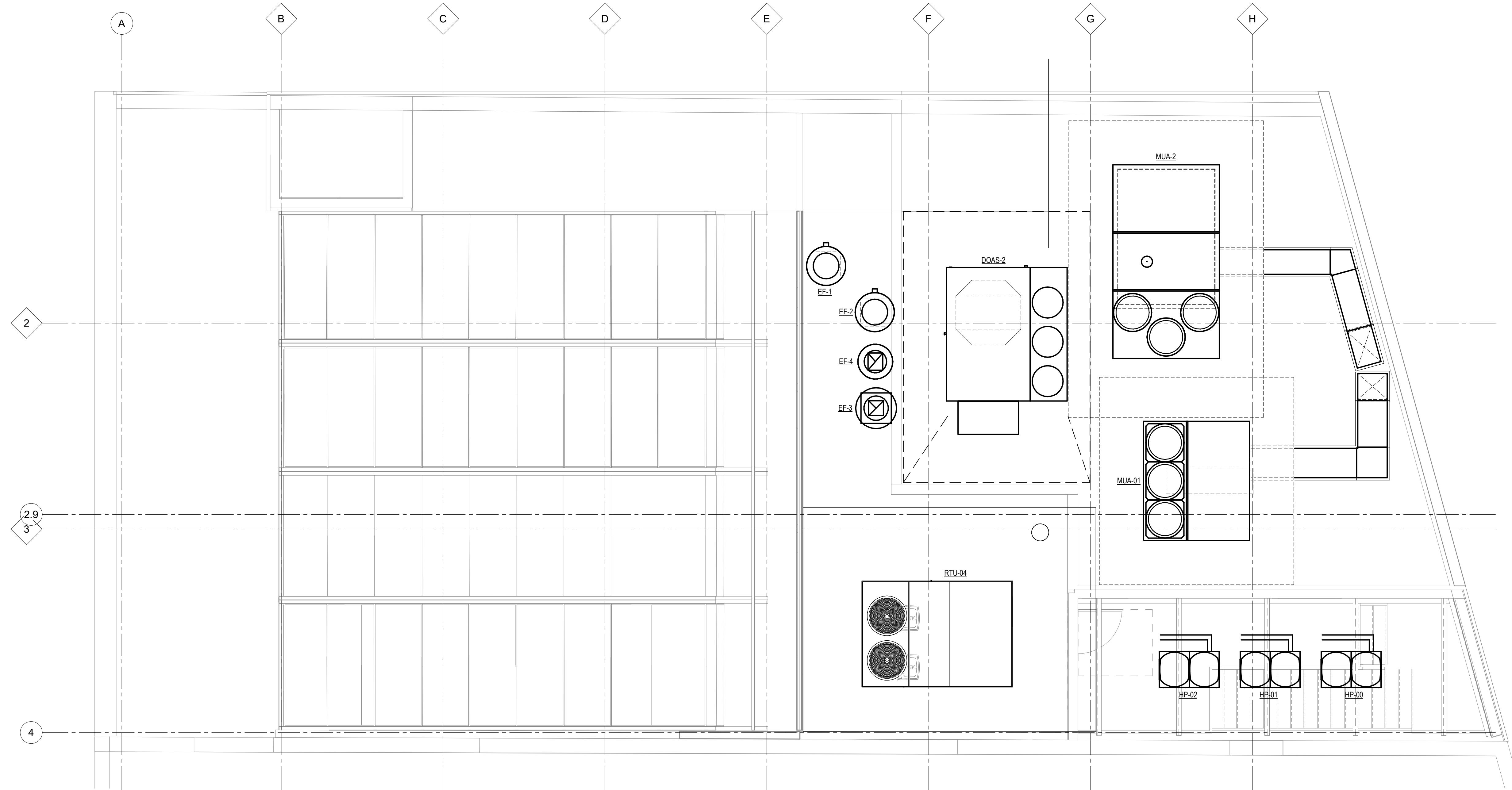


ISSUED FOR
DATE



 **UPPER ROOF MECHANICAL PLAN**
SCALE: 1/4" = 1'-0"

PROJECT

**1550
WOODWARD**

1550 Woodward
Avenue, Detroit, MI
48226

SHEET

**UPPER ROOF
MECHANICAL
PLAN**

STAMP

**NOT FOR
CONSTRUCTION**

SCALE

1/4" = 1'-0"

PROJECT NUMBER

2216

SHEET NUMBER

M-105

RV-45-17.5I-M-E1

Unit Performance

Design Conditions						
Elevation (ft)	Summer		Winter DB (F)	Supply (CFM)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)				
873	91.0	76.4	-3.0	3,600	3,600	-

Unit Specifications						
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing	Furnace ETL Listing
1	3,066 (+/- 5%)	Packaged DX	Indirect Gas	Outdoor	ULcUL 1995	ANSI Z83.8 / CSA 2.6

Configuration				
Outdoor Air			Exhaust Air	
Intake	Discharge		Intake	Discharge
End	Bottom		None	-

ASHRAE 90.1-2019 Compliance			
ISMRE	ASHRAE 90.1 Min. Efficiency	Calculated Efficiency	Compliance
	4	9	✓

Cooling Specifications							
Type	Total Capacity (MBH)	Sensible Capacity (MBH)	Lead Compressor Type	Coil (DB/WB)		Reheat	
				EAT (F)	LAT (F)	Capacity (MBH)	LAT (F)
Packaged DX	236.2	127.4	Inverter Scroll	91.0 / 76.4	58.9 / 58.8	-	-

Heating Specifications								
Type	Gas Type	Input (MBH)	Output (MBH)	Temperature Rise		Turndown	Performance	
				Min (F)	Max (F)		EAT (F)	LAT (F)
Indirect Gas	Natural	400.0	320.0	21.0	82.0	4:1	-3.0	79.3

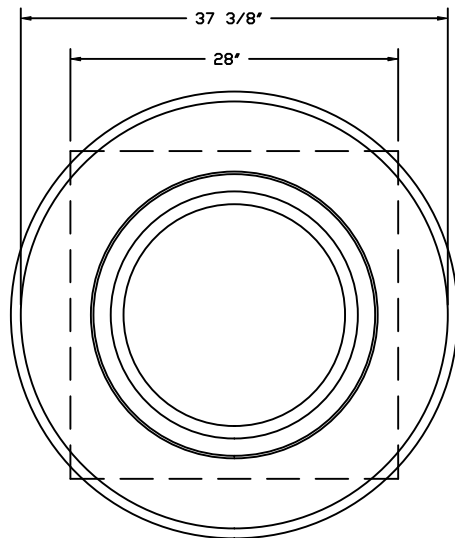
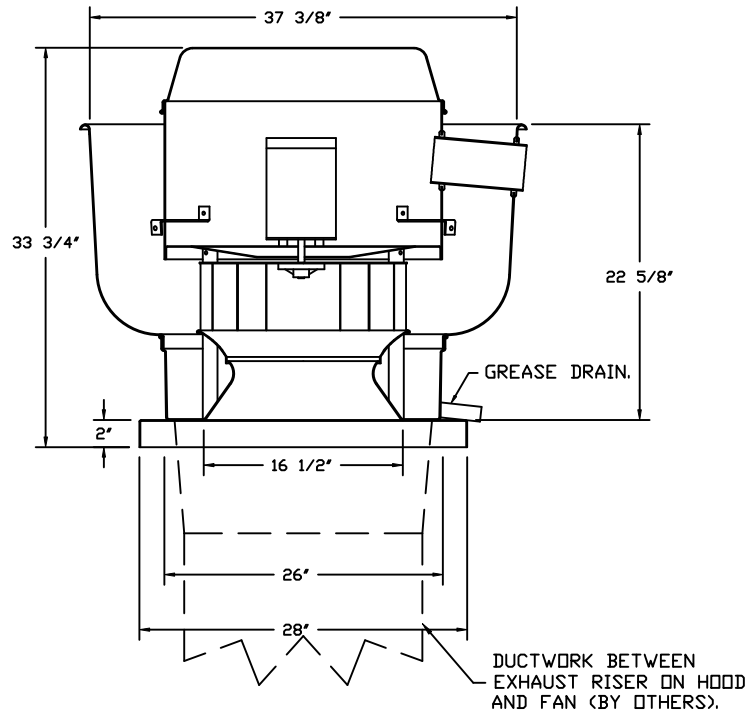
Air Performance							
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	3,600	1.25	1.718	1122	1	Plenum	Direct

Motor Specifications						
Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	1.49	2	ODP	PE	1165

Electrical Specifications				
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	Fan Power (W/CFM)*
Unit	208/60/3	82.6	125.0	0.308

*Fan Power (W/CFM) = (Supply BHP + Exhaust BHP) / Supply CFM

EF-1



TOP VIEW

FEATURES:

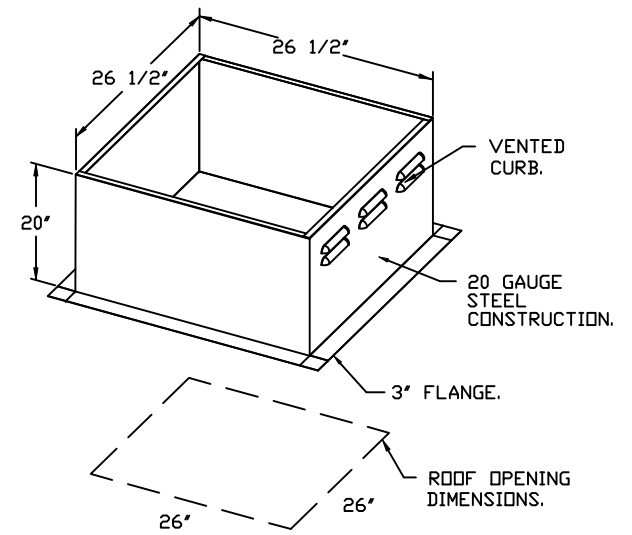
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT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

NORMAL TEMPERATURE TEST

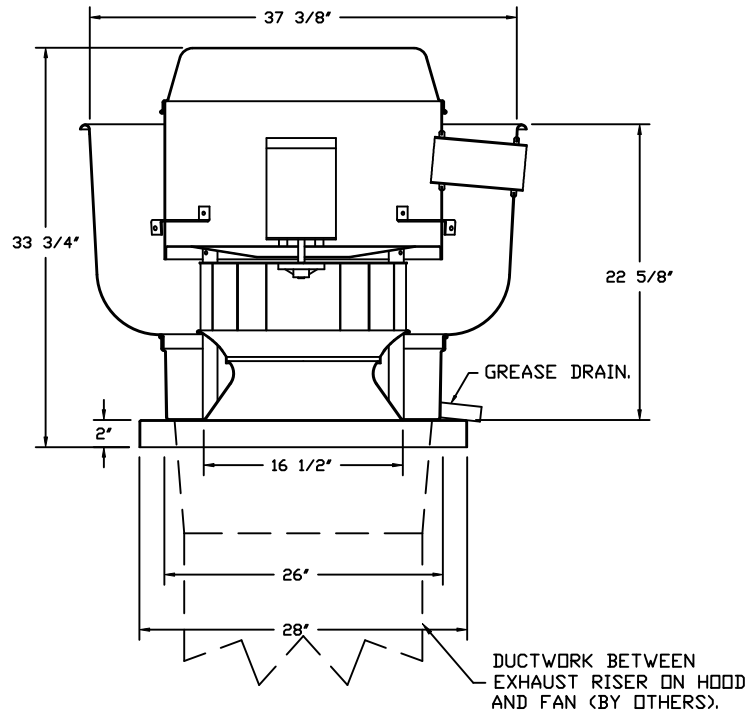
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

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.



EF-2



FEATURES:

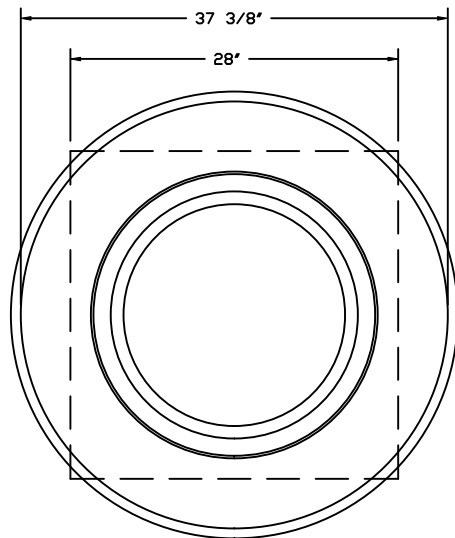
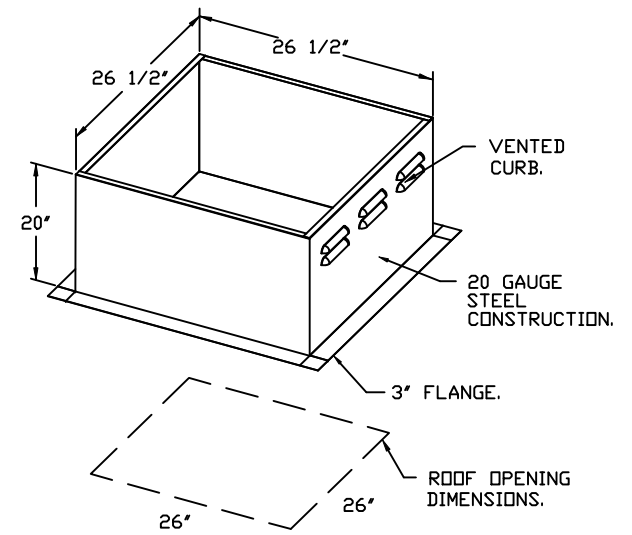
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT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

NORMAL TEMPERATURE TEST

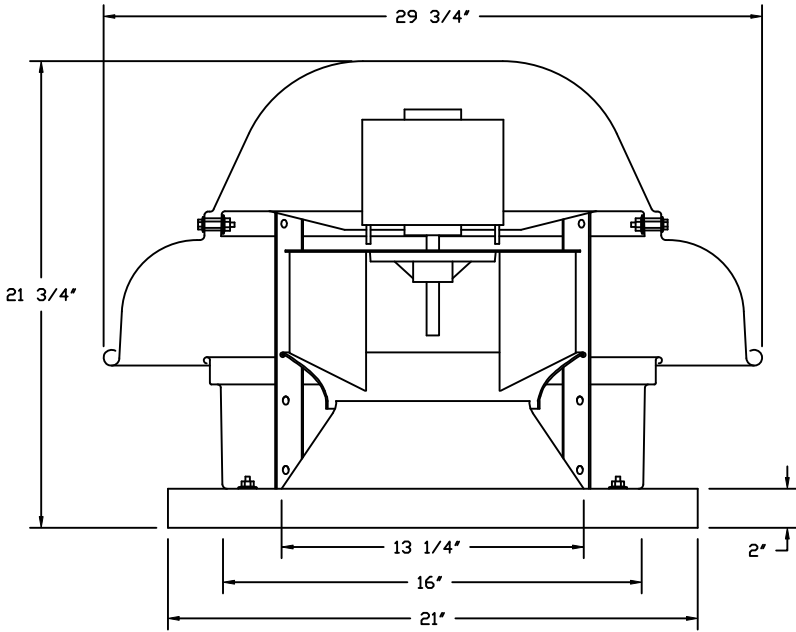
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

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.

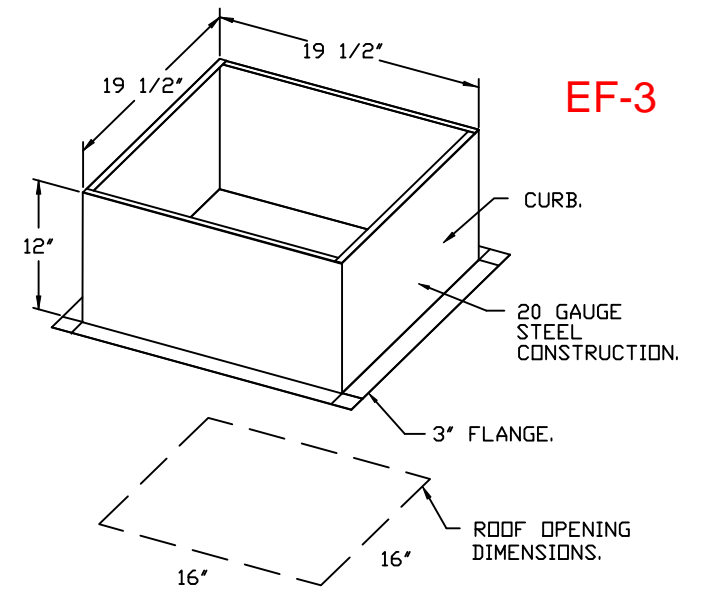


TOP VIEW

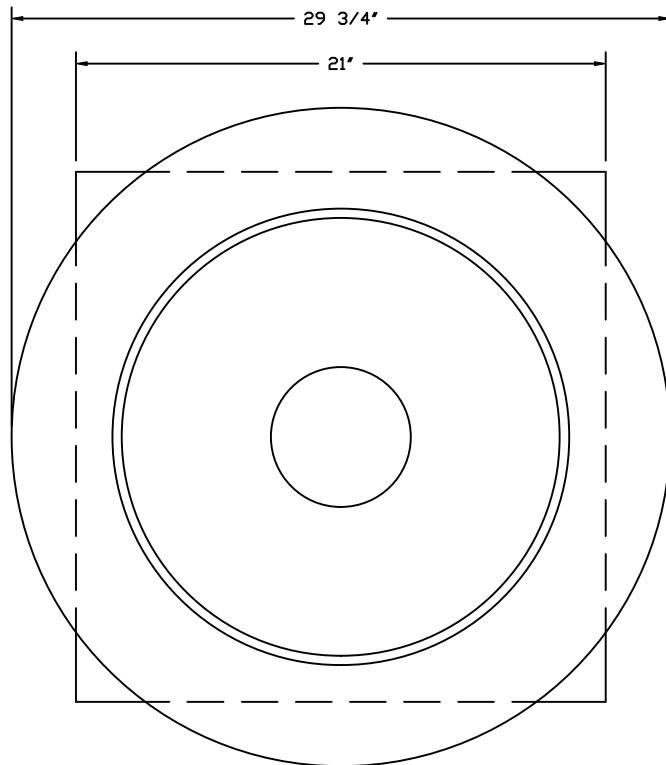


FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- SAFETY DISCONNECT.
- STANDARD BIRD SCREEN.
- SPEED CONTROL.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).

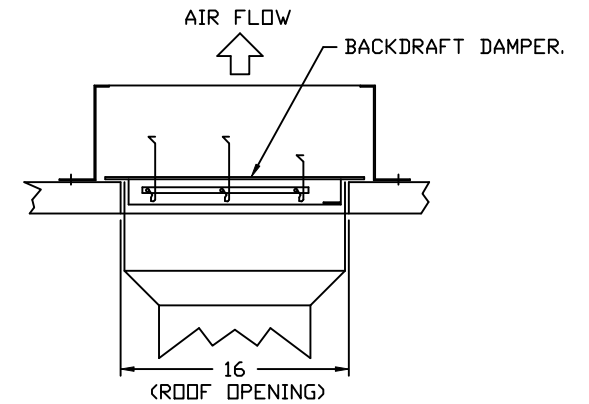


EF-3

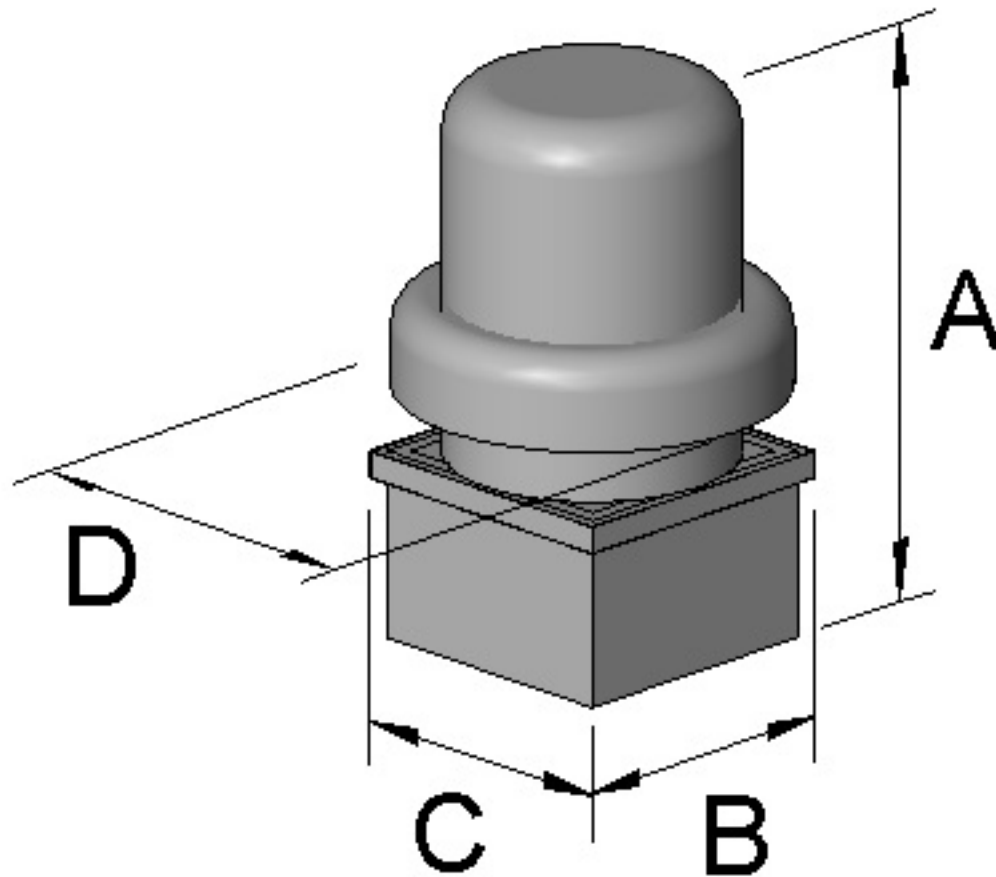


TOP VIEW

BACKDRAFT DAMPER INSTALLATION



Dimensions and Weights		
Label	Value	Description
-	44	Weight w/o accessories (lbs)
A	36	Overall Height (in)
D	28	Overall Width (in)
B	19	Curb Cap Width (in)
C	19	Curb Cap Length (in)
-	12	Duct / Damper Width (in)
-	12	Duct / Damper Length (in)
-	14.5	Roof Opening Width (in)
-	14.5	Roof Opening Length (in)



*All dimensions are in inches.

OUTDOOR UNIT: TUHYH0963AN40AN – DIMENSIONS

TUHYH(072/096/120)3AN40AN

Unit: mm (in.)

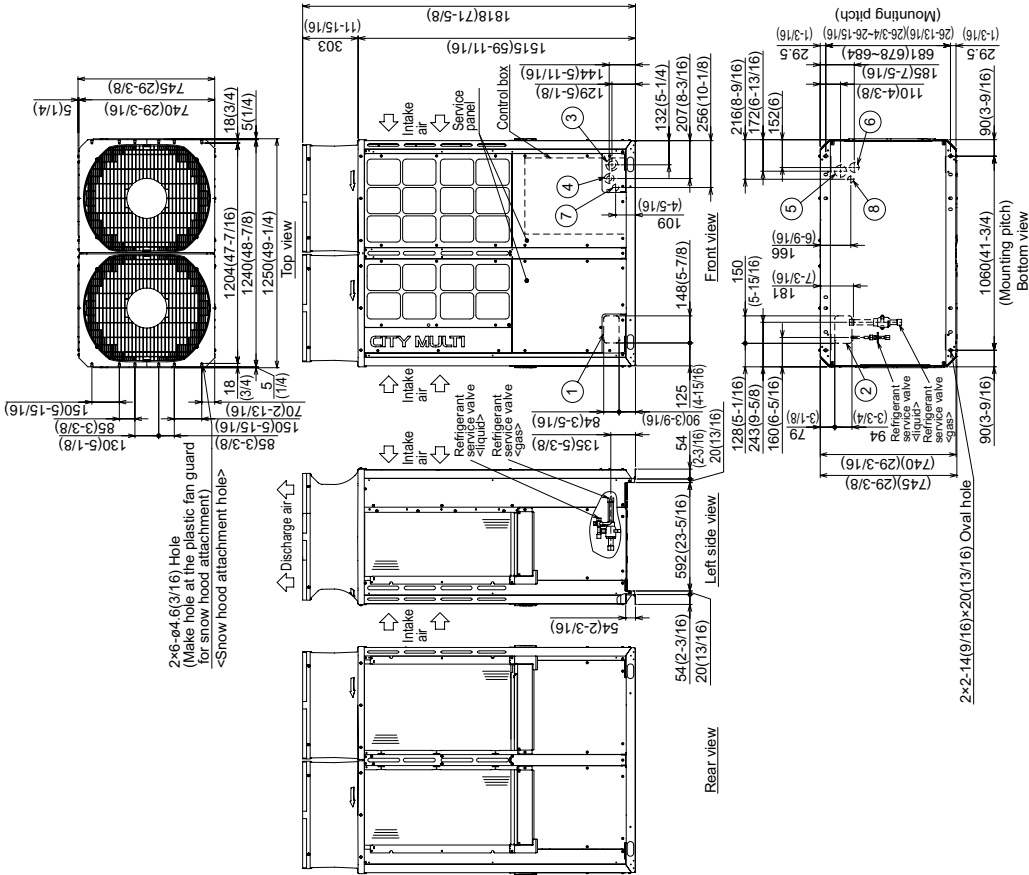
HP-01

Note 1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.
 2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C (248°F).

Model	Refrigerant pipe		Diameter		Service valve
	Liquid	Gas	Gas	Liquid	
H072	φ9.52(3/8) Braze ^{*1}		φ22.2(7/8) Braze ^{*1}		Gas
H096	φ9.52(3/8) Braze ^{*1}		φ22.2(7/8) Braze ^{*1}		Gas
H120	φ9.52(3/8) Braze ^{*1}	φ12.7(1/2) Braze ^{*1,3}	φ28.58(1-1/8) Braze ^{*1,2,4}	φ28.58(1-1/8) Braze ^{*1,2,4}	Gas

*1 Connect the refrigerant pipe to the service valve according to the Installation Manual.
 *2 Indicates dimensions and connection specifications in the case the unit is used in combination with other outdoor units.
 *3 Furthest piping length (OU from IU) ≥ 90m
 *4 Furthest piping length (OU from IU) ≥ 40m

NO.	Usage	Specifications
①	Front through hole	148(5-7/8) x 84(3-5/16) Knockout hole
②	Bottom through hole	150(5-15/16) x 94(3-3/4) Knockout hole
③	Front through hole	φ67.7(2-1/2) or φ34.5(1-3/8) Knockout hole
④	Front through hole	φ43.7(1-3/4) or φ22.7(7/8) Knockout hole
⑤	Bottom through hole	φ43.7(1-3/4) or φ22.7(7/8) Knockout hole
⑥	Bottom through hole	φ52(2-9/16) Knockout hole
⑦	Front through hole	φ34(1-3/8) Knockout hole
⑧	Bottom through hole	φ34(1-3/8) Knockout hole



Paragon RTU Fan Schedule

Tag	Model Basis of Design CaptiveAire	Qty	Blower	Return Air In CFM	Max Outside Air In CFM	Total CFM	SP	HP	BHP	Ø	Voltage	MCA	MOCP	Weight lbs	Notes
MUA-1	CASRTU3-1.400-18-20T	1	18P-3	0	3200	3200	2	5.000	3.345	N/A	208	87.5A	100A	2603	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
NOTES: 1. Occupied Scheduling 2. Gas Train 3. Heater Temperature Controls 4. Variable Air Volume Heater Con 5. Smoke Detector 6. RTU Miscellaneous Components 7. CASLink Controls 8. Cooling Section 9. RTU COMPONENT 10. Single Point Electrical Connection for RTU. 750va Transformer Used. If a Non-DCV Prewire controls this unit, the #28, #47, "MA", or "EZ" Prewire Option must be selected. Does not provide supply starter in prewire. 11. RTU Intake Option 12. RTU Discharge Option 13. Curb 14. Remote Temperature and Humidity Space Sensor 15. Regulator 16. Variable Frequency Drive 17. Cooling Heat Pump 18. Reheat Coil															


Paragon RTU Cooling Schedule

Tag	Compressor(s)				Outdoor Fan				Indoor Coil		Outside Air DB Temp	Outside Air WB Temp	Mixed Air DB Temp	Mixed Air WB Temp	Leaving DB Temp	Leaving WB Temp	Leaving DP Temp	Total Capacity	Sensible Capacity	Latent Capacity	Reheat Leaving DB Temp	Reheat Leaving WB Temp	Desired Reheat Capacity	Max Reheat Capacity	Reheat Leaving Relative Humidity	Moisture Removal Rate	IEER
	Stage	Tonnage	Voltage	Phase	Motor Voltage	Motor Ø	Motor Frequency	Motor Qty	Rows	Face Area																	
MUA-1	1	20.00	190-240	3	200-240	3	60	3	7	11.9 SQFT	82.5°F	76.1°F	82.5°F	76.1°F	51.4°F	51.4°F	51.5°F	263.3 MBH	108.0 MBH	155.3 MBH	70.0°F	58.9°F	65.6 MBH	129.6 MBH	52	135.8 LBS/HR	18.2

Paragon RTU Heating Schedule

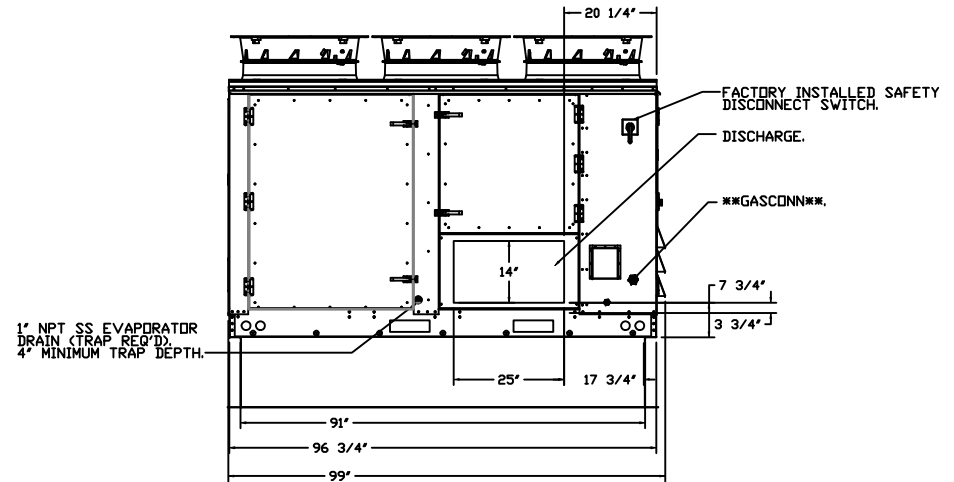
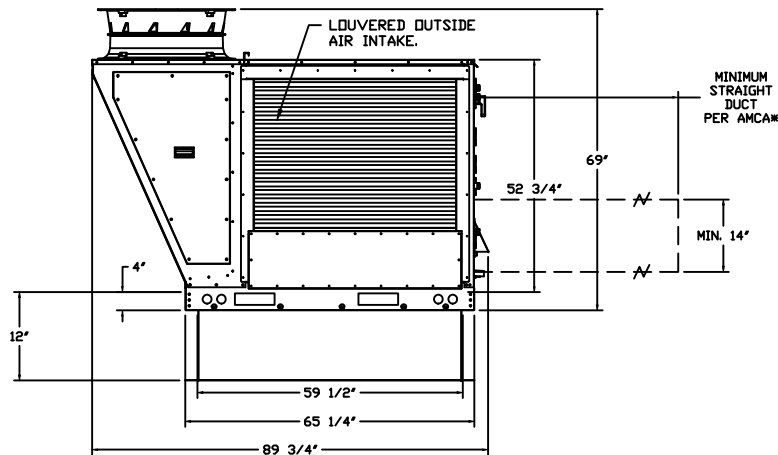
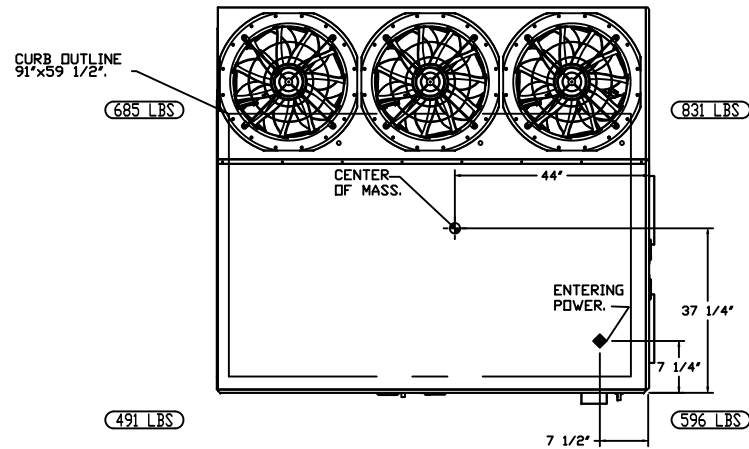
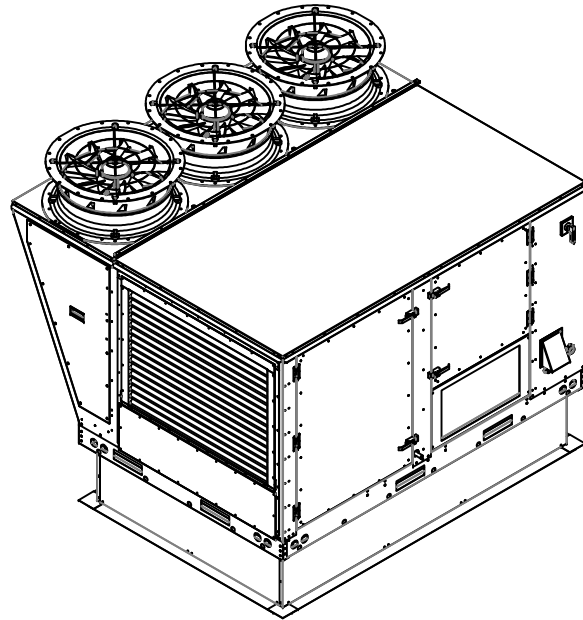
Tag	Input BTUs	Output BTUs	Temp Rise	Required Input Gas Pressure	Gas Type	Burner Efficiency(%)
MUA-1	377669	305912	80°F	1 LB. - 5 LB.	NATURAL	81

NOTES:

1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2.  DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2' SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.

MUA-01

*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 25' x 14'.





Trane Precedent Gas/Electric/Cooling Only Packaged Rooftop

Unit Overview - YSJ240A3S0H**R4E0C1010004000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Operating Weight	EER	IEER/SEER	Elevation
DX Cooling / Gas Heat	20 Ton	Airflow	Total External Static Pressure	Height	Width	Length	2511.0 lb	9.80	13.50	0.00 ft
		7000 cfm	1.628 in H2O	4.92 ft	7.25 ft	10.25 ft				

Unit Features

Hinged Service Access/Filters	Hinged Access Panels with 2-in MERV 13
Through the Base Provisions	Electric and Gas
Disconnect / Circuit Breaker	Non-Fused Disconnect Switch
Fresh Air Selection	DF Low Leak Econ Differential DB w BR



Unit Electrical

Voltage/phase/hertz	208-230/60/3
MCA	108.00 A
MOP	125.00 A
Condenser Fan FLA	4.30 A
Evaporator Fan FLA	8.80 A
Compressor 1 RLA	43.10 A
Compressor 2 RLA	26.10 A
Compressor Power	17.68 kW
System Power	25.10 kW

Controls

Unit Controls	Symbio 700
Communications Option	Advanced Controls and BACnet BAS
System Monitoring Controls 1	Clogged Filter & Condensate Overflow
SupplyFan/Drive/MotorType	Multiple Zone VAV with Standard Motor

Cooling Section

		Capacity
Entering Dry Bulb	80.00 F	Gross Total 243.04 MBh
Entering Wet Bulb	67.00 F	Gross Latent 67.15 MBh
Ambient Temp	95.00 F	Gross Sensible 175.88 MBh
Leaving Coil Dry Bulb	56.72 F	Net Total 233.79 MBh
Leaving Coil Wet Bulb	55.63 F	Net Sensible 166.64 MBh
Leaving Unit Dry Bulb	58.63 F	Net Sensible Heat Ratio 71.28 %
Leaving Unit Wet Bulb	56.41 F	Fan Motor Heat 1.49 MBh
Saturated Discharge Temperature	120.67 F	Refrig Charge-Circuit 1 16.6 lb
Saturated Suction Temperature	49.40 F	

Heating Section

Heating	High Gas Heat
Input Heating Capacity	400.00 MBh
Output Heating Capacity	324.00 MBh
Heating EAT	50.00 F
Heating LAT	92.35 F
Heating Temp Rise	42.35 F

Fan Section

Indoor Fan Data		Indoor Fan Performance	
Airflow Application	Downflow	Airflow	7000 cfm
Design ESP	1.200 in H2O	Supply Motor Horsepower	3.100 hp
Component SP	0.428 in H2O	Indoor Motor Operating Power	3.729 hp
Heat SP	0.000 in H2O	Indoor RPM	1415 rpm
Total External SP	1.628 in H2O	Outdoor Fan Data	
Supply Fan Count	2.00 Number	Outdoor Fan Drive Type	Direct
Indoor Fan Drive Type	Variable Direct	Outdoor Fan Quantity	2.00 Number
Indoor Fan Quantity	2.00 Number	Outdoor Fan Type	Propeller
Indoor Fan Type	BC Plenum		

- NOTES:
1. APPROX. INSTALLED WEIGHT INCLUDES ALL SELECTED OPTIONS AND ACCESSORIES.
 2. CORNER WEIGHTS ARE FOR BASE UNIT ONLY AND DO NOT INCLUDE OPTIONS OR ACCESSORIES.
 3. WEIGHT INCLUDES BOTH FACTORY AND FIELD INSTALLED ACCESSORY.

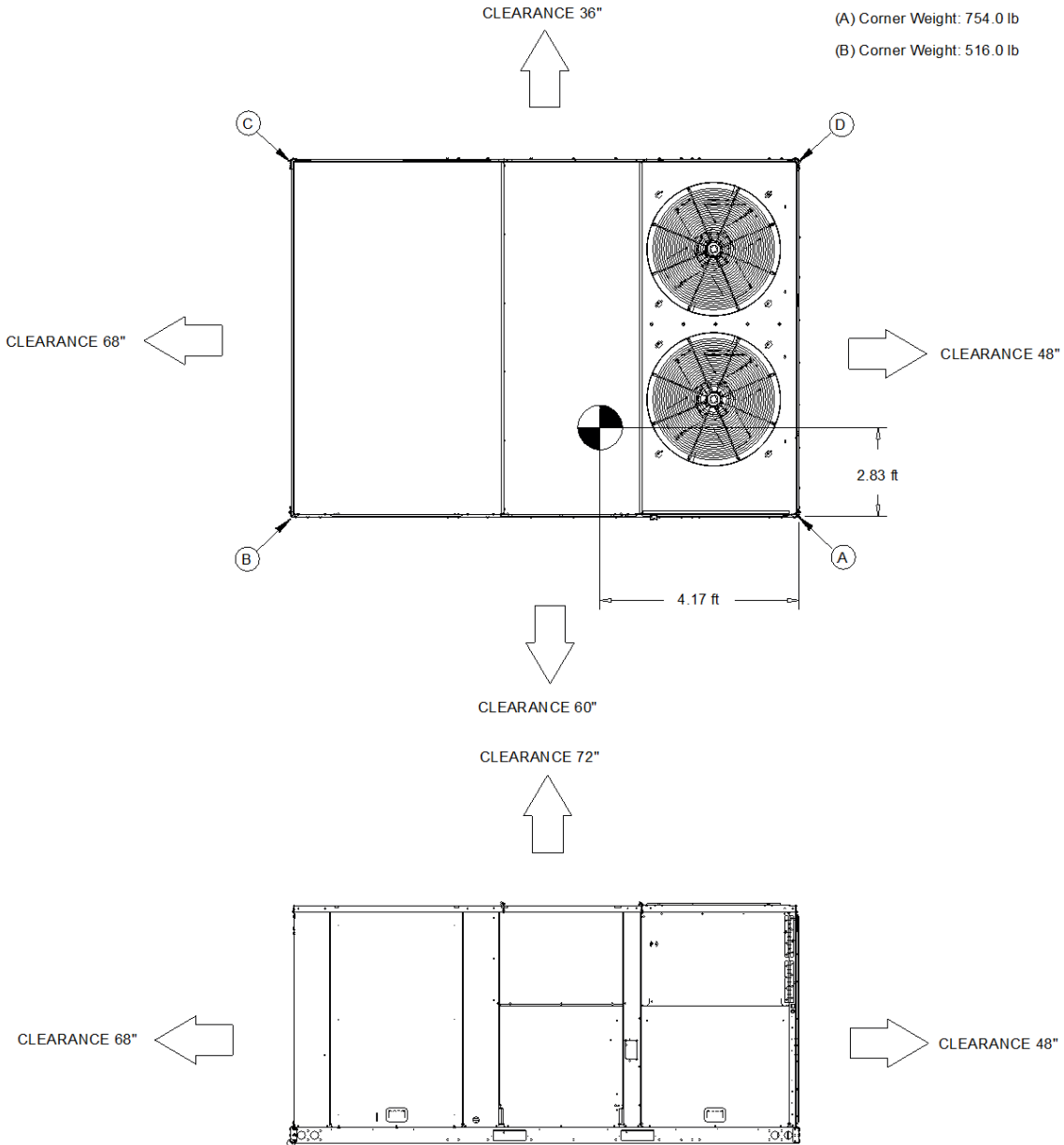
Approximate Installed Weight: 2,511.0 lb

(A) Corner Weight: 754.0 lb

(C) Corner Weight: 337.0 lb

(B) Corner Weight: 516.0 lb

(D) Corner Weight: 493.0 lb



DX COOLING / GAS HEAT STANDARD EFFICIENCY

WEIGHTS AND CLEARANCES