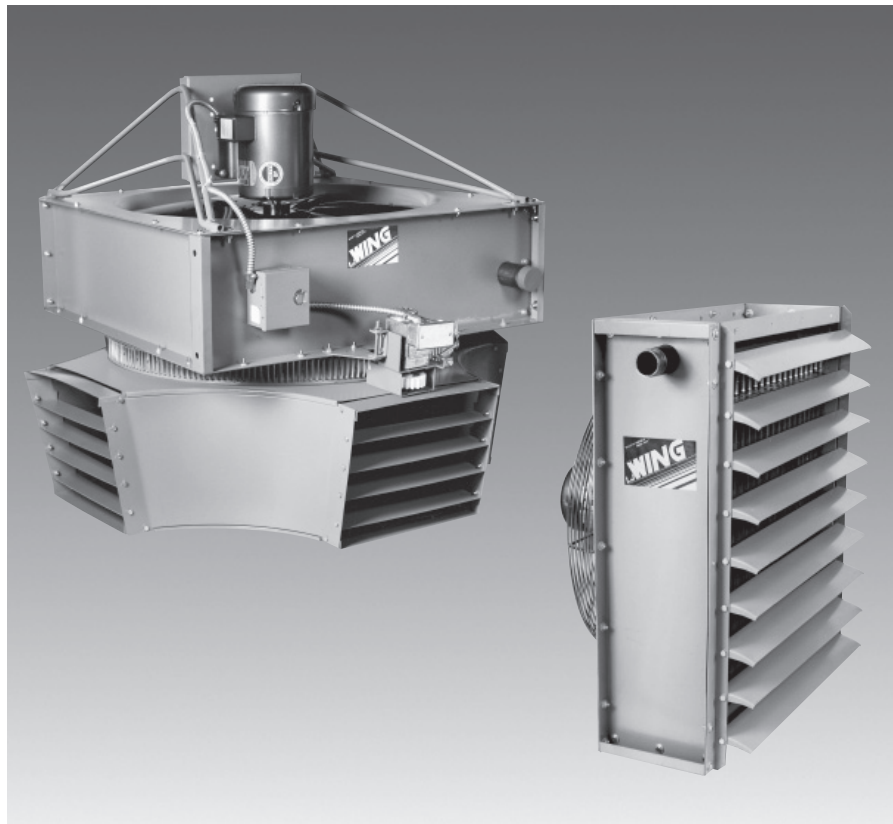


HU, HCF, HCR Unit Heaters Technical Guide



STEAM AND HOT WATER HEATERS TO PROVIDE A COMFORTABLE ENVIRONMENT IN OPEN AREAS

Since 1875, the L.J. Wing Company has been a leader in providing innovative solutions for difficult HVAC problems. Wing HU, HCF, and HCR Unit Heaters offer efficient air heating with steam or hot water for large open areas. This technical guide will help you size, select and specify the proper HU, HCF, or HCR model to satisfy your project's heating requirements. If you have questions, please contact your local L.J. Wing representative; he will be glad to assist you.



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In the interest of product improvement, L.J. Wing reserves the right to make changes without notice.

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PRODUCT DESCRIPTION

Product Offering

Wing unit heaters are available in three different models:

Type HU – Horizontal airflow with three different designs of adjustable discharge blades;

Type HCF – Vertical airflow with three different styles of fixed discharges;

Type HCR – Vertical airflow with four different styles of Wing’s unique revolving discharge.

A wide range of sizes is offered for HU, HCF, and HCR models as shown below.

Wing’s revolving discharge develops a sweeping flow of air in a circular pattern. The discharge is driven by Wing’s Positrack®, a small, high-torque gear motor that slowly rotates the discharge at one RPM by means of an idler gear drive.

Type 4R and 5R discharge designs have adjustable louvers, while type 8R and 10R have adjustable deflectors. Proper positioning of the louvers or deflectors assures maximum floor coverage commensurate with mounting height.

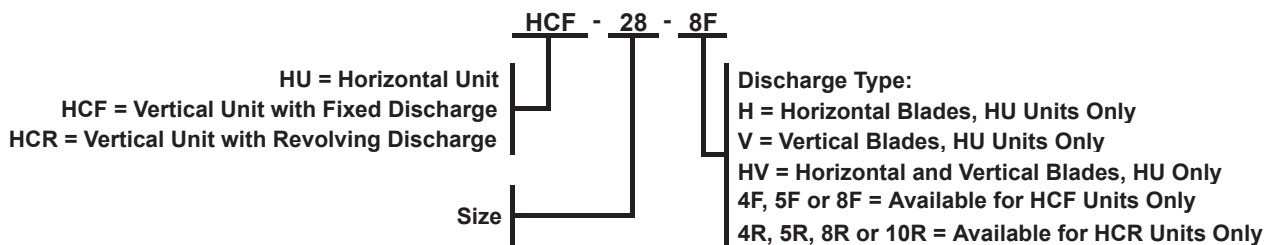
Motor and Sound Data

SIZE	CFM (AT INLET)	MOTOR HP	MOTOR RPM	SOUND PRESSURE LEVEL (dBA) AT DISTANCE FROM UNIT				SOUND POWER LEVEL (dB)
				5'	10'	20'	30'	
2.5*	750	1/20	1,550	57.8	51.8	48.3	45.8	73.1
13	885	1/6	1,750	55.7	49.7	46.2	43.7	78.0
15	1,200	1/6	1,150	57.1	51.1	47.6	45.1	79.0
17	1,400	1/6	1,150	55.9	49.9	46.4	43.9	79.0
18	1,700	1/4	1,750	57.0	51.0	47.5	45.0	80.0
19	2,000	1/4	1,150	59.1	53.1	49.6	47.1	82.0
20	2,550	1/3	1,750	60.5	51.5	51.0	48.5	82.0
22	2,750	1/4	1,150	61.2	55.2	51.7	49.2	84.4
23	3,600	1/2	1,150	63.6	57.6	54.1	51.6	86.0
25	4,300	1/2	1,150	76.8	70.8	67.3	64.8	96.3
26	5,500	3/4	1,150	78.4	72.4	68.9	66.4	98.0
28	6,500	3/4	850	74.3	68.3	64.8	62.3	92.5
30	7,000	3/4	850	75.1	69.1	65.6	63.1	92.5
33	8,700	1	850	76.6	70.6	67.1	64.6	94.5
36	10,000	1 1/2	850	77.1	71.1	67.6	65.1	95.0
38	13,000	2	850	79.0	73.0	69.5	67.5	97.0
40	16,500	3	850	80.2	74.2	70.7	68.2	99.0
43	21,500	5	850	83.5	77.5	74.0	71.5	101.5
44	27,000	7 1/2	850	84.9	78.9	75.4	72.9	102.5

Notes: * Available for HU models only.

1. Integral OSHA-approved fan guards are furnished as standard on all units up to and including size 26. For larger sizes, OSHA-approved fan guards are optional.
2. All units are direct-driven. Sizes 28 through 44 units in optional belt drive configuration are available with 1,750 RPM motors.

Model Number Description



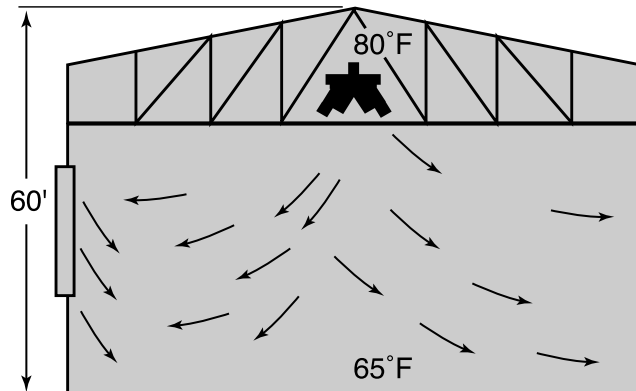
SELECTION

General Guidelines

The first step in selection should be the calculation of the building heat loss.

The next step is to look at individual Wing unit heater capacities, heating coverage and mounting height data. You will find that with Wing's large capacity/coverage models, fewer heaters will be required. This will reduce the cost of installation, piping, wiring and controls. In addition, ongoing savings in operating and maintenance costs will be achieved.

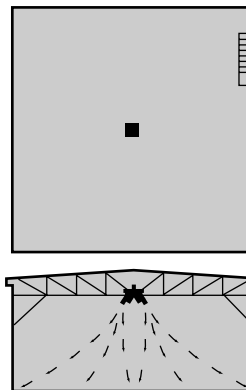
Wing heaters can be mounted high in truss or ceiling areas, freeing up valuable floor space and recirculating stratified air as they operate. Type HU horizontal unit heaters are available for maximum mounting heights up to 28 feet. This makes them ideal for buildings with lower ceiling heights. For taller buildings, type HCF and HCR unit heaters offer mounting heights up to 73 feet.



Wing vertical unit heaters minimize stratification by drawing in hot air from the truss area and distributing it to the floor level. They reduce the floor-to-ceiling temperature gradient, reduce roof heat loss, and conserve fuel.

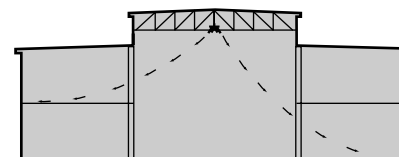
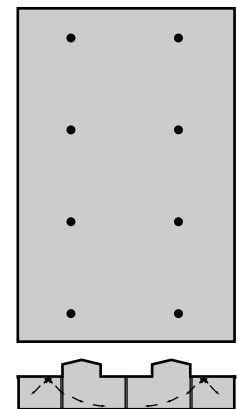
Using capacities at up to 5 lb. Steam and published mounting heights and coverage will insure the proper velocity and temperature of the air as it reaches the comfort level, 5 to 6 feet above the floor. For higher steam pressures we recommend that heater sections be factory adjusted to maintain the 5 lb. level.

Select the type of discharge with the lowest maximum mounting height suitable for the installation. Keep in mind that revolving discharges are especially useful for installations where machinery or storage racks would make air distribution with fixed discharges difficult. The gentle sweeping motion of the revolving discharge insures better overall coverage with minimal temperature gradients from floor to ceiling.



Typical monitor-style building is very satisfactorily heated by type HCF or HCR unit heaters, located high in the center, where they are out of the way of cranes.

Wide double monitor-style building is easily heated with two rows of HCF or HCR unit heaters, Building is 360' by 240' and heaters are mounted 32 ft. high where they do not interfere with cranes.



Two floor levels are perfectly heated with only one Wing type HCR unit heater. This is accomplished by adjusting the discharge outlets so that one outlet covers the upper floor or balcony while the other covers the ground floor.

SELECTION AND PERFORMANCE

Unit Selection Procedure and Steam Performance Data

Steam Performance

For 5 psig operation:

1. Read the heat transfer, Q, and leaving air temperature, LAT, directly from the table below.
2. Calculate CL = (Q x 1,000)/LH (where LH = Latent Heat from Latent Heat table).

For 2 psig operation:

1. Multiply the table value of Q by 0.95
2. Calculate CL = (Q x 1,000)/LH
3. Calculate Air Temperature Rise, ATR:
 $ATR = (Q \times 1,000) / (1.085 \times CFM)$, where CFM is obtained from the Motor and Sound Data table.
4. Calculate LAT = EAT + ATR.

For operation at pressures higher than 5 psig:

The heating surface is factory adjusted so the heater will deliver the same Q and LAT as shown in the table.

1. Read Q and LAT from table for 5 psig.
2. Calculate CL = (Q x 1,000)/ LH.

Example A: Calculate the performance for a size 20 heater at 5 psig and EAT = 60° F.

Solution:

1. Q = 167.8 MBH and LAT = 121° F.
2. CL = (167.8 x 1,000)/961 = 175 lbm/hr.

Example B: Calculate the performance for a size 20 heater at 2 psig and EAT = 60° F.

Solution:

1. Q = 0.95 x 167.8 = 159.4 MBH.
2. CL = (159.4 x 1,000)/966 = 165 lbm/hr.
3. ATR = (159.4 x 1,000)/(1.085 x 2,550) = 58° F.
4. LAT = 60 + 58 = 118° F.

Hot Water Performance

1. Given the Water Temperature Drop, WTD, through the heater, read the standard heat transfer, QS, and standard water flow rate, GPMS, from the Hot Water Performance Table at EWT = 200° F and EAT = 60° F.
2. Look up the Hot Water Performance Correction Factor, WPF, from the table on page 6 at the given EWT and EAT.
3. Calculate Q = WPF x QS
4. Calculate WTD = (Q x 1,000)/(495 x GPMS)
5. Look up the CFM for the unit from the Motor and Sound Data table.
6. Calculate ATR = (Q x 1,000)/(1.085 x CFM)
7. Calculate LAT = EAT + ATR.
8. Read Water Pressure Drop, WPD, from the Hot Water Performance table.

Example:

Determine the performance of a size 40 heater with EWT = 190° F, EAT = 55° F, and WTD = 15° F.

Solution:

1. QS = 652.9 MBH and GPMS = 87.8.
2. WPF = 0.97.
3. Q = 0.97 x 652.9 = 633.3 MBH.
4. WTD = (633.3 x 1,000)/(495 x 87.8) = 14.6° F.
5. CFM = 16,500.
6. ATR = (633.3 x 1,000)/(1.085 x 16,500) = 35° F.
7. LAT = 55 + 35 = 90° F.
8. WPD = 5.1 ft. H₂O.

Note: For performance with other tube or fin materials, or with other water flow rates, or with glycol solutions, please consult your local Wing representative.

Steam Performance - 5 psig

SIZE	Entering Air Temperature, EAT (deg. F)									
	50		55		60		65		70	
	Q (MBH)	LAT (deg. F)	Q (MBH)	LAT (deg. F)	Q (MBH)	LAT (deg. F)	Q (MBH)	LAT (deg. F)	Q (MBH)	LAT (deg. F)
2.5	59.1	123	57.5	126	55.8	129	54.1	132	52.5	135
13	64.8	118	63.0	121	61.1	124	59.3	127	57.5	130
15	82.7	114	80.3	117	78.0	120	75.7	123	73.3	126
17	99.7	116	96.9	119	94.1	122	91.3	125	88.4	128
18	120.6	115	117.2	119	113.8	122	110.4	125	107.0	128
19	142.1	116	138.1	119	134.1	122	130.1	125	126.0	128
20	177.8	114	172.8	117	167.8	121	162.7	124	157.7	127
22	203.8	118	198.0	121	192.3	124	186.5	128	180.8	131
23	259.8	117	252.5	120	245.1	123	237.8	126	230.5	129
25	311.1	117	302.3	120	293.5	123	284.7	126	275.9	129
26	387.3	115	376.4	118	365.4	121	354.5	124	343.6	128
28	454.8	115	441.9	118	429.1	121	416.3	124	403.4	127
30	474.1	112	460.7	116	447.4	119	434.0	122	420.6	125
33	578.9	111	562.6	115	546.2	118	529.9	121	513.6	124
36	677.3	112	658.2	116	639.1	119	620.0	122	600.8	125
38	790.3	106	768.0	109	745.7	113	723.4	116	701.1	120
40	1,041.5	108	1,012.2	112	982.8	115	953.4	118	924.0	122
43	1,291.7	105	1,255.2	109	1,218.8	112	1,182.3	116	1,145.8	119
44	1,458.9	100	1,417.7	103	1,376.5	107	1,335.3	111	1,294.1	114

PERFORMANCE

Hot Water Performance

Hot Water Performance

SIZE	WTD (deg. F)	QS (MBH)	GPM	LAT (deg. F)	WPD (feet water)
2.5	10	36.4	7.4	105	1.1
	20	27.6	2.8	94	0.2
	25	24.8	2.0	90	0.1
13	10	39.7	8.0	101	1.3
	20	30.7	3.1	92	0.2
	25	27.4	2.2	89	0.1
15	10	51.6	10.4	100	2.2
	20	42.8	4.3	93	0.4
	25	38.5	3.1	90	0.2
17	10	62.2	12.6	101	1.9
	20	50.6	5.1	93	0.3
	25	45.6	3.7	90	0.2
18	10	77.6	15.7	102	3.4
	20	66.4	6.7	96	0.6
	25	60.4	4.9	93	0.3
19	10	91.7	18.5	102	3.5
	20	79.0	8.0	96	0.7
	25	71.8	5.8	93	0.3
20	15	110.6	14.9	100	2.5
	20	105.0	10.6	98	1.3
	30	90.7	6.1	93	0.4
22	15	126.3	17.0	102	1.8
	20	117.9	11.9	100	0.9
	30	99.4	6.7	93	0.3
23	15	166.0	22.4	103	3.8
	20	158.4	16.0	101	2.0
	30	140.4	9.5	96	0.7
25	15	198.8	26.8	103	3.8
	20	189.8	19.2	101	2.0
	30	167.8	11.3	96	0.7
26	15	254.2	34.2	103	7.4
	20	242.5	24.5	101	3.8
	30	223.8	15.1	98	1.4
28	15	298.3	40.2	102	7.5
	20	284.5	28.7	100	3.8
	30	262.7	17.7	97	1.5
30	15	309.1	41.5	101	8.0
	20	295.2	29.8	99	4.1
	30	273.5	18.4	96	1.6
33	15	381.8	51.5	101	14.5
	20	370.9	37.5	99	7.7
	30	347.0	23.4	97	3.0
36	15	449.0	60.3	101	14.3
	20	435.9	44.0	100	7.6
	30	408.0	27.5	98	3.0
38	15	510.8	69.0	96	18.7
	20	499.6	50.5	95	10.0
	30	469.1	31.6	93	3.9
40	15	652.9	87.8	97	5.1
	20	623.0	63.0	95	2.6
	30	565.9	38.1	92	1.0
43	15	805.2	108.5	95	5.9
	20	767.7	77.5	93	3.0
	30	705.5	47.5	90	1.1
44	15	896.7	121.0	91	7.4
	20	857.7	86.5	89	3.8
	30	797.7	53.7	87	1.5

Hot Water Performance Correction Factors

EWT (deg. F)	ENTERING AIR TEMP. EAT (deg. F)				
	50	55	60	65	70
140	0.64	0.61	0.57	0.54	0.50
150	0.71	0.68	0.64	0.61	0.57
160	0.79	0.76	0.72	0.68	0.63
170	0.87	0.83	0.79	0.75	0.70
180	0.94	0.90	0.86	0.82	0.77
190	1.01	0.97	0.93	0.87	0.80
200	1.08	1.04	1.00	0.99	0.97
210	1.16	1.12	1.07	1.03	0.99
220	1.23	1.19	1.14	1.10	1.06

Latent Heat

SP	LH	SP	LH
2	966	40	919
5	961	50	911
10	953	60	904
15	945	70	897
20	939	80	891
30	929	100	880


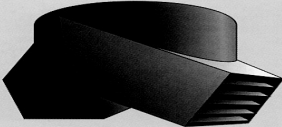
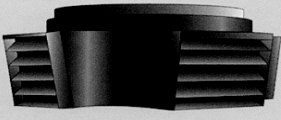
Note:


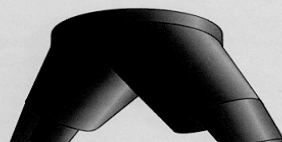
SP = Steam Pressure in psig

LH = Latent heat of steam in BTU/lbm.

PERFORMANCE

Vertical Discharges

TYPE 1F			TYPES 4F & 4R			TYPES 5F & 5R		
								
SIZE	MH	CF	MH	CR	CF	MH	CR	CF
13	10	20x40	10	43x43	22x43	8	43x43	43x43
15	11	23x46	10	50x50	25x50	8	50x50	50x50
17	12	26x52	11	56x56	28x56	9	56x56	56x56
18	13	27x54	11	59x59	30x59	9	59x59	59x59
19	14	29x58	12	63x63	32x63	10	63x63	63x63
20	15	30x60	13	66x66	33x66	11	66x66	66x66
22	16	33x66	14	73x73	37x73	12	73x73	73x73
23	17	35x70	15	76x76	38x76	12	76x76	76x76
25	18	38x76	16	83x83	42x83	13	83x83	83x83
26	19	39x78	17	86x86	43x86	14	86x86	86x86
28	21	42x84	18	96x96	48x96	14	92x92	92x92
30	22	45x90	19	105x105	52x105	15	99x99	99x99
33	23	49x99	20	115x115	57x115	16	109x109	109x109
36	24	54x108	21	120x120	60x120	17	119x119	119x119
38	26	55x112	24	145x145	72x145	18	125x125	125x125
40	28	60x115	25	152x152	76x152	19	132x132	132x132
43	31	65x122	31	180x180	90x180	21	139x139	139x139
44	34	65x122	34	195x195	97x195	24	150x150	150x150




TYPE 10R			TYPES 8R & 8F		
					
SIZE	MH	CR	MH	CR	CF
13	---	---	12	39x39	20x39
15	---	---	13	45x45	23x45
17	---	---	14	51x51	26x51
18	---	---	15	54x54	27x54
19	---	---	16	57x57	28x57
20	---	---	17	60x60	30x60
22	---	---	18	66x66	33x66
23	---	---	19	69x69	35x69
25	---	---	20	75x75	38x75
26	---	---	21	78x78	39x78
28	30	91x91	26	84x84	42x84
30	33	98x98	28	90x90	45x90
33	37	110x110	30	100x100	50x100
36	39	118x118	32	108x108	54x108
38	46	127x127	40	114x114	57x114
40	51	132x132	43	120x120	60x120
43	68	150x150	58	130x130	65x130
44	73	160x160	63	140x140	70x140

Notes:

- MH = Mounting height in feet;
CF = Coverage in feet for a fixed discharge;
CR = Coverage in feet for a revolving discharge.
- Mounting height is the distance from the floor to the bottom of the discharge outlet.
- Mounting height and coverage are based on 115 deg. F EAT and 65 deg. F floor temperature. For operation at other conditions, consult your Wing representative for recommendations.

PERFORMANCE

Horizontal Discharges

	TYPE H		TYPE V		TYPE HV	
						
SIZE	MH	EHT	MH	EHT	MH	EHT
2.5	9	30	9	30	9	30
13	10	35	10	35	10	35
15	12	40	12	40	12	40
17	12	45	12	45	12	45
18	13	50	13	50	13	50
19	13	55	13	55	13	55
20	13	60	13	60	13	60
22	14	65	14	65	14	65
23	14	70	14	70	14	70
25	15	75	15	75	15	75
26	17	80	17	80	17	80
28	18	88	18	88	18	88
30	18	92	18	92	18	92
33	19	102	19	102	19	102
36	19	110	19	110	19	110
38	20	122	20	122	20	122
40	22	135	22	135	22	135
43	25	155	25	155	25	155
44	28	180	28	180	28	180

Notes:

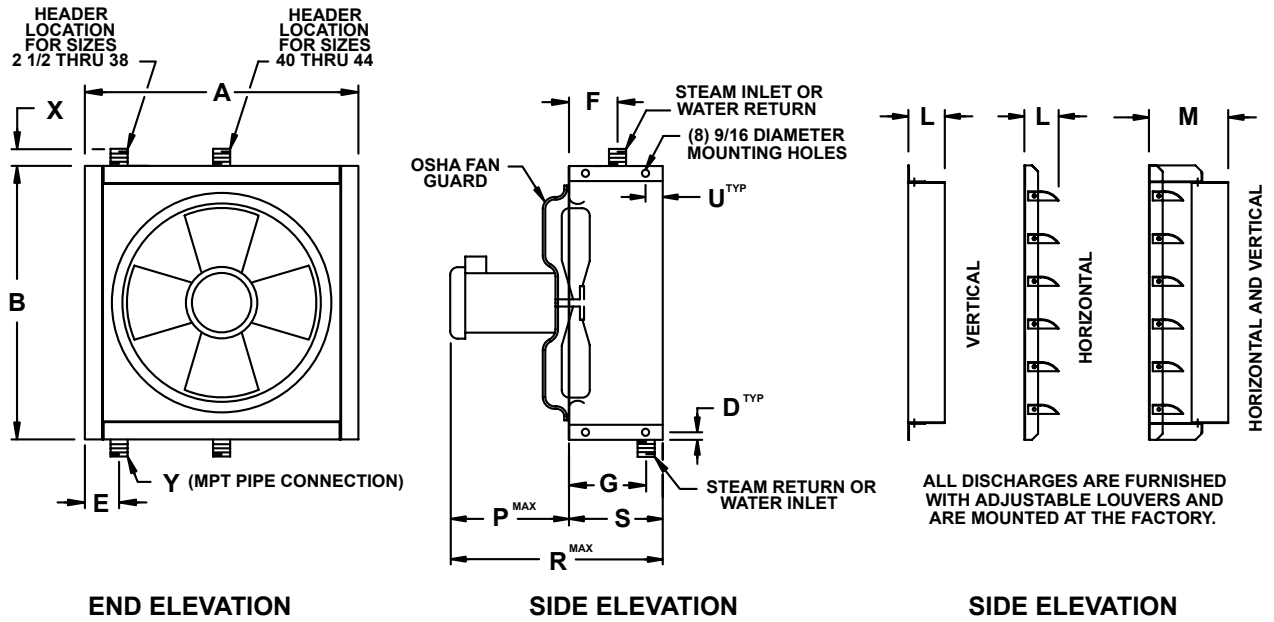
- 1 MH = Mounting height in feet;
EHT = Effective Heating Throw in feet.
- 2 Mounting height is the distance from the floor to the bottom of the discharge outlet.
- 3 Mounting height and coverage are based on 115 deg. F EAT and 60 deg. F floor temperature. For operation at other conditions, consult your Wing representative for recommendations.

DIMENSIONS

Unit Dimensions

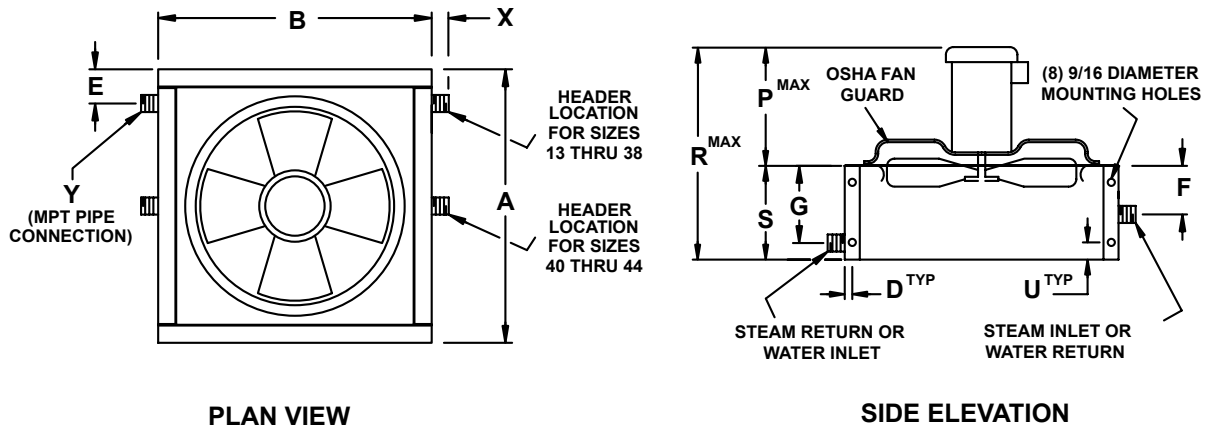
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TYPE HU



NOTE : HU-2.5 THRU HU-26 PROVIDED WITH OSHA FAN GUARD AS SHOWN.
 OSHA FAN GUARD OPTIONAL ON SIZES HU-28 THRU HU-44.

TYPES HCF AND HCR



NOTE : SIZE HCF, HCR-13 THRU HCF, HCR-26 PROVIDED WITH OSHA FAN GUARD AS SHOWN.
 OSHA FAN GUARD OPTIONAL ON SIZES HCF, HCR-28 THRU HCF, HCR-44.

DIMENSIONS

Unit Dimensions and Weights

UNIT DIMENSIONS

SIZE	A	B	D	E	F	G	L	M	P	R	S	U	X	Y
2.5	16	16	1/2	2	4 1/4	5 7/8	3 5/16	6 1/2	8 1/2	14 1/8	8 3/8	1	1	1
13	16	16	1/2	2 11/32	4 1/4	5 7/8	3 5/16	6 1/2	10 5/16	18 3/4	8 3/8	-	2 1/2	1
15	18 1/4	19 3/4	5/8	2 1/2	4 7/16	6 1/2	3 5/16	6 1/2	14	22	8	1	1 1/2	1 1/2
17	19 3/8	19 3/8	5/8	2 1/2	4 7/16	6 1/2	3 5/16	6 1/2	14	22	8	1	1 1/2	1 1/2
18	22 3/8	19 3/4	5/8	2 1/2	4 7/16	6 1/2	3 5/16	6 1/2	14	22	8	1	1 1/2	1 1/2
19	22 3/8	22 3/8	5/8	2 1/2	5 7/8	7 5/16	3 5/16	6 1/2	18	27	9	1	1 1/2	1 1/2
20	27 3/8	27 3/8	5/8	2 1/2	5 7/8	7 5/16	3 5/16	6 1/2	18	27	9	1	1 1/2	1 1/2
22	27 3/8	27 3/4	5/8	2 5/8	5	7 5/16	3 5/16	6 1/2	18	27	9	1	1 1/2	1 1/2
23	32 3/8	32 3/8	5/8	2 5/8	5	7 5/16	3 5/16	6 1/2	18	27	9	1	1 1/2	1 1/2
25	32 3/4	32 3/4	5/8	2 5/8	5	7 7/16	3 5/16	6 1/2	19	28	9	1	1 1/2	1 1/2
26	38 1/8	32 3/4	5/8	2 5/8	5	7 7/16	3 5/16	8 1/2	19	28	9	1	1 1/2	1 1/2
28	39 1/8	39 1/8	7/8	3 3/8	7	9 5/8	4 5/16	8 1/2	17	29	12	1 1/2	2	2
30	39 1/8	39 1/8	7/8	3 3/8	7	9 5/8	4 5/16	8 1/2	17	29	12	1 1/2	2	2
33	45 1/8	39 1/8	7/8	3 3/8	7	9 5/8	4 5/16	8 1/2	18	30	12	1 1/2	2	2
36	45 1/8	45 1/8	7/8	3 3/8	7	9 5/8	4 5/16	8 1/2	18	30	12	1 1/2	2	2
38	45 1/8	45 1/8	7/8	3 3/8	7	9 5/8	4 5/16	8 1/2	18	30	12	1 1/2	2	2
40	63 1/8	51 5/8	7/8	31 9/16	11 1/4	15 1/4	4 5/16	8 1/2	19	43	24	1 1/2	2	3
43	63 1/8	51 5/8	7/8	31 9/16	11 1/4	15 1/4	4 5/16	8 1/2	19	43	24	1 1/2	2	3
44	63 1/8	51 5/8	7/8	31 9/16	11 1/4	15 1/4	4 5/16	8 1/2	21	43	24	1 1/2	2	3

NOTE:

1. All dimensions in inches.

UNIT WEIGHTS WITH DISCHARGE

Size	HU			HCF				HCR			
	H	V	HV	4F	5F	8F	10F	4R	5R	8R	10R
2.5	39	41	45	---	---	---	---	---	---	---	---
13	40	42	46	96	95	91	---	101	100	96	---
15	41	44	53	98	97	93	---	103	102	98	---
17	41	44	52	101	101	101	---	106	107	106	---
18	43	47	56	106	106	105	---	112	112	111	---
19	47	50	59	130	126	128	---	136	133	135	---
20	57	58	72	147	142	144	---	154	148	150	---
22	60	62	77	175	166	171	---	182	173	178	---
23	72	74	92	191	188	189	---	198	195	196	---
25	73	78	97	220	220	216	---	259	258	254	---
26	97	100	124	251	251	252	---	290	290	290	---
28	138	144	172	357	359	351	345	401	404	395	389
30	138	144	172	357	359	351	345	401	404	395	389
33	163	169	199	397	402	395	389	442	446	440	433
36	174	184	222	472	455	463	437	577	559	567	541
38	205	215	253	503	486	494	468	608	590	598	572
40	283	301	357	782	811	776	747	901	931	896	866
43	417	435	491	929	959	924	894	1,049	1,078	1,043	1,014
44	452	470	526	970	1,002	954	930	1,090	1,122	1,073	1,050

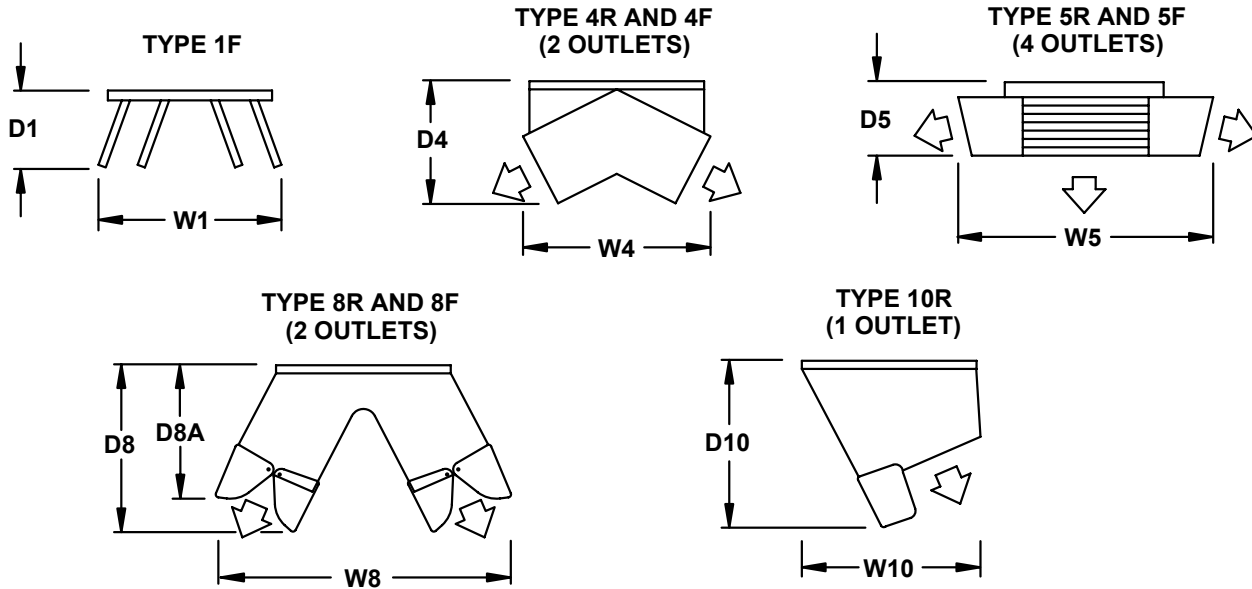
NOTE:

1. All weights in pounds.

DIMENSIONS

Vertical Discharges

C000650

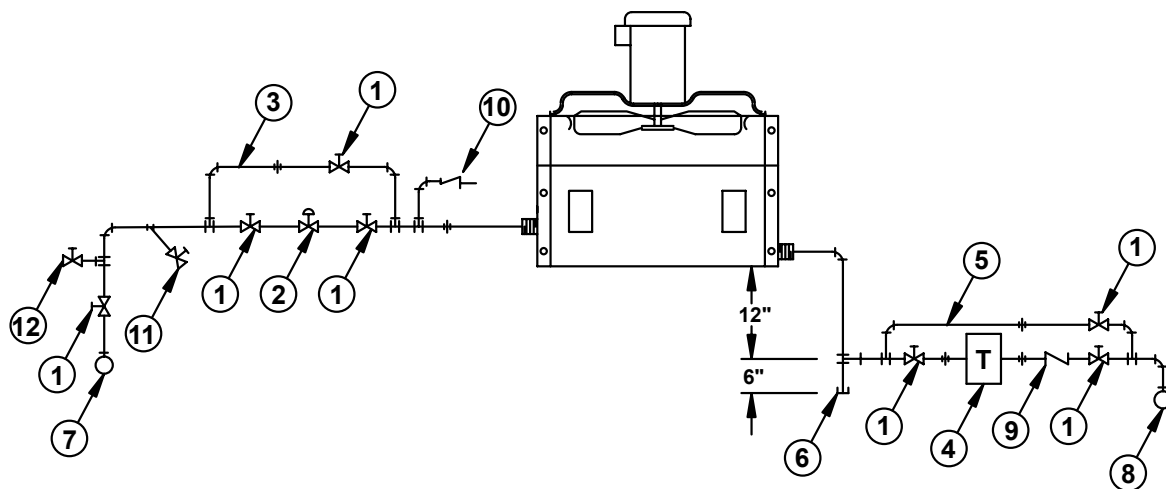


VERTICAL DISCHARGE DIMENSIONS

SIZE	D1	W1	D4	W4	D5	W5	D8	D8A	W8	D10	W10
13	7 1/8	27 1/8	16 1/16	20 13/16	9 5/8	22	21 9/16	19 13/16	29 1/2	----	----
15	7 1/8	27 1/8	16 1/16	20 13/16	9 5/8	22	21 9/16	19 13/16	29 1/2	----	----
17	7 1/8	27 1/8	17 3/8	25 3/16	10 1/8	25 1/2	24 3/8	22 3/8	35 1/2	----	----
18	7 1/8	27 1/8	17 3/8	25 3/16	10 1/8	25 1/2	24 3/8	22 3/8	35 1/2	----	----
19	7 1/8	31 1/8	18 9/16	25 1/8	11 1/8	28 15/16	27 9/16	24 13/16	41	----	----
20	7 1/8	31 1/8	18 9/16	25 1/8	11 1/8	28 15/16	27 9/16	24 13/16	41	----	----
22	8 1/8	38 1/16	21	29 1/8	11 7/8	34 1/2	29 7/8	26 7/8	47 1/2	----	----
23	8 1/8	38 1/16	21	29 1/8	11 7/8	34 1/2	29 7/8	26 7/8	47 1/2	----	----
25	9 1/8	45	24 7/8	39 1/4	14 3/4	40	31 1/2	28 1/4	53 1/2	----	----
26	9 1/8	45	24 7/8	39 1/4	14 3/4	40	31 1/2	28 1/4	53 1/2	----	----
28	10 1/8	52 3/8	28 1/4	39 13/16	17 3/8	50	35 1/2	33 3/4	64	40 1/2	39 11/16
30	10 1/8	52 3/8	28 1/4	39 13/16	17 3/8	50	35 1/2	33 3/4	64	40 1/2	39 11/16
33	10 1/8	52 3/8	28 1/4	39 13/16	17 3/8	50	35 1/2	33 3/4	64	40 1/2	39 11/16
36	10 1/8	58 3/8	35 1/4	47 1/4	20 1/16	57	47 1/16	43 5/16	77	45 13/16	44 7/8
38	10 1/8	58 3/8	35 1/4	47 1/4	20 1/16	57	47 1/16	43 5/16	77	45 13/16	44 7/8
40	10 1/8	64 7/8	39 1/4	51 1/16	21 15/16	66 1/2	54 9/16	49 5/16	89 1/2	52 9/16	53 3/16
43	10 1/8	64 7/8	39 1/4	51 1/16	21 15/16	66 1/2	54 9/16	49 5/16	89 1/2	52 9/16	53 3/16
44	10 1/8	64 7/8	42 1/8	55 3/16	23 11/16	66 1/2	53 7/16	47 7/16	86	50 3/16	56

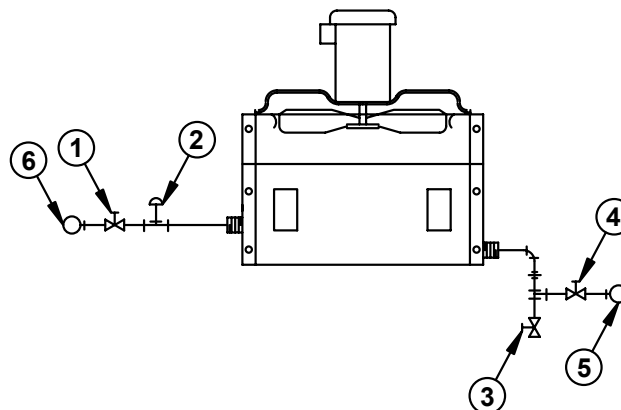
NOTES:

1. All dimensions in inches.
2. Values shown for D4, D5, D8, and D8A apply to revolving discharge only. To get dimension of fixed discharge, subtract 13/16" from values shown for sizes 13 through 33 and for larger sizes, subtract 1 3/4".
3. To get overall unit height including the discharge, add dimension R from page 11 plus 3" for a standoff channel, plus either D4, D5, D8, or D10 as appropriate from the above table.



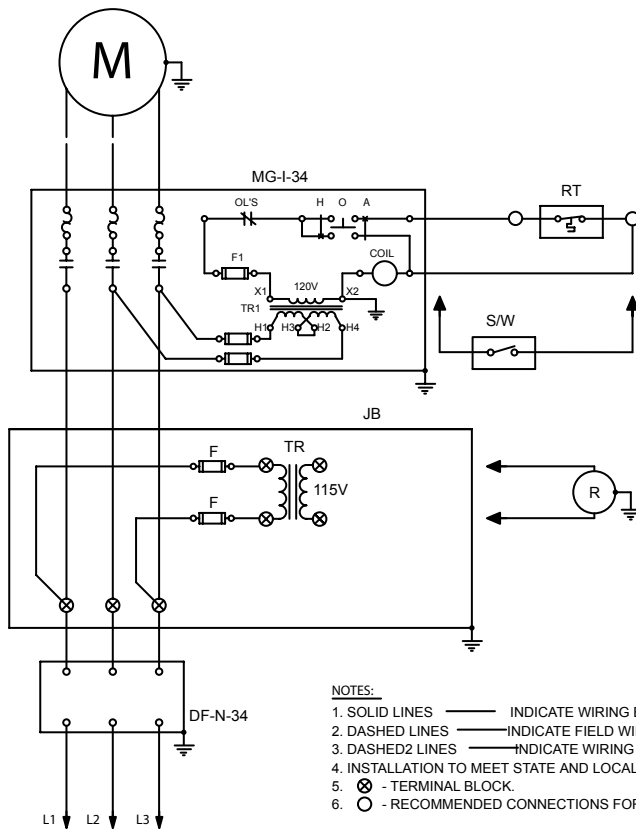
STEAM PIPING LEGEND (FOR GRAVITY ATMOSPHERIC RETURN SYSTEMS)

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. GLOBE OR GATE VALVE 2. OPTIONAL MOTORIZED SHUT-OFF VALVE 3. BY-PASS TO ALLOW SERVICING OF MOTORIZED VALVE.
BYPASS LINE TO BE THE SAME SIZE AS MOTORIZED VALVE. 4. INVERTED BUCKET OR COMBINATION FLOAT AND THERMOSTATIC TRAP WITH VENT. 5. BY-PASS TO PERMIT SERVICING OF TRAP. BY-PASS TO BE ONE PIPE SIZE LARGER THAN TRAP ORIFICE. 6. DIRT POCKET AND DRIP LEG. TO BE THE SAME SIZE AS THE HEATER CONDENSATE RETURN LINE. | <ul style="list-style-type: none"> 7. STEAM SUPPLY MAIN. 8. CONDENSATE RETURN MAIN. 9. 15° SWING CHECK VALVE. 10. 15° VACUUM BREAKER CHECK VALVE TO ATMOSPHERE. 11. STEAM STRAINER WITH BLOW-DOWN VALVE. 12. 1/2" DRAIN VALVE. TO BE OPENED WHEN GLOBE OR GATE SHUTOFF VALVE IS CLOSED. |
|--|---|



HOT WATER PIPING LEGEND

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. GLOBE OR GATE VALVE 2. AUTOMATIC AIR VENT 3. COIL DRAIN VALVE | <ul style="list-style-type: none"> 4. WATER FLOW CONTROL VALVE 5. HOT WATER SUPPLY LINE 6. HOT WATER RETURN LINE |
|--|---|



OPTIONS:

- (MG-I-34) MAGNETIC STARTER - IEC1
- (MG-N-34) MAGNETIC STARTER - NEMA1
- (DF-N-34) FUSED DISCONNECT SWITCH - NEMA1
- (R) REVOLVING DISCHARGE MOTOR
- (S/W) SUMMER/WINTER SWITCH
- (F) FUSE
- (RT) ROOM THERMOSTAT - LINE VOLTAGE
- (DS) DOOR SWITCH
- (TR) TRANSFORMER
- (JB) JUNCTION BOX

NOTES:

1. SOLID LINES ——— INDICATE WIRING BY WING.
2. DASHED LINES ——— INDICATE FIELD WIRING BY OTHERS.
3. DASHED2 LINES ——— INDICATE WIRING BY WING OR BY OTHERS (SEE OPTIONS LISTING ABOVE).
4. INSTALLATION TO MEET STATE AND LOCAL BUILDING CODES.
5. ⊗ - TERMINAL BLOCK.
6. ○ - RECOMMENDED CONNECTIONS FOR CONTROL COMPONENTS.

Wiring

Fan motors on HU-2.5 heaters are equipped with internal thermal overload protection. All other units should be equipped with either a manual or a magnetic starter. (Both of these items are available as options). They may be factory-mounted and wired or shipped loose. For your convenience, both NEMA-rated and IEC-rated starters are offered. Please note that HU-2.5 units cannot be fitted with a unit-mounted starter and/or disconnect due to the unit's small size.

Smaller single-phase motors may be controlled with a line voltage thermostat, while larger single phase and all three phase motors require a magnetic starter, with the thermostat controlling the holding coil.

Models equipped with revolving discharges are supplied with the "R" drive motor pre-wired. Units supplied for any electrical service other than 115 volts/single-phase or 230 volts/three-phase are factory equipped with a step-down transformer.

Fan motors, "R" Drive (revolving discharge) motors, and room thermostats are available in explosion-proof versions. The required Division, Class, and Group must be known to properly select explosion-proof items.

ELECTRICAL

Amp Draw Table

ITEM	SOURCE	ELECTRICAL SERVICE	MOTOR AMPS AT GIVEN MOTOR HORSEPOWER										
			1/6	1/4	1/3	1/2	3/4	1	1 1/2	2	3	5	7 1/2
A	Fan Motor	115 V 1 Ph	4.4	5.8	7.2	9.8	13.8	16.0	20.0	24.0	34.0	56.0	80.0
		208V 3 Ph	1.4	1.7	1.9	2.4	3.5	4.6	6.6	7.5	10.6	16.7	24.2
		230V 3 Ph	1.2	1.3	1.6	2.2	3.2	4.2	6.0	6.8	9.6	15.2	22.0
		460V 3 Ph	0.6	0.7	0.8	1.1	1.6	2.1	3.0	3.4	4.8	7.6	11.0
		575V 3 Ph	0.5	0.5	0.6	0.9	1.3	1.7	2.4	2.7	3.9	6.1	9.0
B	Control Transformer	ELECTRICAL SERVICE	CONTROL CIRCUIT AMPS										
		115 V 1 Ph	0.9										
		208V 3 Ph	0.5										
		230V 3 Ph	0.4										
		460V 3 Ph	0.2										
		575V 3 Ph	0.2										

NOTES:

1. For motors smaller than 1/2 HP, motor amps are based on motors as manufactured by Baldor; for larger motor HP, motor amps are based on latest version of the National Electrical Code.
2. Control circuit amps are based on standard controls and a 100va-rated transformer.
3. Steps to size optional disconnect switch:
 - A. Using the required fan motor HP from page 4 and the given electrical service, look up the fan motor amp draw from Item A in the above chart.
 - B. Look up the control circuit amps from Item B in above chart.
 - C. Add Fan Motor amps from Step A to Control Circuit amps of Step B, then multiply result by 1.25 to get required size of optional disconnect switch.

SPECIFICATIONS AND SCHEDULE

Typical Specification

General

Furnish a factory-assembled HU, HCF, HCR model unit heater as manufactured by L.J. Wing, Dallas, TX. Unit shall heat air using steam or hot water as the heating medium with performance as shown in the schedule. Finned heating elements shall be fabricated of seamless return bend type 3/8" o.d. copper tubes with rectangular 0.010" thick aluminum fins. Each tube shall be secured to the headers by a brazed joint. The opposite end of the tubes shall be secured by channel-shaped retainers that permit expansion and contraction. Finned elements shall be factory tested with 200 psig steam and 500 psig hydrostatic pressure.

Unit shall have a propeller type fan blade driven by a TEFC motor (**optional:** explosion-proof direct drive motor) with electrical characteristics as scheduled. Each unit shall be provided with a non-overloading fan wheel directly connected to a constant speed motor with prelubricated, sealed ball bearings. The fan wheel shall be dynamically balanced and used in conjunction with an inlet venturi.

Casing and discharge shall be constructed of galvanized sheet metal painted inside and out with an air-dried alkyd enamel finish.

Discharge

HU units only:

Unit shall be fitted with (type H discharge with horizontal blades; type V discharge with vertical blades; type HV discharge with horizontal and vertical blades) to provide maximum throw of the heated air. Blades shall be adjustable.

HCF units only:

Unit shall be fitted with (type 4F, 5F or 8F discharge) to provide proper coverage at the floor.

HCR units only:

Unit shall be provided with a (type 4R, 5R, 8R or 10R) revolving discharge consisting of a gear-driven revolving outlet mounted on a sheet steel air chamber that is properly balanced and suspended from the unit casing on a dual, prelubricated, sealed ball bearing assembly. (Type 8R and 10R only: Each outlet opening shall be fitted with adjustable deflectors to permit adjusting the discharged air to provide proper coverage at the floor.)

Controls (optional)

(A) Furnish a remote control panel with NEMA 1 housing, contactors, overload relays, line voltage to 120-volt transformer, line and control terminal strips.

(B) Furnish magnetic motor starter that is (shipped loose; mounted and wired).

(C) Furnish (non-fused; fused) disconnect switch that is (shipped loose; mounted and wired).

Typical Schedule

Model no.	Airflow Rate (scfm)	Ent. Air Temp. (deg. F)	Leav. Air Temp. (deg. F)	Steam Pressure (psig)	Heat Transfer (MBH)	Condensate load (lbm/hr)	Electrical Service (volt/ph./Hz)	Motor Horsepower (HP)
HU-20-HV	2,550	60	121	5	168	175	230/3/60	1/3