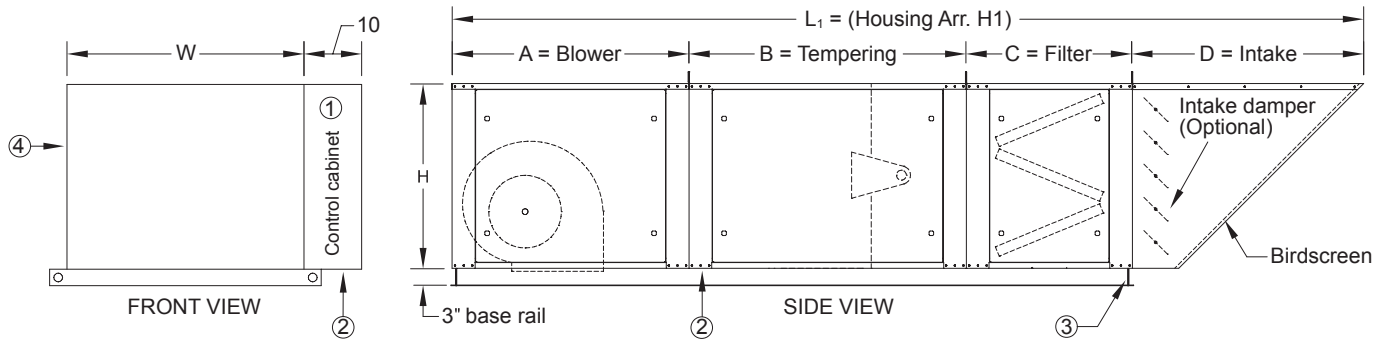




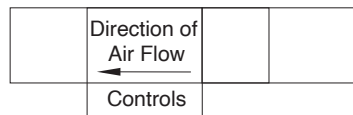
DFG DIRECT FIRED MAKE-UP AIR HEATER

Constant Volume



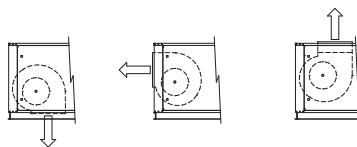
- ① Electrical connection
- ② Heater connection(s)
- ③ Lifting lugs (4)
- ④ Observation port

- Select one:
- ☐ LH Controls (Shown)
 - ☐ RH Controls



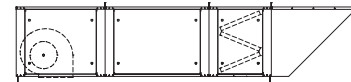
TOP VIEW

- Select one:
- ☐ Down Discharge
 - ☐ End Discharge
 - ☐ Top Discharge

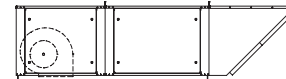


Select one:

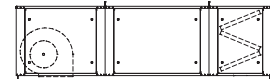
- ☐ H1 Housing
V-bank filters with intake hood



- ☐ H2 Housing
Flat filters in the intake hood



- ☐ H3 Housing
V-bank filters, no intake hood



*Optional intake damper adds 8" to the L₃ length.

Notes:

1. Intake hood ships loose.
2. Access doors typical on both sides.
3. The control cabinet is a part of the heater section. It extends out 10" to one side as shown in the front view. It contains the gas controls for the burner and the electrical controls. Standard location is on the LH side as shown above.

Model	Housing	A	B	C	D	L ₁	L ₂	L ₃ *	H	W
						H1 Hsg.	H2 Hsg.	H3 Hsg.		
☐ DFG-109-SM	#1	33	48	28	34	143	115	109	26	33
☐ DFG-109										
☐ DFG-110										
☐ DFG-112-10	#2	41	48	29	40	158	129	118	32	41
☐ DFG-112										
☐ DFG-115										
☐ DFG-118-15	#3	57	48	28	54	187	159	133	46	52.5
☐ DFG-118										
☐ DFG-120										
☐ DFG-218-15	#4	57	48	28	54	187	159	133	46	101
☐ DFG-218										
☐ DFG-220										

To maintain KEES' policy of continuous product development, we reserve the right to change prices, specifications, ratings and dimensions without notice or obligation.

Project	Location		
Engineer			
Architect	Dwg. No.	SD-DFG	
Contractor	Date	04/23	



KEES INCORPORATED
400 S. Industrial Dr.
Elkhart Lake, WI 53020
Phone: (920) 876-3391
Website: www.kees.com

MODEL DFG DIRECT FIRED MAKE-UP AIR HEATER (CONSTANT VOLUME)

Qty.	Model	CFM	S.P.	BHP	RPM	HP	Volts	Ph.	BTU	Tag

General Construction

Housing

- Galvanized steel
- 1" fiberglass insulation
- Weatherproof construction
- Large access panels

Housing Options

- ☐ Painted housing - machinery grey
- ☐ Painted housing - special color: _____
- ☐ Double wall insulation
- ☐ Foil faced insulation
- ☐ Hinged access doors

Blower Section

- Forward curved, DWDI blower
- Precision machined steel shaft
- Blower wheels statically and dynamically balanced
- Adjustable V-belt drives
- Pulleys and belts selected for not less than 165% of driven HP
- Fan and motor mounted on vibration isolators
- Self-aligning pre-lubricated bearings
- EPACT rated motor
 - ☐ ODP (standard)
 - ☐ TEFC
 - ☐ Other _____

Heater Section

- Direct fired gas burner
- Inlet gas pressure
 - ☐ Natural gas (standard) _____ (ins/lbs)
 - ☐ Propane fuel _____ (ins/lbs)
- 100% combustion efficiency
- Up to 30 to 1 turndown ratio
- Adjustable profile plates
- Factory tested and pre-piped burner and gas manifold
- Observation port to view pilot and main flame

Controls

- Electronic modulating gas valve
 - ☐ Discharge ductstat
 - ☐ Space temp. control
 - ☐ DDC interface
 - ☐ Room override thermostat
- Main fusible disconnect switch
- Motor starter with overload protection (included as standard)
 - ☐ Extra starters: _____ HP
 - _____ HP
- Fused control transformer
- Flame safety control-electronic
- Flame rod safety flame detection
- Main safety solenoid gas valves
- High temperature limit switch
- Air flow proving switch
- Main and pilot gas pressure regulators
- Electric spark intermittent pilot
- All components UL recognized and wired in accordance with NEC
- Numbered terminal strip and color coded wires

Optional Accessories

Damper Options

- ☐ Motorized intake damper (mounted)
- ☐ Motorized discharge damper (field installed)
- ☐ End switch on damper

Curb Options

- _____ Height
 - ☐ Modular curb and rail (Arrangement A1)
 - ☐ Roof curb and rail (Arrangement A2)
 - ☐ Two support rails (Arrangement A3)
 - ☐ Full perimeter curb (Arrangement A4)

Filter Options

- _____ Thickness
 - ☐ Aluminum cleanable (Intake hood, V-bank, or both)
 - ☐ Fiberglass throw-away (V-bank only)
 - ☐ 30% efficient pleated (V-bank only)
 - ☐ Other _____

Cooling Options (requires drawing from factory)

- ☐ Chilled water
- ☐ Dx Direct Expansion
- ☐ Evaporative

Other Options

- ☐ Remote control panel
- Enclosure - surface mounted
 - ☐ NEMA12 plastic enclosure (standard)
 - ☐ Metal enclosure (NEMA rating: _____)
- 2-Position switches
 - ☐ Fan ☐ Heat ☐ Cool ☐ Hood lights
- Indicator lights
 - ☐ Fan ☐ Heat ☐ Cool ☐ Hood lights
 - ☐ Alarm ☐ Filter ☐ Other _____
- 3-Position switches
 - ☐ Heat-Off-Cool ☐ Summer-Off-Winter
 - ☐ Fan-Off-Auto ☐ Other _____
- ☐ Mild weather thermostat (inlet air sensor)
- ☐ Low temperature limit (freezestat)
- ☐ Clogged filter switch
- ☐ Gas pressure safety switch (high, low or both)
- ☐ Convenience outlet (115V service receptacle)
- ☐ Diagnostic indicator - burner control system
- ☐ Flame failure relay
- ☐ High gas pressure regulator
- ☐ Pre-purge timer
- ☐ Time clock
- ☐ Occupied/Unoccupied (Night setback)
- ☐ Discharge diffuser (3-way or 4-way)
- ☐ Elevation (over 2,000'): _____
- ☐ Other _____

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Architect	Dwg. No.	SD-DFG	
Contractor	Date	04/23	



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MODEL DFG GENERAL INFORMATION

CFM Information

Model	Housing Size	Blower CFM Limits		Maximum CFM, Size and Area	
		Minimum	Maximum	Dx or Chilled Water Coil	Evaporative Cooler
DFG-109-SM	#1	600	1,600	2,200	2,700
DFG-109		1,000	2,600	21" x 31"	24" x 29"
DFG-110		1,200	3,600	4.4 Sqft.	4.9 Sqft.
DFG-112-10	#2	1,200	3,600	3,700	4,300
DFG-112		1,800	5,000	27" x 39"	30" x 37"
DFG-115		3,000	7,000	7.3 Sqft.	7.8 Sqft.
DFG-118-15	#3	3,000	7,000	7,200	8,200
DFG-118		4,000	10,000	42" x 50"	44" x 49"
DFG-120		5,000	12,000	14.6 Sqft.	14.9 Sqft.
DFG-120-HD		5,000	15,000		
DFG-218-15	#4	6,000	14,000	13,000	16,500
DFG-218		8,000	20,000	42" x 89"	44" x 97"
DFG-220		10,000	30,000	26.0 Sqft.	30.0 Sqft.

Filter Information

Model	Housing Size	V-bank Filters		Filters in Intake Hood		Special Filters*	
		Quantity / Area	CFM @ 500 FPM	Quantity / Area	CFM @ 500 FPM	Quantity / Area	CFM @ 500 FPM
DFG-109-SM	#1	(4) 16" x 20"	4,400	(2) 16" x 25"	2,800	(2) 16" x 20"	2,200
DFG-109		8.9 Sqft.		5.6 Sqft.		4.4 Sqft.	
DFG-110							
DFG-112-10	#2	(6) 20" x 20"	8,300	(4) 20" x 20"	5,600	(2) 20" x 25"	3,500
DFG-112		16.7 Sqft.		11.1 Sqft.		6.9 Sqft.	
DFG-115							
DFG-118-15	#3	(8) 16" x 20"	14,400	(6) 20" x 25"	10,400	(4) 20" x 25"	6,900
DFG-118		(4) 20" x 20"		20.8 Sqft.		13.9 Sqft.	
DFG-120		28.9 Sqft.					
DFG-120-HD							
DFG-218-15	#4	(16) 20" x 25"	27,800	(12) 20" x 25"	20,800	(8) 20" x 25"	13,900
DFG-218		55.6 Sqft.		41.7 Sqft.		27.8 Sqft.	
DFG-220							

* Examples of special filters would include 6" and 12" deep high efficiency filters that are in flat bank located in the standard filter section.

Weight Information

Model	Housing Size	Housing Arrangement			Intake Damper	Full Perimeter Curb	Modular Curb & Rail
		H1	H2	H3			
DFG-109-SM	#1	690#	610#	620#	50#	130#	170#
DFG-109		700#	620#	630#			
DFG-110		720#	640#	650#			
DFG-112-10	#2	980#	890#	880#	60#	140#	190#
DFG-112		1,000#	910#	900#			
DFG-115		1,040#	950#	940#			
DFG-118-15	#3	1,360#	1,260#	1,180#	70#	160#	220#
DFG-118		1,400#	1,300#	1,220#			
DFG-120		1,500#	1,400#	1,320#			
DFG-120-HD		1,520#	1,420#	1,340#			
DFG-218-15	#4	2,520#	2,400#	2,230#	100#	200#	280#
DFG-218		2,600#	2,480#	2,310#			
DFG-220		2,700#	2,580#	2,410#			

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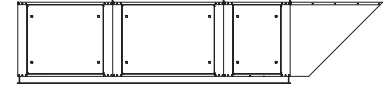
Project			Location		
Engineer					
Architect			Dwg. No.	SD-DFG	 KEES INCORPORATED 400 S. Industrial Dr. Elkhart Lake, WI 53020 Phone: (920) 876-3391 Website: www.kees.com
Contractor			Date	04/23	

MODEL DFG GENERAL INFORMATION

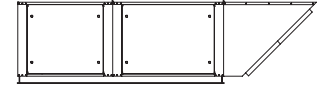
Base Rail / Curb Cap Information

Model	Housing Size	A	B	H1, H3 Housing Arrangement C	H2 Housing Arrangement C
DFG-109-SM	#1	32.00	32.00	108.00	80.00
DFG-109					
DFG-110					
DFG-112-10	#2	40.00	40.00	116.75	88.00
DFG-112					
DFG-115					
DFG-118-15	#3	51.50	56.25	132.50	104.25
DFG-118					
DFG-120					
DFG-120-HD					
DFG-218-15	#4	99.50	56.25	132.50	104.25
DFG-218					
DFG-220					

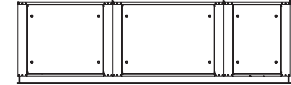
H1 Housing



H2 Housing



H3 Housing



Note: All of the dimensions are measured to the inside of the base rail / curb cap. Undersize the O.D. of the curb accordingly.

Dimension B is the curb cap measurement for Curb Arrangements A1 and A2 where the curb is under the blower section only.

Dimension C is the curb cap measurement for Curb Arrangement A4 where the curb is around the full perimeter of the unit.

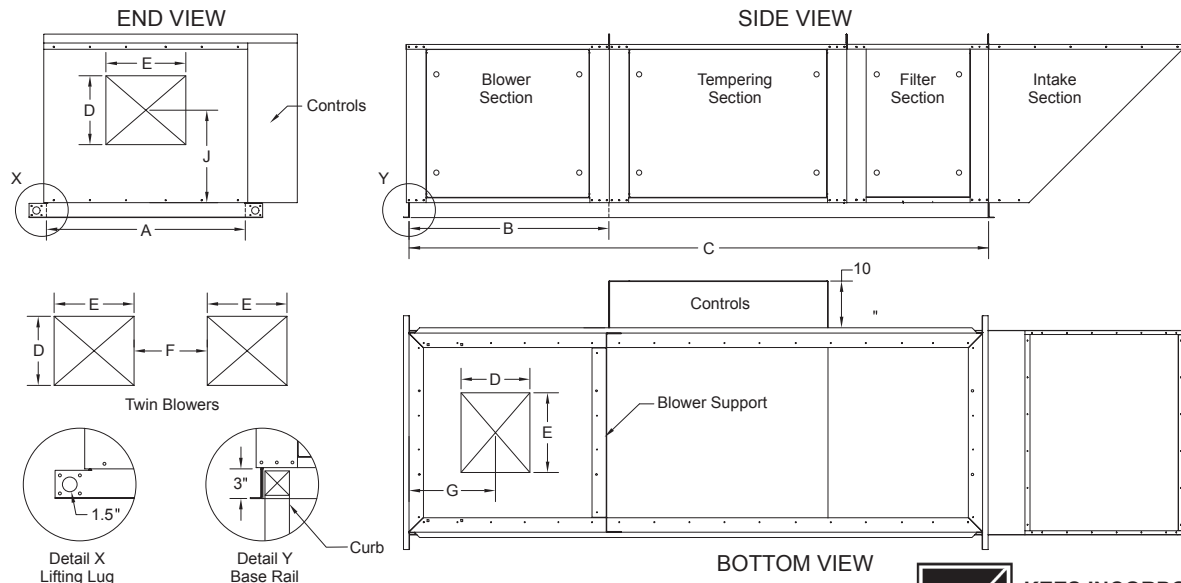
The first dimension C listed is for Housing Arrangements H1 and H3 that have the V-bank filter section.

The second dimension C is for Housing Arrangement H2. It is smaller since the V-bank filter section is replaced by flat filters in the intake section.

Blower Opening Information

Model	Housing Size	D	Blower Opening E	F	Down Discharge G	End Discharge J
DFG-109-SM	#1	10.25	7.00	NA	12.50	15.50
DFG-109		10.25	12.00	NA	12.50	15.50
DFG-110		11.50	13.25	NA	12.50	15.50
DFG-112-10	#2	11.50	13.25	NA	17.50	20.50
DFG-112		13.50	15.75	NA	17.50	20.50
DFG-115		16.00	18.75	NA	17.50	20.50
DFG-118-15	#3	16.00	18.75	NA	17.50	24.50
DFG-118		19.00	22.00	NA	25.00	24.50
DFG-120		24.75	22.75	NA	25.00	24.50
DFG-120-HD		24.75	24.75	NA	25.00	24.50
DFG-218-15	#4	16.00	18.75	15.00	25.00	17.50
DFG-218		19.00	22.00	18.00	25.00	20.75
DFG-220		24.75	24.75	20.00	25.00	24.50

Note: Blower openings are centered on the width of the unit. Dim. G is from the inside of the curb cap. Dim. J is measured from the bottom of the unit.



Note: The Controls Box extends out 10" from the tempering section. (LH controls shown above)

The views shown above are of Housing Arrangement H1.



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