

# ***SUBMITTAL***

**Job Name:** Marshfield Mexican Restaurant

**Job Site:** El Sombrero Mexican

Marshfield  
Marshfield, MO 65706  
United States

**Customer PO#:** 209736A

**Engineer:** -

**Elevation: (ft)** 1,024

**Date:** 5/02/2023

**Submitted By:** Benjamin Obrien

**Agent Order#:** 209736A

ACCUREX KS NE WESTERN MO  
22904 E 41ST TERRACE SOUTH  
BLUE SPRINGS, MO 64015  
US

Phone: (816)888-9742

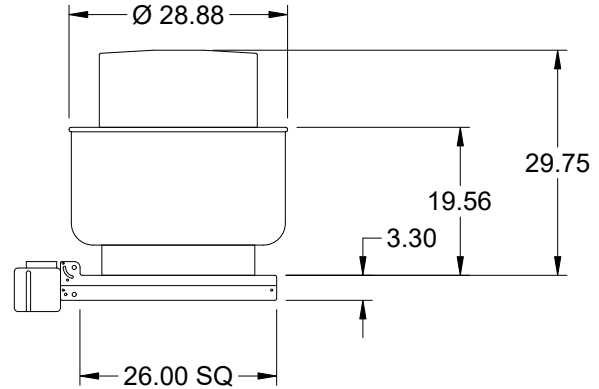
Fax: (866)468-8730

Email Address: benjamin.obrien@accurex.com



## Model: XRUD-160-VG

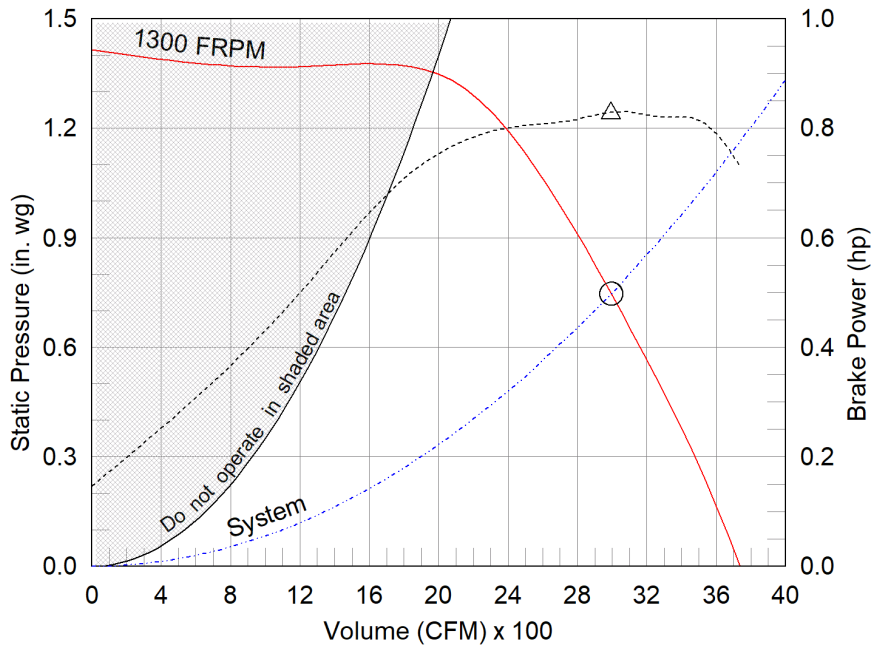
Direct Drive Upblast Centrifugal Roof Exhaust Fan



Dimensional	
Quantity	1
Weight w/o Acc's (lb)	81
Weight w/ Acc's (lb)	99
Roof Opening (in.)	22.5 x 22.5

OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

Performance	
Requested Volume (CFM)	3,000
Actual Volume (CFM)	2,993
Total External SP (in. wg)	0.747
Fan RPM	1300
Operating Power (hp)	0.83
Elevation (ft)	1,024
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.072
Tip Speed (ft/min)	5,658
Static Eff. (%)	43



Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	230/60/1
Enclosure	TENV
Motor RPM	1300
Efficiency Rating	High
Windings	1
FLA (Amps)	7

- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

### Static Pressure Calculations

External SP	0.75 in. wg
Direct Drive RPM Adjustment	-0.003 in. wg
<b>Total External SP</b>	<b>0.747 in. wg</b>

### Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	75	81	82	79	72	70	67	64	80	69	16.9

### Notes:

All dimensions shown are in units of in.  
 \*NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory.  
 MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).  
 LwA - A weighted sound power level, based on ANSI S1.4  
 dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International  
 Sones - calculated using AMCA 301 at 5 ft



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### Direct Drive Upblast Centrifugal Roof Exhaust Fan

#### Standard Construction Features:

- Aluminum housing with galvanized steel hood and hoodband - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 99-200HP and all Vari Green - Motor isolated on shock mounts - Corrosion resistant fasteners

#### Selected Options & Accessories:

Motor - Vari-Green EC motor  
Control – 0-10VDC Input, (no control provided, signal supplied by others)  
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)  
Switch, NEMA-3R, Toggle, Shipped with Unit  
Junction Box Mounted & Wired  
Hinge, Factory Installed  
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)  
Grease Trap (PN 475538)  
Unit Warranty: 1 Yr (Standard)

***The Vari-Green Motor included in this order has a 'Multi-Voltage' ability. The red wire on the motor is called a 'Voltage Doubler', and when it is connected the motor can be powered by 115V.***

***If the Red wire is disconnected, then the motor can be powered with 208-230/277V. The motor will leave the factory with the voltage doubler wired per the order.***

## SPLASH PANEL

Splash Panels

430 Stainless Steel

Stainless Steel Backsplash 297 in. Long, 120 in. High 371 lbs

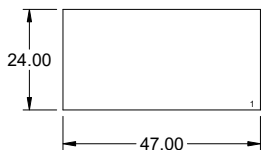
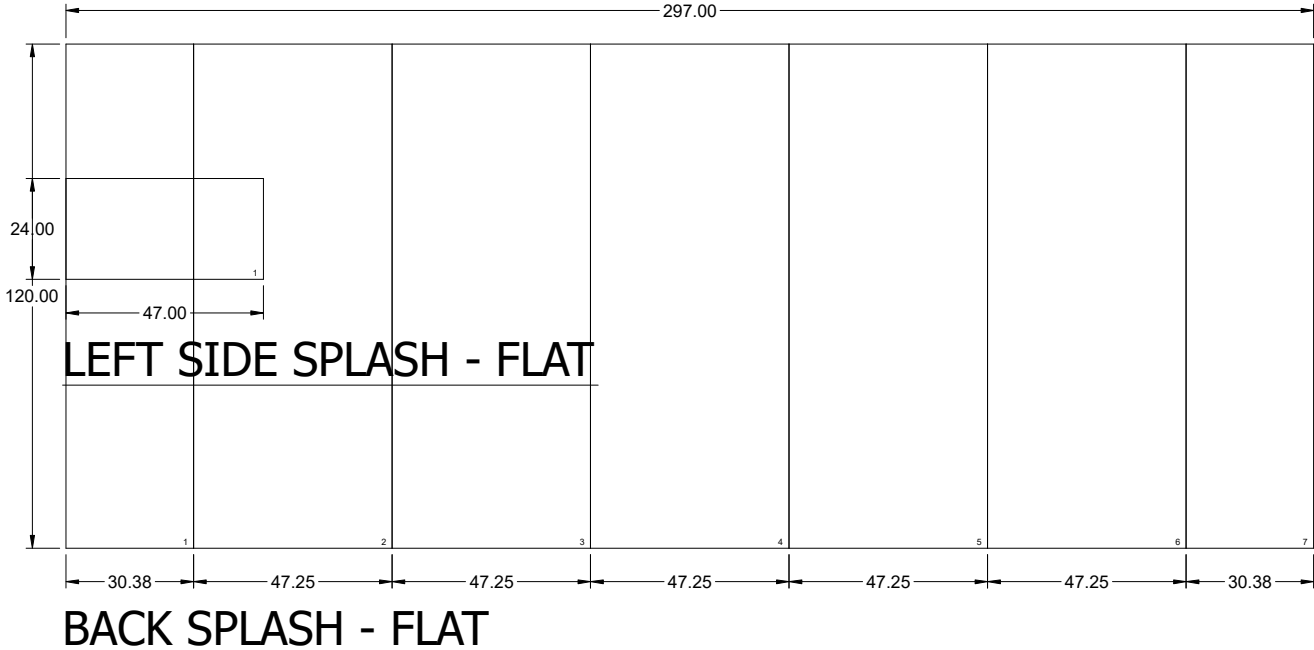
Stainless Steel Sidesplash Panel on Right 47 in. Long, 24 in. High 12 lbs

Stainless Steel Sidesplash Panel on Left 47 in. Long, 24 in. High 12 lbs

Additional Divider Bar for Backsplash 84" (9)

Inside Corner Trim 80" x 2" x 2" (2)

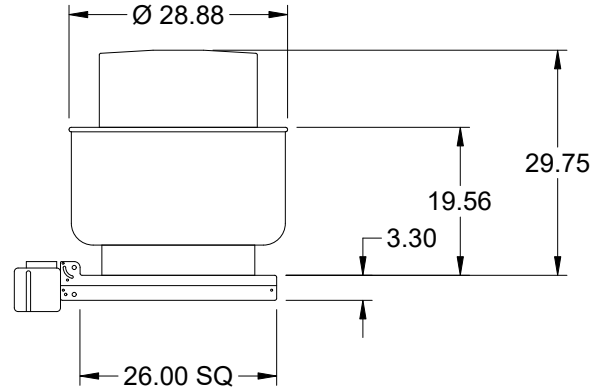
Outside Corner Trim 80" x 2" x 2" (2)



## RIGHT SIDE SPLASH - FLAT

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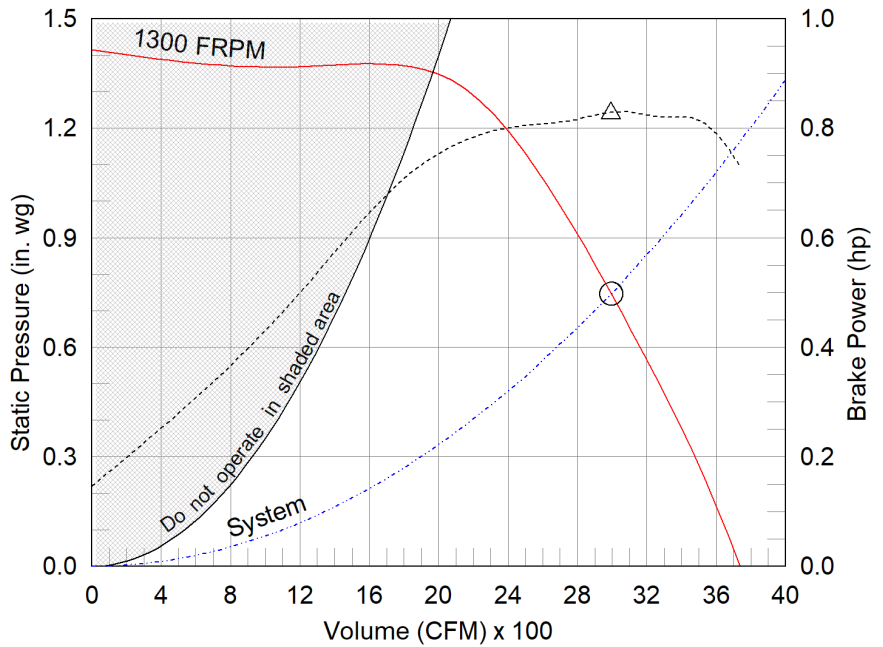


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Junction Box Mounted & Wired  
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High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)  
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## XDGX-P116-H12-MF

### Unit Performance

Design Conditions					
Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)
	DB (°F)	WB (°F)			
1,024	96.2	79.5	-0.1	4,800	4,800

Unit Specifications					
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing
1	698 (+/- 5%)	None	Direct Gas-Fired	Outdoor/Indoor	ANSI Z83.4 / CSA 3.7

Configuration				
Unit Orientation	Unit Configuration	Outdoor Air Intake	Return Air Intake	Supply Air Discharge
Horizontal	Constant Volume 100% OA	End	-	Bottom

Heating Specifications								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	12	0.5	395.0	363.4	70.1	0.0	70.0

Air Performance									
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Fan			
						Qty	Type	Size (in.)	Drive-Type
Supply	4,800	0.5	1.602	1966	2.59	1	Mixed Flow	20	Direct-Drive

Motor Specifications					
Motor	Qty	Size (HP)	Enclosure	Efficiency	RPM
Supply Fan Motor	1	3	ODP	NEMA Premium	1725

Electrical Specifications				
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	SCCR
Unit	230/60/1	21.9	35	5kA



### CONSTRUCTION FEATURES AND ACCESSORIES

Unit	
Unit Installation - Indoor or Outdoor	Std
Unit Construction - Double Wall	X
Wall Insulation - 1in. fiberglass - Tempering on	X
Base Insulation - 1in. fiberglass - entire unit base pan	Std
Paneled Bottom - Sheet metal liner for base insulation	X
Corrosion Resistant Fasteners	Std
Access and Connections - Right side when facing intake	X
Service Access - Removable lift off panels	X
Unit Finish - G90 Galvanized	X
Finish Color	
Supply Fan - Direct-drive, mixed flow plenum	X
Supply Fan and Motor Vibration isolation - Neoprene	X
Controls	
Unit Controls - Terminal strip	X
Remote Panel	
BMS Communication	
BMS Protocol	
Temperature Control - Discharge control	X
Supply Fan VFD - VFD by factory	X
Supply Fan Control - Constant Volume	X
Unoccupied Mode (Night Setback)	
Recirculation Control	
Control Accessories	
Remote display	
Heating Inlet Air Sensor	X
Cooling Inlet Air Sensor	
Dirty Filter Switch	
Fire Stat Type III (Ships loose)	
120V/24V Smoke Detector (Ships loose)	
Inlet Damper End Switch	
External Cooling Lockout Relay	
Freeze Protection (Supply Air Low Limit)	
Auxiliary Supply Starter Contacts	
Auxiliary Exhaust Starter Contacts	
Airflow Proving Monitoring Contact	

Accessories	
Factory Installed, Lockable, NEMA 3R Disconnect	Std
Weatherhood - Aluminum Mesh filtered	X
Supply Air Filters	
Outdoor Air Inlet Damper - Low leakage	X
Supply Air Outlet Damper	
Return Air Damper	
Diffuser	
Roof Curb	
Combination Curb	
Electrofin Coil Coating	
Fan Bearing Extended Lube Lines	
Inlet Damper Module	
Spare Belts	
Spare Filters	
Motor with Shaft Grounding	
Service Outlet	
Service Lights	
Gas Heating Accessories	
Pilot Ignition	Std
Flame Sensing - Flame rod	X
Flame Safeguard Display	
Agency Approval - ETL	Std
FM Compliant	X
High Gas Pressure Switch	
Low Gas Pressure Switch	
Visual Indication Valves	
Proof of Closure Valve	
External Gas Pressure Regulator (Ships loose)	
Carbon Dioxide Sensor (Ships loose)	
Warranty Options	
Unit Warranty - 18 months (std.)	X
5 Year Compressor Warranty	
5 Year Burner Warranty	
10 Year Burner Warranty	

Standard Option	Std
Not Included	
Included	X

#### Notes

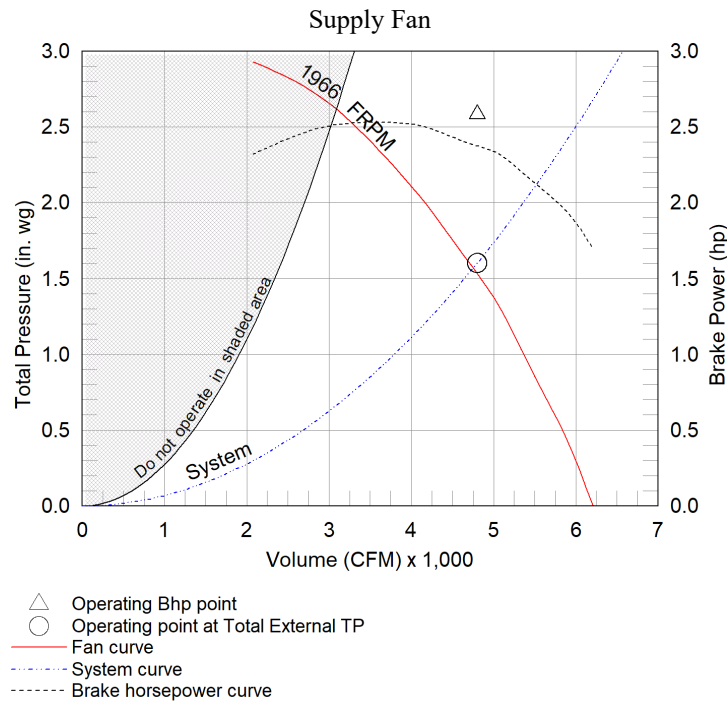
Damper(s) supplied are low leakage, motorized VCD-23 (leakage rate of 3 CFM/ft<sup>2</sup> @ 1 in.wg), Class 1A

## Fan Charts And Performance

Supply Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (HP)	Qty	Type	Drive-Type
4,800	0.5	1.602	1966	2.59	1	3	1	Mixed Flow	Direct

Pressure Drop (in. wg)							
Diffuser	Weatherhood	Filter	Damper	Cooling	Heating	External	Total
-	0.286	-	0.191	-	0.625	0.5	1.602

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
83	80	78	80	80	77	75	72	84	73	21



## Heating Specifications

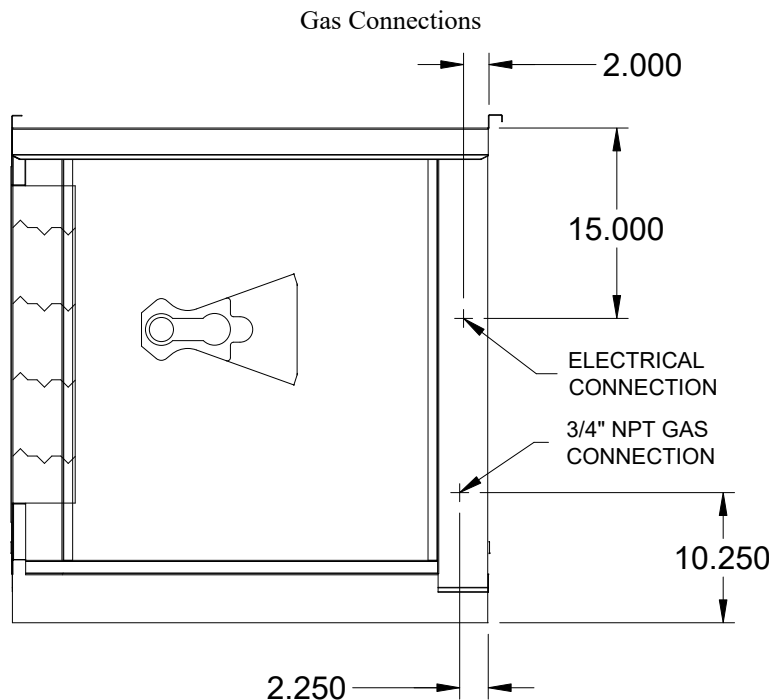
Heating Performance								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	12	0.5	395.0	363.4	70.1	0.0	70.0

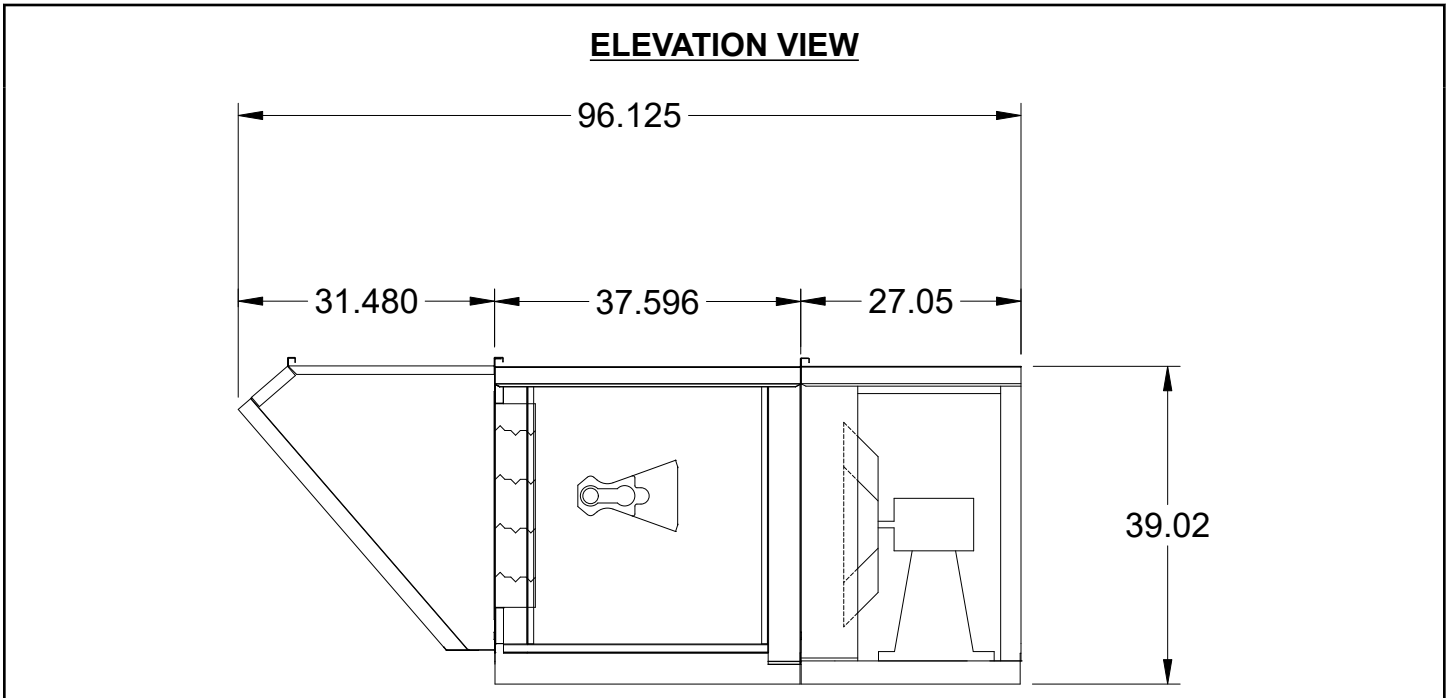
Gas Train Details							
Redundant Main Valves	Electronic Modulating Valve	Pilot Valve	Internal Regulator	Visual Indication Valve	Proof of Closure Valve	Gas Pressure Switch(es)	External Regulator
Std	Std	Std	Std	-	-	-	-

Additional Heating Information						
ETL Approved	FM Compliant	Temperature Control	Flame Sensing	Ignition Control	CO2 Sensor	Flame Safeguard Display
Std	Yes	Discharge	Flame Rod	Economy Pilot	-	-

Unit Details
92% thermal efficiency
Cast aluminum burner manifold with stainless steel mixing plates
Electronic modulation burner control

10 second pre-purge sequence
Low fire start





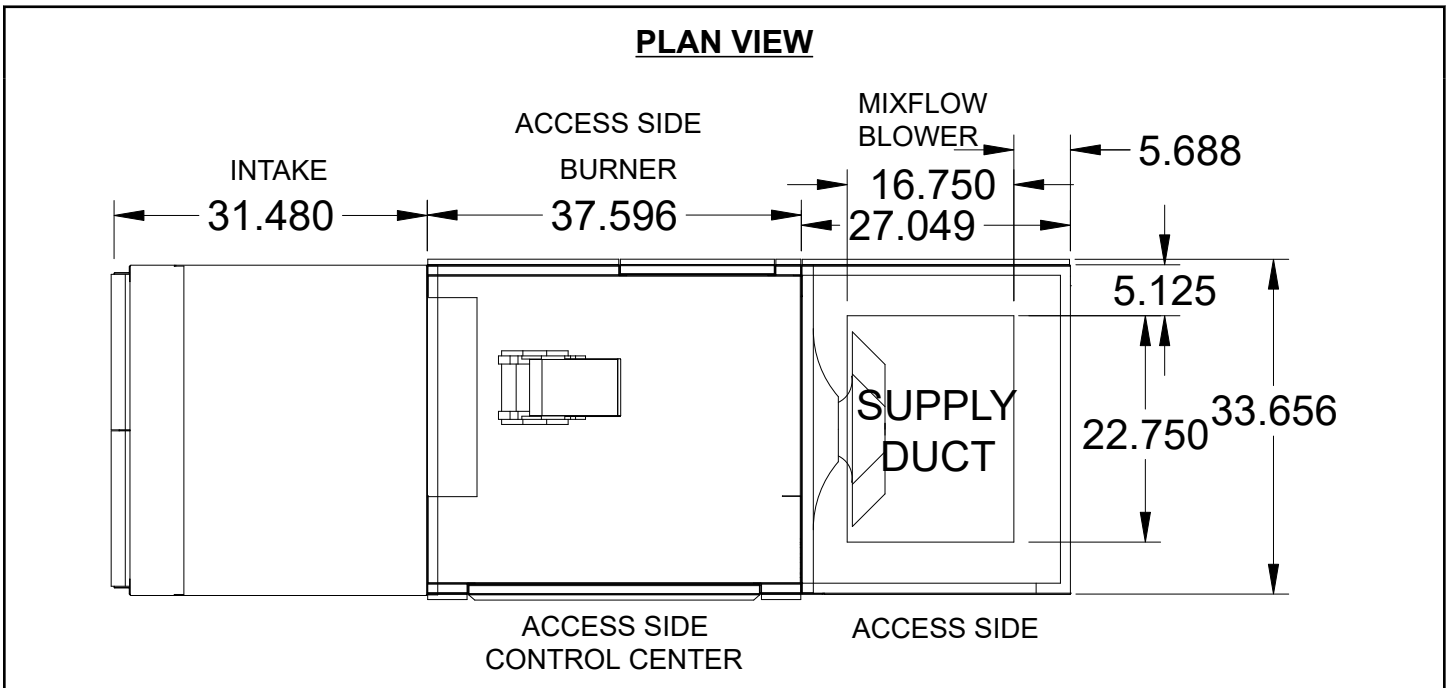
**Notes - Elevation View**

Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.

Order of unit sections is from intake of unit to discharge of unit.

Sections included on this unit: Weatherhood Section, Heating Section, Blower Section

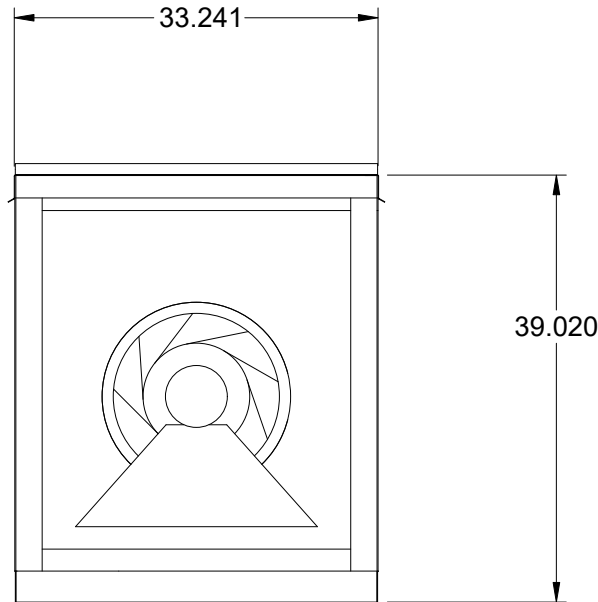
Insulation: Double Wall, from Burner Section through end of unit.



**Notes - Plan View**

Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.

## END VIEW

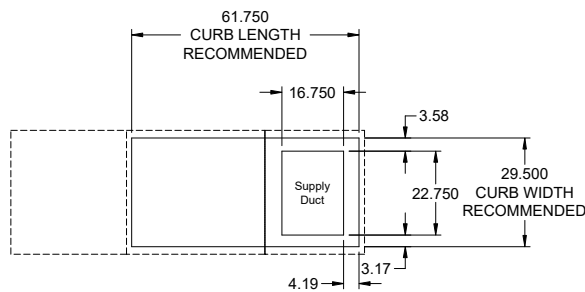


## FOOTPRINT VIEW

NOTE: Roof Opening Requirements:

Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides.  
 For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb.  
 For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.



NOTE: The weatherhood and filter sections of the make-up air unit extend beyond the curb. This is by design, to prevent water infiltration.

### Clearance Specifications

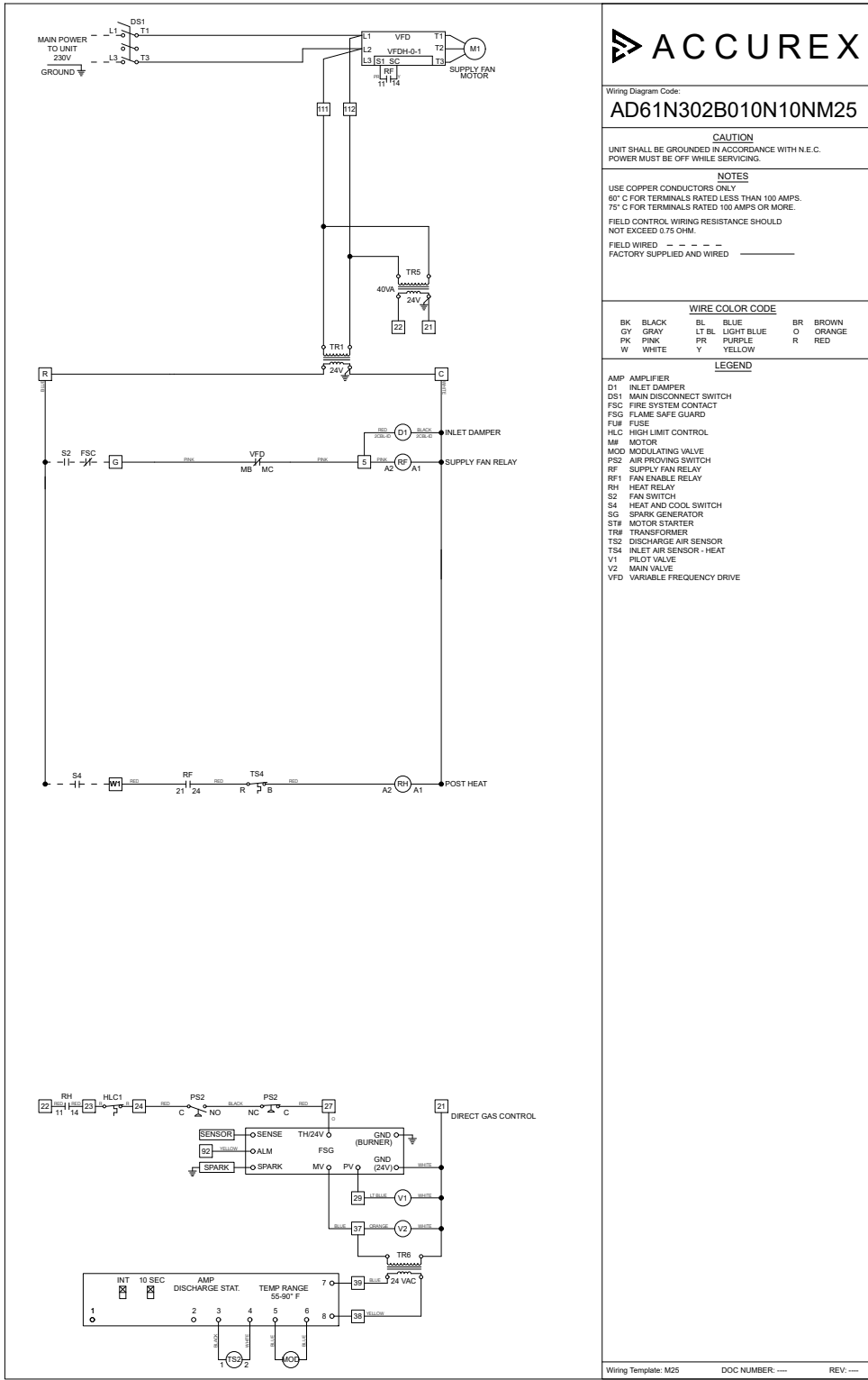
Recommended Minimum Combustible Clearances				
	Floor (in.)	Top (in.)	Sides (in.)	Ends (in.)
Insulated Units	0	0	0	0
Non-Insulated Units	0	6	6	6

**Notes - Combustible Clearances**  
 Clearance to combustibles is defined as the minimum distance required between the heating source and the adjacent combustible surfaces to ensure the adjacent surface's temperature does not exceed 90 F above the ambient temperature.

Recommended Minimum Service Clearances	
Housing 32 and less (in.)	Housing 35 and higher (in.)
42 on the controls side of the unit	48 on the controls side of the unit

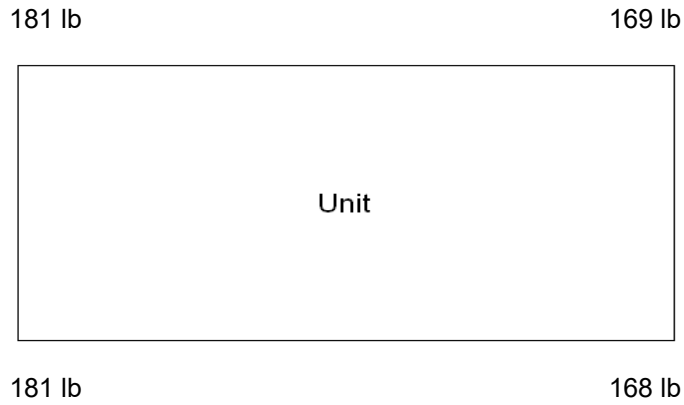
**Notes - Service Clearances**  
 To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

## Wiring Diagram



Manufacturer reserves the right to change, modify, or improve this product at anytime

**Corner Weights**



## SEQUENCE OF OPERATIONS

### Unit Controls

The unit shall be provided from the factory with:

- 24VAC Transformer
- Terminal Strip
- Supply fan VFD
- Factory mounted and wired outdoor air inlet damper with actuator

### Field Provided Control Requirements

The following field provided control signals must be provided for proper operation of the unit (Reference the unit wiring diagram for additional information):

- Supply fan enable – Contact closure between R and G (24VAC)

### Unit Start-Up Sequence

- Supply Fan Enable Is Received
- Outdoor air inlet damper actuator is energized
- Supply Fan Is Enabled

### Supply Fan Sequence

The unit has been provided with a factory mounted variable frequency drive (VFD). The variable frequency drive shall control the supply fan speed as indicated by the following sequence:

#### Constant Volume

The VFD shall be programmed from the factory for a constant supply fan speed. This is to be adjusted for air balancing only and is not to be modulated.

### Heating Control

A heating enable signal must be present and the supply fan must be enabled before the unit will enable heating.

#### Heating Inlet Air Sensor (Heating Lockout)

The heating will be locked out when the outside air temperature is above the heating inlet air sensor set point (typical 65 F, adj.)

#### Direct Gas Fired Heating (Discharge Control)

The gas control amplifier located in the unit shall modulate the heating to maintain a supply temperature set point (55 F-90 F, adj.).

- The set point is adjusted in the unit control center.

## Warranty Statement for Make-Up Air

### Unit Warranty

Accurex warrants the equipment to be free from defects in material and workmanship for a period of 18 months from the date of shipment. Initial startup must be completed within six months of the shipment date, and a startup report must be submitted to Accurex.

### DG Burner Extended Warranty

The warranty does not include items deemed as consumable components, including, but not limited to: Igniters, Spark rods, Spark generator, Flame rods, Flame wires, UV eye components, and associated components.

Note: Rust, discoloration of the burner material and cracks or holes smaller than .75 in. is not qualification for a defective burner.

### Warranty Notes

Any component which proves defective during the warranty period will be repaired or replaced at Accurex's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Accurex will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Accurex product. These warranties are exclusive and are in lieu of all other warranties, whether written, oral, or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. No person (including any agent or salesperson) has authority to expand Seller's obligation beyond the terms of this warranty, or to state that the performance of the product is other than that published by Seller.

*As a result of our commitment to continuous improvement, Accurex reserves the right to change specifications without notice.*

## Constant Volume

Accurex Kitchen Controls

### Standard Construction Features:

Includes control system, Fan Starters (unless otherwise stated), Temperature Sensors, Touchscreen. IMC 507.2.1.1 compliant. UL/ULC Listed.

### Options & Accessories:

Mounting Option	Ship Loose Enclosure - (12 x 20 x 6)
Exhaust Fan Quantity	2
Supply Fan Quantity	1
Hood Light Control	Yes
User Interface	Full Color Touchscreen
Touchscreen Mounting Location	Face Mount on Control Package (includes 4 ft. of cable)
Additional Fire Contacts	Additional set of dry contacts (2 NO, 2 NC Total)
Exhaust During Fire	Exhaust fans will run at max speed when in fire mode

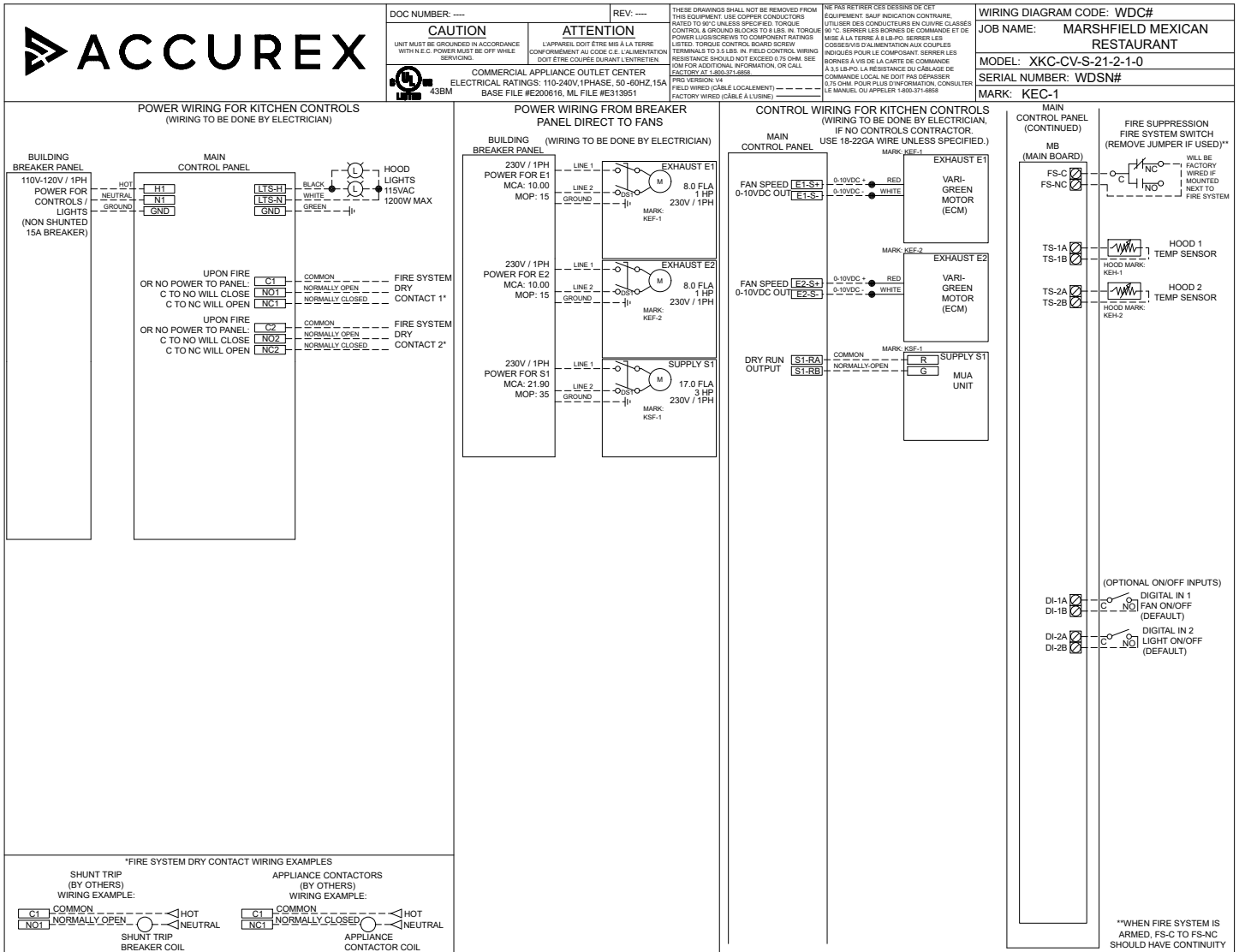
### Controlled Fans:

Fan Mark	Fan Type	Supplied By	Phase	HP	Voltage	NEC FLA	Starter/VFD Required	Starter/VFD Provided
KEF-1	Exhaust	Manufacturer	1	1	230	8.0	No	No
KEF-2	Exhaust	Manufacturer	1	1	230	8.0	No	No
KSF-1	Supply	Manufacturer	1	3	230	17.0	No	No

### Controlled Hood Sections and Fan Relationships:

KEH-1 - Existing Hood - Number of Sensors (mounting by others) = 1	
	Exhaust Fan Name - KEF-1
	Supply Fan Name - KSF-1
KEH-2 - Existing Hood - Number of Sensors (mounting by others) = 1	
	Exhaust Fan Name - KEF-2
	Supply Fan Name - KSF-1

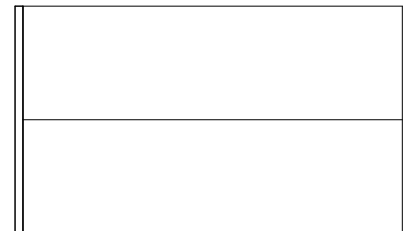
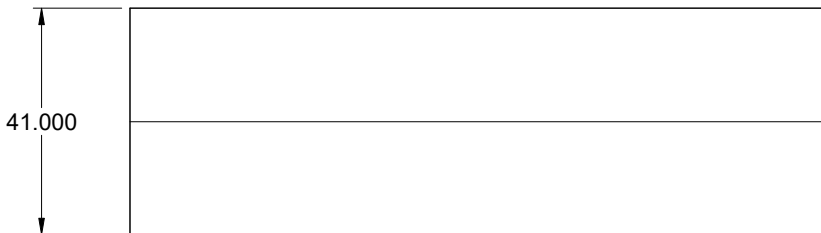
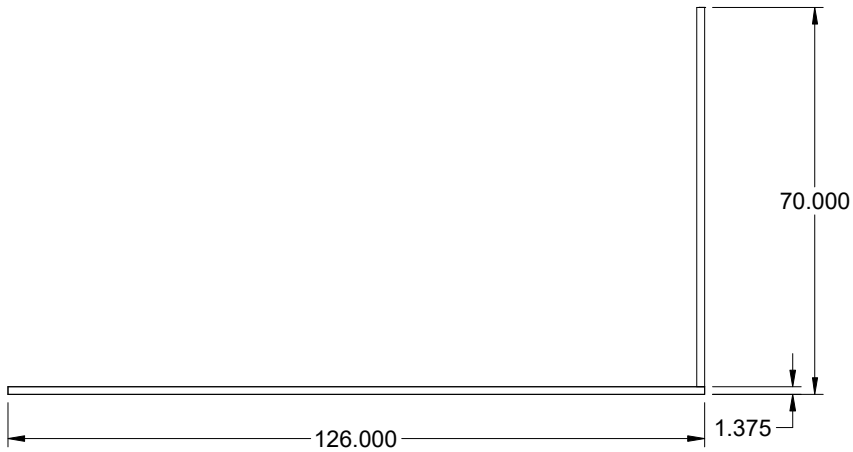




EP

Ceiling Enclosures

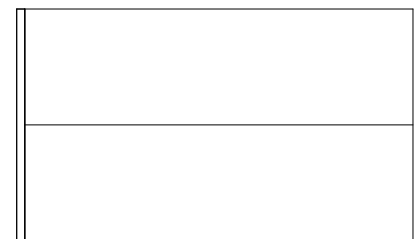
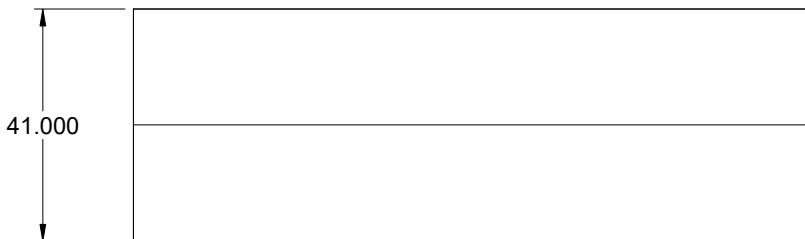
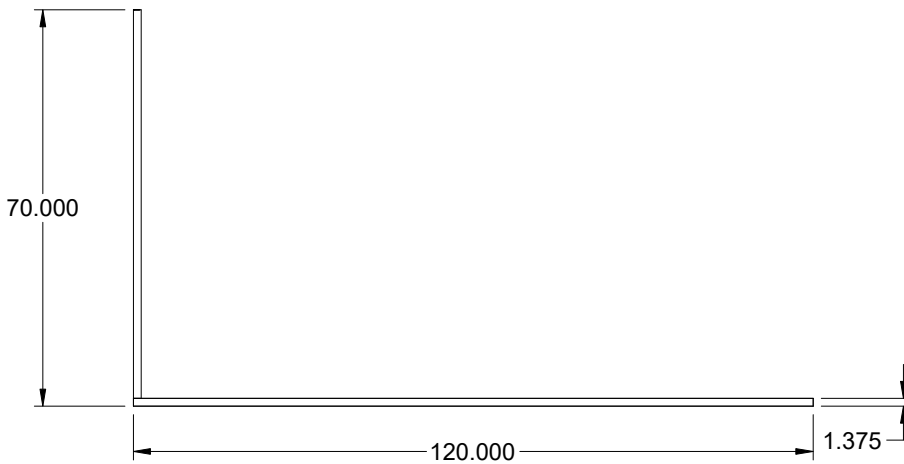
430 Stainless Steel  
Panel Height is 41 in.  
Front Enclosure Panel 126 in. Long  
Right Enclosure Panel 68.625 in. Long  
83 lbs



EP

Ceiling Enclosures

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Accurex Service

<b>Model</b>	Start-Up
<b>Service Description</b>	Full certified test and balance of the hood sysetm only.