



SUBMITTAL RECORD

JOB NAME: LIVE OAKS AHU PRE PURCHASE **JOB NO:** DK9205(TS1132)
CUSTOMER: GREAT OAKS INSTITUTE OF TECH **ENGINEER:** MOTZ CONSULTING ENGINEERS
EngA MODEL: DJX100/HRW2400/O/MV **QTY:** 1 **TAG:** HV-1

SHIPPING AND APPROVAL INFORMATION

MOUNTING <u>Outdoor Base Mounted c/w Prefab Roof Curb</u>	ACCESS <u>As Per Drawing</u>
UNIT MINIMUM AMBIENT <u>-20°F</u>	SHIPPING WEIGHT <u>11800 lb</u>
NO. OF PIECES <u>3 (Unit + Curb + Hood)</u>	OPERATING WEIGHT <u>11900 lb</u>

- Intertek ETL_{us} approval.
- Operating weight includes prefab roof curb.

SUPPLY AIR DATA

AIR FLOW <u>15,520 CFM</u>	FAN SIZE (2) <u>222 Alum EPFN</u>	TSP <u>5.0 in w.c.</u>	RPM <u>1908</u>
MOTOR SIZE (2) <u>10 HP</u>	TYPE (RPM) <u>Super 'E' TEFC (1750)</u>	ESP <u>1.5 in w.c.</u>	BHP (2) <u>8.37 BHP</u>

- Each supply air fan/motor c/w spring vibration isolation, thrust restraint isolators, aluminum wheel, Piezometer ring and pressure transducer.
- Unit mounted ABB adjustable speed drive c/w integral DC link reactor and load reactor.
Adjustable speed drive is designed for constant volume air balancing controlled via 0-10VDC signal by others.
Adjustable speed drive is used for direct fan motor operation at 64.9 Hz under design conditions for the rated air flow.
- Greystone pressure transducers c/w individual 0-10VDC output signals for use by others.

EXHAUST AIR DATA

AIR FLOW <u>15,831 CFM</u>	FAN SIZE <u>See Below [1]</u>	TSP <u>2.8 in w.c.</u>	RPM <u>1355</u>
MOTOR SIZE (2) <u>6.7 HP</u>	TYPE (RPM) <u>See Below [2]</u>	ESP <u>1.0 in w.c.</u>	BHP (2) <u>5.3 BHP</u>

- [1] - (2) 25" GR63C-ZID.GQ.CR Cpro
- [2] - EC Blue 116183/A01 (1450 Direct Drive)
- Each exhaust air fan/motor c/w pressure taps, pressure transducer and 5.0kW EC motor controlled via 0-10VDC signal by others for constant volume air balancing only.
- Greystone pressure transducers c/w individual 0-10VDC output signals for use by others.
- Exhaust air data includes 831CFM purge. (ie. 15,000CFM + 831CFM purge = 15,831CFM)

AIR OPENING DATA

AIR OPENING	LOCATION	DAMPER TYPE	OPERATION
SUPPLY AIR	See Below [1]		
RECIRC AIR	See Below [1]	See Below [2]	Two Position
OUTSIDE AIR	See Below [1]	See Below [3]	Two Position
EXHAUST AIR	See Below [1]	See Below [2]	Two Position
RETURN AIR	See Below [1]		

- [1] - See Mechanical Drawing
- [2] - TAMCO Series 1000 Low Leakage Aluminum Air-foil Opposed Blade
- [3] - TAMCO Series 1000 Low Leakage Aluminum Air-foil Parallel Blade
- Flanged duct collar supplied on supply air opening.

CONSTRUCTION DATA

UNIT CABINET	<u>2" foam panel construction c/w 26 gauge satin coat galvanized interior sheet metal, 26 gauge satin coat galvanized exterior sheet metal and R16 polyurethane insulation on entire unit casing.</u>
UNIT UNDERSIDE	<u>22 gauge satin coat galvanized solid liner.</u>
UNIT FLOOR	<u>16 gauge satin coat galvanized sheet metal on entire unit floor.</u>



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EngA MODEL: DJX100/HRW2400/O/MV QTY: 1 TAG: HV-1

CONSTRUCTION DATA (CONTINUED)

EXTERIOR PAINT	Two component Epoxy c/w Polyurethane topcoat in Aluminum Gray color - Level 3 on all exterior surface but not including unit underside.
AIRSIDE DOOR	All access except positive pressure access - deluxe welded steel framed hinged c/w lever type door handles, 304 stainless steel piano hinge, double pane glass window, test port and bulb seal gasket. Positive pressure access - deluxe welded steel framed hinged c/w lever type door handles, 304 stainless steel piano hinge, door safety catch, double pane glass window, bulb seal gasket, test port and warning label.
SERVICE DOOR	All access - hinged c/w lever type door handles
DRAIN PAN	16 gauge G90 drain pan c/w drain connection through base frame on heat wheel supply and exhaust leaving sections.
	<ul style="list-style-type: none"> Unit to be built with: <ul style="list-style-type: none"> - 2" Spray foam insulation(R12) on unit underside Expanded steel grating over return air floor opening. EngA drainable weather louver(s) c/w 1" bird screen. Heat wheel : (1) HRW enthalpy wheel c/w AC motor (See attached performance data). Unit tag lamicoïd label on (3) sides of unit. 'S' lamicoïd label on supply end of unit.

ELECTRICAL DATA

CIRCUIT NO	POWER SUPPLY	MINIMUM CIRCUIT AMPACITY	MAXIMUM FUSE(D.E.)	MAXIMUM BREAKER
1	460 / 3 / 60	52.3 AMPS	70 AMPS	70 AMPS
2	120 / 1 / 60	12.0 AMPS	15 AMPS	15 AMPS

- See Electrical Data Sheet for details.
- Unit mounted non fused disconnect switch.
- MCA is based on '27' rated adjustable speed drive amps and installed supply motor amps are not used.
- (2) marine lights with 15 Watt LED screw in light bulb c/w an on/off switch with indicating light, 24V/72VA power supply for use by others and (1) 15A service receptacle unit mounted on unit exterior - 120V/1PH/ 60HZ power supply by others.
- 24" x 24" free space provided on the electrical panel for use by others.

OUTSIDE AIR PRE-FILTER SECTION DATA - Face Loaded

FILTER TYPE	Pleated Filter with MERV 8 rating c/w Type 8 Holding Frame		
QTY/SIZE	12 - 24 x 20 x 2"	QTY/SIZE	
TOTAL GROSS AREA	40.00 SQ.FT.	FACE VELOCITY	409 FPM @ 16351 CFM
	<ul style="list-style-type: none"> Filters may be shipped loose or mounted in the tracks 1 spare set of filters (filter metal frame not included) - shipped loose 		

OUTSIDE AIR FINAL FILTER SECTION DATA - Face Loaded

FILTER TYPE	Rigid Filter c/w header with MERV 14 rating c/w Type 8 Holding Frame		
QTY/SIZE	12 - 24 x 20 x 12"	QTY/SIZE	
TOTAL GROSS AREA	40.00 SQ.FT.	FACE VELOCITY	409 FPM @ 16351 CFM
	<ul style="list-style-type: none"> Filters may be shipped loose or mounted in the tracks 1 spare set of filters (filter metal frame not included) - shipped loose Dwyer series 2000 magnehelic gauge 0-2" wc across final filter section. 		



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RETURN AIR FILTER SECTION DATA - Face Loaded

FILTER TYPE <u>Pleated Filter with MERV 8 rating c/w Type 8 Holding Frame</u>	
QTY/SIZE <u>8 - 24 x 24 x 2"</u>	QTY/SIZE _____
TOTAL GROSS AREA <u>32.00 SQ.FT.</u>	FACE VELOCITY <u>469 FPM @ 15000 CFM</u>

- Filters may be shipped loose or mounted in the tracks
- 1 spare set of filters (filter metal frame not included) - shipped loose

BURNER HEATING DATA - INDIRECT FIRED (DJX-100)

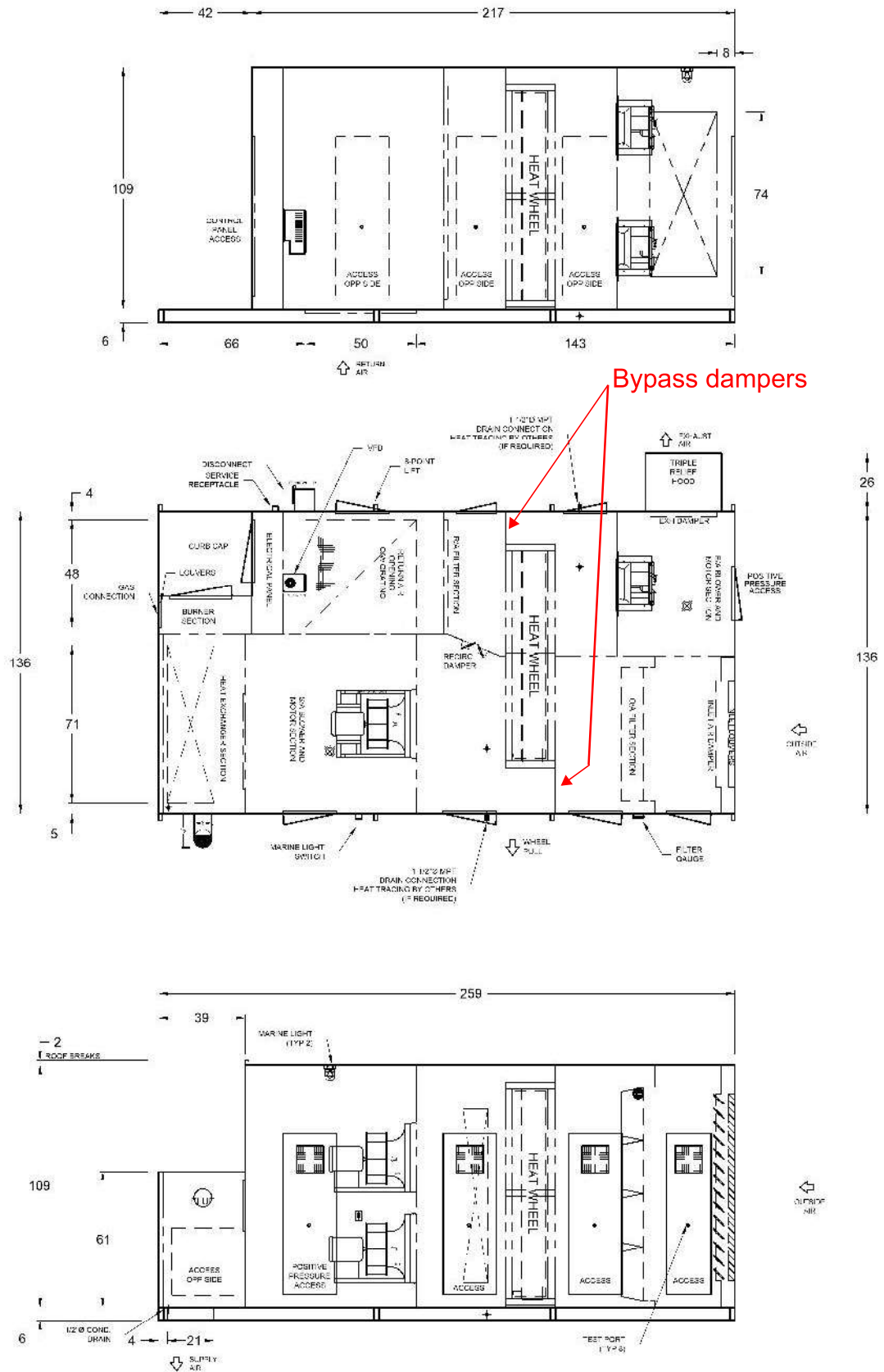
POWER BURNER <u>EngA 'HT' Series</u>	HEAT EXCH. MATERIAL <u>Stainless Steel</u>
FUEL <u>Natural Gas</u>	INLET PRESSURE <u>7 in wc.</u> GAS FIELD CONN. <u>1.25"</u>
HEAT INPUT <u>950,000 Btuh</u>	HEAT OUTPUT <u>865,000 Btuh</u> TEMP. RISE <u>52.0 °F</u>

- EngA (15 : 1) high turndown burner
- Three pass heat exchanger c/w condensate drain connection. Condensate drain piping must be fully piped to a suitable drain before starting unit.
- Heat exchanger section has 1" 1.5 lb/ft insulation with 22 gauge satin coat galvanized solid liner
- Modulating combustion air and gas control.
- F.M. conforming gas manifold.
- CENCON discharge air control c/w BMS interface.
- Wedge style vent.
- Discharge air low limit by others.
- Condensate drain connection is through curb. See roof curb drawing for detail.

SHIPPED LOOSE ITEMS (See filter sections for filters and spare filters)

- 1 - Pre fabricated roof curb (See drawing for details).
- 1 - Exhaust hood c/w 1" birdscreen.
- 1 - Wedge style vent.
- 1 - Condensate Neutralization Kit (NC-2)
- 1 - 42" Condensate drain pipe.
- 1 - 01CT-5LH Discharge Air Sensor

NOTES:
 1) RAIN SLUTTERS ON BOTH SIDES C/W DOWNSPUTS
 2) RLEING DAMPLER BALANCED TO LS: RAVILD 70" W.C. BT TO 02002 BT



Bypass dampers

DOOR SIZES AND INTERNAL COMPONENTS ARE APPROX. VALUES. DIMENSIONS SHOWN IN INCHES ONLY UNLESS OTHERWISE NOTED.

DK9205 (TS1132)
 TAG: HV-1

DJ SERIES



REVISIONS:
 DATE: APR 15 2021

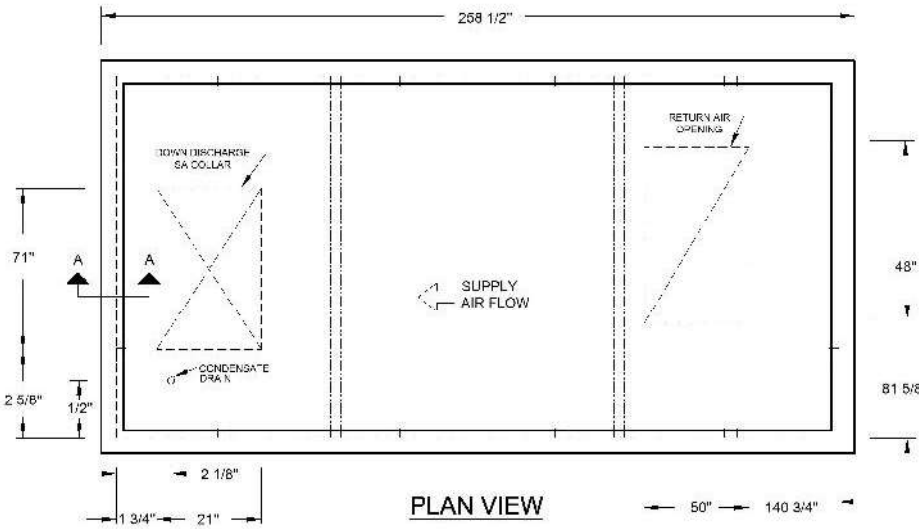
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CHKD BY: DMC

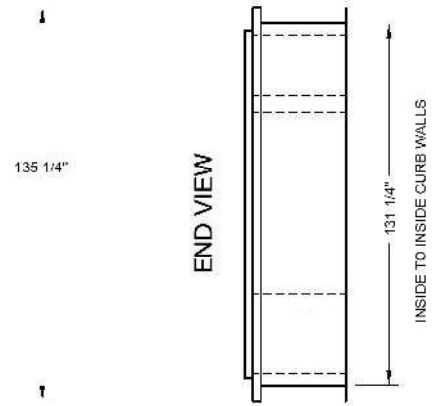
DRWG NO.: 09205M-21-1

GENERAL NOTES:

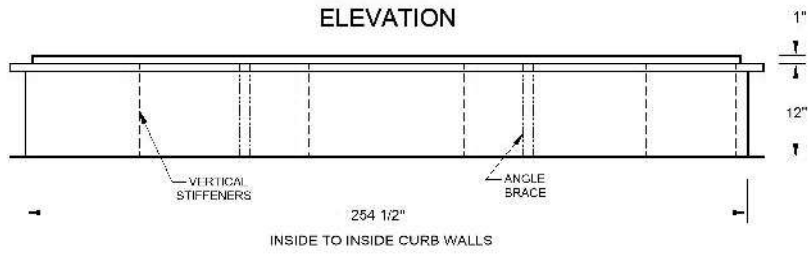
1. INCLUDE 3/8" X 1-1/2" NEOPRENE GASKET
2. CURB MAY BE BROKEN DOWN FOR SHIPPING. IN THESE CASES, FIELD ASSEMBLY WILL BE REQUIRED BY INSTALLING CONTRACTOR.
3. CONTINUOUS BASE SUPPORT TO CURB PANELS, INCLUDING THE CENTER SUPPORT PANEL IF SUPPLIED, IS REQUIRED BY OTHERS.
4. DIMENSIONS GIVEN IN INCHES ONLY
5. FOR CLARITY, DUCT-RAILS ARE SHOWN ON SEPARATE DRAWING. SEE DRAWING# 09205-C-21-2 FOR DETAILS



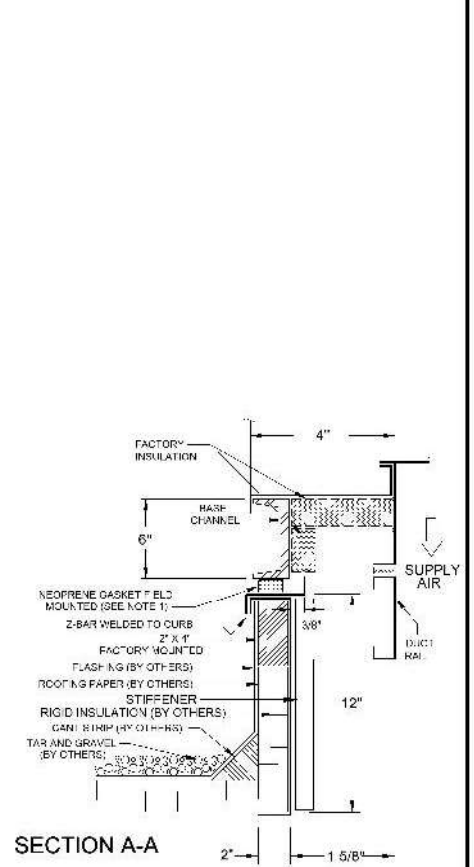
PLAN VIEW



END VIEW



ELEVATION



SECTION A-A

JOB# DK9205 (TS1132)
TAG: HV-1

DRAWING NOT TO SCALE

DJ SERIES
12" HIGH CURB FOR DOWN DISCHARGE UNIT



REVISIONS:
DATE: APR 20 2021

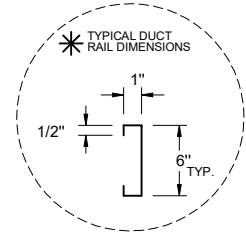
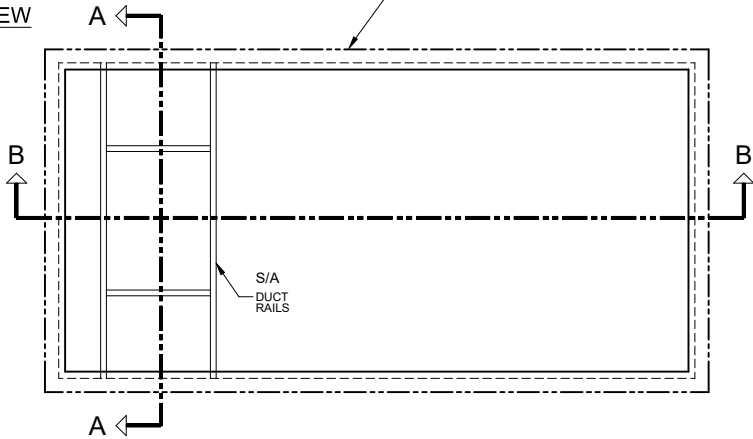
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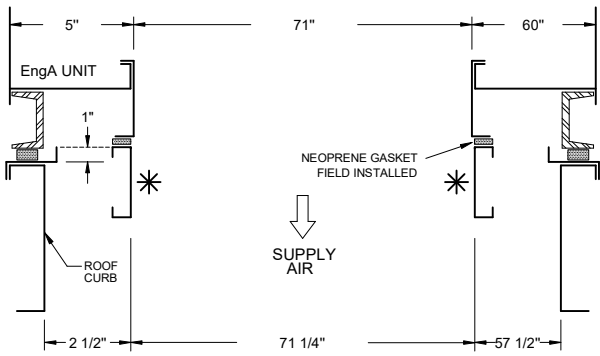
DRWG NO.: 09205-C-21-1

CURB OUTLINE IS ONLY SHOWN FOR LOCATING THE DUCT RAILS. AS SUCH THIS DRAWING DOES NOT INCLUDE ADDITIONAL DETAILS, SUCH AS A VESTIBULE ENCLOSURE (IF ANY), ETC. FOR FULL CURB DETAILS, SEE DRWG# 09205-C-21-1

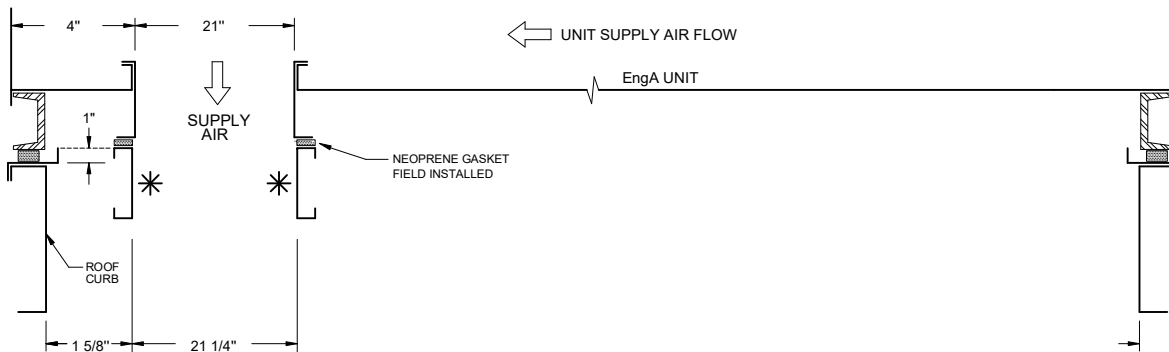
PLAN VIEW



SECTION A-A: SUPPLY AIR



SECTION B-B:



JOB# DK9205 (TS1132)
TAG: HV-1

DRAWING NOT TO SCALE

DJ SERIES
DUCT-RAIL DETAIL



REVISIONS:

DATE: APR 20 2021	DRWN BY: GAB	CHKD BY: DMC	DRWG NO.: 09205C-21-2
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ENTHALPY WHEEL PERFORMANCE DATA

Version 1.1.19

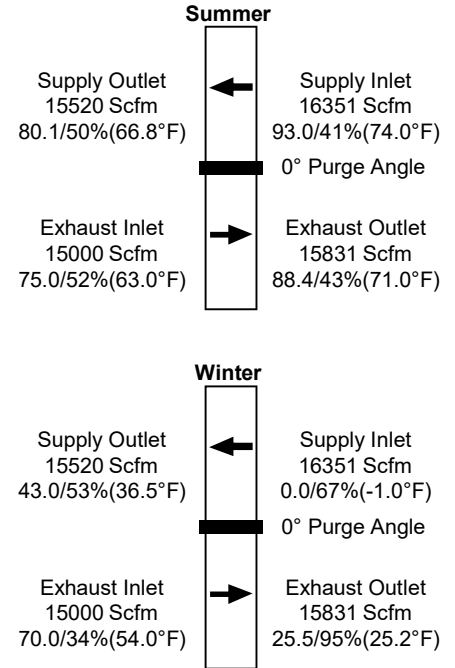
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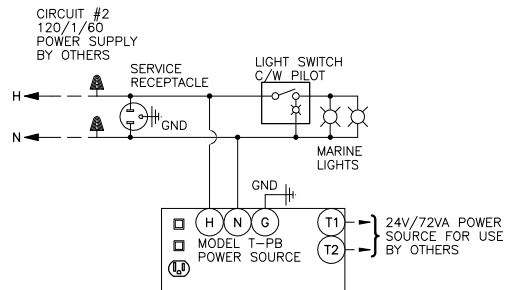
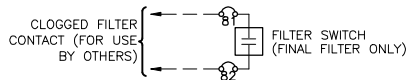
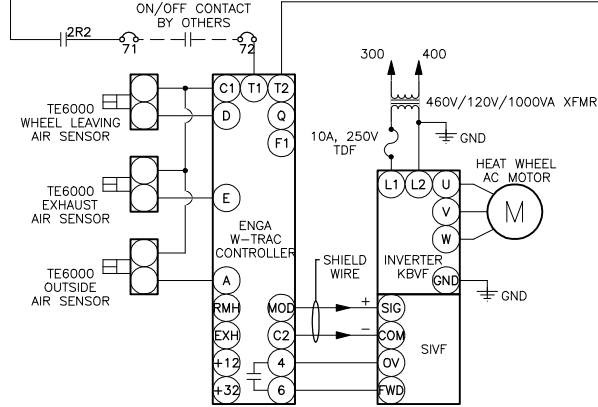
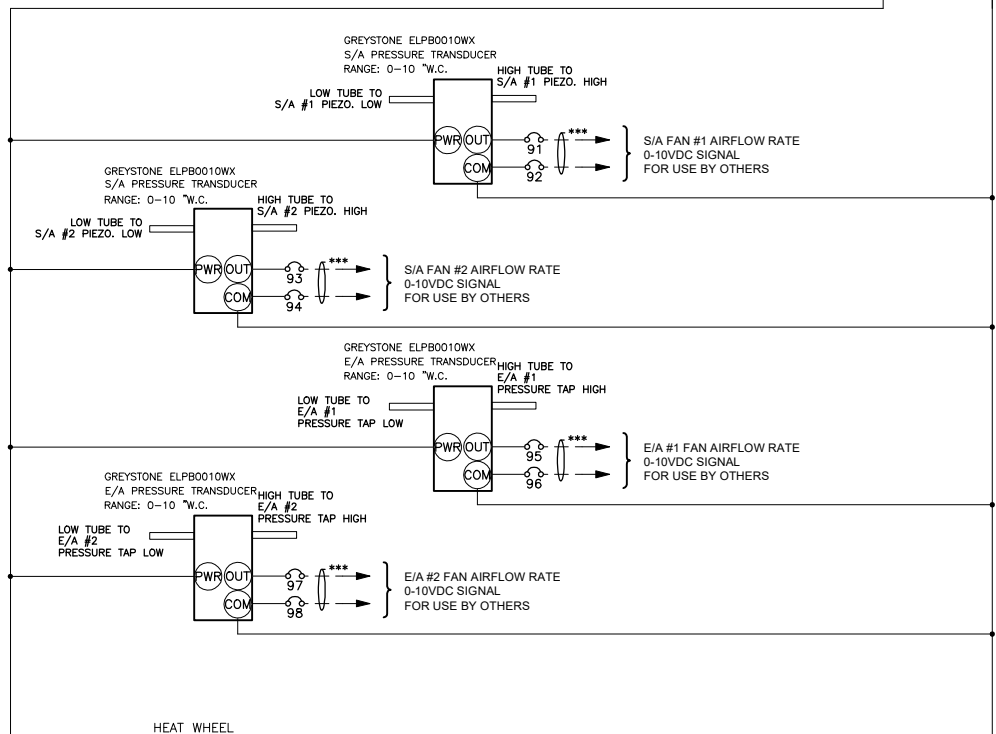
LOCATION: Cincinnati, OH **ALTITUDE:** 0 ft (.0 m)

EngA MODEL: DJX100/HRW2400/O/MV **QTY:** 1 **TAG:** HV-1

Enthalpy Wheel Selection Data - Model AEW10-2400 (Note 1)			
		Supply	Exhaust
Summer Design	Inlet Static Pressure	-1.5"Wc	-1.55"Wc
	Air Flow Through wheel	15520 Scfm Outlet	15000 Scfm Inlet
	Entering Temperature DB/RH(WB)	93.0/41%(74.0°F)	75.0/52%(63.0°F)
	Leaving Temperature DB/RH(WB)	80.1/50%(66.8°F)	88.4/43%(71.0°F)
	Air Pressure Drop	1.06"Wc	1.02"Wc
	Enthalpy/Sensible Recovery	432.74 / 216.30 Mbh	
	Moisture Removal	187.51 Lb/Hr	
	S/A Sensible/Total Efficiency	71.7 / 67.8%	
	ASHRAE Sensible/Latent Effectiveness	74.2 / 67.1%	
	EATR	9.8%	
	OACF	1.15	
	Net Supply Airflow	13999 Scfm	
	Winter Design (Note 2)	Inlet Static Pressure	-1.5"Wc
Air Flow Through wheel		15520 Scfm Outlet	15000 Scfm Inlet
Entering Temperature DB/RH(WB)		0.0/67%(-1.0°F)	70.0/34%(54.0°F)
Leaving Temperature DB/RH(WB)		43.0/53%(36.5°F)	25.5/95%(25.2°F)
Air Pressure Drop		0.93"Wc	0.95"Wc
Enthalpy/Sensible Recovery		912.53 / 720.21 Mbh	
Moisture Addition		176.6 Lb/Hr	
Frost Point		8.0°F	
ASHRAE Sensible/Latent Effectiveness		74.2 / 55.8%	
EATR		9.8%	
OACF		1.15	
Net Supply Airflow		13999 Scfm	



- Notes:
1. Energy recovery component is outside the scope of AHRI ERV certification program but is rated in accordance with ARI Standard 1060
 2. Wheel performance in the winter design section includes the effects of frost control.
 3. Values are under no frost condition



- * RED FEEDBACK CABLE HOOKED DIRECTLY TO MAIN GAS VALVE
- ** MOTOR GROUND WIRE TO BE SAME SIZE AS MOTOR WIRE
- *** SHIELDED WIRE IS REQUIRED WITH ELECTRONIC COMPONENTS.



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Circuit No	Power Supply	Minimum Circuit Ampacity	Terminal Block to Accept	Maximum Fuse (Dual Element)	Maximum Breaker
1	460 / 3 / 60	52.3 AMPS	6 Awg	70 AMPS	70 AMPS
2	120 / 1 / 60	12.0 AMPS	14 Awg	15 AMPS	15 AMPS

Components	Circuit No	Model	Minimum Conductor Size	Ampacity FLA / LRA	SubFuse Group	Subfuse Group Fuse Size	Terminal Block to Subfuse
Burner Motor(Xfmr)	1	PSC(Use Xfmr) 1/2 HP	14(14) Awg	8 @ 120/1/60			
Control Xfmr	1		14 Awg	2.2			
Main Control Xfmr	1		14 Awg	.8			
Supply Fan Motor #1 and #2	1	Super 'E' TEFC (1750) 10 HP	14 Awg	12.3	1	35	8 Awg
Motor VFD	1		10 Awg	27.0			
Exhaust Fan Motor #1 and #2	1	EC Blue 116183/A01 (1450 Direct Drive) 6.7 HP	14 Awg	6.2	2	20	14 Awg
Convenience Circuit	2		14 Awg	12.0			

UNIT CONTROL PANEL(S) SHORT CIRCUIT CURRENT RATING (SCCR)

Short circuit current 5 kA rms symmetrical, 460 V maximum

WIRING DRAWING LEGEND

APS	Air Proving Switch	DM	Damper Motor	NFD	Non Fused Disconnect
ASF	Auto Fan Switch	FR	Fan Relay	OL	Thermal Overload
AUX	Auxiliary Contact	GND	Ground	PS	Pressure Sensor
BM	Burner Motor	GV	Gas Valve	PV	Pilot Gas Valve
C	Contact	HL	High Limit	R	Relay
CCH	Compressor Crankcase Heater	HPC	High Pressure Control	RevHL	Reverse Airflow High Limit
CFC	Condenser Fan Control	HR	Heating Relay	TB	Terminal Block
CLC	Compressor Loading Control	IGN	Ignition Control	TDF	Time Delay Fuse
CPM	Compressor Protection Module	ITP	Internal Thermo Protection	TDR	Time Delay Relay
CR	Cooling Relay	LPC	Low Pressure Control	TS	Temperature Sensor
CS	Current Sensor	M	Motor	VFD	Variable Frequency Drive
DHSS	Draft Hood Spill Switch	MV	Main Gas Valve	XFMR	Transformer



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UNIT FUNCTION

Unit mounted non-fused disconnect switch 'on', service switch 'on', fire alarm contact (by others) 'closed' (jumper if not required), duct high pressure limit (by others) 'closed', VFD fault contact 'closed', EC fault contacts 'closed'.

Unit on/off contact (by others) 'closed' -and- occupied mode contact (by others) 'closed', outside air damper and exhaust air damper open, recirc damper closes. Blowers will delay on and run continuously. VFD and EC blower/motor speed control via separate 0-10VDC signals (by others). The CENCON controller, with a 0-10VDC reset signal (by others), will modulate heating to maintain the required discharge air temperature.

HEAT MODE

Heat on/off contact (by others) 'closed', the J-XM controller module will begin modulating the gas heating. The discharge air temperature will be reset proportionally from 55°F to 90°F as the reset signal (by others) increases from 0-10VDC.

Heat wheel on/off contact (by others) 'closed', heat wheel is enabled. The WTRAC controller, with an adjustable integral set point set at 55°F, will modulate the wheel rotation speed to maintain the heat wheel supply air leaving temperature. The heat/vent changeover will automatically switch between heating and venting modes as required. The WTRAC controller reduces wheel rotation speed in frost control mode to prevent frost formation.

(Open bypass dampers)

Unit on/off contact (by others) 'closed' -and- occupied mode contact (by others) 'open', outside air damper and exhaust air damper close, recirc damper opens. Heat wheel operation is disabled and exhaust air blowers shut down.

Unit on/off contact (by others) 'open', outside air and exhaust air dampers close, recirc damper opens, blowers shut down. Unit is off. If the fire alarm contact (by others) 'open' -or- duct high pressure limit (by others) 'open' -or- VFD fault contact 'open' -or- EC fault contacts 'open', equipment operation is disabled immediately.

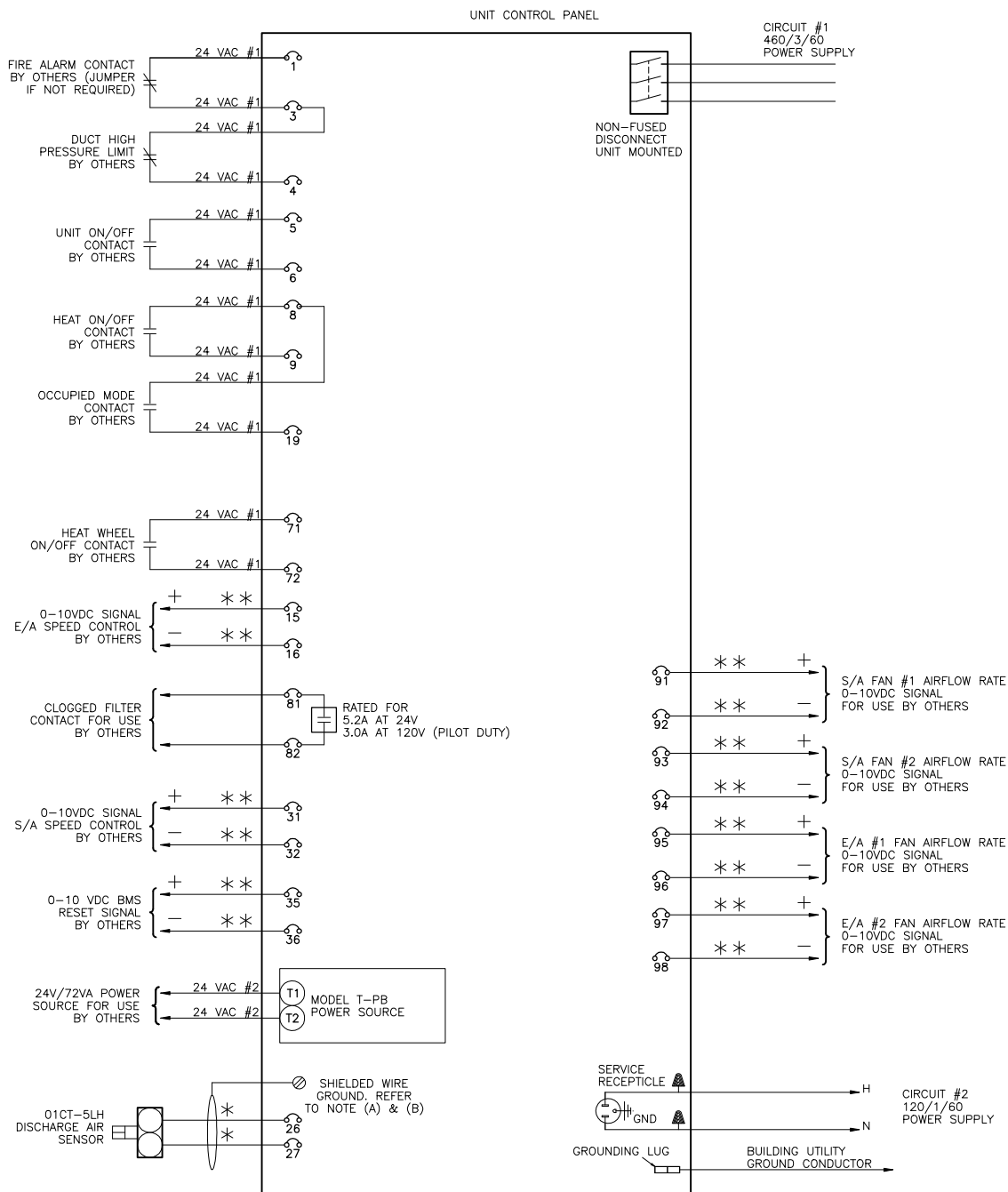
The CFM and BHP performance is based on the exhaust air fans running at 1355 RPM with an approximate 7.4 VDC control signal.

Note 1 - Refer to manuals shipped with unit for more detailed explanation of maintenance, components and controls.

Note 2 - Go to <http://www.engineeredair.com/index.php/manuals/> for online manual details

Note 3 - Discharge air low limit (by others).

Note 4 - Recirc damper balanced to estimated 1.0" W.C. at 15,520CFM.



MAXIMUM CONTROL CIRCUIT AMPACITY 10.41 AMPS AT 24 VAC #1

MAXIMUM CONTROL CIRCUIT AMPACITY 3 AMPS AT 24 VAC #2

- * SHIELDED WIRE IS REQUIRED WITH ELECTRONIC COMPONENTS.
- ** SHIELDED WIRE IS REQUIRED WITH BMS ANALOG SIGNALS.
- TAPE THE GROUND WIRE AND SHIELD TO PREVENT GROUNDING.
- TAPE THE ENDS OF ALL UNUSED WIRES.
- ANALOG BMS SIGNALS ARE SUBJECT TO GROUND LOOP INTERFERENCE.
- SIGNAL ISOLATION MAY BE REQUIRED.
- REFER TO THE OPERATION MANUAL OF THE SPECIFIC CONTROLLER.

- (A) SHIELDED WIRE TO BE GROUNDED AT MAIN ENG A CONTROL CABINET END ONLY.
TAPE OTHER END OF GROUND WIRE AND SHIELDING TO PREVENT GROUNDING.
TAPE THE ENDS OF ALL UNUSED WIRES.
- (B) ENGINEERED AIR STRONGLY RECOMMENDS THAT THE SHIPPED LOOSE DISCHARGE AIR SENSOR BE MOUNTED 5 - 10 FT. DOWN STREAM OF HEAT EXCHANGER OPENING TO AVOID TEMPERATURE SWING CAUSED BY RADIANT HEAT.

1. FIELD WIRING VOLTAGE DROP NOT TO EXCEED 10%.
2. ALL WIRING SHOWN SHALL BE COMPLETED BY INSTALLER.
3. ALL FIELD WIRING MUST COMPLY WITH ALL NATIONAL AND LOCAL ELECTRICAL CODES.



TAG: HV-1

FIELD WIRING DIAGRAM
DJ SERIES

REVISION:	DRN.BY: GAB	DWG.NO: 09205F-21-1
DATE: 4/19/2021	CHKD.BY: DMC	



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EngA MODEL: DJX100/HRW2400/O/MV **QTY:** 1 **TAG:** HV-2

SHIPPING AND APPROVAL INFORMATION

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UNIT MINIMUM AMBIENT <u>-20°F</u>	SHIPPING WEIGHT <u>11300 lb</u>
NO. OF PIECES <u>3 (Unit + Curb + Hood)</u>	OPERATING WEIGHT <u>11400 lb</u>

- Intertek ETL_{us} approval.
- Operating weight includes prefab roof curb.

SUPPLY AIR DATA

AIR FLOW <u>14,000 CFM</u>	FAN SIZE (2) <u>200 Alum EPFN</u>	TSP <u>4.7 in w.c.</u>	RPM <u>2210</u>
MOTOR SIZE (2) <u>10 HP</u>	TYPE (RPM) <u>Super 'E' TEFC (1750)</u>	ESP <u>1.5 in w.c.</u>	BHP (2) <u>7.53 BHP</u>

- Each supply air fan/motor c/w spring vibration isolation, thrust restraint isolators, aluminum wheel, Piezometer ring and pressure transducer.
- Unit mounted ABB adjustable speed drive c/w integral DC link reactor and load reactor.
Adjustable speed drive is designed for constant volume air balancing controlled via 0-10VDC signal by others.
Adjustable speed drive is used for direct fan motor operation at 75.1 Hz under design conditions for the rated air flow.
- Greystone pressure transducers c/w individual 0-10VDC output signals for use by others.

EXHAUST AIR DATA

AIR FLOW <u>14,331 CFM</u>	FAN SIZE <u>See Below [1]</u>	TSP <u>2.7 in w.c.</u>	RPM <u>1289</u>
MOTOR SIZE (2) <u>6.7 HP</u>	TYPE (RPM) <u>See Below [2]</u>	ESP <u>1.0 in w.c.</u>	BHP (2) <u>4.6 BHP</u>

- [1] - (2) 25" GR63C-ZID.GQ.CR Cpro
- [2] - EC Blue 116183/A01 (1450 Direct Drive)
- Each exhaust air fan/motor c/w pressure taps, pressure transducer and 5.0kW EC motor controlled via 0-10VDC signal by others for constant volume air balancing only.
- Greystone pressure transducers c/w individual 0-10VDC output signals for use by others.
- Exhaust air data includes 831CFM purge. (ie. 13,500CFM + 831CFM purge = 14,331CFM)

AIR OPENING DATA

AIR OPENING	LOCATION	DAMPER TYPE	OPERATION
SUPPLY AIR	See Below [1]		
RECIRC AIR	See Below [1]	See Below [2]	Two Position
OUTSIDE AIR	See Below [1]	See Below [3]	Two Position
EXHAUST AIR	See Below [1]	See Below [2]	Two Position
RETURN AIR	See Below [1]		

- [1] - See Mechanical Drawing
- [2] - TAMCO Series 1000 Low Leakage Aluminum Air-foil Opposed Blade
- [3] - TAMCO Series 1000 Low Leakage Aluminum Air-foil Parallel Blade
- Flanged duct collar supplied on supply air opening.

CONSTRUCTION DATA

UNIT CABINET	<u>2" foam panel construction c/w 26 gauge satin coat galvanized interior sheet metal, 26 gauge satin coat galvanized exterior sheet metal and R16 polyurethane insulation on entire unit casing.</u>
UNIT UNDERSIDE	<u>22 gauge satin coat galvanized solid liner.</u>
UNIT FLOOR	<u>16 gauge satin coat galvanized sheet metal on entire unit floor.</u>



SUBMITTAL RECORD

JOB NAME: LIVE OAKS AHU PRE PURCHASE JOB NO: DK9205(TS1132)

EngA MODEL: DJX100/HRW2400/O/MV QTY: 1 TAG: HV-2

CONSTRUCTION DATA (CONTINUED)

EXTERIOR PAINT	Two component Epoxy c/w Polyurethane topcoat in Aluminum Gray color - Level 3 on all exterior surface but not including unit underside.
AIRSIDE DOOR	All access except positive pressure access - deluxe welded steel framed hinged c/w lever type door handles, 304 stainless steel piano hinge, double pane glass window, test port and bulb seal gasket. Positive pressure access - deluxe welded steel framed hinged c/w lever type door handles, 304 stainless steel piano hinge, door safety catch, double pane glass window, bulb seal gasket, test port and warning label.
SERVICE DOOR	All access - hinged c/w lever type door handles
DRAIN PAN	16 gauge G90 drain pan c/w drain connection through base frame on heat wheel supply and exhaust leaving sections.
	<ul style="list-style-type: none"> Unit to be built with: <ul style="list-style-type: none"> - 2" Spray foam insulation(R12) on unit underside Expanded steel grating over return air floor opening. EngA drainable weather louver(s) c/w 1" bird screen. Heat wheel : (1) HRW enthalpy wheel c/w AC motor (See attached performance data). Unit tag lamicoïd label on (3) sides of unit. 'S' lamicoïd label on supply end of unit.

ELECTRICAL DATA

CIRCUIT NO	POWER SUPPLY	MINIMUM CIRCUIT AMPACITY	MAXIMUM FUSE(D.E.)	MAXIMUM BREAKER
1	460 / 3 / 60	52.3 AMPS	70 AMPS	70 AMPS
2	120 / 1 / 60	12.0 AMPS	15 AMPS	15 AMPS

- See Electrical Data Sheet for details.
- Unit mounted non fused disconnect switch.
- MCA is based on '27' rated adjustable speed drive amps and installed supply motor amps are not used.
- (2) marine lights with 15 Watt LED screw in light bulb c/w an on/off switch with indicating light, 24V/72VA power supply for use by others and (1) 15A service receptacle unit mounted on unit exterior - 120V/1PH/ 60HZ power supply by others.
- 24" x 24" free space provided on the electrical panel for use by others.

OUTSIDE AIR PRE-FILTER SECTION DATA - Face Loaded

FILTER TYPE	Pleated Filter with MERV 8 rating c/w Type 8 Holding Frame		
QTY/SIZE	8 - 24 x 24 x 2"	QTY/SIZE	
TOTAL GROSS AREA	32.00 SQ.FT.	FACE VELOCITY	463 FPM @ 14831 CFM
	<ul style="list-style-type: none"> Filters may be shipped loose or mounted in the tracks 1 spare set of filters (filter metal frame not included) - shipped loose 		

OUTSIDE AIR FINAL FILTER SECTION DATA - Face Loaded

FILTER TYPE	Rigid Filter c/w header with MERV 14 rating c/w Type 8 Holding Frame		
QTY/SIZE	8 - 24 x 24 x 12"	QTY/SIZE	
TOTAL GROSS AREA	32.00 SQ.FT.	FACE VELOCITY	463 FPM @ 14831 CFM
	<ul style="list-style-type: none"> Filters may be shipped loose or mounted in the tracks 1 spare set of filters (filter metal frame not included) - shipped loose Dwyer series 2000 magnehelic gauge 0-2" wc across final filter section. 		



SUBMITTAL RECORD

JOB NAME: LIVE OAKS AHU PRE PURCHASE JOB NO: DK9205(TS1132)

EngA MODEL: DJX100/HRW2400/O/MV QTY: 1 TAG: HV-2

RETURN AIR FILTER SECTION DATA - Face Loaded

FILTER TYPE <u>Pleated Filter with MERV 8 rating c/w Type 8 Holding Frame</u>	
QTY/SIZE <u>8 - 24 x 24 x 2"</u>	QTY/SIZE _____
TOTAL GROSS AREA <u>32.00 SQ.FT.</u>	FACE VELOCITY <u>422 FPM @ 13500 CFM</u>

- Filters may be shipped loose or mounted in the tracks
- 1 spare set of filters (filter metal frame not included) - shipped loose

BURNER HEATING DATA - INDIRECT FIRED (DJX-100)

POWER BURNER <u>EngA 'HT' Series</u>	HEAT EXCH. MATERIAL <u>Stainless Steel</u>
FUEL <u>Natural Gas</u>	INLET PRESSURE <u>7 in wc.</u> GAS FIELD CONN. <u>1.25"</u>
HEAT INPUT <u>850,000 Btuh</u>	HEAT OUTPUT <u>774,000 Btuh</u> TEMP. RISE <u>51.0 °F</u>

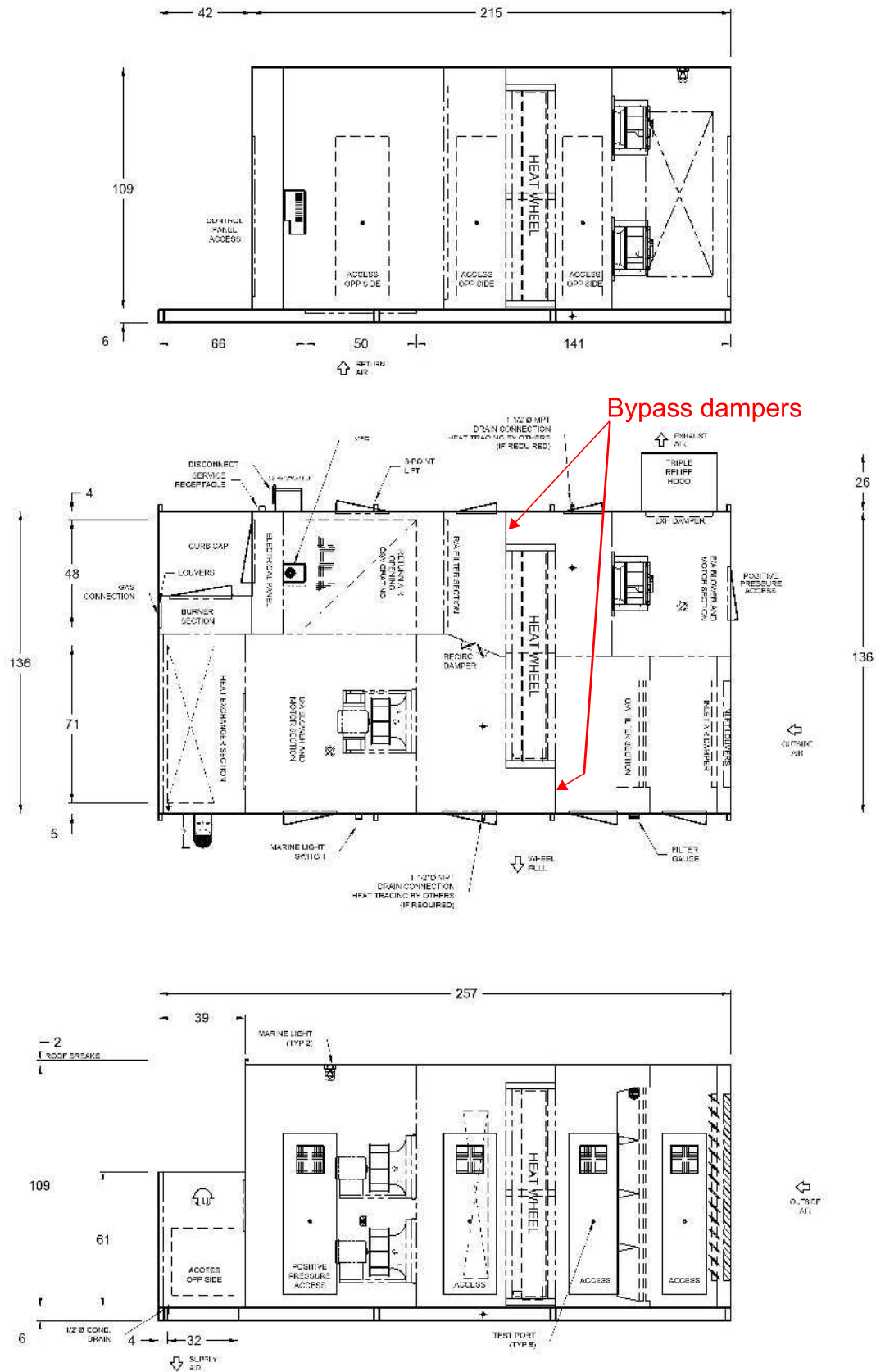
- EngA (15 : 1) high turndown burner
- Three pass heat exchanger c/w condensate drain connection. Condensate drain piping must be fully piped to a suitable drain before starting unit.
- Heat exchanger section has 1" 1.5 lb/ft insulation with 22 gauge satin coat galvanized solid liner
- Modulating combustion air and gas control.
- F.M. conforming gas manifold.
- CENCON discharge air control c/w BMS interface.
- Wedge style vent.
- Discharge air low limit by others.
- Condensate drain connection is through curb. See roof curb drawing for detail.

SHIPPED LOOSE ITEMS (See filter sections for filters and spare filters)

- 1 - Pre fabricated roof curb (See drawing for details).
- 1 - Exhaust hood c/w 1" birdscreen.
- 1 - Wedge style vent.
- 1 - Condensate Neutralization Kit (NC-2)
- 1 - 42" Condensate drain pipe.
- 1 - 01CT-5LH Discharge Air Sensor

U
 Energy recovery data
 Submit

NOTES:
 1) RAIN SLUTTERS ON BOTH SIDES C/W DOWNSPUTS
 2) ROLING DAMPER BALANCED TO LS: (RAVIL) C/W W.C. ST. 14 00003 87

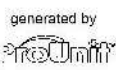


DOOR SIZES AND INTERNAL COMPONENTS ARE APPROX. VALUES. DIMENSIONS SHOWN IN INCHES ONLY UNLESS OTHERWISE NOTED.

DK9205 (TS1132)

TAG: HV-2

DJ SERIES



REVISIONS:

DATE: APR 20 2021

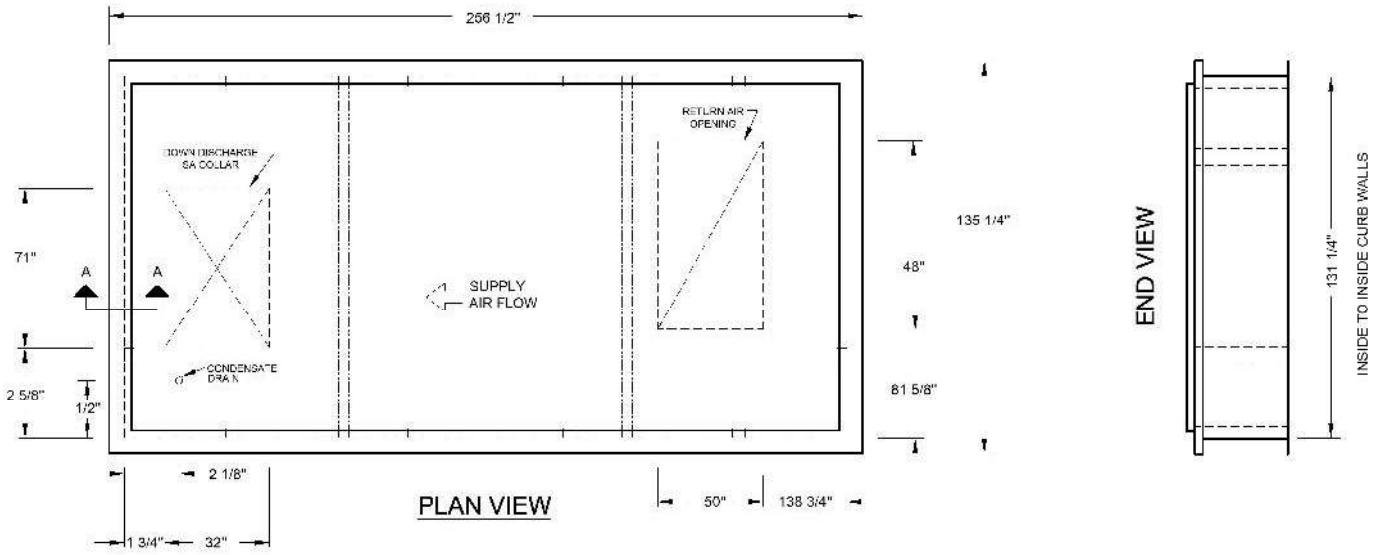
DRWN BY: GAB

CHKD BY: DMC

DRWG NO.: 09205M-22-1

GENERAL NOTES:

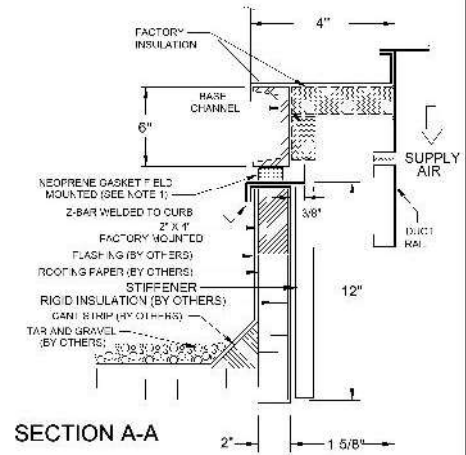
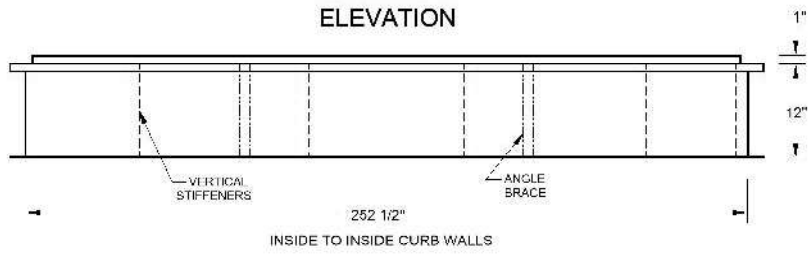
1. INCLUDE 3/8" X 1-1/2" NEOPRENE GASKET
2. CURB MAY BE BROKEN DOWN FOR SHIPPING. IN THESE CASES, FIELD ASSEMBLY WILL BE REQUIRED BY INSTALLING CONTRACTOR.
3. CONTINUOUS BASE SUPPORT TO CURB PANELS, INCLUDING THE CENTER SUPPORT PANEL IF SUPPLIED, IS REQUIRED BY OTHERS.
4. DIMENSIONS GIVEN IN INCHES ONLY
5. FOR CLARITY, DUCT-RAILS ARE SHOWN ON SEPARATE DRAWING. SEE DRAWING# 09205-C-22-2 FOR DETAILS



PLAN VIEW

END VIEW

ELEVATION



SECTION A-A

JOB# DK9205 (TS1132)
TAG: HV-2

DRAWING NOT TO SCALE

DJ SERIES
12" HIGH CURB FOR DOWN DISCHARGE UNIT



REVISIONS:
DATE: APR 20 2021

DRWN BY: GAB

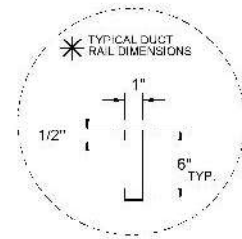
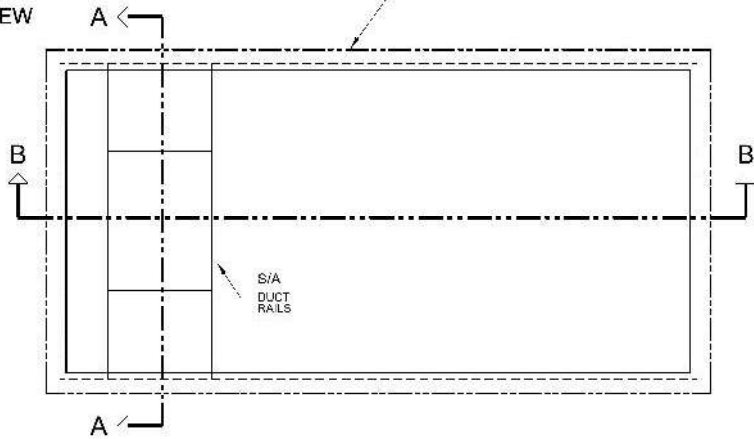
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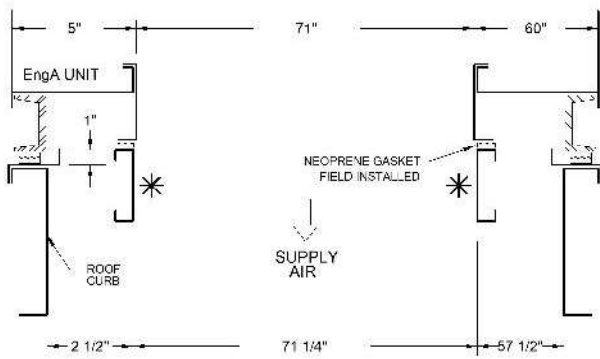
CURB OUTLINE IS ONLY SHOWN FOR LOCATING THE DUCT RAILS, AS SUCH THIS DRAWING DOES NOT INCLUDE ADDITIONAL DETAILS, SUCH AS A VESTIBULE ENCLOSURE (IF ANY), ETC. FOR FULL CURB DETAILS, SEE DRWG#

09205-C-22-1

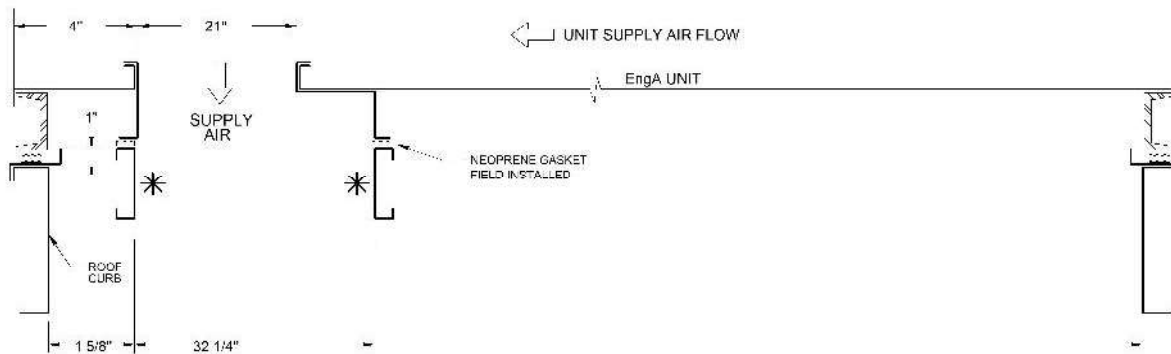
PLAN VIEW



SECTION A-A: SUPPLY AIR



SECTION B-B:



JOB# DK9205 (TS1132)
TAG: HV-2

DRAWING NOT TO SCALE

DJ SERIES
DUCT-RAIL DETAIL



REVISIONS:

DATE: APR 20 2021

DRWN BY: GAB

CHKD BY: DMC

DRWG NO.: 09205C-22-2



ENTHALPY WHEEL PERFORMANCE DATA

Version 1.1.19

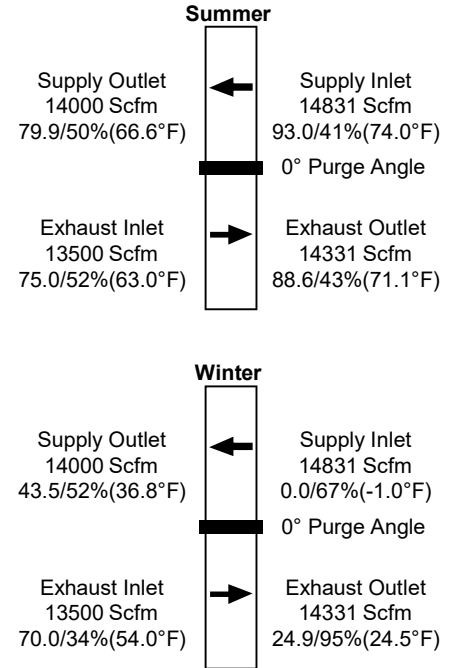
JOB NAME: LIVE OAKS AHU PRE PURCHASE **JOB NO:** DK9205(TS1132)

CUSTOMER: GREAT OAKS INSTITUTE OF TECH **ENGINEER:** MOTZ CONSULTING ENGINEERS

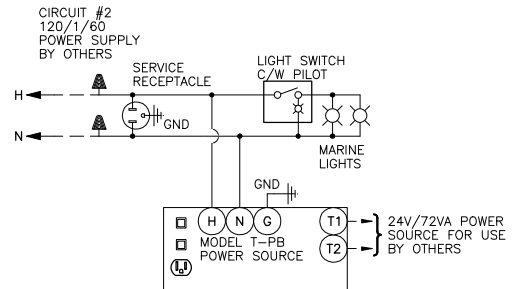
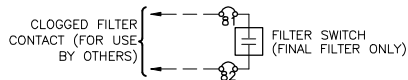
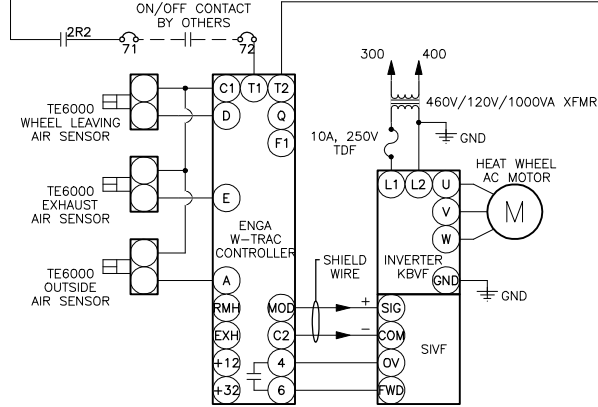
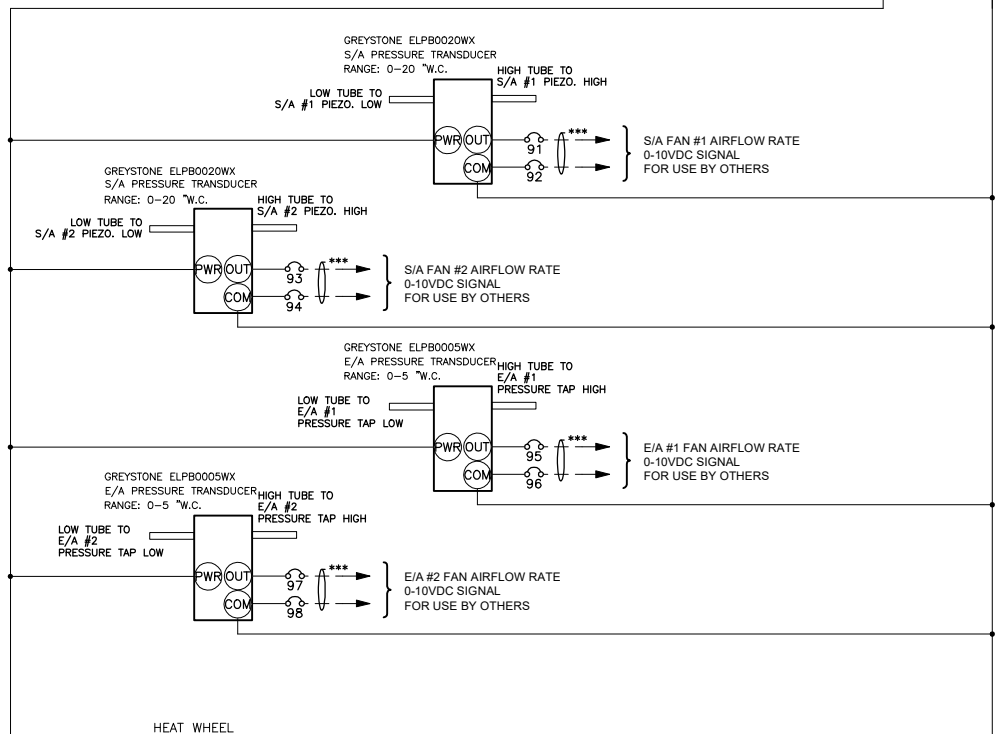
LOCATION: Cincinnati, OH **ALTITUDE:** 0 ft (.0 m)

EngA MODEL: DJX100/HRW2400/O/MV **QTY:** 1 **TAG:** HV-2

Enthalpy Wheel Selection Data - Model AEW10-2400 (Note 1)			
		Supply	Exhaust
Summer Design	Inlet Static Pressure	-1.5"Wc	-1.55"Wc
	Air Flow Through wheel	14000 Scfm Outlet	13500 Scfm Inlet
	Entering Temperature DB/RH(WB)	93.0/41%(74.0°F)	75.0/52%(63.0°F)
	Leaving Temperature DB/RH(WB)	79.9/50%(66.6°F)	88.6/43%(71.1°F)
	Air Pressure Drop	0.96"Wc	0.92"Wc
	Enthalpy/Sensible Recovery	397.18 / 198.33 Mbh	
	Moisture Removal	172.16 Lb/Hr	
	S/A Sensible/Total Efficiency	72.9 / 68.9%	
	ASHRAE Sensible/Latent Effectiveness	75.6 / 68.5%	
	EATR	9.8%	
	OACF	1.15	
	Net Supply Airflow	12628 Scfm	
Winter Design (Note 2)	Inlet Static Pressure	-1.5"Wc	-1.55"Wc
	Air Flow Through wheel	14000 Scfm Outlet	13500 Scfm Inlet
	Entering Temperature DB/RH(WB)	0.0/67%(-1.0°F)	70.0/34%(54.0°F)
	Leaving Temperature DB/RH(WB)	43.5/52%(36.8°F)	24.9/95%(24.5°F)
	Air Pressure Drop	0.84"Wc	0.85"Wc
	Enthalpy/Sensible Recovery	833.06 / 657.11 Mbh	
	Moisture Addition	161.4 Lb/Hr	
	Frost Point	8.3°F	
	ASHRAE Sensible/Latent Effectiveness	75.6 / 56.6%	
	EATR	9.8%	
	OACF	1.15	
	Net Supply Airflow	12628 Scfm	



- Notes: 1. Energy recovery component is outside the scope of AHRI ERV certification program but is rated in accordance with ARI Standard 1060
2. Wheel performance in the winter design section includes the effects of frost control.
3. Values are under no frost condition



* RED FEEDBACK CABLE HOOKED DIRECTLY TO MAIN GAS VALVE
 ** MOTOR GROUND WIRE TO BE SAME SIZE AS MOTOR WIRE
 *** SHIELDED WIRE IS REQUIRED WITH ELECTRONIC COMPONENTS.



ELECTRICAL DATA

JOB NAME: LIVE OAKS AHU PRE PURCHASE

JOB NO: DK9205(TS1132)

EngA MODEL: DJX100/HRW2400/O/MV

QTY: 1

TAG: HV-2

Circuit No	Power Supply	Minimum Circuit Ampacity	Terminal Block to Accept	Maximum Fuse (Dual Element)	Maximum Breaker
1	460 / 3 / 60	52.3 AMPS	6 Awg	70 AMPS	70 AMPS
2	120 / 1 / 60	12.0 AMPS	14 Awg	15 AMPS	15 AMPS

Components	Circuit No	Model	Minimum Conductor Size	Ampacity FLA / LRA	SubFuse Group	Subfuse Group Fuse Size	Terminal Block to Subfuse
Burner Motor(Xfmr)	1	PSC(Use Xfmr) 1/2 HP	14(14) Awg	8 @ 120/1/60			
Control Xfmr	1		14 Awg	2.2			
Main Control Xfmr	1		14 Awg	.8			
Supply Fan Motor #1 and #2	1	Super 'E' TEFC (1750) 10 HP	14 Awg	12.3	1	35	8 Awg
Motor VFD	1		10 Awg	27.0			
Exhaust Fan Motor #1 and #2	1	EC Blue 116183/A01 (1450 Direct Drive) 6.7 HP	14 Awg	6.2	2	20	14 Awg
Convenience Circuit	2		14 Awg	12.0			

UNIT CONTROL PANEL(S) SHORT CIRCUIT CURRENT RATING (SCCR)

Short circuit current 5 kA rms symmetrical, 460 V maximum

WIRING DRAWING LEGEND

APS	Air Proving Switch	DM	Damper Motor	NFD	Non Fused Disconnect
ASF	Auto Fan Switch	FR	Fan Relay	OL	Thermal Overload
AUX	Auxiliary Contact	GND	Ground	PS	Pressure Sensor
BM	Burner Motor	GV	Gas Valve	PV	Pilot Gas Valve
C	Contact	HL	High Limit	R	Relay
CCH	Compressor Crankcase Heater	HPC	High Pressure Control	RevHL	Reverse Airflow High Limit
CFC	Condenser Fan Control	HR	Heating Relay	TB	Terminal Block
CLC	Compressor Loading Control	IGN	Ignition Control	TDF	Time Delay Fuse
CPM	Compressor Protection Module	ITP	Internal Thermo Protection	TDR	Time Delay Relay
CR	Cooling Relay	LPC	Low Pressure Control	TS	Temperature Sensor
CS	Current Sensor	M	Motor	VFD	Variable Frequency Drive
DHSS	Draft Hood Spill Switch	MV	Main Gas Valve	XFMR	Transformer



ELECTRICAL DATA

JOB NAME: LIVE OAKS AHU PRE PURCHASE JOB NO: DK9205(TS1132)

EngA MODEL: DJX100/HRW2400/O/MV QTY: 1 TAG: HV-2

UNIT FUNCTION

Unit mounted non-fused disconnect switch 'on', service switch 'on', fire alarm contact (by others) 'closed' (jumper if not required), duct high pressure limit (by others) 'closed', VFD fault contact 'closed', EC fault contacts 'closed'.

Unit on/off contact (by others) 'closed' -and- occupied mode contact (by others) 'closed', outside air damper and exhaust air damper open, recirc damper closes. Blowers will delay on and run continuously. VFD and EC blower/motor speed control via separate 0-10VDC signals (by others). The CENCON controller, with a 0-10VDC reset signal (by others), will modulate heating to maintain the required discharge air temperature.

HEAT MODE

Heat on/off contact (by others) 'closed', the J-XM controller module will begin modulating the gas heating. The discharge air temperature will be reset proportionally from 55°F to 90°F as the reset signal (by others) increases from 0-10VDC.

Heat wheel on/off contact (by others) 'closed', heat wheel is enabled. The WTRAC controller, with an adjustable integral set point set at 55°F, will modulate the wheel rotation speed to maintain the heat wheel supply air leaving temperature. The heat/vent changeover will automatically switch between heating and venting modes as required. The WTRAC controller reduces wheel rotation speed in frost control mode to prevent frost formation.

(Open bypass dampers)

Unit on/off contact (by others) 'closed' -and- occupied mode contact (by others) 'open', outside air damper and exhaust air damper close, recirc damper opens. Heat wheel operation is disabled and exhaust air blowers shut down.

Unit on/off contact (by others) 'open', outside air and exhaust air dampers close, recirc damper opens, blowers shut down. Unit is off. If the fire alarm contact (by others) 'open' -or- duct high pressure limit (by others) 'open' -or- VFD fault contact 'open' -or- EC fault contacts 'open', equipment operation is disabled immediately.

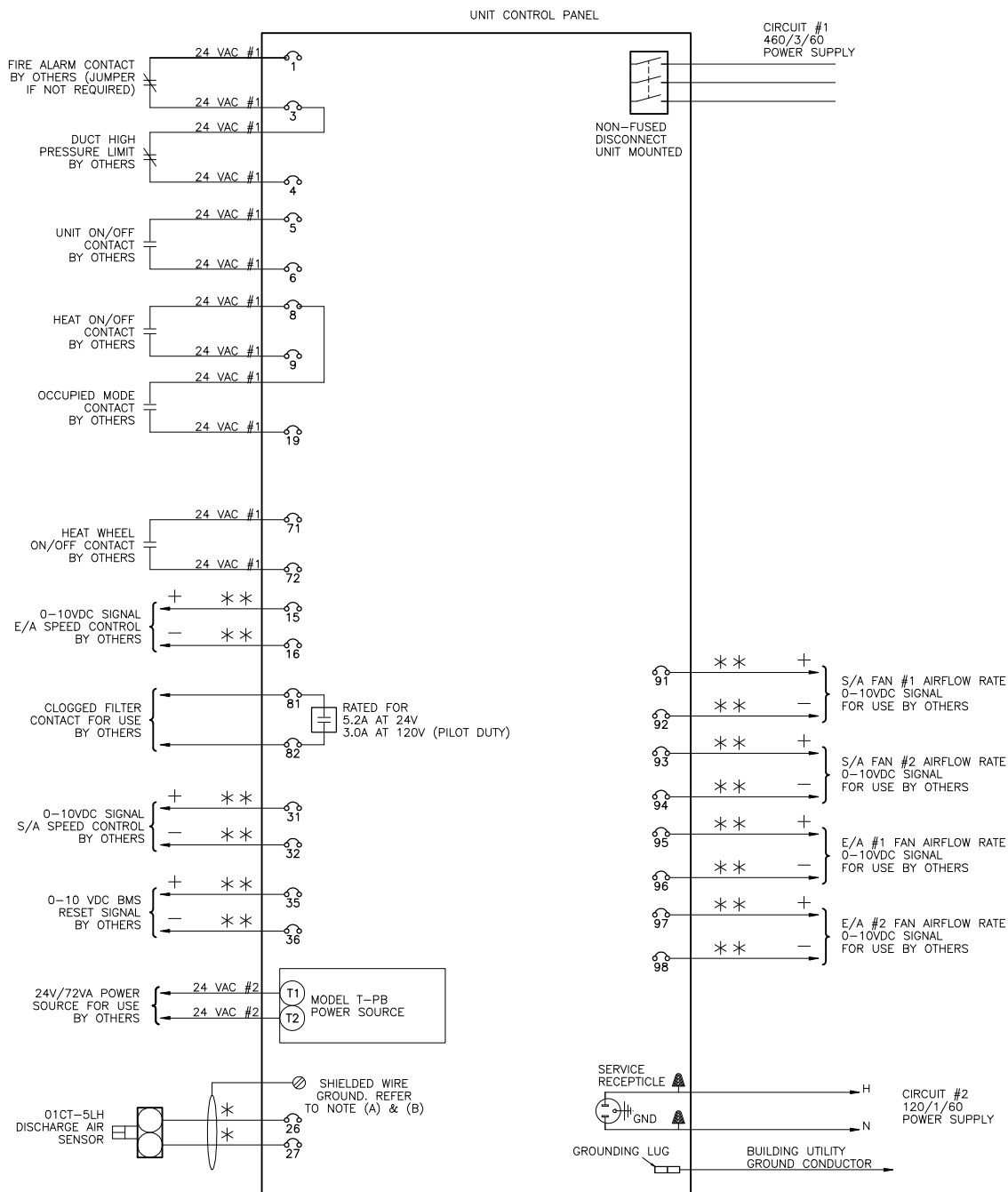
The CFM and BHP performance is based on the exhaust air fans running at 1289 RPM with an approximate 6.2 VDC control signal.

Note 1 - Refer to manuals shipped with unit for more detailed explanation of maintenance, components and controls.

Note 2 - Go to <http://www.engineeredair.com/index.php/manuals/> for online manual details

Note 3 - Discharge air low limit (by others).

Note 4 - Recirc damper balanced to estimated 0.9" W.C. at 14,000CFM.



MAXIMUM CONTROL CIRCUIT AMPACITY 10.41 AMPS AT 24 VAC #1

MAXIMUM CONTROL CIRCUIT AMPACITY 3 AMPS AT 24 VAC #2

- * SHIELDED WIRE IS REQUIRED WITH ELECTRONIC COMPONENTS.
 - ** SHIELDED WIRE IS REQUIRED WITH BMS ANALOG SIGNALS.
- TAPE THE GROUND WIRE AND SHIELD TO PREVENT GROUNDING.
 TAPE THE ENDS OF ALL UNUSED WIRES.
 ANALOG BMS SIGNALS ARE SUBJECT TO GROUND LOOP INTERFERENCE.
 SIGNAL ISOLATION MAY BE REQUIRED.
 REFER TO THE OPERATION MANUAL OF THE SPECIFIC CONTROLLER.

- (A) SHIELDED WIRE TO BE GROUNDED AT MAIN ENG A CONTROL CABINET END ONLY.
 TAPE OTHER END OF GROUND WIRE AND SHIELDING TO PREVENT GROUNDING.
 TAPE THE ENDS OF ALL UNUSED WIRES.
- (B) ENGINEERED AIR STRONGLY RECOMMENDS THAT THE SHIPPED LOOSE DISCHARGE AIR SENSOR BE MOUNTED 5 - 10 FT. DOWN STREAM OF HEAT EXCHANGER OPENING TO AVOID TEMPERATURE SWING CAUSED BY RADIANT HEAT.

1. FIELD WIRING VOLTAGE DROP NOT TO EXCEED 10%.
2. ALL WIRING SHOWN SHALL BE COMPLETED BY INSTALLER.
3. ALL FIELD WIRING MUST COMPLY WITH ALL NATIONAL AND LOCAL ELECTRICAL CODES.



TAG: HV-2

FIELD WIRING DIAGRAM

DJ SERIES

REVISION:

DRN.BY: GAB

DWG.NO:

09205F-22-1

DATE: 4/20/2021

CHKD.BY: DMC