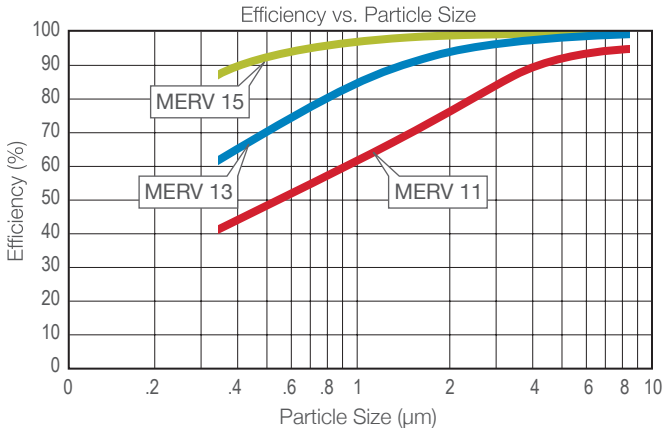
VariCel® VXLS Filters

Product Information

Sizes (Inches) (W x H x D)	Actual Sizes (Inches) (W x H x D)	Rated Airflow Capacity (SCFM)			Media Area (sq. ft.)
		Low	Med	High	
24 x 12 x 12	23⅜ x 11⅜ x 11½	600	1,000	1,250	65
24 x 20 x 12	23⅜ x 19⅜ x 11½	1,000	1,650	2,100	120
24 x 24 x 12	23⅜ x 23⅜ x 11½	1,200	2,000	2,500	145

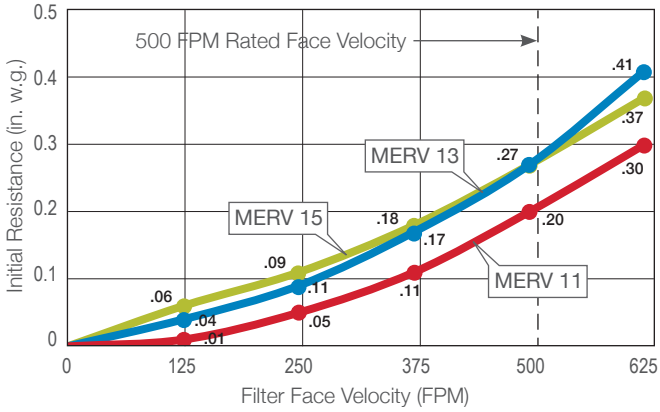
Performance Data

Composite Minimum Efficiency Curve



Tested in accordance with ASHRAE Standard 52.2.

Initial Resistance vs. Filter Face Velocity



Recommended final resistance for all VariCel® VXLS filters is 1.5 in. w.g.* VariCel VXLS filters can be operated to 2.0 in. w.g.

**Significant energy savings may be realized by operating the VariCel VXLS filter to a lower final resistance. Contact your local AAF representative for a Total Cost of Ownership (TCO) analysis for your specific application.*

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888.223.2003 Fax 888.223.6500 I aafintl.com

ISO Certified Firm AFP-1-163C 12/23

FACTORY FAN VIBRATION TEST

Fans and motors will be dynamically balanced to exceed a BV-4 criterion as per AMCA 204-96. The test will be conducted after the fan and motor base assembly has been completed.

The required measurement points are as follows: one horizontal measurement and one vertical measurement shall be taken for each fan and motor bearing and one axial measurement shall be taken for each shaft. The measurements will be taken using calibrated, magnetically mounted accelerometers and a calibrated measuring instrument.

Vibration measurement locations will be as close as possible to the bearing or shaft centerlines. Measurements will be taken from the bearing housings, bearing pedestals, or motor casings.

Fans and motors will be tested at the design RPM and the maximum overall filter-in vibration levels at each measurement point will be less than or equal to 0.15 in/sec peak velocity at the operating speed. If any measurements exceed the above criterion, the assembly will be rebalanced and re-tested until the criterion is achieved.

The result of the test will be certified by Haakon.

PRODUCT NOTE

Critical Cooling motors

Highest reliability with lifetime motor bearing protection

Baldor-Reliance® Critical Cooling motors are ideal for variable speed applications where downtime is not an option. Specially designed hybrid ceramic bearings offer a lifetime warranty against motor bearing failure caused by shaft currents.

BALDOR • RELIANCE

Features:

- Lifetime warranty on motor bearings against shaft currents caused by VFDs
- TEAO and TEFC enclosures
- Hybrid ceramic ball bearings on both motor ends
- IP54 ingress protection
- Turndown ratio 20:1 variable torque
- Induction rotor for NEMA Premium® efficiency (IE3) or ultra premium efficiency (IE5+)
- NEMA Design A
- Multi-color leads for ease of connections
- Suitable for inverter use per MG1 Part 31.4.4.2
- Designed for longevity with 5-year warranty

Applications:

The Baldor-Reliance Critical Cooling motor is best suited for direct drive or belt-driven HVAC applications that utilize VFDs. Ideal for applications where stable temperature control and continuous operation are critical such as data centers, clean rooms, hospitals, and other commercial and industrial buildings.

★ ★ ★ ★ ★

Lifetime warranty
against bearing failure
from shaft currents

Energy efficient and reliable

Critical cooling motors are offered in two different rotor designs: (1) Induction rotor that meets NEMA Premium® efficiency (IE3) levels and (2) Ferrite Assisted Synchronous Reluctance, or FASR rotor, that is ultra-premium and achieves (IE5+) efficiency levels.

(1)

(2)

Critical cooling motor, 3 phase, TEFC, ultra premium efficiency (IE5+)

5 thru 20 Hp

Hp	Base speed RPM	C.H. speed RPM	NEMA frame	Enclosure	Catalog number	"C" dim.	Aprx. wt. (lb.)	Full load efficiency	Voltage	Full load amps
5	1800	4000	143T	TEFC	ECC101M0H5DF4	15.54	64	93.0%	230/460	10.4/5.2
		4000	182T	TEFC	ECC101M0H5EF4	16.54	68	93.7%	230/460	10.5/5.3
7.5	1800	4000	184T	TEFC	ECC101M0H7EF4	18.04	92	94.0%	230/460	17.5/8.8
		3000	213T	TEFC	ECC101M0H7FF4	17.89	105	94.0%	230/460	17.4/8.7
10	1800	3000	213T	TEFC	ECC101M0H10FF4	19.02	123	94.8%	230/460	22.0/11.0
15	1800	3000	215T	TEFC	ECC101M0H15FF4	21.96	168	95.6%	230/460	34.8/17.4
20	1800	3000	215T	TEFC	ECC101M4H20FF4	23.51	218	95.9%	460	21.6

Critical cooling motor, 3 phase, TEFC

1 thru 30 Hp

Hp	RPM	NEMA frame	Catalog number	"C" dim.	Aprx. wt. (lb.)	Full load efficiency	Voltage	Full load amps
1	1800	143T	HBEM3546T	12.31	30	85.5	230/460	1.5
		143T	HBEM3581T	12.54	55	85.5	230/460	1.5
	1200	145T	HBEM3556T	13.31	43	82.5	230/460	1.8
		145T	HBEM3582T	12.54	56	82.5	230/460	1.7
1-1/2	1800	145T	HBEM3554T	13.31	42	86.5	230/460	2.2
		145T	HBEM3584T	12.54	61	86.5	230/460	2.3
	1200	182T	HBEM3607T	16.54	76	87.5	230/460	2.4
		182T	HBEM3667T	15.24	99	87.5	230/460	2.5
2	1800	145T	HBEM3558T	13.31	42	86.5	230/460	2.9
		145T	HBEM3587T	12.54	62	86.5	230/460	2.9
	1200	184T	HBEM3614T	18.04	94	88.5	230/460	3.5
		184T	HBEM3664T	15.24	123	88.5	230/460	3.15
3	1800	182T	HBEM3611T	16.54	74	89.5	230/460	4.2
		182T	HBEM3661T	15.24	105	89.5	230/460	4.1
	1200	213T	HBEM3704T	19.01	135	89.5	230/460	4.6
		213T	HBEM3764T	18.45	211	89.5	230/460	4.5
5	1800	184T	HBEM3615T	18.04	92	89.5	230/460	6.7
		184T	HBEM3665T	15.24	115	89.5	230/460	6.6
	1200	215T	HBEM3708T	19.76	154	89.5	230/460	7.3
		215T	HBEM3768T	18.45	198	89.5	230/460	7.4
7-1/2	1800	213T	HBEM3710T	19.01	129	91.7	230/460	9.4
		213T	HBEM3770T	18.45	193	91.7	230/460	9.5
	1200	254T	HBEM2276T	23.3	281	91	230/460	11
10	1800	215T	HBEM3714T	20.51	156	91.7	230/460	12
		215T	HBEM3774T	18.45	232	91.7	230/460	12.2
	1200	256T	HBEM2332T	23.3	322	91	230/460	14.1
15	1800	254T	HBEM2333T	23.3	270	92.4	230/460	18.1
	1200	284T	HBEM4100T	27.76	369	91.7	230/460	21
20	1800	256T	HBEM2334T	23.3	295	93	230/460	24
	1200	286T	HBEM4102T	27.76	393	91.7	230/460	27
25	1800	284T	HBEM4103T	27.76	400	93.6	230/460	30
30	1800	286T	HBEM4104T	27.76	410	93.6	230/460	38

Cast iron frame

Critical cooling motor, 3 phase, TEAO

1 thru 30 Hp

Hp	RPM	NEMA frame	Catalog number	"C" dim.	Aprx. wt. (lb.)	Full load efficiency	Voltage	Full load amps
1	1800	143T	HBAO3581T	11.44	58	86.5	230/460	2.9
2	3600	145T	HBAO3586T	11.44	64	86.5	230/460	5.4
	1800	145T	HBAO3587T	11.44	64	86.5	230/460	5.7
3	3600	182T	HBAO3660T	13.89	95	89.5	230/460	7.5
	1800	182T	HBAO3661T	13.89	100	89.5	230/460	8.4
5	3600	184T	HBAO3663T	13.89	105	90.2	230/460	12
	1800	184T	HBAO3665T	13.89	120	90.2	230/460	13.7
7.5	3600	213T	HBAO3769T	16.88	173	91	230/460	19
	1800	213T	HBAO3770T	16.88	198	91.7	230/460	19
10	3600	215T	HBAO3771T	16.88	203	91.7	230/460	24
	1800	215T	HBAO3774T	16.88	231	92.4	230/460	26.3
15	3600	254T	HBAO2394T	20.75	239	91.7	230/460	34.4
	1800	254T	HBAO2333T	20.75	268	92.4	230/460	36.2
20	3600	256T	HBAO4106T	23.00	293	91	230/460	23
	1800	256T	HBAO2334T	23.00	293	93	230/460	24
25	3600	284T	HBAO4118T	25.63	378	91.7	230/460	29
	1800	286T	HBAO4103T	25.63	378	93.6	230/460	30
30	3600	286T	HBAO4108T	25.63	410	91.7	230/460	34
	1800	286T	HBAO4104T	25.63	410	93.6	230/460	38

Cast iron frame

ABB Motors and Mechanical Inc.
5711 R.S. Boreham, Jr. Street
Fort Smith, AR 72901
Ph: 1.479.646.4711

FL492 01.2022 Printshop 2,000

ALTERNATE MOTORS

BALDOR • RELIANCE

Customer information packet

HBEM2333T

44M 4P TEFC HOR 254T
Class - None
Division - Not Applicable

11/24/2025 1:07:10 PM

Specifications

Part detail

Revision	H
Type	AC
Mech. spec.	09T115
Base	
Status	PRD/A
Elec. spec.	09WGT597
Layout	09LYT115
Eff. date	12-06-2024
CD Diagram	CD0005
Poles	04
Leads	9#12
Proprietary	False
Created date	01-06-2022

Enclosure	TEFC
Insulation Class	H
Frame	254T
Inverter Code	Inverter Ready
Frame Material	Iron
KVA Code	H
Frequency	60.00 Hz
Lifting Lugs	Standard Lifting Lugs
Haz Area Class and Group	None
Locked Bearing Indicator	Locked Bearing
Haz Area Division	Not Applicable
Max Speed	2700 rpm
Motor Letter Type	Three Phase
Motor Lead Quantity/Wire Size	9 @ 12 AWG
Output @ Frequency	15.000 HP @ 60 HZ
Motor Lead Termination	Flying Leads
Phase	3
Motor Standards	NEMA
Synchronous Speed @ Frequency	1800 RPM @ 60 HZ
Motor Type	0944M
Voltage @ Frequency	460.0 V @ 60 HZ
Mounting Arrangement	F1
	230.0 V @ 60 HZ
Number of Poles	4
Agency Approvals	CURUSEEV
Overall Length	23.36 IN
	NEMA PREMIUM
Power Factor	83
	WEEE
Product Family	General Purpose
Ambient Temperature	40 °C
Pulley End Bearing Type	Sealed Bearing
Auxiliary Box	No Auxiliary Box
Pulley Face Code	Standard
Auxiliary Box Lead Termination	None
Pulley Shaft Indicator	Standard
Base Indicator	Rigid
Rodent Screen	None
Bearing Grease Type	Polyrex EM (-20F +300F)
RoHS Status	ROHS COMPLIANT
Blower	None
Service Factor	1.15
Current @ Voltage	36.200 A @ 230.0 V
Shaft Diameter	1.625 IN
	38.000 A @ 208.0 V
Shaft Ground Indicator	No Shaft Grounding
	18.100 A @ 460.0 V
Shaft Rotation	Reversible
Design Code	A
Shaft Slinger Indicator	Shaft Slinger
Drip Cover	No Drip Cover
Speed	1765 rpm
Duty Rating	CONT
Speed Code	Single Speed
Efficiency @ 100% Load	92.4 %
Starting Method	Direct on line
Electrically Isolated Bearing	Electrically Isolated Bearings
Thermal Device - Bearing	None
Feedback Device	NO FEEDBACK
Thermal Device - Winding	None
Front Shaft Indicator	None
Vibration Sensor Indicator	No Vibration Sensor
Heater Indicator	No Heater
Winding Thermal 1	None
High Voltage Full Load Amps	18.1 a
Winding Thermal 2	None

High Voltage Full Load Amps	18.1 a
Insulation Class	H
Inverter Code	Inverter Ready
KVA Code	H
Lifting Lugs	Standard Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Max Speed	2700 rpm
Motor Lead Quantity/Wire Size	9 @ 12 AWG
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	0944M
Mounting Arrangement	F1
Number of Poles	4
Overall Length	23.36 IN
Power Factor	83
Product Family	General Purpose
Pulley End Bearing Type	Sealed Bearing
Pulley Face Code	Standard
Pulley Shaft Indicator	Standard
Rodent Screen	None
RoHS Status	ROHS COMPLIANT
Service Factor	1.15
Shaft Diameter	1.625 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Shaft Slinger Indicator	Shaft Slinger
Speed	1765 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	None
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None

Nameplate

Part number	NP4312A01A01L	Description	Quantity
SA400713	CAT # SER	SA 09T 97G1 CC WGT LBS	1.000 ea
RA391883	SPEC RATING		1.000 ea
37FN3002B02		EXPN, PLASTIC, 7.50 OD, 1.503 ID	1.000 ea
09CB3003	HZ VOLTS AMPS RPM HP SF NEMA NOM. EFF	CB W/1.75" DIA LD HL - 37, 39, 307 & 309	1.000 ea
09GS10(		DUIT /16 T EXID	1.000 ea
51XW2520 2	PH CL CODE DES ENCL IP PF %	75, TAPT II, HEX W R SLTD	4.000 ea
WD1000B16	DE BRG ODE BRG	L70 TERMIN FRAME	1.000 ea
59XW2520G07	INV TYPE: VPWM SL HZ CHP TO	25-20X.44,H SER WSI PTIT N	1.000 ea
09EP1100A67	WK2 LB FT2 MAX RPM CT TO	E ATI	1.000 ea
HA3400A22	VT TO	STUD, 3 W-01 X 4.96 HEX	4.000 ea
HW1001		OCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW			1.000 ea
HW	V-R		1.000 ea
HA			1.000 ea
10X	4-20		4.000 ea
HW	OCK		4.000 ea
09E	END		1.000 ea
10X	/8-1		4.000 ea
HW1001A38		LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW4600B44	VR	V-RING SLINGER 1.500 X 1.810 X .28 VITON	1.000 ea
HA4054		SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 ea
09FH4000SP		309 FH - BLACK PRIMER	1.000 ea
XY3816A12		3/8-16 FINISHED NUT W/SERRATIONS	4.000 ea
HW1001A38		LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
09CB3501SP		CONDUIT BOX LID FOR 09CB3001 & 09CB3002	1.000 ea
09GS1013SP		GS FOR 09CB3501, 12CB1500 & 12CB1503 LID	1.000 ea
51XW2520A12		.25-20 X .75, TAPTITE II, HEX WSHR SLTD	2.000 ea
HW2501G25		KEY, 3/8 SQ X 2.875	1.000 ea
85XU0407S04		4X1/4 U DRIVE PIN STAINLESS	4.000 ea
MJ1000A02		XXON	0.080 lb

Part number	Description	Quantity
SA400713	SA 09T115T597G1	1.000 ea
RA391883	RA 09T115T597G1	1.000 ea
37FN3002B02	EXFN, PLASTIC, 7.50 OD, 1.503 ID	1.000 ea
09CB3003	CB W/1.75" DIA LD HL - 37, 39, 307 & 309	1.000 ea
09GS1000	GASKET-CONDUIT BOX, 1/16 THICK LEXIDE	1.000 ea
51XW2520A12	.25-20 X .75, TAPTITE II, HEX WSHR SLTD	4.000 ea
WD1000B16	T&B CX70TN OR L70P TERMINAL LUG	1.000 ea
59XW2520G07	.25-20X.44,HEX SER WSHR,TAPTITE 2,GREEN	1.000 ea
09EP1100A67	ENDPLATE, MACH	1.000 ea
HA3400A33	STUD- 3/8-16 X 4.96 HEX	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW5100A08	W3118-035 WVY WSHR (WB)	1.000 ea
HW4600B44	V-RING SLINGER 1.500 X 1.810 X .28 VITON	1.000 ea
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 ea
10XN2520K36	1/4-20 X 2.25" HX HD SCRWGRADE 5, ZINC P	4.000 ea
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	4.000 ea
09EP1101A44	PU ENDPLATE, MACH W/NO GREASER HOLES	1.000 ea
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW4600B44	V-RING SLINGER 1.500 X 1.810 X .28 VITON	1.000 ea
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 ea
09FH4000SP	309 FH - BLACK PRIMER	1.000 ea
XY3816A12	3/8-16 FINISHED NUT W/SERRATIONS	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
09CB3501SP	CONDUIT BOX LID FOR 09CB3001 & 09CB3002	1.000 ea
09GS1013SP	GS FOR 09CB3501, 12CB1500 & 12CB1503 LID	1.000 ea
51XW2520A12	.25-20 X .75, TAPTITE II, HEX WSHR SLTD	2.000 ea
HW2501G25	KEY, 3/8 SQ X 2.875	1.000 ea
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	4.000 ea
MJ1000A02	GREASE, POLYREX EM EXXON	0.080 lb
HW2500A25	WOODRUFF KEY USA #1008 #BLOW CARBON STEE	1.000 ea
MG1025B113	WILKOFAST, 789.55, CRITICAL COOL BLUE	0.070 ga
NP4312A01A01L	ALUM CRITICAL COOLING,CURUS,NEMA,WEEE,BA	1.000 ea

BALDOR • RELIANCE **CUSTOMER INFORMATION PACKET** HBEM233 GREASE, POLYREX EM E

HW2500A25	WOODRUFF KEY USA #1008 #BLOW CARBON STEE	1.000 ea
MG1025B113	WILKOFAST, 789.55, CRITICAL COOL BLUE	0.070 ga
NP4312A01A01L	ALUM CRITICAL COOLING,CURUS,NEMA,WEEE,BA	1.000 ea
40PA1005	PACKAGING GROUP, 09 STD	1.000 ea
MN416A01	TAG-INSTAL-MAINT no wire (2400 bx)4/22	1.000 ea
LD7020D09	LEAD SET, 12AWG, 9 LEAD, 20" LONG LEADS	1.000 ea
LB1620	MYLAR LABEL, LIFETIME WARRANTY (LB1315)	1.000 ea
LB1624	COMBINED WARNING LABEL, ISO/ANSI PICTOGR	1.000 ea

AC Induction Motor Performance Data
Record # 86504
Preliminary Data Sheet

Winding: 09WGT597-R002	**Type:** 0944M	**Enclosure:** TEFC

Nameplate Data				**460 V, 60 Hz: High Voltage Connection**	
Rated Output (HP)			15	**Full Load Torque**	44.5 LB-FT
Volts			230/460	**Start Configuration**	direct on line
Full Load Amps			36.2/18.1	**Breakdown Torque**	154 LB-FT
R.P.M.			1765	**Pull-up Torque**	67.2 LB-FT
Hz	60	**Phase**	3	**Locked-rotor Torque**	83.5 LB-FT
NEMA Design Code	A	**KVA Code**	H	**Starting Current**	129 A
Service Factor (S.F.)			1.15	**No-load Current**	7.32 A
NEMA Nom. Eff.	92.4	**Power Factor**	84	**Line-line Res. @ 25ºC**	0.57 Ω
Rating - Duty			40C AMB-CONT	**Temp. Rise @ Rated Load**	52°C
S.F. Amps			41.0/20.5	**Temp. Rise @ S.F. Load**	64°C
				Locked-rotor Power Factor	33.3
				Rotor inertia	1.92 lb-ft²

Load Characteristics 460 V, 60 Hz, 15 HP

% of Rated Load	**25**	**50**	**75**	**100**	**125**	**150**	**S.F.**
Power Factor	48	70	79	84	86	87	86
Efficiency	87.3	91.8	92.8	92.3	91.6	90.7	91.9
Speed	1792	1785	1777	1768	1759	1749	1761
Line amperes	8.45	11	14.3	18.1	22.2	26.7	20.5

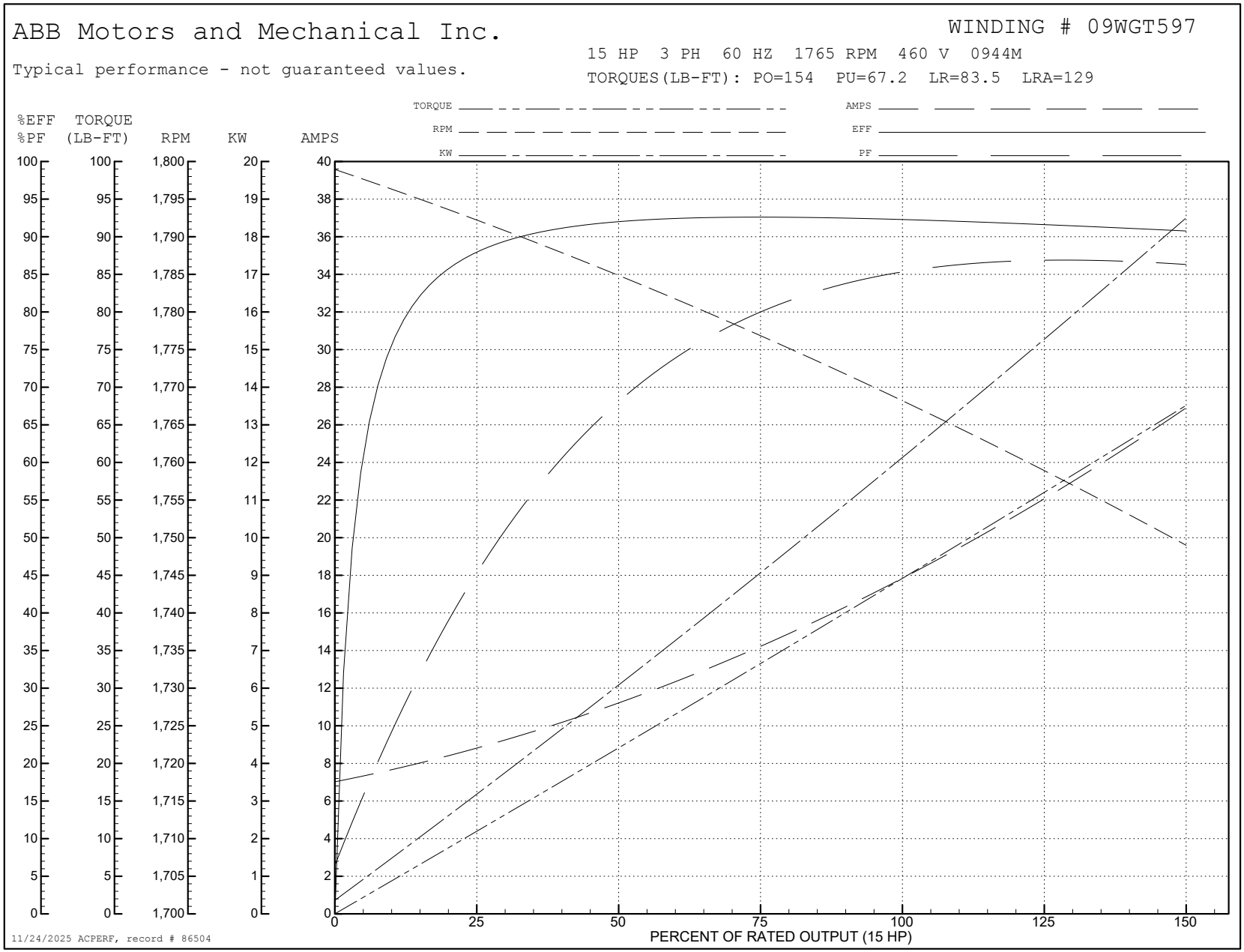
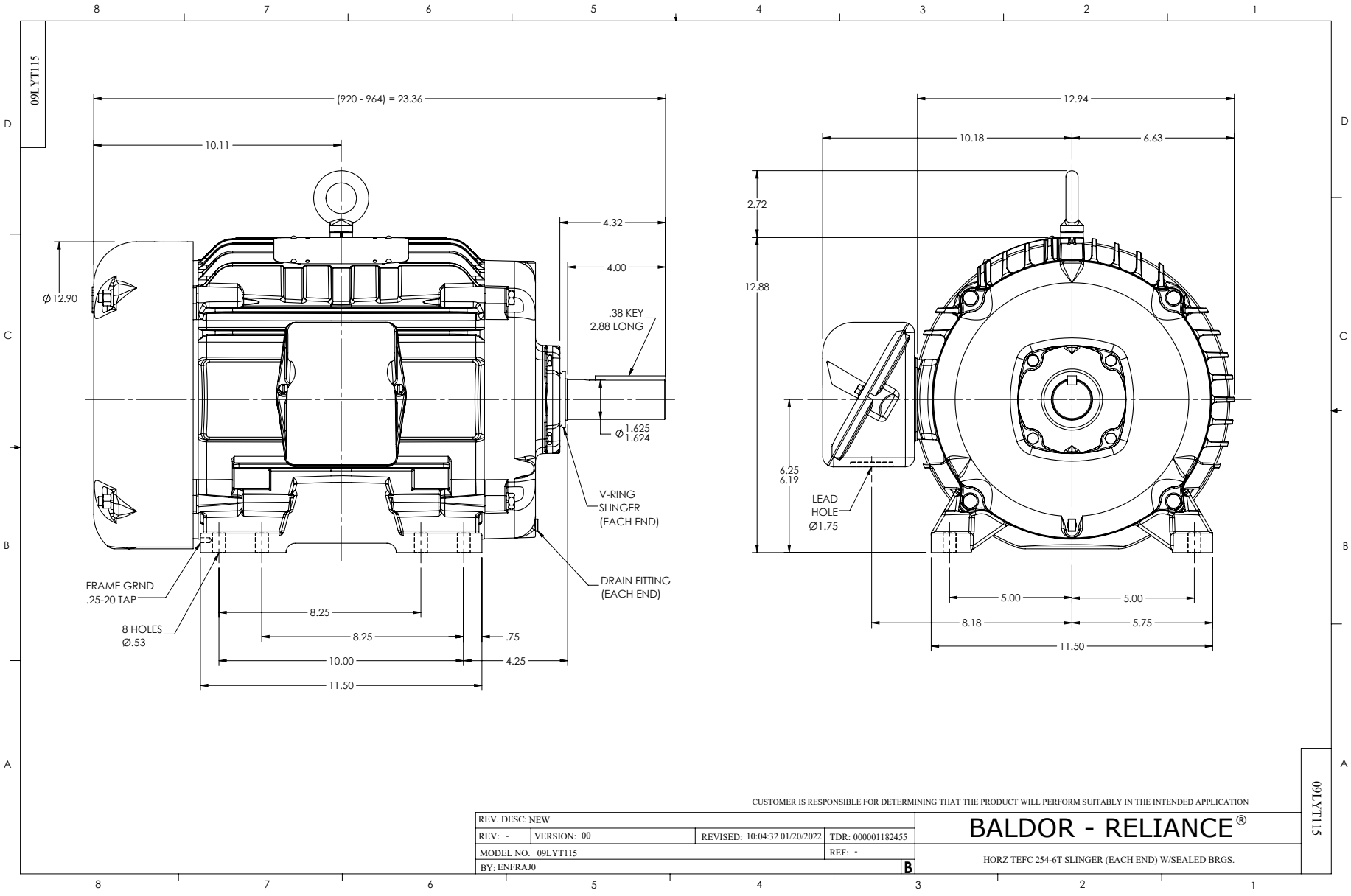


ABB Motors and Mechanical Inc.
WINDING # 09WGT597
15 HP 3 PH 60 HZ 1765 RPM 460 V 0944M
Typical performance - not guaranteed values.
TORQUES(LB-FT): PO=154 PU=67.2 LR=83.5 LRA=129
TORQUE
RPM
KW
AMPS
EFF
PF
%EFF
%PF
TORQUE (LB-FT)
RPM
KW
AMPS
PERCENT OF RATED OUTPUT (15 HP)
11/24/2025 ACPERF, record # 86504


09LYT115
(920 - 964) = 23.36
10.11
4.32
4.00
Ø 12.90
.38 KEY
2.88 LONG
Ø 1.625
1.624
V-RING
SLINGER
(EACH END)
DRAIN FITTING
(EACH END)
FRAME GRND
.25-20 TAP
8 HOLES
Ø.53
8.25
8.25
.75
10.00
4.25
11.50
12.94
10.18
6.63
2.72
12.88
6.25
6.19
LEAD
HOLE
Ø1.75
5.00
5.00
8.18
5.75
11.50
CUSTOMER IS RESPONSIBLE FOR DETERMINING THAT THE PRODUCT WILL PERFORM SUITABLY IN THE INTENDED APPLICATION
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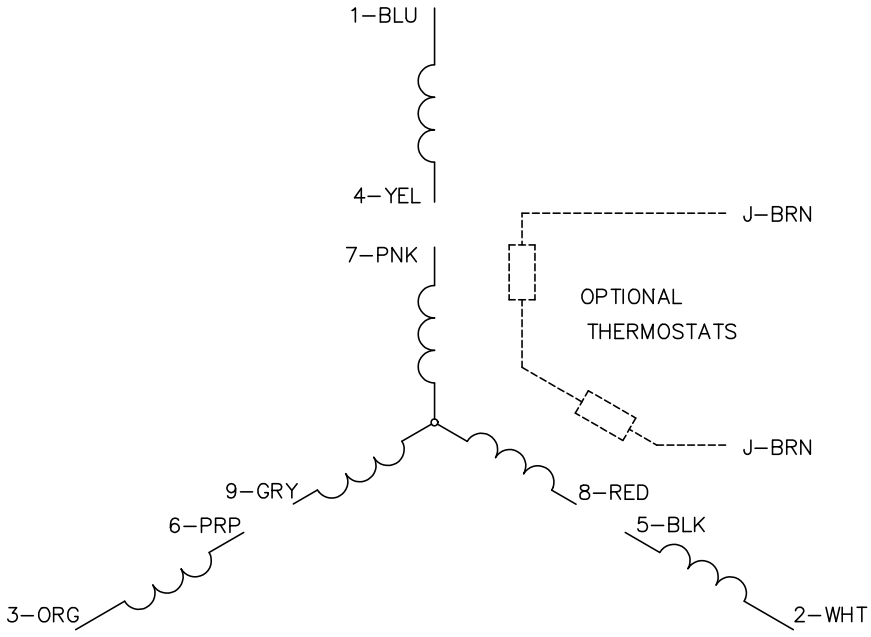
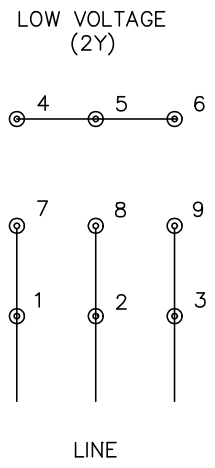
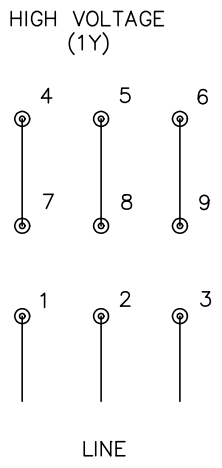
MODEL NO. 09LYT115 REF: -
BY: ENFRAJ0 B
BALDOR - RELIANCE®
HORZ TEFC 254-6T SLINGER (EACH END) W/SEALED BRGS.
09LYT115

CD0005







NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

Marketing maintained PDF of MN416:

http://www.baldor.com/support/Literature/Load.ashx/MN416?ManNumber=MN416

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Customer information packet

HBEM2333T

44M 4P TEFC HOR 254T
Class - None
Division - Not Applicable

11/24/2025 1:07:10 PM

Specifications

Enclosure	TEFC
Frame	254T
Frame Material	Iron
Frequency	60.00 Hz
Haz Area Class and Group	None
Haz Area Division	Not Applicable
Motor Letter Type	Three Phase
Output @ Frequency	15.000 HP @ 60 HZ
Phase	3
Synchronous Speed @ Frequency	1800 RPM @ 60 HZ
Voltage @ Frequency	460.0 V @ 60 HZ
	230.0 V @ 60 HZ
Agency Approvals	CURUSEEV
	NEMA PREMIUM
	WEEE
Ambient Temperature	40 °C
Auxillary Box	No Auxillary Box
Auxillary Box Lead Termination	None
Base Indicator	Rigid
Bearing Grease Type	Polyrex EM (-20F +300F)
Blower	None
Current @ Voltage	36.200 A @ 230.0 V
	38.000 A @ 208.0 V
	18.100 A @ 460.0 V
Design Code	A
Drip Cover	No Drip Cover
Duty Rating	CONT
Efficiency @ 100% Load	92.4 %
Electrically Isolated Bearing	Electrically Isolated Bearings
Feedback Device	NO FEEDBACK
Front Shaft Indicator	None
Heater Indicator	No Heater

Part detail

Revision	H
Type	AC
Mech. spec.	09T115
Base	
Status	PRD/A
Elec. spec.	09WGT597
Layout	09LYT115
Eff. date	12-06-2024
CD Diagram	CD0005
Poles	04
Leads	9#12
Proprietary	False
Created date	01-06-2022

High Voltage Full Load Amps	18.1 a
Insulation Class	H
Inverter Code	Inverter Ready
KVA Code	H
Lifting Lugs	Standard Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Max Speed	2700 rpm
Motor Lead Quantity/Wire Size	9 @ 12 AWG
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	0944M
Mounting Arrangement	F1
Number of Poles	4
Overall Length	23.36 IN
Power Factor	83
Product Family	General Purpose
Pulley End Bearing Type	Sealed Bearing
Pulley Face Code	Standard
Pulley Shaft Indicator	Standard
Rodent Screen	None
RoHS Status	ROHS COMPLIANT
Service Factor	1.15
Shaft Diameter	1.625 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Shaft Slinger Indicator	Shaft Slinger
Speed	1765 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	None
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None

Nameplate

NP4312A01A01L

CAT #	HBEM2333T	**SER**		**CC**	010A	**WGT**		**LBS**	
SPEC	09T115T597G1	**RATING**	40C AMB-CONT						
HZ	**VOLTS**	**AMPS**	**RPM**	**HP**	**SF**	**NEMA NOM. EFF**			
60	230/460	36.2/18.1	1765	15	1.15	92.4			
PH 3	**CL** H	**CODE** H	**DES** A	**ENCL** TEFC	**IP** 54	**PF** 83	**%**		
DE BRG	6309	**ODE BRG**	6208	**FRAME**	254T				
INV TYPE:	**VPWM**	**SL HZ**	1.17	**CHP**	60	**TO**	90	1.5:1	
WK2	1.93	**LB FT2**	**MAX RPM**	2700	**CT**	6	**TO**	60	10:1
14.6/7.3		**VT**	3	**TO**	60	20:1			
SFA 41.2/20.6									
YR									

Parts list

Part number	Description	Quantity
SA400713	SA 09T115T597G1	1.000 ea
RA391883	RA 09T115T597G1	1.000 ea
37FN3002B02	EXFN, PLASTIC, 7.50 OD, 1.503 ID	1.000 ea
09CB3003	CB W/1.75" DIA LD HL - 37, 39, 307 & 309	1.000 ea
09GS1000	GASKET-CONDUIT BOX, 1/16 THICK LEXIDE	1.000 ea
51XW2520A12	.25-20 X .75, TAPTITE II, HEX WSHR SLTD	4.000 ea
WD1000B16	T&B CX70TN OR L70P TERMINAL LUG	1.000 ea
59XW2520G07	.25-20X.44,HEX SER WSHR,TAPTITE 2,GREEN	1.000 ea
09EP1100A67	ENDPLATE, MACH	1.000 ea
HA3400A33	STUD- 3/8-16 X 4.96 HEX	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW5100A08	W3118-035 WVY WSHR (WB)	1.000 ea
HW4600B44	V-RING SLINGER 1.500 X 1.810 X .28 VITON	1.000 ea
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 ea
10XN2520K36	1/4-20 X 2.25" HX HD SCRWGRADE 5, ZINC P	4.000 ea
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	4.000 ea
09EP1101A44	PU ENDPLATE, MACH W/NO GREASER HOLES	1.000 ea
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
HW4600B44	V-RING SLINGER 1.500 X 1.810 X .28 VITON	1.000 ea
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 ea
09FH4000SP	309 FH - BLACK PRIMER	1.000 ea
XY3816A12	3/8-16 FINISHED NUT W/SERRATIONS	4.000 ea
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 ea
09CB3501SP	CONDUIT BOX LID FOR 09CB3001 & 09CB3002	1.000 ea
09GS1013SP	GS FOR 09CB3501, 12CB1500 & 12CB1503 LID	1.000 ea
51XW2520A12	.25-20 X .75, TAPTITE II, HEX WSHR SLTD	2.000 ea
HW2501G25	KEY, 3/8 SQ X 2.875	1.000 ea
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	4.000 ea
MJ1000A02	GREASE, POLYREX EM EXXON	0.080 lb
HW2500A25	WOODRUFF KEY USA #1008 #BLOW CARBON STEE	1.000 ea

MG1025B113	WILKOFAST, 789.55, CRITICAL COOL BLUE	0.070 ga
NP4312A01A01L	ALUM CRITICAL COOLING,CURUS,NEMA,WEEE,BA	1.000 ea
40PA1005	PACKAGING GROUP, 09 STD	1.000 ea
MN416A01	TAG-INSTAL-MAINT no wire (2400 bx)4/22	1.000 ea
LD7020D09	LEAD SET, 12AWG, 9 LEAD, 20" LONG LEADS	1.000 ea
LB1620	MYLAR LABEL, LIFETIME WARRANTY (LB1315)	1.000 ea
LB1624	COMBINED WARNING LABEL, ISO/ANSI PICTOGR	1.000 ea

AC Induction Motor Performance Data
Record # 86504
Preliminary Data Sheet

Winding: 09WGT597-R002	**Type:** 0944M	**Enclosure:** TEFC

Nameplate Data				**460 V, 60 Hz: High Voltage Connection**	
Rated Output (HP)			15	**Full Load Torque**	44.5 LB-FT
Volts			230/460	**Start Configuration**	direct on line
Full Load Amps			36.2/18.1	**Breakdown Torque**	154 LB-FT
R.P.M.			1765	**Pull-up Torque**	67.2 LB-FT
Hz	60	**Phase**	3	**Locked-rotor Torque**	83.5 LB-FT
NEMA Design Code	A	**KVA Code**	H	**Starting Current**	129 A
Service Factor (S.F.)			1.15	**No-load Current**	7.32 A
NEMA Nom. Eff.	92.4	**Power Factor**	84	**Line-line Res. @ 25ºC**	0.57 Ω
Rating - Duty			40C AMB-CONT	**Temp. Rise @ Rated Load**	52°C
S.F. Amps			41.0/20.5	**Temp. Rise @ S.F. Load**	64°C
				Locked-rotor Power Factor	33.3
				Rotor inertia	1.92 lb-ft²

Load Characteristics 460 V, 60 Hz, 15 HP

% of Rated Load	**25**	**50**	**75**	**100**	**125**	**150**	**S.F.**
Power Factor	48	70	79	84	86	87	86
Efficiency	87.3	91.8	92.8	92.3	91.6	90.7	91.9
Speed	1792	1785	1777	1768	1759	1749	1761
Line amperes	8.45	11	14.3	18.1	22.2	26.7	20.5

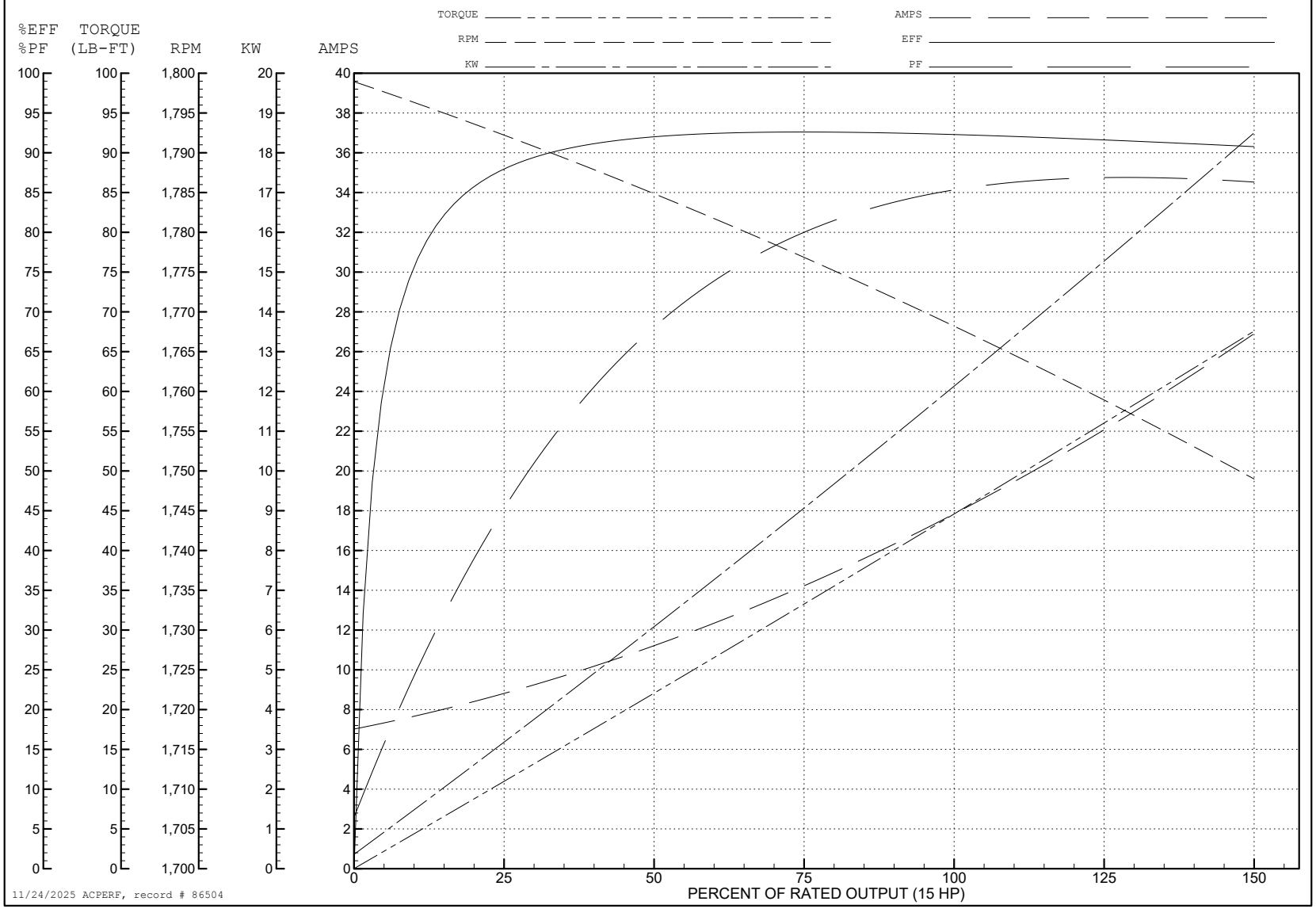
ABB Motors and Mechanical Inc.

WINDING # 09WGT597

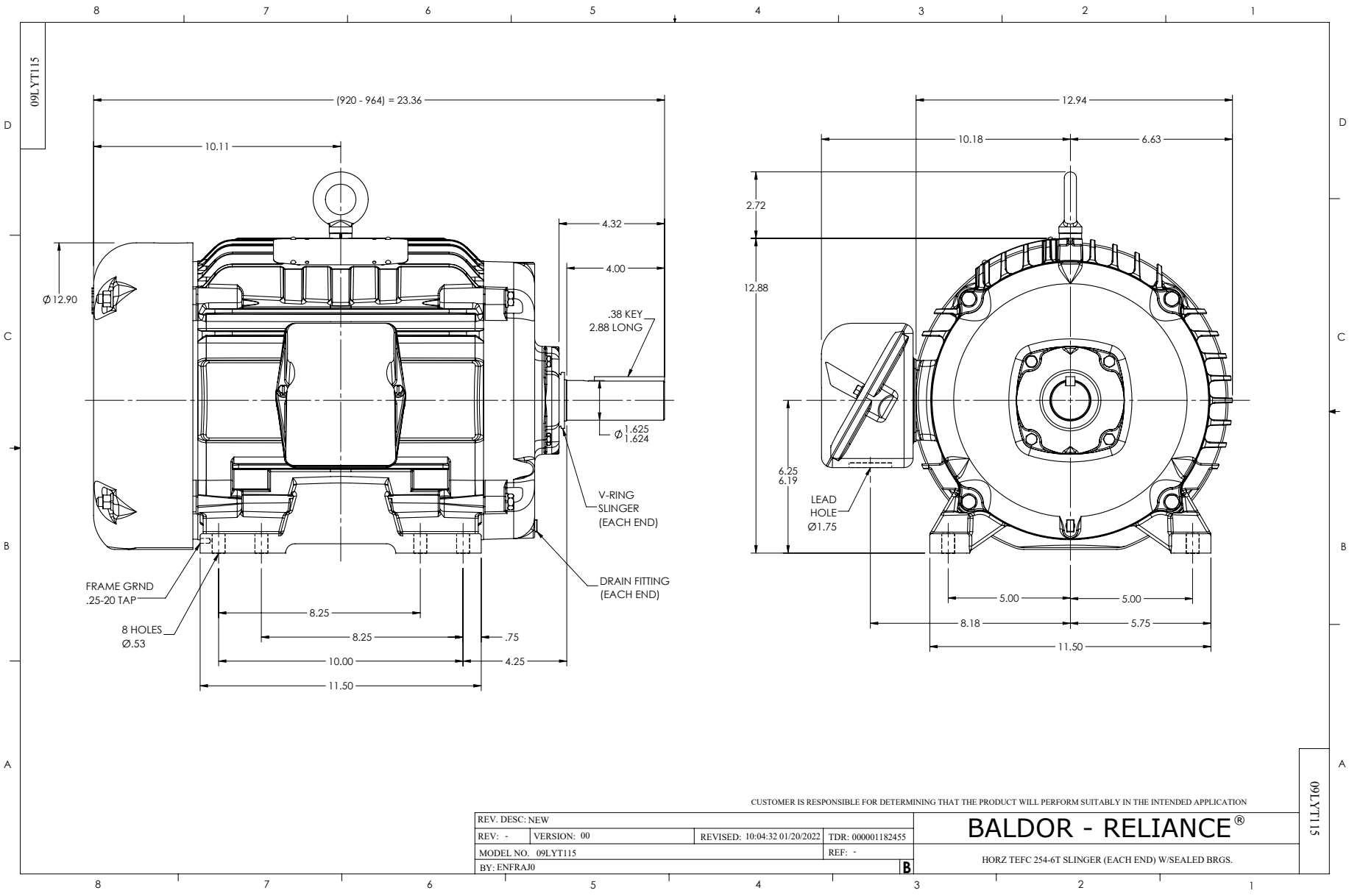
15 HP 3 PH 60 HZ 1765 RPM 460 V 0944M

Typical performance - not guaranteed values.

TORQUES(LB-FT): PO=154 PU=67.2 LR=83.5 LRA=129



11/24/2025 ACPERF, record # 86504


09LYT115
(920 - 964) = 23.36
10.11
4.32
4.00
Ø 12.90
.38 KEY
2.88 LONG
Ø 1.625
1.624
V-RING
SLINGER
(EACH END)
DRAIN FITTING
(EACH END)
FRAME GRND
.25-20 TAP
8 HOLES
Ø.53
8.25
8.25
.75
10.00
4.25
11.50
12.94
10.18
6.63
2.72
12.88
6.25
6.19
LEAD
HOLE
Ø1.75
5.00
5.00
8.18
5.75
11.50
CUSTOMER IS RESPONSIBLE FOR DETERMINING THAT THE PRODUCT WILL PERFORM SUITABLY IN THE INTENDED APPLICATION
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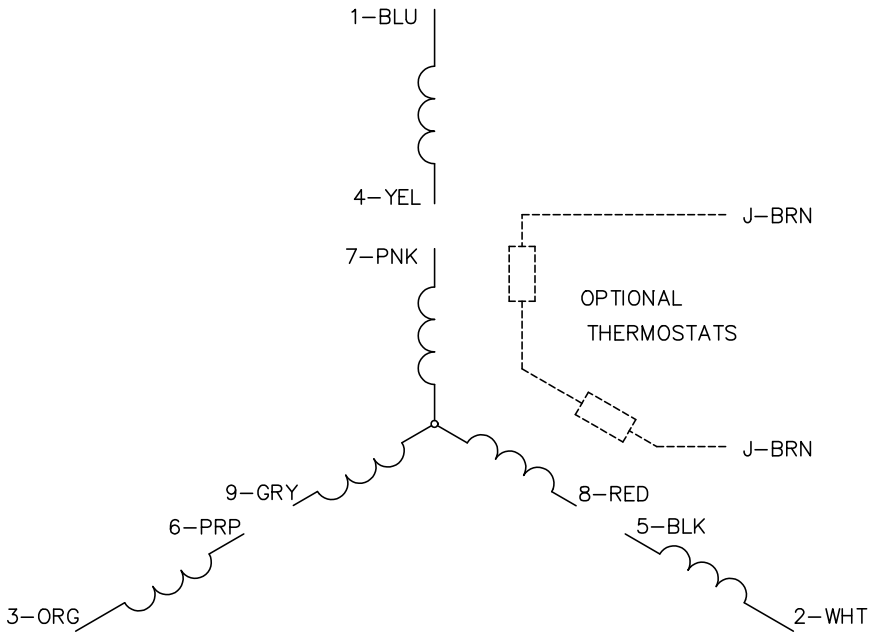
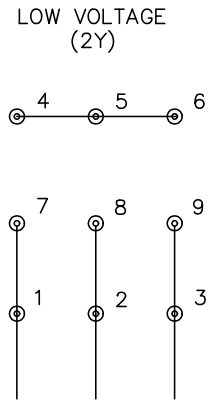
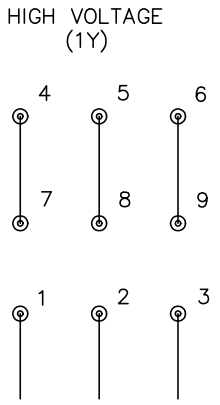
MODEL NO. 09LYT115 REF: -
BY: ENFRAJ0 B
BALDOR - RELIANCE®
HORZ TEFC 254-6T SLINGER (EACH END) W/SEALED BRGS.
09LYT115

CD0005







NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

CD0005

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			BALDOR ELECTRIC Co.
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
CD0005		FILE: AAA00005140	MDL: –
		MTL: –	3PH, DV, 9 LEADS

Marketing maintained PDF of MN416:

http://www.baldor.com/support/Literature/Load.ashx/MN416?ManNumber=MN416

BASEMENT INTERSTITIAL PLAN - HVAC

SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. FTR-1 SHALL BE 6' LG. / MBH EA. ON PERIMETER UNLESS OTHERWISE NOTED. SEE MISC. EQUIP. SCHEDULE FOR SIZE.
2. ALL DROPS TO RADIATION SHALL BE 1/2" FOR HS & HR.
3. FOR TYPICAL PIPING OF FTR SEE DETAIL B, SHT. #M-23.
4. FOR TYPICAL PIPING OF HEATING COIL SEE DETAIL A, SHT. #M-23.
5. THIS SYMBOL ⊣×⊢ INDICATES PIPE ANCHOR WHERE SHOWN.
6. THIS SYMBOL ⊣═⊢ INDICATES PIPE GUIDE WHERE SHOWN.
7. FOR DUCT SERVING SNORKELS SEE DETAIL 'H', SHT. #M-23.
8. FAN POWERED BOX COIL PIPING SHALL BE 1/2" FOR UNITS UP TO 1.25 GPM & 3/4" FOR UNITS FROM 1.3 GPM THRU 3.5 GPM.
9. FOR TYPICAL CABINET HEATER INSTALLATION SEE DETAIL 'C', SHT. #M-23.
10. CFH (CHEMICAL FUME HOOD) FOR TYPICAL SIZES OF EXH. DUCT, DAMPERS & GRILLES, SEE DETAIL G, SHT. #M-23.
11. TERMINAL BOXES D-09 & D-010 OMITTED.

NORTH

NUETRAL AIR COOLING COIL
NEUTRAL AIR REHEAT COIL

AS-BUILT
R.E. GRESCHEL, INC.

SCIENCE ENGINEERING TECHNOLOGY BUILDING PHASE II
INDIANA UNIVERSITY PURDUE UNIVERSITY @ INDIANAPOLIS

IUPUI
JOB NO. 855-2110

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R.E. DIMOND & ASSOCIATES, INC.

MECHANICAL & ELECTRICAL ENGINEER
STRUCTURAL ENGINEER
ASSOCIATE ARCHITECT

NO	DATE	DESCRIPTION
1	3/15/09	ISSUED FOR BIDS

SHEET: BASEMENT INTERSTITIAL PLAN — HVAC

M-4

BASEMENT FLOOR PLAN

NOT TO SCALE

AHU #

IN072–095–AHU0W–A

IN072–089–AHU0E–A

IUPUI
INDIANA UNIVERSITY- PURDUE UNIVERSITY INDIANAPOLIS

Campus Facility Services
Engineering

PHYSICAL PLANT
1220 WISHARD BLVD
INDIANAPOLIS, IN 46202

PROJECT TITLE:

ENG. SCIENCE TECHNOLOGY

SHEET TITLE:

BASEMENT FLOOR PLAN

REVISIONS:

DRAWN BY:	W.S. HIETT
CHECKED BY:	W.S.HIETT
DATE:	3/25/2016
CAD FILE NAME:	072-SL
BLDG. #:	072
CAMPUS:	IN

DRAWING NO.

M1

SHEET 1 OF 5 SHEETS