

U.S. Army Corps of Engineers (USACE) TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE For use of this form, see ER 415-1-0; the proponent agency is CECW-CE	DATE 5/10/2023	TRANSMITTAL NO. 23 30 00-6.1
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SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)
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TO: 81st RSC Geographic District ROs 69A Hagood Avenue Charleston, SC 29403-5107	FROM: TEAM CONSTRUCTION 825 Gum Branch Rd. STE 128 JACKSONVILLE NC 28540-6312 USA	CONTRACT NO. W912HP21D6006 W912HP22F1176	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input checked="" type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL 23 30 00-6
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SPECIFICATION SEC. NO. (Covers only one section with each transmittal) 23 30 00-HVAC Air Distribution	PROJECT TITLE AND LOCATION FY22 81st NC026 HEP Reset; W'ville, NC, Winterville, NC	THIS TRANSMITTAL IS FOR: (Check one) <input type="checkbox"/> FIO <input checked="" type="checkbox"/> GA <input type="checkbox"/> DA <input type="checkbox"/> CR <input type="checkbox"/> DA/CR <input type="checkbox"/> DA/GA
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ITEM NO. <small>(See Note 3)</small>	DESCRIPTION OF SUBMITTAL ITEM <small>(Type size, model number/etc)</small>	SUBMITTAL TYPE CODE <small>(See Note 8)</small>	NO. OF COPIES	CONTRACT DOCUMENT REFERENCE		CONTRACTOR REVIEW CODE	VARIATION <small>Enter "Y" if requesting a variation (See Note 6)</small>	USACE ACTION CODE <small>(Note 9)</small>
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.
1	Detail Drawings	02 - SHOP	1	1.4.4		A	No	

REMARKS
 This is a resubmittal.

	I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.
NAME OF CONTRACTOR	SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.)	NAME AND TITLE OF APPROVING AUTHORITY	SIGNATURE OF APPROVING AUTHORITY	DATE
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SUBMITTAL DATA SHEET

To:

Project:

Architect:

Engineer:

Product:


Supplier:

Spec Section:

Drawing:

Submittal Notes:

APPROVAL STAMPS

<p>East Bound Mechanical 3195-B Airport Blvd. Wilson, NC 27896</p>  <p>Reviewed - Furnish Pending A/E Approval/Review</p> <p>Notes Indicated</p> <p>Resubmittal - See Comments</p> <p>Reviewed By:</p> <p>Date:</p> <p>Review of this drawing and or data does not indicate approval of variations to the contract documents or coordination with other trades as may be required.</p>	<p>General Contractor</p>	<p>Architect/Engineer</p>
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FOR QUESTIONS, CALL THE
Eastern North Carolina
REGION 36
PHONE: (919) 825-3566
EMAIL: reg36@econair.com

PATENT NUMBERS

AC-PSP (UNITED STATES) - US PATENT 7963830 B2.
AC-PSP WALL (CANADA) - CA PATENT 2820509.
AC-PSP ISLAND (CANADA) - CA PATENT 2520330.

HOOD INFORMATION - JOB#5996145

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)						TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG		
										WIDTH	LENG	HEIGHT	DIA	CFM	VEL			SP	END TO END	RDW
1		4824 EX-2-PSP-F	ECON-AIR	13' 7"	600 DEG	I	HEAVY	222	3015	10'	29'	4'		3015	1497	-0.798'	2231	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S)				LIGHT(S)				UTILITY CABINET(S)				FIRE SYSTEM PIPING	HOOD HANGING WEIGHT		
		TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM	ELECTRICAL			SWITCHES	
1		CAPRATE SOLID FILTER	10	20"	16"	85% SEE FILTER SPEC	4	RECESSED ROUND	NO	WALL MNT	12"x48"x24"	TANK FS	4.0/4.0	DCV-1111	1 LIGHT 1 FAN	YES	693 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1		FIELD WRAPPER 18.00' HIGH FRONT. BACKSPLASH 80.00' HIGH X 164.00' LONG 430 SS VERTICAL. LEFT SIDESPLASH 80.00' HIGH X 48.00' LONG 430 SS VERTICAL. RIGHT SIDESPLASH 80.00' HIGH X 48.00' LONG 430 SS VERTICAL. RIGHT END STANDOFF (FINISHED) 1' WIDE 48" LONG INSULATED. INSULATION FOR BACK OF HOOD. RISER SENSOR INSTALL 6IN PLEN. RIGHT WALL AS END PANEL.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	PDS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S)				
							WIDTH	LENG	DIA	CFM	SP
1		Front	164'	14'	6'	MUA	12"	28"		743	0.179'
						MUA	12"	28"		743	0.179'
						MUA	12"	28"		743	0.179'

WALL-MOUNT UTILITY CABINET

HOOD NO	LOCATION	SIZE	UTILITY CABINET(S)				WEIGHT
			TYPE	SIZE	ELECTRICAL	SWITCHES	
1	WALL MNT	12"x48"x24"	TANK FS	4.0/4.0	DCV-1111	1 LIGHT 1 FAN	340.00 LBS

SPECIFICATION: CAPRATE® GREASE-STOP® SOLID FILTER

THE CAPRATE GREASE-STOP SOLID FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

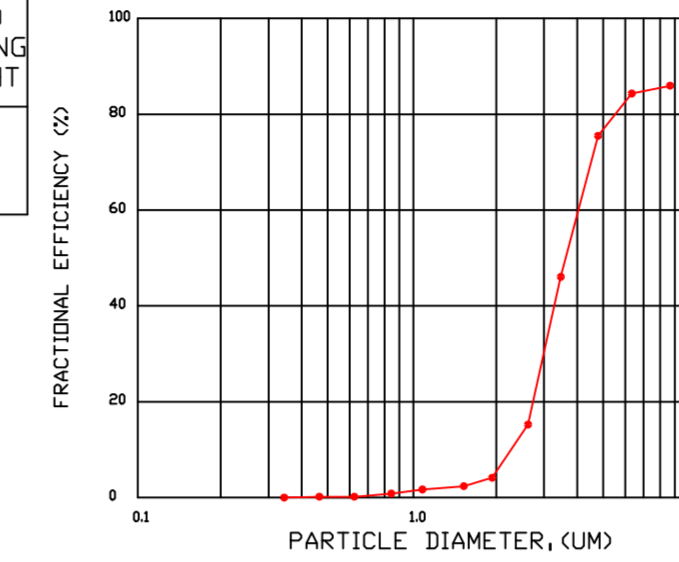
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

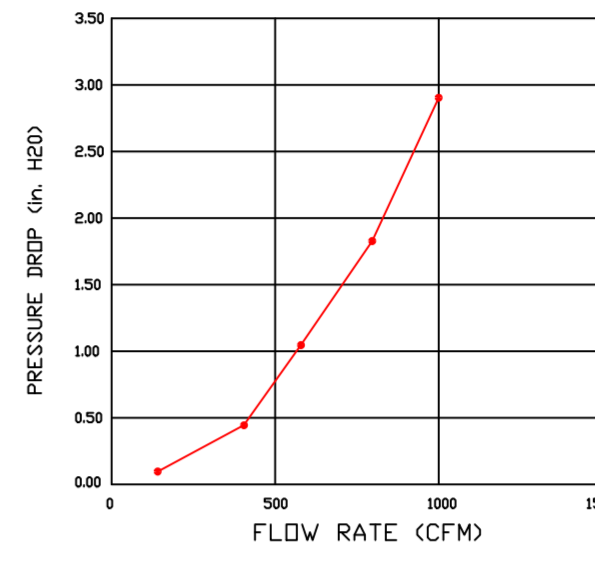
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPRATE GREASE-STOP SOLID WAS TESTED TO ASTM STANDARD ASTM F2519-05, MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

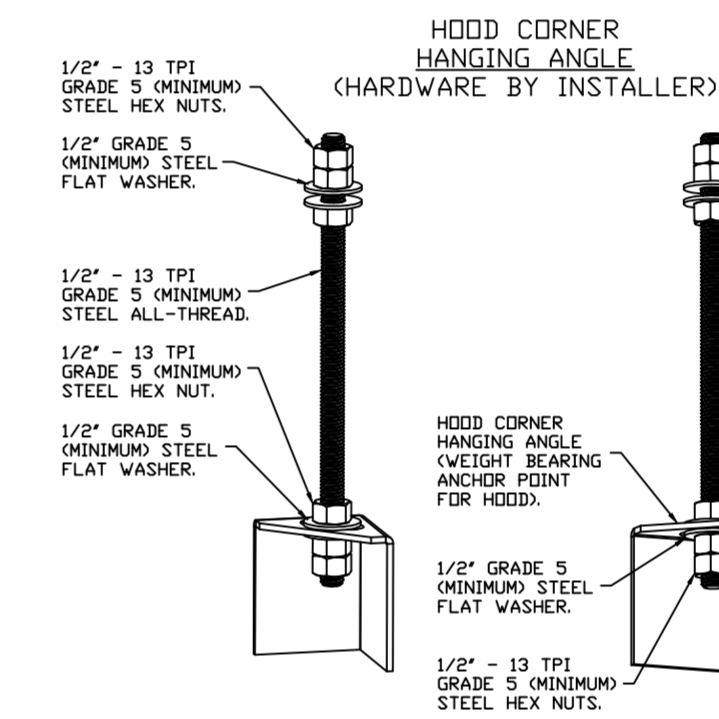
EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE



CAPRATE FILTERS ARE BUILT IN COMPLIANCE WITH:
NFPA #96.
NSF STANDARD #2.
UL STANDARD #1046.
INT. MECH. CODE (IMC).
ULC-S649.

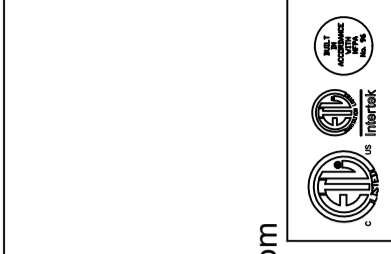


ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

REVISIONS

DESCRIPTION	DATE

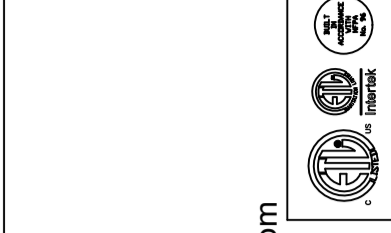


NC026 HVAC RESET-81st-WINTERVILLE, NC-R1
WINTERVILLE-CHP CASH MEMORIAL AFRC-3000 MILL ST. - 81st-Readiness Division
Winterville, NC, 28590

DATE: 5/10/2023
DWG.#: 5996145
DRAWN BY: REG 36
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1

REVISIONS

DESCRIPTION	DATE



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www.econair.com

Eastern North Carolina
4641 Pargon Park Rd., Raleigh, NC 27616 PHONE: (919) 825-3666 FAX: (919) 227-5917 EMAIL: reg36@econair.com

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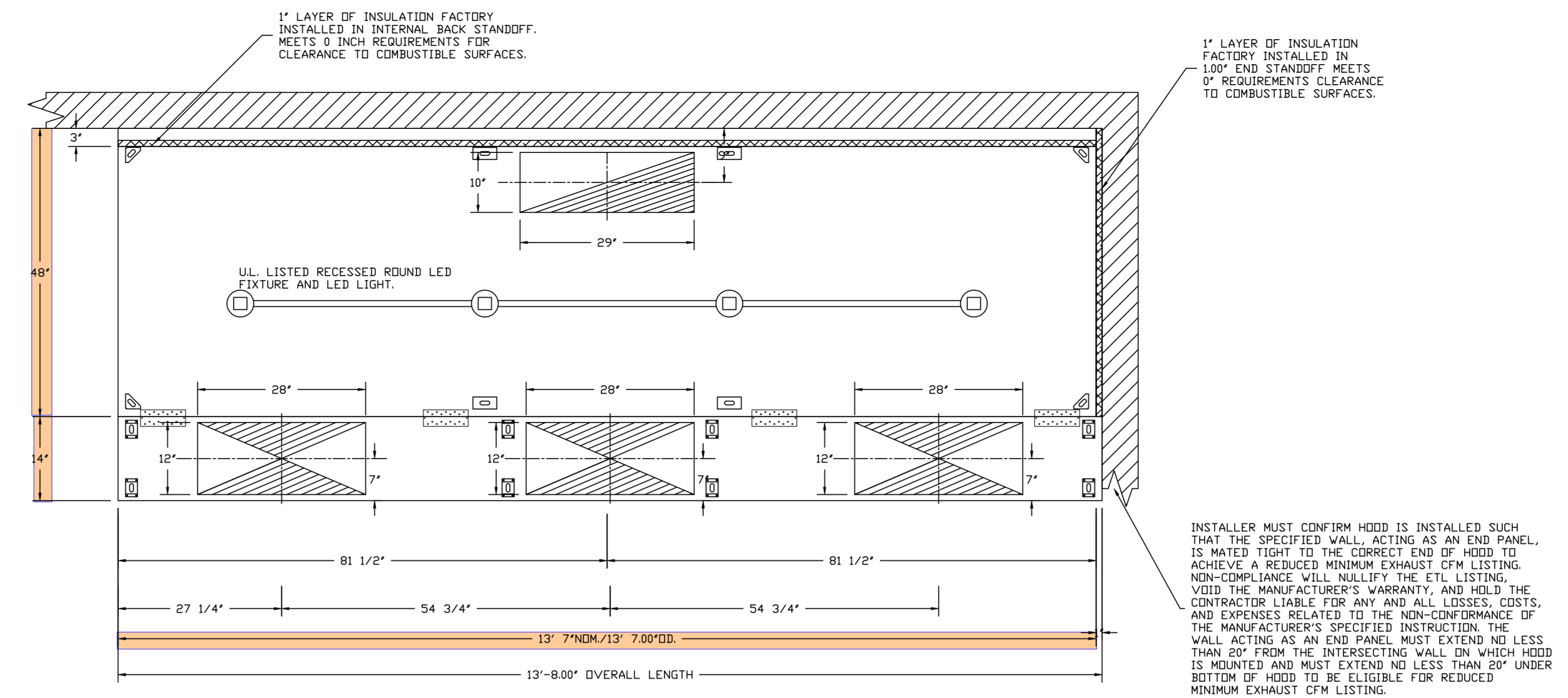
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MASTER DRAWING

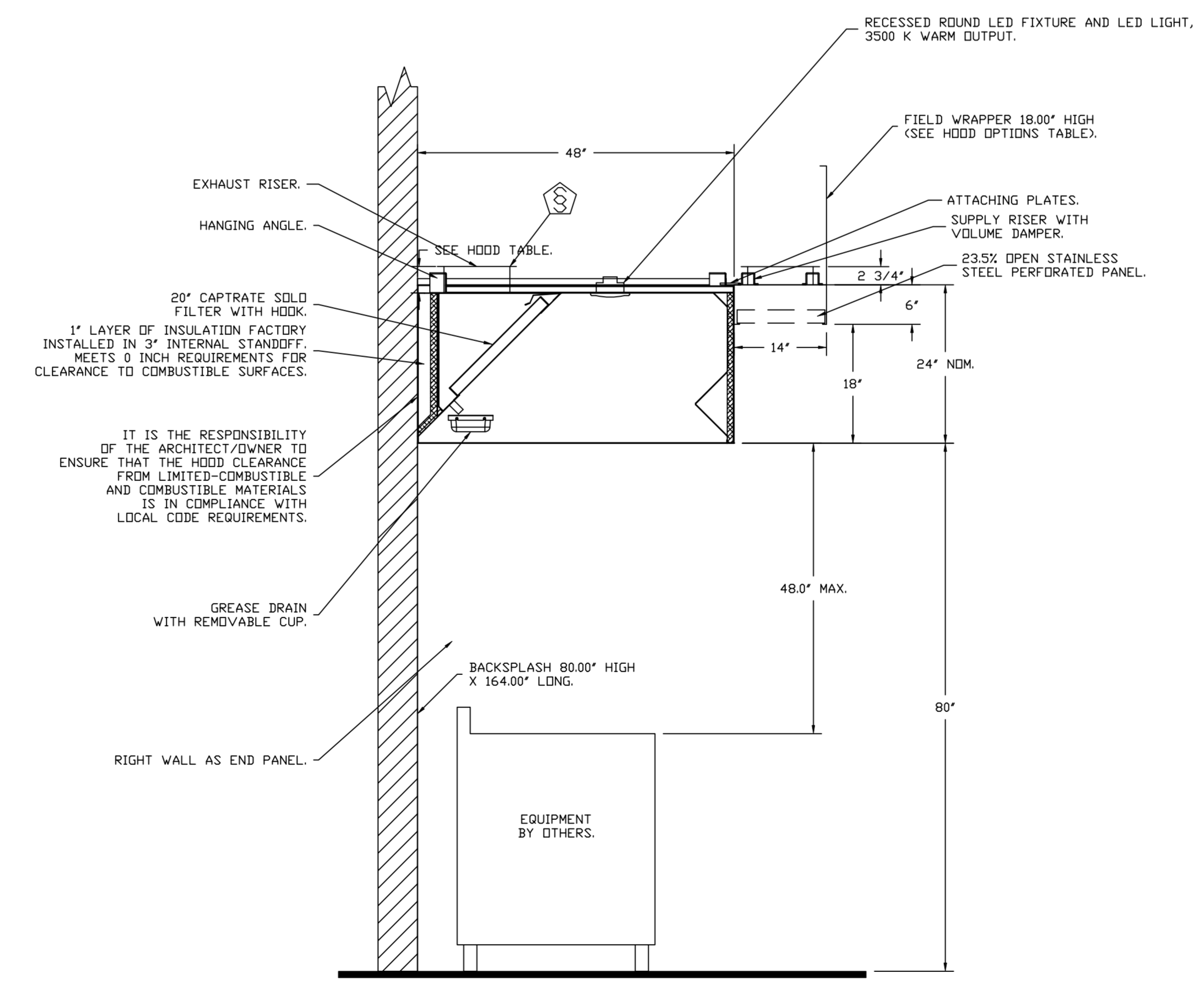
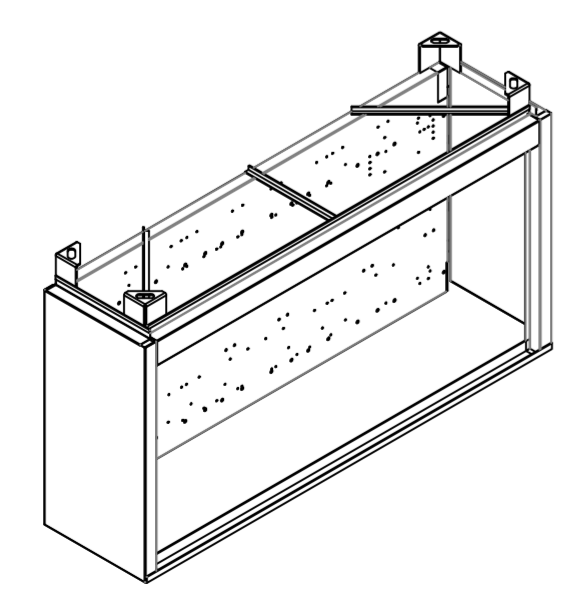
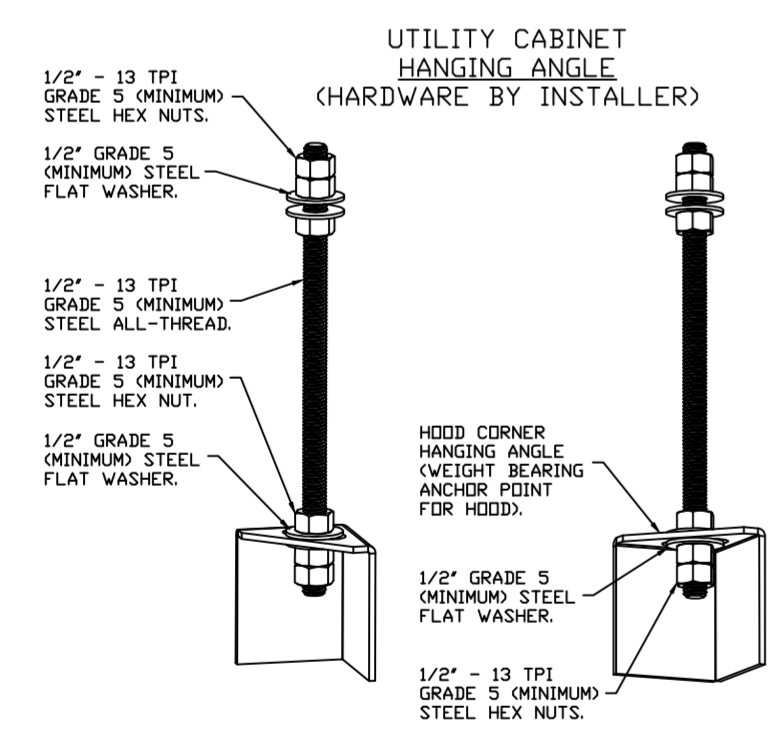
SHEET NO. 2



WALL-MOUNT UTILITY CABINET ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD, SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH UTILITY CABINET HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

CABINET TO BE HUNG BY HOOD INSTALLER. SEE UTILITY CABINET SCHEDULE FOR CABINET SIZE.



SECTION VIEW - MODEL 4824EX-2-PSP-F
HOOD - #1

EXHAUST FAN INFORMATION – JOB#5996145

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SDNES
1	KEF-1	1	DUI80HFA	CAPTIVEAIRE	3053	1.700	1366	DDP,PREMIUM	3.000	1.8170	3	460	4.3	705 FPM	184	20.7

MUA FAN INFORMATION – JOB#5996145

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	MCA	MOCP	WEIGHT (LBS)	SDNES
2	MAU-01 (KH-01)	1	A1-D.250-16Z	16Z-1-MDD	A1-D.250	1000	2231	0.500	2391	DDP-ECM	3.400	1.6790	3	460	3.3	4.2A	15A	485	27.1

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO	TAG	INPUT BTUs	OUTPUT BTUs	TEMP RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE	BURNER EFFICIENCY(%)
2	MAU-01 (KH-01)	129209	118872	50°F	7 IN. W.C. – 14 IN. W.C.	NATURAL	92

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	LOAD REACTOR MOUNTED IN FAN
2	MAU-01 (KH-01)	1	2 YEAR PARTS WARRANTY
		1	SIZE 1 TEMPERED COMMERCIAL DOWN DISCHARGE FOR DIRECT DRIVE AHUS
		1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC
		1	SHIP LOOSE GAS STRAINER 3/4"
		1	MOTORIZED BACKDRAFT DAMPER FOR A1-D HOUSING – MEETS AMCA CLASS 1A RATING
		1	HIGH PRESSURE GAS SWITCH
		1	LOW PRESSURE GAS SWITCH
		1	ECM WIRING PACKAGE-SUPPLY – MODBUS CONTROL –MSC- (3 PHASE ZIEHL MOTOR)
		1	2 YEAR PARTS WARRANTY

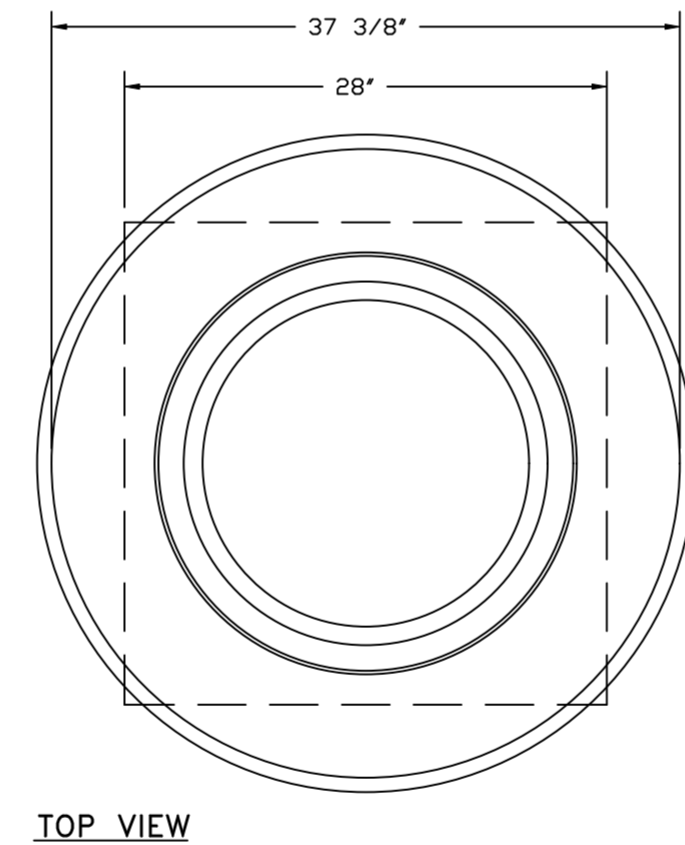
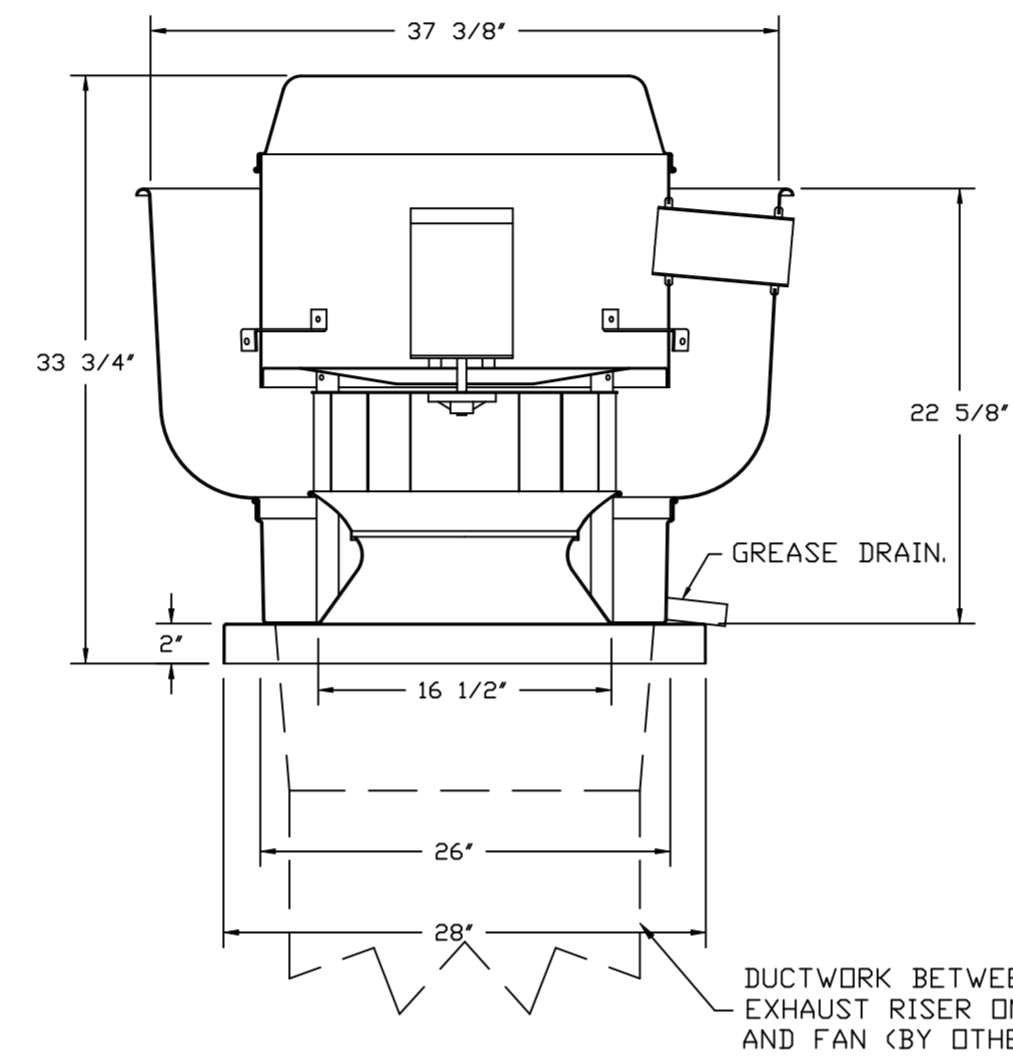
FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST				SUPPLY		
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF-1	YES						
2	MAU-01 (KH-01)						YES	

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	52 LBS	CURB	26.500"W X 26.500"L X 24.000"H ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	MAU-01 (KH-01)	63 LBS	CURB	21.000"W X 71.000"L X 16.000"H ALONG WIDTH, RIGHT INSULATED.

FAN #1 DUI80HFA – EXHAUST FAN (KEF-1)



TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST

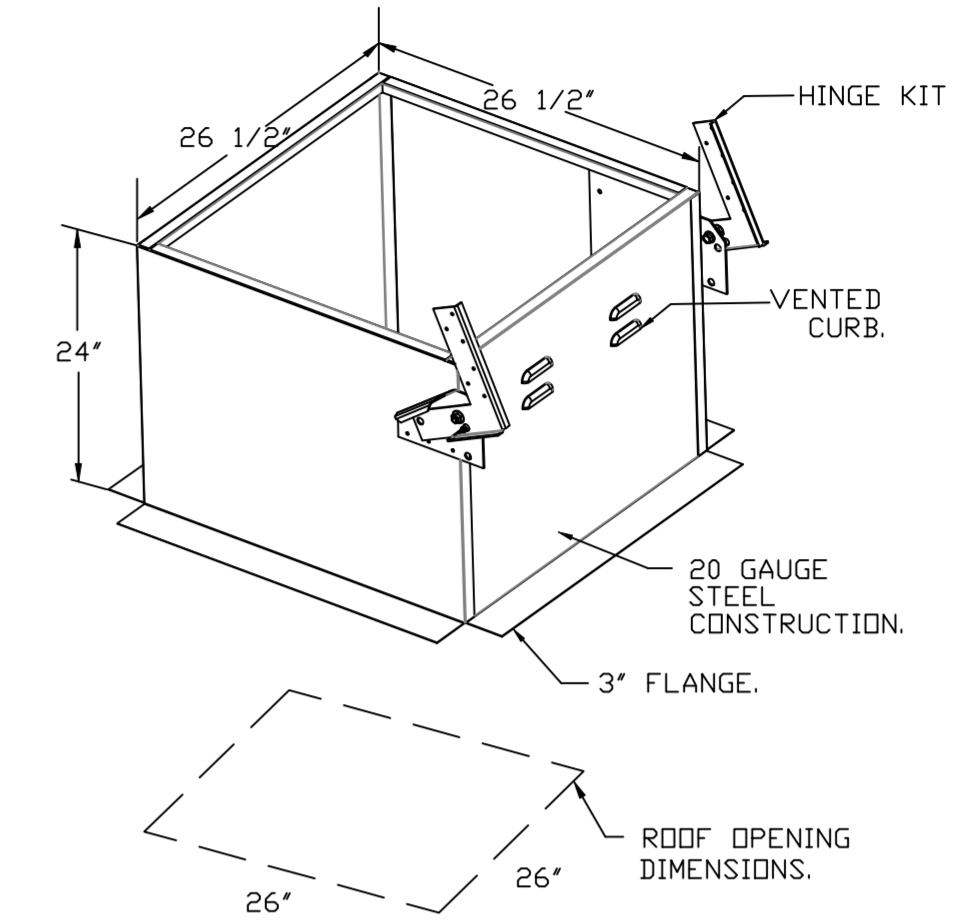
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX.
- LOAD REACTOR MOUNTED IN FAN.
- 2 YEAR PARTS WARRANTY.



REVISIONS

DESCRIPTION	DATE:

Recon·air
www.econair.com
Eastern North Carolina
4641 Paragon Park Rd., Raleigh, NC, 27616 PHONE: (919) 825-3566 FAX: (919) 227-5917 EMAIL: reg36@econair.com

NC026 HVAC RESET-81st-WINTERVILLE, NC-R1
WINTERVILLE-CAPT. CASH MEMORIAL AFRC-3000 MILL ST. - 81st-Readiness Division
Winterville, NC, 28590

DATE: 5/10/2023
DWG.#: 5996145
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SCALE: 3/4" = 1'-0"
MASTER DRAWING

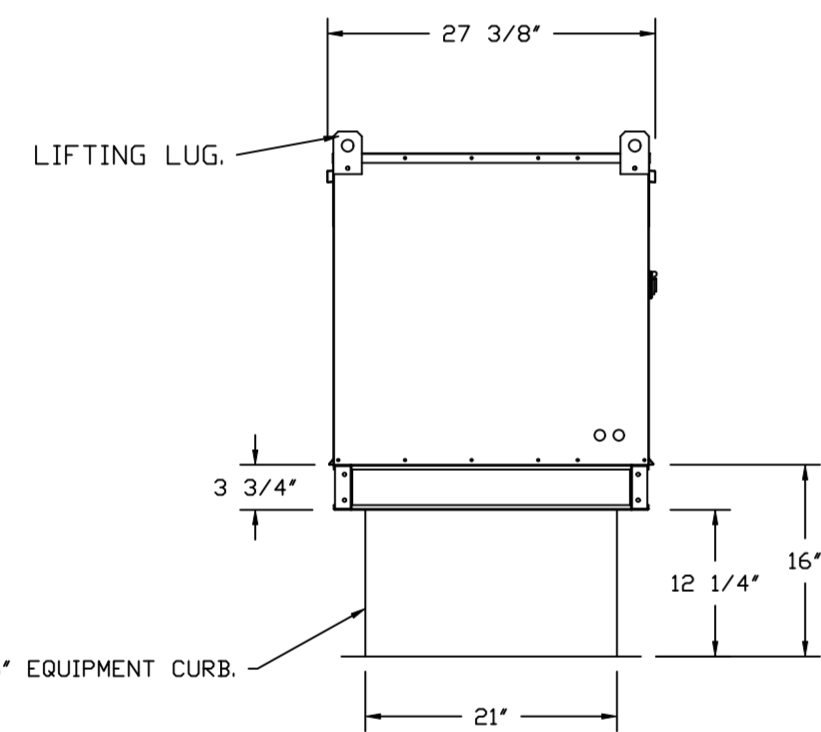
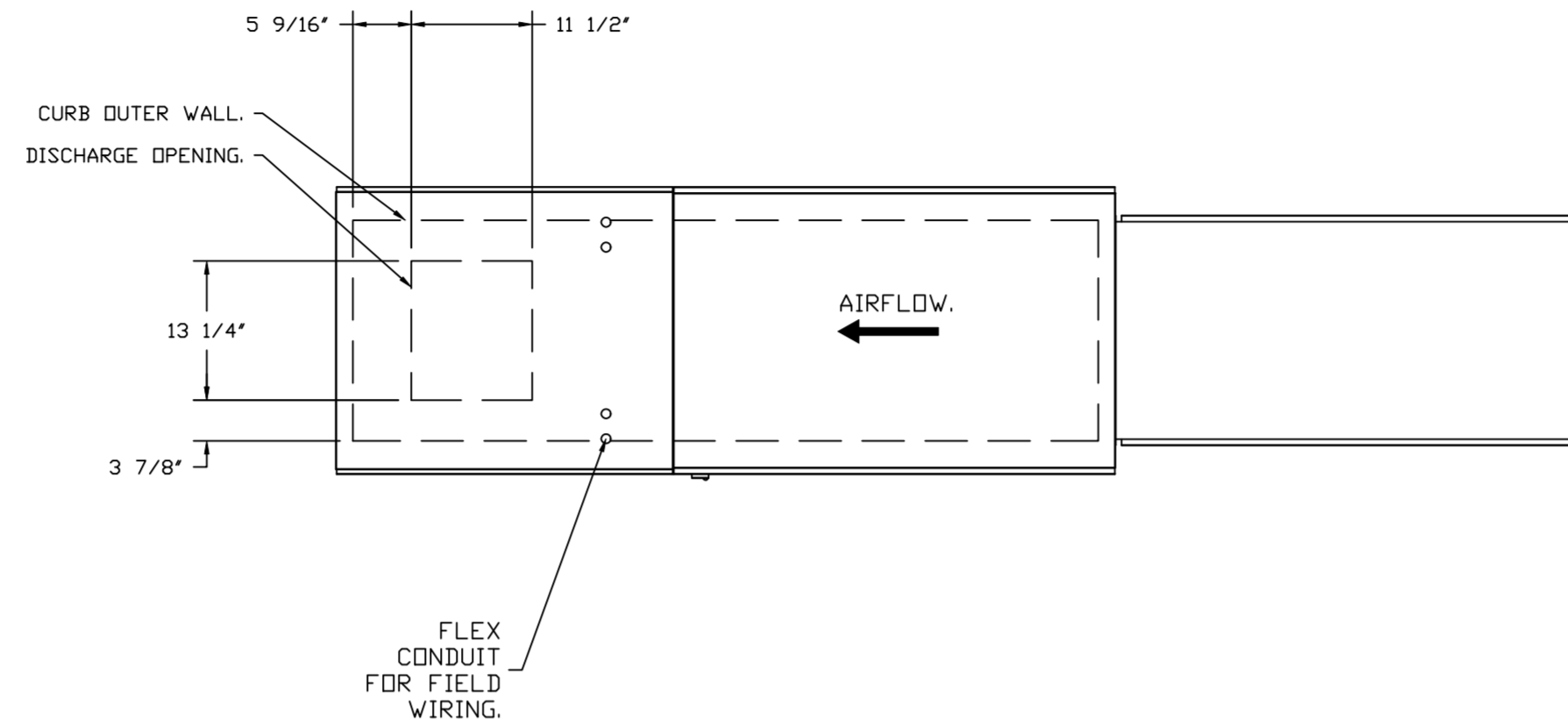
SHEET NO.
4

- FAN #2 AI-D250-16Z - HEATER (MAU-01 (KH-01))
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 16' DIRECT DRIVE FAN.
 2. INTAKE HOOD WITH EZ FILTERS.
 3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT.
 4. DOWN DISCHARGE CONSTRUCTION FOR SIZE 1 DIRECT DRIVE AHUS.
 5. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE.
 6. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC, 2.5" DIAMETER, 1/4" THREAD SIZE.
 7. SHIP LOOSE GAS STRAINER TO BE INSTALLED UPSTREAM OF UNIT CONNECTION, 3/4" CONNECTION.
 8. MOTORIZED BACK DRAFT DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, TFB202S ACTUATOR INCLUDED.
 9. HIGH GAS PRESSURE SWITCH (1" - 20" WC) FACTORY SET AT 8" W.C. REPLACES PART HGP-A.
 10. LOW PRESSURE GAS SWITCH (1" - 6" WC) FACTORY SET AT 2" W.C.
 11. ECM WIRING PACKAGE MODBUS CONTROL FOR SUPPLY EC ZIEHL FANS. MSC CONTROLLER.
 12. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER SECTION).
 13. 2 YEAR PARTS WARRANTY.

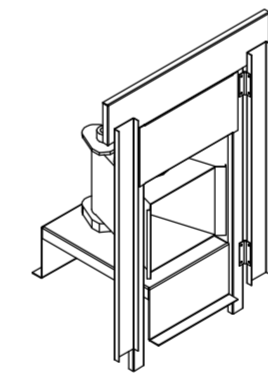
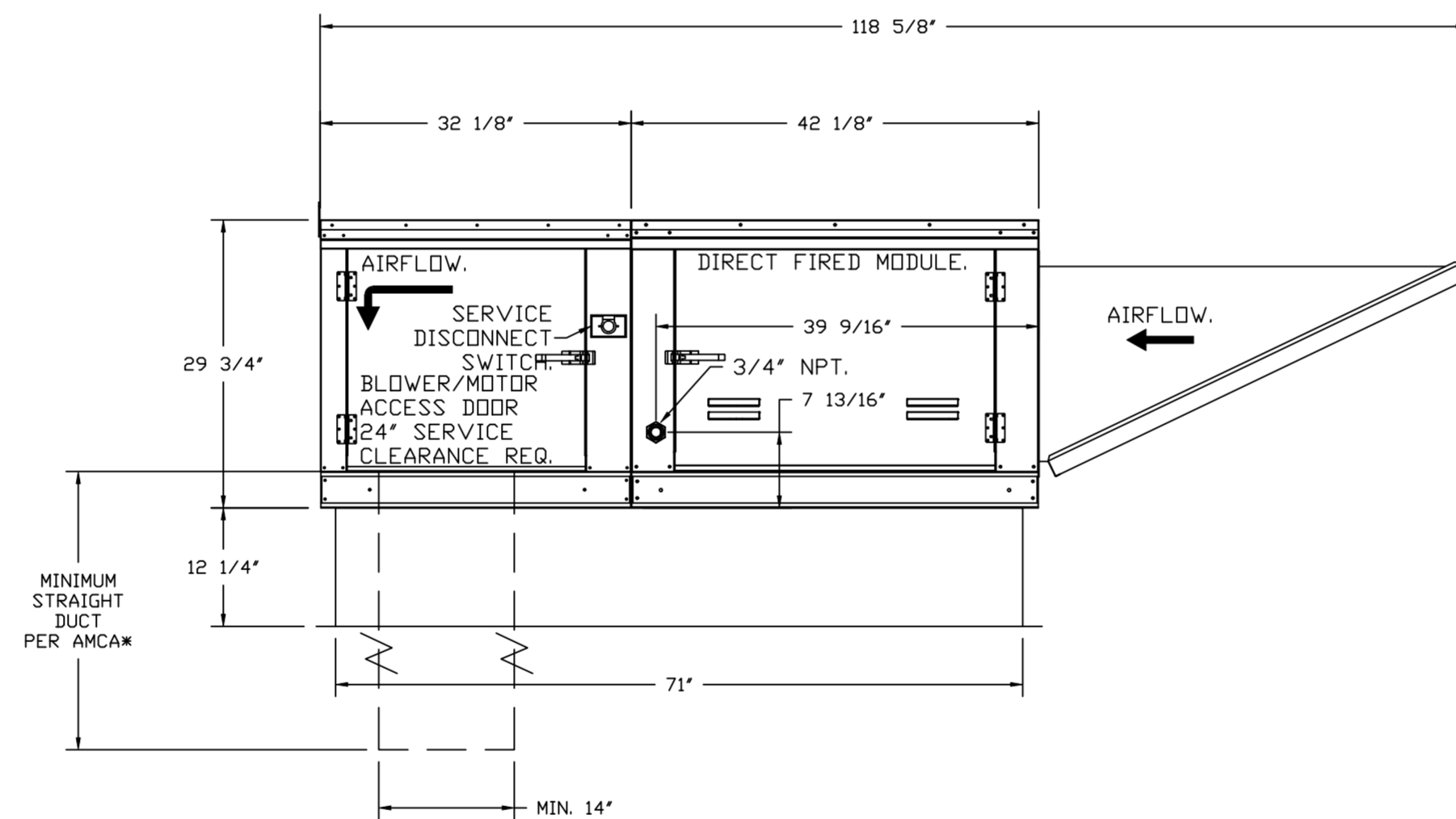
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 14" x 14".

SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = 25°F. TEMP. RISE = 50°F.
 BTUs CALCULATED OFF ACTUAL AIR DENSITY.
 OUTPUT BTUs AT ALTITUDE OF 0.0 FT. = 119173.
 INPUT BTUs AT ALTITUDE OF 0.0 FT. = 129536.
 OUTPUT BTUs AT ALTITUDE OF 70 FT. = 118872.
 INPUT BTUs AT ALTITUDE OF 70 FT. = 129209.



ROOF OPENING 2" SMALLER THAN CURB DIMENSION.



DIRECT FIRED (DF) PROFILE PLATE ASSEMBLY

DIRECT FIRED PROFILE PLATE SPECIFICATIONS:

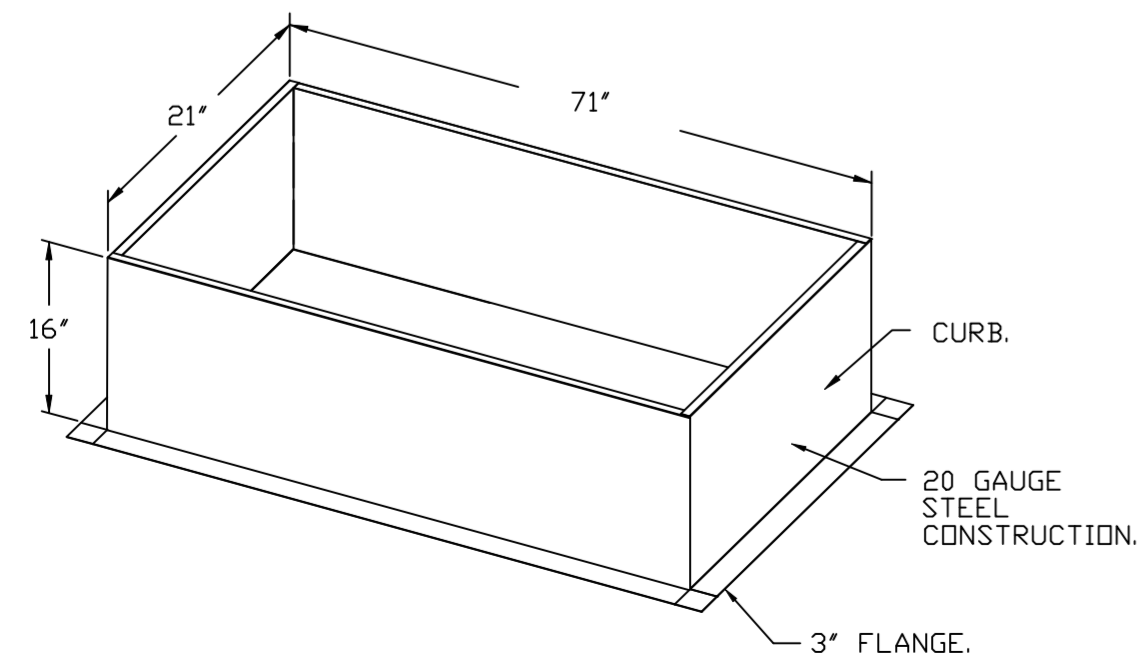
DESCRIPTION:
 DIRECT FIRED BURNERS SHALL HAVE PATENTED (US PATENT NO. US6699508B0), SELF-ADJUSTING PROFILE PLATES DESIGNED TO ENSURE PROPER AIR VELOCITY AND PRESSURE DROP ACROSS THE BURNER. PROFILE PLATES SHALL ALLOW BURNERS TO ACHIEVE CLEAN COMBUSTION BY LIMITING BY-PRODUCT LEVELS TO A MAXIMUM OF 0.01% OF CARBON MONOXIDE (CO), AND 0.01% OF NITROGEN DIOXIDE (NO2). DIRECT FIRED UNITS SHALL BE CONFIGURED WITH THE BLOWER MOUNTED DOWNSTREAM OF THE BURNER. THIS ARRANGEMENT WILL ENSURE A CONSISTENT AIRFLOW, REGARDLESS OF INLET AIR TEMPERATURE.

APPLICATION:
 SPRING-LOADED BURNER PROFILE PLATES ARE ENGINEERED TO AUTOMATICALLY REACT TO THE MOMENTUM OF A FRESH AIR STREAM, WITHOUT THE NEED FOR ANY MOTORS OR ACTUATORS TO MECHANICALLY ADJUST THEM. WITH THIS FEATURE, ALL DF UNITS ARE DESIGNED FOR DEMAND CONTROL VENTILATION (DCV) REQUIREMENTS.

CERTIFICATIONS:
 ALL PROFILE PLATE ASSEMBLIES SHALL BE INCLUDED IN THE DF UNIT'S ETL LISTING AND COMPLY WITH COMBINED SAFETY STANDARDS ANSI Z89.4 AND CSA 3.7 (NON-RECIRCULATING DF HEATERS) AND ANSI Z83.8 (RECIRCULATING DF HEATERS).

GENERAL CONSTRUCTION:
 -PROFILE PLATES SHALL BE FORMED FROM G90 GALVANIZED STEEL.
 -PROFILE PLATES SHALL VARY IN SIZE PER UNIT.
 -PROFILE PLATES SHALL BE MOUNTED ALONG THE SAME PLANE AS THE DISCHARGE OF THE BURNER.
 -DESIGN SHALL INCORPORATE PROPERLY TORQUED, PERMANENTLY MOUNTED SPRING HINGES.
 -SPRING HINGES SHALL BE MADE FROM PLATED STEEL.

OPTIONS:
 - FULL BOTTOM CORNERS.



REVISIONS	
DESCRIPTION	DATE

www.econair.com
 Eastern North Carolina
 4641 Pargeton Park Rd., Raleigh, NC, 27616 PHONE: (919) 825-3566 FAX: (919) 227-5917 EMAIL: reg36@econair.com

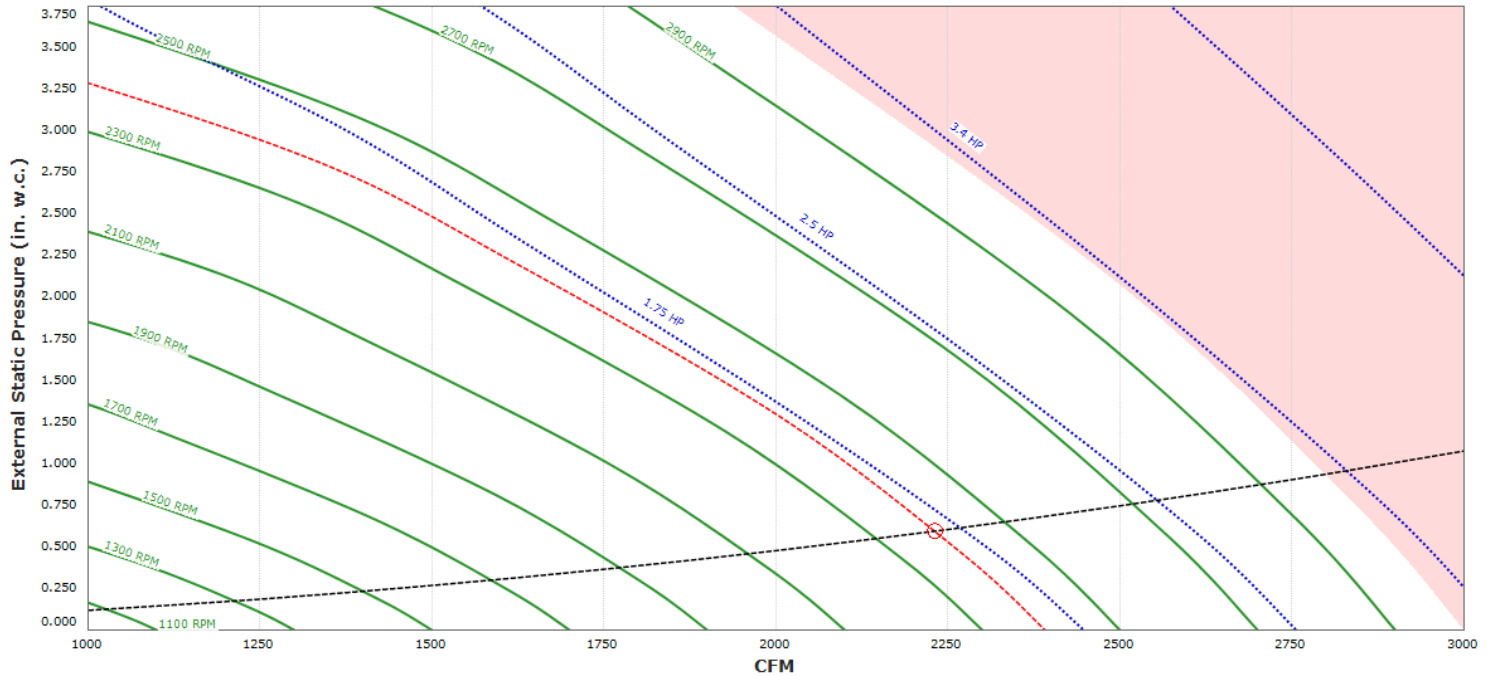
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 DRAWN BY: REG 36
 SCALE: 3/4" = 1'-0"
 MASTER DRAWING



A1-D.250-16Z (#1) MAU-01 (KH-01) Weight: 485 lbs./63 curb

Direct Gas Fired Heated Make Up Air Unit with 16" Direct Drive Fan



SUPPLY MOTOR

Model 186727/A01-ECM-60-480-16 • 3.400 HP, 3 Phs, 460 V, 60 Hz, 3.3 FLA, ODP-ECM (Open Drip Proof Electronically Commutated Motor)

BURNER

Min Output BTU:	18,000 BTU/Hr
Max Output BTU:	275,000 BTU/Hr
Size:	6" long
Gas Type:	Natural

SUPPLY PERFORMANCE

Volume:	2231 CFM	RPM:	2391
Tip Speed:	10015 ft/min	BHP:	1.6790
Static Pressure:	0.596" w.g. (0.500" Ext. + 0.057" Int. + 0.039" Opt.)		
Altitude:	70 ft		

CONSTRUCTION FEATURES

- Housing constructed of heavy duty G90 galvanized steel
- Forward curved centrifugal blower wheel
- Vibration isolation
- Adjustable drive assemblies
- Adjustable motor mount
- Ball bearing motors
- Heavy duty, pre-lubricated bearings rated for 200,000 hours of operation
- Static resistant belts
- Service doors on both sides
- Horizontal & down discharge
- Large intake area ensures low pressure drop across unit
- Spring loaded profile plates automatically adjust for any airflow - no manual setting required!
- Weatherproof safety disconnect switch
- Modular design provides design flexibility
- Fully insulated casing

BLOWER

16 Inch Plenum Fan for size 1 MOD. Motor integral to Wheel. Max RPM = 3000

TEMPERATURE CONTROL

0-150°F Discharge Temp Control • Field Wired On/Off Start Command • Heating Activation Based On Intake Set Point. Use with MUA

INTAKE

HEATING SCHEDULE

Altitude:	70 ft
Winter Outdoor Air Dry Bulb Temp:	25°F
Temp Rise:	50°F
Output BTU:	118872
Input BTU:	129209
Based Off:	BTUs Actual Air Density

SUPPLY INSTALLATION INFORMATION

Gas Pressure:	7 in. w.c. - 14 in. w.c.
Insurance Requirements:	No Insurance Requirement (ANSI)
Unit Voltage:	3 phs 460 V 60Hz
Motor Circuit:	4.2 Amps MCA • 15 Amps MOP • 460 V • 14 AWG Wire Min.
Control Circuit:	2.0 Amps MCA • 15 Amps MOP • 120 V • 14 AWG Wire Min.
SCCR:	10 kAmp

- Sloped Filtered Intake for Size #1 Modular Heater. 21.813" Wide x 44.375" Long x 23.375" High. Includes 2" MV EZ Kleen Metal Mesh Filters.

AIRFLOW DIRECTION

- Down Discharge - Air Flow Right -> Left

FILTERS

- 3x MV EZ Kleen Metal Mesh Filter. 16"x 20"x 2" Used for heater and supply fan intakes. (3412)

CURB & SUPPORTS

- ROOF CURB - 21" Width, 71" Length, 16" Supply Height, Insulated. For #1 Modular Heater.

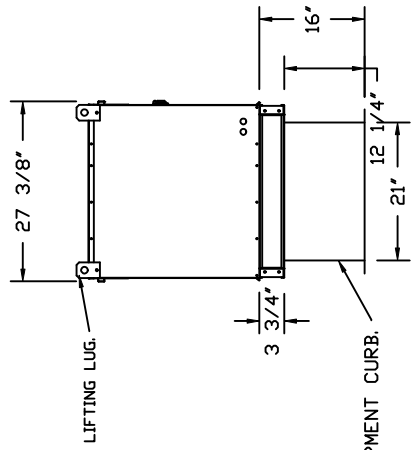
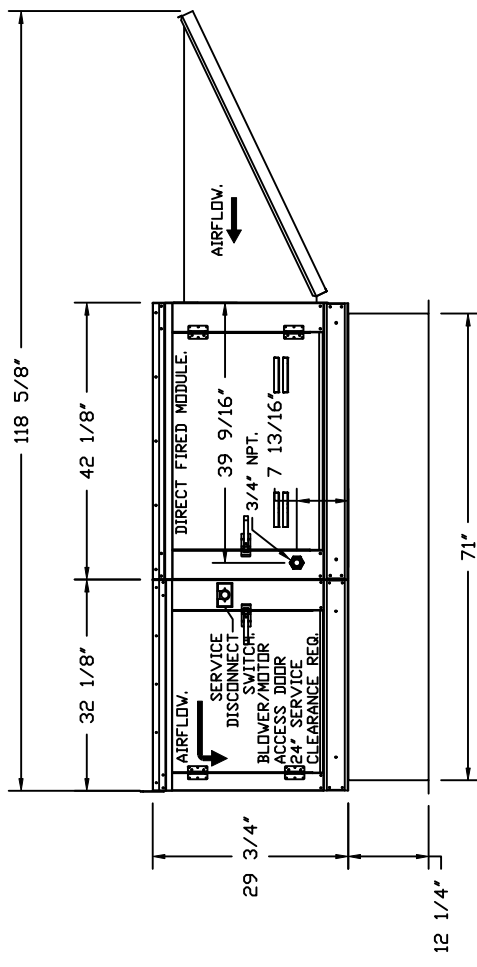
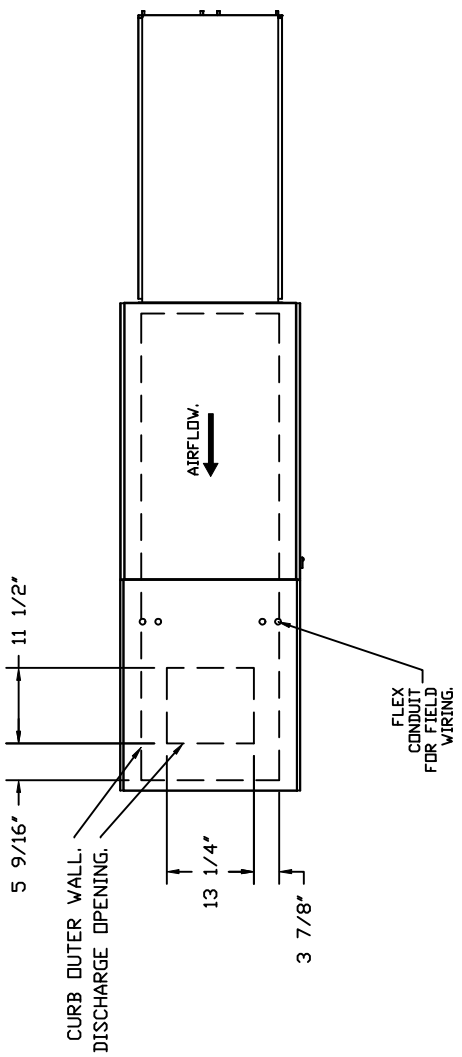
CONFIGURED OPTIONS

- Down Discharge Construction for Size 1 Direct Drive AHUs
- Gas Pressure Gauge, 0-35", 2.5" Diameter, 1/4" Thread Size
- Gas Pressure Gauge, -5 to +15 Inches Wc., 2.5" Diameter, 1/4" Thread Size
- Ship Loose Gas Strainer. To be installed upstream of unit connection. 3/4" Connection
- Motorized Back Draft Damper 16" X 18" for Size 1 Standard & Modular Heater Units w/Extended Shaft, Standard Galvanized Construction, 3/4" Rear Flange, Low Leakage, TFB120S Actuator Included
- High Gas Pressure Switch (1" - 20" WC) Factory set at 8" w.c. Replaces part HGP-A.
- Low Pressure Gas Switch (1" - 6" WC) Factory set at 2" w.c.
- ECM Wiring Package MODBUS Control for Supply EC Ziehl Fans. MSC Controller

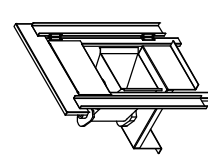
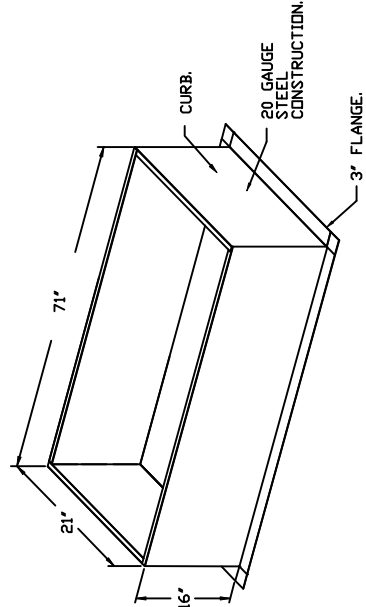
A1-D.250-16Z SOUND (2391 RPM) AT 5 FT. IN OCTAVES:

	1	2	3	4	5	6	7	8	
	80.7	88.6	87	84.8	80.6	78	77.3	73.9	
LWA:	87.1		Sones:		27.1		DBA:		75.6

Note: Sound data across operational range. Tested in accordance to AHRI Standard 270/370.



OPTIONS:
- FULL BOTTOM CORNERS.



DIRECT FIRED (DF) PROFILE PLATE ASSEMBLY

DIRECT FIRED PROFILE PLATE SPECIFICATIONS:

DIRECT FIRED BURNERS SHALL HAVE PATENTED (US PATENT NO. 4,886,883) SELF-ADJUSTING PROFILE PLATE DESIGN. THE PROFILE PLATE DESIGN IS A SELF-ADJUSTING PROFILE PLATE DESIGN THAT ADJUSTS TO ACHIEVE CLEAN COMBUSTION BY LIMITING BY-PRODUCT LEVELS TO A MAXIMUM OF 50PPM OF CARBON MONOXIDE (CO), AND 100PPM OF NITROGEN DIOXIDE (NO2) LEVELS. THE PROFILE PLATE DESIGN WILL ENSURE A CONSISTENT AIRFLOW, REGARDLESS OF INLET AIR TEMPERATURE.

APPLICATION:

SPRING-LOADED BURNER PROFILE PLATES ARE ENGINEERED TO AUTOMATICALLY REACT TO THE MOMENTUM OF AIRFLOW THROUGH THE BURNER. THE PROFILE PLATES ARE DESIGNED FOR DEMAND CONTROL VENTILATION (DCV) REQUIREMENTS.

CERTIFICATIONS:

ALL PROFILE PLATE ASSEMBLIES SHALL BE INCLUDED IN THE DF UNIT'S ETL LISTING AND COMPLY WITH COMBINED SAFETY STANDARDS ANSI Z83.4 AND CSA 37 (NON-REGULATING DF HEATERS) AND ANSI Z83.18 (REGULATING DF HEATERS).

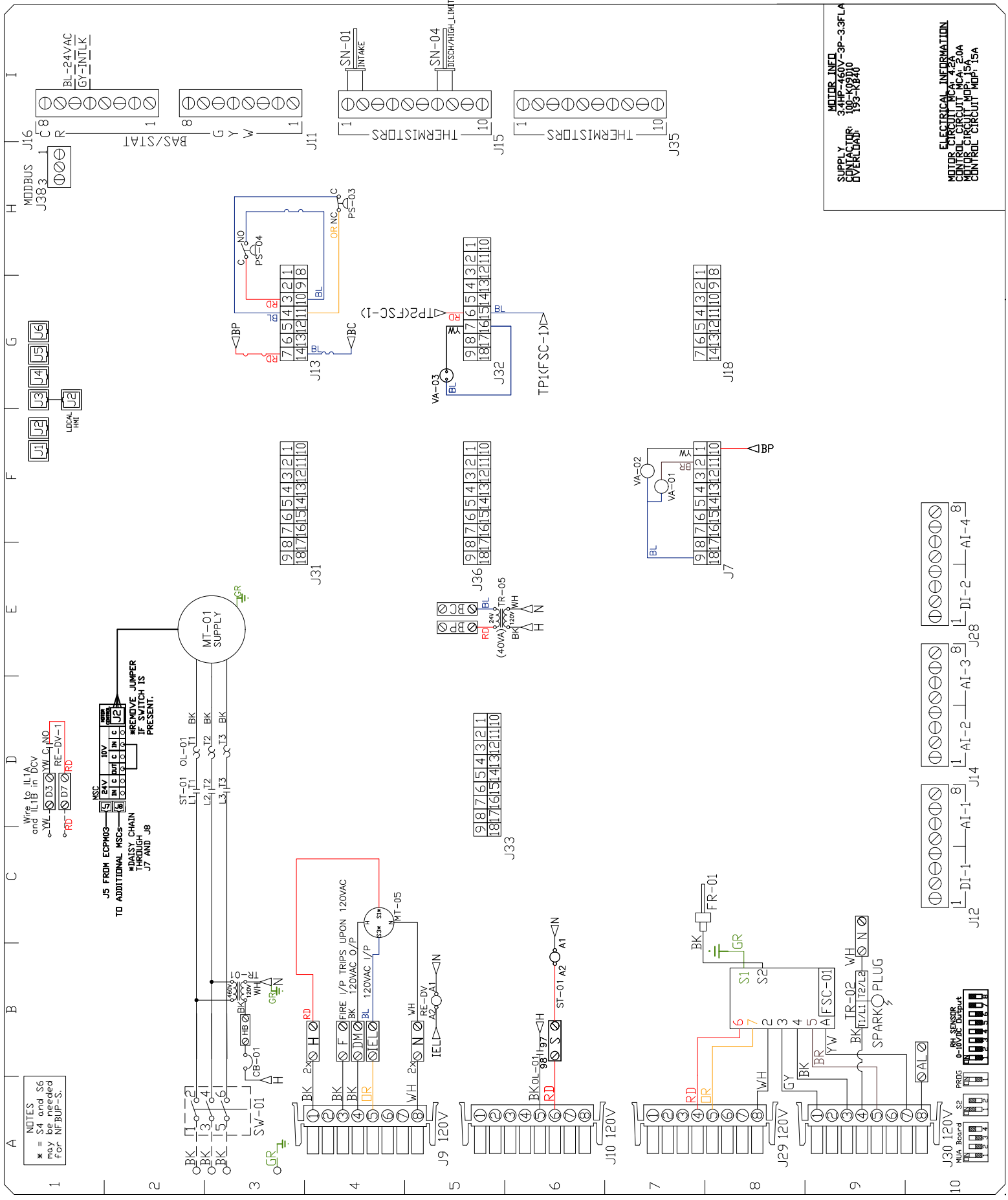
GENERAL NOTES:

- PROFILE PLATES SHALL BE FORMED FROM 600 GALVANIZED STEEL.
- PROFILE PLATES SHALL VARY IN SIZE PER UNIT.
- PROFILE PLATES SHALL BE PERMANENTLY MOUNTED TO THE BURNER ASSEMBLY.
- DESIGN SHALL INCORPORATE PROPERLY TIGHTENED PERMANENTLY MOUNTED SPRING HINGES.
- SPRING HINGES SHALL BE MADE FROM PLATED STEEL.

COMPONENT LIST	LABEL	DESCRIPTION
B3	CB-01	CIRCUIT_BREAKER
BB	FR-01	FLAME_ROD
BB	FSC-01	FIREYE_FLAME_SAFETY
E2	MT-01	SUPPLY_MOTRS
E4	MT-05	INTAKE_JUMPER_MTR
DB	DL-XX	MTR_OVERLOAD
H4	PS-03	HIGH_GAS_SWITCH_L
H3	PS-04	LOW_GAS_SWITCH
DB	SN-XX	TEMP_SENSOR
DB	ST-XX	MTR_STARTER
A3	SW-01	DISCONNECT_SWITCH
B3	TR-01	CTRL_TRANSFMR
B9	TR-02	IGNITION_TRANSFMR
E5	TR-05	BOARD_POWER_TRFMR
F7	VA-01	PILOT_GAS_VALVE
F7	VA-02	MAIN_GAS_VALVE
G5	VA-03	MOD_GAS_VALVE

LEGEND	FIELD WIRING FACTORY
—	BLACK
—	BROWN
—	RED
—	BLUE
—	YELLOW
—	GREY
—	PURPLE
—	PINK
—	ORANGE
—	GREEN
—	WHITE
—	STRIPES
—	BL/RO- BL/ROD STRIPE
—	RO/GN- RO/GND STRIPE
—	WH/BL- WH/BL STRIPE

JOB NAME	DRAWING TITLE
NC026	HVAC_RESE...
DESCRIPTION OF OPERATION	
MUA BOARD	(DETAILS TO FOLLOW)
JOB NO.	DRAWN BY
5996145	AUTO
TYPE	DATE
FACTORY	5/10/2023
DWG. NO.	
HW5996145-2	



NOTES
* = S4 and S6 may be needed for NF-BUP-S.

Wiring to LTA and LTB in DCV

RE-DV-1

WIRE FROM ECPM03 TO ADDITIONAL MSCS THROUGH J7 AND J8

REMOVE JUMPER IF SWITCH IS PRESENT.

FIRE I/P TRIPS UPON 120VAC

DM 120VAC O/P

EL 120VAC I/P

RE-DV

WH

GR

ST-01 A2

ST-01 A1

FR-01

GR

FSC-01

TR-02 WH

SPARK PLUG

J30 120V MUA Board

REG 0-10VDC Output

J12 DI-1-A1-1-8

J14 AI-2-A1-3-8

J28 DI-2-A1-4-8

LOCAL HMT

MODBUS J38.3

J16

C8

BAS/STAT

J11

Y

W

J13

BP

BC

PS-04

PS-03

J32

VA-03

TP1(FSC-1)

J35

THERMISTORS

J18

J7

VA-02

VA-01

J31

J36

J33

BL-24VAC

GY-INTLK

SN-01 INTAKE

SN-04 DISCH/HIGH LIMIT

SUPPLY INFO

3.4HP-460V-3P-3.3FLA

CONTROL CIRCUIT MUA 4.2A

CONTROL CIRCUIT MUA 2.0A

CONTROL CIRCUIT MUA 1.5A

ELECTRICAL INFORMATION

LEGEND

COMPONENT LIST

JOB NAME

DRAWING TITLE

DESCRIPTION OF OPERATION

FACTORY

Installation Wiring

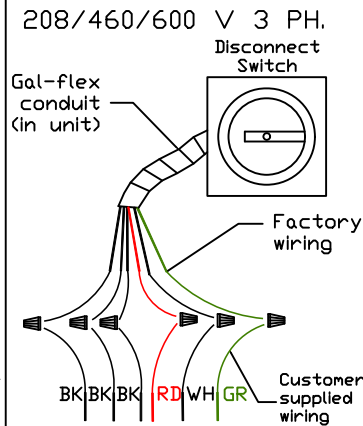
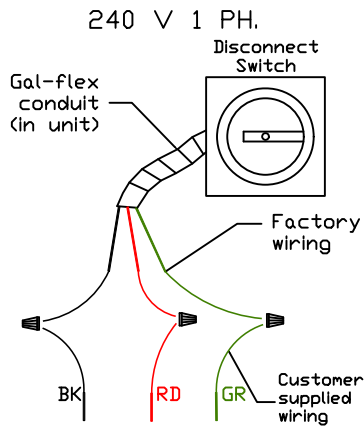
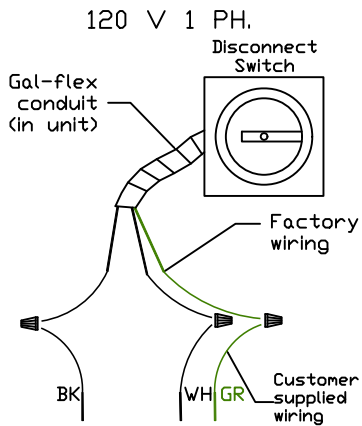
JOB 5996145 - NC026 HVAC RESET-81st-WINTERV...

DRAWING NUMBER RP5996145-2

SHIP DATE 5/10/2023

MODEL A1-D.250-16Z

Installed Options

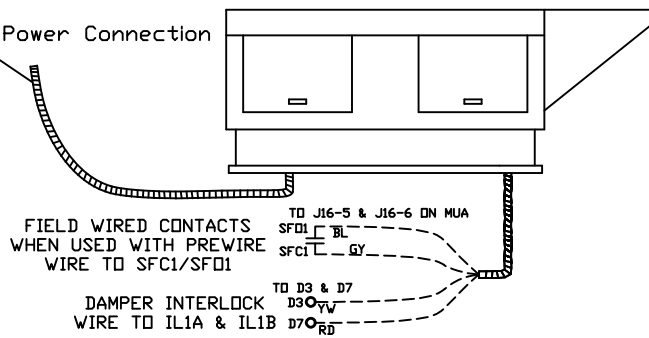


Field Wired Switch

STANDING POWER
RD & WH Wire (115V, 1 PHASE)

See above details.

Power Connection



NOTES

WIRE COLOR

- BK - BLACK
- BL - BLUE
- BR - BROWN
- OR - ORANGE
- RD - RED
- WH - WHITE
- YW - YELLOW
- GR - GREEN
- GY - GRAY
- PR - PURPLE
- PK - PINK

SECTION 23 74 33

FACTORY FABRICATED PACKAGED HEATING AND COOLING MAKE-UP AIR UNITS

SPECIFICATIONS

**TAG: Modular Direct-Fired
Heater**

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes modular packaged heating and cooling units capable of supplying up to 100 percent outdoor air.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

- A. ETL-Listed to the American National Standard/CSA Standard for Gas Unit Heaters And Gas-Fired Duct Furnaces ANSI Z83.4, CSA 3.7.
- B. The Safety Control Board is ETL-Listed to standards UL 60730-2-9, UL 60730-1; CSA E60730-1, and CSA E60730-2-9.

1.4 WARRANTY

- A. All units are provided with the following 2-year standard warranty.
- B. This warranty shall not apply if:
 - 1. The equipment is not installed by a qualified installer per the manufacturer's installation instructions shipped with the product.
 - 2. The equipment is not installed in accordance with Federal, State, Local codes and regulations.
 - 3. The equipment is misused, neglected, or not maintained per the manufacturer's maintenance instructions.
 - 4. The equipment is not operated within its published capacity.
 - 5. The invoice is not paid within the terms of the sales agreement.
- C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by the manufacturer

at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL ASSEMBLY

- A. Unit(s) shall be factory assembled, tested and shipped as a complete packaged assembly, for indoor or outdoor mounting, consisting of the following specifications, deliver all capacities scheduled, and conform to design indicated herein. Alternate layouts or dimensional changes will not be accepted.

2.2 CABINET

- A. Unit(s) shall be constructed of minimum 20-gauge G-90 galvanized steel riveted together via structural pop-rivets. All metal shall be CNC bent for precise assembly.
1. Base Construction: The base shall be constructed of galvanized steel for improved rigidity. Base shall be structurally reinforced to accommodate the blower assembly and burner.
 2. Rigging Provisions: The unit shall have a structural base constructed of minimum 14ga. G-90 galvanized steel, and include lifting points on all four sides.
 3. Roof Construction: Roof shall be pitched to allow for proper drainage.
 4. Exterior Wall Construction: All exterior walls shall consist of insulated galvanized steel construction.
 5. Service Access Doors: All door jambs shall be gasketed around their perimeter. Doors may be mounted via spring actuated, stainless steel hinges with stainless steel rivets, and self-compressing stainless steel pad lockable latches or through removable sliding panels.
 6. Each compartment shall have removable access panels to allow for ease of service and maintainability. Electrical cabinet doors shall be outfitted with schematic/manual pouches formed into the door, along with wiring diagram attached to the interior of the door from the factory.
- B. Entire interior and exterior casing shall be constructed of minimum 20-gauge G-90 galvanized steel with no painting, and shall have undergone a salt spray corrosion test as per ASTM B 117.
- C. An observation port shall be located on the exterior of the unit for observation of the main flame and pilot flame. All controls, gas valves, modulating controls and electrical components shall be mounted within the burner vestibule. The burner vestibule shall be an integral part of the unit and not extend outside the exterior casing of the unit and not exposed to the main air stream.

2.3 AIRFLOW CONFIGURATIONS

- A. Unit shall be configurable for down (vertical) discharge through unit.
- B. Unit intake airflow configuration shall be through use of a fresh/outdoor damper.
 - 1. Damper: Manufacturer shall provide and install on unit, when possible, a two-position, motor-operated damper with internal end switch to energize the blower-starter circuit, when damper is 80% open. Blades shall be a maximum of 6" wide 16-gauge G-90 galvanized steel and shall be made to guarantee the absence of noticeable vibration at design air velocities. Damper blades are to be mounted on friction-free synthetic bearings. Damper edges shall have PVC coated polyester fabric mechanically locked into blade edge. Jamb seals used are flexible metal, compression type. Damper shall exceed AMCA Class 1A standard for low leakage. Damper assembly shall be a single assembly, and outfitted with an integral bird screen and louver/gutter system to divert any drainage through the base of the unit - intake air hood not required.
 - 2. Discharge Diffuser: Shall be constructed of G-90 galvanized steel with horizontal and vertical blades capable of four-way diffusion.
 - 3. Actuator: A single direct drive damper actuator shall be used with spring return to ensure that the outdoor air section opens when not powered.

2.4 SUPPLY AIR BLOWER AND MOTOR

- A. All supply fans shall be:
 - 1. Direct Drive: Blower assembly shall consist of a centrifugal backward inclined, non- overloading wheel secured directly to a heavy-duty, ball bearing type motor via two set screws. The motor and wheel assembly shall be mounted to a heavy gauge galvanized steel frame. The motor shall be controlled by a variable frequency drive, allowing for variable airflow without the need of belts and pulleys.
- B. Blower Motor: Motor shall be a premium efficiency motor available as:
 - 1. Electronically Commutated Motor (ECM).
- C. Fans to be selected at or near efficiency peak. Check fan curves provided with job.
- D. Blower and motor assembly shall be dynamically balanced. The entire blower and motor assembly shall be mounted on rubber vibration isolators. Wheels balanced as per AMCA 204-96; Balance Quality and Vibration Levels for fans.

2.5 SHAFTS AND BEARINGS

- A. Shafts shall be precision ground and polished. Heavy duty, pre-lubricated bearings designed for, and individually tested, specifically for, use in air handling applications.

2.6 HEATING SYSTEM

- A. The gas burner shall be a direct-fired, pull-through type, using natural gas at an inlet-supply pressure to the unit of 7" w.c. minimum natural gas.
- B. Burner design shall be capable of using natural gas. Burner ignition shall be of the direct-spark design with remote flame sensing at the pilot assembly to detect the presence of flame in the burner.
- C. Direct-sparking sequence shall last through the complete duration of the trial for ignition period for guaranteed light-off. Each burner ignition module shall have LED indicators for troubleshooting and a set of exposed prongs for testing flame indication signal.
- D. Unit should include self-adjusting burner profile plates, which ensure proper air velocity and pressure drop across the burner for clean combustion. Spring-loaded profile plates should react to the momentum of the fresh air stream. No motors or actuators are needed to drive them, nor should they need to be manually set to a specific position. Units should be capable of variable air volume applications.
- E. Each furnace shall have:
 - 1. The burner shall have non-clogging, stainless steel combustion baffles attached to a ductile aluminum gas-supply section with no moving parts to wear out or fail. The burner shall be capable of 92% combustion efficiency with a maximum turndown ratio of up to 30 to 1.
 - 2. Stainless steel Quick Seal Connection for gas connection.
 - 3. Manifold and Input gas pressure gauges.
 - 4. Inlet pressure gauge installed on the gas manifold (0-35" wc).
 - 5. Inlet pressure gauge installed on the gas manifold (-5 to 15" wc).
 - 6. Optional high gas-pressure switches to disable heating, if gas pressure is too high.
 - 7. Optional low gas-pressure switch to disable heating, if gas pressure is too low.

2.7 FILTERS

- A. Provide filters as part of unit. All filters shall be furnished and installed to meet the performance requirements set forth in the schedule and as specified under another section of this work.
- B. The filters shall be (2") thick, aluminum mesh coated with super-filter adhesive, aluminum mesh with polyester foam or pleated throw away. Aluminum-mesh filters shall have aluminum frames with media to be layers of slit and expanded aluminum, varying in pattern to obtain maximum depth loading. Washable 2" filters shall be enclosed in two-piece, die-cut frame with diagonal supports. Frame shall be constructed of heavy-duty beverage board. Filter media is supported on the air leaving side by a metal grid.
- C. All filters shall be installed on tracks for easy removal from the unit.
- D. Shall be either insulated or non-insulated constructed of G-90 galvanized

steel with filters supported by internal slides and with removable access panels.

2.8 ELECTRICAL

- A. All controls shall be pre-wired and housed in an insulated electrical cabinet within the unit to protect against risk of condensation.
- B. All direct fired and cooling only units shall be provided with single point electrical connection.
- C. Unit shall be provided with a door safety switch that de-energizes the supply fan when the door is opened.
- D. Units shall be provided with a factory mounted averaging intake air temperature sensor to allow for accurate intake temperature reading regardless of how the OA/RA dampers are positioned.
- E. The electrical cabinet shall be outfitted with the following:
 - 1. Color wiring schematics, laminated to the interior wall of the cabinet doors.
 - 2. Factory mounted disconnect with unit bottom knockouts.
 - 3. A LED backlit, LCD Human-Machine Interface (HMI) shall be mounted within the unit's control cabinet to allow for all setpoints configuration and refrigeration system monitoring at the unit.
 - 4. Up to 4 additional space mounted HMIs available. Additional HMIs shall allow for full programming capabilities and are outfitted with integral temperature and humidity sensors. Additional HMIs shall be capable of being individually averaged for space temperature/humidity readings. All HMIs shall be wired using standard CAT5/6 cables.

2.9 CONTROLS

- A. Unit shall be outfitted with a control board to allow for full control of the entire unit.
- B. Provide onboard air flow switch located on MUA control board to sense air flow.
- C. All unit controls shall be compatible with BACnet and LonWorks based building management systems.
- D. All units shall be outfitted with CASLink cloud based monitoring, which monitors every point of operation. Provides configurable automated fault alert e-mails, and remote control capabilities.
- E. Integrated cellular module to provide remote connection to monitoring services to view both real time and historical unit operation. Data shall be stored a minimum of 3 years on the cloud. Data sample rate shall be a maximum of 60 seconds.
- F. Temperature Control System:
 - 1. **Discharge Temp Control (Heating)** - Unit modulates the burner flame (current supply in the case of electric heating) to accurately maintain the

desired discharge temperature set point and compensate for fluctuations in entering air temperature, air volume and % of OA using heating PID controls.

G. Activation Controls:

1. **Activate Based on Intake (Heating)** - Unit will activate heating when the intake temperature drops below the desired set point.
2. **Activate Based on Space (Heating)** - Unit will activate heating when the space temperature drops below the desired set point.
3. **Activate Based on Both (Heating)** - Unit will activate heating when the space AND intake temperature drop below the desired set point.
4. **Activate Based on Either (Heating)** - Unit will activate heating when the space OR intake temperature drops below the desired set point.
5. **Activate Based on Stat (Heating)** - Unit will activate heating when the space thermostat sends a 24V signal to W and G on the main control board. Unit will modulate to maintain a constant discharge heat set point.

2.10 ROOF CURBS

- A. Unit shall be factory assembled, and constructed of 18GA galvanized steel.
- B. Curb shall be fully insulated with 1" acoustical and thermal insulation.
- C. Curb shall be factory outfitted with duct support hangers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all areas and conditions under which packaged units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual and all applicable building codes.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties. Install piping to allow service and maintenance.
- B. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts.
- C. Electrical connections conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP

A. System start-up is performed by a factory-trained Service Technician.

SECTION 21 23 00

WET- CHEMICAL FIRE-EXTINGUISHING SYSTEMS

TAG: TANK Fire Suppression

PART 1 - GENERAL

1.1 SUMMARY

- A. TANK Fire Suppression is a pre-engineered, stored-pressure wet chemical solutionextinguishing system.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the requirements of the project and meet Federal, State, and Local codes.
- B. As the manufacturer continues product development, it reserves the right to changedesign and specifications without notice.

1.3 QUALITY ASSURANCE

- A. TANK Fire Suppression System shall be UL & ULC listed in accordance with UL300,UL1254, ULCORD-C1254.6.
- B. Microprocessor-based control board shall be ETL Listed to UL Standard 864 and CAN/ULC-S527-11.
- C. TANK Fire Suppression System intended for installation and for use in accordance withthe National Fire Protection Association Standards:
 - 1. Wet Chemical Extinguishing Systems, NFPA 17A
 - 2. National Electrical Code, NFPA 70
 - 3. National Fire Alarm & Signaling Code, NFPA 72
- D. New York City and FDNY approved under COA# 5870.
- E. California State Fire Marshal (CFSM), Listing No. 7085-2199:0502.

1.4 WARRANTY

- A. All units shall be provided with the following standard warranties:
 - 1. TANK Fire Suppression System is warranted to be free from defects in materials andworkmanship, under normal use and service, for a period of 60-months from date of shipment.
- B. Warranty does not cover consumable products such as batteries and nitrogen.
- C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 60-month warrantyperiod, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection withsuch repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid toa destination determined by the manufacturer.

- D. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is/is not covered and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

- A. A pre-engineered, fixed pipe, automatic wet chemical agent fire suppression system for protection of all hazard areas associated with cooking operations, including exhaust hoods, plenums, ductwork, and cooking appliances.

2.2 COMPONENTS

- A. Exhaust hood fire system components to be factory installed.
- B. Cylinder and Valve Assembly
 1. The cylinders shall have a tin-nickel alloy plated brass valve with pressure gauge.
 2. Wet chemical agent shall be contained in one or more stored pressure DOT/TC rated steel cylinder and valve assemblies.
 3. Each cylinder is factory-filled with liquid fire suppressant and pressurized to 200 PSIG at 70°F.
 4. Maximum cylinder flow points = 20.
- C. Distribution Nozzles
 1. Nozzles shall be located to protect the exhaust ducts, plenums, and all cooking appliances requiring protection.
 2. All nozzles shall be equipped with a metal blow off cap. The cap prevents contamination from entering the pipe network and is designed to pop-off upon system discharge, allowing agent to flow to the protected hazard area.
 3. All nozzles shall incorporate a stamped part number to easily identify nozzle type.
- D. Distribution System
 1. The distribution system shall consist of Copper, Schedule 40 black iron, chrome-plated or stainless-steel pipe and fittings. All exposed piping and fittings must be chrome-plated or stainless steel.
 2. Fittings shall be minimum class 150. Galvanized fittings shall not be used.
- E. Suppression System
 1. The system control equipment shall be capable of all functions associated with automatically and manually discharging the wet chemical agent from all cylinder and valve assemblies, including automatic shutdown of the heat source or fuel and electrical power to all protected areas upon system discharge.
 2. Liquid Fire Suppressant shall be Aqueous Potassium Carbonate (APC).
 3. All mechanical components of the actuator kit shall be enclosed.
 4. The actuator kit shall be capable of automatic or manual activation means.
 5. Supervisory Pressure Switch added to monitor operating system pressure.
 6. For manual activation, an electrically operated manual release shall be used to actuate the system manually.
 7. For automatic activation, the system will be activated by a Firestat (heat) detector.

F. Electrical

1. Electrical Division to provide shunt trip breakers at main power panel, or disconnects, as designated by the Electrical Engineer; interconnection provided at hood control panel for the signal to shut down all electricity in and under the exhaust hood. Shunt trips/disconnects to accomplish shut off of electricity in the event of fire system activation by others.
2. Printed circuit board with microprocessor-based controller that provides all the necessary monitoring, timing, and supervision functions required for the reliable operation of the fire system.
3. Independent supervised loops incorporate redundancy and fault detection.
4. Real-time cloud-based monitoring connection provided with system by ownership.
5. Primary power supply, with battery backup for power loss.
6. All wiring must be in accordance to NFPA 70 and the Authority Having Jurisdiction (AHJ).
7. Electric gas valve provided for equipment below exhaust hood. Coordinate size and installation with Plumbing Division.
8. All wiring is to be in accordance with the applicable manufacturer's instructions for the fire alarm control panel, gas shut-off valve, manual reset relay, and contractor supplied shut-off devices.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 APPLICATION

- A. Wet chemical-based fire suppression system for use in commercial kitchens. It can be mounted in the integral cabinet located at the end of the hood or offered as a wall mount package.

3.3 INSTALLATION

- A. As part of this item, provide wall mounted type K handheld portable fire extinguisher, placard, and mounting bracket as required in the immediate vicinity of each cooking area, per NFPA-96 and NFPA-10. Additional fire extinguishers as required in the kitchen area are to be specified by the Architect and provided by the General Contractor.
- B. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.
- C. Six-month and twelve-month inspections, servicing, and replacement of components as per NFPA 96 to be provided by the General Contractor or Owner.

SECTION 23 38 13 13

SPECIFICATIONS

TAG: Commercial Kitchen Ventilation Hoods, Listed Commercial

Kitchen Hoods

PART 1 - GENERAL

1.1 SUMMARY

- A. The ND2 series is a Type I, wall canopy hood for use over 600°F cooking surface temperatures. The aerodynamic design includes a mechanical baffle and performance enhancing lip for exceptional capture and containment.
- B. The hood shall have the size, shape, and performance specified on drawings.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the project's requirements and meet Federal, State, and Local codes and regulations.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.
- C. The manufacturer shall supply complete computer generated submittal drawings, including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect, and owner for their use in construction, operation, and maintenance.

1.3 QUALITY ASSURANCE

- A. This hood is ETL-listed to standard UL710, ULC710, and ULC-S646 when installed in accordance with these installation instructions and National Fire Protection Association Standard "NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations."
- B. Built-in compliance with NSF/ANSI Standard 2.
- C. The hood shall be ETL Listed as:
 - 1. "Exhaust Hood Without Exhaust Damper."
 - 2. ETL Sanitation Listed and built in accordance with NFPA 96.
 - 3. The ETL label shall list temperature rating(s) and minimum CFM/ft rating(s).

1.4 WARRANTY

- A. All units shall be provided with the following standard warranty:
 - 1. This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment.
- B. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such

repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

- C. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is/is not covered and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter, which directs and captures grease-laden vapor and exhaust gases, shall have a liquid-tight continuous external weld in accordance with NFPA 96.
- B. Duct sizes, CFM, and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.

2.2 CONSTRUCTION

- A. Construction shall be type 430 stainless steel.
- B. Double wall insulated front to eliminate condensation and increase rigidity on wide sizes. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
- C. Hood shall be equipped with a minimum of four connections for hanger rods. Hood lengths greater than 12' will have added hangers.
- D. Exhaust duct collar to be 4" high with flange.
- E. The grease drain system shall be an enclosed integral part of the hood back and have slopes with an exposed, removable 1/2 grease cup to facilitate cleaning.
- F. An integral baffle to direct grease laden vapors toward the exhaust filter bank.
- G. Hood shall be furnished with UL classified filters, supplied in size and quantity as required by ventilator.
- H. All seams shall be welded and have stainless steel on exposed surfaces.

2.3 LIGHTING

- A. Recessed round LED fixture and LED light, 3500K Warm output.

2.4 FILTERS

- A. Stainless Steel Captrate Solo filter with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.

2.5 OPTIONS

- A. Fire Suppression System: UL 300 fire suppression system.
- B. Optional perforated supply plenum shall provide make-up air discharged below the cooking equipment.
 - 1. Perforated diffuser plates shall be included in the design to

- provide even air distribution.
- 2. Unexposed surfaces shall be constructed of aluminized steel. Plenum shall be insulated to prevent condensation.
- 3. Perforated Supply Plenum (PSP)
- C. Wall Mounted Utility Cabinet - Cabinet can store listed fire suppression system, listed components, pre-wired electrical controls.

2.6 ACCESSORIES

- A. End Panel(s) maximize hood performance and eliminate the effects of cross drafts in the kitchen. Units constructed of stainless steel and sized according to hood width and cooking equipment. Exposed edges hemmed for safety and rigidity. Selected panels:
 - 1. Wall as End Panel
- B. Splash panel(s) selected:
 - 1. Backsplash
 - 2. Left Sidesplash
 - 3. Right Sidesplash
- C. Standoff(s) selected:
 - 1. Right End Standoff
- D. Wrapper(s) may be installed from the factory or field installed. Wrapper(s) selected:
 - 1. Wrapper
- E. Miscellaneous option(s) selected:
 - 1. Insulation for Back of Hood - Backside of hood is fully insulated.
 - 2. Riser Sensor Install - Sensor set-up for 6" plenum.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

SECTION 23 34 23

POWER VENTILATORS

TAG: Centrifugal Upblast

PART 1 - GENERAL

1.1 SUMMARY

- A. Fan shall be a spun aluminum, G90 Galvanized, roof or wall-mounted, direct drive, upblast centrifugal exhaust ventilator.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

- A. ETL Listed and complies with UL705 (electrical) Standards and CSA Std C22.2, No 113.
- B. ETL Listed and comply with UL762 and ULC-S645 Standards.
- C. Fan shall bear the AMCA certified rating seal for air performance.
- D. Wheels shall be balanced in two planes and done in accordance with AMCA standard 204-96, Balance Quality and Vibration Levels for Fans.

1.4 WARRANTY

- A. All units are provided with the following 2-year standard warranty from date of shipment.
- B. This warranty shall not apply if:
 - 1. The equipment is not installed by a qualified installer per the manufacturer's installation instructions shipped with the product.
 - 2. The equipment is not installed in accordance with Federal, State, and Local codes and regulations.
 - 3. The equipment is misused, neglected, or not maintained per the manufacturer's maintenance instructions.
 - 4. The equipment is not operated within its published capacity.
 - 5. The invoice is not paid within the terms of the sales agreement.
- C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by the manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without

manufacturer's prior authorization. All returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL ASSEMBLY

- A. The fan shall be factory assembled, tested, and shipped as a complete unit.
- B. The following specifications, delivering all capacities scheduled and conforming to the design indicated herein. Alternate layouts or dimensional changes will not be accepted.

2.2 CONSTRUCTION

- A. The fan wind band shall be constructed of heavy gauge aluminum or G90 Galvanized and shall be spun on an automatic lathe to provide consistent dimensions.
- B. Horizontal and vertical internal supports shall be used to fasten the wind band to the discharge apron securely. This provides rigidity for hinging and added strength to reduce shipping damage.
- C. The discharge apron shall have a rolled bead for added strength.
- D. Base corners shall be welded to provide strength and support for hinging and cleaning and prevent leakage into the building.
- E. The fan shall bear a permanently attached nameplate displaying model and serial number of unit for future identification.
- F. Nylon washers provide a tight seal. All fasteners in the fan housing shall be backed with nylon washers.
- G. The unit shall be factory tested after assembly.

2.3 CURB

- A. The curb shall be constructed of galvanized steel.
- B. The heavy duty G90 galvanized curb cap shall have fully welded corners for added strength and leak protection.
- C. Fan #1 has curb options:
 - 1. Hinged Base: Attached
 - 2. Vented
 - 3. Paint Option: Not Painted

2.4 WHEEL

- A. The fan wheel shall be centrifugal backward inclined and non-overloading.
- B. The wheel blades shall be aerodynamically designed to minimize turbulence, increase efficiency and reduce noise.
- C. The wheel blades shall be welded to the wheel inlet cone.
- D. If balancing weights are required, they shall be riveted to the blades or

wheel.

E. The wheel inlet shall overlap the fan base inlet for maximum performance and efficiency.

F. The wheel shall be firmly attached to the motor shaft with two set screws.

2.5 MOTOR

A. Fan(s) 1 Motor Type: Open Drip Proof (ODP).

B. Motor shall be permanently lubricated and rated for continuous duty.

C. Furnished at the specified voltage, phase, and enclosure. Motor speed shall be variable, controlled using an integrated speed controller.

D. Motors shall be mounted out of the airstream and furnished at the specified voltage, phase, and enclosure.

E. Motor mounting plate shall be constructed of heavy gauge galvanized steel.

F. The motor compartment shall be cooled by outside air drawn through an extruded aluminum conduit tube.

G. An integral electrical conduit running from the fan base to the motor compartment is provided for ease of installation.

H. The conduit tube passage shall be sealed to prevent noise. Silicone rubber grommets shall isolate the conduit tube from the fan housing.

I. The motor compartment shall be a two-piece construction. The cap has quick-release clips to provide fast and easy access to the motor compartment.

2.6 GREASE

A. The grease spout shall be made of aluminum tubing, welded to the fan housing. The weld shall be factory tested to ensure no leaks.

B. Grease Box.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all areas and conditions under which package(s) are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

A. Install the package in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

3.3 CONNECTIONS

A. Electrical connections conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP

A. System start-up is performed by a factory-trained Service Technician.

SECTION 26 27 16

SPECIFICATIONS

TAG: Electrical Cabinets and Enclosures

PART 1 - GENERAL

1.1 SUMMARY

- A. ECP #1:
 - 1. Control Package: Demand Control Ventilation (DCV).
 - 2. The system is designed to control, activate, and operate 1st Voltage: 1 Exhaust Fans, 1 Supply Fans, CORE System(s):Fire System #1 TANK FS - 4.0/4.0, and wash system dependent on the HMI settings and temperature sensors.
 - 3. Zone Configuration: Fan Zones: 1, Light Zones: 1

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the project's requirements and meet Federal, State, and Local codes and regulations.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.
- C. The manufacturer shall supply complete computer generated submittal drawings, including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect, and owner for their use in construction, operation, and maintenance.

1.3 QUALITY ASSURANCE

- A. Control package shall be listed by ETL and complies with UL508A Standard and CAN/CSA C22.2, No. 14-05 Standards.
- B. ECPM03 Circuit Board shall be listed by ETL and complies with UL 61010-1 Standard and CAN/CSA C22.2, No. 61010-1 Standards.

1.4 WARRANTY

- A. All units shall be provided with the following standard warranty:
 - 1. This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment.
- B. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.
- C. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is and is not covered, and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The system includes an LCD screen interface for fan(s) and hood lights control, wash control (if applicable), gas valve reset, programmable schedule, Max Air Override function, Preparation Time mode, Cool Down mode, and diagnostics including VFD status.
- B. The LCD screen shows descriptive plain text explaining the functions or values. The LCD screen interface will be installed on the face of the hood, on the face of the utility cabinet, or on the face of a wall mounted control enclosure.

2.2 CONSTRUCTION

- A. Control enclosure will be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. Control enclosure may be constructed of stainless steel or painted steel.

2.3 FAN CONNECTIONS

- A. ECP #1: 1st Voltage: 1 Exhaust Fans, 1 Supply Fans.

2.4 SWITCHES

- A. Switches to be included with the packages ECP #1:
 - 1. Light Switches: 1
 - 2. Fan Switches: 1

2.5 ZONE CONFIGURATION

- A. Zone Configuration to be included with the packages ECP #1:
 - 1. Number of Fan Zones: 1
 - 2. Number of Light Zones: 1

2.6 ZONE SCHEDULING

- A. Zone Scheduling ECP #1: Zone Scheduling Enabled

2.7 ZONE OPTIONS

- A. ECP #1 Fan Zone 1:
 - 1. Modulation Activation Offset: 20
 - 2. Preparation Activation Offset: 12
 - 3. IO 1 Max Air Enable.

2.8 LOCATION

- A. ECP #1:
 - 1. ECP: Wall Utility Cabinet Left
 - 2. Switches: Face Mount Right Side Hood

2.9 HOOD COVERAGE

- A. ECP #1 will cover: Hood #1 4824EX-2-PSP-F
- B. ECP #1 Smart Control coverage for installed Fire System control board: Fire System #1 TANK FS - 4.0/4.0

2.10 FAN AND MOTOR COVERAGE

- A. ECP #1:

1. 1st Voltage Exhaust - Fan #1
2. 3.00HP * 3Ph * 460V * 60Hz * 4.3 FLA * ODP, Premium * DTP0034
3. Hood #1 4824EX-2-PSP-F
4. Load Reactor
5. 460 Single Phase Input
6. 1st Voltage Supply - Fan #2
7. 3.40HP * 3Ph * 460V * 60Hz * 3.3 FLA * ODP-ECM * 186727/A01-ECM-60-480-16
8. Hood #1 4824EX-2-PSP-F
9. 460 Single Phase Input

2.11 OPTIONS

- A. ECP #1 has options:
 1. 120V Elec. Gas Valve Coverage.
 2. Zone Scheduling.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

