

**CHICAGO**

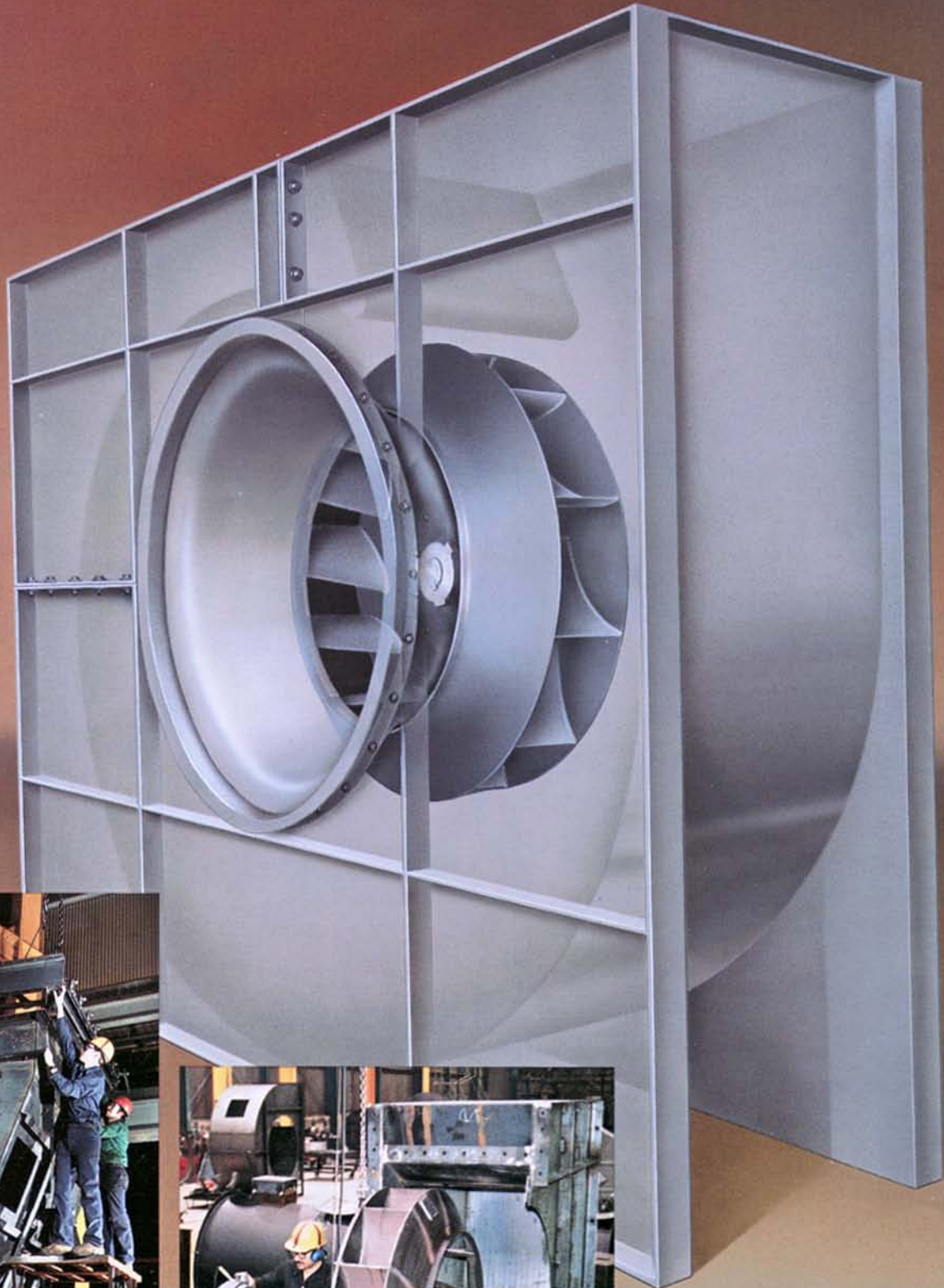
*an ISO 9001 Company*

BULLETIN IRT 103



**IRT**  
Industrial Radial Tip  
**FANS**

# Upgrade to **HICAGO**



# ...the Right Fan for every Application

Chicago's Industrial Radial Tip (IRT) fan was designed specifically for demanding heavy-duty applications, including hot gasses and fumes, induced draft, process exhaust and light concentrations of solids in a variety of industries. The IRT combines the advantages of the radial and backward inclined blades and replaces the traditional light-duty exhauster with a more rugged, longer life fan. It will handle moderate to high pressures and temperatures and has a static efficiency capability of 76%.

Chicago's IRT offers exceptional efficiency, performance, reliability and versatility with a choice of belt drive or direct drive arrangements. Nine standard models from size 3000 to 6000 provide pressures to 30" WG, and capacities to

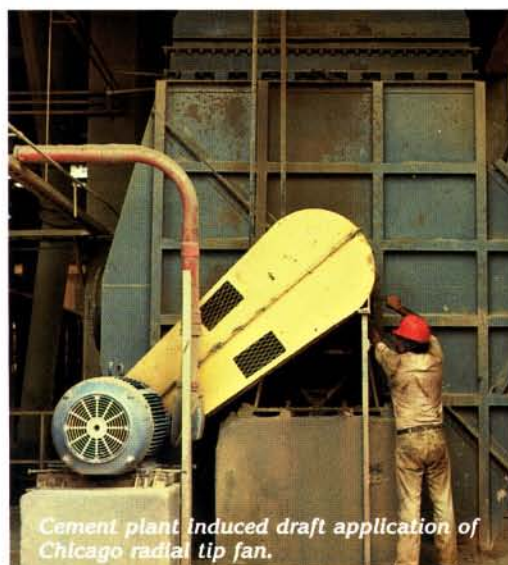
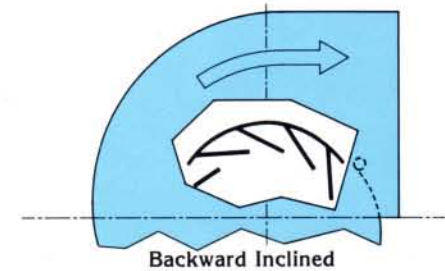
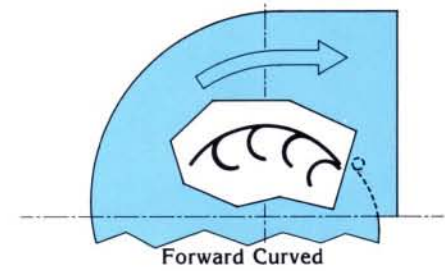
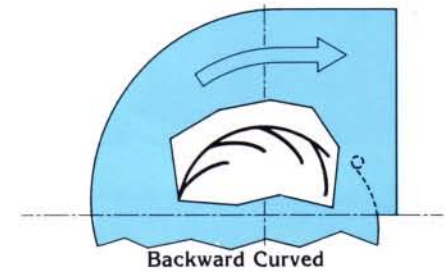
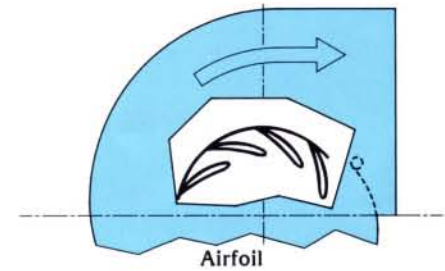
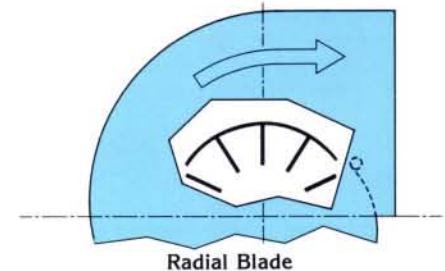
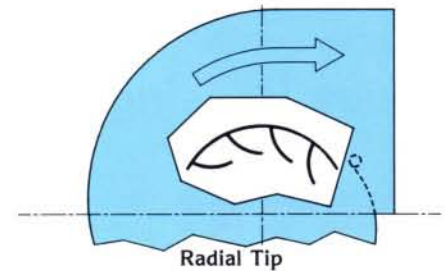
116,000 CFM at temperatures up to 800°F. Performance ratings are based on tests made in accordance with AMCA standard 210 and AMCA standard 300.

Chicago's IRT is the right choice for many industrial applications. Other applications, however, will need higher pressures and temperatures, or require greater efficiency, or require tougher solids-handling capability.

The following table and illustrations compare the basic heavy-duty types. Each is designed to solve particular application problems and all are available from Chicago Blower. For assistance with fan application or selection, consult with a Chicago Blower Sales Engineer.

## Typical Industrial Applications

Blade Type	Pressure Range (WG)	MAX Temp (°F)	MAX CFM	Applications
Radial Tip	10"-40"	800	300,000	Moderately dirty environment, induced draft on coal fired boilers, process exhaust, cement kiln exhaust. Medium efficiency
Radial Blade	20"-40"	1250	90,000	Severe duty environment, induced draft, conveying sawdust, woodchips, metal chips. Low efficiency
Airfoil	8"-35"	800	450,000	Clean gas, forced draft on boilers, induced draft process combustion. High efficiency
Backward Curved	20"-100"	800	120,000	Relatively clean gas, induced draft after baghouse process blowers, forced draft on fluid bed boilers. High efficiency
Forward Curved	8"	1500	60,000	High temperature applications with low operating speeds. Medium efficiency
Backward Inclined	30"	800	120,000	Clean to slightly dirty gas, induced draft on boilers, baghouses, forced draft, combustion air. Medium efficiency



# IRT Design Features

## Square Housing

The IRT adapts Chicago's unique rugged square housing proven for structural integrity and dependability in thousands of installations world-wide. This design also offers the unmatched versatility of three available discharges should the field installation ever require the discharge to be changed or the fan moved to another site. Only a minimal amount of field rework is needed.

In the upblast position, the square housing is capable of handling much

higher stack loads than the traditional scroll shaped housing without any additional bracing and cost. If an angular discharge is required, the scroll shaped housing is available.

All housings are split, as standard, to facilitate wheel and shaft removal without disturbing the inlet or outlet ductwork. Continuously welded steel plate reinforced with strong structural bracing maintain housing stability.

## Wheels

Chicago's Industrial Radial Tip wheel is constructed from heavy ASTM A-242 steel and fabricated by skilled welders. Other abrasion-resistant blade materials and liners are available. Each IRT wheel is statically and dynamically balanced to assure smooth, trouble-free operation.



## Bearings and Shafts

Bearings are heavy duty double row spherical rollers mounted in a split pillow block housing. Typical bearing

L-10 life ranges from 400,000 for direct drive to 100,000 hours minimum L-10 life on belt drive configurations. Bearings and shafts are designed for gas temperatures up to 800°F.

All shafts are machined from AISI 1040 steel and precision ground and polished. Shafts are shrink fitted to the wheel hub to ensure the integrity of the fit when under vibratory loads or elevated temperatures.

## Bearing Pedestal

The IRT has a new wide-base angular bearing pedestal for increased stability for V-belt and direct drive applications. It is constructed from heavy plate and internally reinforced.

## Belt or Direct Drive

To suit individual system requirements, arrangements 1 and 8 are both offered to provide the versatility of belt drive and the inherent advantages of direct drive. Regardless of arrangement selected, the shaft first critical speed is well above running speed to assure trouble free performance under all operating conditions.

Since bearings and shafts are identical for both drive types, it is possible to convert direct drive to belt drive to increase capacity, providing wheel speed maximums are not exceeded.



## Dampers

Outlet dampers effectively control the air volume and can also be used to isolate the fan from the system.

Dampers are sized to match the fan outlet or recommended evase section. They are furnished with ball bearings and stuffing boxes. Double surfaced opposed blades run perpendicular to the fan shaft. Outlet dampers are suitable for manual or automatic operation at temperatures to 800°F.

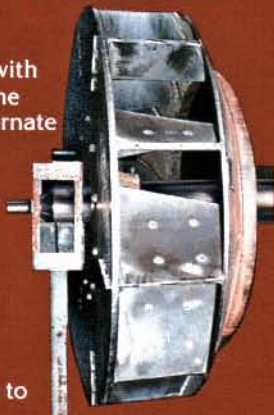
Inlet box dampers are provided with double surfaced parallel blades to allow the incoming gasses to pre swirl in the inlet box, reducing the flow as the characteristic curve shape is changed. Dampers can be controlled manually or with automatic pneumatic or electric actuators.

## Access Doors

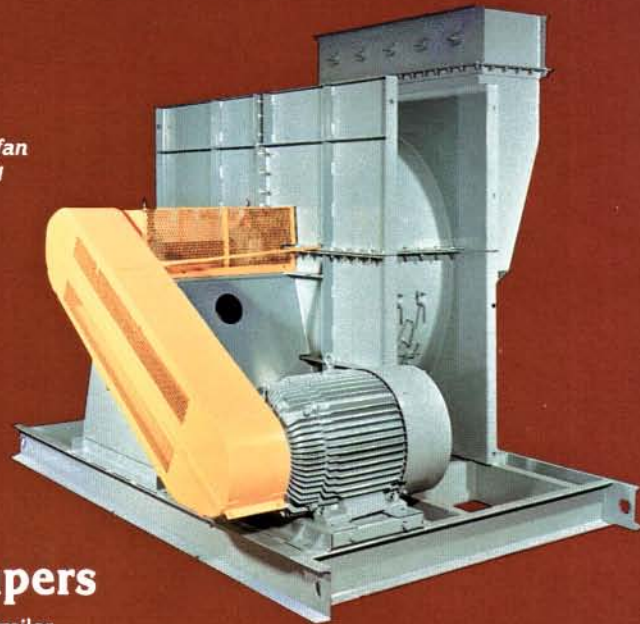
A rectangular clamp type door is flushed mounted to the scroll and has quick opening tension latches. A round plug type door is raised 4" to allow for housing insulation. Both doors are neoprene gasketed for temperatures to 300°F, non-asbestos gasketed to 800°F.

## Abrasion-Resistant Blades

For application with excessive airborne particulates, alternate fabrication of alloy steel are available. Also, various blade liners can be continuously welded to the blade or, in the case of ceramic liners, cemented to the blade.



*Arrangement 9H IRT fan equipped with unitary base, inlet box and damper, access door and cooling wheel with guard.*

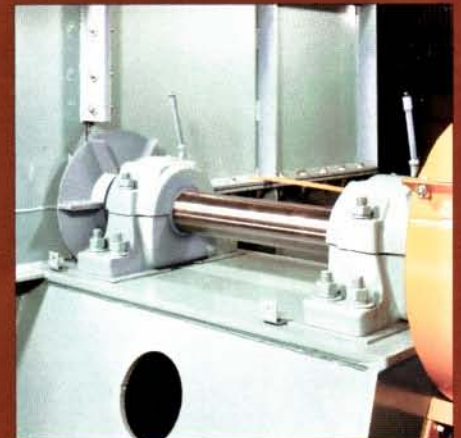
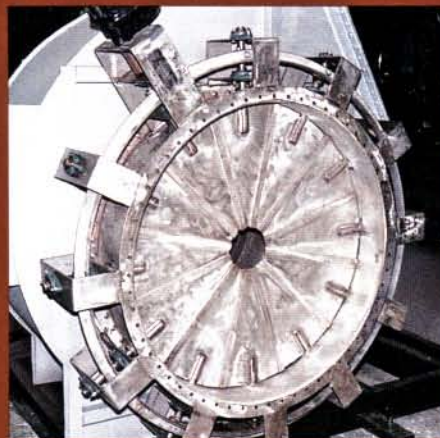


## Inlet Vane Dampers

Inlet Vane Dampers produce similar results as the inlet box dampers, and they more efficiently reduce horsepower consumption. The gasses must be relatively clean as erosion can occur in the high velocity gas stream. The operating mechanism and bearings are mounted externally from the gas stream, always insuring easy access and lubrication of bearings. The Inlet Vane Dampers are available in a variety of optional materials.

## Cooling Wheel and Guard

For gas stream temperatures above 300°F, a cast aluminum finned disc is mounted between the fan housing and inboard bearing to help dissipate heat. A safety guard is included. A longer wheel and shaft guard with extended lube lines is also available.



## Angular Discharge

Conventional scroll type housings are available to accommodate any angular discharge position.

## Flanged Inlet

A formed pre-punched inlet ring simplifies duct connection.

## Unitary Base

Structural steel base is used to support the fan, motor and drive. Fans are factory assembled, run tested and final balanced.

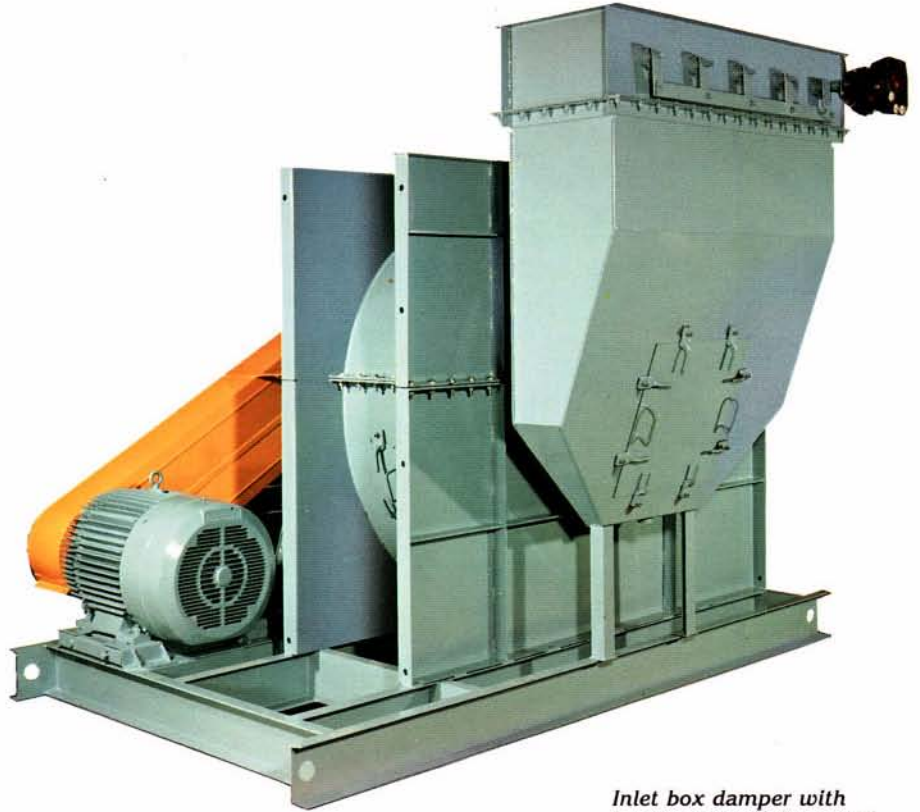
## Special Coatings and Construction

Custom finishes to customer specification are available, including corrosion and heat resistant coatings and various construction modifications for severe duty applications.

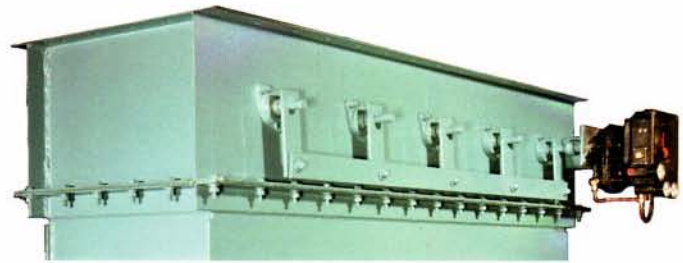
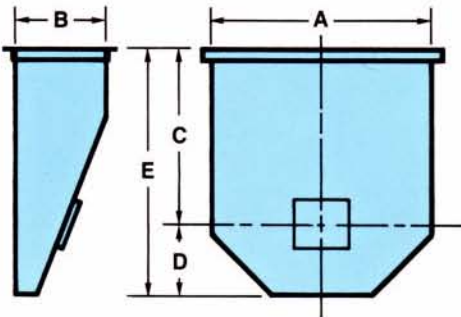
## IRT Optional Inlet Boxes

When a field condition restricts the use of a properly designed elbow, an inlet box provides a smooth air flow into the fan. Chicago inlet boxes are designed aerodynamically in conjunction with the fan to achieve maximum performance. They are bolted to the fan inlet in the orientation selected from the five inlet box positions shown below. The box can easily be turned in the field if required.

Heavy duty construction of the box is the same as for the IRT Fan, continuously welded and reinforced with heavy gauge steel. Inlet boxes include a punched inlet flange, quick clamp access door and drain. They are assembled and mounted prior to shipment and left assembled, when possible, to minimize field work.

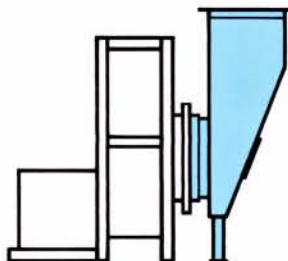


*Inlet box damper with heavy gauge linkage and mounted actuator.*

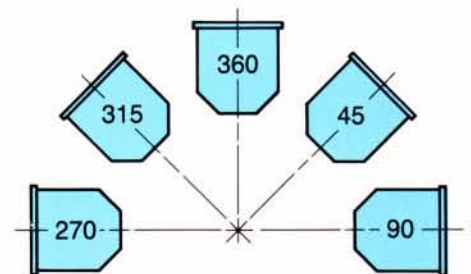


DIMENSIONS IN INCHES							
Fan Size	Sq. Ft. Inlet Area	A	B	C	D	E	Wt. (Lbs.)
3000	3.97	41 <sup>3</sup> / <sub>8</sub>	13 <sup>7</sup> / <sub>8</sub>	28 <sup>7</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>16</sub>	44 <sup>5</sup> / <sub>8</sub>	284
3300	4.80	45 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>4</sub>	31 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>16</sub>	49 <sup>1</sup> / <sub>16</sub>	335
3612	5.88	50 <sup>3</sup> / <sub>8</sub>	16 <sup>7</sup> / <sub>8</sub>	34 <sup>1</sup> / <sub>2</sub>	19 <sup>1</sup> / <sub>16</sub>	54 <sup>3</sup> / <sub>16</sub>	402
4014	7.15	55 <sup>1</sup> / <sub>2</sub>	18 <sup>5</sup> / <sub>8</sub>	38 <sup>1</sup> / <sub>16</sub>	21 <sup>7</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	485
4412	8.74	61 <sup>3</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>2</sub>	42 <sup>1</sup> / <sub>16</sub>	23 <sup>1</sup> / <sub>16</sub>	65 <sup>3</sup> / <sub>4</sub>	584
4900	10.59	67 <sup>5</sup> / <sub>8</sub>	22 <sup>5</sup> / <sub>8</sub>	46 <sup>5</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>16</sub>	72 <sup>3</sup> / <sub>8</sub>	919
5414	12.98	74 <sup>7</sup> / <sub>8</sub>	24 <sup>3</sup> / <sub>4</sub>	51 <sup>1</sup> / <sub>4</sub>	28 <sup>7</sup> / <sub>8</sub>	80 <sup>1</sup> / <sub>8</sub>	1099
5718	14.39	78 <sup>3</sup> / <sub>4</sub>	26 <sup>3</sup> / <sub>8</sub>	54	30 <sup>3</sup> / <sub>8</sub>	84 <sup>3</sup> / <sub>8</sub>	1206
6000	15.88	82 <sup>5</sup> / <sub>8</sub>	27 <sup>5</sup> / <sub>8</sub>	56 <sup>1</sup> / <sub>16</sub>	31 <sup>7</sup> / <sub>8</sub>	88 <sup>9</sup> / <sub>16</sub>	1402

### Arrangement

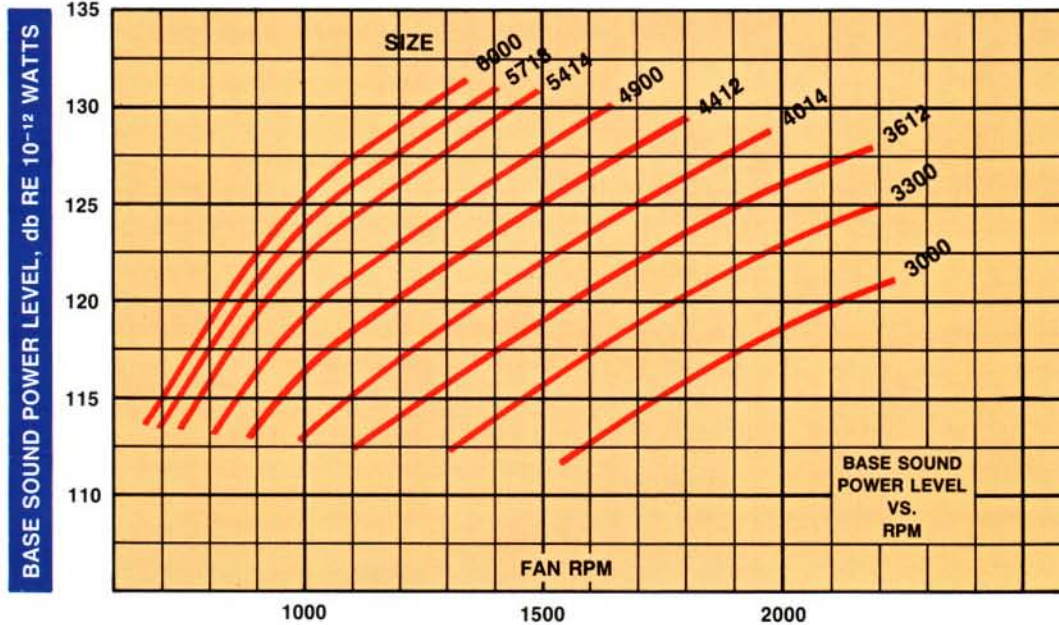


### Inlet Box Positions



**Inlet Box Positions**  
Positions Determined From Fan Drive Side

CURVE 1



**PROCEDURE:**

Enter dB chart at fan RPM and read vertically up to fan size. Resulting dB value is then used as a base from which octave band values may be obtained by applying corrections shown in Table 1 at this RPM. Further correction must be applied to account for the point of operation on the fan's characteristic curve. Calculate velocity pressure (VP) at the fan outlet and divide by fan static pressure (SP). Apply corrections, at this VP/SP, from Table 2. See example, page 8.

**NOTES:**

The sound power ratings shown are decibel levels (referred to 10<sup>-12</sup> watts) and were obtained in accordance with AMCA standard 300, test setup no. 2. Values shown are total Sound Power internal to any ductwork.

Table 1

OCTAVE BAND CONVERSION AT VARIOUS RPM'S									
OCTAVE CENTER Hz		1	2	3	4	5	6	7	8
		63	125	250	500	1000	2000	4000	8000
RPM	600	-3	-4	-10	-16	-21	-26	-31	-35
	700	-2	-5	-9	-16	-21	-26	-31	-35
	800	-2	-7	-9	-16	-21	-26	-31	-35
	900	-2	-8	-8	-17	-21	-26	-31	-35
	1000	-2	-9	-8	-17	-22	-26	-31	-36
	1200	-2	-7	-8	-14	-20	-25	-30	-34
	1400	-3	-5	-8	-12	-19	-24	-29	-33
	1600	-4	-4	-9	-11	-19	-23	-28	-33
	1800	-5	-3	-10	-10	-18	-23	-28	-33
	2000	-6	-3	-10	-9	-18	-23	-27	-32
2200	-6	-3	-9	-9	-17	-22	-27	-32	

**Fan Outlet Area**

FAN SIZE	OUTLET AREA, FT <sup>2</sup>
3000	5.19
3300	6.28
3612	7.68
4014	9.32
4412	11.41
4900	13.83
5414	16.97
5718	18.82
6000	20.74

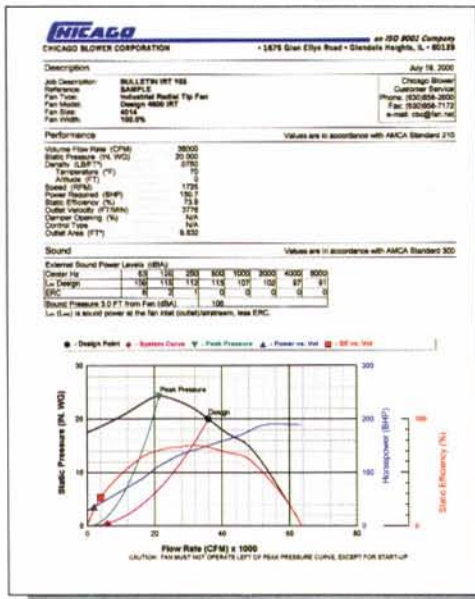
Table 2

CORRECTION FOR POINT OF OPERATION, dB									
OCTAVE		1	2	3	4	5	6	7	8
VP/SP RATIO	.018-.037	0	0	0	0	0	0	0	0
	.038-.082	-4	-2	-1	2	5	5	4	3
	.083-.104	-3	0	1	5	7	7	6	5

# IRT Selection Data

Refer to Chicago Blower's Selection Program, fan.net, for performance, fan curves and sound data.

Contact your local Chicago Blower sales engineer for software and assistance.



## Sample Selection for Belt Drive

1. Required: 42000 CFM; 400°F; 1500 feet elevation; 10" S.P.
2. Since Rating Tables are at sea level and 70°F. (.075 lb./ft<sup>3</sup> density), convert required SP to equivalent SP at standard conditions using altitude and temperature correction factors from Table 3.

$$10" \times 1.71 = 17.1" \text{ SP}$$

3. From Rating Tables, select size 4412 fan.
4. Double interpolating from Rating Table, fan performance is:

Static Pressure	17"		17.1"		18"	
	CFM	RPM	BHP	RPM	BHP	BHP
40,000	1449	144.8			1479	1525
42,000	1471	153.9	1474	154.7	1486	157.8
44,000	1492	163.4			1521	171.5

5. Note that BHP from Rating Table is for handling air at .075 lb/ft<sup>3</sup> density; for BHP at actual temperature and elevation, divide Rating Table BHP by altitude and temperature factor:  
 $154.7 \div 1.71 = 90.5 \text{ BHP at conditions.}$

If temperature were over 500°F., correct performance for increased running clearances would be determined as follows:

$$\begin{aligned} \text{RPM} \times 1.05 &= \text{revised RPM} \\ \text{BHP} \times 1.02 &= \text{revised BHP} \end{aligned}$$

**CONCLUSION:** Size 4412 fan will deliver 42000 CFM, 400°F., 1500 feet elevation, 10" SP, running at 1474 RPM requiring 90.5 BHP at operating conditions. Note, this does not include V-belt drive losses of approximately 5%.

6. Check fan mechanical limitations: Since maximum wheel speed shown in Rating Table of 1781 RPM is at 70°F., speed deration factor for temperature from Table 4 of .943 must be used:  
 $.943 \times 1781 = 1679 \text{ Maximum RPM at } 400^\circ\text{F.}$   
From Rating Table, maximum HP belt drive is 250, so even if fan is motored for cold startup with 200 HP motor, Size 4412 fan is satisfactory mechanically.
7. **Sound Levels:** Enter Curve 1 on Page 7 at RPM of fan and read base dB value of 124 dB.

- A. For octave band analysis, use conversions in Table 1:  
**OCTAVE BAND**                    1   2   3   4   5   6   7   8  
Base                                124 124 124 124 124 124 124 124  
Conversion                       -3   -5   -8   -12   -19   -24   -29   -33  
Sound Power Level               121 119 116 112 105 106 95 91

- B. For point of operation correction, determine fan velocity pressure.

$$VP = \left( \frac{\text{Outlet Velocity}}{4006} \right)^2$$

Enter Table 2 with VP/SP ratio, and apply corrections to the sound power levels determined in step A.

$$VP = \left( \frac{3684}{4006} \right)^2 = .845 \quad \frac{VP}{SP} = \frac{.845}{17.1} = .049$$

OCTAVE BAND	1	2	3	4	5	6	7	8
Sound Power from Step A	121	119	116	112	105	100	95	91
Point of Operation Sound Power Levels (dB re 10 <sup>-12</sup> watts)	-4	-2	-1	2	5	5	4	3
	117	117	115	114	110	105	99	94

Table 3

ALTITUDE & TEMPERATURE CORRECTION FACTORS												
ALTITUDE (FEET) WITH BAROMETRIC PRESSURE IN "Hg												
TEMP. °F	0'	500'	1000'	1500'	2000'	2500'	3000'	3500'	4000'	4500'	5000'	
-40	.79	.81	.82	.84	.85	.87	.88	.90	.92	.93	.95	
0	.87	.88	.90	.92	.93	.95	.97	.99	1.00	1.02	1.04	
40	.94	.96	.98	1.00	1.01	1.03	1.05	1.07	1.09	1.11	1.13	
70	1.00	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	
80	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	1.22	
100	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.25	1.27	
120	1.09	1.11	1.13	1.16	1.18	1.20	1.22	1.24	1.27	1.29	1.31	
140	1.13	1.15	1.17	1.20	1.22	1.24	1.26	1.29	1.31	1.34	1.36	
160	1.17	1.19	1.21	1.24	1.26	1.28	1.31	1.33	1.35	1.38	1.41	
180	1.21	1.23	1.25	1.28	1.30	1.32	1.35	1.37	1.40	1.42	1.45	
200	1.25	1.27	1.29	1.32	1.34	1.36	1.39	1.42	1.44	1.47	1.50	
250	1.34	1.36	1.39	1.41	1.44	1.47	1.49	1.52	1.55	1.58	1.61	
300	1.43	1.46	1.49	1.51	1.54	1.57	1.60	1.63	1.66	1.69	1.72	
350	1.53	1.56	1.58	1.61	1.64	1.67	1.70	1.74	1.77	1.80	1.84	
400	1.62	1.65	1.68	1.71	1.75	1.78	1.81	1.84	1.88	1.91	1.95	
450	1.72	1.75	1.78	1.81	1.85	1.88	1.92	1.95	1.99	2.03	2.06	
500	1.81	1.84	1.88	1.91	1.95	1.98	2.02	2.06	2.10	2.14	2.18	
550	1.91	1.94	1.98	2.01	2.05	2.09	2.13	2.17	2.21	2.25	2.29	
600	2.00	2.04	2.07	2.11	2.15	2.19	2.23	2.27	2.32	2.36	2.40	
650	2.09	2.13	2.17	2.21	2.25	2.29	2.34	2.38	2.43	2.47	2.52	
700	2.19	2.23	2.27	2.31	2.35	2.40	2.44	2.49	2.53	2.58	2.63	
750	2.28	2.32	2.37	2.41	2.46	2.50	2.55	2.60	2.64	2.69	2.74	
800	2.38	2.42	2.46	2.51	2.56	2.60	2.65	2.70	2.75	2.80	2.86	

Fans are rated at standard air: .075 lbs./ft<sup>3</sup>; 70°F at sea level; therefore, pressures corrected to standard must be used when selecting Fans from Fan Rating Tables or curves. Pressure at operating conditions x factor = pressure at standard. Horsepower at standard ÷ factor = horsepower at operating conditions. Caution: size motor for highest density (lowest factor) condition at which it is expected to operate.

Table 4

Temperature/Speed Deration			
Temp. °F	Factor	Temp. °F	Factor
100	.993	500	.915
200	.964	600	.884
300	.954	700	.865
400	.943	800	.828

Fan speed limits shown with multi-rating tables are at 70° F. For higher temperatures, derate wheel limits per Table 4. Maximum safe speed at temperature is the lower limit...i.e. limit on multi-rating table or derated wheel limit.

**NOTE:** For temperatures above 500° F. add 5% to RPM and 2% to BHP for increased running clearances.



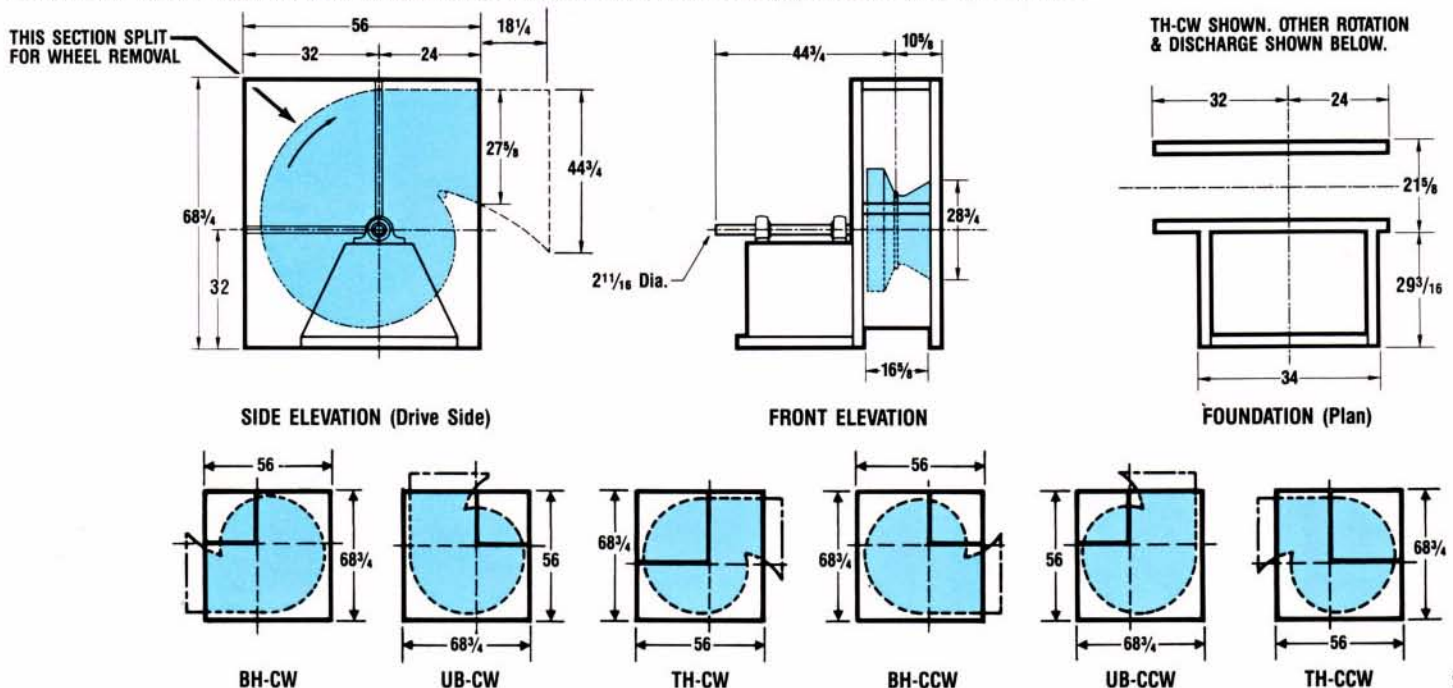
**Wheel Diameter:** 30 inches  
**Inlet Area:** 4.32 sq. ft.  
**Outlet Area:** 5.19 sq. ft. @ evase/3.19 sq. ft. @ fan discharge

**Maximum Motor Size:** 125 HP  
**Maximum Allowable Speed @70° F:** 2805 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
8000	1542	1351 13.6	1500 17.4								
9000	1735	1370 15.1	1511 19.1	1645 23.4	1773 27.8						
10000	1928	1396 16.7	1530 21.0	1658 25.4	1780 30.1	1839 32.5	1897 35.0	1954 37.5			
11000	2120	1426 18.4	1555 22.9	1677 27.7	1794 32.6	1851 35.1	1906 37.6	1961 40.2	2015 42.9	2068 45.6	2120 48.3
12000	2313	1459 20.3	1585 25.1	1702 30.0	1815 35.2	1869 37.8	1922 40.5	1975 43.2	2027 45.9	2078 48.7	2128 51.6
13000	2506	1493 22.4	1617 27.4	1731 32.6	1840 38.0	1892 40.7	1944 43.5	1994 46.3	2044 49.2	2093 52.1	2142 55.1
14000	2699	1528 24.6	1651 29.8	1763 35.3	1869 40.9	1920 43.8	1970 46.7	2019 49.7	2067 52.7	2114 55.7	2161 58.7
15000	2891	1561 27.1	1685 32.5	1797 38.2	1901 44.0	1950 47.1	1999 50.1	2047 53.2	2093 56.3	2139 59.5	2185 62.6
16000	3084	1595 29.5	1720 35.5	1831 41.3	1934 47.4	1983 50.5	2031 53.7	2077 56.9	2123 60.1	2168 63.4	2212 66.7
17000	3277	1628 31.6	1753 38.5	1866 44.7	1968 51.0	2017 54.2	2064 57.5	2110 60.8	2155 64.2	2199 67.6	2242 71.0
18000	3470	1659 34.2	1787 41.5	1900 48.3	2003 54.9	2051 58.2	2098 61.6	2144 65.0	2188 68.5	2232 72.0	2274 75.5
19000	3662	1688 37.4	1820 44.2	1933 52.0	2037 59.0	2086 62.5	2133 66.0	2178 69.5	2222 73.1	2265 76.7	2307 80.3
20000	3855	1724 41.0	1851 47.3	1967 55.5	2071 63.3	2120 67.0	2167 70.6	2213 74.2	2257 77.9	2300 81.7	2342 85.4
22000	4241	1833 50.6	1912 55.6	2030 62.6	2137 71.4	2187 76.0	2234 80.4	2281 84.5	2325 88.6	2369 92.5	2411 96.5
24000	4626	1963 62.9	2013 66.8	2091 72.6	2200 80.2	2252 84.4	2301 89.3	2347 94.5	2392 99.4	2436 104.1	2478 108.7
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
11000	2120	2172 51.1									
12000	2313	2178 54.4	2226 57.4	2275 60.3	2322 63.3	2369 66.3					
13000	2506	2190 58.0	2237 61.1	2283 64.1	2330 67.2	2375 70.3	2420 73.5	2465 76.7	2509 79.9	2552 83.2	2595 86.5
14000	2699	2207 61.8	2253 65.0	2298 68.1	2342 71.3	2386 74.6	2430 77.8	2473 81.1	2516 84.5	2558 87.9	2600 91.3
15000	2891	2229 65.9	2274 69.1	2317 72.4	2360 75.7	2403 79.1	2445 82.4	2487 85.9	2528 89.3	2569 92.8	2610 96.3
16000	3084	2255 70.1	2298 73.5	2341 76.9	2383 80.3	2424 83.8	2465 87.3	2505 90.8	2546 94.4	2585 97.9	2625 101.6
18000	3470	2316 79.1	2357 82.8	2397 86.4	2437 90.1	2476 93.8	2515 97.6	2554 101.4	2591 105.2	2629 109.0	2666 112.9
20000	3855	2382 89.2	2423 93.1	2462 97.0	2500 100.9	2538 104.9	2576 108.8	2613 112.9	2649 116.9	2685 121.0	2721 125.1
22000	4241	2451 100.6	2491 104.6	2530 108.7	2568 112.9	2606 117.1	2642 121.3	2678 125.5	2714 129.8	2749 134.1	
24000	4626	2519 113.1	2560 117.5	2599 121.8	2637 126.2	2675 130.6	2711 135.0	2747 139.5			
26000	5012	2586 125.7	2627 130.9	2666 135.9	2705 140.7	2743 145.5					
28000	5397	2652 137.3	2693 143.2	2733 149.2							

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 1494 lbs.



## IRT Size 3300

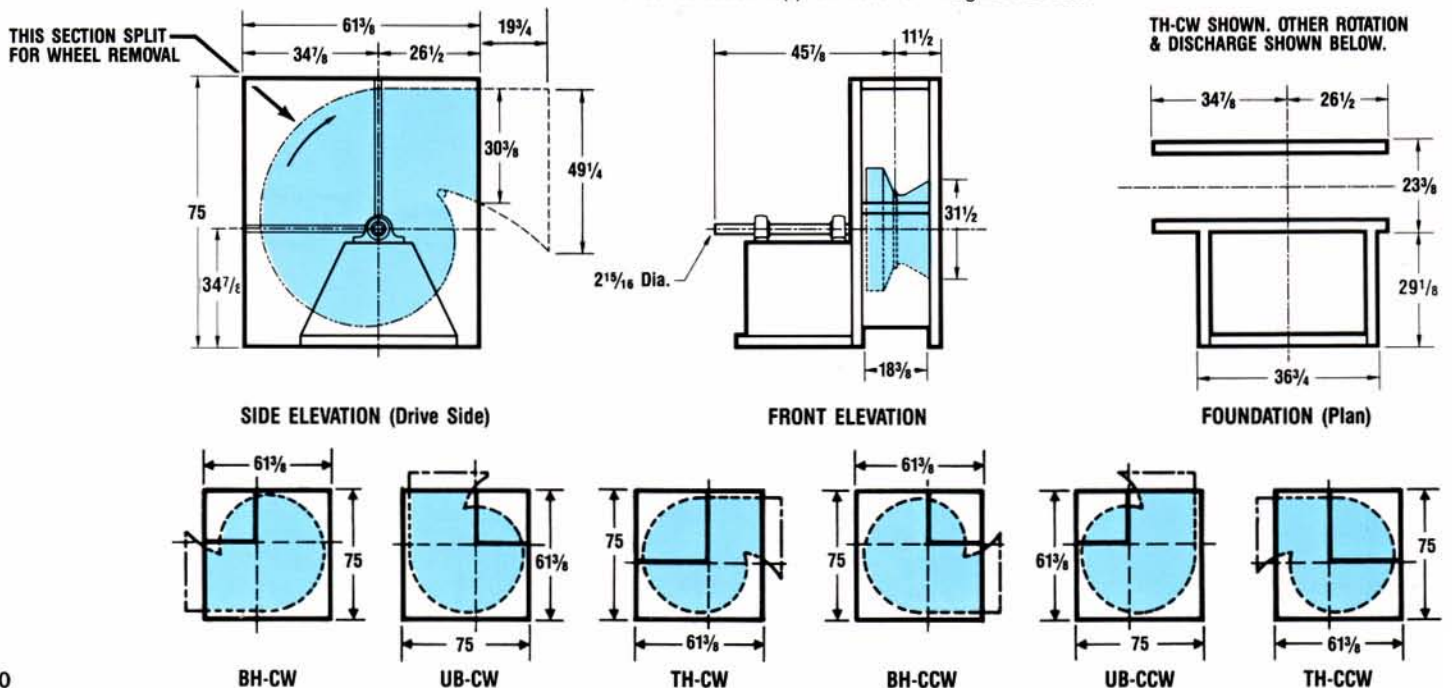
Wheel Diameter: 33 inches  
 Inlet Area: 5.22 sq. ft.  
 Outlet Area: 6.28 sq. ft. @ evase/3.88 sq. ft. @ fan discharge

Maximum Motor Size: 150 HP  
 Maximum Allowable  
 Speed @70° F: 2450 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
10000	1593	1232 16.9	1366 21.6	1492 26.6							
11000	1752	1247 18.4	1375 23.3	1497 28.5	1612 33.9						
12000	1912	1267 20.0	1390 25.2	1506 30.6	1617 36.2	1671 39.1	1724 42.1	1776 45.1			
13000	2071	1289 21.7	1408 27.1	1520 32.8	1627 38.6	1679 41.6	1730 44.7	1781 47.8	1830 51.0	1879 54.2	1927 57.5
14000	2230	1313 23.5	1429 29.2	1537 35.1	1641 41.2	1691 44.3	1741 47.5	1789 50.7	1837 54.0	1884 57.3	1931 60.7
15000	2390	1338 25.5	1452 31.4	1558 37.5	1658 43.9	1707 47.1	1755 50.4	1802 53.7	1848 57.1	1894 60.6	1939 64.0
16000	2549	1364 27.6	1477 33.7	1580 40.1	1678 46.7	1726 50.1	1772 53.5	1818 57.0	1863 60.5	1907 64.0	1951 67.6
17000	2708	1390 29.9	1502 36.3	1605 42.8	1700 49.7	1747 53.2	1792 56.7	1836 60.3	1880 63.9	1923 67.6	1966 71.3
18000	2868	1416 32.4	1528 38.9	1630 45.8	1724 52.8	1769 56.4	1814 60.1	1857 63.8	1900 67.6	1942 71.4	1983 75.2
19000	3027	1441 34.8	1554 41.8	1656 48.9	1749 56.1	1794 59.9	1837 63.6	1880 67.5	1922 71.3	1963 75.3	2003 79.2
20000	3186	1466 37.1	1580 44.9	1681 52.1	1775 59.6	1819 63.5	1862 67.4	1904 71.3	1945 75.3	1985 79.4	2025 83.4
22000	3505	1513 42.0	1630 50.8	1733 59.3	1826 67.3	1871 71.4	1913 75.5	1955 79.6	1995 83.9	2034 88.1	2073 92.4
24000	3823	1561 48.9	1678 56.6	1783 66.5	1877 75.7	1922 80.1	1965 84.5	2006 88.9	2047 93.3	2086 97.8	2124 102.3
26000	4142	1638 57.9	1723 64.5	1832 73.2	1928 84.1	1972 89.3	2016 94.2	2058 99.0	2098 103.7	2137 108.5	2175 113.2
28000	4461	1733 69.4	1786 74.4	1876 82.4	1977 91.9	2022 97.6	2066 103.6	2108 109.3	2149 114.7	2188 120.0	2227 125.1
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
14000	2230	1977 64.1	2022 67.6	2066 71.1							
15000	2390	1983 67.6	2027 71.1	2070 74.8	2113 78.4	2155 82.1	2197 85.9	2238 89.7			
16000	2549	1994 71.2	2036 74.9	2078 78.6	2120 82.4	2161 86.2	2202 90.1	2242 94.0	2282 97.9	2321 101.9	2360 105.9
17000	2708	2008 75.1	2049 78.9	2090 82.7	2130 86.6	2170 90.5	2210 94.5	2249 98.5	2288 102.5	2326 106.6	2364 110.7
18000	2868	2024 79.1	2064 83.0	2104 86.9	2144 90.9	2182 95.0	2221 99.0	2259 103.2	2297 107.3	2334 111.5	2371 115.7
20000	3186	2064 87.6	2103 91.7	2140 96.0	2178 100.2	2215 104.5	2252 108.8	2288 113.1	2324 117.5	2360 121.9	2395 126.4
22000	3505	2111 96.8	2148 101.2	2184 105.7	2220 110.2	2256 114.7	2291 119.3	2326 123.9	2360 128.5	2394 133.2	
24000	3823	2161 106.9	2197 111.6	2233 116.2	2268 121.0	2303 125.7	2337 130.5	2370 135.4	2404 140.3		
26000	4142	2212 118.0	2249 122.9	2284 127.8	2319 132.7	2353 137.7	2386 142.7	2419 147.8			
28000	4461	2264 130.2	2300 135.3	2336 140.4	2371 145.6	2404 150.8					
30000	4779	2315 143.0	2351 148.6	2387 154.1	2422 159.6						
32000	5098	2365 155.3	2402 161.9								

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 1739 lbs.



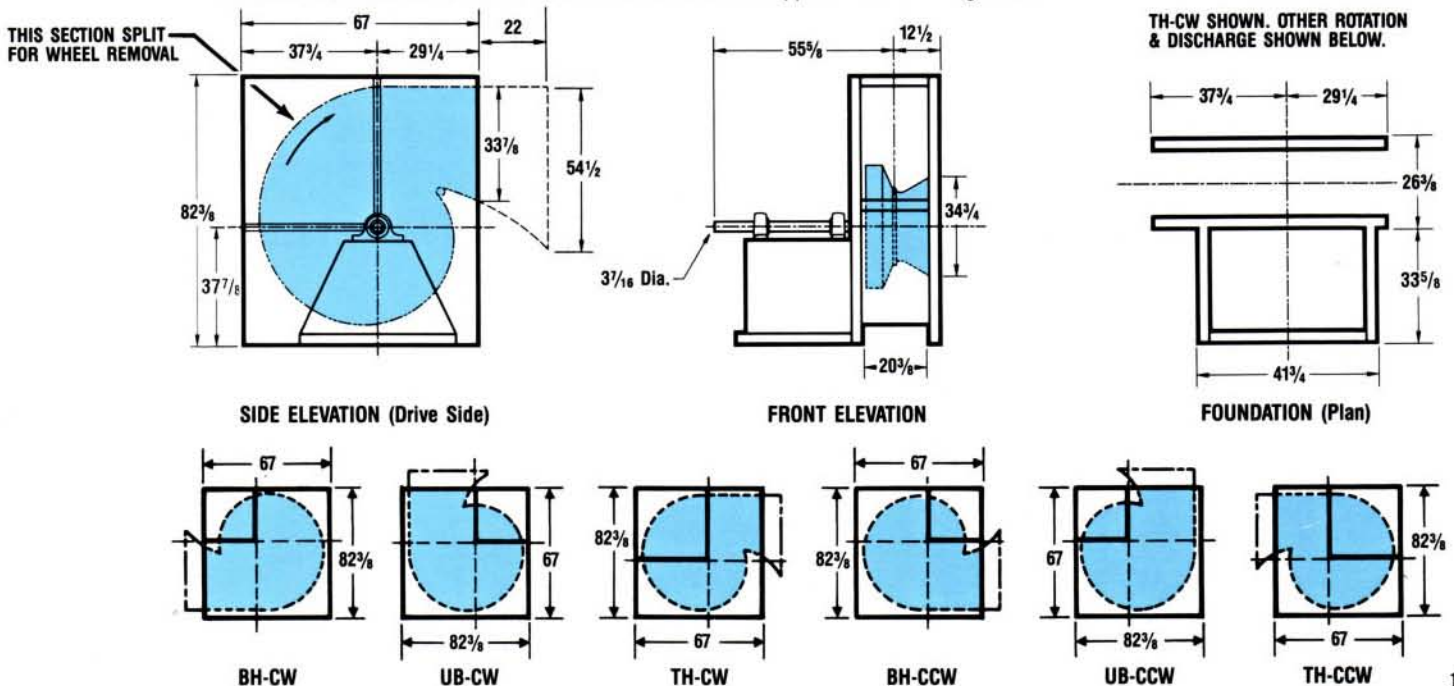
Wheel Diameter: 36.5 inches  
 Inlet Area: 6.39 sq. ft.  
 Outlet Area: 7.68 sq. ft. @ evase/4.78 sq. ft. @ fan discharge

Maximum Motor Size: 200 HP  
 Maximum Allowable  
 Speed @70° F: 2200 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
12000	1563	1112 20.4	1234 26.1								
13000	1693	1122 21.8	1240 27.7	1351 34.0							
14000	1823	1135 23.4	1249 29.5	1356 36.0	1459 42.7	1509 46.2					
15000	1953	1150 25.0	1260 31.4	1365 38.1	1464 45.0	1513 48.6	1560 52.3	1607 56.0	1652 59.8		
16000	2084	1167 26.7	1274 33.4	1375 40.3	1472 47.5	1519 51.2	1565 54.9	1610 58.7	1655 62.6	1699 66.6	1742 70.6
18000	2344	1203 30.5	1307 37.6	1403 45.0	1494 52.7	1539 56.6	1583 60.6	1626 64.7	1668 68.8	1709 72.9	1751 77.1
20000	2605	1242 34.8	1343 42.3	1436 50.2	1524 58.4	1566 62.6	1608 66.8	1649 71.1	1689 75.4	1729 79.8	1768 84.3
22000	2865	1279 39.5	1381 47.6	1473 55.9	1558 64.5	1599 69.0	1640 73.4	1679 78.0	1717 82.6	1755 87.2	1793 91.9
24000	3125	1317 44.3	1419 53.4	1511 62.2	1596 71.3	1636 75.9	1675 80.6	1713 85.4	1750 90.3	1787 95.1	1823 100.1
26000	3386	1353 48.8	1457 59.5	1549 69.2	1634 78.7	1674 83.6	1712 88.5	1750 93.5	1786 98.6	1822 103.7	1857 108.9
28000	3646	1385 55.0	1493 65.1	1587 76.5	1672 86.8	1712 91.9	1751 97.1	1788 102.3	1824 107.6	1860 112.9	1894 118.3
30000	3907	1426 62.3	1528 71.5	1624 83.4	1709 95.4	1750 101.0	1789 106.4	1826 111.9	1863 117.4	1898 122.9	1932 128.5
32000	4167	1487 71.9	1561 79.8	1659 90.3	1746 103.6	1787 110.1	1826 116.2	1864 122.1	1901 128.0	1936 133.8	1970 139.6
34000	4428	1557 83.3	1607 89.6	1692 99.5	1783 111.3	1824 118.4	1863 125.6	1901 132.5	1938 139.0	1974 145.3	2008 151.5
36000	4688	1631 96.3	1670 101.9	1729 110.1	1816 121.3	1859 127.4	1900 134.3	1938 142.0	1975 149.6	2011 156.8	2046 163.8
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
18000	2344	1791 81.4	1831 85.8	1870 90.1	1909 94.6	1948 99.1	1986 103.6				
20000	2605	1807 88.8	1845 93.3	1882 97.9	1920 102.6	1956 107.3	1993 112.0	2029 116.9	2064 121.7	2100 126.6	2134 131.6
22000	2865	1830 96.7	1866 101.4	1902 106.3	1938 111.2	1973 116.1	2008 121.1	2042 126.1	2076 131.2	2110 136.3	2144 141.5
24000	3125	1859 105.1	1894 110.1	1928 115.2	1963 120.4	1996 125.5	2030 130.7	2063 136.0	2096 141.3	2128 146.7	2160 152.1
26000	3386	1892 114.1	1926 119.4	1959 124.7	1992 130.1	2025 135.5	2057 141.0	2089 146.5	2121 152.1	2152 157.7	
28000	3646	1928 123.8	1961 129.3	1994 134.9	2026 140.5	2058 146.2	2089 151.9	2120 157.7	2151 163.5		
30000	3907	1966 134.2	1999 140.0	2031 145.8	2062 151.6	2094 157.5	2124 163.5	2154 169.5			
32000	4167	2004 145.5	2037 151.5	2069 157.5	2100 163.6	2131 169.7	2161 175.9				
34000	4428	2042 157.7	2075 163.9	2107 170.1	2138 176.4	2169 182.7					
36000	4688	2080 170.5	2113 177.1	2145 183.6							
38000	4949	2117 183.2	2150 190.5								
40000	5209	2154 194.9									

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 2329 lbs.



## IRT Size 4014

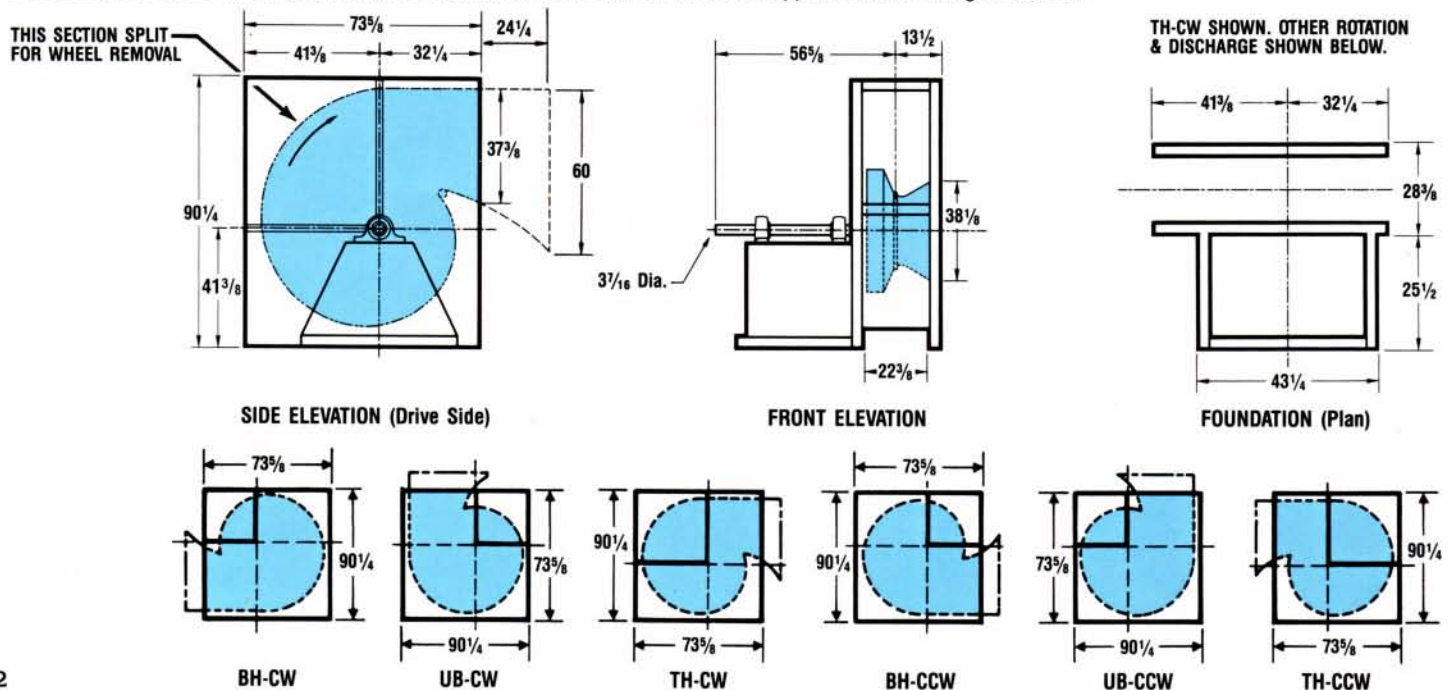
Wheel Diameter: 40.25 inches  
 Inlet Area: 7.72 sq. ft.  
 Outlet Area: 9.32 sq. ft. @ evase/5.81 sq. ft. @ fan discharge

Maximum Motor Size: 200 HP  
 Maximum Allowable  
 Speed @70° F: 1988 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
15000	1609	1011 25.4	1120 32.4	1224 39.8							
16000	1716	1019 26.9	1125 34.1	1226 41.7	1321 49.7						
18000	1931	1040 30.0	1141 37.7	1236 45.8	1327 54.2	1371 58.5	1414 62.9	1457 67.4			
20000	2145	1065 33.5	1162 41.7	1252 50.3	1339 59.1	1381 63.7	1422 68.3	1463 73.0	1503 77.8	1542 82.6	1581 87.6
22000	2360	1093 37.3	1186 46.0	1273 55.1	1356 64.4	1397 69.2	1436 74.1	1475 79.0	1513 84.0	1551 89.0	1588 94.2
24000	2574	1121 41.6	1214 50.7	1298 60.2	1378 70.1	1417 75.1	1455 80.2	1492 85.4	1529 90.6	1565 95.9	1601 101.3
26000	2789	1150 46.3	1242 55.8	1325 65.8	1403 76.1	1441 81.4	1478 86.8	1514 92.2	1549 97.7	1584 103.2	1618 108.8
28000	3003	1178 51.1	1270 61.4	1354 71.8	1430 82.6	1467 88.1	1503 93.7	1538 99.4	1572 105.1	1606 110.9	1639 116.8
30000	3218	1205 55.7	1299 67.5	1382 78.4	1459 89.6	1495 95.4	1530 101.2	1564 107.1	1598 113.1	1631 119.1	1663 125.2
32000	3432	1232 60.4	1326 73.5	1410 85.6	1487 97.2	1523 103.2	1558 109.2	1592 115.3	1625 121.5	1658 127.8	1690 134.1
34000	3647	1256 66.7	1354 79.1	1438 92.9	1516 105.4	1552 111.6	1587 117.8	1621 124.2	1654 130.6	1686 137.1	1717 143.7
36000	3861	1285 73.9	1380 85.2	1466 99.9	1543 114.0	1580 120.6	1615 127.1	1649 133.7	1682 140.3	1714 147.0	1745 153.8
38000	4076	1326 82.7	1404 93.2	1493 106.4	1571 122.4	1608 129.8	1643 136.9	1678 143.8	1711 150.7	1743 157.6	1774 164.6
40000	4290	1377 93.4	1432 102.0	1518 114.5	1599 130.1	1635 138.6	1671 146.6	1705 154.2	1739 161.6	1771 168.9	1802 176.2
42000	4505	1430 105.4	1472 112.7	1563 124.4	1625 138.3	1663 146.7	1699 155.7	1733 164.4	1766 172.6	1799 180.5	1831 188.3
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
20000	2145	1619 92.6	1656 97.6								
22000	2360	1625 99.4	1661 104.7	1697 110.0	1732 115.5	1767 121.0	1801 126.5				
24000	2574	1636 106.7	1671 112.2	1705 117.8	1739 123.4	1773 129.1	1806 134.9	1839 140.7	1871 146.6	1903 152.5	1935 158.5
26000	2789	1652 114.5	1686 120.2	1719 126.0	1752 131.9	1784 137.8	1816 143.8	1847 149.8	1879 155.9	1910 162.0	1941 168.2
28000	3003	1672 122.7	1705 128.7	1737 134.7	1768 140.8	1799 147.0	1830 153.2	1861 159.4	1891 165.8	1921 172.1	1951 178.5
30000	3218	1695 131.4	1727 137.6	1758 143.9	1788 150.3	1819 156.7	1849 163.1	1878 169.6	1908 176.2	1937 182.8	1966 189.4
32000	3432	1721 140.6	1751 147.0	1782 153.6	1812 160.2	1841 166.8	1870 173.5	1899 180.3	1927 187.1	1956 194.0	
34000	3647	1748 150.3	1778 157.0	1808 163.8	1837 170.6	1866 177.5	1894 184.4	1922 191.5	1950 198.5		
37000	3969	1790 166.1	1820 173.1	1849 180.2	1878 187.4	1906 194.6	1933 201.9	1961 209.3			
40000	4290	1833 183.4	1863 190.8	1892 198.2	1920 205.8	1948 213.3					
43000	4612	1875 202.3	1905 210.2	1934 218.0	1963 225.8						
46000	4934	1917 221.5	1947 230.4								

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 2636 lbs.



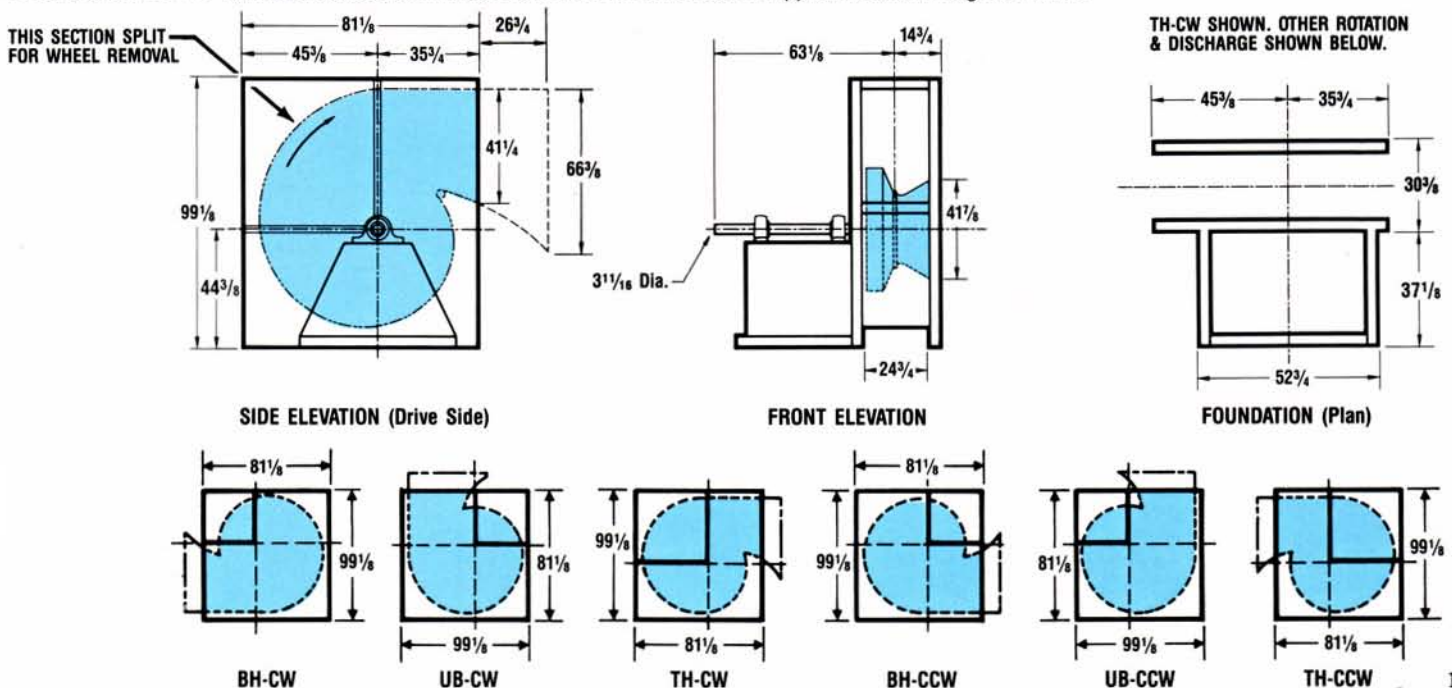
Wheel Diameter: 44.5 inches  
 Inlet Area: 9.33 sq. ft.  
 Outlet Area: 11.41 sq. ft. @ evase/7.09 sq. ft. @ fan discharge

Maximum Motor Size: 250 HP  
 Maximum Allowable Speed @70° F: 1895 RPM

CFM	OUTLET VEL.	8" SP		10" SP		12" SP		14" SP		15" SP		16" SP		17" SP		18" SP		19" SP		20" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
18000	1578	913	30.5	1012	39.0																
20000	1753	925	33.5	1020	42.4	1110	51.8	1196	61.7												
22000	1928	941	36.7	1032	46.1	1118	56.0	1200	66.2	1240	71.5	1279	76.9	1317	82.4						
24000	2104	959	40.1	1047	50.1	1129	60.4	1209	71.1	1247	76.6	1285	82.2	1322	87.9	1358	93.7	1394	99.6	1429	105.6
26000	2279	979	43.9	1065	54.3	1144	65.1	1221	76.3	1257	82.1	1294	87.9	1329	93.8	1365	99.8	1399	105.9	1433	112.1
28000	2454	1000	47.9	1084	58.8	1162	70.1	1235	81.8	1271	87.8	1306	93.9	1341	100.0	1375	106.3	1408	112.6	1441	119.0
30000	2630	1021	52.3	1105	63.6	1181	75.4	1253	87.6	1287	93.8	1321	100.2	1355	106.6	1388	113.1	1420	119.6	1452	126.3
32000	2805	1042	57.1	1126	68.8	1201	81.0	1271	93.7	1305	100.2	1338	106.8	1371	113.4	1403	120.2	1434	127.0	1465	133.9
34000	2980	1063	62.0	1147	74.4	1222	87.1	1291	100.2	1325	106.9	1357	113.7	1389	120.6	1420	127.6	1451	134.7	1481	141.8
36000	3156	1083	66.6	1168	80.4	1243	93.6	1312	107.1	1345	114.1	1377	121.1	1408	128.2	1439	135.5	1469	142.8	1498	150.2
38000	3331	1103	71.0	1188	86.6	1264	100.5	1333	114.5	1366	121.7	1398	128.9	1429	136.3	1459	143.7	1488	151.3	1517	158.9
40000	3506	1122	76.4	1209	92.4	1285	107.8	1354	122.4	1387	129.7	1419	137.2	1449	144.8	1479	152.5	1508	160.2	1537	168.1
44000	3857	1162	90.3	1248	104.1	1326	122.1	1396	139.3	1429	147.4	1461	155.3	1492	163.4	1521	171.5	1550	179.7	1579	188.0
48000	4208	1228	109.2	1285	120.5	1365	136.0	1437	155.6	1470	165.5	1502	174.9	1533	183.8	1563	192.6	1593	201.3	1621	210.0
52000	4558	1307	133.0	1342	141.8	1401	155.4	1476	172.2	1511	182.1	1543	193.1	1574	204.1	1604	214.5	1634	224.5	1662	234.2
CFM	OUTLET VEL.	21" SP		22" SP		23" SP		24" SP		25" SP		26" SP		27" SP		28" SP		29" SP		30" SP	
24000	2104	1464	111.7			1502	128.4	1535	134.9	1567	141.5	1598	148.3	1629	155.1						
27000	2367	1470	121.9	1502	128.4	1535	134.9	1567	141.5	1598	148.3	1629	155.1	1665	174.9	1694	182.2	1723	189.5	1751	196.9
30000	2630	1483	133.0	1514	139.8	1545	146.6	1576	153.6	1606	160.6	1635	167.7	1665	174.9	1694	182.2	1723	189.5	1751	196.9
33000	2893	1503	144.9	1533	152.1	1562	159.3	1591	166.6	1620	173.9	1648	181.4	1677	188.9	1704	196.5	1732	204.1	1759	211.8
36000	3156	1527	157.6	1556	165.2	1584	172.8	1612	180.5	1640	188.2	1667	196.0	1694	203.8	1721	211.8	1748	219.8	1774	227.8
39000	3419	1555	171.3	1583	179.2	1610	187.1	1637	195.2	1664	203.3	1690	211.5	1717	219.8	1742	228.0	1768	236.4		
42000	3682	1585	185.9	1613	194.2	1639	202.5	1666	210.9	1692	219.4	1717	227.9	1743	236.5	1768	245.2				
45000	3945	1617	201.8	1644	210.3	1670	219.0	1696	227.7	1721	236.5	1746	245.4	1771	254.4						
48000	4208	1648	218.9	1675	227.8	1701	236.8	1727	245.8	1752	255.0	1777	264.2								
51000	4471	1680	237.3	1707	246.6	1733	255.9	1759	265.3												
54000	4734	1711	256.6	1738	266.6	1765	276.4														
58000	5084	1752	281.4	1779	293.2																

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 3443 lbs.



## IRT Size 4900

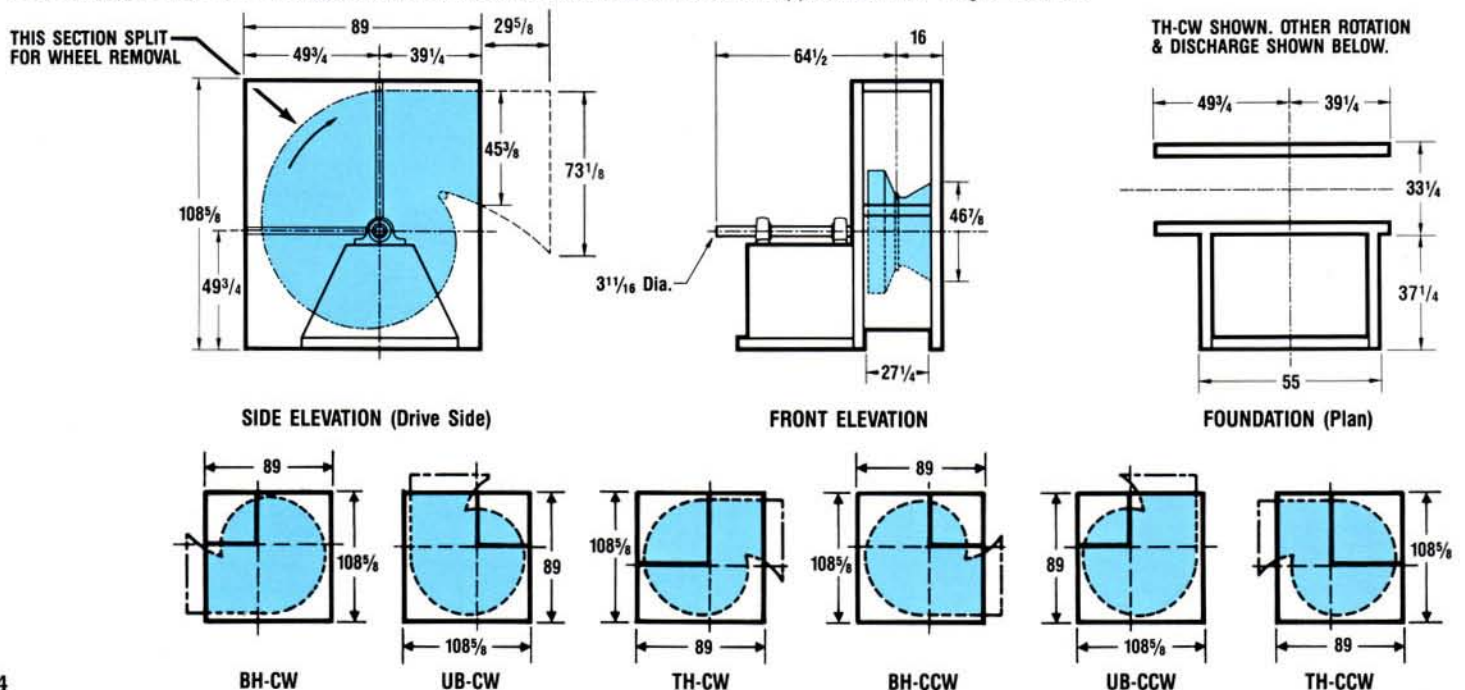
Wheel Diameter: 49 inches  
 Inlet Area: 11.73 sq. ft.  
 Outlet Area: 13.83 sq. ft. @ evase/8.59 sq. ft. @ fan discharge

Maximum Motor Size: 250 HP  
 Maximum Allowable  
 Speed @70° F: 1790 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
22000	1591	830 37.3	920 47.6	1005 58.5							
24000	1736	839 40.2	925 51.0	1007 62.3	1086 74.2						
26000	1880	850 43.4	934 54.6	1013 66.4	1088 78.7	1125 85.1	1161 91.6				
28000	2025	863 46.7	944 58.5	1021 70.8	1094 83.5	1129 90.1	1164 96.7	1198 103.5	1232 110.5	1265 117.5	
30000	2170	878 50.3	956 62.6	1030 75.3	1101 88.5	1136 95.3	1169 102.2	1202 109.2	1235 116.3	1267 123.6	1299 130.9
32000	2314	893 54.1	970 66.8	1042 80.1	1111 93.8	1144 100.8	1177 108.0	1209 115.2	1241 122.5	1272 130.0	1303 137.5
34000	2459	909 58.2	985 71.4	1055 85.1	1122 99.3	1155 106.6	1186 114.0	1218 121.4	1249 129.0	1279 136.7	1309 144.5
36000	2604	925 62.6	1000 76.2	1070 90.4	1135 105.1	1167 112.6	1198 120.2	1228 128.0	1258 135.8	1288 143.7	1317 151.7
40000	2893	956 72.1	1032 86.7	1100 101.8	1164 117.5	1194 125.5	1224 133.6	1253 141.8	1282 150.1	1310 158.6	1337 167.0
44000	3182	986 81.5	1063 98.6	1132 114.6	1194 131.2	1224 139.6	1253 148.2	1282 156.9	1309 165.7	1336 174.6	1363 183.6
48000	3471	1016 91.2	1094 110.6	1163 128.9	1226 146.4	1256 155.2	1285 164.3	1312 173.4	1340 182.6	1366 192.0	1392 201.5
52000	3761	1043 104.4	1124 121.7	1194 143.4	1257 163.1	1287 172.5	1316 182.0	1344 191.5	1371 201.2	1397 211.0	1423 220.9
56000	4050	1085 121.1	1151 136.7	1224 156.6	1288 180.0	1318 190.9	1347 201.3	1375 211.5	1403 221.6	1429 231.8	1455 242.2
60000	4339	1141 142.5	1183 154.7	1252 173.1	1319 195.5	1349 208.3	1378 220.6	1406 232.2	1434 243.5	1460 254.5	1486 265.4
64000	4629	1202 167.5	1232 178.0	1280 193.4	1347 213.7	1379 225.1	1409 238.2	1437 251.9	1464 265.1	1491 277.7	1517 289.8
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
30000	2170	1330 138.4	1361 145.9								
33000	2387	1336 148.7	1365 156.6	1394 164.6	1423 172.6	1452 180.8	1480 189.1	1507 197.4			
36000	2604	1346 159.8	1374 168.0	1402 176.3	1430 184.7	1457 193.1	1484 201.7	1511 210.4	1538 219.2	1564 228.0	1590 237.0
39000	2821	1360 171.6	1387 180.1	1414 188.8	1441 197.5	1467 206.3	1493 215.2	1519 224.2	1545 233.3	1570 242.4	1595 251.7
42000	3038	1377 184.0	1403 192.9	1429 202.0	1455 211.0	1481 220.2	1506 229.5	1531 238.8	1556 248.2	1580 257.7	1604 267.3
46000	3327	1403 201.7	1429 211.1	1454 220.6	1479 230.2	1503 239.9	1527 249.6	1551 259.5	1575 269.4	1599 279.4	
50000	3616	1433 220.8	1458 230.7	1482 240.7	1506 250.7	1530 260.9	1553 271.2	1576 281.5	1599 291.9		
54000	3905	1464 241.6	1488 251.9	1512 262.3	1536 272.9	1559 283.5	1582 294.2	1604 305.0			
58000	4195	1495 264.2	1520 275.0	1544 285.9	1567 296.8	1590 307.9	1612 319.1				
62000	4484	1527 288.8	1551 300.0	1575 311.3	1599 322.8						
66000	4773	1558 314.5	1583 326.8	1607 338.8							
70000	5063	1588 339.3	1613 353.4								

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 4598 lbs.



Wheel Diameter: 54.25 inches

Inlet Area: 14.18 sq. ft.

Outlet Area: 16.97 sq. ft. @ evase/10.53 sq. ft. @ fan discharge

Maximum Motor Size: 300 HP

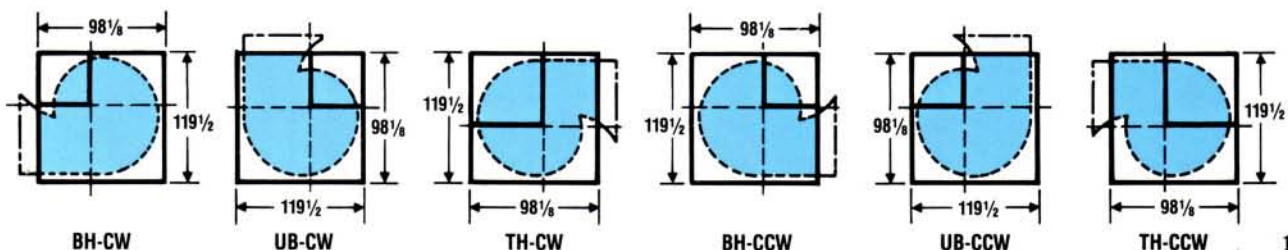
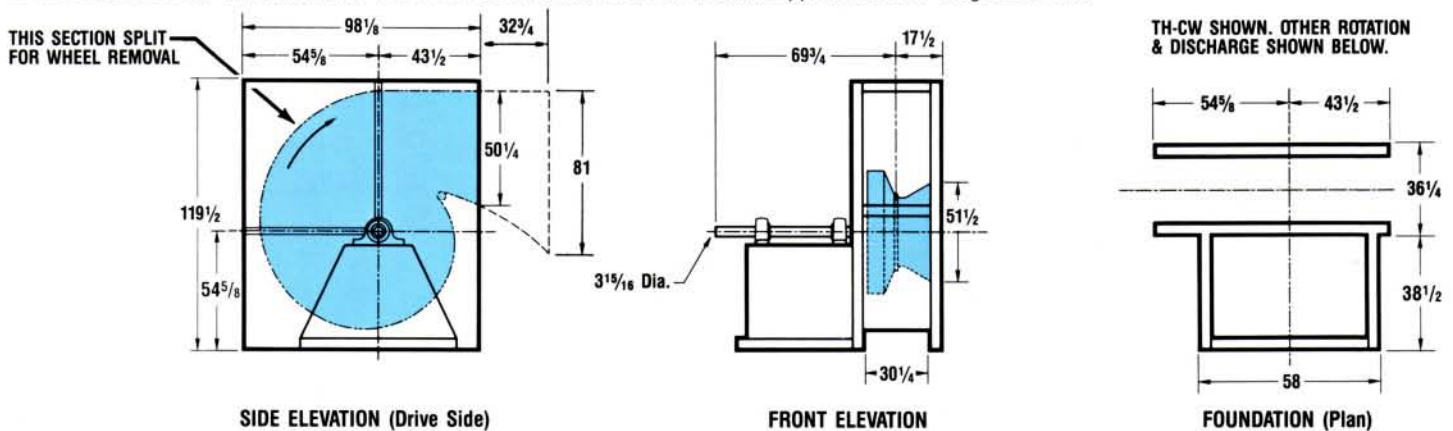
Maximum Allowable

Speed @70° F: 1571 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
26000	1532	747 44.3	830 56.7								
28000	1650	753 47.2	833 60.0	908 73.7							
32000	1886	768 53.4	844 67.2	915 81.7	983 96.8	1016 104.6	1049 112.6	1080 120.6			
36000	2122	789 60.2	860 75.1	928 90.5	992 106.5	1024 114.8	1054 123.1	1085 131.6	1114 140.3	1144 149.1	1173 158.0
40000	2358	811 67.9	880 83.6	945 100.1	1006 117.1	1036 125.8	1066 134.6	1094 143.6	1123 152.7	1151 161.9	1178 171.2
44000	2593	834 76.4	903 93.1	965 110.4	1025 128.4	1053 137.7	1081 147.0	1109 156.4	1136 166.0	1163 175.7	1189 185.5
48000	2829	857 85.9	926 103.5	988 121.7	1045 140.7	1073 150.4	1100 160.2	1127 170.1	1153 180.2	1178 190.4	1204 200.7
52000	3065	880 95.6	949 115.0	1011 134.1	1068 153.9	1095 164.1	1121 174.4	1147 184.8	1172 195.4	1197 206.0	1222 216.8
56000	3301	902 104.4	972 127.2	1034 147.7	1091 168.4	1118 179.0	1144 189.7	1169 200.6	1194 211.6	1218 222.7	1242 234.0
60000	3536	923 115.3	994 138.8	1057 162.3	1114 184.1	1141 195.1	1167 206.3	1192 217.6	1217 229.1	1240 240.7	1264 252.4
64000	3772	944 128.9	1016 150.0	1080 176.7	1137 201.0	1164 212.6	1190 224.3	1215 236.0	1240 247.9	1264 260.0	1287 272.1
68000	4008	974 145.4	1036 164.9	1102 189.8	1160 218.0	1187 231.0	1213 243.5	1239 255.9	1263 268.2	1287 280.7	1310 293.3
72000	4244	1014 165.9	1058 182.1	1123 205.0	1182 233.8	1210 248.8	1236 263.0	1261 276.6	1286 289.9	1310 303.0	1333 316.0
76000	4479	1058 189.5	1089 203.0	1143 224.3	1204 249.8	1232 265.2	1258 281.4	1284 297.0	1309 311.9	1333 326.2	1356 340.2
80000	4715	1103 215.9	1129 228.4	1167 246.0	1224 270.6	1253 283.8	1281 298.9	1307 315.8	1331 332.8	1356 349.1	1379 364.6
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
36000	2122	1201 167.1									
40000	2358	1205 180.7	1232 190.3	1259 200.0	1285 209.9	1311 219.8	1336 229.9				
44000	2593	1215 195.4	1241 205.4	1266 215.5	1291 225.8	1316 236.2	1340 246.7	1365 257.3	1389 268.1	1412 278.9	1436 289.9
48000	2829	1229 211.1	1253 221.6	1278 232.2	1302 242.9	1326 253.7	1349 264.7	1373 275.7	1396 286.9	1418 298.1	1441 309.5
52000	3065	1246 227.8	1269 238.8	1293 249.9	1316 261.1	1339 272.4	1362 283.8	1384 295.3	1407 306.9	1429 318.6	1450 330.4
57000	3359	1271 250.0	1294 261.6	1316 273.4	1338 285.2	1360 297.2	1382 309.2	1404 321.3	1425 333.6	1446 345.9	
62000	3654	1298 274.2	1320 286.4	1342 298.7	1364 311.1	1385 323.7	1406 336.4	1427 349.1	1448 362.0		
67000	3949	1327 300.5	1349 313.2	1370 326.1	1392 339.1	1413 352.3	1433 365.5	1453 378.8			
72000	4244	1356 329.2	1378 342.5	1400 355.9	1421 369.5	1441 383.2					
77000	4538	1385 360.4	1407 374.3	1429 388.3	1450 402.4						
82000	4833	1413 392.4	1436 407.9	1457 423.0							
87000	5128	1441 422.8									

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 5630 lbs.



## IRT Size 5718

Wheel Diameter: 57.125 inches

Inlet Area: 15.68 sq. ft.

Outlet Area: 18.82 sq. ft. @ evase/11.74 sq. ft. @ fan discharge

Maximum Motor Size: 300 HP

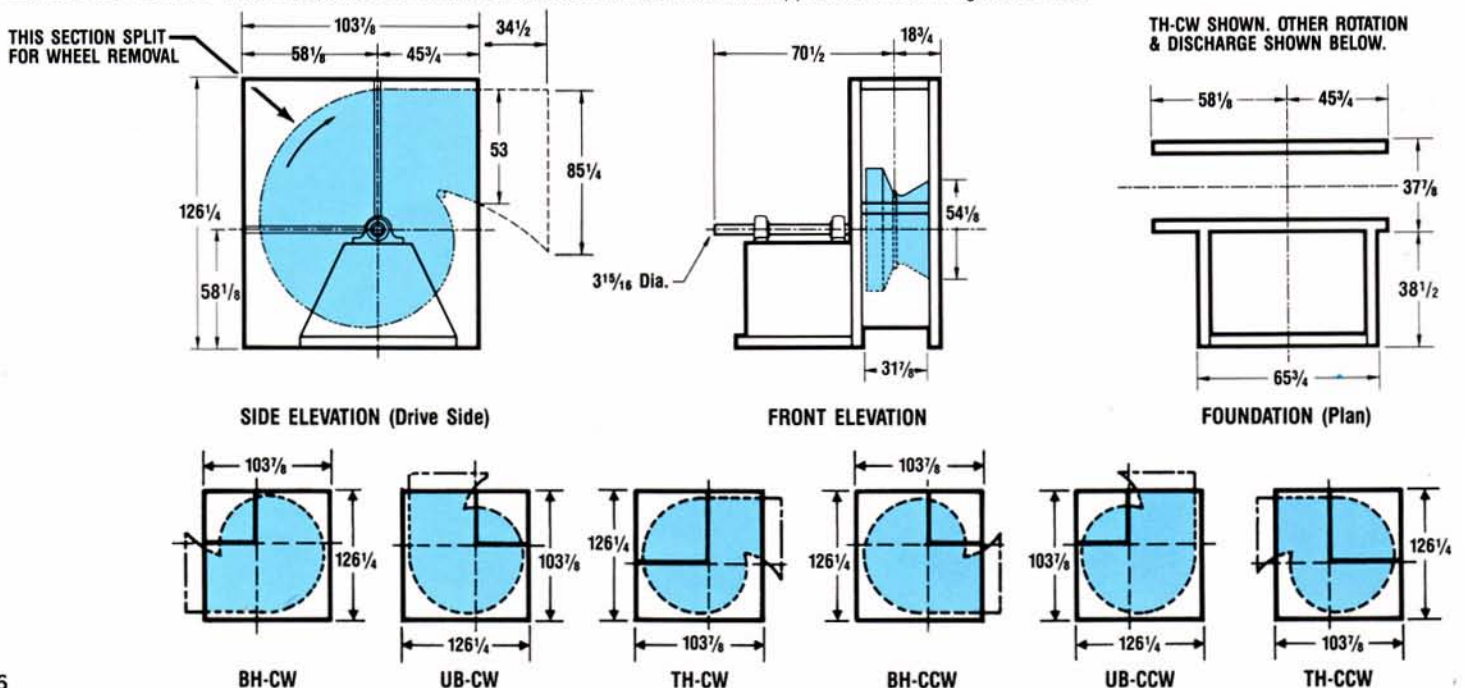
Maximum Allowable

Speed @70° F: 1457 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
30000	1594	712 50.8	789 64.8	862 79.7							
34000	1807	724 56.8	797 71.8	866 87.5	932 104.0	964 112.4					
38000	2019	740 63.4	810 79.4	875 96.0	938 113.3	968 122.3	998 131.3	1028 140.6	1056 150.0	1085 159.5	
42000	2232	759 70.7	826 87.6	888 105.2	948 123.5	977 132.9	1006 142.4	1034 152.0	1061 161.9	1089 171.8	1115 181.9
46000	2444	778 78.7	844 96.5	904 115.1	962 134.4	990 144.3	1017 154.2	1044 164.4	1070 174.6	1097 185.0	1122 195.6
50000	2657	798 87.5	863 106.2	922 125.8	978 146.0	1005 156.4	1031 166.9	1057 177.5	1083 188.3	1108 199.1	1133 210.1
54000	2869	818 97.1	883 116.9	942 137.3	996 158.5	1022 169.3	1048 180.3	1073 191.4	1098 202.7	1122 214.1	1146 225.6
58000	3082	837 106.8	903 128.5	962 149.8	1016 171.9	1041 183.1	1066 194.6	1091 206.2	1115 218.0	1138 229.8	1162 241.9
62000	3294	857 115.5	923 140.7	982 163.4	1035 186.3	1061 198.1	1086 210.0	1110 222.0	1133 234.2	1156 246.6	1179 259.1
66000	3507	874 126.2	942 152.5	1001 178.0	1055 202.0	1081 214.1	1106 226.5	1129 239.0	1153 251.6	1175 264.4	1198 277.4
70000	3719	891 139.5	961 163.4	1021 192.5	1075 218.7	1101 231.4	1126 244.2	1149 257.1	1173 270.2	1195 283.4	1217 296.8
74000	3932	915 154.9	978 177.2	1040 206.0	1095 235.8	1120 249.7	1145 263.2	1169 276.6	1193 290.1	1215 303.8	1237 317.6
78000	4145	947 174.1	995 193.8	1059 219.7	1114 252.2	1140 267.9	1165 282.8	1189 297.2	1212 311.3	1235 325.5	1257 339.8
83000	4410	992 202.3	1025 217.9	1080 242.4	1138 271.4	1164 288.9	1189 306.4	1213 323.0	1237 338.9	1260 354.3	1282 369.4
88000	4676	1041 234.5	1066 248.5	1104 268.6	1159 296.0	1187 311.0	1213 328.2	1237 346.9	1261 365.5	1284 383.1	1306 400.0
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
41000	2179	1141 188.8	1167 199.1								
46000	2444	1148 206.3	1173 217.1	1197 228.0	1222 239.1	1246 250.4	1270 261.7	1294 273.2	1317 284.8		
51000	2710	1160 225.2	1184 236.6	1207 248.1	1231 259.7	1254 271.4	1277 283.3	1299 295.3	1322 307.4	1344 319.7	1366 332.1
56000	2976	1177 245.5	1200 257.5	1222 269.6	1245 281.8	1267 294.1	1288 306.6	1310 319.1	1332 331.8	1353 344.6	1374 357.5
61000	3241	1197 267.2	1219 279.8	1241 292.6	1262 305.4	1283 318.3	1304 331.4	1325 344.6	1346 357.9	1366 371.2	1386 384.7
66000	3507	1220 290.4	1241 303.7	1262 317.0	1283 330.5	1304 344.1	1324 357.8	1344 371.6	1364 385.5	1383 399.5	
71000	3773	1244 315.5	1265 329.3	1285 343.3	1306 357.3	1326 371.5	1346 385.8	1365 400.2	1385 414.7		
76000	4038	1269 342.7	1289 357.0	1310 371.5	1330 386.1	1350 400.8	1369 415.7				
81000	4304	1294 372.1	1314 386.9	1335 401.9	1355 417.1	1374 432.4					
86000	4570	1318 403.5	1339 419.1	1360 434.7	1380 450.4						
91000	4835	1342 435.6	1364 452.8	1384 469.6							
96000	5101	1367 466.1									

Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 6492 lbs.





Wheel Diameter: 60 inches

Inlet Area: 17.18 sq. ft.

Outlet Area: 20.74 sq. ft. @ evase/12.88 sq. ft. @ fan discharge

Maximum Motor Size: 300 HP

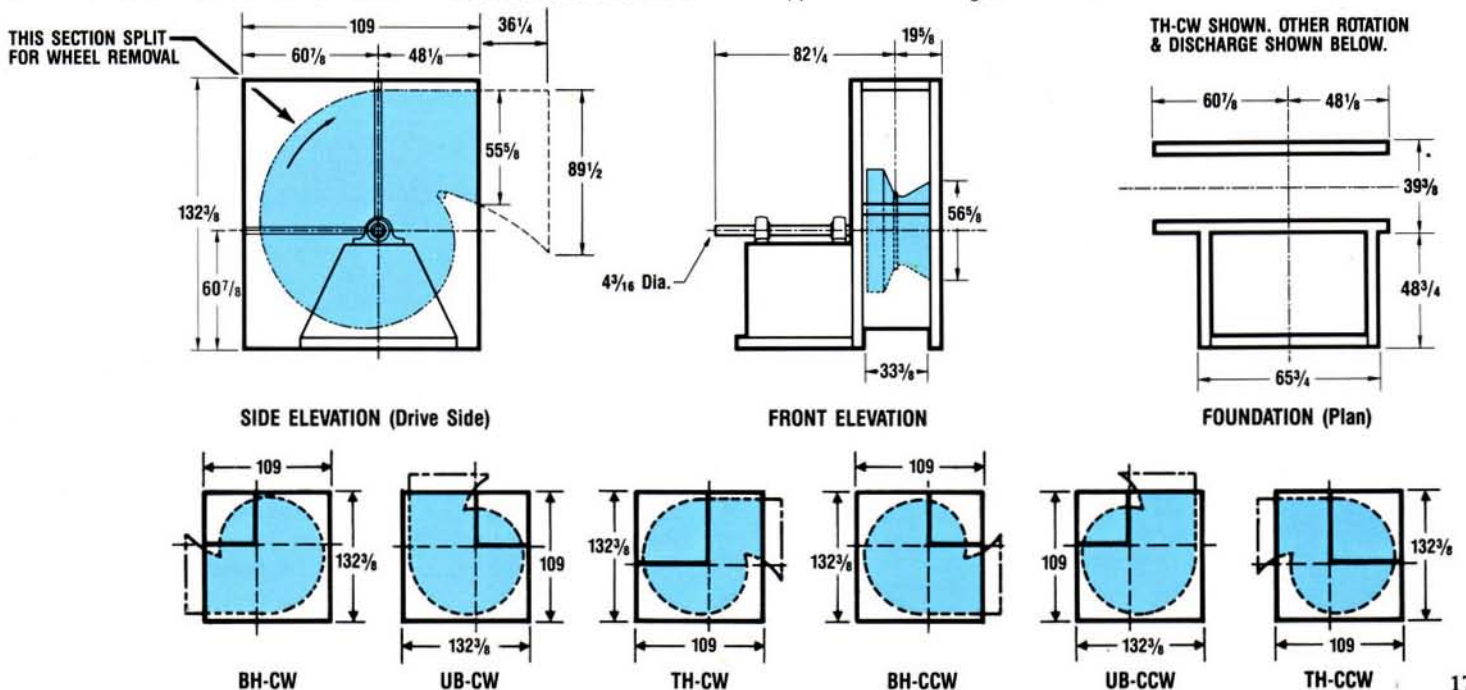
Maximum Allowable

Speed @70° F: 1359 RPM

CFM	OUTLET VEL.	8" SP RPM BHP	10" SP RPM BHP	12" SP RPM BHP	14" SP RPM BHP	15" SP RPM BHP	16" SP RPM BHP	17" SP RPM BHP	18" SP RPM BHP	19" SP RPM BHP	20" SP RPM BHP
32000	1543	676 54.4	750 69.7								
36000	1736	685 60.3	756 76.5	823 93.5	887 111.3						
40000	1928	698 66.7	765 83.9	829 101.8	890 120.4	920 130.1	949 139.9	977 149.9			
44000	2121	713 73.6	778 91.8	839 110.6	897 130.2	925 140.3	953 150.5	981 160.9	1008 171.5	1034 182.3	1060 193.2
48000	2314	729 81.2	792 100.2	851 120.1	907 140.7	934 151.2	961 161.9	988 172.8	1013 183.8	1039 194.9	1064 206.3
52000	2507	747 89.4	808 109.4	866 130.3	920 151.8	946 162.8	972 174.0	997 185.4	1022 196.8	1047 208.5	1071 220.2
57000	2748	768 100.9	830 122.0	886 143.9	938 166.7	964 178.3	988 190.2	1013 202.1	1037 214.2	1060 226.5	1083 238.8
62000	2989	789 113.1	851 135.9	907 158.9	959 182.8	983 195.0	1007 207.5	1031 220.0	1054 232.8	1077 245.6	1099 258.6
67000	3230	810 124.4	872 151.0	929 175.4	980 200.4	1004 213.2	1028 226.1	1051 239.3	1073 252.6	1095 266.1	1117 279.7
72000	3471	829 136.8	893 165.9	950 193.4	1001 219.6	1026 232.9	1049 246.4	1072 260.1	1094 274.0	1116 288.0	1137 302.2
77000	3712	848 153.1	914 179.6	971 211.6	1023 240.4	1047 254.3	1071 268.4	1093 282.6	1116 297.0	1137 311.6	1158 326.4
82000	3953	873 172.5	933 197.0	992 228.4	1044 261.8	1068 277.1	1092 292.1	1115 307.0	1137 321.9	1159 337.1	1179 352.4
87000	4194	909 197.1	952 217.9	1011 246.2	1065 281.9	1089 299.7	1113 316.6	1136 332.8	1158 348.7	1180 364.5	1201 380.3
92000	4435	948 225.8	979 242.8	1030 269.6	1085 301.3	1110 320.5	1134 340.0	1157 358.6	1179 376.3	1201 393.4	1222 410.2
97000	4676	990 258.2	1014 273.6	1050 295.8	1104 326.1	1130 342.7	1155 361.8	1178 382.4	1200 402.8	1222 422.2	1243 440.8
CFM	OUTLET VEL.	21" SP RPM BHP	22" SP RPM BHP	23" SP RPM BHP	24" SP RPM BHP	25" SP RPM BHP	26" SP RPM BHP	27" SP RPM BHP	28" SP RPM BHP	29" SP RPM BHP	30" SP RPM BHP
45000	2169	1086 207.6	1111 218.9								
50000	2410	1091 224.8	1115 236.7	1139 248.7	1163 260.9	1186 273.2	1209 285.6	1231 298.2			
56000	2700	1104 247.4	1126 259.9	1149 272.6	1171 285.4	1193 298.3	1215 311.4	1237 324.6	1258 337.9	1279 351.4	1300 365.1
62000	2989	1121 271.8	1143 285.0	1164 298.4	1186 311.9	1206 325.5	1227 339.3	1248 353.2	1268 367.2	1288 381.3	1308 395.6
68000	3278	1142 297.9	1163 312.0	1184 326.1	1204 340.4	1224 354.8	1244 369.3	1264 383.9	1283 398.6	1303 413.5	
74000	3567	1166 326.2	1186 341.0	1206 355.8	1226 370.8	1246 386.0	1265 401.2	1284 416.6	1303 432.1	1321 447.7	
80000	3857	1191 357.0	1211 372.4	1231 387.9	1250 403.6	1269 419.4	1288 435.4	1306 451.5			
86000	4146	1217 390.5	1237 406.5	1256 422.7	1276 439.1	1294 455.6	1313 472.2				
92000	4435	1243 426.9	1263 443.6	1282 460.5	1301 477.5	1320 494.6					
98000	4724	1268 465.4	1288 483.4	1308 501.3							
104000	5014	1293 503.0	1313 523.6								
110000	5303	1318 537.4									

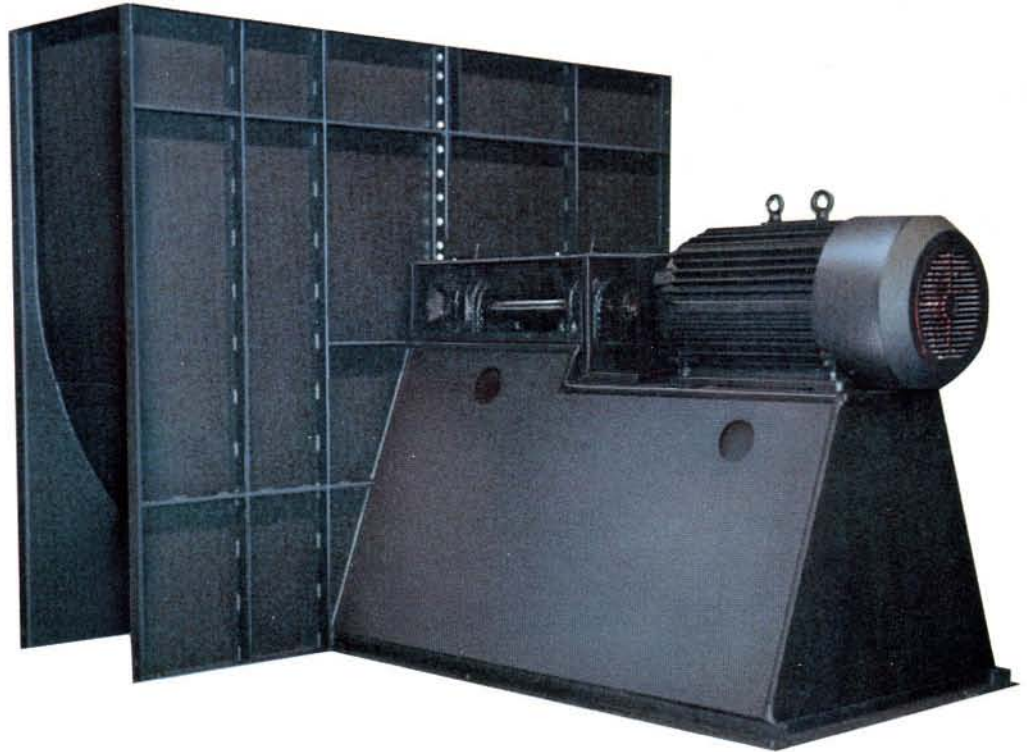
Performance shown is for ducted inlet, and outlet with evase discharge.

**Dimensions** All dimensions are in inches. Do not use for construction. Approximate A/1 weight 7282 lbs.



## IRT Direct Drive

Direct drive arrangements are selected for many industrial applications for their minimal maintenance. While belt drive fans offer wide performance variations if job conditions require, many specifiers and users are reluctant to use belt drives over 100-150 BHP. The IRT Fan is designed for direct drive speeds to 1800 RPM on the size 4900 and smaller and 1200 RPM on larger sizes. The motor can be direct coupled to the standard Arrangement 1 base. The Arrangement 8 base can also be provided including coupling mounting and alignment, motor mounting and mechanical run testing prior to shipment.



### Dimensions

#### ARRANGEMENT 8 motor pedestal dimensions

These approximate dimensions can be used to estimate the overall size of Arrangement 8 fans. Add the appropriate dimensions from Table 5 to the fan dimensions on pages 9-17.

Note: Coupling gap is based on the FALK STEELFLEX couplings. As the gap will vary with other coupling sizes or types, so will the Arrangement 8 motor pedestal dimensions. Specific motor and coupling data are required to determine exact dimensions.

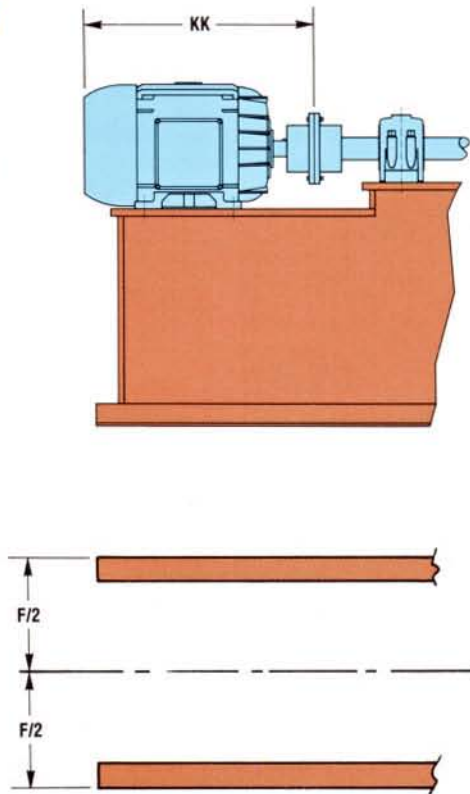


Table 5

Motor Base Pedestal Arrangement 8			
Size	KK†	F/2	Weight*
3000	46-11/16	17	788
3300	48-11/16	18-3/8	851
3612	51-1/8	20-7/8	978
4014	51-1/8	21-5/8	1066
4412	52-7/16	26-3/8	1381
4900	52-7/16	27-1/2	1840
5414	61-5/16	29	2252
5718	61-5/16	32-7/8	2597
6000	61-5/16	32-7/8	2913

These dimensions, when added to dimensions on the Selection Data page for each fan, will approximate the overall fan size. All dimensions are in inches.

\*Addition to arrangement 1 weight. Motor weight not included.

†Based on maximum motor allowed.

## Performance Flexibility

Inlet and outlet dampers and inlet vane dampers can be used with direct driven units to extend the fan's available operating range. Dampers can be closed to cause the fan to move less air and draw less horsepower, thus combining the mechanical integrity of direct drive with the performance flexibility of belt drive.

## Sample Selection For Direct Drive

1. Required: 42,000 CFM; 400°F; 1500' elevation, 10" S.P.
2. As in belt drive example, convert SP to standard conditions: using altitude and temperature correction factors from Table 3.

$$10'' \times 1.71 = 17.1'' \text{ S.P.}$$

3. From Selection Chart, select a size 4014 at 1780 RPM. If a slower speed selection is desired, select a size 5414 at 1180 RPM. Since the fans are direct connected to a driver, the fan width must be modified to meet the required performance. The BHP must also be calculated.

The BHP is estimated by comparing the point of operation to the volume and BHP at maximum width, calculating the width factor (WF) and then calculating the BHP.

### Size 4014

$$WF = \frac{\text{Point of Rating}}{\text{Max. CFM}} = \frac{42,000}{47,000} = .894$$

$$\text{BHP} = WF \times \text{Max. BHP} = .894 \times 190 = 169.8$$

$$\text{BHP at conditions} = 169.8 \div 1.71 = 99.3$$

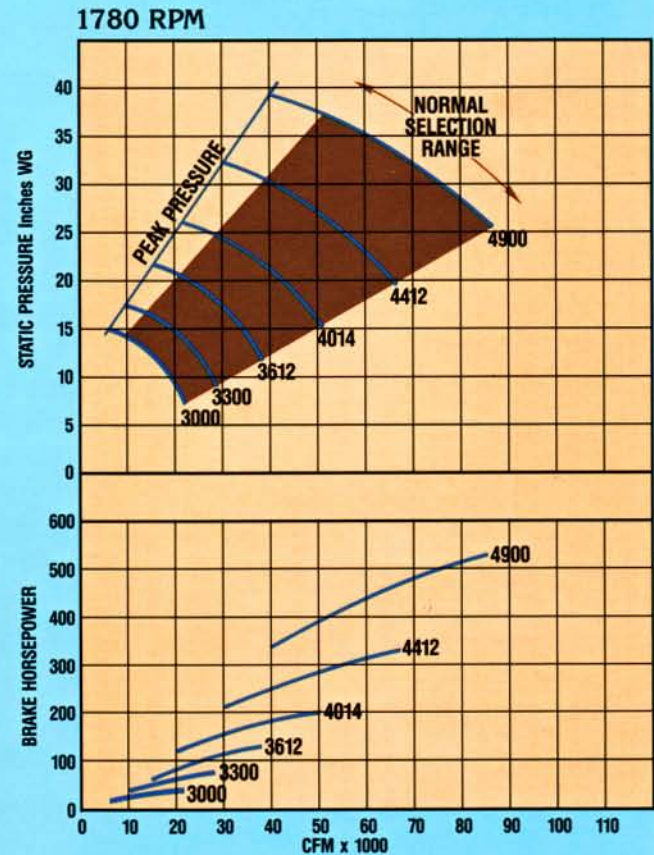
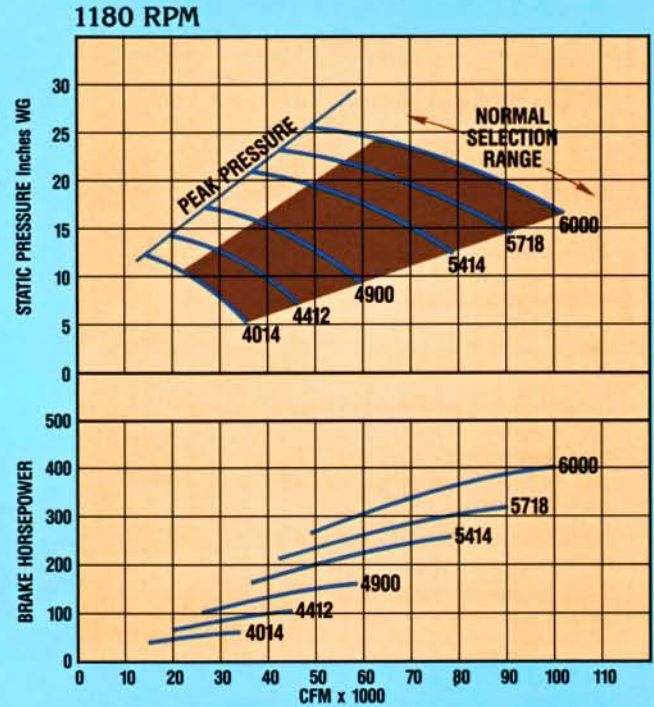
### Size 5414

$$WF = \frac{\text{Point of Rating}}{\text{Max. CFM}} = \frac{42,000}{60,000} = .70$$

$$\text{BHP} = WF \times \text{Max. BHP} = .70 \times 220 = 154.0$$

$$\text{BHP at conditions} = 154.0 \div 1.71 = 90.1$$

4. Check fan mechanical limitations. Refer to Rating Tables on Pages 9-17 and Table 4 for temperature derations.



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