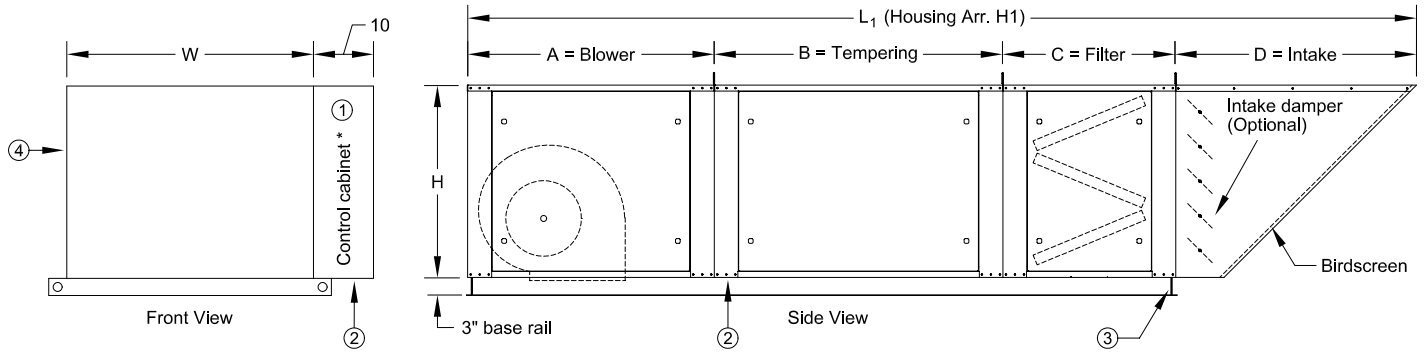


# MODEL DFG DIRECT FIRED MAKE-UP AIR HEATER

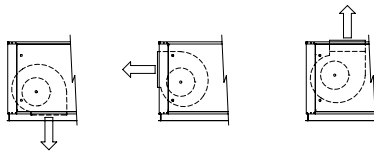


\* See note 10 below

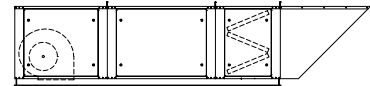
- ① Electrical connection
- ② Heater connection(s)
- ③ Lifting lugs (4)
- ④ Observation port

Select one:

- Down Discharge
- End Discharge
- Top Discharge



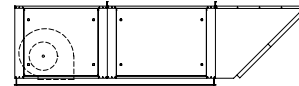
H1 Housing  
V-bank filters with intake hood



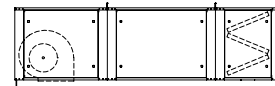
Select one:

- H1 Housing
- H2 Housing
- H3 Housing

H2 Housing  
Flat filters in the intake hood



H3 Housing  
V-bank filters, no intake hood



\* Optional intake damper adds 8" to the L<sub>3</sub> length.

## Notes:

1. Intake hood ships loose.
2. Access doors typical on both sides.
3. Refer to SD-DFG-INFO for CFM ranges, filter sizes, weights, curb cap sizes, blower openings, and a bottom view.
4. Consult factory for drawings of multi-speed or vertical units or units with return air or cooling options.
5. Refer to SD-MUA-CURB for curb options and dimensions.
6. Refer to SD-IFG for Indirect Fired Make-up Air Heaters.
7. Refer to SD-MUA for Tempered Make-up Air Units.
8. Refer to SD-NTS for Non-tempered Supply Units.
9. Refer to SD-EVAP for Evaporative Coolers.
10. 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.

Model	Housing	A	B	C	D	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub> *	H	W
						H1 Hsg.	H2 Hsg.	H3 Hsg.		
DFG-109	#1	33	48	28	34	143	115	109	26	33
DFG-110										
DFG-110	#2	41	48	29	40	158	129	118	32	41
DFG-112										
DFG-115										
DFG-115	#3	57	48	28	54	187	159	133	46	52.5
DFG-118										
DFG-120										
DFG-215	#4	57	48	28	54	187	159	133	46	101
DFG-218										
DFG-220										

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

<b>Project</b>			<b>Location</b>			
<b>Engineer</b>					<b>KEES INCORPORATED</b> 400 S. Industrial Dr. • P.O. Box L Elkhart Lake, WI 53020 Phone: (920) 876-3391 Fax: (920) 876-3065 Website: www.kees.com	
<b>Architect</b>			<b>Dwg No.</b>	<b>SD-DFG</b>		
<b>Contractor</b>			<b>Date</b>	<b>08/09</b>		



# 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-110	#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-115	#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-215	#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-110	#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-115	#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-215	#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. These would be located in a flat bank in the standard filter section.

## Weight Information

Model	Housing Size	Housing Arrangement			Intake Damper	Modular Curb & Rail	Full Perimeter Curb
		H1	H2	H3			
DFG-109-SM	#1	690#	610#	620#	50#	170#	130#
DFG-109		700#	620#	630#			
DFG-110		720#	640#	650#			
DFG-110	#2	980#	890#	880#	60#	190#	140#
DFG-112		1,000#	910#	900#			
DFG-115		1,040#	950#	940#			
DFG-115	#3	1,360#	1,260#	1,180#	70#	220#	160#
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-215	#4	2,520#	2,400#	2,230#	100#	280#	200#
DFG-218		2,600#	2,480#	2,310#			
DFG-220		2,700#	2,580#	2,410#			

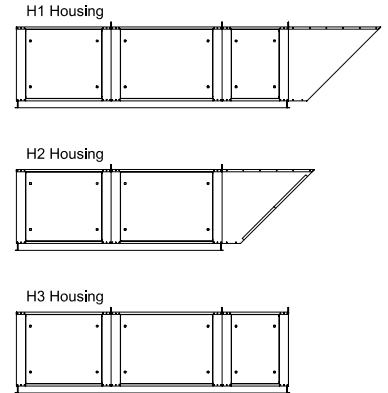
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<b>Project</b>		<b>Location</b>		
<b>Engineer</b>		 <b>KEES INCORPORATED</b> 400 S. Industrial Dr. • P.O. Box L Elkhart Lake, WI 53020 Phone: (920) 876-3391 Fax: (920) 876-3065 Website: www.kees.com		
<b>Architect</b>			<b>Drwg.</b>	<b>SD-DFG-INFO</b>
<b>Contractor</b>			<b>Date:</b>	<b>03/07</b>

# MODEL DFG GENERAL INFORMATION

## Base Rail / Curb Cap Information

Model	Housing Size	A	B	H1, H3 Housing	H2 Housing
				Arrangement	Arrangement
				C	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					



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.

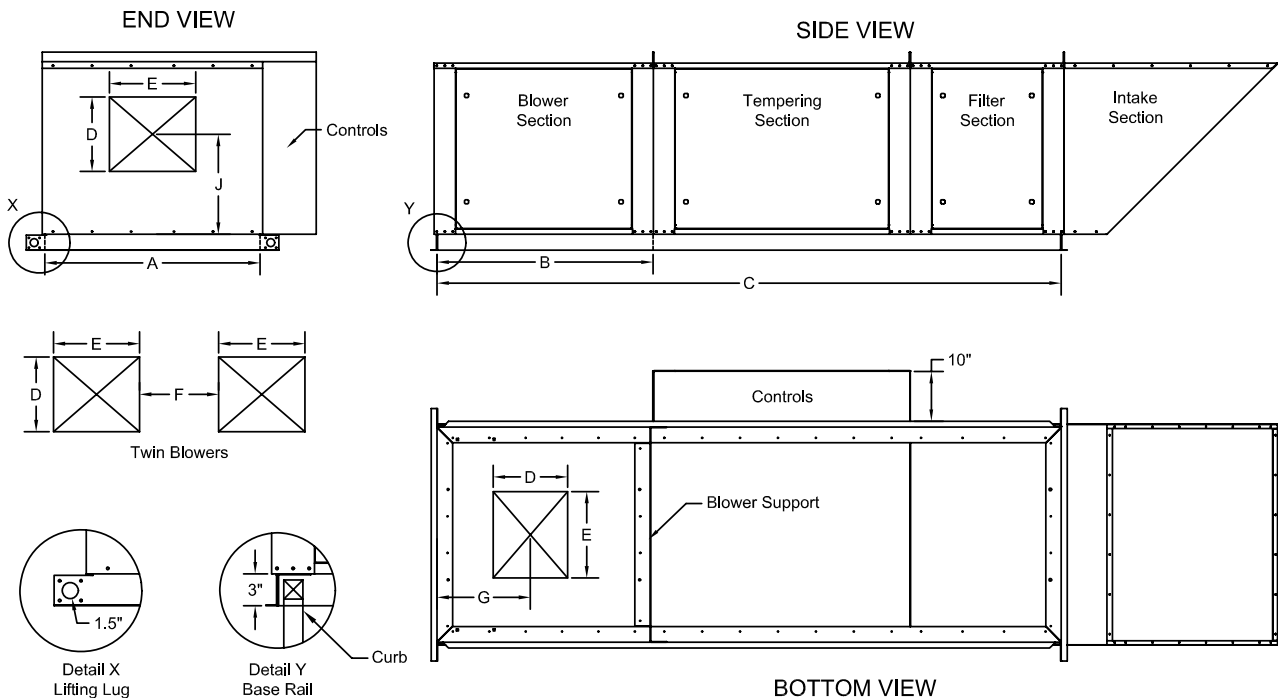
The first dimension C listed is for Housing Arrangements H1 and H3 that have the V-bank filter section.

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		Down Discharge	End Discharge
			E	F	G	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	25.00	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.

The views shown above are of Housing Arrangement H1.