

HOOD INFORMATION - Job#3217422

HOOD NO.	TAG	MODEL	LENGTH	MAX. COOKING TEMP.	EXHAUST PLENUM RISER(S)								TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG.	
					TOTAL EXH. CFM	WIDTH	LENG.	HEIGHT	DIA.	CFM	VEL.	S.P.			END TO END	ROW
1		5424 ND-2-PSP-F	12' 6"	600 Deg.	2938			4'	14"	1469	1374	-0.569"	2644	430 SS Where Exposed	ALONE	ALONE

HOOD INFORMATION

HOOD NO.	TAG	FILTER(S)				LIGHT(S)				UTILITY CABINET(S)				FIRE SYSTEM PIPING	HOOD HANGING WGHT		
		TYPE	QTY.	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY.	TYPE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM TYPE	SIZE			ELECTRICAL MODEL #	SWITCHES QUANTITY
1		Captrate Solo Filter	9	20"	16'	85% See Filter Spec.	4	Screw In Compact	NO	Left	12"x54"x24'			DCV-2111	1 Light 1 Fan	NO	928 LBS

HOOD OPTIONS

HOOD NO.	TAG	OPTION
1		FIELD WRAPPER 18.00' High Front, Left, Right
		BACKSPLASH 80.00' High X 162.00' Long 430 SS Vertical
		INSULATION FOR BACK OF HOOD
		LEFT WIDE VERTICAL END PANEL 42' Top Width, 36' Bottom Width, 80' High Insulated 430 SS
		RIGHT WIDE VERTICAL END PANEL 42' Top Width, 36' Bottom Width, 80' High Insulated 430 SS

PERFORATED SUPPLY PLENUM(S)

HOOD NO.	TAG	POS.	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S)				
							WIDTH	LENG.	DIA.	CFM	S.P.
1		Front	162'	18'	6'	MUA			16"	439	0.129"
									16"	439	0.129"
									16"	439	0.129"
									16"	439	0.129"
									16"	439	0.129"
									16"	439	0.129"

SPECIFICATION: CAPTRATE® GREASE-STOP® SOLID FILTER

THE CAPTRATE 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.

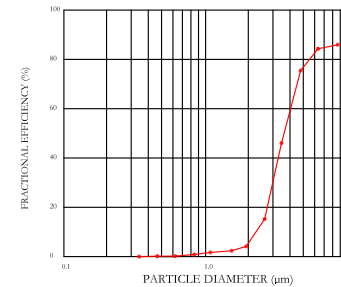
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

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

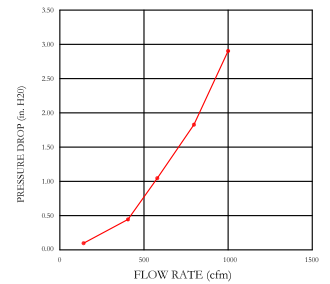
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPTRATE GREASE-STOP SOLID WAS TESTED TO ASTM STANDARD ASTM F2519-05.

EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE



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



	CAPTIVEAIR		JOB Bob's Clam Hut - Portland	
			LOCATION PORTLAND, ME, 04101	
			DATE 11/17/2017	JOB # 3217422
			DWG # 1	DRAWN BY BFC-21
			REV.	SCALE 3/8" = 1'-0"



GREASE DUCT & CHIMNEY SPECIFICATIONS:

PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.

PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12". DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

PATENT NUMBERS

AC-PSP (United States) - US Patent 7963830 B2
AC-PSP Wall (Canada) - CA Patent 2820509
AC-PSP Island (Canada) - CA Patent 2520330

CAPTIVEAIRE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

HVAC DISTRIBUTION NOTE

HIGH VELOCITY DIFFUSERS OR HVAC RETURNS SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

VERIFY CEILING HEIGHT

___' - ___"

HEIGHT REQUIRED TO VERIFY THAT HOOD FITS SPACE AND TO SIZE THE ENCLOSURE PANELS

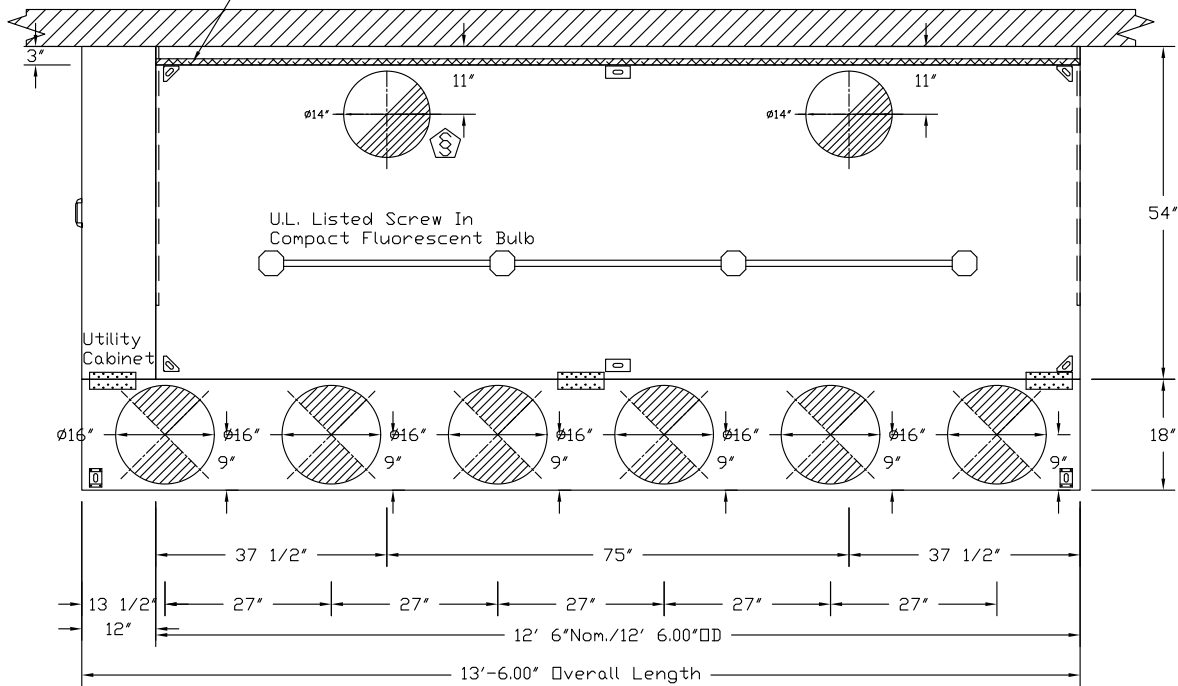
CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted
Approved with NO Exception Taken
Revise and Resubmit
SIGNATURE _____
Your Title _____ Date _____

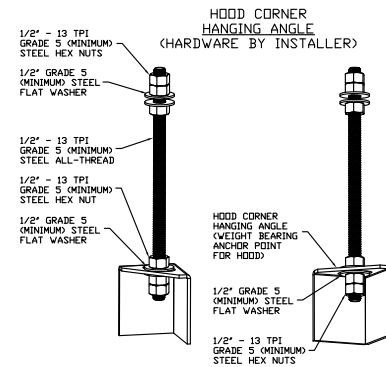


<i>JOB</i> Bob's Clam Hut - Portland	
<i>LOCATION</i> PORTLAND, ME, 04101	
<i>DATE</i> 11/17/2017	<i>JOB #</i> 3217422
<i>DWG #</i> 2	<i>DRAWN BY</i> BFC-21
<i>REV.</i>	<i>SCALE</i> 3/8" = 1'-0"

1" LAYER OF INSULATION FACTORY
 INSTALLED IN INTERNAL BACK STANDOFF.
 MEETS 0 INCH REQUIREMENTS FOR
 CLEARANCE TO COMBUSTIBLE SURFACES.

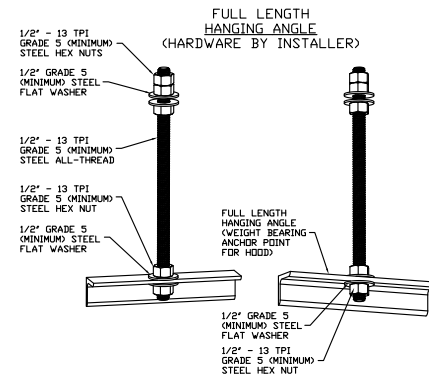


PLAN VIEW - Hood #1
 12' 6.00" LONG 5424ND-2-PSP-F
 NOTE: Additional hanging angles provided for hoods 12' and longer.



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.



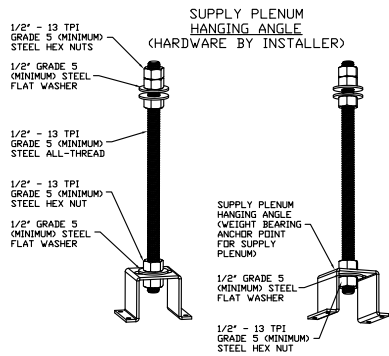
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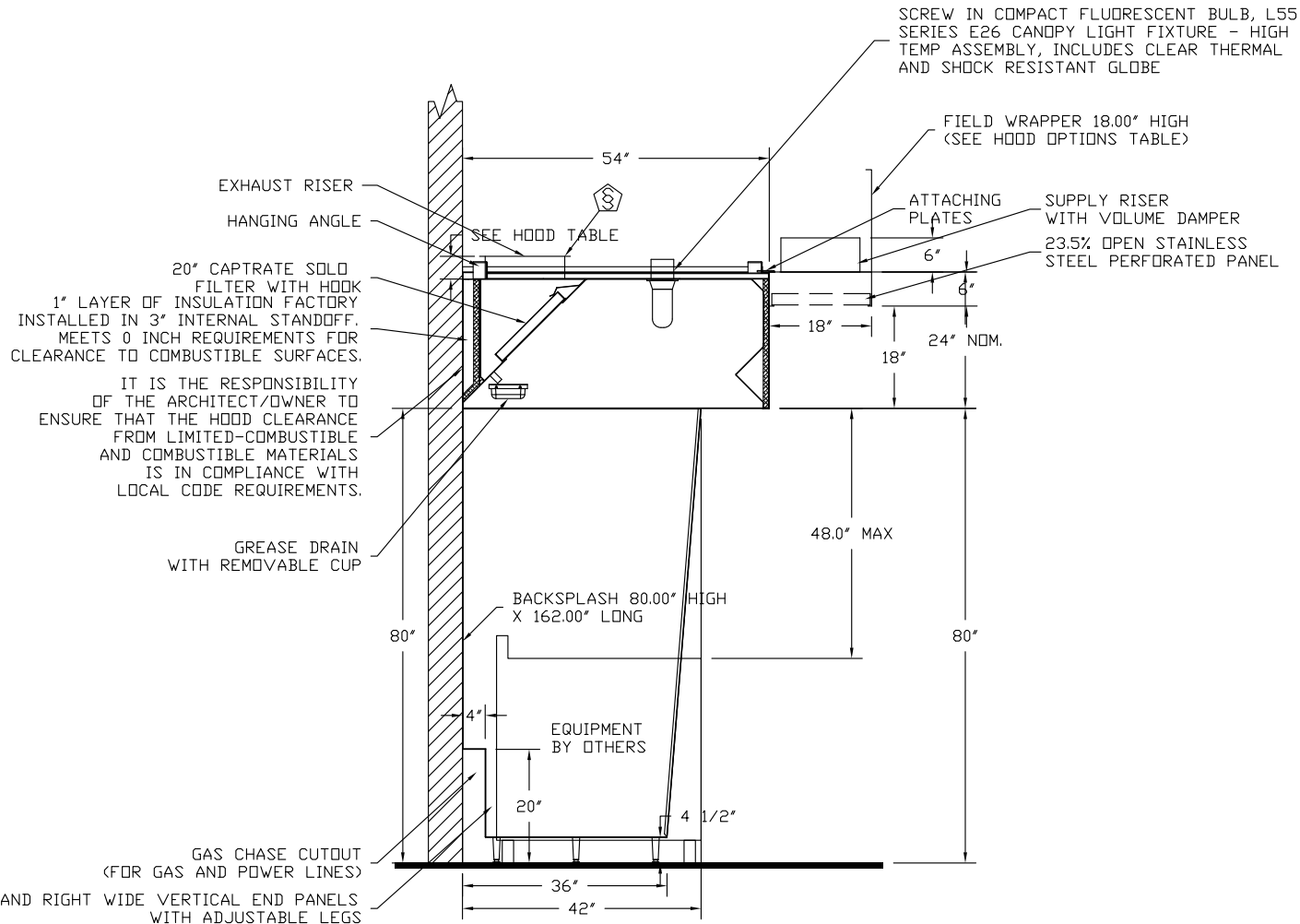
CAPTIVEAIR

JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 3	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"



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 ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR PSP HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.



**SECTION VIEW - MODEL 5424ND-2-PSP-F
HOOD - #1**



CAPTIVEAIR

JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 4	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

EXHAUST FAN INFORMATION - Job#3217422

FAN UNIT NO.	TAG	FAN UNIT MODEL #	CFM	ESP.	RPM	H.P.	B.H.P.	Ø	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS.)	SONES
1		DU85HFA	1469	0.650	1083	0.750	0.2500	1	115	8.8	465 FPM	132	10.3
2		DU85HFA	1469	0.650	1083	0.750	0.2500	1	115	8.8	465 FPM	132	10.3

MUA FAN INFORMATION - Job#3217422

FAN UNIT NO.	TAG	FAN UNIT MODEL #	BLOWER	HOUSING	DESIGN CFM		ESP.	RPM	H.P.	B.H.P.	Ø	VOLT	FLA	WEIGHT (LBS.)	SONES	BURNER EFFICIENCY(%)
					MIN	MAX										
3		A1-D.250-G10	G10	A1-D.250	1000	2644	0.400	1233	2.000	1.4840	3	208	6.1	703	23	92

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO.	TAG	INPUT BTUs	OUTPUT BTUs	TEMP. RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE
3		263825	242719	85 deg F	7 in. w.c. - 14 in. w.c.	Natural

FAN OPTIONS

FAN UNIT NO.	TAG	OPTION (Qty. - Descr.)
1		1 - Grease Box
		1 - Full Crating For Exhaust Fans
		1 - 3 Year Extended Motor Warranty
		1 - Fan Base Ceramic Seal - Ship Loose - For Grease Ducts
		1 - ECM Wiring Package-Exhaust - PWM Signal from ECPMD3 Prewire (NIDEC Motor)
2		1 - Grease Box
		1 - Full Crating For Exhaust Fans
		1 - 3 Year Extended Motor Warranty
		1 - Fan Base Ceramic Seal - Ship Loose - For Grease Ducts
		1 - ECM Wiring Package-Exhaust - PWM Signal from ECPMD3 Prewire (NIDEC Motor)
3		1 - AC Interlock Relay - 24VAC Coil
		1 - Motorized Backdraft Damper for A1-D Housing
		1 - Full Crating For Commercial Heater
		1 - Low Fire Start
		1 - Inlet Pressure Gauge, 0-35"
		1 - Manifold Pressure Gauge, -5 to 15" wc
		1 - 3 Year Extended Motor Warranty
		1 - Extra Set of Belts
	1 - Separate 120V Wiring Package (Required and used only for DCV or Prewire with VFD) - Three Phase Only	

FAN ACCESSORIES

FAN UNIT NO.	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1		YES						
2		YES						
3						YES		

CURB ASSEMBLIES

NO.	DN FAN	WEIGHT	ITEM	SIZE
1	# 1	41 LBS	Curb	23.000"W x 23.000"L x 24.000"H Vented Hinged
2	# 2	41 LBS	Curb	23.000"W x 23.000"L x 24.000"H Vented Hinged
3	# 3	74 LBS	Curb	21.000"W x 71.000"L x 24.000"H Insulated

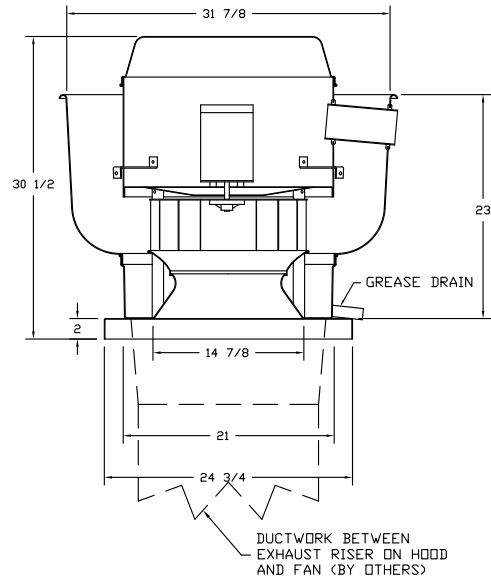
FAN SOUND INFORMATION

FAN UNIT NO.	MOTOR	RPM	LWA	SONES	DBA	DISTANCE FT	OCTAVE 1	OCTAVE 2	OCTAVE 3	OCTAVE 4	OCTAVE 5	OCTAVE 6	OCTAVE 7	OCTAVE 8
1	Exhaust	1083	72.1	10.3	60.6	5	71.9	75.5	73.6	67.7	65	64.6	60.7	53.7
2	Exhaust	1083	72.1	10.3	60.6	5	71.9	75.5	73.6	67.7	65	64.6	60.7	53.7
3	Supply	1233	85	23	73.5	5	86.2	86.6	84.9	81.6	77.7	78	73.9	70.4



JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 5	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

FANS #1, #2 - DU85HFA EXHAUST FAN



FEATURES:

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

NORMAL TEMPERATURE TEST

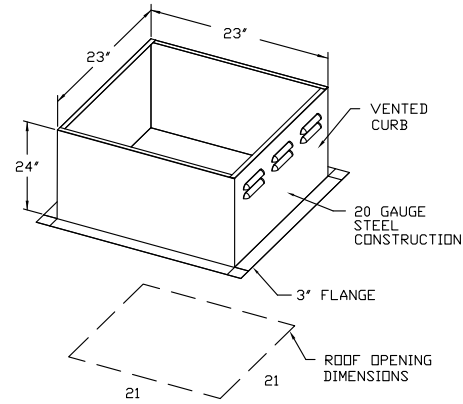
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

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.

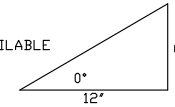
OPTIONS

- GREASE BOX
- FULL CRATING FOR EXHAUST FANS
- 3 YEAR EXTENDED MOTOR WARRANTY
- FAN BASE CERAMIC SEAL - SHIP LOOSE - FOR GREASE DUCTS
- ECM WIRING PACKAGE-EXHAUST - PWM SIGNAL FROM ECPM03 PREWIRE (NIDEC MOTOR)



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

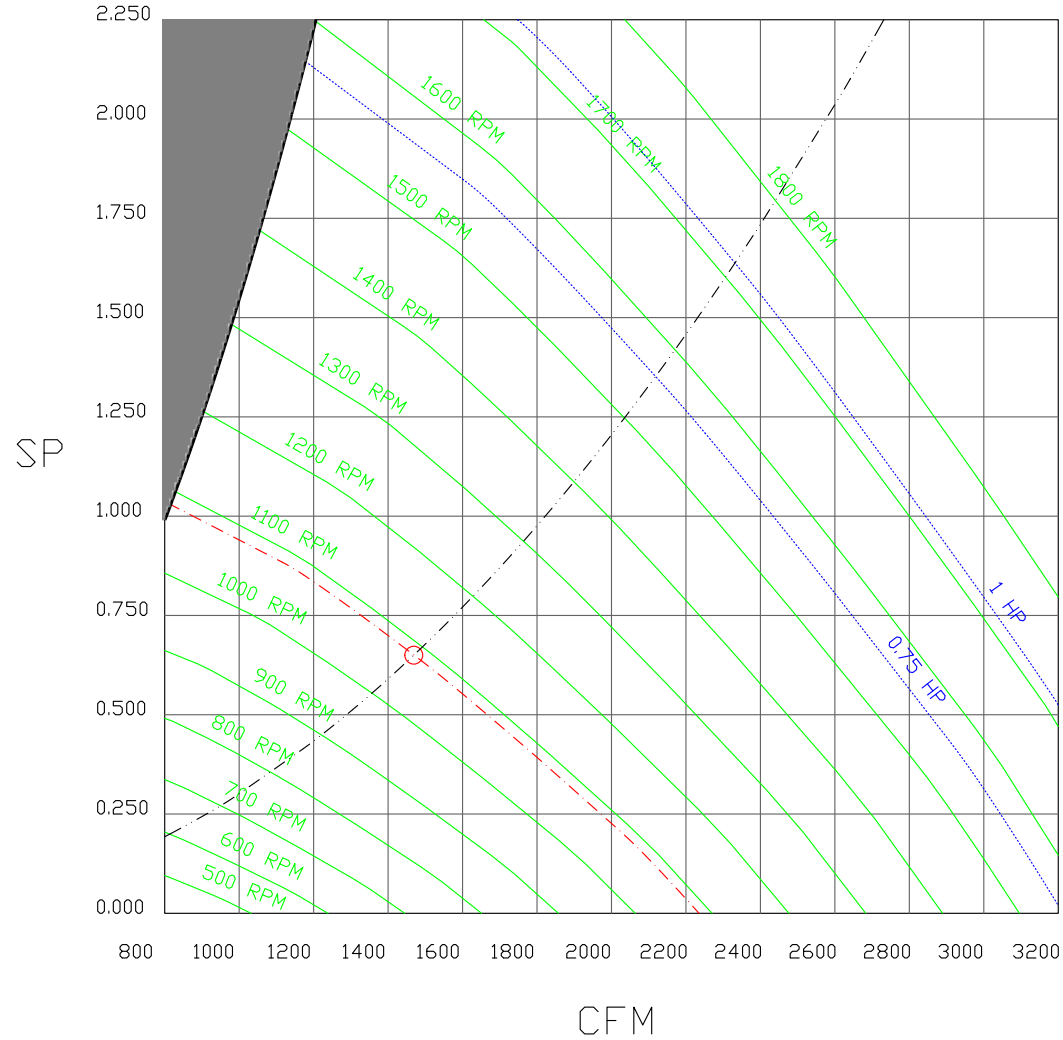
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 6	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

FANS #1 #2 - EXHAUST PERFORMANCE CURVES.

1469 CFM, 0.65 SP @ 1083 RPM and 0.25 BHP at 237 feet and 70 deg F
 * Please note that these curves were adjusted for job specific temperature and altitude.

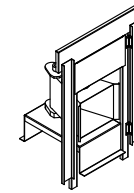
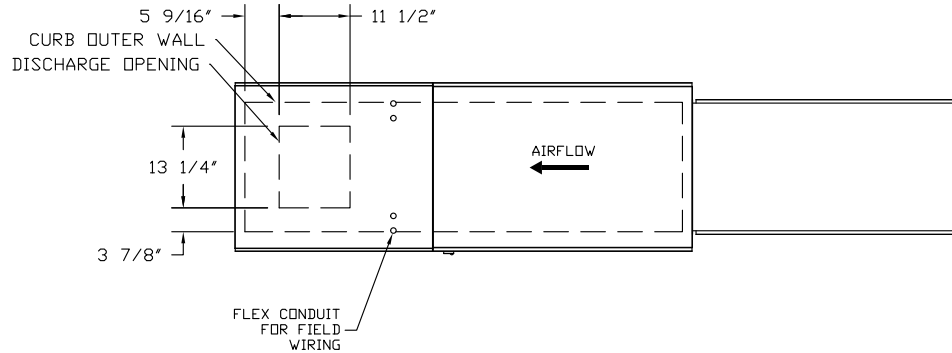


		JOB Bob's Clam Hut - Portland	
		LOCATION PORTLAND, ME, 04101	
		DATE 11/17/2017	JOB # 3217422
		DWG # 7	DRAWN BY BFC-21
		REV.	SCALE 3/8" = 1'-0"

FAN #3 A1-D.250-G10 - HEATER

1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 10' BLOWER
2. INTAKE HOOD WITH EZ FILTERS
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT
4. COOLING INTERLOCK RELAY, 24VAC COIL, 120V CONTACTS. LOCKS OUT BURNER CIRCUIT WHEN AC IS ENERGIZED.
5. MOTORIZED BACK DRAFT DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, TFB120S ACTUATOR INCLUDED
6. FULL CRATING FOR COMMERCIAL HEATERS FOR SHIPPING.
7. LOW FIRE START. ALLOWS THE BURNER CIRCUIT TO ENERGIZE WHEN THE MODULATION CONTROL IS IN A LOW FIRE POSITION.
8. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE
9. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC., 2.5" DIAMETER, 1/4" THREAD SIZE
10. 3 YEAR EXTENDED WARRANTY FOR FAN MOTOR. PARTS ONLY; DOES NOT INCLUDE LABOR.
11. EXTRA SET OF V-BELTS. ONLY TO BE ORDERED AS FAN OPTION AT TIME FAN IS ORDERED.
12. SEPARATE 120VAC WIRING PACKAGE FOR MAKE-UP AIR UNITS. OPTION MUST BE SELECTED WHEN MOUNTING VFD IN PREWIRE PANEL OR WITH DCV PACKAGE. PROVIDES SEPARATE 120VAC INPUT TO SUPPLY FAN. THIS 120V SIGNAL MUST BE RUN BY ELECTRICIAN FROM DCV TO MUA SWITCH.

NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH EQUAL TO THREE TIMES THE SUPPLY DUCT EQUIVALENT DIAMETER MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE UNLESS OTHERWISE SPECIFIED. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY.



Direct Fired (DF) Profile Plate Assembly

Direct Fired Profile Plate Specifications:

Description:

Direct Fired burners shall have patented (US Patent No. US6629523B2), 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 5ppm of carbon monoxide (CO), and 0.5ppm of nitrogen dioxide (NO2).

Application:

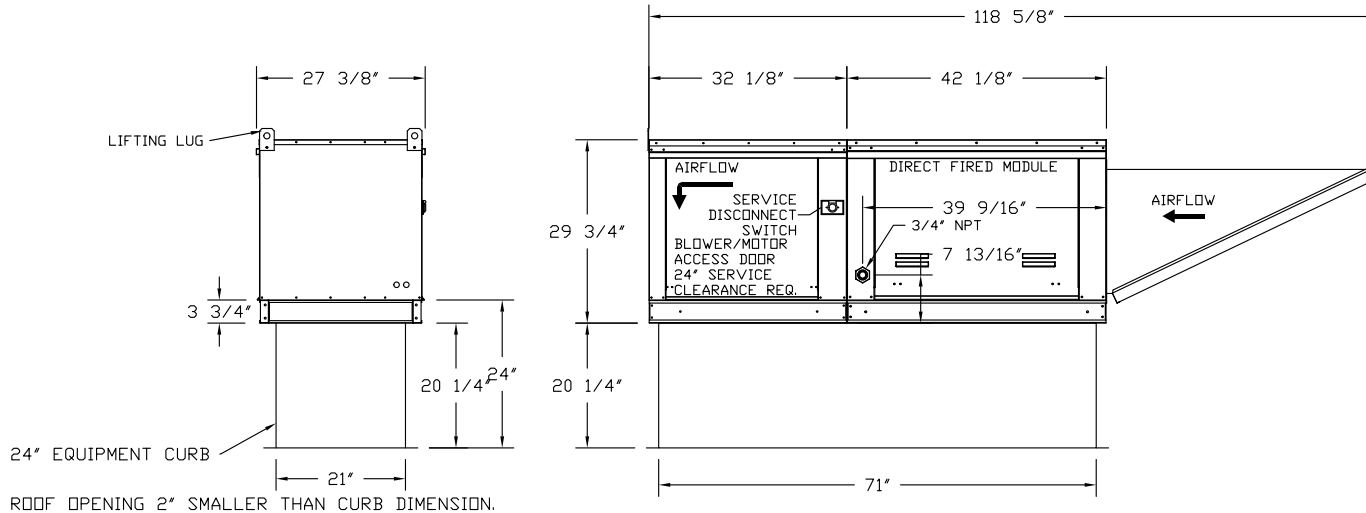
Spring-loaded burner profile plates are engineered to automatically react to the momentum of a fresh air stream, without the need for any motors or actuators to mechanically adjust them. With this feature, all DF units are designed for demand control ventilation (DCV) requirements.

Certifications:

All profile plate assemblies shall be included in the DF unit's ETL listing and comply with combined safety standards ANSI Z83.4 and CSA 3.7 (non-recirculating DF heaters) and ANSI Z83.18 (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.



24" EQUIPMENT CURB

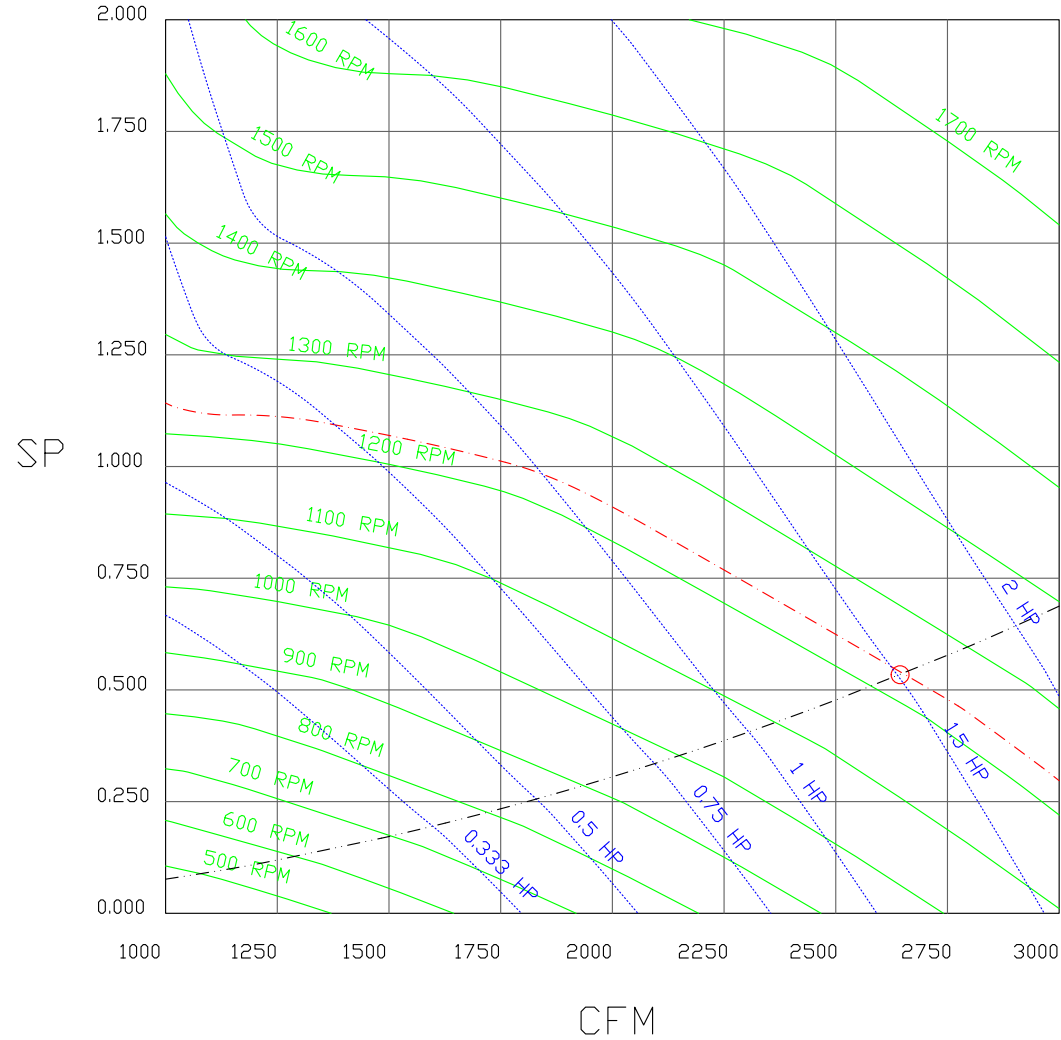
ROOF OPENING 2" SMALLER THAN CURB DIMENSION.



JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 8	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

FAN#3 - HEATER PERFORMANCE CURVES.

2644 CFM, 0.534 SP @ 1233 RPM and 1.484 BHP at 237 feet and 85 deg F
 * Please note that these curves were adjusted for job specific temperature and altitude.



  			JOB Bob's Clam Hut - Portland	
			LOCATION PORTLAND, ME, 04101	
			DATE 11/17/2017	JOB # 3217422
			DWG # 9	DRAWN BY BFC-21
			REV.	SCALE 3/8" = 1'-0"



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CUSTOMER APPROVAL TO MANUFACTURE:

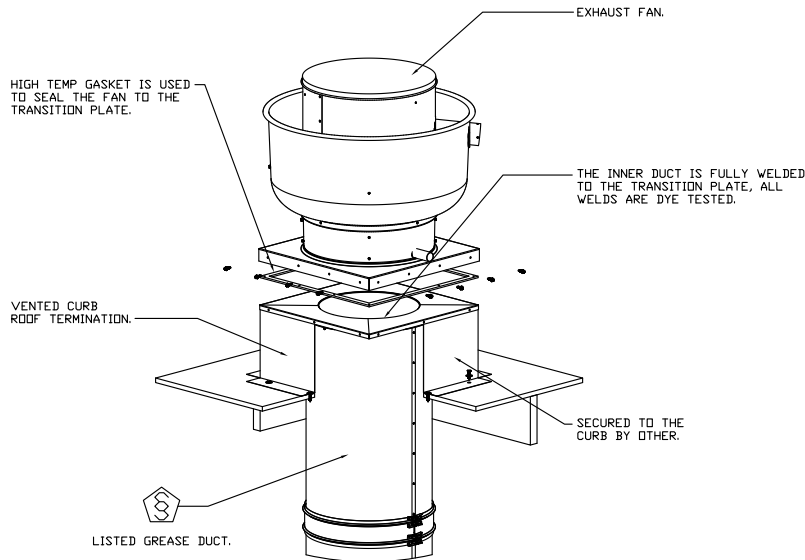
Approved as Noted

Approved with NO Exception Taken

Revise and Resubmit

SIGNATURE _____

Your Title _____ Date _____



CAPTIVEAIRE

JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 10	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

Exhaust Fan Wiring

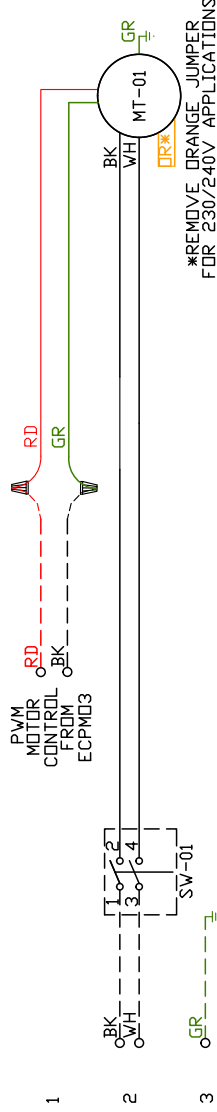
JOB 3217422 - Bob's Clam Hut - Portland

DRAWING NUMBER EXH3217422-1

SHIP DATE 11/17/2017

MODEL DU85HFA

Installed Options



Label	Component Description	Location
MT-01	Fan Motor	[20]
SW-01	Main disconnect switch	[20]

EXHAUST MOTOR_INFO 0.75HP-115V-IP-8FLA

ELECTRICAL INFORMATION
 MOTOR/CTRL MOP: 15A
 MOTOR/CTRL MOP: 15A

NOTES
 --- DENOTES FIELD WIRING
 ____ DENOTES INTERNAL WIRING

WIRE COLOR

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

Exhaust Fan Wiring

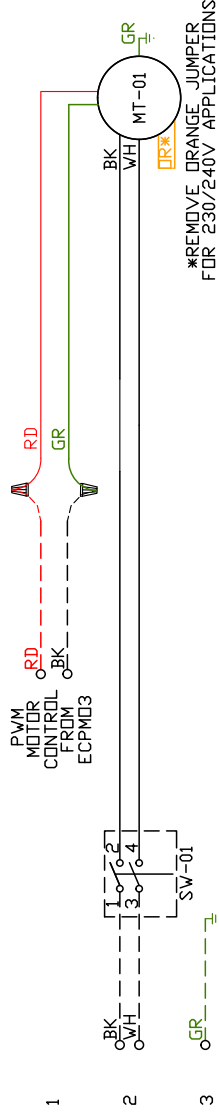
JOB 3217422 - Bob's Clam Hut - Portland

DRAWING NUMBER EXH3217422-2

SHIP DATE 11/17/2017

MODEL DU85HFA

Installed Options



Label	Component Description	Location
MT-01	Fan Motor	[20]
SW-01	Main disconnect switch	[20]

EXHAUST MOTOR INFO
0.75HP-115V-1P-8FLA

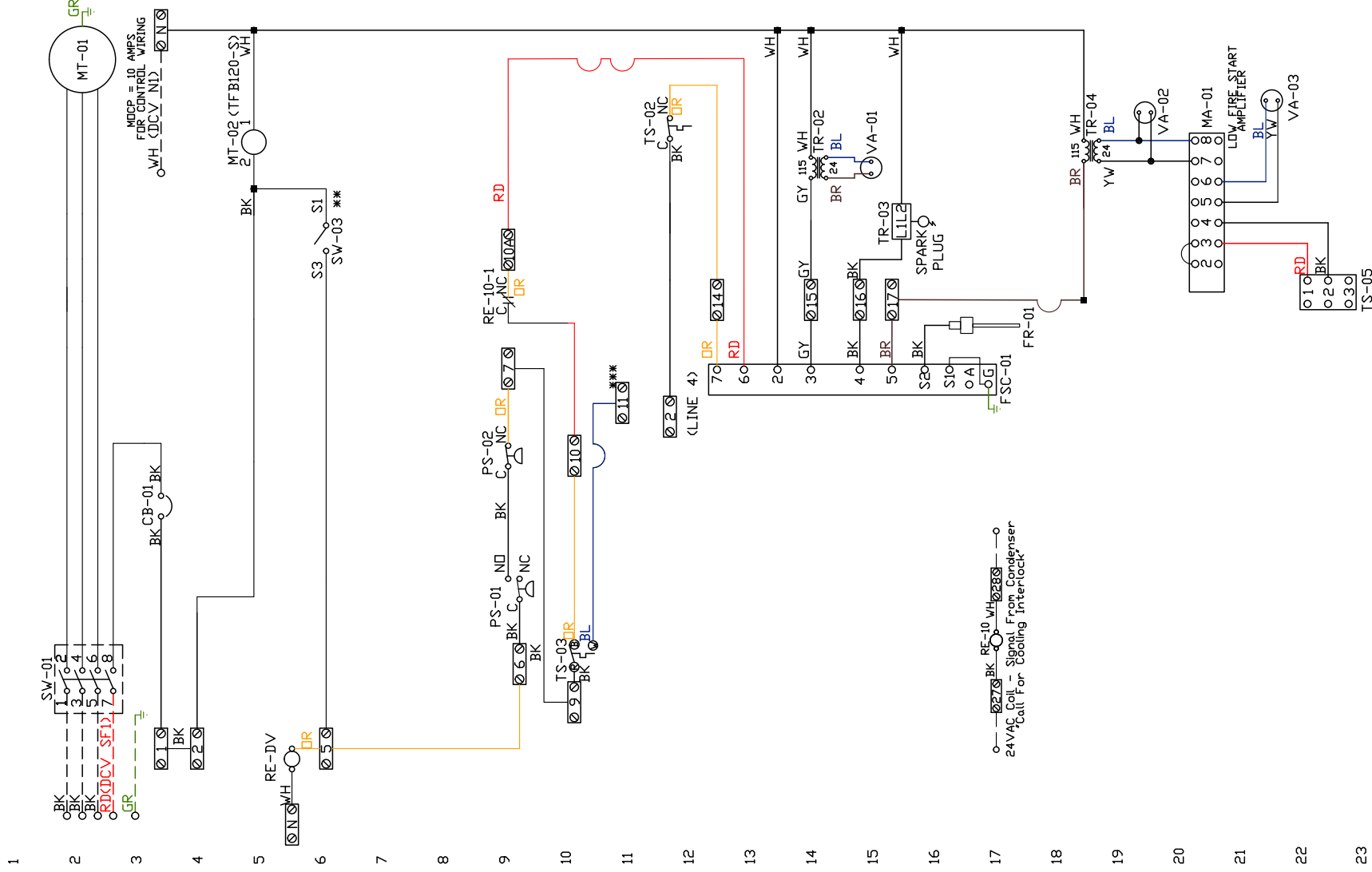
ELECTRICAL INFORMATION
MOTOR/CTRL MOP: 150A
MOTOR/CTRL MOP: 15A

NOTES
--- DENOTES FIELD WIRING
___ DENOTES INTERNAL WIRING

WIRE COLOR

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

ATTENTION ELECTRICIAN
 DROP FOR DISCONNECT CONNECTION WIRE TO YW C11ND
 IS FACTORY SUPPLIED IN DCV RE-DV-1
 CONNECT POWER TO THE DROP (D3&D7 IN EMSPLUS)



Installed Options
 Motorized Back Draft Damper
 Discharge Temp. Control

DCV Wiring
 24V AC Interlock Relay

Label	Description	Location
CB-01	Circuit breaker (comp)	[3]
FR-01	Fine eye FSC	[16]
FSC-01	Fine eye FSC	[11-14]
MA-01	Modulating amplifier	[19]
MT-01	Supply motor	[2]
MT-02	Damper motor	[5]
PS-01	Low Air-flow Switch	[9]
PS-02	High Air-flow Switch	[9]
RE-DV	DCV Relay	[10E5]
RE-10	AC Interlock Relay	[10][17]
SW-01	Main disconnect switch	[2]
SW-03	Damper end limit switch	[4]
TR-01	Power transformer(200v)	[3]
TR-02	Power transformer(20v)	[10]
TR-03	Ignition transformer	[14]
TR-04	Power transformer(20v)	[17]
TS-02	High temp limit switch	[10]
TS-03	Intake Air Sensor	[10]
TS-05	Discharge Air Sensor	[21]
VA-01	Pilot gas valve	[13]
VA-02	Main gas valve	[18]
VA-03	Modulating gas valve	[20]

SUPPLY MOTOR INFO
 2HP-208V-3P-61FLA

ELECTRICAL INFORMATION
 MOTOR ELECTRICAL DATA
 CONTROL CIRCUIT MCA: 7.50A
 MOTOR CIRCUIT MOP: 15.20A
 CONTROL CIRCUIT MOP: 15A

NOTES
 --- DENOTES FIELD WIRING
 --- DENOTES INTERNAL WIRING

** TERMINALS S4 AND S6 USED ON NF & AF SERIES ACTUATORS
 *** TERMINAL 11 PROVIDES COOLING CONNECTION

WIRE COLOR	RED	GREEN	YELLOW	WHITE	PINK	PURPLE
BK-BLACK	YV	GR	YW	WH	PK	PR
BL-BLUE	RD	YL	GY	GR	PK	PR
BR - BROWN	RD	YL	GY	GR	PK	PR
DR - ORANGE	RD	YL	GY	GR	PK	PR

SOCKET STYLE	NO	NO	NO
115V RELAY	4	3	3
115V RELAY	2	1	1
115V RELAY	6	7	7
115V RELAY	8	9	9

Installation Wiring

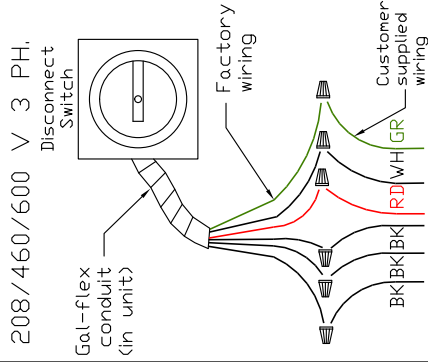
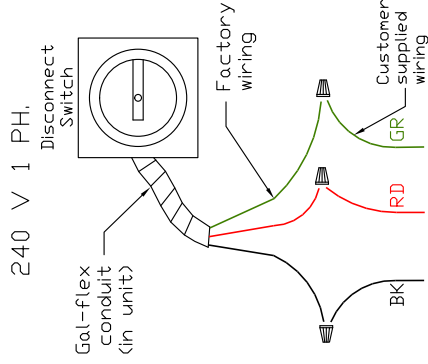
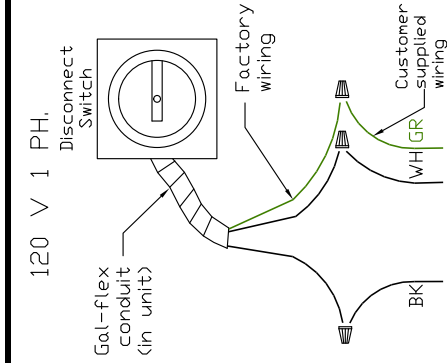
JOB

3217422 - Bob's Clam Hut - Portland

DRAWING NUMBER RP3217422-3

SHIP DATE 11/17/2017

MODEL AI-D.250-G10



POWER FROM DEDICATED BREAKER

See above details. Power Connection

D3 IN HEATER TO IL1A IN DCV
D7 IN HEATER TO IL1B IN DCV
WIRE TO DCV
D13
D17

Installed Options

DCV Connections

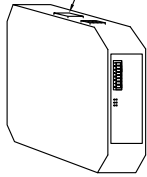
NOTES

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

ELECTRICAL PACKAGES - Job#3217422

NO.	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED				
				LOCATION	QUANTITY		TYPE	?	H.P.	VOLT	FLA
1		DCV-2111	Utility Cabinet Left	03 - Utility Cabinet Left	1 Light	Smart Controls DCV	Exhaust	1	0.750	115	8.8
				Hood # 1	1 Fan		Exhaust	1	0.750	115	8.8
							Supply	3	2.000	208	6.1

Field Connection to Router or Ethernet Switch
OR Factory Wired Connection to Cellular Kit



CASlink Monitor and Control

- Hood control panel to support communications to cloud-based Building Management System.
- Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.
- Hood Control Panel to allow cloud-based Building Management System to control parameters outlined as CONTROL in the points list.
- Hood control panel to allow remote changes to system setting such as: VFD Frequencies, ECM speeds, temperature set points, fan and wash schedules, etc.

MONITORING AND CONTROL POINTS LIST

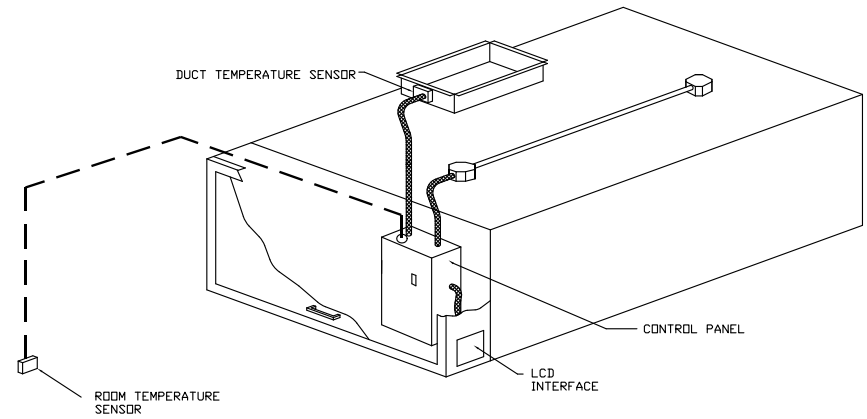
DCV Packages	Function	SC Packages	Function
Room Temperature	MONITOR	Room Temperature(s)	MONITOR
Duct Temperature(s)	MONITOR	Duct Temperature(s)	MONITOR
MJA Discharge Temperature	MONITOR	MJA Discharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR	Kitchen RTU Discharge Temperature	MONITOR
Fan Speed	MONITOR	Controller Faults	MONITOR
Fan Amperage	MONITOR	Fan Faults	MONITOR
Fan Power	MONITOR	Fan Status	MONITOR
VFD Faults	MONITOR	PCU Faults	MONITOR
Controller Faults	MONITOR	PCU Filter Clog Percentages	MONITOR
Fan Faults	MONITOR	Fire Condition	MONITOR
Fan Status	MONITOR	CDRE Fire System	MONITOR
PCU Faults	MONITOR	Building Pressures	MONITOR
PCU Filter Clog Percentages	MONITOR	Fans Button(s)	MONITOR & CONTROL
Fire Condition	MONITOR	Lights Button(s)	MONITOR & CONTROL
CDRE Fire System	MONITOR	Wash Button	MONITOR & CONTROL
Building Pressures	MONITOR		
Prep Time Button	MONITOR & CONTROL		
Fans Button	MONITOR & CONTROL		
Lights Button	MONITOR & CONTROL		
Wash Button	MONITOR & CONTROL		



JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWC # 15	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

Demand Control Ventilation Hood Control Panel Specifications:

- Controls shall be listed by ETL (UL 508A) and shall comply with demand ventilation system turndown requirements outlined in IECC 403.2.8 (2015).
- The control enclosure shall be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. The control enclosure may be constructed of stainless steel or painted steel.
- Temperature probe(s) located in the exhaust duct riser(s) shall be constructed of stainless steel.
- A digital controller shall be provided to activate the hood exhaust fans dynamically based on a fixed differential between the ambient and duct temperatures sensors. This function shall meet the requirements of IMC 5.7.1.1.
- A digital controller shall provide adjustable hysteresis settings to prevent cycling of the fans after the cooking appliances have been turned off and/or the heat in the exhaust system is reduced.
- A digital controller shall provide an adjustable minimum fan run-time setting to prevent fan cycling.
- Variable Frequency Drives (VFDs) shall be provided for fans as required. The digital controller shall modulate the VFDs between a minimum setpoint and a maximum setpoint on demand. The duct temperature sensor input(s) to the digital controller shall be used to calculate the speed reference signal.
- The VFD speed range of operation shall be from 0% to 100% for the system, with the actual minimum speed set as required to meet minimum ventilation requirements.
- An internal algorithm to the digital controller shall modulate supply fan VFD speed proportional to all exhaust fans that are located in the same fan group as the supply fan.
- The system shall operate in PREP MODE during light cooking load or COOL DOWN MODE when sufficient heat remains underneath the hood system after cooking operations have completed. Operation during either of these periods will disable the supply fans and provide an exhaust fan speed that is equal to the minimum ventilation requirement.
- A digital controller shall disable the supply fan(s), activate the exhaust fan(s), activate the appliance shunt trip, and disable an electric gas valve automatically when fire condition is detected on a covered hood.
- A digital controller shall allow for external BMS fan control via Dry Contact (external control shall not override fan operation logic as required by code).
- An LCD interface shall be provided with the following features:
 - a. On/Off push button fan & light switch activation
 - b. Integrated gas valve reset for electronic gas valves (no reset relay required)
 - c. VFD Fault display with audible & visual alarm notification
 - d. Duct temperature sensor failure detection with audible & visual alarm notification
 - e. Mis-wired duct temperature sensor detection with audible & visual alarm notification
 - f. A single low voltage Cat-5 RJ45 wiring connection
 - g. An energy savings indicator that utilizes measured kWh from the VFDs



TYPICAL HOOD CONTROL PANEL INSTALLATION

Sequence of Operations:

The hood control panel is capable of operating in one or more of the following states at any given time:

- **Automatic:** The system operates based on the differential between room temperature and the temperature at the hood cavity or exhaust duct collar. Fans activate at a configurable temperature differential threshold. Depending on the job configuration each fan zone can be configured as static or dynamic. These terms refer to whether a variable motor (such as EC Motors or VFD driven motors) modulate with temperature. If the panel is equipped with variable speed fans and the zone is defined as "dynamic", these will modulate within a user-defined range based on the temperature differential. Panels equipped with variable speed fans and a fan zone defined as "static", fans will run at a set speed calculated for the drive. Demand control ventilation systems are capable of modulating exhaust and make up air fan speeds per the requirements outlined in IECC 403.2.8.
- **Manual:** The system operates based on human input from an HMI.
- **Schedule:** A weekly schedule can be set to run fans for a specified period throughout the day. There are three occupied times per day to allow for the user to set up a time that is suitable to their needs. Any time that is within the defined occupied time, the system will run at modulation mode and follow the fan procedure algorithm based on temperature during this time. During unoccupied time, the system will have an extra offset to prevent unintended activation of the system during a time where the system is not being occupied.
- **Other:** The system operates based on the input from an external source (DDC, BMS or hard-wired interlock)

  	CAPTIVEAIR		JOB Bob's Clam Hut - Portland	
			LOCATION PORTLAND, ME, 04101	
			DATE 11/17/2017	JOB # 3217422
			DWG # 16	DRAWN BY BFC-21
			REV.	SCALE 3/8" = 1'-0"

JOB NO
3217422

MODEL NUMBER
DCV-2111

DRAWN BY
INSTALL

DESCRIPTION OF OPERATION:
Demand Control Ventilation, w/ control for 2 Exhaust Fans, 1 Supply Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. INVERTER DUTY THREE PHASE MOTOR REQUIRED! Room temperature sensor shipped loose for field installation. Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.

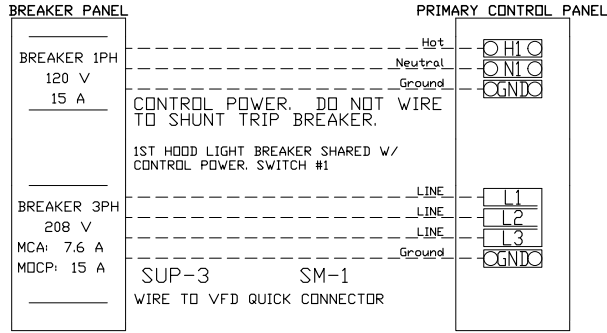
JOB NAME
Bob's Clan Hut - Portland

DATE
11/17/2017

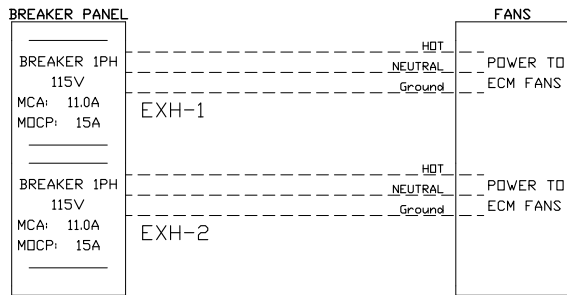
DWG NO
ECP #1-1

BREAKER PANEL TO PRIMARY CONTROL PANEL

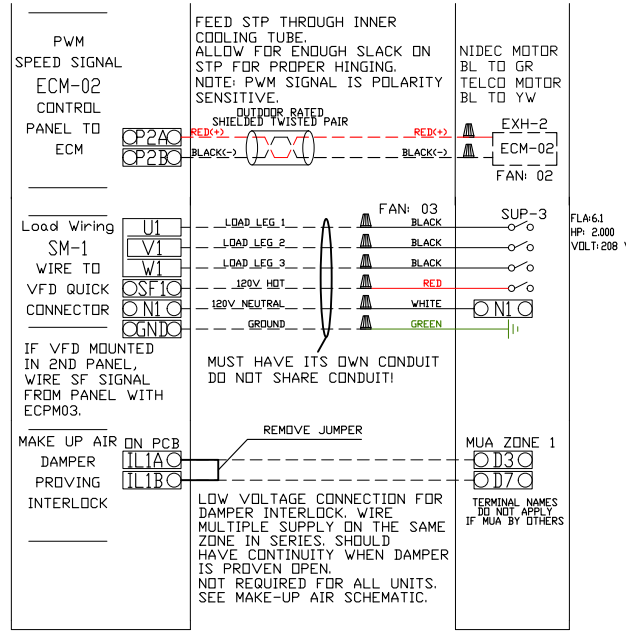
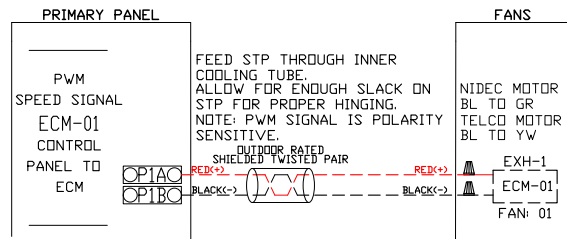
Responsibility: Electrician
BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED



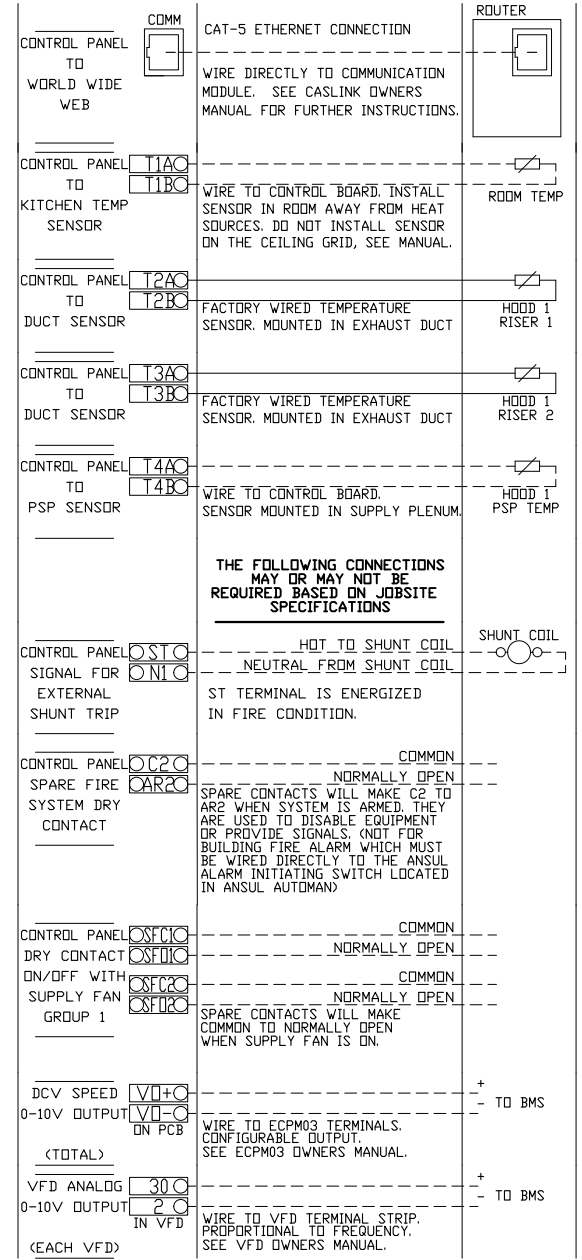
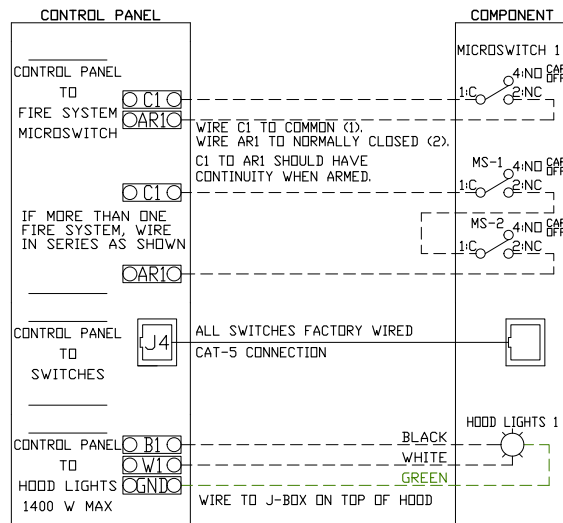
BREAKER PANEL TO FANS
Responsibility: Electrician



CONTROL PANEL TO FANS
Responsibility: Electrician



CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician



JOB NO
3217422

MODEL NUMBER
DCV-2111

DRAWN BY

SCHEMATIC TYPE
INSTALL

DESCRIPTION OF OPERATION:

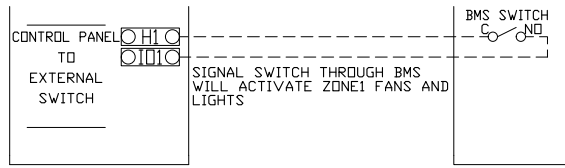
Demand Control Ventilation, w/ control for 2 Exhaust Fans, 1 Supply Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. INVERTER DUTY THREE PHASE MOTOR REQUIRED! Room temperature sensor shipped loose for field installation. Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.

JOB NAME
Bob's Clam Hut - Portland

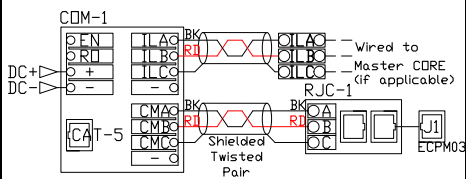
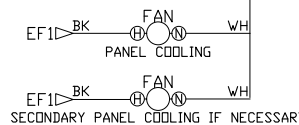
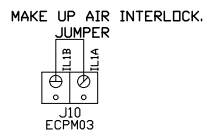
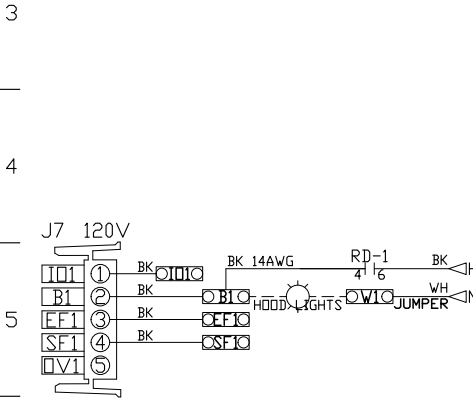
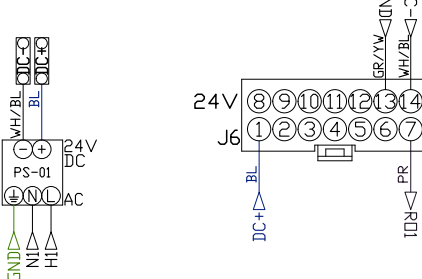
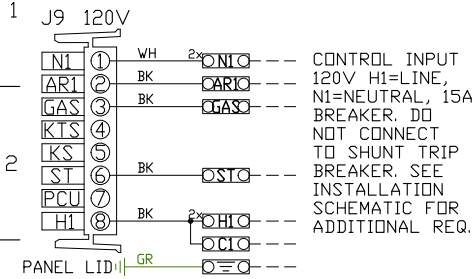
DATE
11/17/2017

DWG NO
ECP #1-2

- 1
- 2
- 3
- 4
- 5
- 6
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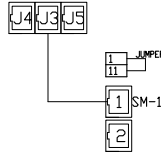


UNLESS SPECIFIED OTHERWISE, ALL FACTORY AC WIRING 16 AWG. ALL FACTORY DC WIRING 18 AWG.



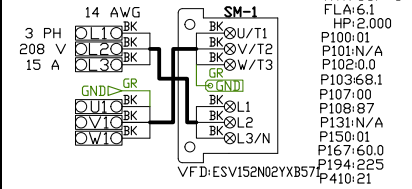
NOTE: All items on ECPM03 J3 line to be daisy chained from one component to the next, with EDL120A at end of line. Place PN: EDL120A in empty RJ45 port.

ECPM03/DAISY CHAIN



MOTOR POWER CIRCUIT

NOTE: IF VFD HAS 1PH 240V INPUT, USE L1 & L2 ONLY. IF VFD HAS 1PH 120V INPUT, USE L1 & N ONLY.



FACTORY WIRING SCHEMATIC CIRCUIT BOARDS ECPM03

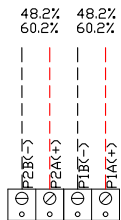
DCV Rev. 2.08.00

HMI Rev. 2.08.00

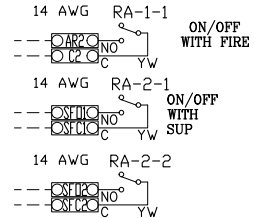
RA-x	120 VAC RELAY	RD-x	24 VDC RELAY
NO	4 3	NO	4 3
NC	2 1	NC	2 1
COIL	8 7	COIL	8 7
COM	6 5	COM	6 5

COMPONENT LIST

LABEL	DESCRIPTION
ST-X	Starter PN-varies
DL-X	Overload PN-varies
C-X	Contactors PN-varies
PS-1	Power Sup. 24VDC PN-MDP18-24A-1C
RA-x	120V Relay DPDT PN-34.110.0184.0
RD-x	24VDC Light Relay PN-34.110.018.0
TS-x	Duct Thermostat PN-A/CP-P0-14'-EXPL
RJC-x	RJ45 to Twist Pair PN:RJ45_M0DBUS_CONV.
CDM-1	CASLink MODULE PN:CDM01



DRY CONTACTS (SHOWN DE-ENERGIZED)



LEGEND

--- FIELD WIRING

--- FACTORY WIRING

BK- BLACK YW- YELLOW

BL- BLUE GY- GREY

BR- BROWN PR- PURPLE

OR- ORANGE RD- RED

WH- WHITE GR- GREEN

OR/BL- OR/BL STRIPE

BL/RD- BL/RD STRIPE

RD/GN- RD/GN STRIPE

WH/BL- WH/BL STRIPE

JOB NAME
Bob's Claim Hut - ...

DRAWING TITLE
DCV-2111

DESCRIPTION OF OPERATION
Demand Control Ventilation, w/ control For 2 Exhaust Fans, 1 Supply Fan, Exhaust on in Fire, Fans modulate based on duct temperature. INVERTER DUTY THREE PHASE MOTOR REQUIRED! Room temperature sensor shipped loose for field installation. Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.

JOB NO	3217422	DRAWN BY	
TYPE	FACTORY	DATE	11/17/2017

DWG NO ECP #1-3

DuctWork #1 Parts - Job#3217422 GREASE DUCT

Tag	Part #	CFM	S.P.	Weight	Velocity	QTY	Description
P1	DW1459LT	1469	-0.0168	37.12	1374.16	1	Single Wall Duct 14" diameter, 59' long, flange at both ends. Stainless Steel.
P2	DW144175LT	1469	-0.0119	21.62	1374.16	1	Single Wall Duct 14" diameter, 41.750' long, flange at both ends. Stainless Steel.
P3 Assembled w/P4	DW1460AJDKIT	1469	-0.0083	29.73	1374.16	1	Single Wall Duct Adjustable, 14" diameter, 59.5' long, flange at one end With a 14" Diameter - 4" Tall - Adjustable Collar - Stainless Steel.
P4 Assembled w/P3 System at P4	DW2314TP	1469	0	8.49	1374.16	1	Duct to Curb Transition, 23' Curb to 14' Duct, 16 GA Aluminized. Used on BDUI5, DU75 & 85.
P5	DW1459LT	1469	-0.0168	37.12	1374.16	1	Single Wall Duct 14" diameter, 59' long, flange at both ends. Stainless Steel.
P6	DW144175LT	1469	-0.0119	21.62	1374.16	1	Single Wall Duct 14" diameter, 41.750' long, flange at both ends. Stainless Steel.
P7 Assembled w/P8	DW1460AJDKIT	1469	-0.0083	29.73	1374.16	1	Single Wall Duct Adjustable, 14" diameter, 59.5' long, flange at one end With a 14" Diameter - 4" Tall - Adjustable Collar - Stainless Steel.
P8 Assembled w/P7 System at P8	DW2314TP	1469	0	8.49	1374.16	1	Duct to Curb Transition, 23' Curb to 14' Duct, 16 GA Aluminized. Used on BDUI5, DU75 & 85.
	3M-2000PLUS			0.80		2	Duct - 3M Fire Barrier 2000 Plus Silicone - Used as sealant to Seal Duct Joints.
	DW14CLASY			1.37		6	Duct "V" Clamp With new design 14 Ga Brackets, 14" Duct, Assembly.
Total Weight				203.74			

SINGLE WALL FACTORY BUILT DUCTWORK

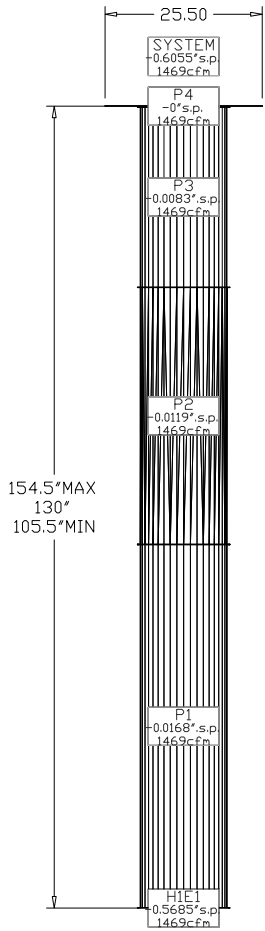
- ALL DUCTWORK IS REQUIRED TO BE INSTALLED WITH THE MAXIMUM SUPPORT SPACING LISTED BELOW.
- FOR A COMPLETE LIST OF APPROVED SUPPORT METHODS, SEE THE INSTALLATION AND OPERATION MANUAL.
- DUCTWORK SHALL SLOPE NOT LESS THAN 1/16" PER LINEAR FOOT TOWARDS THE HOOD OR AN APPROVED GREASE COLLECTION RESERVOIR.
- WHERE HORIZONTAL DUCTS EXCEED 75 FEET IN LENGTH, THE SLOPE SHALL NOT BE LESS THAN 3/16" PER LINEAR FOOT.

DUCT DIAMETER	HORIZONTAL SUPPORT (ft)	VERTICAL WALL SUPPORT (ft)	VERTICAL CURB SUPPORT (ft)
8"	10'	10'	24'
10"	10'	10'	24'
12"	10'	10'	24'
14"	10'	10'	24'
16"	10'	10'	24'
18"	10'	10'	24'
20"	10'	10'	24'
22"	10'	10'	24'
24"	10'	10'	24'

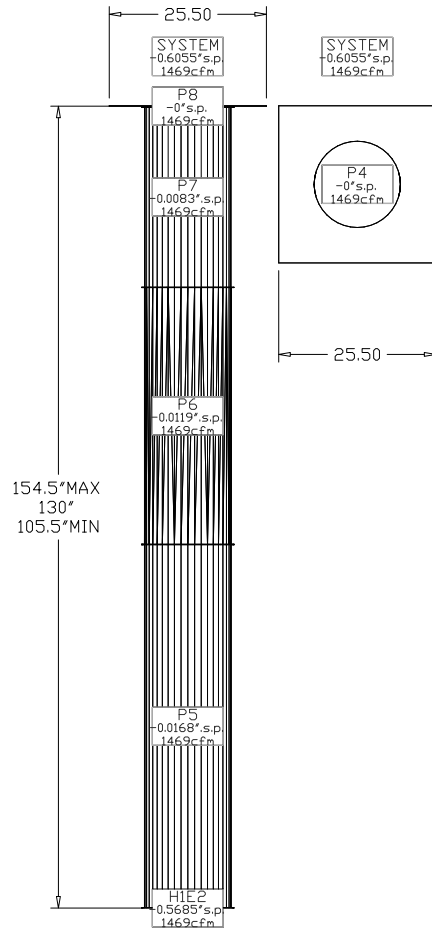


<i>JOB</i> Bob's Clam Hut - Portland	
<i>LOCATION</i> PORTLAND, ME, 04101	
<i>DATE</i> 11/17/2017	<i>JOB #</i> 3217422
<i>DWG #</i> 20	<i>DRAWN BY</i> BFC-21
<i>REV.</i>	<i>SCALE</i> 3/8" = 1'-0"

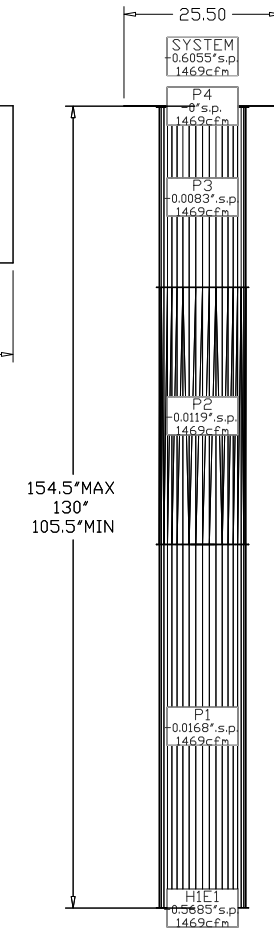
DuctWork #1 Front View
GREASE DUCT



DuctWork #1 Top View
GREASE DUCT

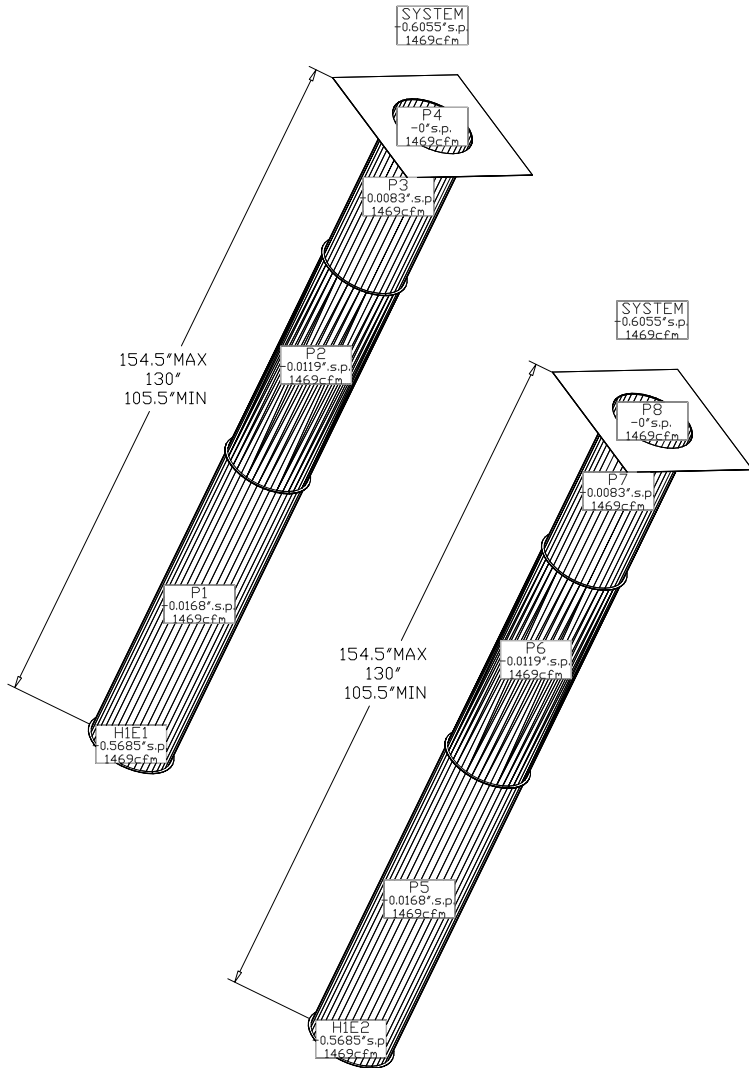


DuctWork #1 Side View
GREASE DUCT



JOB Bob's Clam Hut - Portland	
LOCATION PORTLAND, ME, 04101	
DATE 11/17/2017	JOB # 3217422
DWG # 21	DRAWN BY BFC-21
REV.	SCALE 3/8" = 1'-0"

DuctWork #1 SE View
GREASE DUCT



  		JOB Bob's Clam Hut - Portland	
		LOCATION PORTLAND, ME, 04101	
		DATE 11/17/2017	JOB # 3217422
		DWG # 22	DRAWN BY BFC-21
		REV.	SCALE 3/8" = 1'-0"

System Design Verification (SDV)

If ordered, CAS Service will perform a System Design Verification (SDV) once all equipment has had a complete start up per the Operation and Installation Manual. Typically, the SDV will be performed after all inspections are complete.

Any field related discrepancies that are discovered during the SDV will be brought to the attention of the general contractor and corresponding trades on site. These issues will be documented and forwarded to the appropriate sales office. If CAS Service has to resolve a discrepancy that is a field issue, the general contractor will be notified and billed for the work. Should a return trip be required due to any field related discrepancy that cannot be resolved during the SDV, there will be additional trip charges.

During the SDV, CAS Service will address any discrepancy that is the fault of the manufacturer. Should a return trip be required, the general contractor and appropriate sales office will be notified. There will be no additional charges for manufacturer discrepancies.

  	CAPTIVEAIR		<i>JOB</i> Bob's Clam Hut - Portland	
			<i>LOCATION</i> PORTLAND, ME, 04101	
	<i>DATE</i> 11/17/2017	<i>JOB #</i>	3217422	
	<i>DWG #</i> 23	<i>DRAWN BY</i> BFC-21		
	<i>REV.</i>	<i>SCALE</i> 3/8" = 1'-0"		