

11/13/2023

HVAC SUBMITTAL REVIEW COMMENTS

#21068: Southside HS JR Additions

General Contractor: Nabholz
 HVAC Contractor: Comfort Systems

- | | |
|--|-----------------------|
| 1. Duct: | Approved |
| 2. Duct Sealant | Approved |
| 3. Kitchen Hood Systems | Approved |
| 4. Mini-Splits | Approved as corrected |
| a. Provide means for control by DDC system on ceiling cassettes. | |
| b. Coordinate electrical changes for DSCU1-1, 2-1, 2-2. | |
| 5. Residential Kitchen Hoods | Approved |
| 6. Welding Exhaust Drops | Approved |
| 7. Pipe Hanging and Support | Approved |
| 8. Identification | Approved |
| 9. TAB | Approved |
| 10. Insulation | Approved |
| 11. Controls | Approved |
| 12. Refrigerant Piping | Approved |
| 13. Take off fitting | Approved |
| 14. Fans | Approved |
| 15. Air Devices | Approved as corrected |
| a. V – provide insect screen. | |
| 16. Fabric Duct | Revise and Resubmit |
| a. Cfm's and lengths don't match plans. | |

Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 8/14/2023

Return Request: 8/24/2023

Project: Southside HS & JH Additions

Supplier: Airetech

Manufacturer: Greenheck

Submittal: Kitchen Hood Ventilation Systems

Submittal Number: 23 00 00-01

Drawing # and Installation: Mechanical Drawings

ARCHITECT

Lewis Architects Engineers
11225 Huron Lane, Suite 104
Little Rock, AR 72211
501-223-9302

ENGINEER

Lewis Architects Engineers
11225 Huron Lane, Suite 104
Little Rock, AR 72211
501-223-9302

GENERAL CONTRACTOR

Nabholz
612 Garland St.
Conway, AR 72032
501-505-5800

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.

23-8009

dpierce@comfortar.com

9924 Landers Rd.
No. Little Rock, AR 72117



SUBMITTAL DATA


EQUIPMENT: Kitchen Hood Ventilation Systems

SPEC SECTION: No Spec Section

TAGS: KH-1, KEF1-1,1-2,1-3 & MAU-1
KH-2 & KEF-2
KH-3, KEF-3 & SF-1
KH-4, KEF-4 & MAU-2
DHEF-1

PROJECT: Southside High School and Junior High Additions

LOCATION: Batesville, AR

ENGINEER: LEWIS
ARCHITECTS
ENGINEERS 

The logo for Lewis Architects Engineers consists of the company name stacked vertically in a bold, black, sans-serif font, followed by a large, stylized black 'LA' monogram.

CONTRACTOR: COMFORT SYSTEMS 
A R K A N S A S

The logo for Comfort Systems USA features the company name in a bold, black, sans-serif font, with 'USA' in a larger, stylized font where the 'U' and 'S' are connected. Below the name is a horizontal line with red and blue segments, and the word 'ARKANSAS' is written in a spaced-out, black, sans-serif font underneath.

DATE: 7/26/2023

SUBMITTED BY: Forrest Moseley
forrest@airetechcorp.com
501-425-6112

GXEW Type 1, X-Tractor Filter Single Wall - Exhaust Only Wall Canopy

Model	Hood Length (in.)	Width (in.)	Bottom Width (in.)	Height (in.)		Exhaust Volume (CFM)	Exhaust SP (in. w.g.)	Double Island
				Front	Back			
GXEW	312	54	54	24	24	5850	0.663	No

Selected Options & Accessories:

Option or Accessory	Description
Mounting Height	80 in. off Finished Floor.
Integral Air Space	Factory Mounted on Back - 3" wide 84 lbs
Ceiling Enclosures	8 in. High on Left Front Right
Filter Type	Stainless Steel X-Tractor Filters 168 lbs
Backsplash Panel	80 in High 336 in Long 0 in Wide 373 lbs
Continuous Capture	UL listed connection to join multiple sections.
Exhaust Air Balancing Baffle	Damper used to balance system with multiple collars.

Material: 430 SS Where Exposed
UL Listing: UL 710 w/out Exhaust Fire Damper

Features:
 Performance Enhancing Lip (PEL)
 Standing Seam Construction for Superior Strength
 Stainless Steel Finish for Higher Corrosion Resistance

Hood End Conditions:
 Back Wall - Limited Combustible

Section Data:

Length (in.)	Volume (CFM)	Exhaust Rate (CFM/FT)	SP (in. wg)	Filter Qty		Filter Ht. (in.)	Cooking Load	Light Qty	Light Type	Foot Candles	Drain Location	Hood Weight (LBS)
				16" W	20" W							
104	1950	225	0.663	4	2	20	Heavy	2	Round LED	63.6	Left/Right	287.15
104	1950	225	0.663	4	2	20	Heavy	2	Round LED	63.6	Left/Right	287.15
104	1950	225	0.663	4	2	20	Heavy	2	Round LED	63.6	Left/Right	287.15

Exhaust Collar Data:

Collar Num.	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos Off Back (in.)	Velocity (fpm)	Mounting Option
1	14	52	9	1824	Factory Mounted Exhaust Collar(s)
1	14	70	9	1824	Factory Mounted Exhaust Collar(s)
1	14	52	9	1824	Factory Mounted Exhaust Collar(s)

External Supply Plenum Data:

Supply: 4680 CFM

MUA: 4680 CFM

AC: 0 CFM

Plenum Num.	Side	Type	Length (in.)	Width (in.)	Height (in.)	Volume (CFM)	Weight (lbs)	SP (in. wg)	Insulated	MBD	LED Lights
1	Front	Air Curtain Supply (ASP)	116	14	4	1560	67	0.01	No	Yes	No
2	Front	Air Curtain Supply (ASP)	104	14	4	1560	63	0.01	No	Yes	No
3	Front	Air Curtain Supply (ASP)	116	14	4	1560	67	0.01	No	Yes	No

External Supply Collar Data:

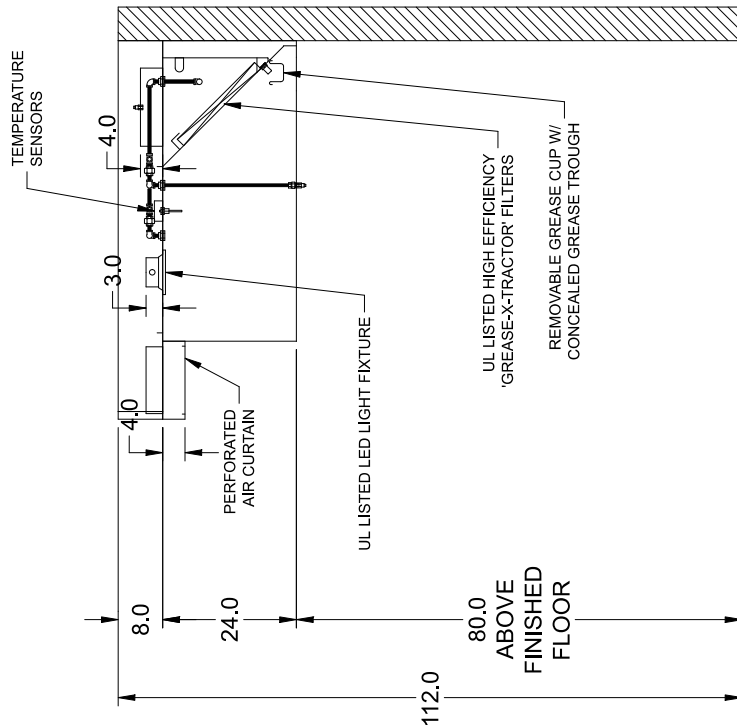
Section Num.	Plenum Num.	Side	Collar Num.	Collar Shape	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos. Off Front (in.)	Velocity (fpm)	Mounting Option
1	1	Front	1	rectangular	28 x 12	22	7	223	Factory Mounted Supply Collar(s)
1	1	Front	2	rectangular	28 x 12	58	7	223	Factory Mounted Supply Collar(s)
1	1	Front	3	rectangular	28 x 12	94	7	223	Factory Mounted Supply Collar(s)
2	1	Front	1	rectangular	24 x 12	20	7	260	Factory Mounted Supply Collar(s)
2	1	Front	2	rectangular	24 x 12	52	7	260	Factory Mounted Supply Collar(s)
2	1	Front	3	rectangular	24 x 12	84	7	260	Factory Mounted Supply Collar(s)
3	1	Front	1	rectangular	28 x 12	22	7	223	Factory Mounted Supply Collar(s)
3	1	Front	2	rectangular	28 x 12	58	7	223	Factory Mounted Supply Collar(s)
3	1	Front	3	rectangular	28 x 12	94	7	223	Factory Mounted Supply Collar(s)

Utility Cabinet Data:

Descripton	Length (in.)	Width (in.)	Height (in.)	Weight (lbs)
Left Utility Cabinet	54	12	24	234.4
Right Utility Cabinet	54	12	24	75

Hanger Bracket Locations			
Sec #	Brkt #	Distance Off Left (in)	Distance Off Front (in)
1	1	3.50	2.50
1	2	100.50	2.50
1	3	3.50	50.00
1	4	100.50	50.00
2	1	3.50	2.50
2	2	100.50	2.50
2	3	3.50	50.00
2	4	100.50	50.00
3	1	3.50	2.50
3	2	100.50	2.50
3	3	3.50	50.00
3	4	100.50	50.00

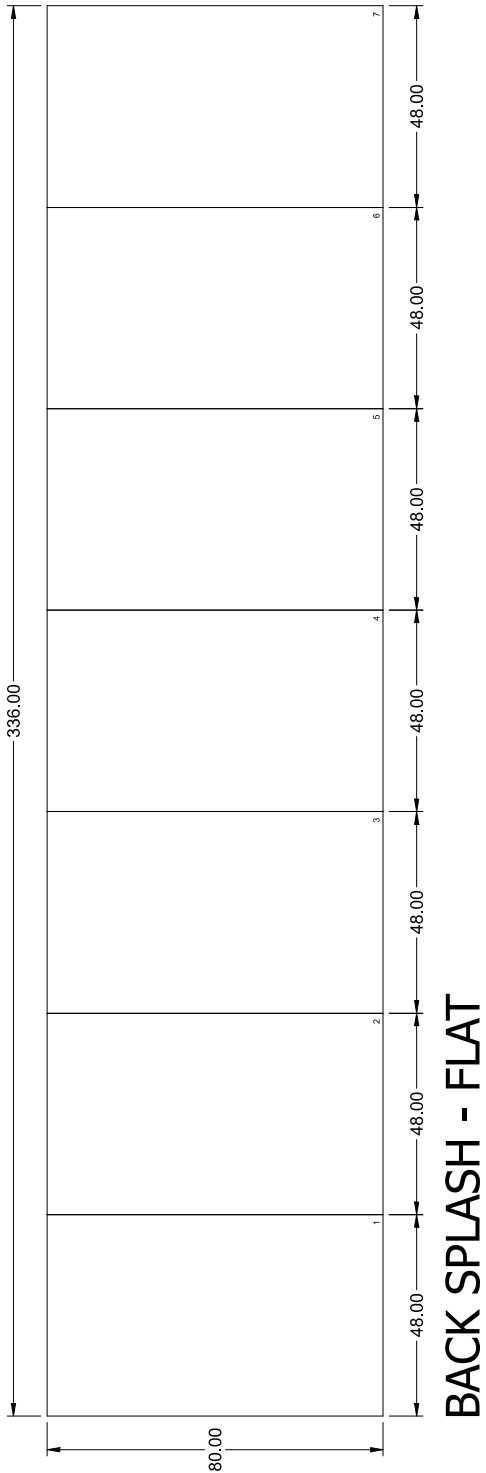
Bracket Mounting Position for 4 Bracket Hood	
3	4
1	2
	BACK
	FRONT



MARK: KH-1 (LAST HOOD IN ROW)

NOTE: All dimensions are in units of in.





NOTE: All dimensions are in units of in.



Ansul R-102 Wet Chemical Fire Suppression System

Scope:
Pre-Pipe With Parts and Factory Coordinated Installation

Hood Fire Suppression System

Detection Type	Mechanical
Coverage	Appliance Specific
Hood Mark(s) Connected	KH-1 KH-1 KH-1
Mounting Location	Utility cabinet on hood (see hood submittal for more visual detail)
System Size	9 Gallon
Flow Points	Maximum of 33 and 29 are utilized.

Options and Accessories for Hood Fire System Provided from Factory

OEM Regulated Release Assembly	QTY of 1
3 Gallon Tank Assembly	QTY of 3
Gas Valve	2", mechanical
Manual Pull Stations	QTY of 1
Microswitch	QTY of 1
Alarm Initiating Switch	QTY of 1
Metal Blow Off Caps	Included

Important Notes

- The manner in which the parts included in the scope of this fire system are supplied may vary. They could be shipped from the fire suppression manufacturer, shipped loose with the hood, connected directly to the hood, or supplied directly to the installing distributor.
- Must maintain 8 inch clearance between top of hood and pipe connections for installation (includes piping and workspace clearance).
- The amount of supply pipe that should not be exceeded per system is 32 ft., which includes all pipe used along the length the hood, between hoods, and the pipe needed to connect to the tanks where they are mounted.
- Pull station locations must be a minimum of 10 ft. and a maximum of 20 ft. from the hoods and in the path of egress. They also must be 40-48 in. from the finished floor.
- Systems are pre-piped for a specific appliance line-up. If appliance types and sizes differ from what is shown on the hood submittal, this may result in a field re-pipe which is outside the scope defined here.
- If the collars on the hood are shipped loose, the detection line will not be installed on the hood and the parts will ship loose.

Gas Valve

Quantity: 1
Ansul
Mechanical
2 in.

Variable Volume

Greenheck Kitchen Controls

Standard Construction Features:

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

Options & Accessories:

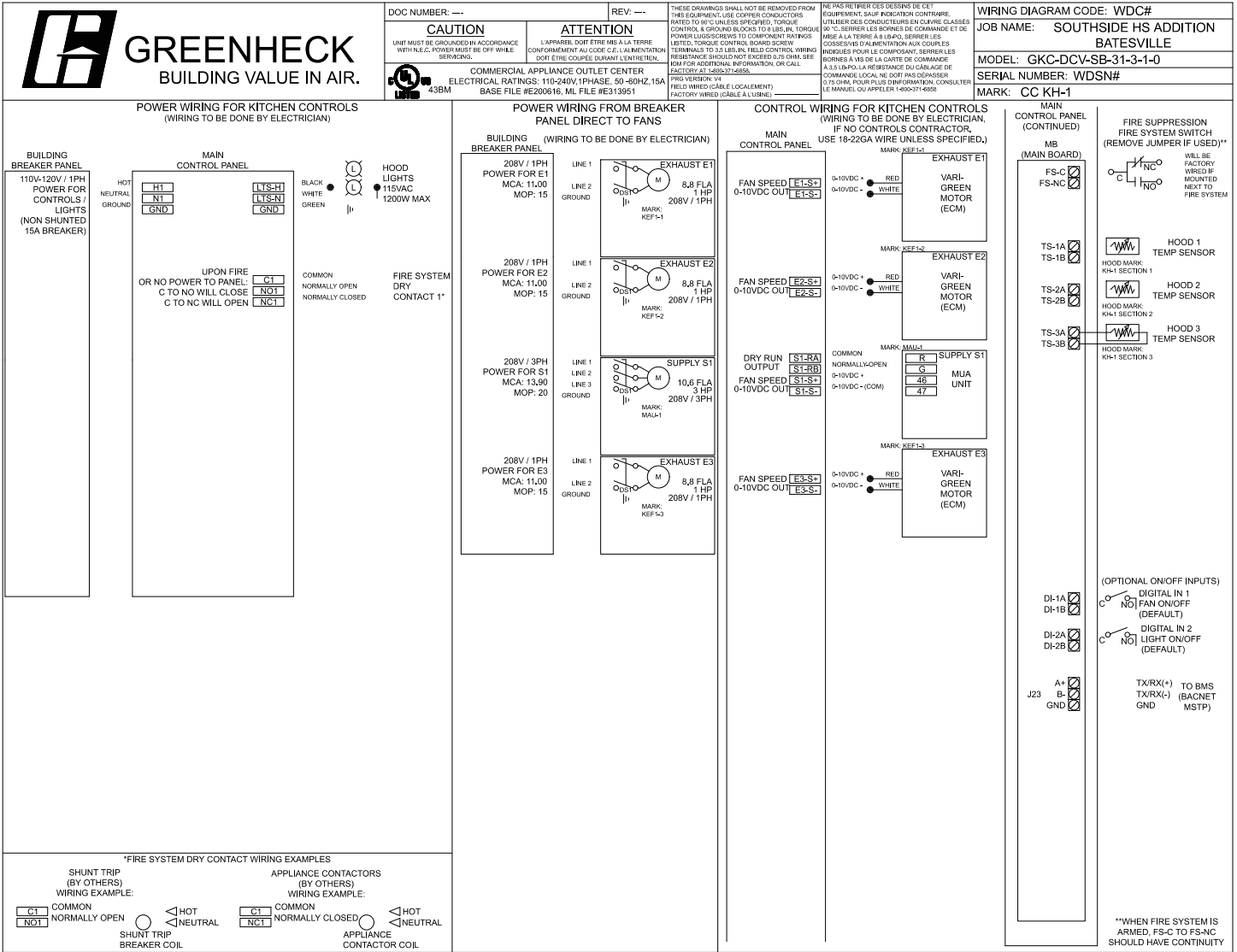
Mounting Option	Right Cabinet on KH-1
Exhaust Fan Quantity	3
Supply Fan Quantity	1
Hood Light Control	Yes
User Interface	Full Color Touchscreen
Touchscreen Mounting Location	Face Mount Right Side of Hood - KH-1 Section 3
Exhaust During Fire	Exhaust fans will run at max speed when in fire mode
Building Management System	BMS Interface: BACnet MSTP

Controlled Fans:

Fan Mark	Fan Type	Supplied By	Phase	HP	Voltage	NEC FLA	Starter/VFD Required	Starter/VFD Provided
KEF1-1	Exhaust	Manufacturer	1	1	208	8.8	No	No
KEF1-2	Exhaust	Manufacturer	1	1	208	8.8	No	No
MAU-1	Supply	Manufacturer	3	3	208	10.6	Yes	No
KEF1-3	Exhaust	Manufacturer	1	1	208	8.8	No	No

Controlled Hood Sections and Fan Relationships:

KH-1 Section - Number of Sensors = 1	
	Exhaust Fan Name - KEF1-1
	Supply Fan Name - MAU-1
KH-1 Section - Number of Sensors = 1	
	Exhaust Fan Name - KEF1-2
	Supply Fan Name - MAU-1
KH-1 Section - Number of Sensors = 1	
	Supply Fan Name - MAU-1
	Exhaust Fan Name - KEF1-3

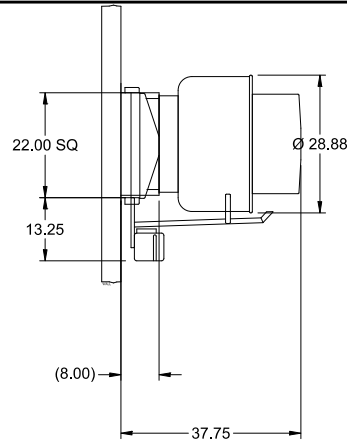


Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Previously: CUE-141-VG

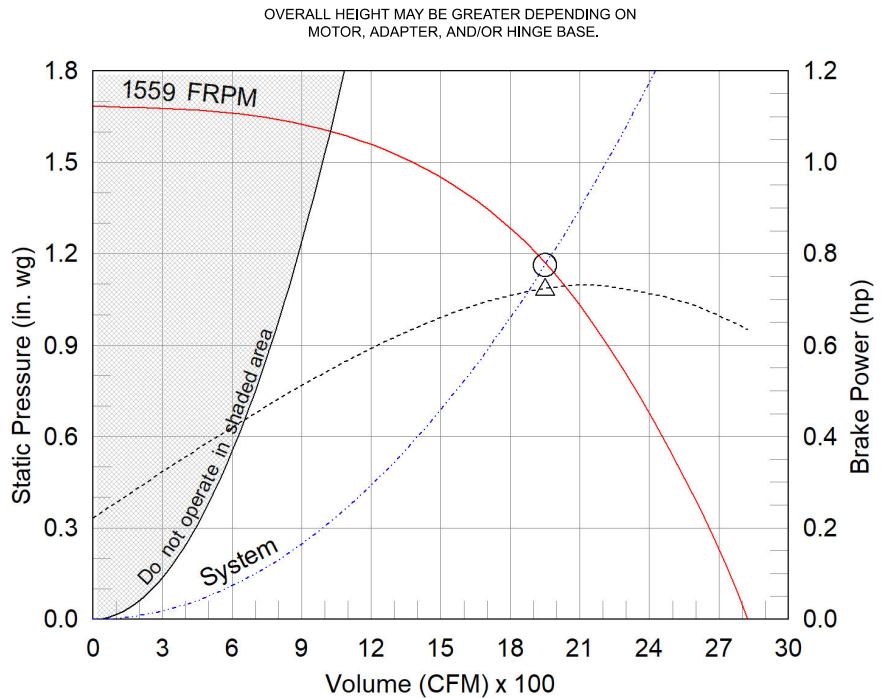
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	73
Weight w/ Acc's (lb)	111
Weight w/ Acc's and Curb (lb)	136
Standard Curb Cap Size (in.)	22 x 22
Wall Opening (in.)	18 x 18



Performance	
Requested Volume (CFM)	1,950
Actual Volume (CFM)	1,950
Total External SP (in. wg)	1.163
Fan RPM	1559
Operating Power (hp)	0.72
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,970
Static Eff. (%)	49

Misc Fan Data	
Fan Eff. Index (FEI)	1.43
Outlet Velocity (ft/min)	1,134

Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	208/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	7
Min. Circuit Ampacity (MCA)	9
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	71	66	81	76	65	57	59	57	76	65	12.3



Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Standard Curb Cap Size - 22 Square
Sidewall Mounting - Fan Configured for Wall-Mounted Applications
Curb will be Mounted to the Wall
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918380), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Pan Kit - Containment Configured for Wall-Mounted Applications (PN:879137)
Grease Trap (PN:475538)
Birdscreen: Stainless Steel, nom. 85% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPF-22-G8

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.

Vari-Green Motor & Control Options

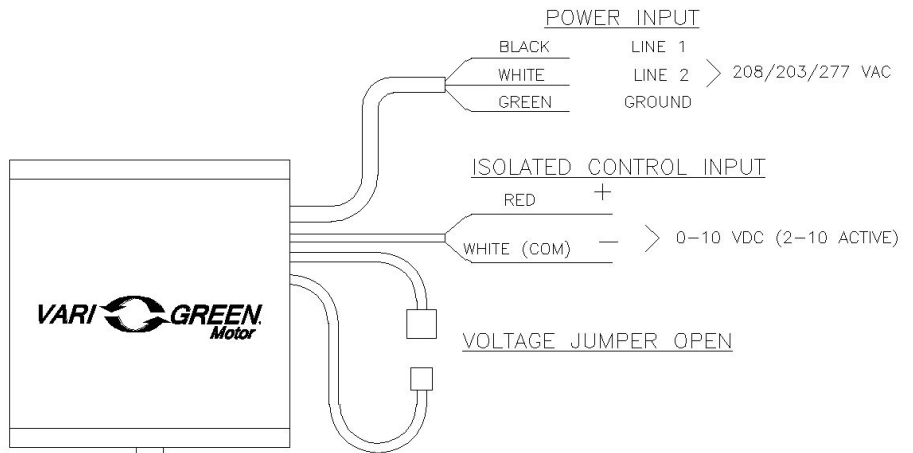
An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

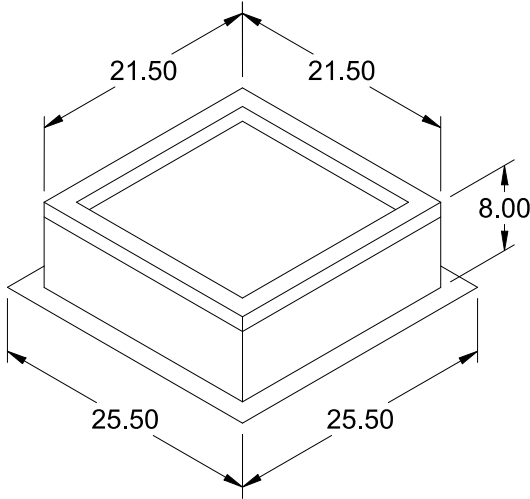
Control Type: By Others
Transformer: None



NOTES

2 VDC IS 15% AND 10 VDC IS 100%
OF NAMEPLATE RPM.
0-1.9 VDC IS OFF.

DRAWING#
1.7.2.v1



Model: GPF

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. or 5 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

***This curb can be mounted on the roof or wall (with a sidewall mounted CUE or CUBE fan).

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPF-22	Nominal	0.5	25	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
8	22	22	21.5	21.5	18	18	25.5	25.5	21	21

*May not be applicable

Accessories

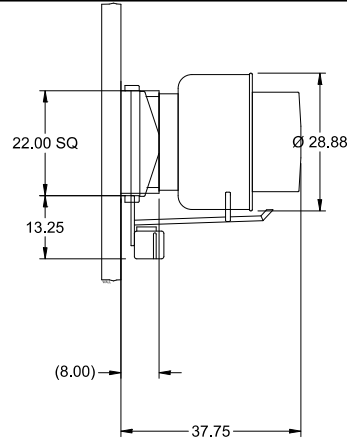
Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Previously: CUE-141-VG

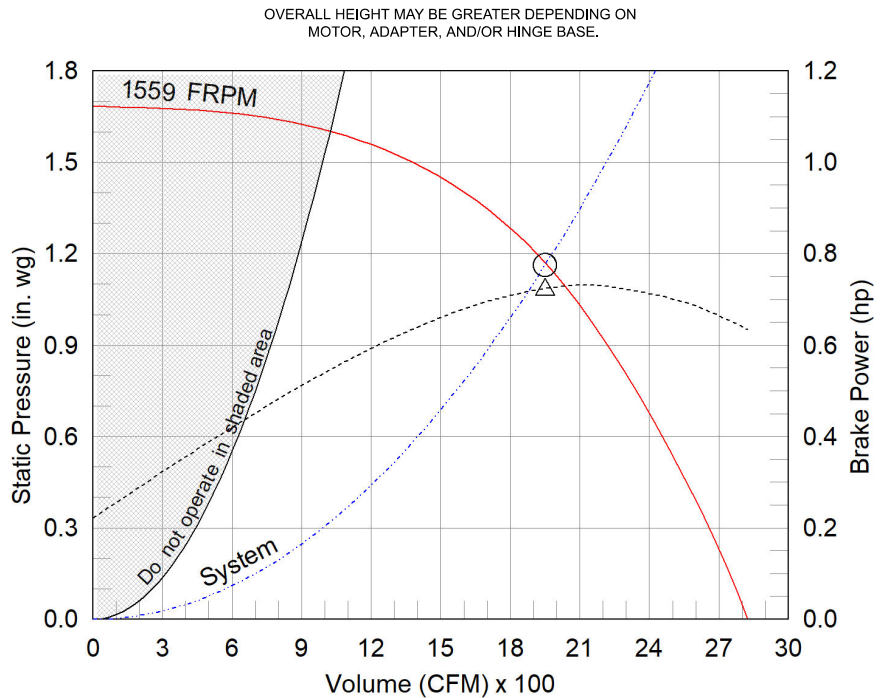
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	73
Weight w/ Acc's (lb)	111
Weight w/ Acc's and Curb (lb)	136
Standard Curb Cap Size (in.)	22 x 22
Wall Opening (in.)	18 x 18



Performance	
Requested Volume (CFM)	1,950
Actual Volume (CFM)	1,950
Total External SP (in. wg)	1.163
Fan RPM	1559
Operating Power (hp)	0.72
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,970
Static Eff. (%)	49

Misc Fan Data	
Fan Eff. Index (FEI)	1.43
Outlet Velocity (ft/min)	1,134

Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	208/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	7
Min. Circuit Ampacity (MCA)	9
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	71	66	81	76	65	57	59	57	76	65	12.3



Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Standard Curb Cap Size - 22 Square
Sidewall Mounting - Fan Configured for Wall-Mounted Applications
Curb will be Mounted to the Wall
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918380), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Pan Kit - Containment Configured for Wall-Mounted Applications (PN:879137)
Grease Trap (PN:475538)
Birdscreen: Stainless Steel, nom. 85% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPF-22-G8

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.

Vari-Green Motor & Control Options

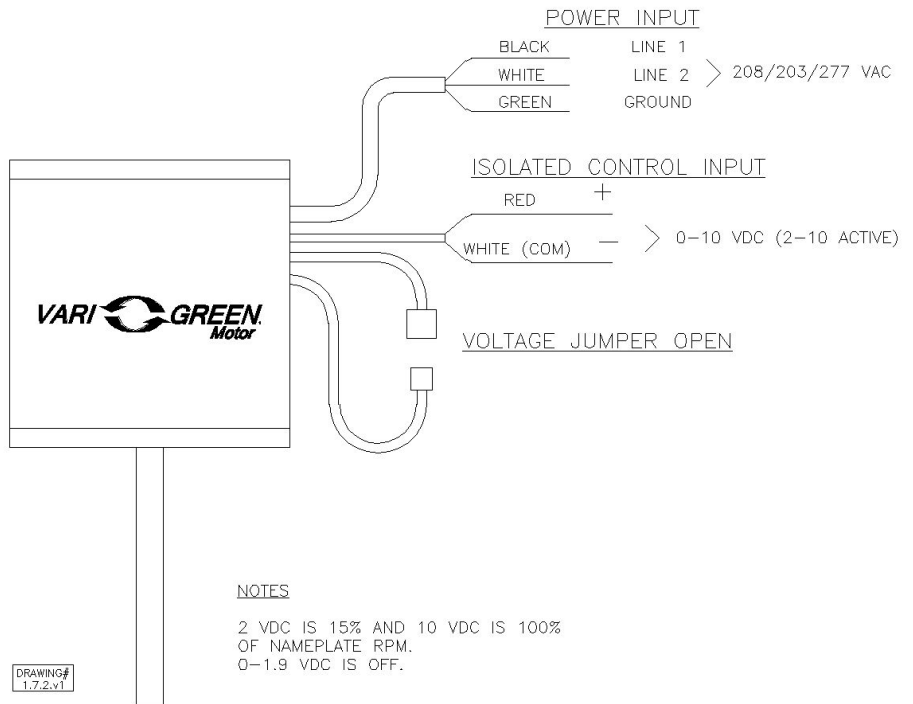
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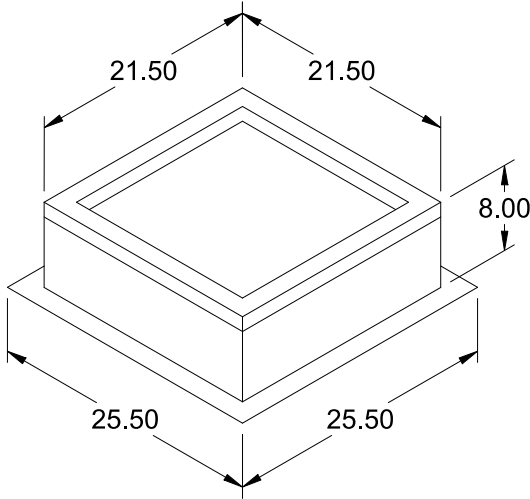
Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

Control Type: By Others
Transformer: None





Model: GPF

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. or 5 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

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General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPF-22	Nominal	0.5	25	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
8	22	22	21.5	21.5	18	18	25.5	25.5	21	21

*May not be applicable

Accessories

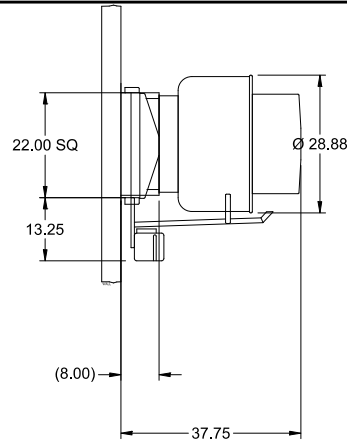
Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Previously: CUE-141-VG

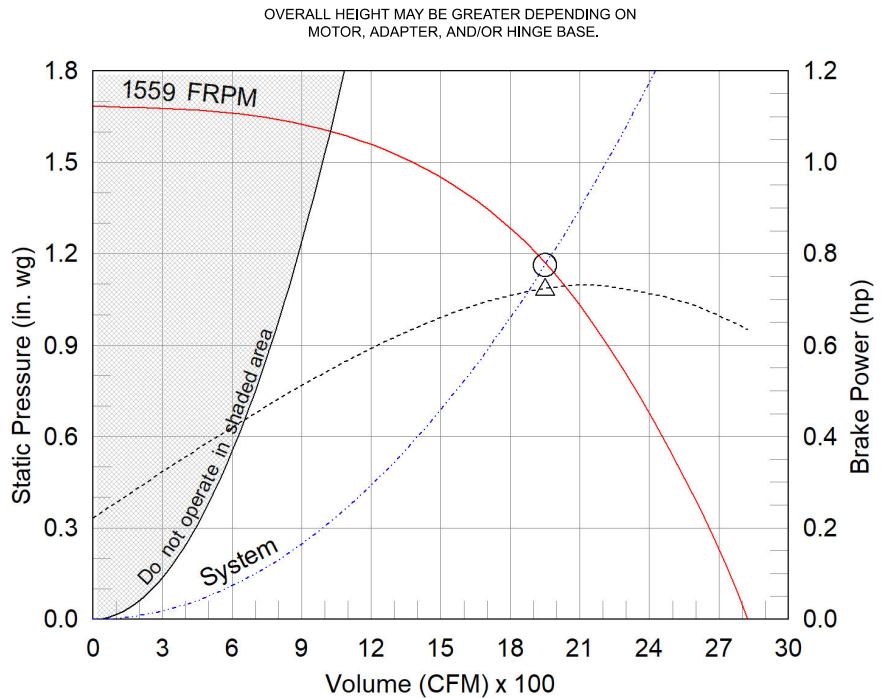
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	73
Weight w/ Acc's (lb)	111
Weight w/ Acc's and Curb (lb)	136
Standard Curb Cap Size (in.)	22 x 22
Wall Opening (in.)	18 x 18



Performance	
Requested Volume (CFM)	1,950
Actual Volume (CFM)	1,950
Total External SP (in. wg)	1.163
Fan RPM	1559
Operating Power (hp)	0.72
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,970
Static Eff. (%)	49

Misc Fan Data	
Fan Eff. Index (FEI)	1.43
Outlet Velocity (ft/min)	1,134

Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	208/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	7
Min. Circuit Ampacity (MCA)	9
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	71	66	81	76	65	57	59	57	76	65	12.3



Model: CUE-140-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Standard Curb Cap Size - 22 Square
Sidewall Mounting - Fan Configured for Wall-Mounted Applications
Curb will be Mounted to the Wall
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918380), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Pan Kit - Containment Configured for Wall-Mounted Applications (PN:879137)
Grease Trap (PN:475538)
Birdscreen: Stainless Steel, nom. 85% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPF-22-G8

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.

Vari-Green Motor & Control Options

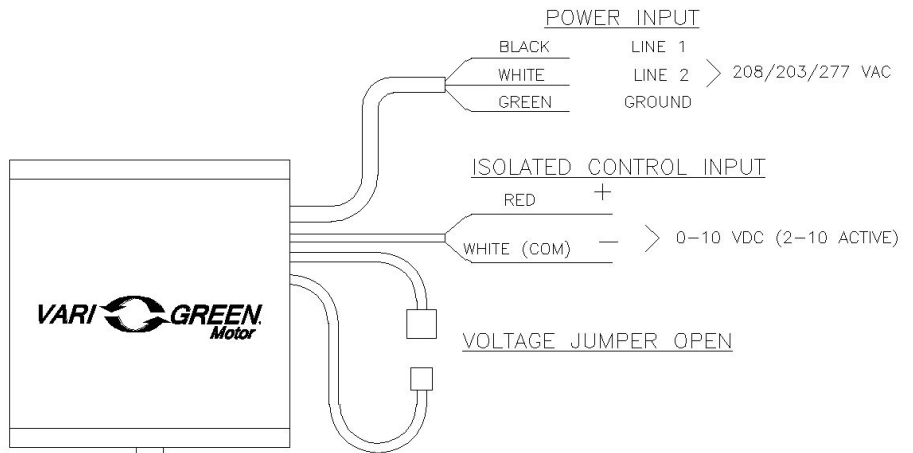
An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

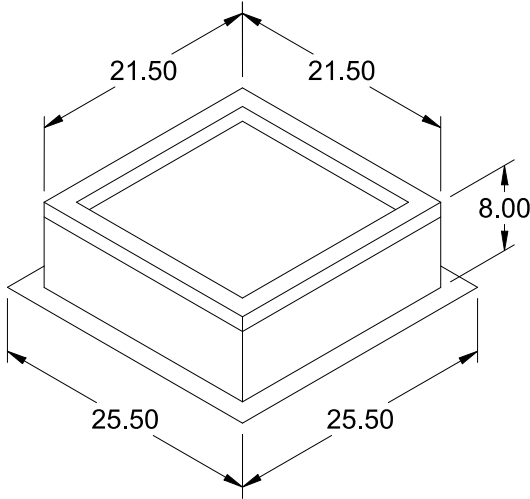
Control Type: By Others
Transformer: None



NOTES

2 VDC IS 15% AND 10 VDC IS 100%
OF NAMEPLATE RPM.
0-1.9 VDC IS OFF.

DRAWING#
1.7.2.v1



Model: GPF

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. or 5 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

***This curb can be mounted on the roof or wall (with a sidewall mounted CUE or CUBE fan).

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPF-22	Nominal	0.5	25	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
8	22	22	21.5	21.5	18	18	25.5	25.5	21	21

*May not be applicable

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

DGX-P116-H12-MF

Unit Performance

Design Conditions						
Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)	Min Supply Airflow (CFM)
	DB (°F)	WB (°F)				
256	98.0	80.2	17.2	4,680	4,680	1,638

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	Variable Volume	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	9	0.5	290.1	266.9	52.8	17.0	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	4,680	0.65	1.729	1974	2.65	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	208/60/3	13.9	20	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	
Corrosion Resistant Fasteners	Std
Access and Connections - Right side when facing intake	X
Service Access - Hinged access doors	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 - External 0-10 VDC signal	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 - GPI	X
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	X

Standard Option	Std
Not Included	
Included	X

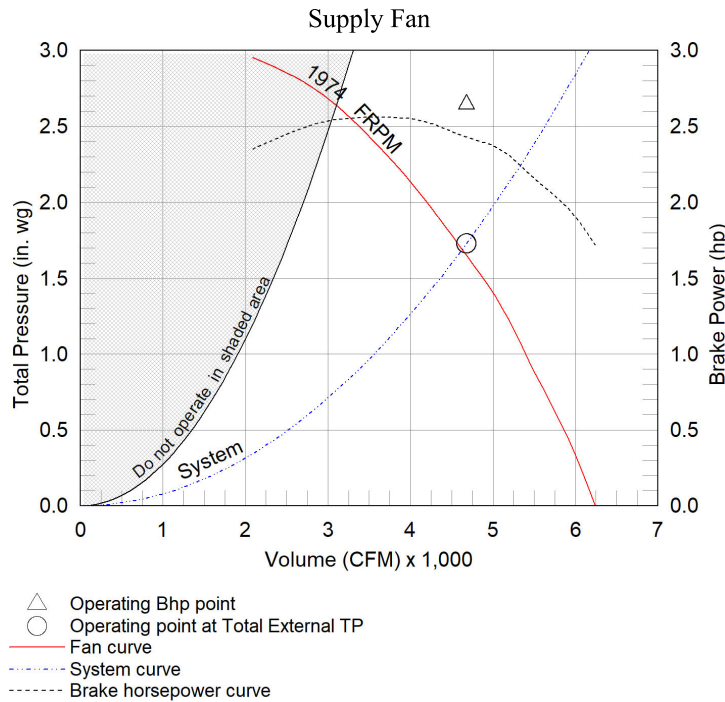
Notes
 Damper(s) supplied are low leakage, motorized VCD-23 (leakage rate of 3 CFM/ft² @ 1 in.wg), Class 1A

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
4,680	0.65	1.729	1974	2.65	1	3	1	Mixed Flow	Direct

Pressure Drop (in. wg)							
Diffuser	Weatherhood	Filter	Damper	Cooling	Heating	External	Total
-	0.272	-	0.182	-	0.625	0.65	1.729

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

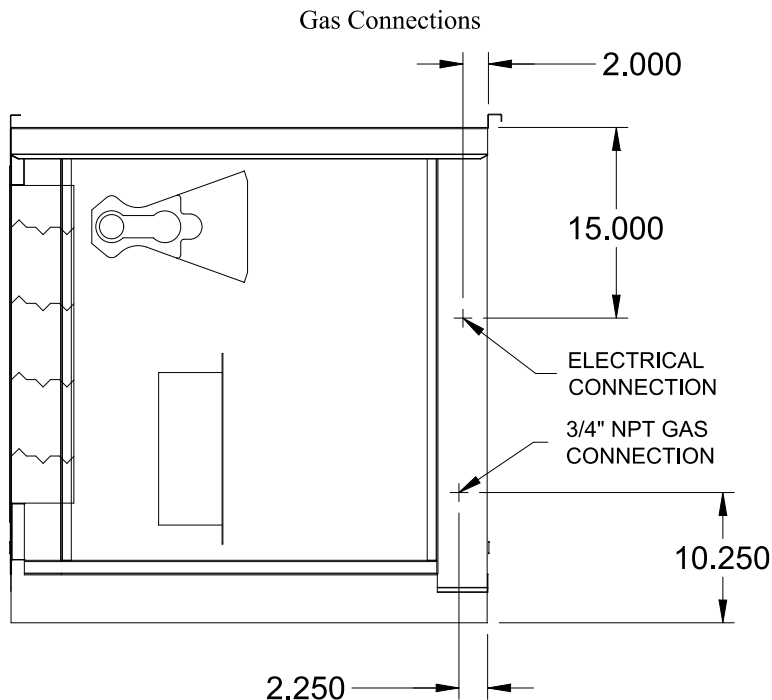
Heating Performance								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	9	0.5	290.1	266.9	52.8	17.0	70.0

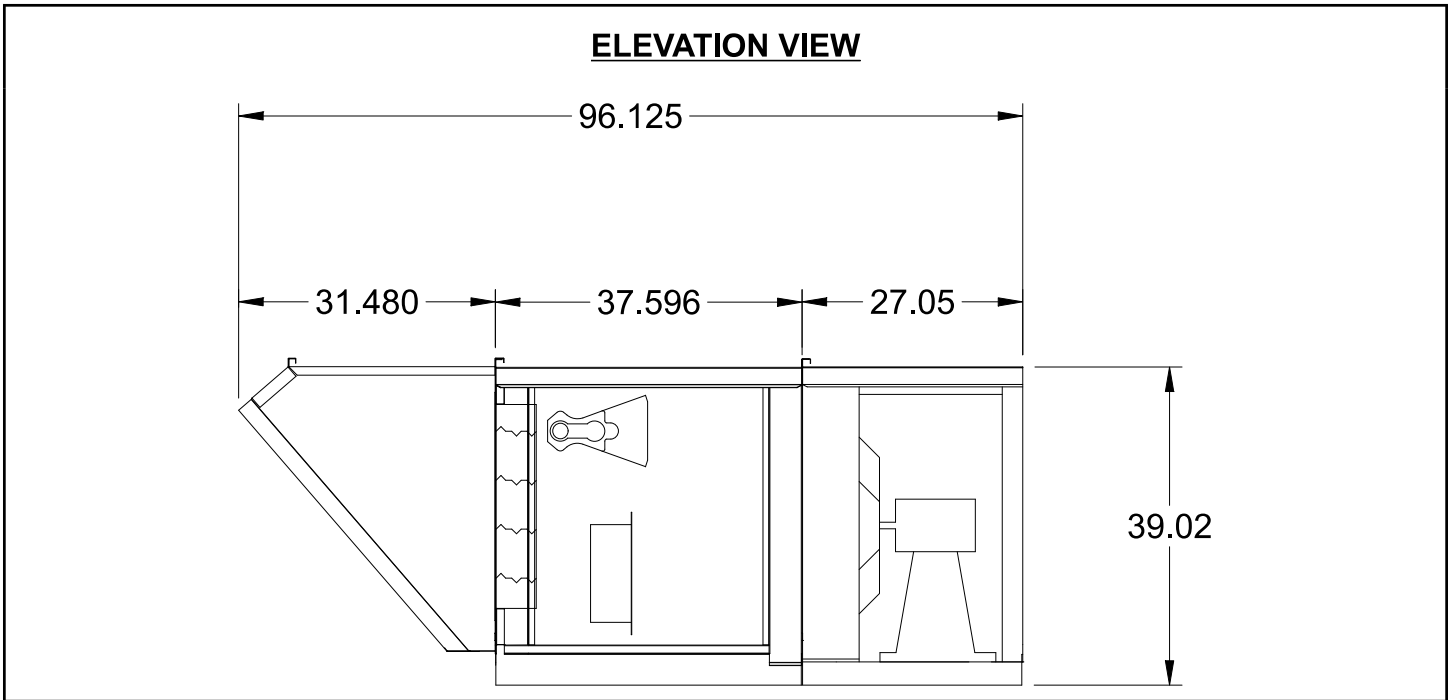
Gas Train Details							
Redundant Main Valves	Electronic Modulating Valve	Pilot Valve	Internal Regulator	Visual Indication Valve	Proof of Closure Valve	Gas Pressure Switch(es)	External Regulator
Std	Std	Std	Std	-	-	-	-

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





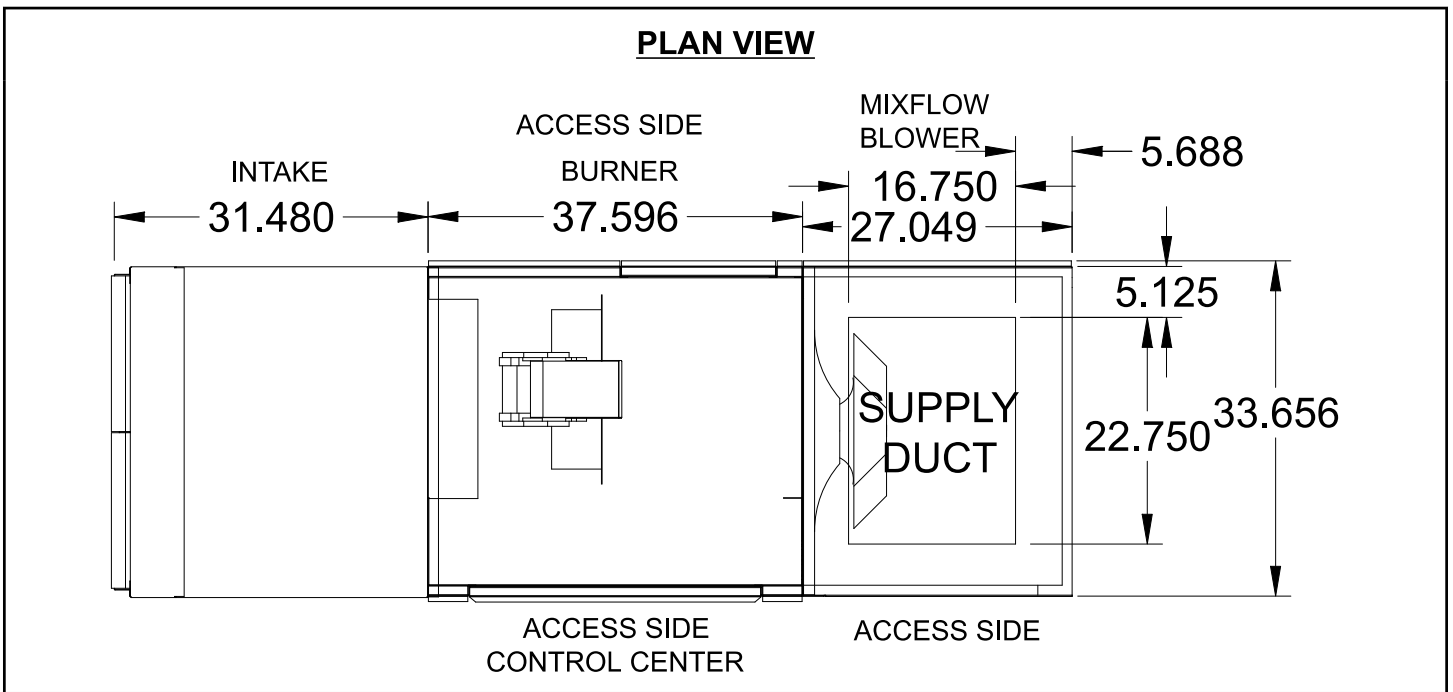
Notes - Elevation View

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.

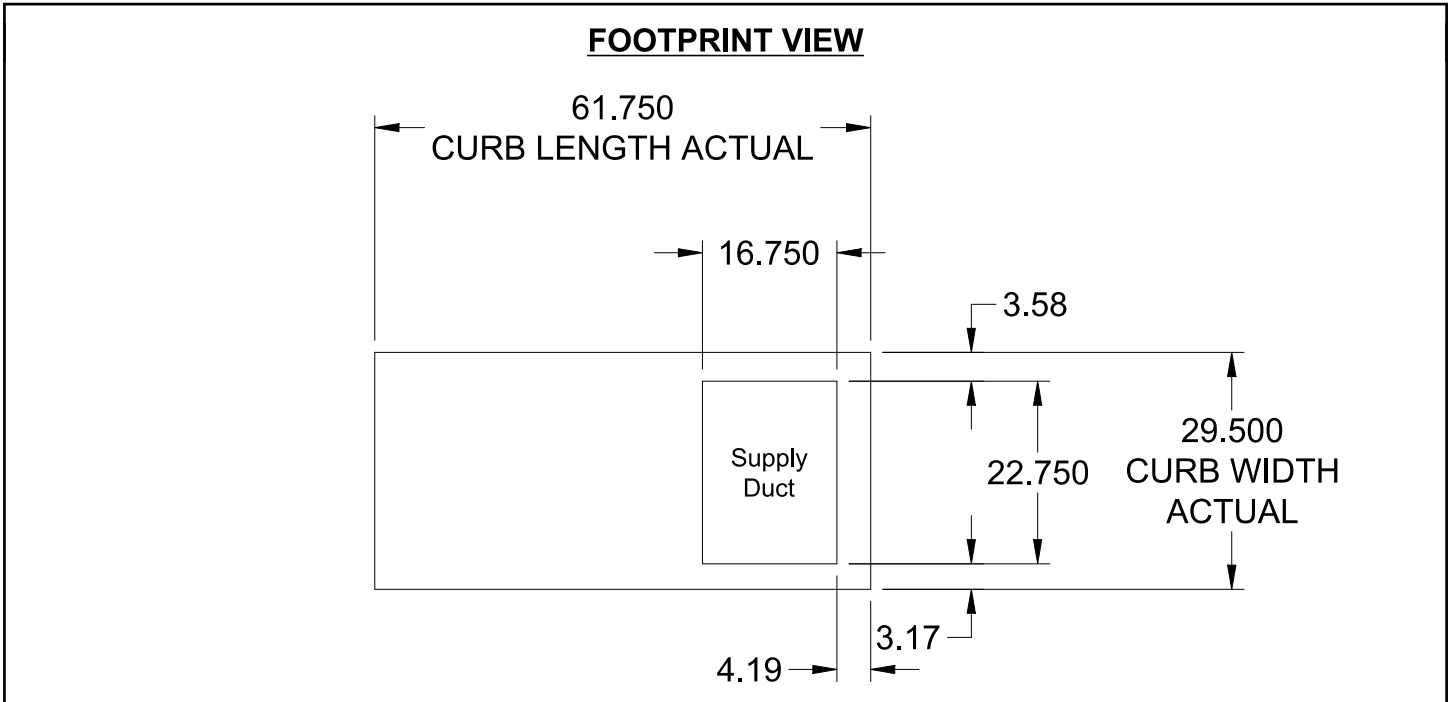
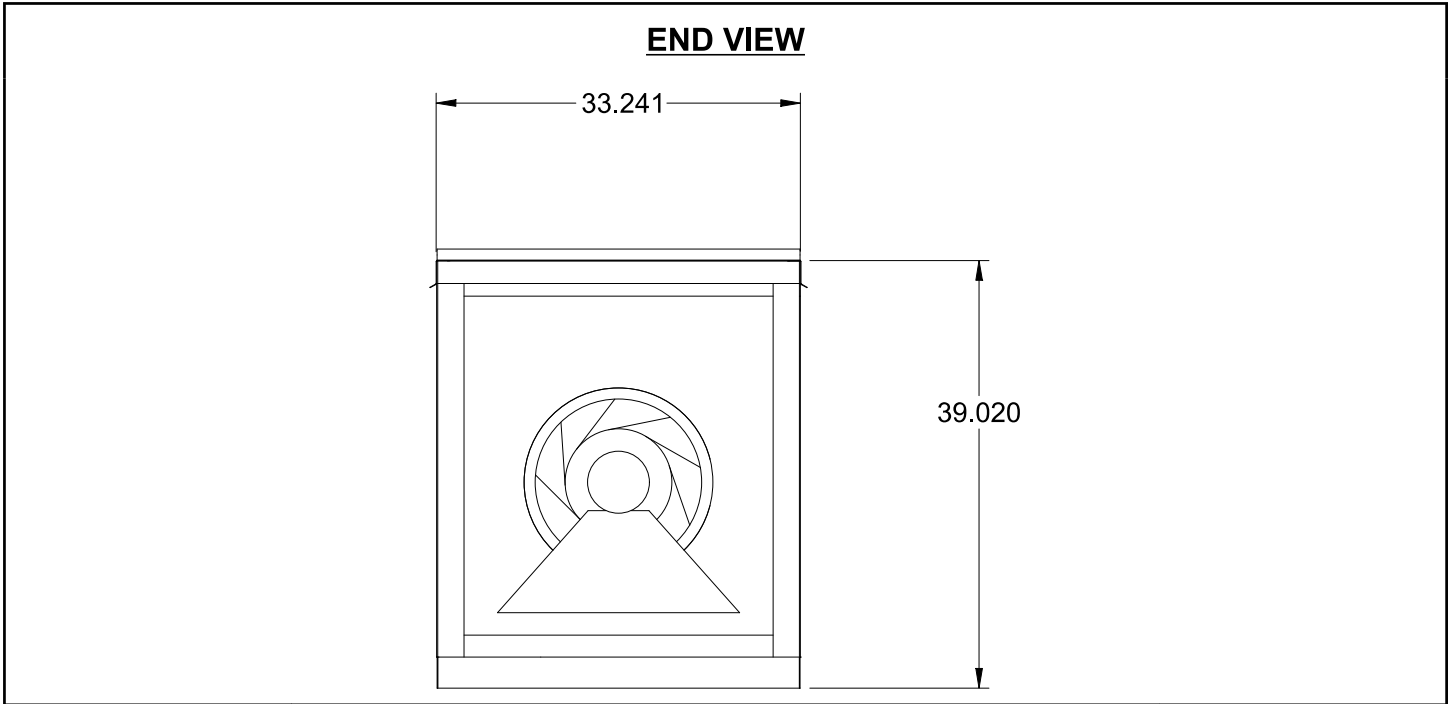
Sections included on this unit: Weatherhood Section, Heating Section, Blower Section

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.



Notes - Footprint View

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.

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

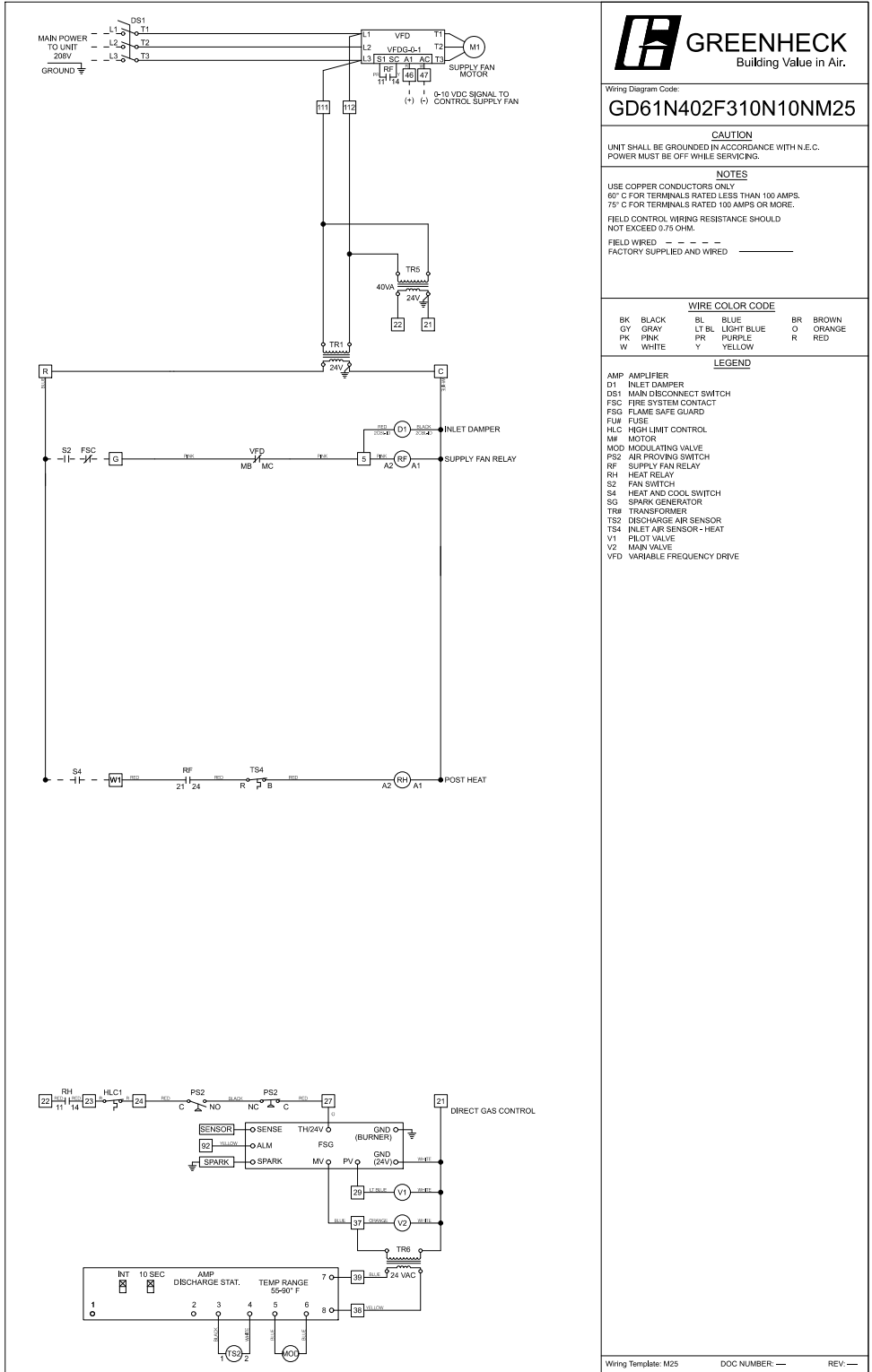
Recommended Minimum Combustible Clearances				
	Floor (in.)	Top (in.)	Sides (in.)	Ends (in.)
Insulated Units	0	0	0	0
Non-Insulated Units	0	6	6	6

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

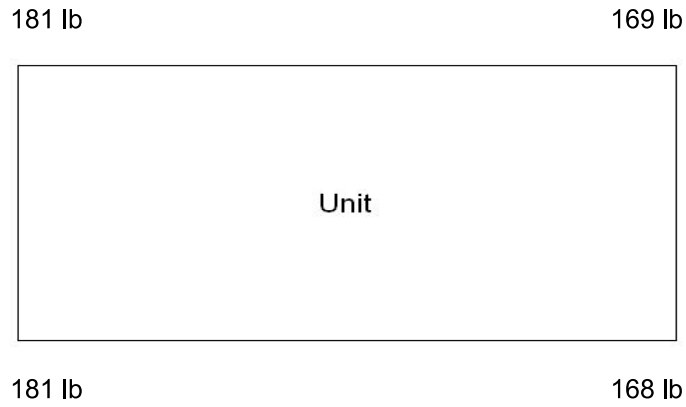
Notes - Service Clearances
 To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

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)
- Supply fan VFD speed signal – 0-10 VDC

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:

External 0-10 VDC Signal By Others:

The supply fan speed is modulated by an external 0-10 VDC signal (field provided and wired) landed to terminals in the unit control center (see unit wiring diagram for details).

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

Greenheck 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 Greenheck.

DG Burner Extended Warranty

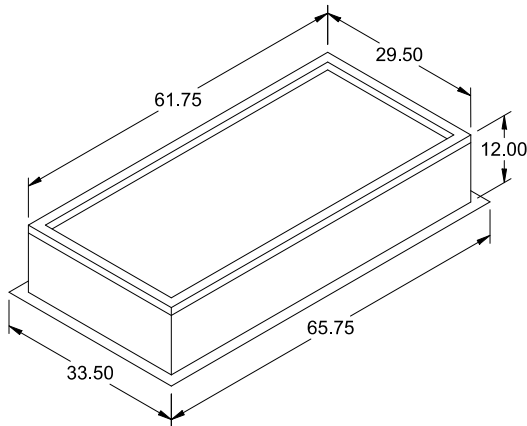
Greenheck warrants the direct-fired gas burner to be free from defects in material and workmanship for a period of 10 years from the shipment date. The warranty does not include items deemed as consumable components, including, but not limited to: Igniters, Spark rods, Spark generator, Flame rods, Flame 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 Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck 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, Greenheck reserves the right to change specifications without notice.



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in., as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPI-31 x 63.25	Nominal	1.5	57	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
12	31	63.25	29.5	61.75	65.75	65.75

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

GXEW Type 1, X-Tractor Filter Single Wall - Exhaust Only Wall Canopy

Model	Hood Length (in.)	Width (in.)	Bottom Width (in.)	Height (in.)		Exhaust Volume (CFM)	Exhaust SP (in. w.g.)	Double Island
				Front	Back			
GXEW	68	54	54	24	24	1275	0.58	No

Selected Options & Accessories:

Option or Accessory	Description
Mounting Height	80 in. off Finished Floor.
Integral Air Space	Factory Mounted on Back - 3" wide 20 lbs
Ceiling Enclosures	18 in. High on Left Front Right
Filter Type	Stainless Steel X-Tractor Filters 36 lbs
Backsplash Panel	80 in High 80 in Long 0 in Wide 89 lbs
Exhaust Air Balancing Baffle	Damper used to balance system with multiple collars.

Material: 430 SS Where Exposed
UL Listing: UL 710 w/out Exhaust Fire Damper

Features:
Performance Enhancing Lip (PEL)
Standing Seam Construction for Superior Strength
Stainless Steel Finish for Higher Corrosion Resistance

Hood End Conditions:
Back Wall - Limited Combustible

Section Data:

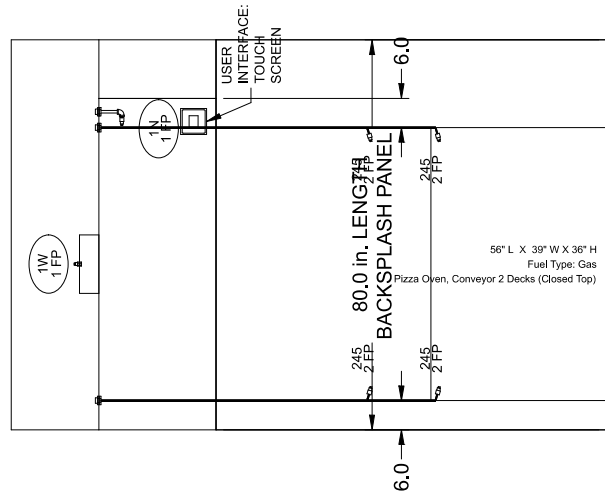
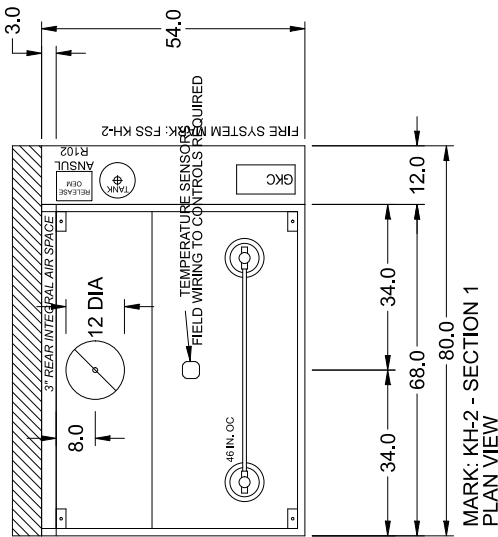
Length (in.)	Volume (CFM)	Exhaust Rate (CFM/FT)	SP (in. wg)	Filter Qty		Filter Ht. (in.)	Cooking Load	Light Qty	Light Type	Foot Candles	Drain Location	Hood Weight (LBS)
				16" W	20" W							
68	1275	225	0.58	3	1	20	Medium	2	Round LED	70.56	Left/Right	203.19

Exhaust Collar Data:

Collar Num.	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos Off Back (in.)	Velocity (fpm)	Mounting Option
1	12	34	8	1623	Factory Mounted Exhaust Collar(s)

Utility Cabinet Data:

Descripton	Length (in.)	Width (in.)	Height (in.)	Weight (lbs)
Right Utility Cabinet	54	12	24	138

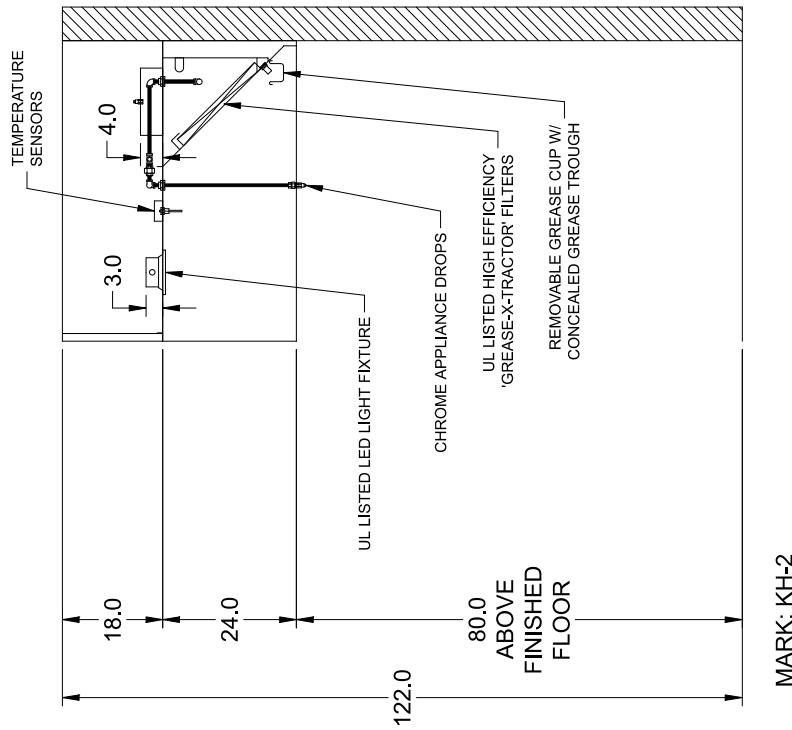


NOTE: All dimensions are in units of in.



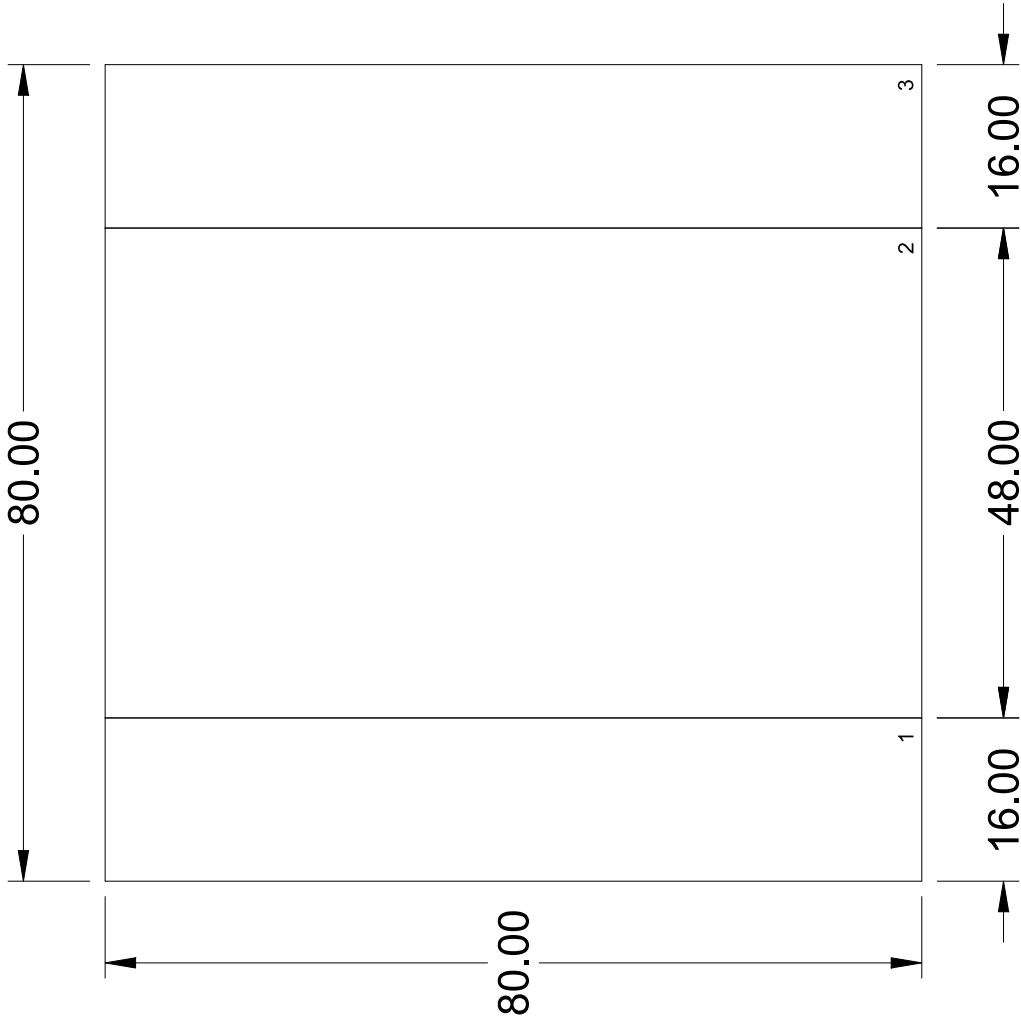
Hanger Bracket Locations			
Sec #	Brkt #	Distance Off Left (in)	Distance Off Front (in)
1	1	3.50	2.50
1	2	64.50	2.50
1	3	3.50	50.00
1	4	64.50	50.00

Bracket Mounting Position for 4 Bracket Hood	
3	4
1	2
BACK	
FRONT	



NOTE: All dimensions are in units of in.





BACK SPLASH - FLAT

NOTE: All dimensions are in units of in.



Ansul R-102 Wet Chemical Fire Suppression System

Scope:
Pre-Pipe With Parts and Factory Coordinated Installation

Hood Fire Suppression System

Detection Type	Mechanical
Coverage	Appliance Specific
Hood Mark(s) Connected	KH-2
Mounting Location	Utility cabinet on hood (see hood submittal for more visual detail)
System Size	3 Gallon
Flow Points	Maximum of 11 and 10 are utilized.

Options and Accessories for Hood Fire System Provided from Factory

OEM Regulated Release Assembly	QTY of 1
3 Gallon Tank Assembly	QTY of 1
Gas Valve	2", mechanical
Manual Pull Stations	QTY of 1
Microswitch	QTY of 1
Alarm Initiating Switch	QTY of 1
Metal Blow Off Caps	Included

Important Notes

- The manner in which the parts included in the scope of this fire system are supplied may vary. They could be shipped from the fire suppression manufacturer, shipped loose with the hood, connected directly to the hood, or supplied directly to the installing distributor.
- Must maintain 8 inch clearance between top of hood and pipe connections for installation (includes piping and workspace clearance).
- The amount of supply pipe that should not be exceeded per system is 32 ft., which includes all pipe used along the length the hood, between hoods, and the pipe needed to connect to the tanks where they are mounted.
- Pull station locations must be a minimum of 10 ft. and a maximum of 20 ft. from the hoods and in the path of egress. They also must be 40-48 in. from the finished floor.
- Systems are pre-piped for a specific appliance line-up. If appliance types and sizes differ from what is shown on the hood submittal, this may result in a field re-pipe which is outside the scope defined here.
- If the collars on the hood are shipped loose, the detection line will not be installed on the hood and the parts will ship loose.

Gas Valve

Quantity: 1
Ansul
Mechanical
2 in.

Labor Information:

Hook-up of detection line and supply line is included.
Surface mounting of the manual pull station in a pre-determined location is included.
Charging and arming of the system is included.
Permit Included
Hood Puff Test Fee Included
Travel Fee Included

Items which may be supplied by the factory, but are not installed or hooked-up by the factory OR the installing distributor:

Gas valve (not applicable for PCU)
Microswitch(es)
Remote mounted cabinets, enclosures, or tank brackets

Not included unless explicitly stated elsewhere in the quote as included:

Special, signed, or sealed drawings required to satisfy a state or local code
Parts or labor required to correct piping due to cooking equipment changes or deviation from approved drawings
More than two trips to the jobsite, special transportation, or overnight lodging requirement in remote areas. Typical travel distance is defined as the first 50 miles from the distributor's office
A shut-off device (e.g. shunt-trip breaker) for electric cooking equipment
All electrical connections required to shut down fan(s), electric cooking equipment, activate an alarm system, etc. aside from what is explicitly stated as "factory-wired" in the Accurex control's scope (if provided)
Installation of the gas shut-off valve
Pre-test
Full dump test or any other system test requirement outside of a standard puff test
Special classes or additional labor for access to security sensitive areas
Union labor, government labor, or prevailing wages required for field hook-up
Any dismantling or reassembly required where access to the fire suppression piping has been blocked
Plan examination fees
Rough-in conduit for remote pull station (for flush mounted pull station) or gas valve
Additional remote pull stations beyond the quantity specified in the submittals

Constant Volume

Greenheck 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:

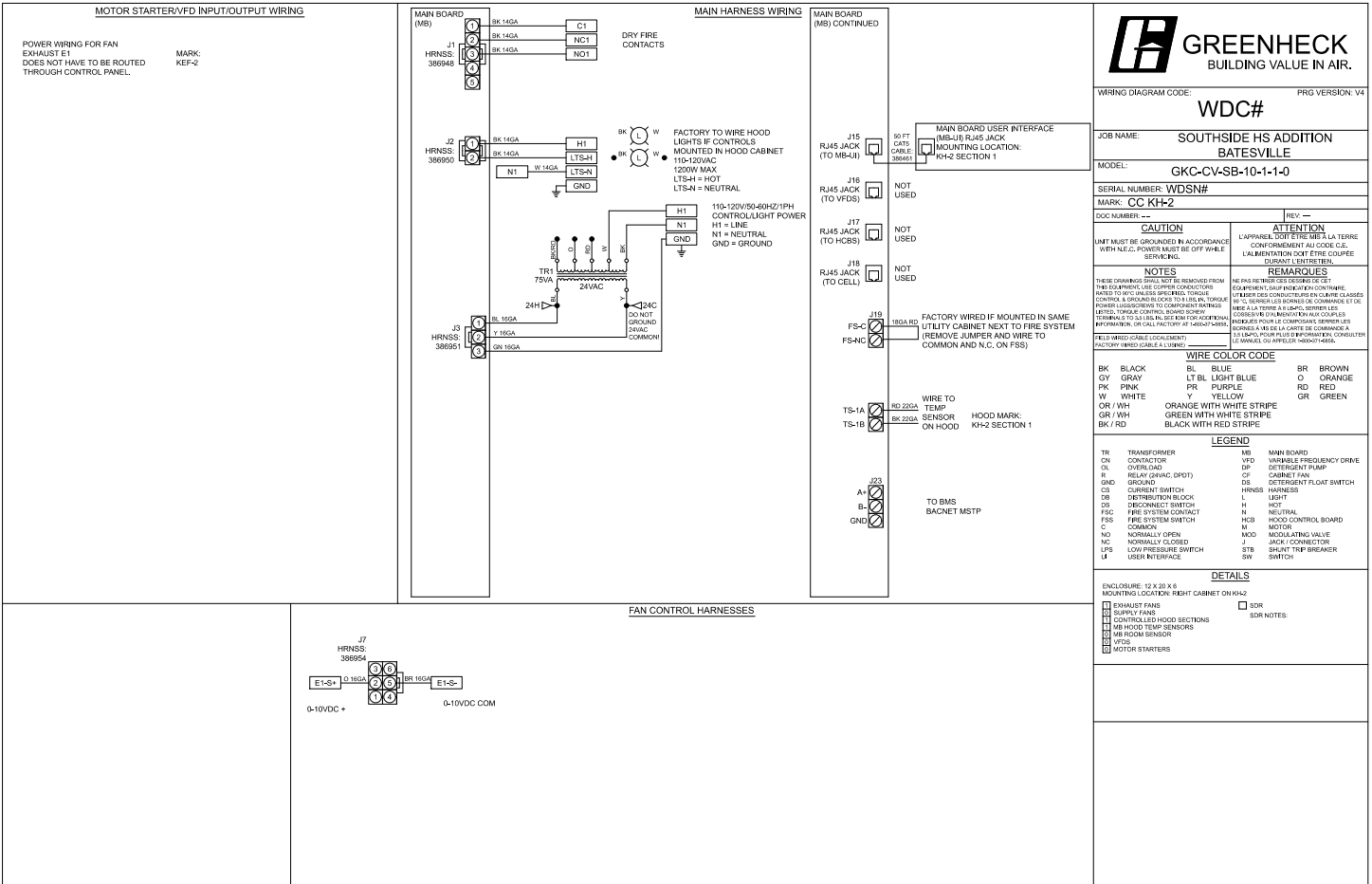
Mounting Option	Right Cabinet on KH-2
Exhaust Fan Quantity	1
Hood Light Control	Yes
User Interface	Full Color Touchscreen
Touchscreen Mounting Location	Face Mount Right Side of Hood - KH-2 Section 1
Exhaust During Fire	Exhaust fans will run at max speed when in fire mode
Building Management System	BMS Interface: BACnet MSTP
VFD for Balancing	Allows fan balancing from the control package

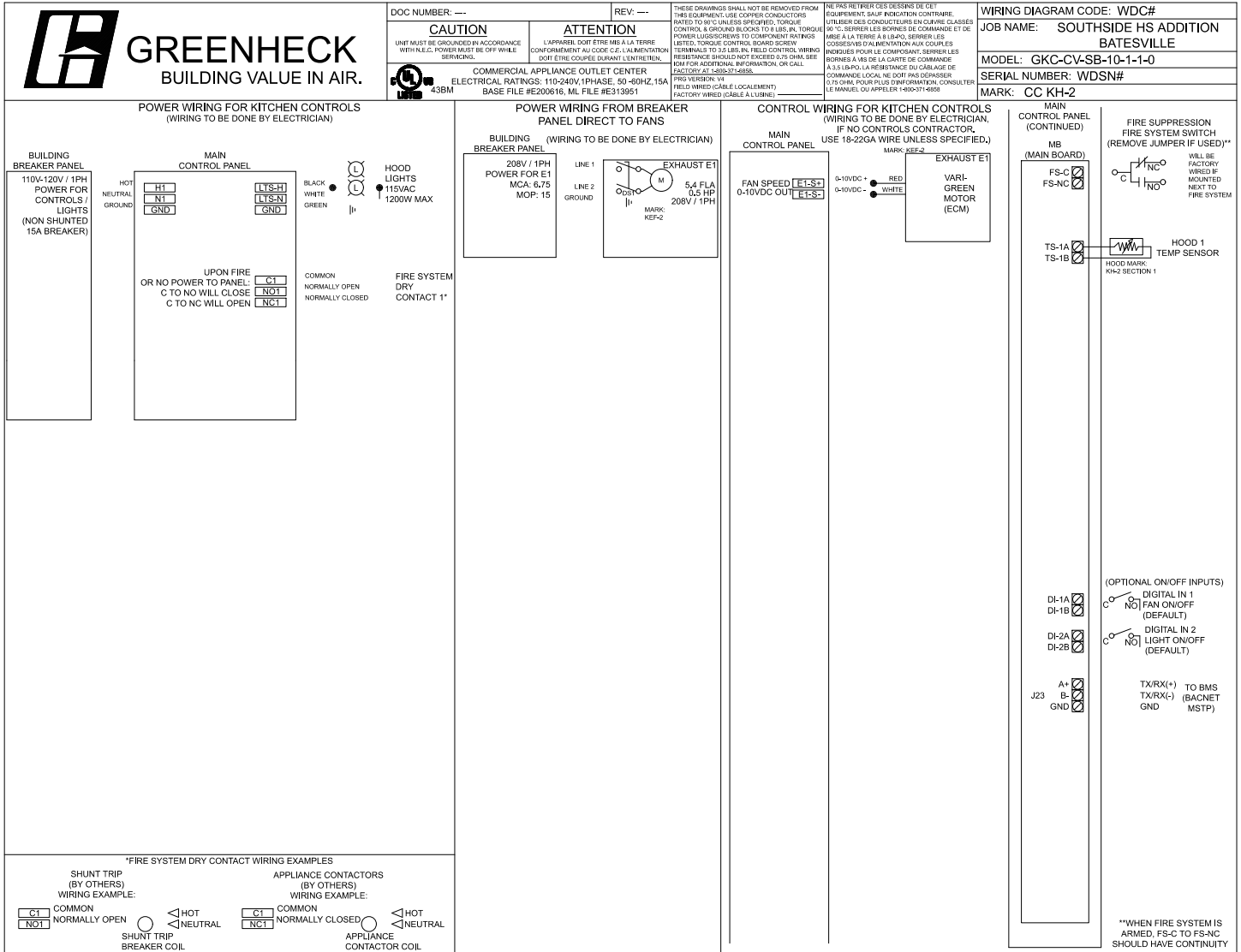
Controlled Fans:

Fan Mark	Fan Type	Supplied By	Phase	HP	Voltage	NEC FLA	Starter/VFD Required	Starter/VFD Provided
KEF-2	Exhaust	Manufacturer	1	0.5	208	5.4	No	No

Controlled Hood Sections and Fan Relationships:

KH-2 Section - Number of Sensors = 1	
	Exhaust Fan Name - KEF-2

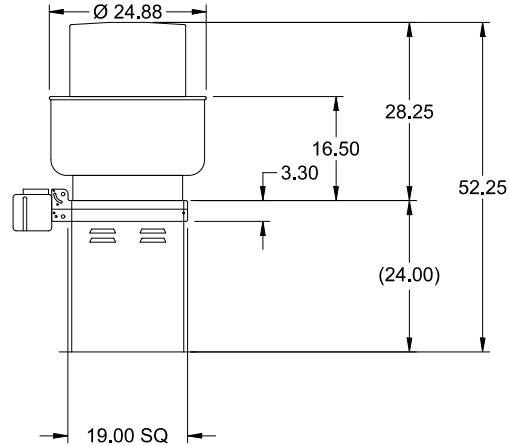




Model: CUE-120-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

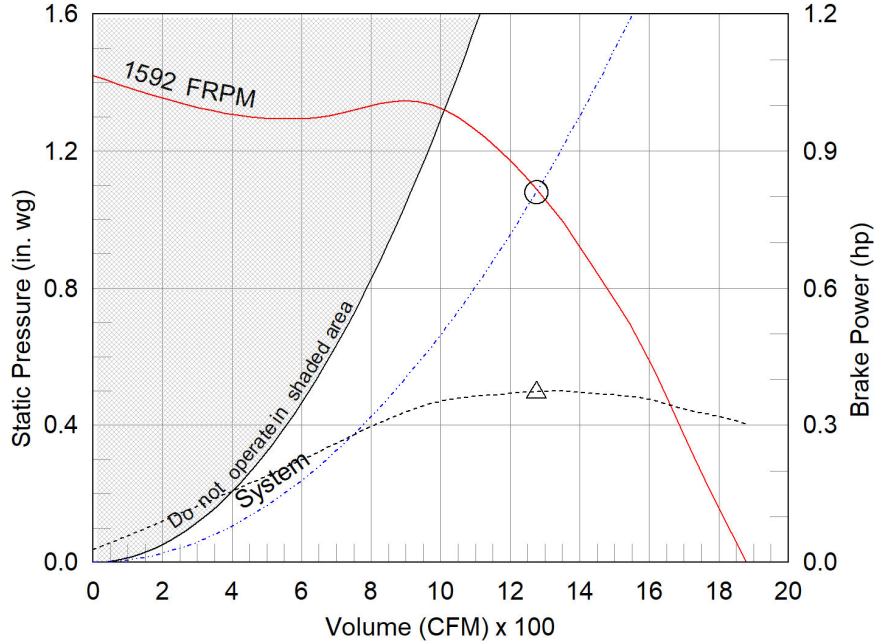
Previously: CUE-121-VG



Dimensional	
Quantity	1
Weight w/o Acc's (lb)	51
Weight w/ Acc's (lb)	71
Weight w/ Acc's and Curb (lb)	95
Standard Curb Cap Size (in.)	19 x 19
Roof Opening (in.)	15.5 x 15.5

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

Performance	
Requested Volume (CFM)	1,275
Actual Volume (CFM)	1,275
Total External SP (in. wg)	1.08
Fan RPM	1592
Operating Power (hp)	0.37
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	5,443
Static Eff. (%)	58



Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	996

Motor	
Motor Mounted	Yes
Size (hp)	1/2
Voltage/Cycle/Phase	208/60/1
Enclosure	ODP
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	3.8
Min. Circuit Ampacity (MCA)	5
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	80	80	86	71	67	66	60	52	79	67	15.7



Model: CUE-120-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Standard Curb Cap Size - 19 Square
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918379), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Trap (PN 475538)
Birdscreen: Stainless Steel, nom. 86% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPFV-19-G24

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.

Vari-Green Motor & Control Options

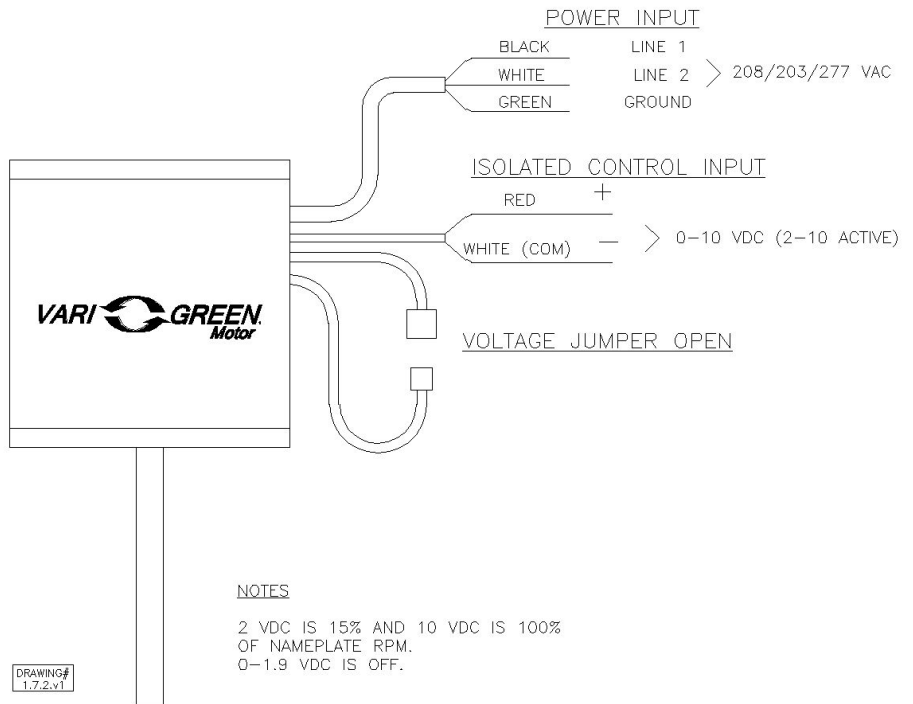
An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

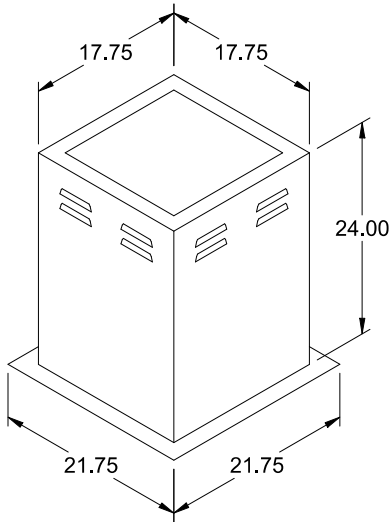
Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

Control Type: By Others
Transformer: None





Model: GPFV

Vented Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - Includes louvered vents to vent heat - 2 in. or 5 in. mounting flange - Height - Designed to provide required 40 in. minimum discharge height above roof line per NFPA 96 Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Trays are not available

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPFV-19	Nominal	1.25	24	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
24	19	19	17.75	17.75	14.25	14.25	21.75	21.75	18	18

*May not be applicable

Accessories

Material
Galvanized

GXEW Type 1, X-Tractor Filter Single Wall - Exhaust Only Wall Canopy

Model	Hood Length (in.)	Width (in.)	Bottom Width (in.)	Height (in.)		Exhaust Volume (CFM)	Exhaust SP (in. w.g.)	Double Island
				Front	Back			
GXEW	120	54	54	24	24	2250	0.575	No

Selected Options & Accessories:

Option or Accessory	Description
Mounting Height	80 in. off Finished Floor.
Integral Air Space	Factory Mounted on Back - 3" wide 33 lbs
Ceiling Enclosures	8 in. High on Left Front Right
Filter Type	Stainless Steel X-Tractor Filters 63 lbs
Backsplash Panel	80 in High 132 in Long 0 in Wide 147 lbs
Exhaust Air Balancing Baffle	Damper used to balance system with multiple collars.

Material: 430 SS Where Exposed
UL Listing: UL 710 w/out Exhaust Fire Damper

Features:
 Performance Enhancing Lip (PEL)
 Standing Seam Construction for Superior Strength
 Stainless Steel Finish for Higher Corrosion Resistance

Hood End Conditions:
 Back Wall - Limited Combustible

Section Data:

Length (in.)	Volume (CFM)	Exhaust Rate (CFM/FT)	SP (in. wg)	Filter Qty		Filter Ht. (in.)	Cooking Load	Light Qty	Light Type	Foot Candles	Drain Location	Hood Weight (LBS)
				16" W	20" W							
120	2250	225	0.575	0	6	20	Heavy	2	Round LED	61.06	Left/Right	322.58

Exhaust Collar Data:

Collar Num.	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos Off Back (in.)	Velocity (fpm)	Mounting Option
1	16	60	8	1611	Factory Mounted Exhaust Collar(s)

External Supply Plenum Data:

Supply: 1800 CFM MUA: 1800 CFM AC: 0 CFM

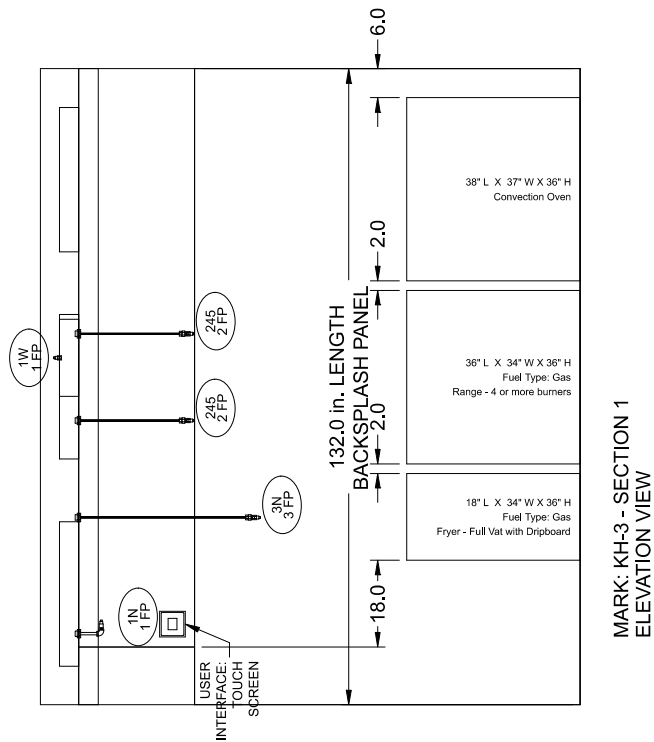
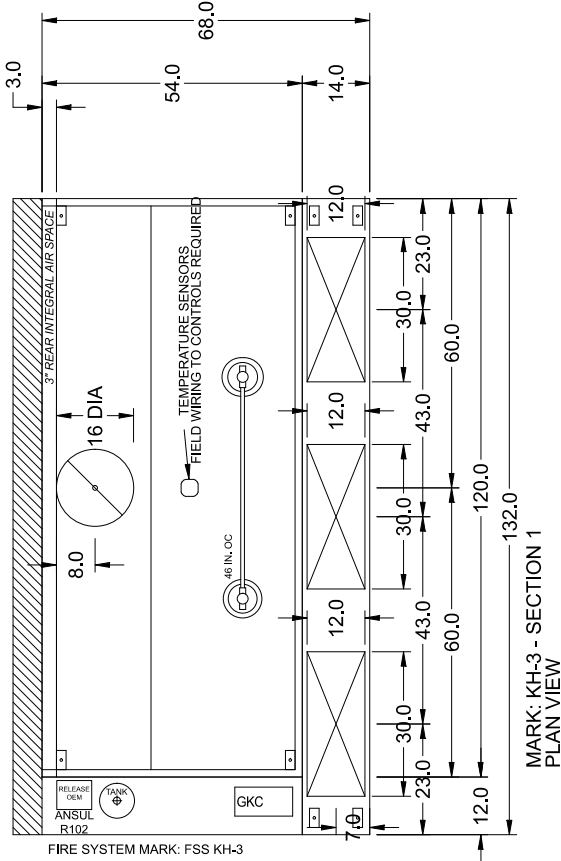
Plenum Num.	Side	Type	Length (in.)	Width (in.)	Height (in.)	Volume (CFM)	Weight (lbs)	SP (in. wg)	Insulated	MBD	LED Lights
1	Front	Air Curtain Supply (ASP)	132	14	4	1800	72	0.01	No	Yes	No

External Supply Collar Data:

Section Num.	Plenum Num.	Side	Collar Num.	Collar Shape	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos. Off Front (in.)	Velocity (fpm)	Mounting Option
1	1	Front	1	rectangular	30 x 12	23	7	240	Factory Mounted Supply Collar(s)
1	1	Front	2	rectangular	30 x 12	66	7	240	Factory Mounted Supply Collar(s)
1	1	Front	3	rectangular	30 x 12	109	7	240	Factory Mounted Supply Collar(s)

Utility Cabinet Data:

Descripton	Length (in.)	Width (in.)	Height (in.)	Weight (lbs)
Left Utility Cabinet	54	12	24	138

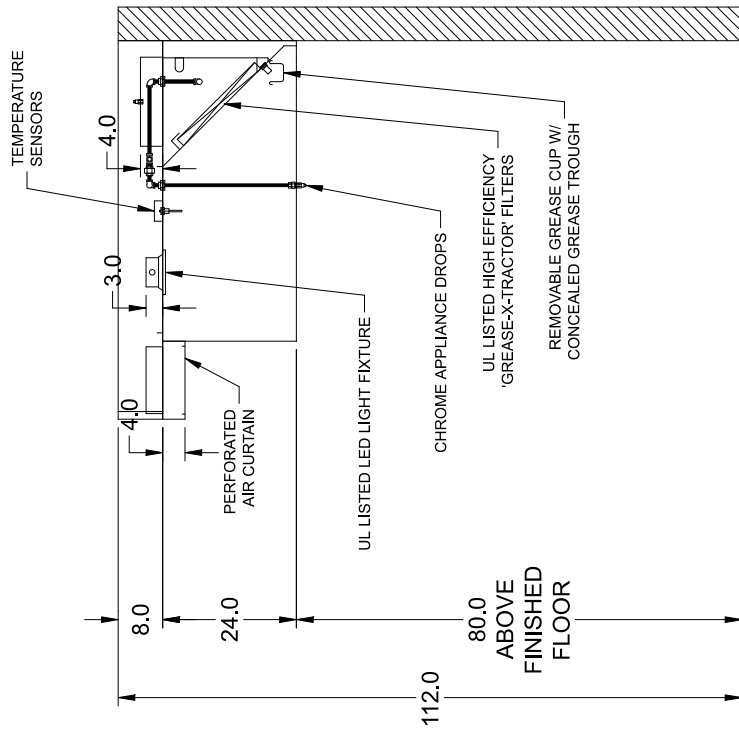


NOTE: All dimensions are in units of in.



Hanger Bracket Locations			
Sec #	Brkt #	Distance Off Left (in)	Distance Off Front (in)
1	1	3.50	2.50
1	2	116.50	2.50
1	3	3.50	50.00
1	4	116.50	50.00

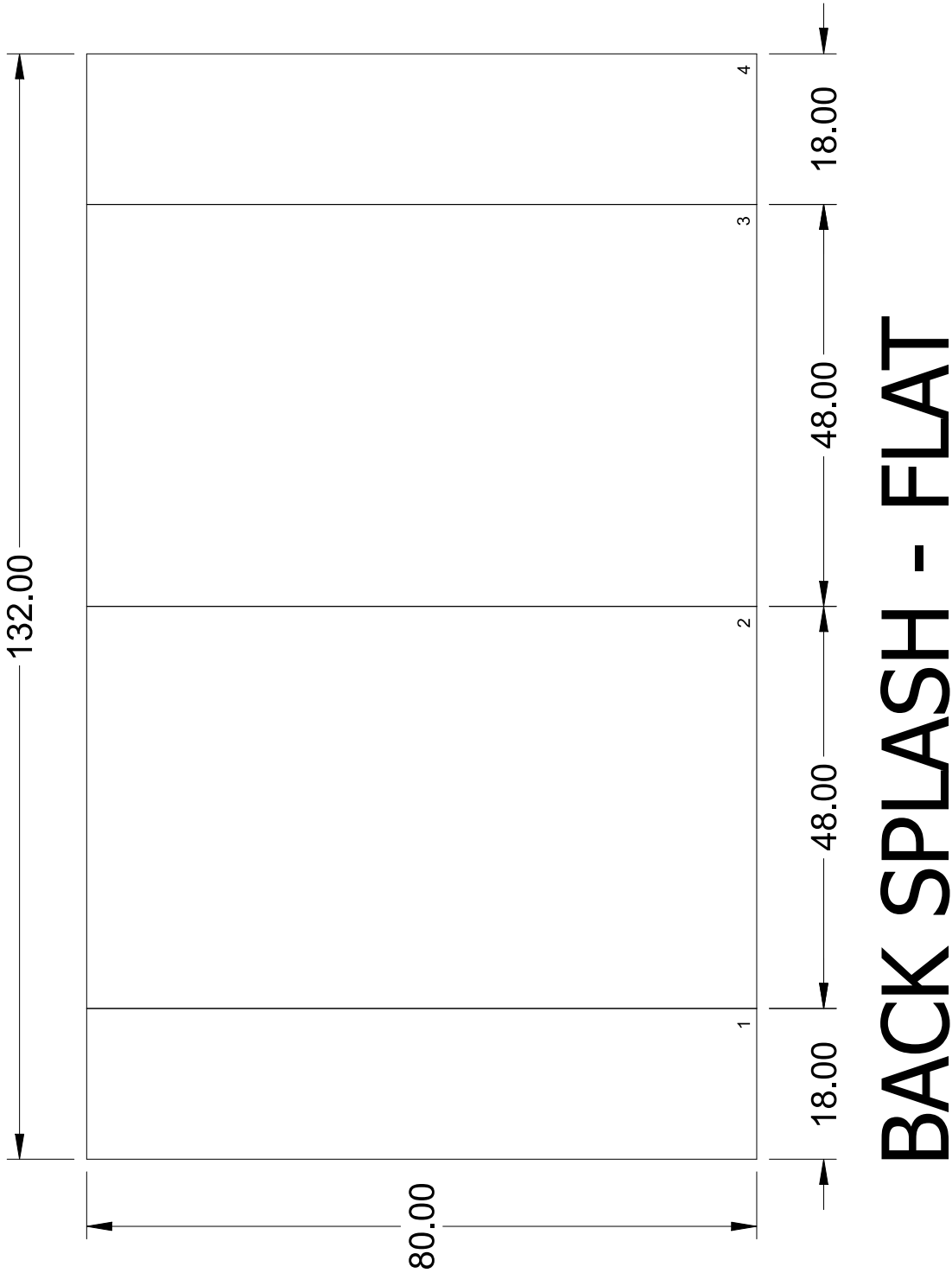
Bracket Mounting Position for 4 Bracket Hood	
3	4
1	2
	BACK
	FRONT



MARK: KH-3

NOTE: All dimensions are in units of in.





NOTE: All dimensions are in units of in.



Ansul R-102 Wet Chemical Fire Suppression System

Scope:
Pre-Pipe With Parts and Factory Coordinated Installation

Hood Fire Suppression System

Detection Type	Mechanical
Coverage	Appliance Specific
Hood Mark(s) Connected	KH-3
Mounting Location	Utility cabinet on hood (see hood submittal for more visual detail)
System Size	3 Gallon
Flow Points	Maximum of 11 and 9 are utilized.

Options and Accessories for Hood Fire System Provided from Factory

OEM Regulated Release Assembly	QTY of 1
3 Gallon Tank Assembly	QTY of 1
Gas Valve	2", mechanical
Manual Pull Stations	QTY of 1
Microswitch	QTY of 1
Alarm Initiating Switch	QTY of 1
Metal Blow Off Caps	Included

Important Notes

- The manner in which the parts included in the scope of this fire system are supplied may vary. They could be shipped from the fire suppression manufacturer, shipped loose with the hood, connected directly to the hood, or supplied directly to the installing distributor.
- Must maintain 8 inch clearance between top of hood and pipe connections for installation (includes piping and workspace clearance).
- The amount of supply pipe that should not be exceeded per system is 32 ft., which includes all pipe used along the length the hood, between hoods, and the pipe needed to connect to the tanks where they are mounted.
- Pull station locations must be a minimum of 10 ft. and a maximum of 20 ft. from the hoods and in the path of egress. They also must be 40-48 in. from the finished floor.
- Systems are pre-piped for a specific appliance line-up. If appliance types and sizes differ from what is shown on the hood submittal, this may result in a field re-pipe which is outside the scope defined here.
- If the collars on the hood are shipped loose, the detection line will not be installed on the hood and the parts will ship loose.

Gas Valve

Quantity: 1
Ansul
Mechanical
2 in.

Labor Information:

Hook-up of detection line and supply line is included.
Surface mounting of the manual pull station in a pre-determined location is included.
Charging and arming of the system is included.
Permit Included
Hood Puff Test Fee Included
Travel Fee Included

Items which may be supplied by the factory, but are not installed or hooked-up by the factory OR the installing distributor:

Gas valve (not applicable for PCU)
Microswitch(es)
Remote mounted cabinets, enclosures, or tank brackets

Not included unless explicitly stated elsewhere in the quote as included:

Special, signed, or sealed drawings required to satisfy a state or local code
Parts or labor required to correct piping due to cooking equipment changes or deviation from approved drawings
More than two trips to the jobsite, special transportation, or overnight lodging requirement in remote areas. Typical travel distance is defined as the first 50 miles from the distributor's office
A shut-off device (e.g. shunt-trip breaker) for electric cooking equipment
All electrical connections required to shut down fan(s), electric cooking equipment, activate an alarm system, etc. aside from what is explicitly stated as "factory-wired" in the Accurex control's scope (if provided)
Installation of the gas shut-off valve
Pre-test
Full dump test or any other system test requirement outside of a standard puff test
Special classes or additional labor for access to security sensitive areas
Union labor, government labor, or prevailing wages required for field hook-up
Any dismantling or reassembly required where access to the fire suppression piping has been blocked
Plan examination fees
Rough-in conduit for remote pull station (for flush mounted pull station) or gas valve
Additional remote pull stations beyond the quantity specified in the submittals

Variable Volume

Greenheck Kitchen Controls

Standard Construction Features:

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

Options & Accessories:

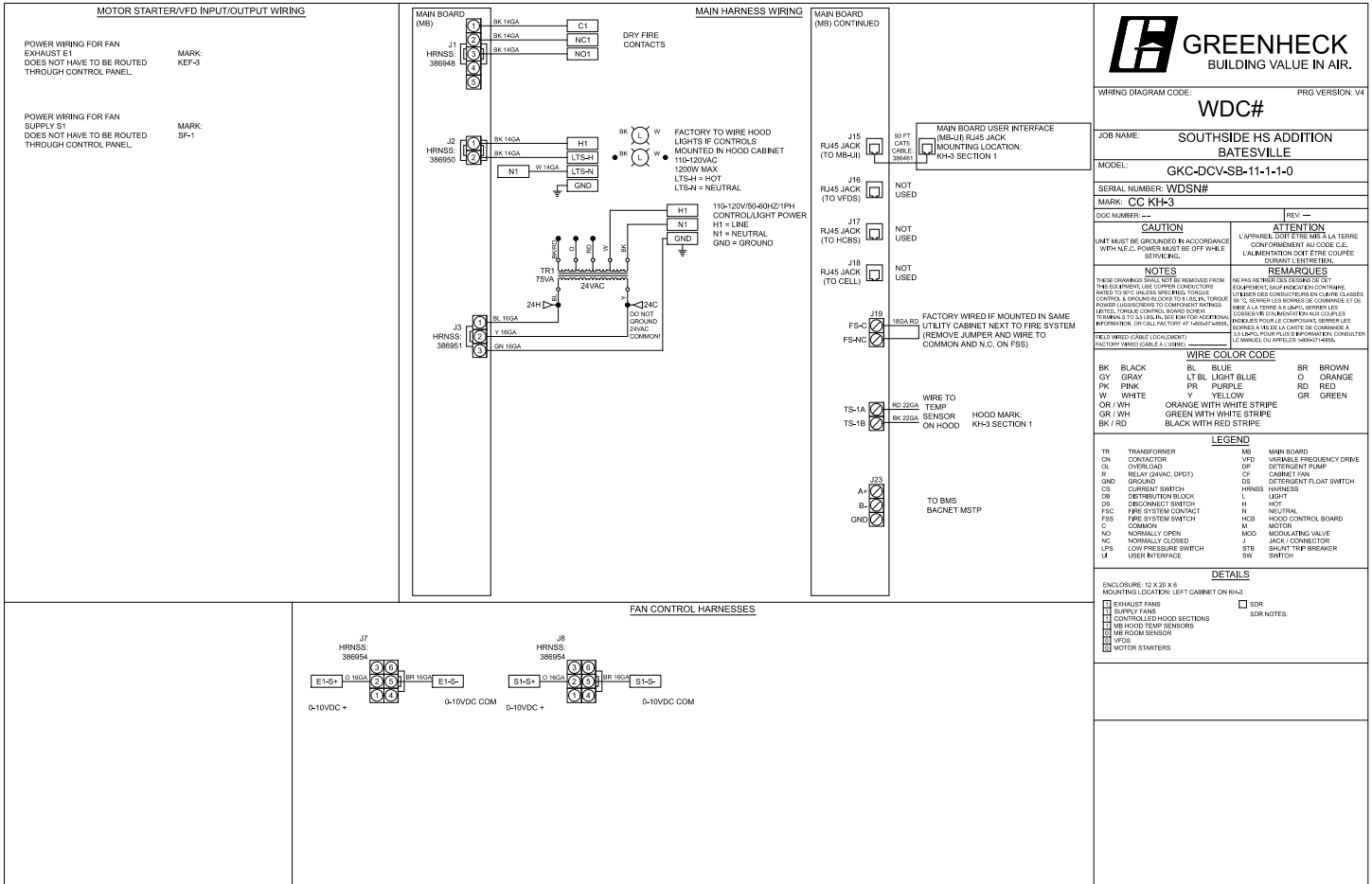
Mounting Option	Left Cabinet on KH-3
Exhaust Fan Quantity	1
Supply Fan Quantity	1
Hood Light Control	Yes
User Interface	Full Color Touchscreen
Touchscreen Mounting Location	Face Mount Left Side of Hood - KH-3 Section 1
Exhaust During Fire	Exhaust fans will run at max speed when in fire mode
Building Management System	BMS Interface: BACnet MSTP

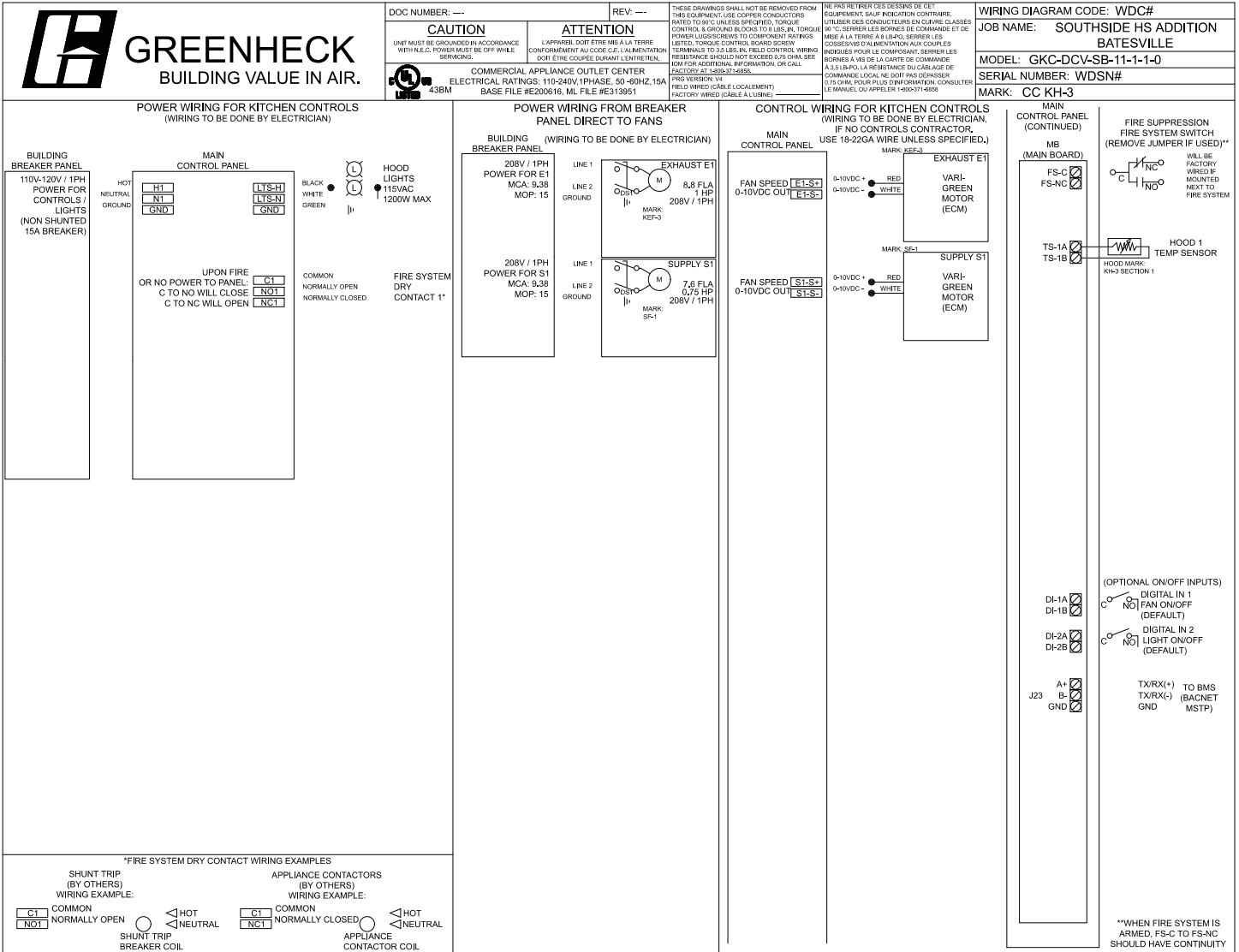
Controlled Fans:

Fan Mark	Fan Type	Supplied By	Phase	HP	Voltage	NEC FLA	Starter/VFD Required	Starter/VFD Provided
KEF-3	Exhaust	Manufacturer	1	1	208	8.8	No	No
SF-1	Supply	Manufacturer	1	0.75	208	7.6	No	No

Controlled Hood Sections and Fan Relationships:

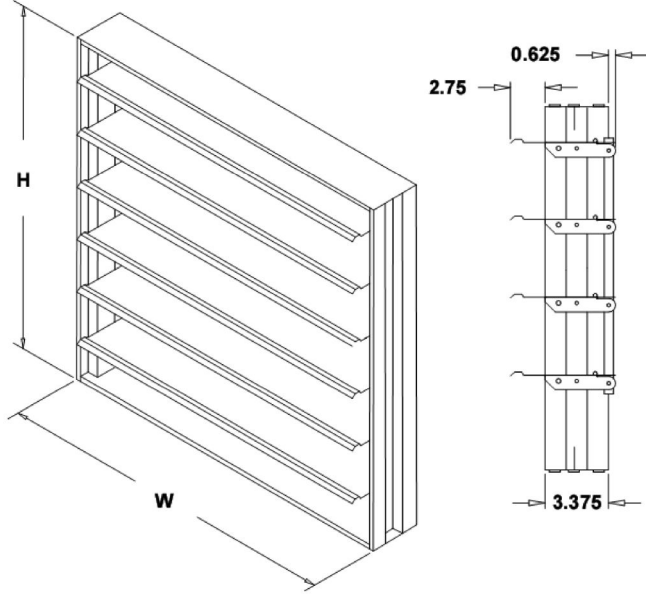
KH-3 Section - Number of Sensors = 1	
Exhaust Fan Name -	KEF-3
Supply Fan Name -	SF-1





Vertical Mount Exhaust Damper

Model: WD-330



Standard Construction Features:

- Model WD-330 is a vertical mount exhaust damper and is constructed of galvanized steel with pre-punched mounting holes - Damper blades are 0.025 in. roll formed aluminum with vinyl seals on the closing edge - Steel axles are 0.188 in. diameter zinc plated steel - Nylon type bushings

Damper Configuration:

ID #:	Tag:	Quantity:	W (in.):	H (in.):	Act Qty:	Actuator Model:
66	SF-1	1	23	23	1	MP-310

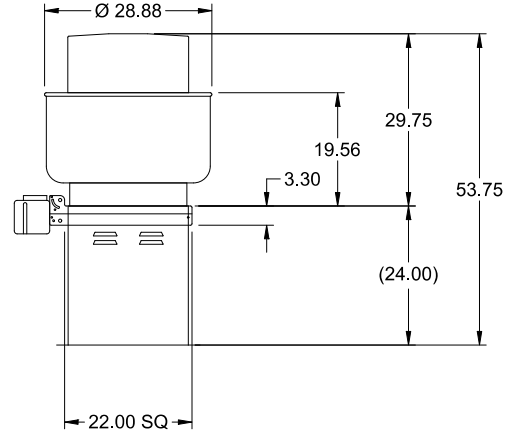
Notes: All dimensions shown are in units of in.
Width And height furnished approximately 0.125 in. undersize

Model: CUE-140-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Previously: CUE-141-VG

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	73
Weight w/ Acc's (lb)	95
Weight w/ Acc's and Curb (lb)	124
Standard Curb Cap Size (in.)	22 x 22
Roof Opening (in.)	18.5 x 18.5

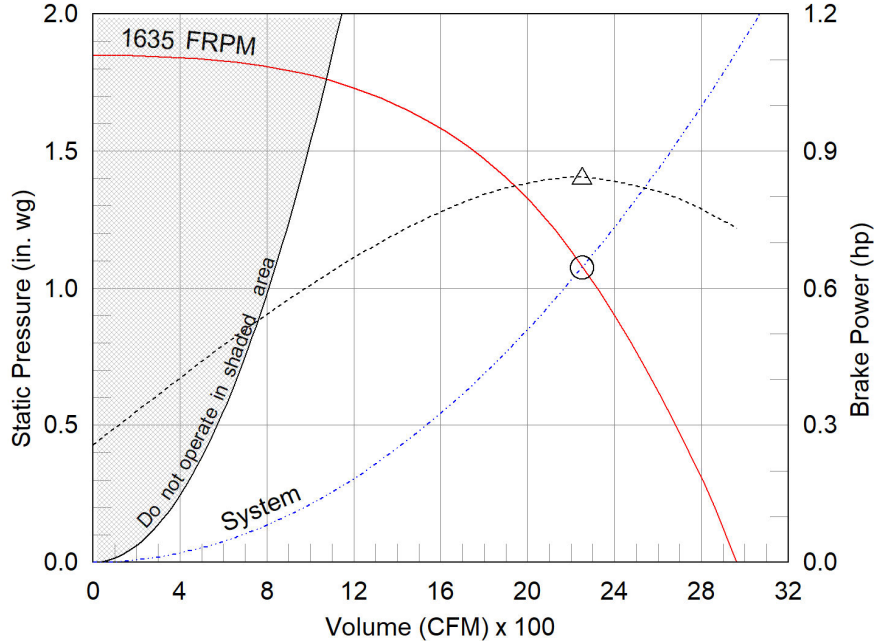


OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

Performance	
Requested Volume (CFM)	2,250
Actual Volume (CFM)	2,250
Total External SP (in. wg)	1.075
Fan RPM	1635
Operating Power (hp)	0.84
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	6,259
Static Eff. (%)	45

Misc Fan Data	
Fan Eff. Index (FEI)	1.31
Outlet Velocity (ft/min)	1,308

Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	208/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	7
Min. Circuit Ampacity (MCA)	9
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	71	66	82	77	67	54	61	57	77	66	12.9



Model: CUE-140-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Standard Curb Cap Size - 22 Square
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, Factory Installed
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Trap (PN 475538)
Birdscreen: Stainless Steel, nom. 85% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPFV-22-G24

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.

Vari-Green Motor & Control Options

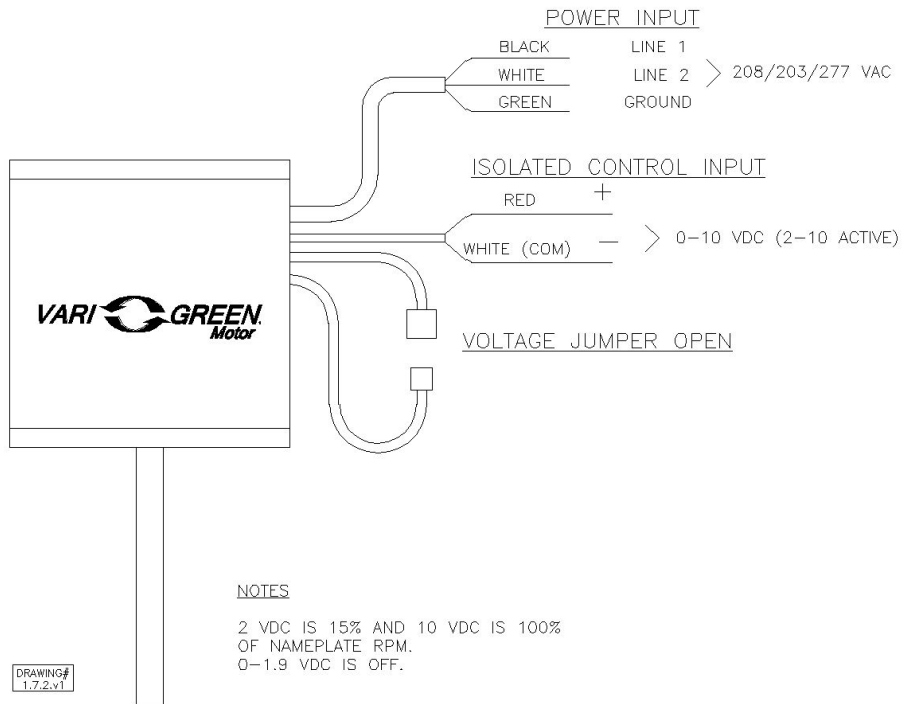
An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

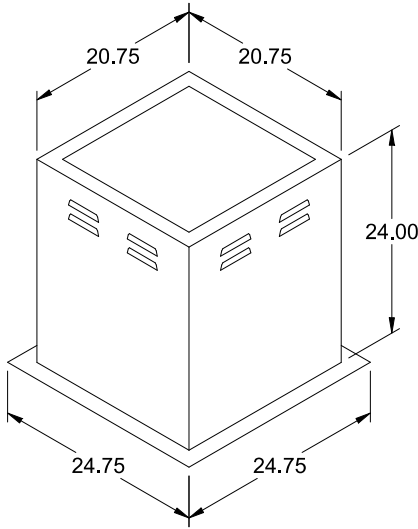
Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

Control Type: By Others
Transformer: None





Model: GPFV

Vented Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - Includes louvered vents to vent heat - 2 in. or 5 in. mounting flange - Height - Designed to provide required 40 in. minimum discharge height above roof line per NFPA 96 Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Trays are not available

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPFV-22	Nominal	1.25	29	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
24	22	22	20.75	20.75	17.25	17.25	24.75	24.75	21	21

*May not be applicable

Accessories

Material
Galvanized

Model: SQ-160-VG

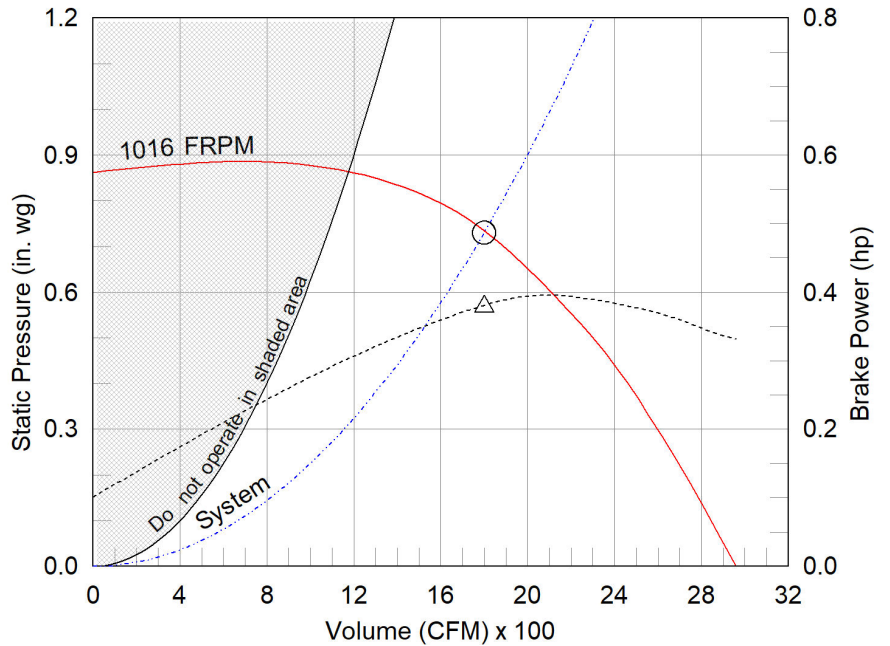
Direct Drive Centrifugal Inline Fan

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	134
Weight w/ Acc's (lb)	254
Optional Damper (in.)	23 x 23

Performance	
Requested Volume (CFM)	1,800
Actual Volume (CFM)	1,800
Total External SP (in. wg)	0.73
Fan RPM	1016
Operating Power (hp)	0.38
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	4,454
Static Eff. (%)	55

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	501

Motor	
Motor Mounted	Yes
Size (hp)	3/4
Voltage/Cycle/Phase	208/60/1
Enclosure	ODP
Motor RPM	1140
Windings	1
FLA (Amps)	5.4
Min. Circuit Ampacity (MCA)	7
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



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

Static Pressure Calculations

External SP	0.62 in. wg
Filters	0.11 in. wg
Total External SP	0.73 in. wg

Nameplate Model: SQ-160-VG

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	68	71	69	70	62	59	54	50	70	58	8.7
Radiated	71	72	65	64	54	44	36	34	64	52	5.7

Notes:

All dimensions shown are in units of in.
 *Please consult factory for actual motor amp draw
 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



Model: SQ-160-VG

Direct Drive Centrifugal Inline Fan

Standard Construction Features:

- Galvanized steel housing - Backward inclined composite (sizes 60-95) or aluminum (sizes 97-160) wheel - Two bolted access panels - Integral duct connection flanges - Ball bearing motors (sizes 97-160 and all vari-green motors), sleeve bearing motors (sizes 60-95) - 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 - "Power Ventilators"

Junction Box Mounted and Wired

Switch, NEMA-1, Toggle, Shipped Separate

Aluminum Wheel Material

Sloped Filter Box, 2 in. Pleated (MERV 8) Filters

Fan: Spring, Hanging, 1 Inch Isolator PN: 850344, Incl. 4 isolators and 4 brackets

Filter Box: Spring, Hanging, 1 Inch Isolator PN: 850343, Incl. 4 isolators and 4 brackets

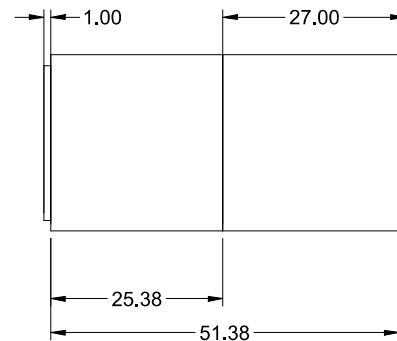
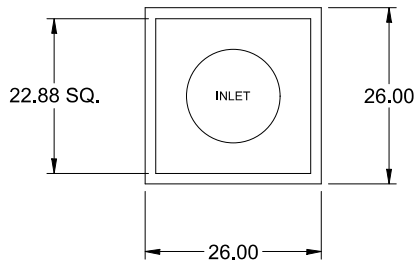
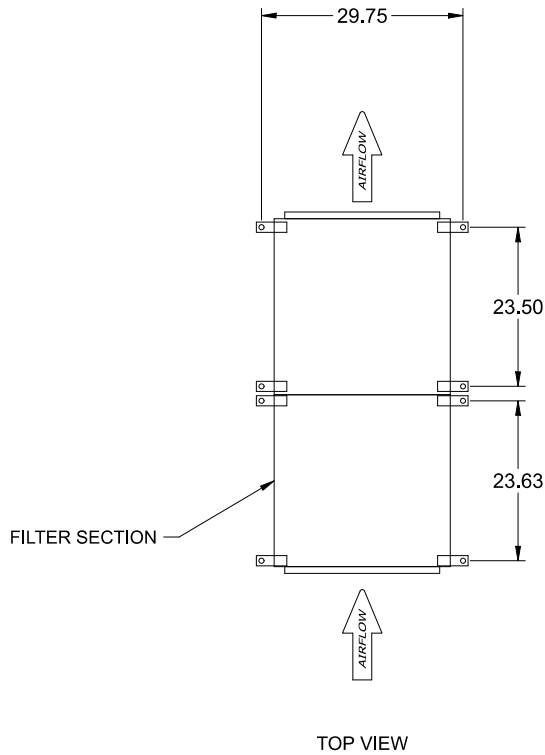
Unit Warranty: 1 Yr (Standard)

Damper Shipped Loose, Inline, WD-330-PB-23X23, Not Coated

Damper Actuator (MP-310), 24 VAC Actuated

SQ-160-VG

Direct Drive Centrifugal Inline Fan



Notes: All dimensions shown are in units of in.

Vari-Green

Motor & Control Options

An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

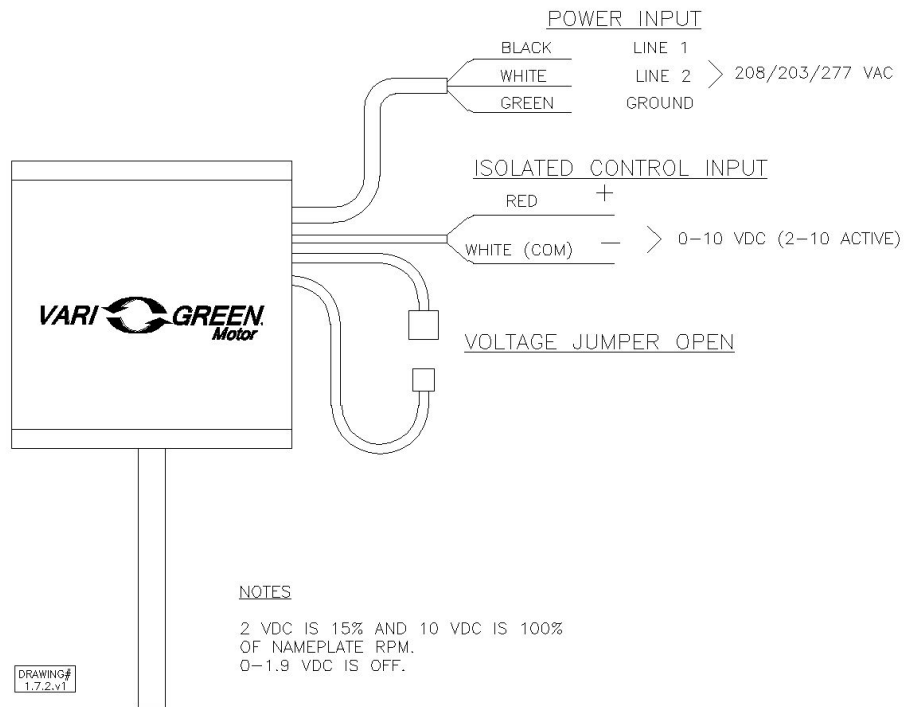
Motor Configuration

Input Voltage: 208
Speed Reference: 0-10VDC
Permanent Dial: No
Balance Dial Included: N/A

Control Configuration

Control Type: By Others
Transformer: None

Vari-Green



GXEW Type 1, X-Tractor Filter Single Wall - Exhaust Only Wall Canopy

Model	Hood Length (in.)	Width (in.)	Bottom Width (in.)	Height (in.)		Exhaust Volume (CFM)	Exhaust SP (in. w.g.)	Double Island
				Front	Back			
GXEW	164	54	54	24	24	3075	0.846	No

Selected Options & Accessories:

Option or Accessory	Description
Mounting Height	80 in. off Finished Floor.
Integral Air Space	Factory Mounted on Back - 3" wide 41 lbs
Ceiling Enclosures	8 in. High on Front
Filter Type	Stainless Steel X-Tractor Filters 88 lbs
Backsplash Panel	80 in High 166 in Long 0 in Wide 184 lbs
Left Sidesplash	80 in High 54 in Long 0 in Wide 60 lbs
Right Sidesplash	80 in High 54 in Long 0 in Wide 60 lbs
Exhaust Air Balancing Baffle	Damper used to balance system with multiple collars.

Material: 430 SS Where Exposed
UL Listing: UL 710 w/out Exhaust Fire Damper

Features:
 Performance Enhancing Lip (PEL)
 Standing Seam Construction for Superior Strength
 Stainless Steel Finish for Higher Corrosion Resistance

Hood End Conditions:
 Back Wall - Limited Combustible

Section Data:

Length (in.)	Volume (CFM)	Exhaust Rate (CFM/FT)	SP (in. wg)	Filter Qty		Filter Ht. (in.)	Cooking Load	Light Qty	Light Type	Foot Candles	Drain Location	Hood Weight (LBS)
				16" W	20" W							
164	3075	225	0.846	9	1	20	Medium	4	Round LED	77.39	Left/Right	425.77

Exhaust Collar Data:

Collar Num.	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos Off Back (in.)	Velocity (fpm)	Mounting Option
1	16	82	9	2202	Factory Mounted Exhaust Collar(s)

External Supply Plenum Data:

Supply: 2460 CFM

MUA: 2460 CFM

AC: 0 CFM

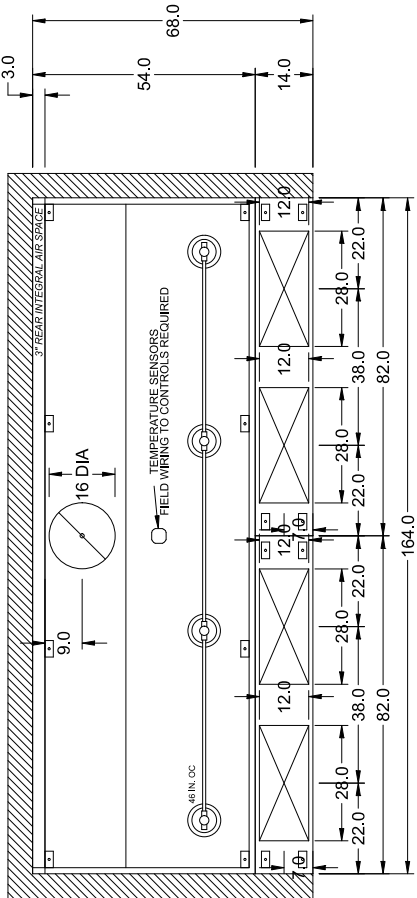
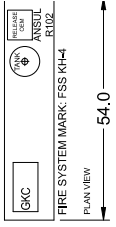
Plenum Num.	Side	Type	Length (in.)	Width (in.)	Height (in.)	Volume (CFM)	Weight (lbs)	SP (in. wg)	Insulated	MBD	LED Lights
1	Front	Air Curtain Supply (ASP)	82	14	4	1230	47	0.01	No	Yes	No
2	Front	Air Curtain Supply (ASP)	82	14	4	1230	47	0.01	No	Yes	No

External Supply Collar Data:

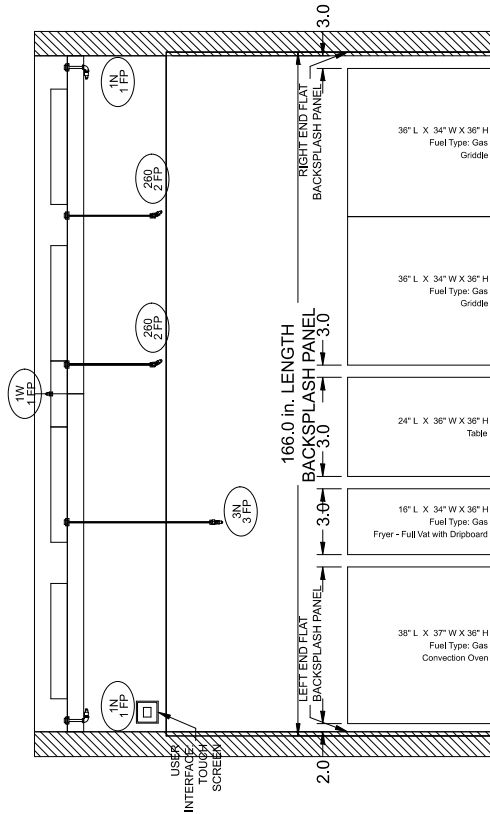
Section Num.	Plenum Num.	Side	Collar Num.	Collar Shape	Collar Size (LxW) in. or Diameter (in.)	Pos. Off Left (in.)	Pos. Off Front (in.)	Velocity (fpm)	Mounting Option
1	1	Front	1	rectangular	28 x 12	22	7	264	Factory Mounted Supply Collar(s)
1	1	Front	2	rectangular	28 x 12	60	7	264	Factory Mounted Supply Collar(s)
1	2	Front	1	rectangular	28 x 12	22	7	264	Factory Mounted Supply Collar(s)
1	2	Front	2	rectangular	28 x 12	60	7	264	Factory Mounted Supply Collar(s)

Utility Cabinet Data:

Descripton	Length (in.)	Width (in.)	Height (in.)	Weight (lbs)
Wall Utility Cabinet	54	12	24	138



MARK: KH-4 - SECTION 1
PLAN VIEW



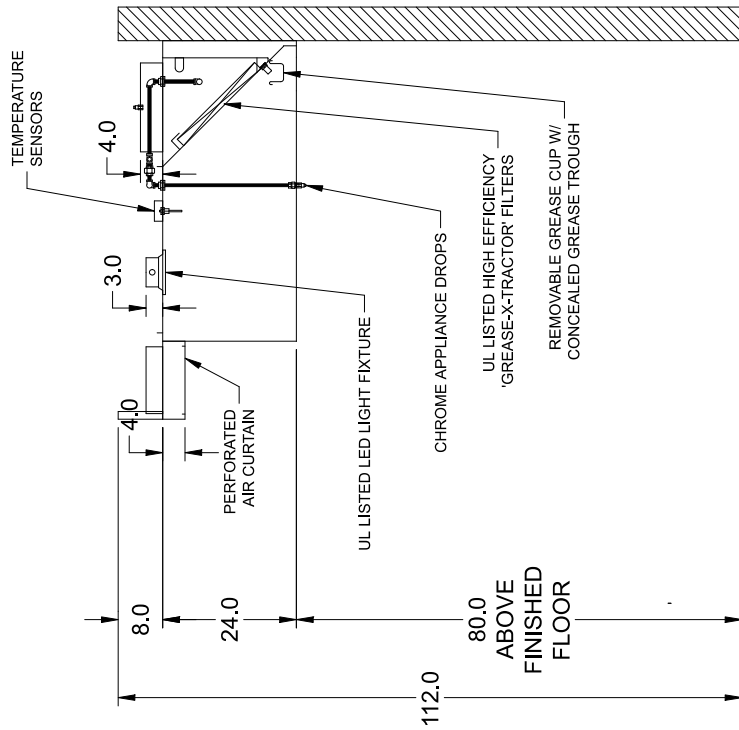
MARK: KH-4 - SECTION 1
ELEVATION VIEW

NOTE: All dimensions are in units of in.



Hanger Bracket Locations			
Sec #	Brkt #	Distance Off Left (in)	Distance Off Front (in)
1	1	3.50	2.50
1	2	54.61	2.50
1	3	109.22	2.50
1	4	160.50	2.50
1	5	3.50	50.00
1	6	54.61	50.00
1	7	109.22	50.00
1	8	160.50	50.00

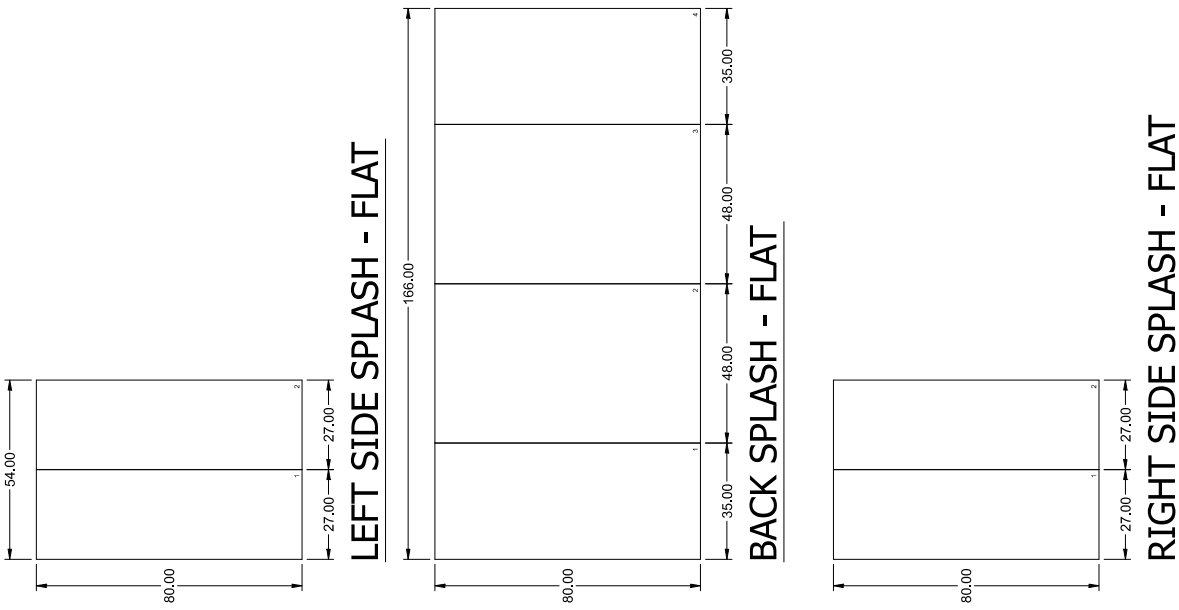
Bracket Mounting Position for an 8 Bracket Hood			
5	6	7	8
BACK		FRONT	
1	2	3	4



MARK: KH-4

NOTE: All dimensions are in units of in.





NOTE: All dimensions are in units of in.



Ansul R-102 Wet Chemical Fire Suppression System

Scope:
Pre-Pipe With Parts and Factory Coordinated Installation

Hood Fire Suppression System

Detection Type	Mechanical
Coverage	Appliance Specific
Hood Mark(s) Connected	KH-4
Mounting Location	Wall-mounted cabinet of size 54x12x24 (see hood submittal for more visual detail)
System Size	3 Gallon
Flow Points	Maximum of 11 and 10 are utilized.

Options and Accessories for Hood Fire System Provided from Factory

OEM Regulated Release Assembly	QTY of 1
3 Gallon Tank Assembly	QTY of 1
Gas Valve	2", mechanical
Manual Pull Stations	QTY of 1
Microswitch	QTY of 1
Alarm Initiating Switch	QTY of 1
Metal Blow Off Caps	Included

Important Notes

- The manner in which the parts included in the scope of this fire system are supplied may vary. They could be shipped from the fire suppression manufacturer, shipped loose with the hood, connected directly to the hood, or supplied directly to the installing distributor.
- Must maintain 8 inch clearance between top of hood and pipe connections for installation (includes piping and workspace clearance).
- The amount of supply pipe that should not be exceeded per system is 32 ft., which includes all pipe used along the length the hood, between hoods, and the pipe needed to connect to the tanks where they are mounted.
- Pull station locations must be a minimum of 10 ft. and a maximum of 20 ft. from the hoods and in the path of egress. They also must be 40-48 in. from the finished floor.
- Systems are pre-piped for a specific appliance line-up. If appliance types and sizes differ from what is shown on the hood submittal, this may result in a field re-pipe which is outside the scope defined here.
- If the collars on the hood are shipped loose, the detection line will not be installed on the hood and the parts will ship loose.

Gas Valve

Quantity: 1
Ansul
Mechanical
2 in.

Labor Information:

Hook-up of detection line and supply line is included.
Surface mounting of the manual pull station in a pre-determined location is included.
Charging and arming of the system is included.
Permit Included
Hood Puff Test Fee Included
Travel Fee Included

Items which may be supplied by the factory, but are not installed or hooked-up by the factory OR the installing distributor:

Gas valve (not applicable for PCU)
Microswitch(es)
Remote mounted cabinets, enclosures, or tank brackets

Not included unless explicitly stated elsewhere in the quote as included:

Special, signed, or sealed drawings required to satisfy a state or local code
Parts or labor required to correct piping due to cooking equipment changes or deviation from approved drawings
More than two trips to the jobsite, special transportation, or overnight lodging requirement in remote areas. Typical travel distance is defined as the first 50 miles from the distributor's office
A shut-off device (e.g. shunt-trip breaker) for electric cooking equipment
All electrical connections required to shut down fan(s), electric cooking equipment, activate an alarm system, etc. aside from what is explicitly stated as "factory-wired" in the Accurex control's scope (if provided)
Installation of the gas shut-off valve
Pre-test
Full dump test or any other system test requirement outside of a standard puff test
Special classes or additional labor for access to security sensitive areas
Union labor, government labor, or prevailing wages required for field hook-up
Any dismantling or reassembly required where access to the fire suppression piping has been blocked
Plan examination fees
Rough-in conduit for remote pull station (for flush mounted pull station) or gas valve
Additional remote pull stations beyond the quantity specified in the submittals

Variable Volume

Greenheck Kitchen Controls

Standard Construction Features:

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

Options & Accessories:

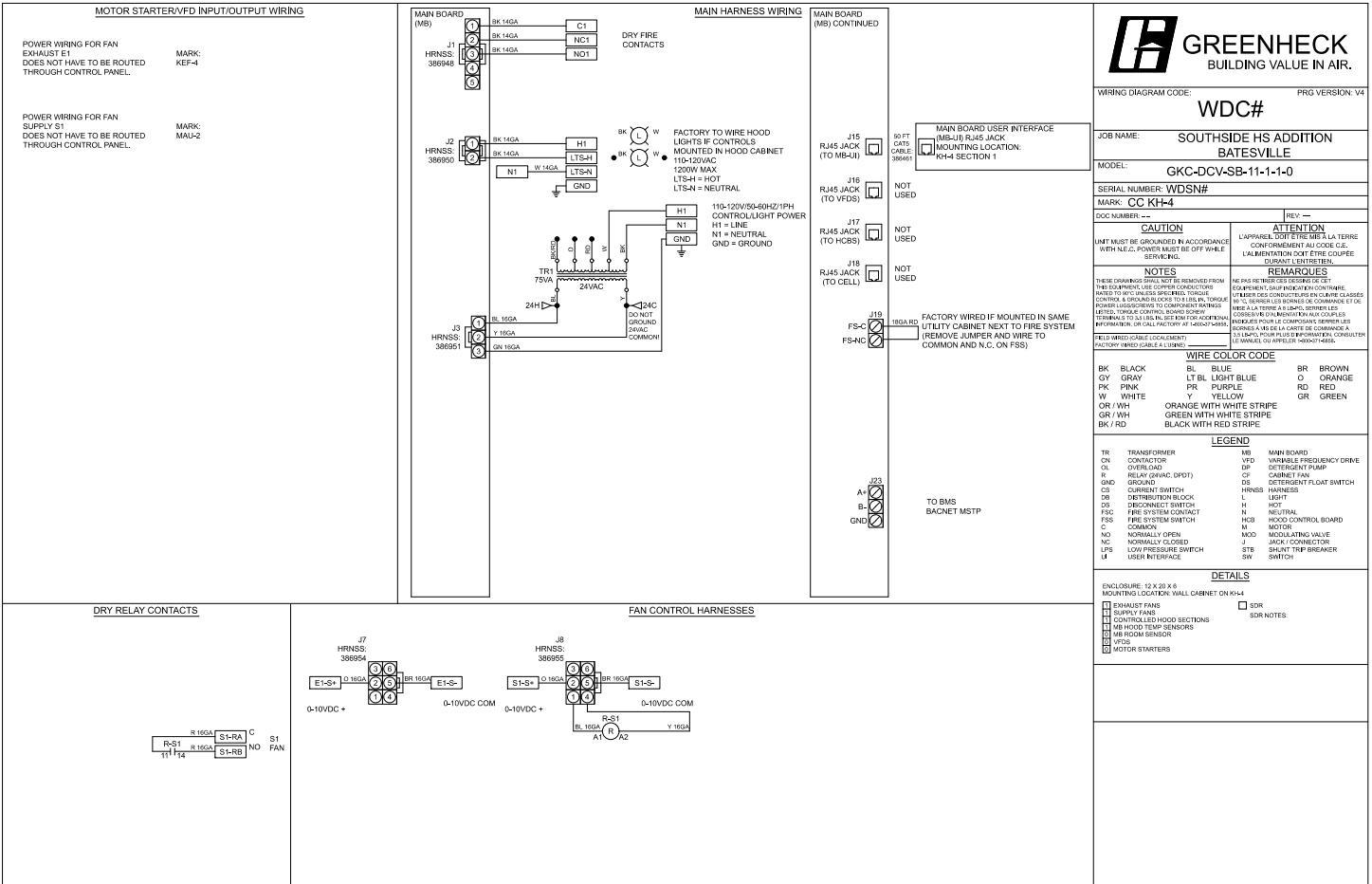
Mounting Option	Wall Cabinet on KH-4
Exhaust Fan Quantity	1
Supply Fan Quantity	1
Hood Light Control	Yes
User Interface	Full Color Touchscreen
Touchscreen Mounting Location	Face Mount Left Side of Hood - KH-4 Section 1
Exhaust During Fire	Exhaust fans will run at max speed when in fire mode
Building Management System	BMS Interface: BACnet MSTP

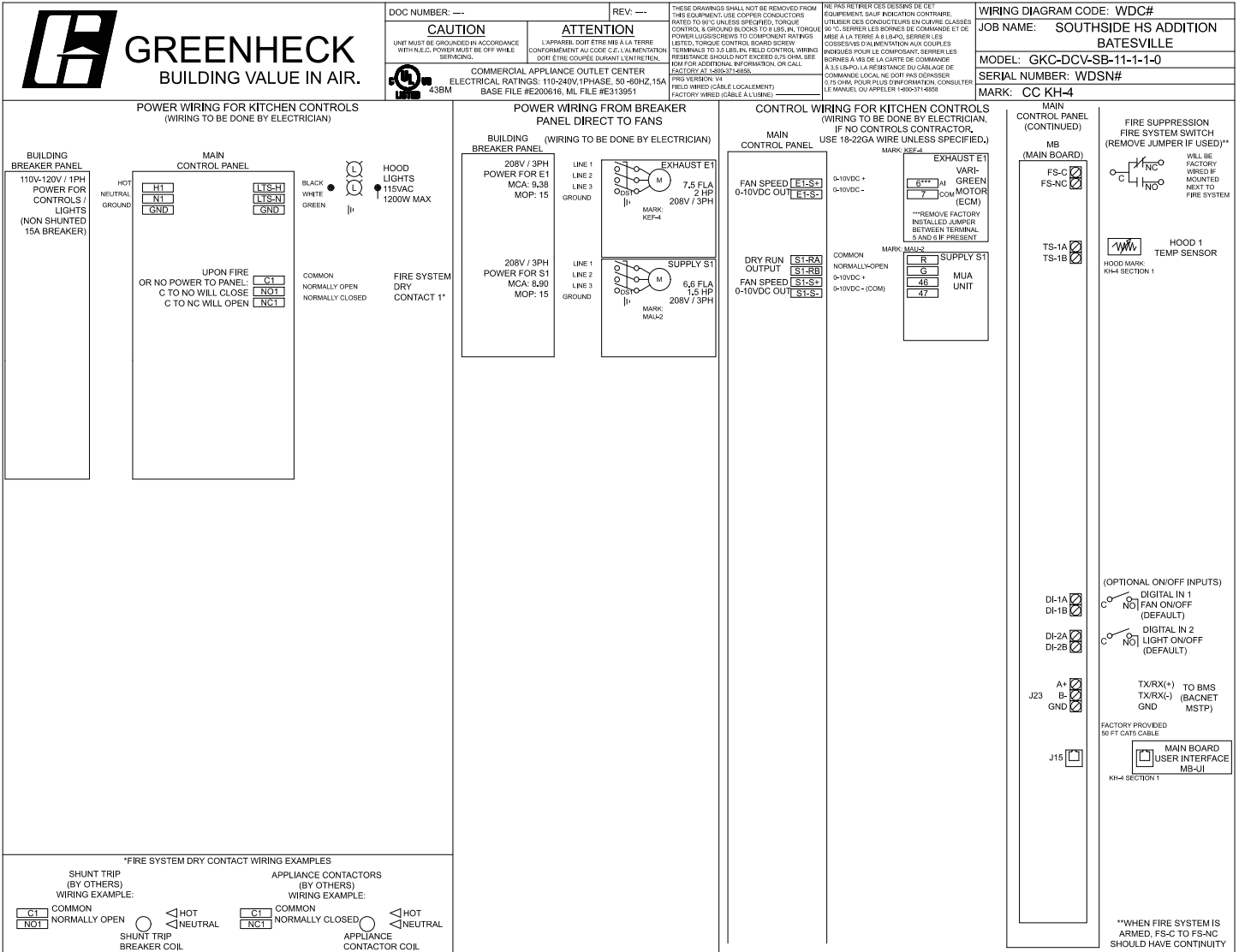
Controlled Fans:

Fan Mark	Fan Type	Supplied By	Phase	HP	Voltage	NEC FLA	Starter/VFD Required	Starter/VFD Provided
KEF-4	Exhaust	Manufacturer	3	2	208	7.5	No	No
MAU-2	Supply	Manufacturer	3	1.5	208	6.6	Yes	No

Controlled Hood Sections and Fan Relationships:

KH-4 Section - Number of Sensors = 1	
	Exhaust Fan Name - KEF-4
	Supply Fan Name - MAU-2

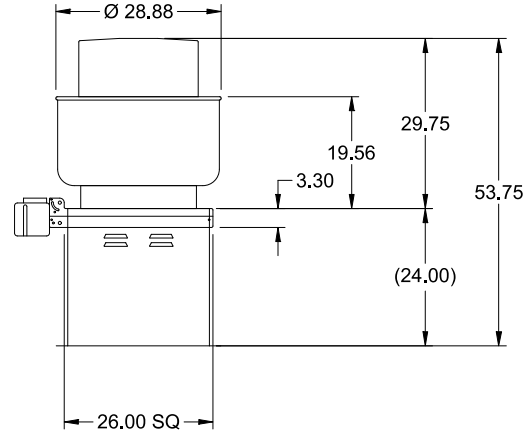




Model: CUE-160-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Previously: CUE-161-VG



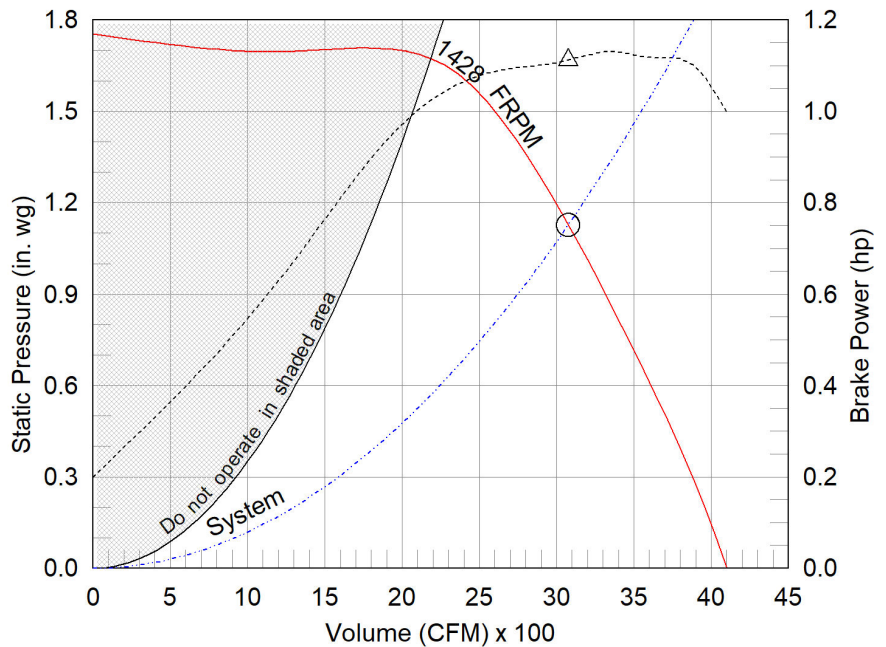
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	104
Weight w/ Acc's (lb)	130
Weight w/ Acc's and Curb (lb)	163
Standard Curb Cap Size (in.)	26 x 26
Roof Opening (in.)	22.5 x 22.5

Performance	
Requested Volume (CFM)	3,075
Actual Volume (CFM)	3,075
Total External SP (in. wg)	1.127
Fan RPM	1428
Operating Power (hp)	1.11
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	6,214
Static Eff. (%)	49

Misc Fan Data	
Fan Eff. Index (FEI)	1.32
Outlet Velocity (ft/min)	1,788

Motor	
Motor Mounted	Yes
Size (hp)	2
Voltage/Cycle/Phase	208/60/3
Enclosure	TEFC
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	6.5
Min. Circuit Ampacity (MCA)	8
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

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



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	77	83	84	82	75	72	69	66	82	71	19.0



Model: CUE-160-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - 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)
Control - Dial for balancing
Larger Curb Cap Size - 26 Square
UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918382), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
Grease Trap (PN 475538)
Birdscreen: Stainless Steel, nom. 85% Free Area
Clean-out Port - Factory Installed
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPFV-26-G24

The Vari-Green Motor included in this order can operate on any three phase voltage between 208V and 240V.

Disconnect Switch

Enclosure Rating: NEMA-1

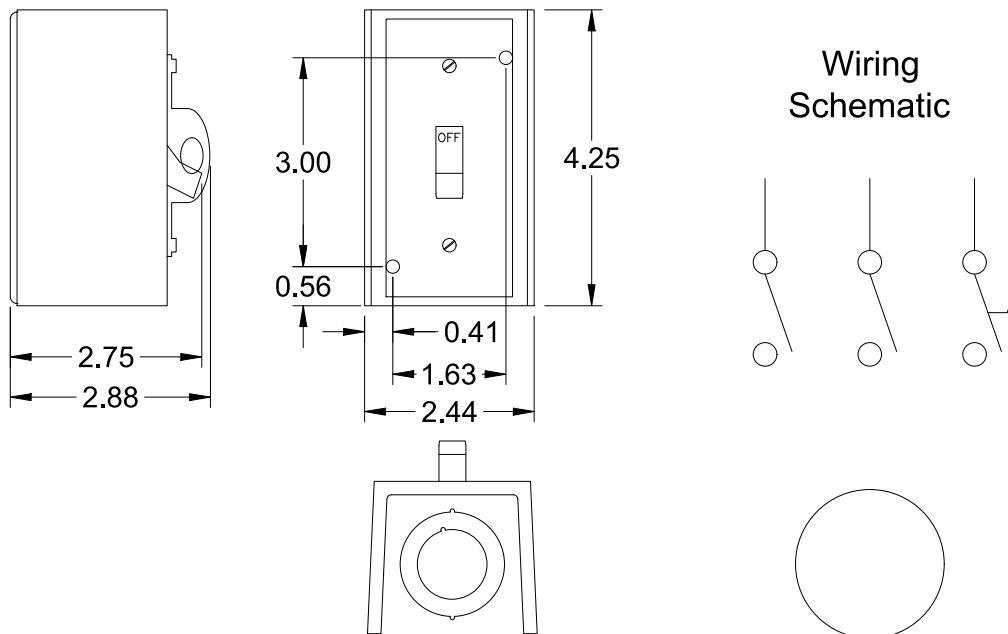
Standard Construction Features:

Enclosure constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dust. This enclosure meets the rod entry and the indoor corrosion protection design tests. The rod entry test is intended to simulate incidental contact with enclosure equipment. Enclosure is equipped with provision to lockout in the off position with customer supplied lock.

Disconnect Switch Configuration

Type:	Toggle	Motor Size:	2 hp	Voltage:	208	UL Listed:	Yes
Manufacturer:	Square D	Cycle:	60	Amperage:	30	CSA Approved:	Yes
Overload Protection:	None	Phase:	3	Switch Pole(s):	3	Rating:	10 hp
Junction Box Mtg.:	Mounted and Wired	RPM:	1725	Exp. Resist. Wiring:	None		
Switch Mounting:	Shipped With Unit						

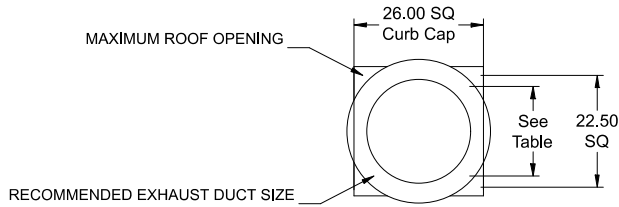
Electrical Drawing Details



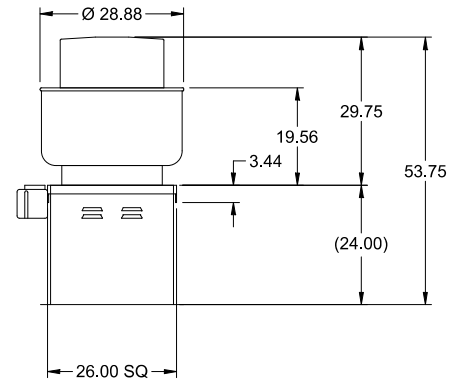
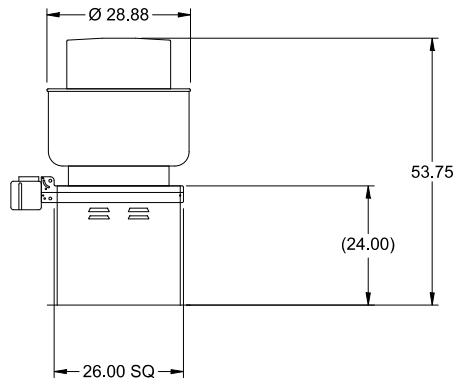
Notes: All dimensions shown are in units of in.

Assembly Drawing

Type: Direct Drive Upblast Centrifugal Roof Exhaust Fan



DUCT TYPE	SIZE
STANDARD	18 SQ
FIRE-WRAPPED	12 SQ



DUCT DIMENSIONS ARE LARGEST POSSIBLE DUCT TO FIT THROUGH CURB.
CONSULT SYSTEM DESIGN ENGINEER FOR RECOMMENDED DUCT SIZE.

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

Notes: All dimensions shown are in units of in..

Vari-Green

Motor & Control Options

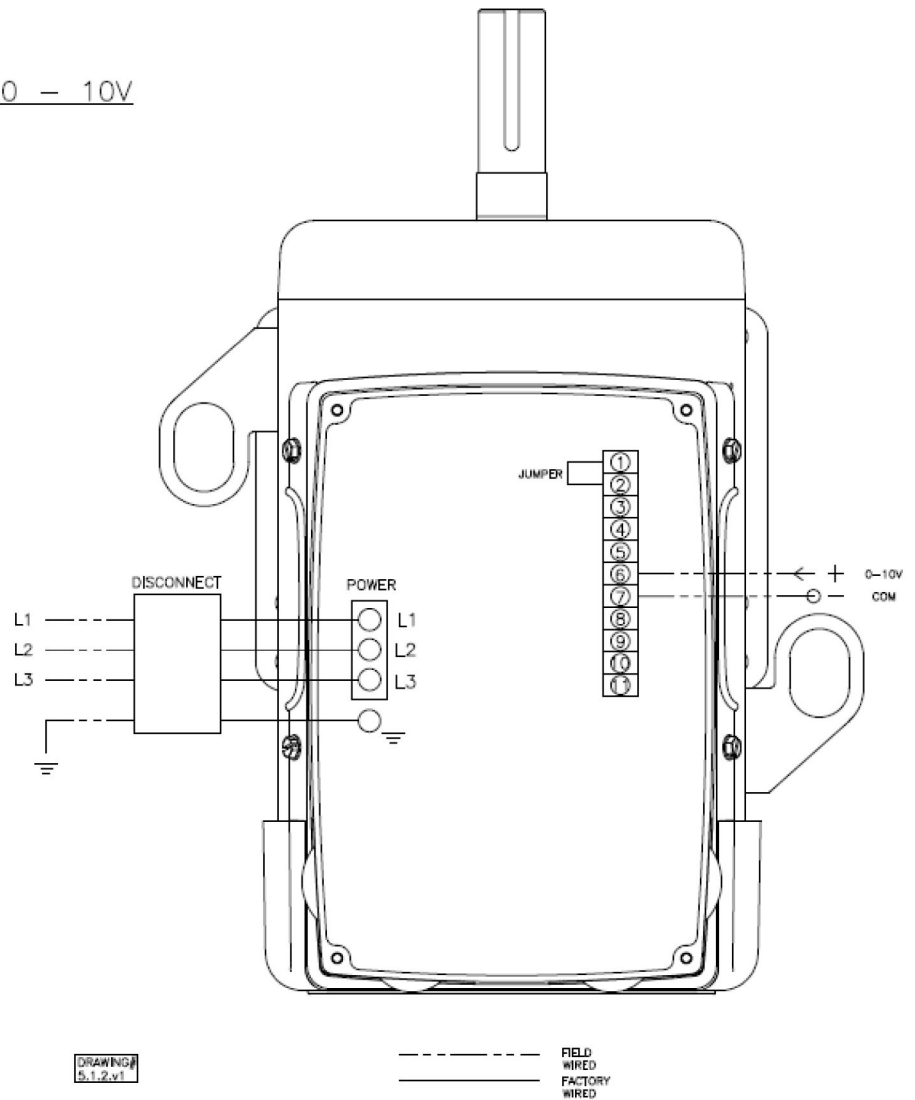
An EC motor that uses AC input power and internally converts it to DC power. Motor accepts a 0-10VDC control signal. Motor is operable in the 2-10VDC range and off while in the 0-1.9VDC range. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

Motor Configuration

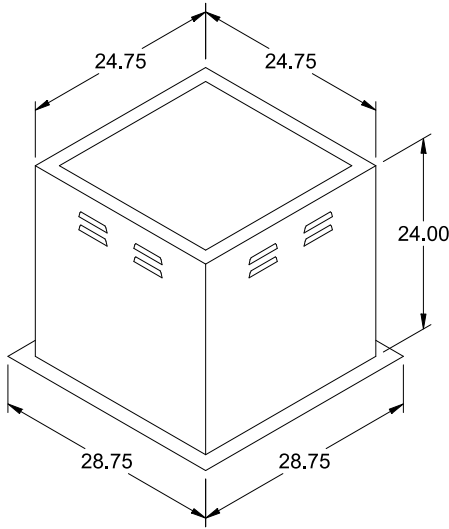
Input Voltage: 208
Speed Reference: 0-10VDC 0 - 10V
Permanent Dial: No
Balance Dial Included: Yes

Control Configuration

Control Type: By Others
Transformer: None



DRAWING# 5.1.2.v1



Model: GPFV

Vented Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - Includes louvered vents to vent heat - 2 in. or 5 in. mounting flange - Height - Designed to provide required 40 in. minimum discharge height above roof line per NFPA 96 Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Trays are not available

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPFV-26	Nominal	1.25	33	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
24	26	26	24.75	24.75	21.25	21.25	28.75	28.75	25	25

*May not be applicable

Accessories

Material
Galvanized

DGX-P112-H12-MF

Unit Performance

Design Conditions						
Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)	Min Supply Airflow (CFM)
	DB (°F)	WB (°F)				
256	98.0	80.2	17.2	2,460	2,460	861

Unit Specifications					
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing
1	618 (+/- 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	Variable Volume	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	7	0.5	152.5	140.3	52.8	17.0	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	2,460	0.64	1.39	2424	1.03	1	Mixed Flow	15	Direct-Drive

Motor Specifications					
Motor	Qty	Size (HP)	Enclosure	Efficiency	RPM
Supply Fan Motor	1	1-1/2	ODP	NEMA Premium	1725

Electrical Specifications				
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)	SCCR
Unit	208/60/3	8.9	15	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	
Corrosion Resistant Fasteners	Std
Access and Connections - Right side when facing intake	X
Service Access - Hinged access doors	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 - External 0-10 VDC signal	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 - GPI	X
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	X

Standard Option	Std
Not Included	
Included	X

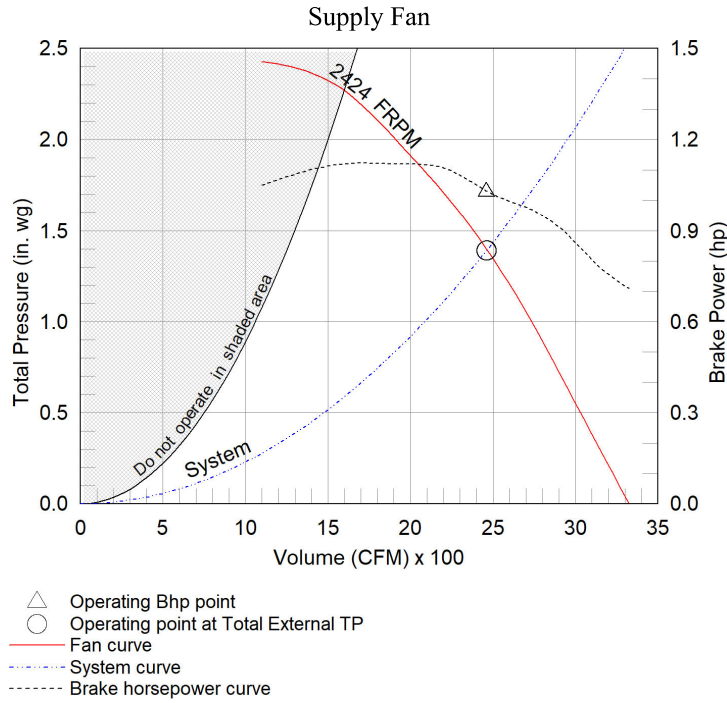
Notes
 Damper(s) supplied are low leakage, motorized VCD-23 (leakage rate of 3 CFM/ft² @ 1 in.wg), Class 1A

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
2,460	0.64	1.39	2424	1.03	1	1-1/2	1	Mixed Flow	Direct

Pressure Drop (in. wg)							
Diffuser	Weatherhood	Filter	Damper	Cooling	Heating	External	Total
-	0.075	-	0.05	-	0.625	0.64	1.39

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
75	71	74	70	76	76	75	69	81	70	18.0



Heating Specifications

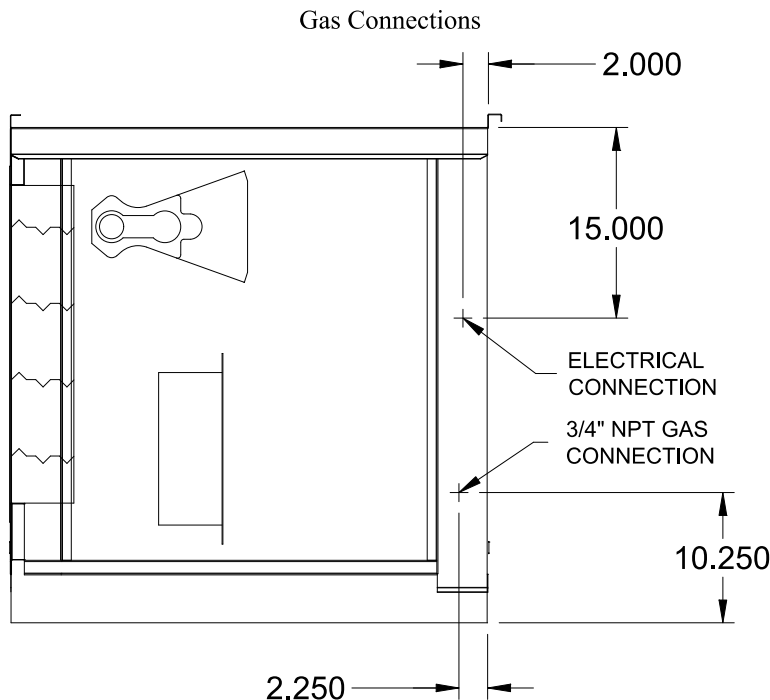
Heating Performance								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	7	0.5	152.5	140.3	52.8	17.0	70.0

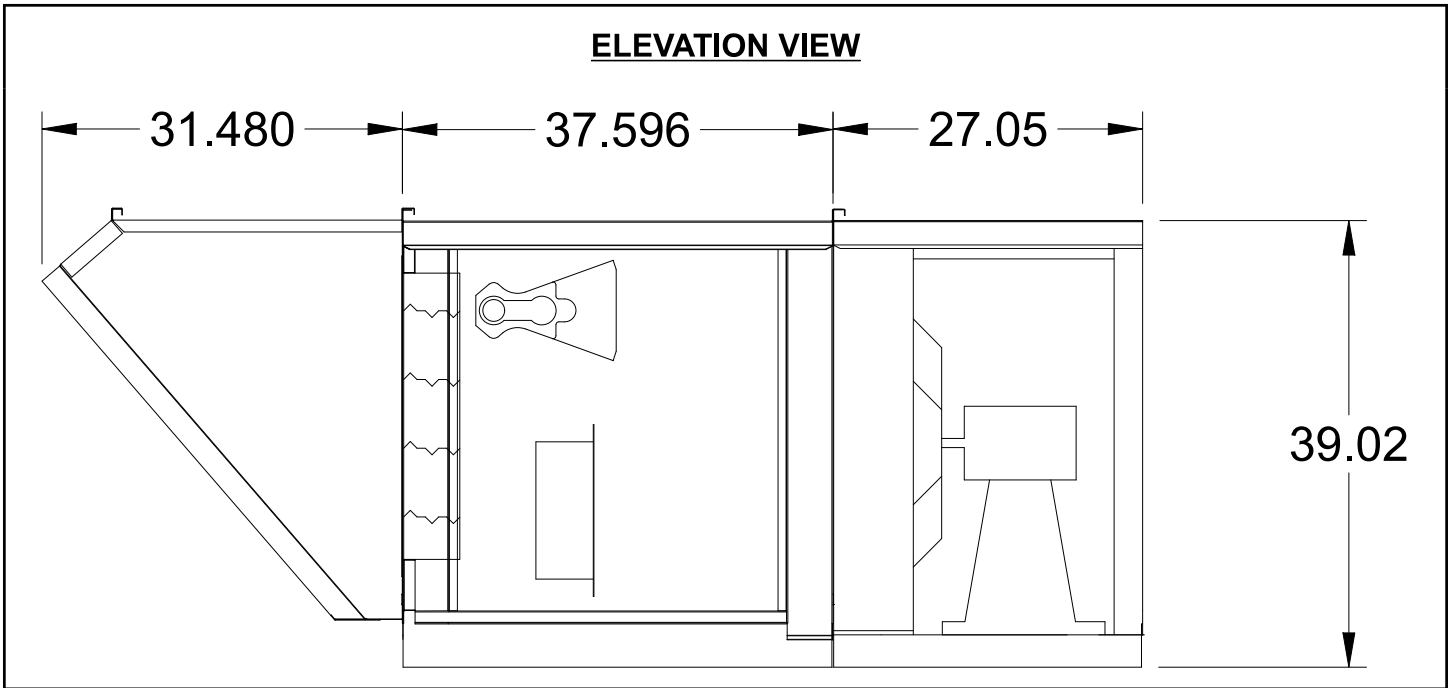
Gas Train Details							
Redundant Main Valves	Electronic Modulating Valve	Pilot Valve	Internal Regulator	Visual Indication Valve	Proof of Closure Valve	Gas Pressure Switch(es)	External Regulator
Std	Std	Std	Std	-	-	-	-

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	-	-

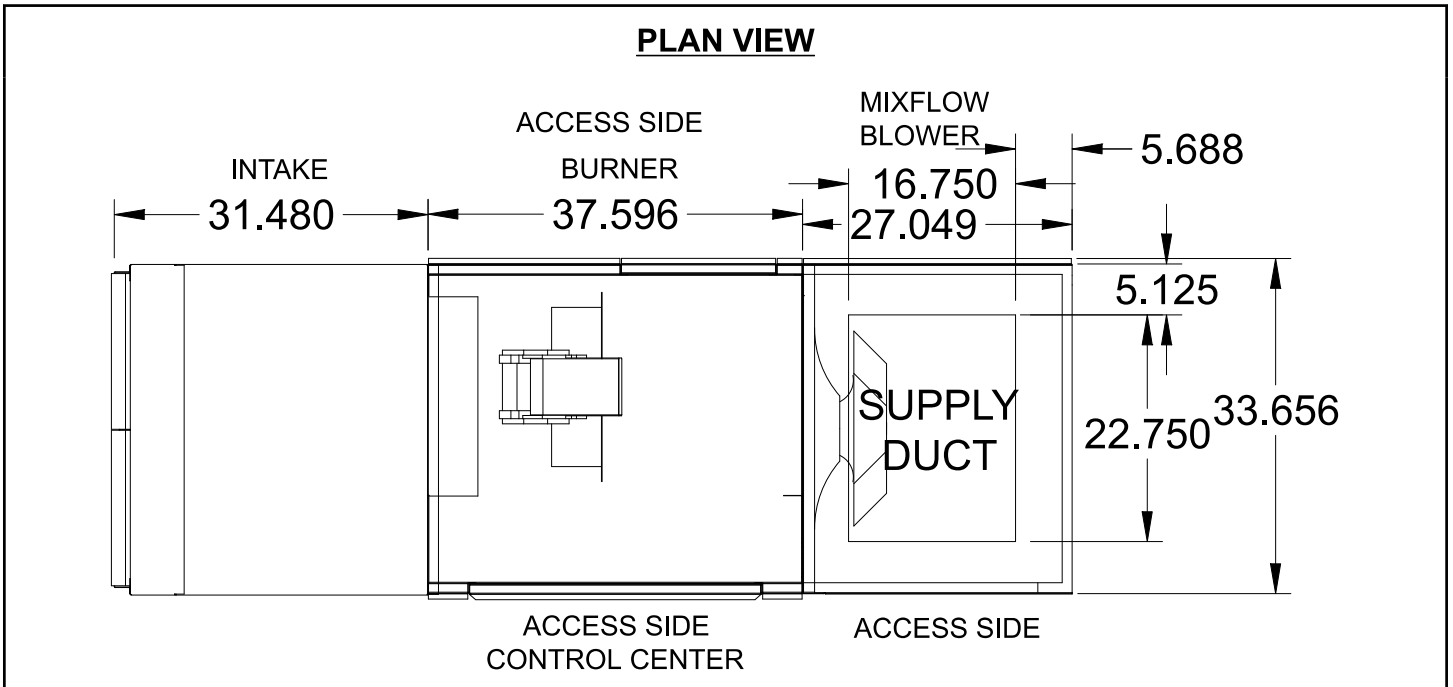
Unit Details
92% thermal efficiency
Cast aluminum burner manifold with stainless steel mixing plates
Electronic modulation burner control

10 second pre-purge sequence
Low fire start

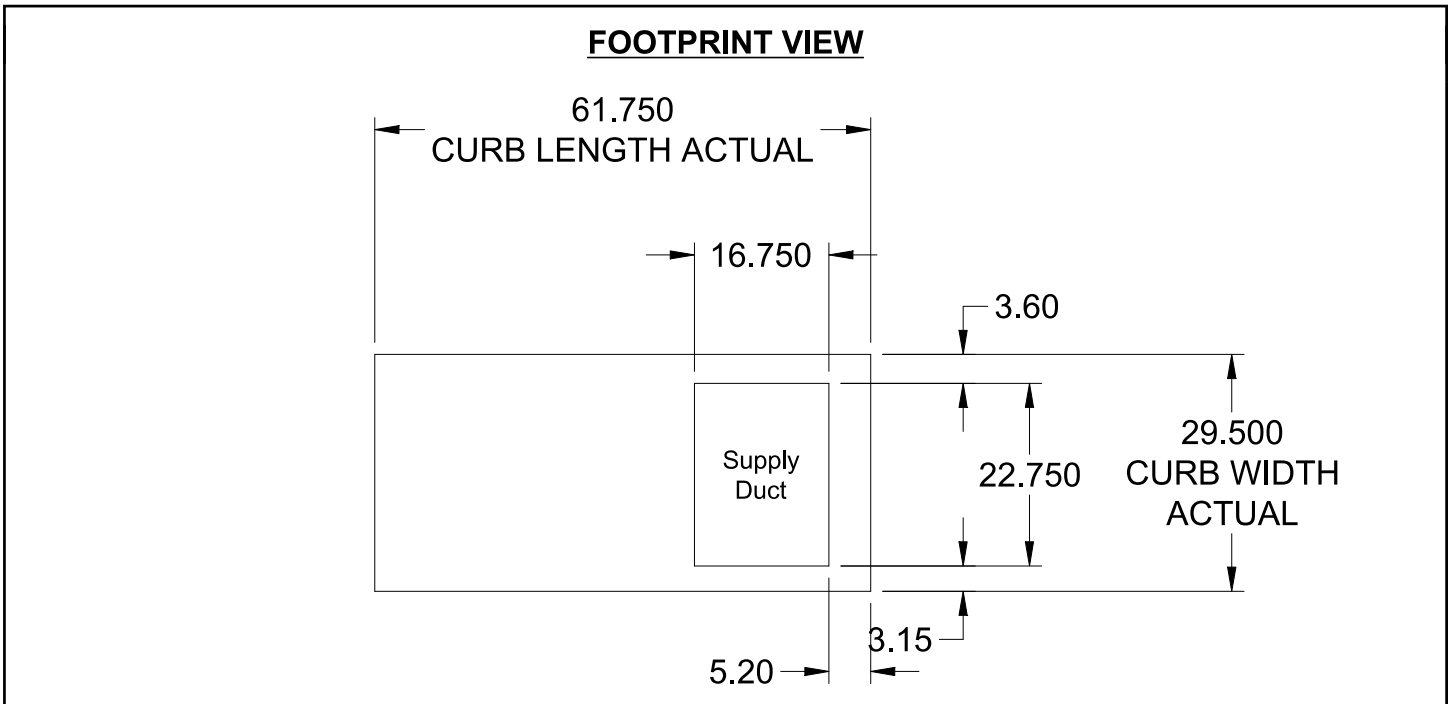
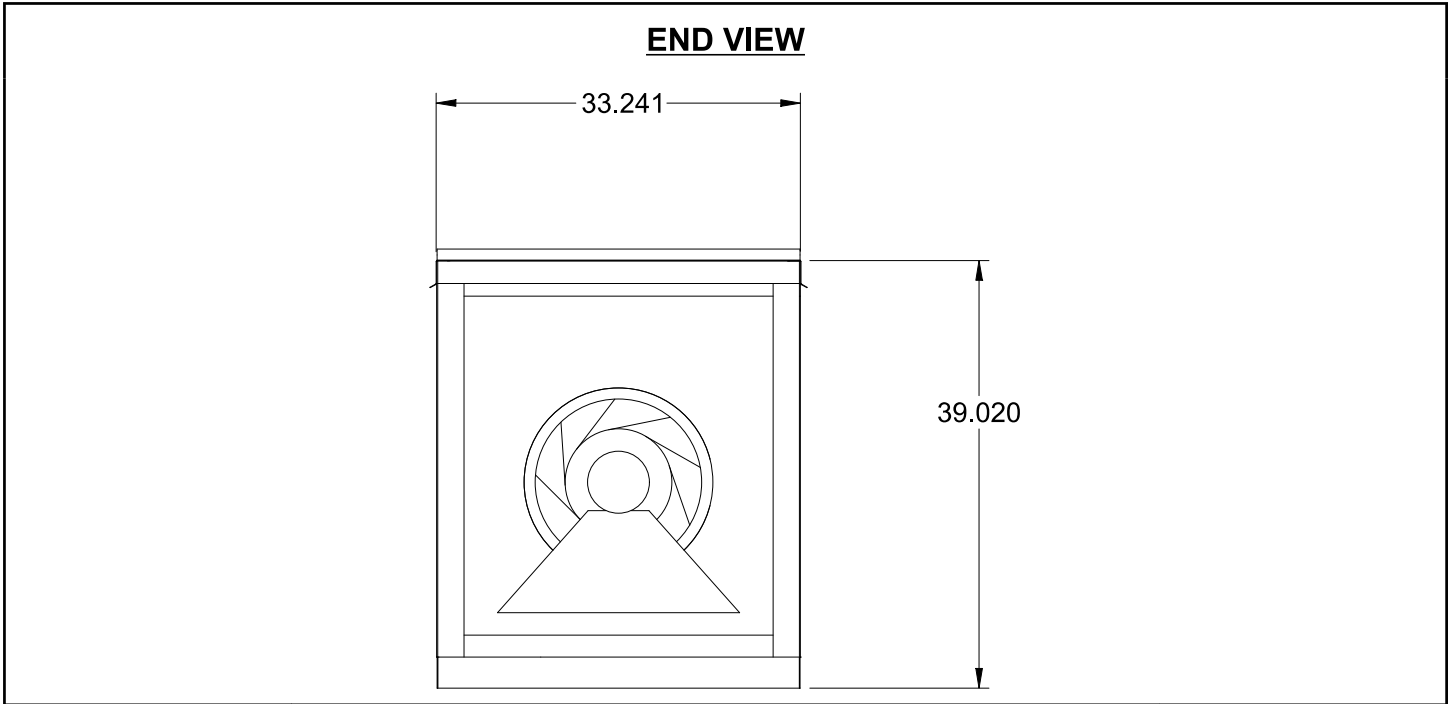




Notes - Elevation View
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.
Order of unit sections is from intake of unit to discharge of unit.
Sections included on this unit: Weatherhood Section, Heating Section, Blower Section
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.



Notes - Footprint View

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.

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

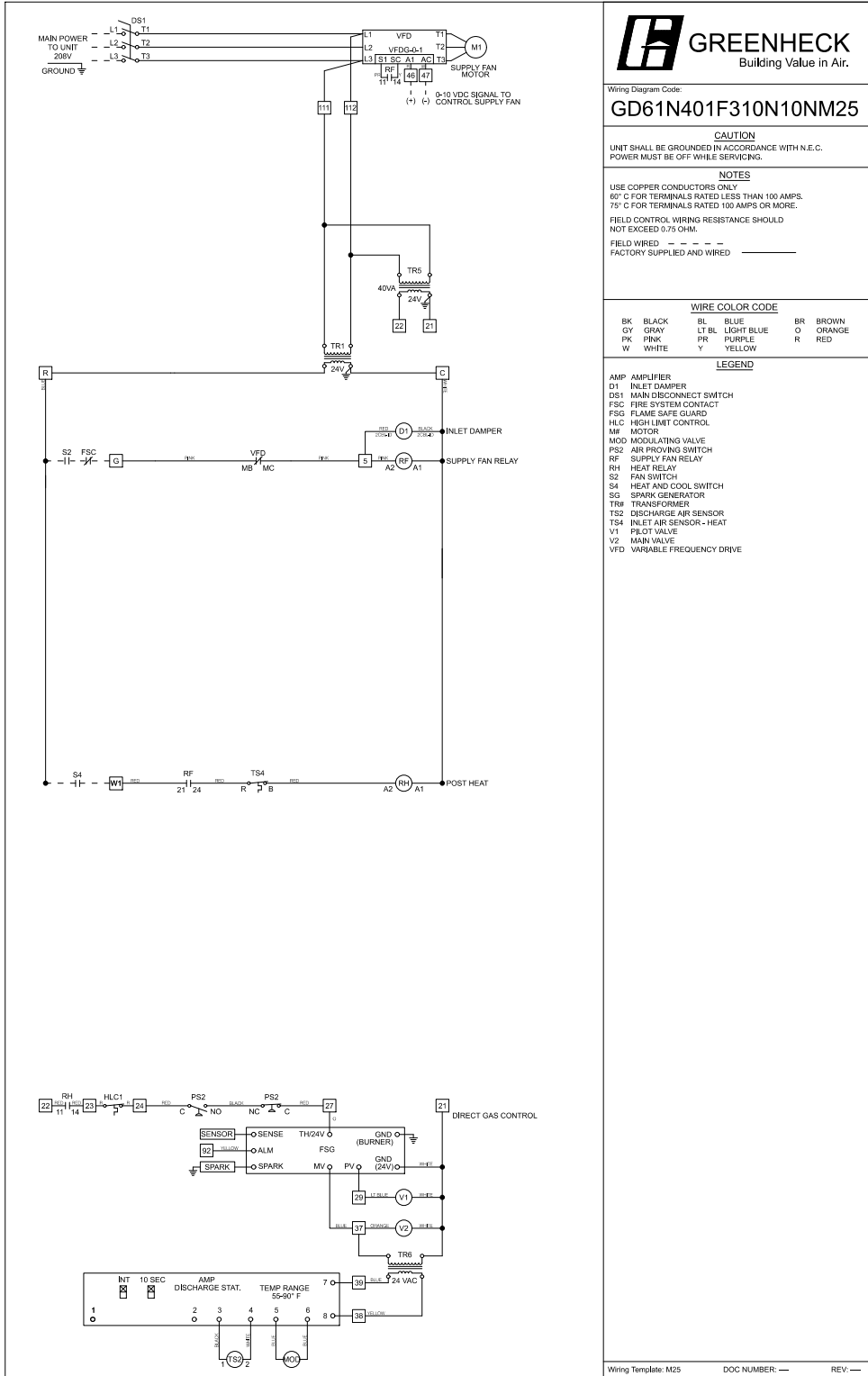
Recommended Minimum Combustible Clearances				
	Floor (in.)	Top (in.)	Sides (in.)	Ends (in.)
Insulated Units	0	0	0	0
Non-Insulated Units	0	6	6	6

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

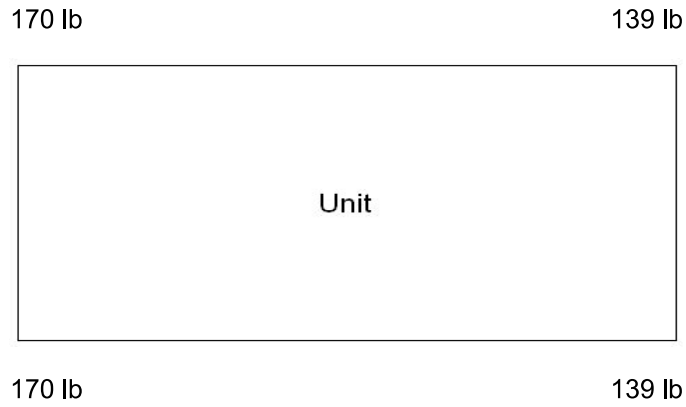
Notes - Service Clearances
 To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

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)
- Supply fan VFD speed signal – 0-10 VDC

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:

External 0-10 VDC Signal By Others:

The supply fan speed is modulated by an external 0-10 VDC signal (field provided and wired) landed to terminals in the unit control center (see unit wiring diagram for details).

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

Greenheck 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 Greenheck.

DG Burner Extended Warranty

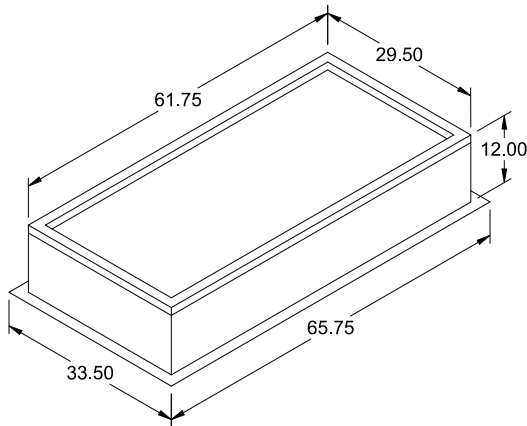
Greenheck warrants the direct-fired gas burner to be free from defects in material and workmanship for a period of 10 years from the shipment date. The warranty does not include items deemed as consumable components, including, but not limited to: Igniters, Spark rods, Spark generator, Flame rods, Flame 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 Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck 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, Greenheck reserves the right to change specifications without notice.



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in., as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPI-31 x 63.25	Nominal	1.5	57	Yes	No Preference

Dimensions

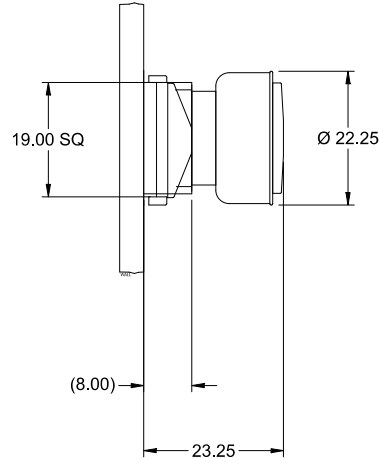
Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
12	31	63.25	29.5	61.75	65.75	65.75

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Model: CUE-095-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan



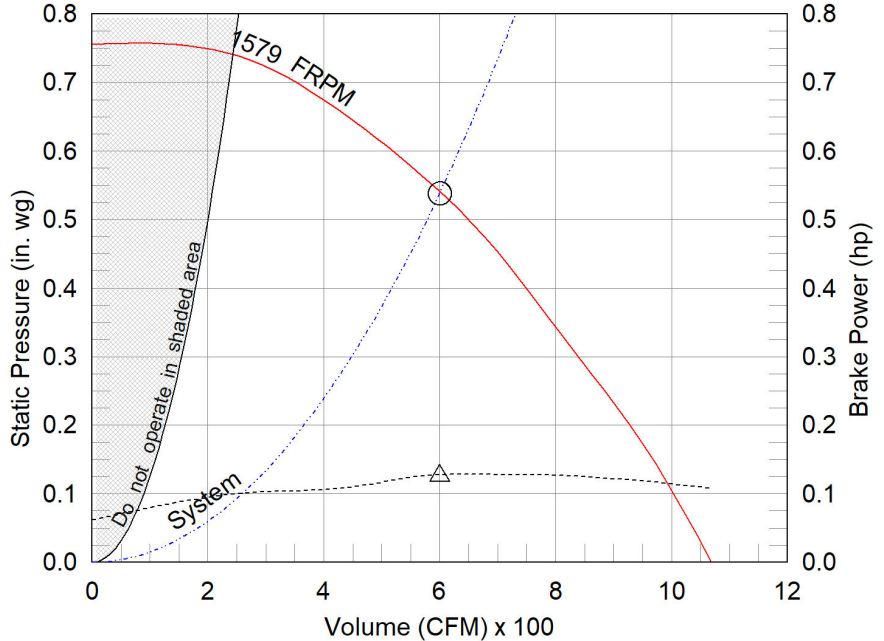
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	34
Weight w/ Acc's (lb)	51
Weight w/ Acc's and Curb (lb)	72
Standard Curb Cap Size (in.)	19 x 19
Wall Opening (in.)	15 x 15

Performance	
Requested Volume (CFM)	600
Actual Volume (CFM)	600
Total External SP (in. wg)	0.538
Fan RPM	1579
Operating Power (hp)	0.13
Elevation (ft)	256
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.074
Tip Speed (ft/min)	4,497
Static Eff. (%)	40

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	517

Motor	
Motor Mounted	Yes
Size (hp)	1/6
Voltage/Cycle/Phase	208/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	1.5
Min. Circuit Ampacity (MCA)	2
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

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



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

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 ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	74	74	73	65	56	58	53	32	68	57	8.3



Model: CUE-095-VG

Direct Drive Upblast Centrifugal Wall Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward curved composite (sizes 60-95) or aluminum (sizes 99-300) wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - Motor isolated on shock mounts - Corrosion resistant fasteners

Selected Options & Accessories:

Motor - Vari-Green EC motor
Control - Dial for balancing
Standard Curb Cap Size - 19 Square
Sidewall Mounting - Fan Configured for Wall-Mounted Applications
Curb will be Mounted to the Wall
UL/cUL 705 Listed - "Power Ventilators"
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, (PN 918379), (Shipped Loose)
Hinge Latch (PN: 879145), Shipped Loose
Foam Curb Seal (Factory Applied)
Birdscreen: Stainless Steel, nom. 89% Free Area
Composite Wheel Material
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPF-19-G8

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.

Vari-Green Motor & Control Options

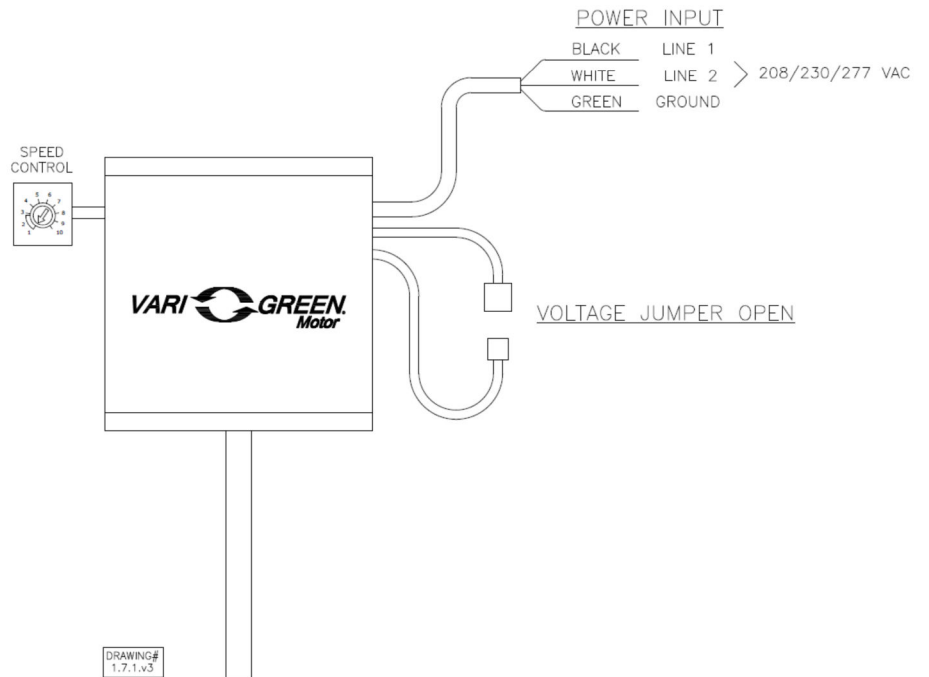
An EC motor that uses AC input power and internally converts it to DC power. Potentiometer (dial) mounted on the motor enclosure adjusts the speed (RPM) down 80%. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

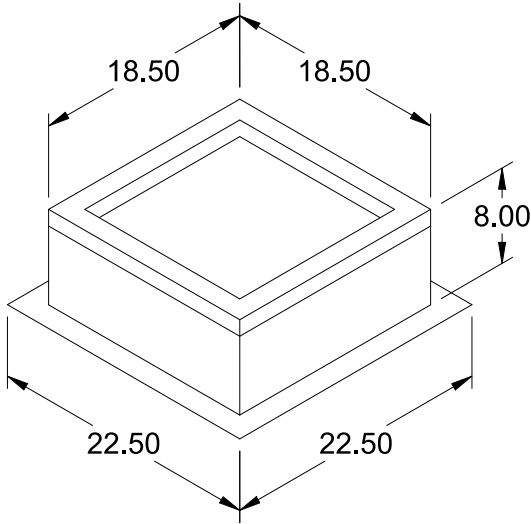
Motor Configuration

Input Voltage: 208
Speed Reference: Dial on Motor
Permanent Dial: Yes

Control Configuration

Control Type: N/A
Transformer: None





Model: GPF

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. or 5 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

***This curb can be mounted on the roof or wall (with a sidewall mounted CUE or CUBE fan).

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPF-19	Nominal	0.5	21	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
8	19	19	18.5	18.5	15	15	22.5	22.5	18	18

*May not be applicable

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3