

Series 4000 Centrifugal BCI Fans

Industrial Duty

Design 4170 • Model 45

Design 4270 • Model 40

Design 4370 • Model 30



Series 4000 Centrifugal BCI Fans

The Series 4000 Centrifugal Backward Curved Industrial (BCI) fans are highly efficient with stable operation suited for a wide range of rigorous industrial applications. Due to the broad capabilities of the Series 4000 fan, this bulletin contains only limited performance information. Further information on extended performance and custom fans is available from your Northern Blower sales representative.

Industrial supply and exhaust:

Thermal Oxidizers

Baghouses

Scrubbers

Forced Draft

Induced Draft

Combustion Air Supply

Pulp and Paper Machines

Drying Kilns

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Flanged Outlet

Punched flange to facilitate the bolting of duct connections to the fan outlet.

Backward Curved Wheel

Superior combination of efficient operation and rugged, dependable service.



Bearings

Heavy duty ball or split pillow-block spherical roller bearings sized for a generous B-10 life.

Shaft

Turned ground and polished or fully machined to close tolerance.

Shaft Seal

Used to reduce leakage through the shaft hole in the housing.

Heavy Duty Structural Bearing Pedestal

Housing

Rugged heavy gauge all welded steel housing with substantial framing sections for maximum rigidity. Standard features include flanged outlet, shaft seal and gasketted housing split on sizes 3650 and larger.

Balancing

Wheel and shaft assemblies are dynamically balanced to ISO 1940 specifications and are interference fit on all Models.

Shafts and Bearings

Shafts

Selected to have suitable strength and operate well below the first critical speed for each maximum class condition.

Bearings

Antifriction, grease or oil lubricated, heavy duty ball or split pillow block spherical roller, and manufactured to internationally adopted standards by companies having worldwide acceptance and support services. Bearings are selected for continuous belt driven operation with a generous bearing life at the maximum specified conditions.



Classes of Construction

Arrangement	Fan Size Range	
	Designs 4170 M45, 4270 M40, and 4370 M30	
A/1 SISW	2450 - 8075	
A/8 SISW *	2450 - 8900	
A/9F SISW	2450 - 6000	

*Refer to Bulletin 4000 for direct drive fan selection criteria.

Capacities, Pressures and Tip Speeds at 70°F				
Design Number	Nominal Specific Speed	High Strength Low Alloy Steel, SS304L & SS316L		
		Model	Maximum S.P. ("W.G.)	Volume at Maximum S.P. (CFM)
4170	15,000	45	48	70,000
4270	20,000	40	42	91,000
4370	25,000	30	33	110,000

The performance and limits of Designs 4170 Model 65, 4270 Model 55 and 4370 Model 45 fans can be determined using Northern Blower's **FanFinder™** and **FanQuote™** computer programs.

Temperatures

Operating Temperatures to 800°F. See Table 2, Page 6

Series 4000

Centrifugal BCI Wheel

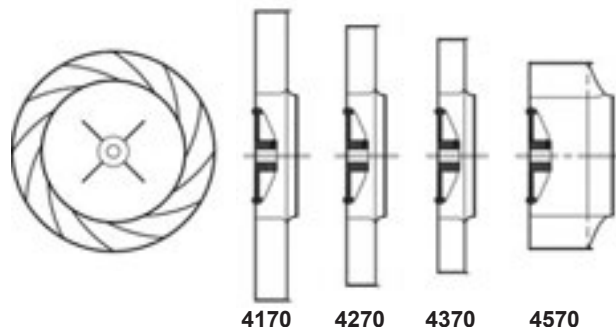
The Northern Blower Backward Curved Industrial (BCI) wheels have a single camber, backward curved design for high operating efficiency and a non-overloading horsepower characteristic. The blades are formed from heavy gauge single thickness material.

The fans are offered in a family of wheel designs with overlapping performance ranges. The backward curved wheels progress from large diameters with narrow blades to small diameters with wide blades, so that a perfectly sized fan can be supplied for the job. Performance tables are provided in this bulletin for Designs 4170, 4270 and 4370 at 110% of nominal

diameter. The performance for Design 4570 is in Bulletin 4500.

The nominal diameters available for the Models in this bulletin are 24-1/2" to 80-3/4". The impellers are available from 95 to 110% of nominal diameter in a fixed width housing.

Performance for these diameters is determined using Northern Blower's **FanFinder™** computer program.



Standard Features

- Heavy Duty Ball or Split Pillow Block Spherical Roller Bearings
- Integral Bearing Pedestal
- Punched Flanged Outlet
- Shaft Seal
- Wheel With Anti-thrust Vanes
- Horizontal Split Housing—Size 3650 and up
- Hinged Flush Mounted Access Door
- Slip Fit Inlet

Vibration Isolation Base

Rigid steel frame to provide a common mounting platform for fan and motor. May be ordered with spring isolators and motor slide base.



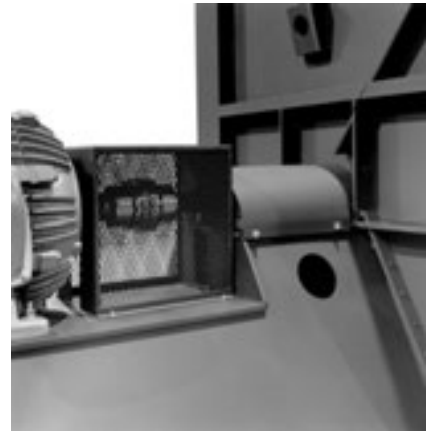
Inlet Box/ Inlet Box Damper

An Inlet Box provides smooth aerodynamic airflow into the fan inlet. The Inlet Box is designed as a bolt-on accessory to the fan. Inlet Dampers also are available in conjunction with the Inlet Box for efficient air volume control.



Coupling/ Shaft and Bearing Guard

The coupling guard encloses the coupling from the face of the motor to the outboard bearing. The Shaft and Bearing Guard encloses the shaft and bearings from the inboard bearing to just beyond the outboard bearing.



Raised Access Door

Access door raised 6" beyond scroll surface to provide room for insulation on exterior of fan housing. Insulated door plug surface is flush with inside of housing scroll.



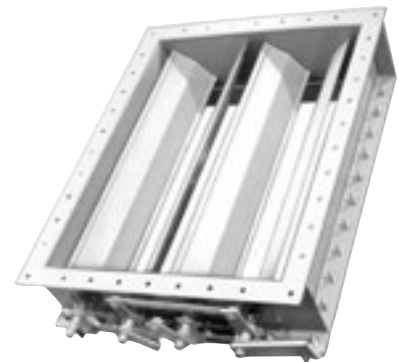
Hinged Quick Release Access Door

The hinged option adds hinges to the standard Quick Release Access Door. Both the standard and Hinged Quick Release Access Doors are mounted flush to the fan scroll and are secured with quick release handles.



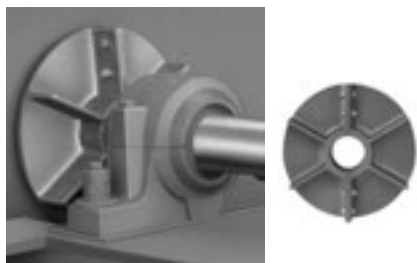
Outlet Damper

Opposed Blade Outlet Dampers are the least expensive air volume control device. Northern Blower Outlet Dampers have punched flanges on both ends to allow for convenient fan and duct connections. Outlet Dampers are available for operating temperatures to 800°F.



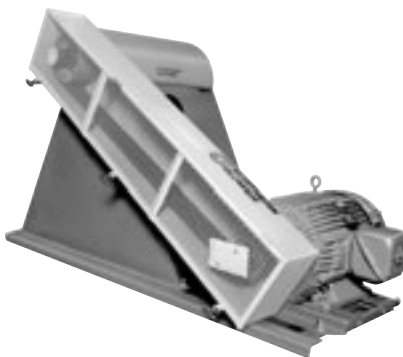
Cooling Wheel

Split aluminum wheel mounted between the inboard bearing and the fan housing. Protects the inboard bearing from shaft conveyed heat and housing radiated heat. Supplied with protective guard as standard. Required for high temperature application; see Page 6.



Belt Guard

Enclosed on all sides, for safe operation, with a mesh cover and quick release fasteners. Tachometer holes and safety colour coatings also available.



Variable Inlet Vanes

Variable Inlet Vanes provide accurate volume control with minimal reduction in performance efficiency. Fan performance remains stable through fully open to fully closed positions. Available for both manual and automatic operation to temperatures of 300°F. Special design available for temperatures to 650°F.



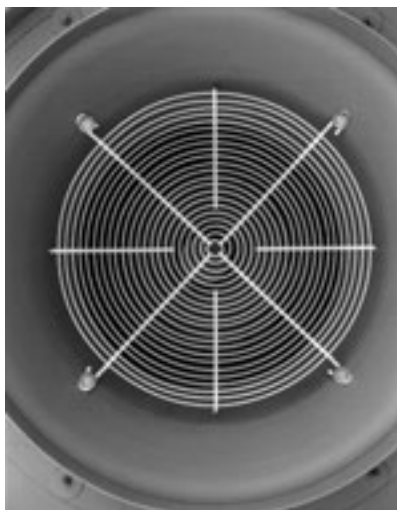
Flanged Inlet

Punched flanges to facilitate the bolting of duct connections to the fan inlet and outlet.



Inlet Screen

Steel screen mounted to the inlet cone. Screens are split where required for easy removal.



Additional Accessories

- Spark Resistant Construction
- Protective Coatings
- Split Housings
Accessory Sizes 2700-3300
Standard Sizes 3650-8075
- Special Metals
- Drain Openings
- High Temperature Construction
- Extended Grease Fittings
- Insulation Clips
- Mounted Drive Package
- Square Flanged Inlet
- Stainless Steel Construction

Due to the wide variety of fans available from Northern Blower we are unable to publish all information in one bulletin. Further information on custom fans is available from your Northern Blower sales representative.

Fan Selection at Elevated Temperature and Altitude

Fan Selection Tables

Ratings shown in the Performance Tables are based on standard air density of .075 pounds per cubic foot at the fan inlet. Standard air is dry air at 70°F and 29.92" Hg barometric pressure. When air density varies from standard, due to temperature or altitude changes, the Air Density Correction Factor from Table 1 is applied. Refer to the sample selection that follows.

Note that data in the selection tables does not include the effects of accessories such as inlet dampers, outlet dampers, screens, or other components in the air stream.

High Temperature

Fans selected for high temperature service must fall within the limits for a particular arrangement as shown in Table 2. For selection, both fan performance and physical operating limits must be corrected. Refer to the sample selection on the following page.

Table 1

Air Density Correction Factor							
Air Temp °F	Elevation (Feet) above Sea Level						
	0	500	1000	2000	3000	4000	5000
-40°	.79	.81	.82	.85	.88	.92	.95
0°	.87	.88	.90	.93	.97	1.00	1.04
40°	.94	.96	.98	1.01	1.05	1.09	1.13
70°	1.00	1.02	1.04	1.08	1.12	1.16	1.20
100°	1.06	1.08	1.10	1.14	1.18	1.22	1.27
140°	1.13	1.15	1.17	1.22	1.26	1.31	1.36
180°	1.21	1.23	1.25	1.30	1.35	1.40	1.45
200°	1.25	1.27	1.29	1.34	1.39	1.44	1.50
250°	1.34	1.36	1.39	1.44	1.49	1.55	1.61
300°	1.43	1.46	1.49	1.54	1.60	1.66	1.72
350°	1.53	1.56	1.58	1.64	1.71	1.77	1.84
400°	1.62	1.65	1.68	1.75	1.81	1.88	1.95
450°	1.72	1.75	1.78	1.85	1.92	1.99	2.06
500°	1.81	1.84	1.88	1.95	2.02	2.10	2.18
600°	2.00	2.04	2.07	2.15	2.23	2.32	2.40
700°	2.19	2.23	2.27	2.35	2.44	2.53	2.63
800°	2.38	2.42	2.46	2.56	2.65	2.75	2.86

Table 2

High Temperature Operating Limits		
Arrangement	Without Cooling Wheel	With Cooling Wheel
1 SW	300°F	800°F
8 SW *	300°F	800°F
9F SW	300°F	650°F

*Refer to bulletin 4000 for direct drive fan selection criteria.

Table 3

Arr. 1, 9F Wheel and Shaft Maximum Speeds at 70°F			
Size	High Strength Low Alloy Steel, SS304L and SS316L		
	Design 4170 Model 45	Design 4270 Model 40	Design 4370 Model 30
2450	3543	3402	3047
2700	3215	3087	2765
3000	2894	2778	2489
3300	2631	2525	2262
3650	2378	2283	2045
4025	2157	2071	1855
4450	1951	1873	1678
4900	1772	1701	1524
5425	1600	1536	1376
6000	1447	1389	1244
6600	1315	1263	1131
7300	1189	1142	1023
8075	1075	1032	925

Table 4

Safe Speed Deration Factors			
Temp °F	High Strength Low Alloy Steel	Stainless Steel 304L	Stainless Steel 316L
-50 to 70	1.00	1.00	1.00
100	0.99	0.99	0.98
200	0.97	0.96	0.91
300	0.96	0.92	0.87
400	0.95	0.88	0.83
500	0.94	0.84	0.80
600	0.92	0.81	0.77
700	0.87	0.78	0.74
800	0.68	0.75	0.72

Sample Selection of a Belt Drive Fan

Select a Series 4000 BCI fan for the operating conditions of 8000CFM at 30" SP, 200°F, 2000 feet elevation and high strength low alloy material.

- 1) Multiply the Operating SP by the Air Density Correction Factor (Table 1) to obtain Equivalent SP:

$$\begin{aligned} \text{Equivalent SP} &= \text{Operating SP} \times \text{Air Density Corr. Factor} \\ &= 30" \times 1.34 = 40" \end{aligned}$$

- 2) From the Performance Tables, select the fan size. For 8000 CFM at 40" SP an efficient selection would be a Design 4170 size 3000 Model 45 fan. Interpolating from the Performance Table given on page 9, the selected fan performance is 2740 RPM and 67.1 BHP at standard temperature and pressure.

- 3) Divide the Equivalent BHP by the Air Density Correction

Factor to obtain the Operating BHP:

$$\begin{aligned} \text{Operating BHP} &= \frac{\text{Equivalent BHP}}{\text{Air Density Correction Factor}} \\ &= \frac{67.1}{1.34} = 50.0 \text{ BHP} \end{aligned}$$

- 4) Multiply the Wheel & Shaft Maximum Speed at 70°F values (Table 3) by the Safe Speed Deration Factors (Table 4). For a 4170 BCI fan, size 3000, Model 45, the maximum speed at 200°F is:

$$\text{Max Speed} = 2894 \times 0.97 = 2807 \text{ RPM}$$

Since the fan selection speed of 2740 RPM is below the maximum allowable speed, the Design 4170 Model 45 fan is a suitable selection.

Drive Configurations

Belt Drive

Design 4170, 4270 and 4370 BCI fans operate at high speeds in systems with large horsepower requirements. Motor sizes are limited to the maximum horsepower limits listed in the accompanying table.

Belt drives are carefully selected by Northern Blower to minimize shaft stress and increase bearing life.

On customer selected belt drives, consult with the motor manufacturer for the motor sheave minimum diameter and maximum width, on motors 125 HP and larger.

Direct Drive

Direct drive arrangements are suitable if the system pressure requirements are known and changes to the system are not expected. The advantage is that belt drive horsepower losses and belt maintenance are eliminated.

Refer to Bulletin 4000 for direct drive fan selection criteria.

The shafts and bearings selected by Northern Blower operate to these limits with a generous B-10 life.

Motor Horsepower Limits *	
Designs 4170, 4270 and 4370	
Size	Arrangement 1 Belt Drive
2450	75
2700	100
3000	125
3300	125
3650	150
4025	200
4450	250
4900	300
5425	350
6000	350
6600	350
7300	350
8075	350

*Refer to pages 29, 30 and 31 for maximum arrangement 9F motor frame sizes.

Wheel Diameter = 88.75 in.
 Outlet Area = 17.12 sq. ft. inside
 Maximum BHP = 640 x (RPM/1000)³
 Tip Speed, fpm = 23.2 x RPM

Size

8075 sisw

Model 45 Maximum RPM 1075
 Maximum Belt Drive Motor HP 350

Design 4170 Centrifugal BCI Fans

Volume O.Vel		12"SP		14"SP		16"SP		18"SP		20"SP		25"SP		30"SP		35"SP		40"SP		45"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
42000	2451	596	111.3	627	125.3	658	140.0	689	155.2	718	170.7	786	211.4								
44000	2567	606	119.5	636	133.9	666	148.7	696	164.2	724	180.1	792	221.6								
46000	2684	617	128.3	646	143.0	675	158.1	703	173.8	731	189.9	798	232.4	859	276.8						
48000	2801	629	137.6	657	152.7	684	168.2	712	184.1	739	200.4	804	243.7	865	289.1						
50000	2918	641	147.2	668	162.9	695	178.9	721	195.0	747	211.6	811	255.6	871	301.9	927	349.6				
52000	3034	653	157.5	679	173.8	705	190.2	730	206.7	756	223.6	818	268.1	877	315.0	933	364.0	985	414.2		
54000	3151	665	168.3	691	185.1	716	202.0	741	219.0	765	236.3	825	281.2	883	328.8	939	378.9	990	429.8		
56000	3268	679	179.8	703	197.0	728	214.5	752	232.1	775	249.8	833	295.2	890	343.4	945	394.0	996	446.3	1045	500.4
58000	3384	692	191.8	716	209.6	740	227.6	763	245.6	786	263.7	842	310.0	897	358.8	951	409.9	1003	463.6	1050	517.6
60000	3501	705	204.7	729	222.8	752	241.2	775	259.7	797	278.4	852	325.9	905	375.2	958	426.8	1008	480.7	1056	536.0
62000	3618	719	218.1	742	236.6	765	255.6	787	274.8	809	294.0	861	342.1	913	392.0	965	444.6	1014	498.8	1062	555.4
64000	3734	734	232.4	756	251.3	777	270.5	799	290.1	820	309.8	872	359.3	922	409.9	972	462.7	1021	518.0	1068	575.1
66000	3851	748	247.3	769	266.5	791	286.3	812	306.3	832	326.5	883	377.5	932	428.9	980	482.0	1028	537.9	1074	595.3
68000	3968	763	263.3	783	282.8	804	302.8	825	323.2	845	343.9	894	395.9	942	448.5	989	502.7	1035	558.4		
70000	4085	778	279.8	798	299.7	818	320.1	838	340.9	857	362.0	906	415.4	952	469.0	998	523.6	1043	580.3		
72000	4201	793	297.3	812	317.5	832	338.2	851	359.4	870	380.9	917	435.4	963	490.5	1007	545.9	1051	603.0		
74000	4318	808	315.7	827	336.3	846	357.4	865	378.8	884	400.6	929	456.3	974	512.4	1018	569.1	1060	626.7		
76000	4435	823	334.9	842	355.8	860	377.2	879	399.0	897	421.2	942	477.9	986	535.7	1028	593.0	1070	651.8		
78000	4551	839	355.2	857	376.5	875	398.2	893	420.4	911	442.8	954	500.5	997	559.0	1039	618.2				
80000	4668	855	376.3	872	398.0	890	419.9	907	442.3	925	465.1	967	523.7	1009	583.9	1050	643.6				
85000	4960	895	433.3	911	456.0	928	478.9	944	502.0	960	525.5	1000	586.2	1040	648.9						
90000	5252	936	496.6	951	520.1	967	544.1	982	568.3	997	592.5	1035	655.0	1072	719.8						
95000	5543	978	566.8	992	591.4	1006	616.0	1021	641.0	1035	666.5	1071	730.5								
100000	5835	1020	643.9	1033	669.5	1047	695.5	1061	721.1	1074	747.2										
105000	6127	1062	728.7																		

Power rating (BHP) does not include drive losses.

Performance ratings do not include the effects of appurtenances in the airstream.

Performance shown is for installation type B - Free inlet, Ducted outlet.

Wheel Diameter = 33.00 in.
 Outlet Area = 2.35 sq. ft. inside
 Maximum BHP = 4.70 x (RPM/1000)³
 Tip Speed, fpm = 8.64 x RPM

Size

3000 sisw

Model 40 Maximum RPM 2778
 Maximum Belt Drive Motor HP 125

Design 4270 Centrifugal BCI Fans

Volume O.Vel		10"SP		12"SP		14"SP		16"SP		18"SP		20"SP		25"SP		30"SP		35"SP		40"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5800	2467	1441	11.6	1542	13.7	1639	15.9	1732	18.2												
6000	2553	1454	12.1	1554	14.3	1649	16.5	1740	18.8												
6200	2638	1467	12.6	1567	14.8	1660	17.1	1750	19.4	1837	21.9										
6400	2723	1479	13.1	1580	15.4	1673	17.7	1760	20.1	1846	22.5										
6600	2808	1493	13.7	1593	16.0	1684	18.3	1772	20.7	1856	23.2	1938	25.8								
6800	2893	1506	14.2	1606	16.6	1697	19.0	1783	21.4	1866	23.9	1946	26.5								
7000	2978	1519	14.7	1618	17.2	1710	19.7	1795	22.2	1877	24.7	1957	27.3								
7200	3063	1533	15.3	1632	17.8	1723	20.4	1809	22.9	1889	25.5	1966	28.1	2154	35.2						
7400	3148	1547	15.9	1644	18.5	1737	21.1	1821	23.7	1901	26.3	1978	29.0	2162	36.1						
7600	3233	1562	16.5	1658	19.1	1749	21.8	1834	24.5	1914	27.2	1990	29.9	2171	36.9						
7800	3318	1578	17.2	1671	19.8	1762	22.5	1847	25.3	1926	28.0	2002	30.8	2181	37.9						
8000	3403	1594	17.9	1685	20.5	1775	23.3	1860	26.1	1940	28.9	2015	31.7	2191	38.9	2358	46.6				
8200	3488	1611	18.6	1700	21.2	1788	24.0	1872	26.9	1952	29.8	2027	32.6	2203	40.0	2368	47.7				
8400	3574	1629	19.3	1715	22.0	1802	24.8	1885	27.7	1966	30.7	2040	33.6	2213	41.0	2376	48.8				
8800	3744	1665	20.9	1747	23.6	1830	26.4	1912	29.4	1991	32.5	2066	35.6	2237	43.2	2396	51.1	2549	59.6		
9200	3914	1704	22.6	1782	25.3	1861	28.2	1939	31.2	2017	34.4	2091	37.6	2262	45.6	2418	53.7	2567	62.1	2710	71.0
9600	4084	1744	24.4	1818	27.2	1893	30.1	1969	33.2	2044	36.4	2117	39.7	2288	48.0	2442	56.3	2587	64.9	2727	73.8
10000	4254	1786	26.3	1857	29.2	1928	32.2	2000	35.3	2072	38.5	2143	41.9	2314	50.5	2468	59.1	2609	67.8	2746	76.9
11000	4680	1896	31.9	1959	34.8	2022	37.9	2087	41.1	2152	44.5	2217	47.9	2378	57.0	2531	66.5	2671	75.8		
12000	5105	2012	38.2	2069	41.4	2126	44.6	2183	48.0	2242	51.4	2300	54.9	2449	64.2	2595	74.2	2734	84.4		
13000	5531	2132	45.6	2185	49.0	2236	52.4	2288	55.9	2341	59.4	2394	63.0	2529	72.6	2665	82.7				
14000	5956	2256	54.0	2304	57.6	2352	61.2	2399	64.8	2447	68.5	2495	72.3	2618	82.0	2742	92.3				
15000	6381	2382	63.4	2426	67.3	2471	71.1	2515	75.0	2559	78.8	2603	82.7	2714	92.7						
16000	6807	2510	74.1	2551	78.2	2593	82.2	2634	86.2	2675	90.3	2715	94.4								
17000	7232	2640	86.0	2679	90.3	2718	94.6	2756	98.8												

Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream. Performance shown is for installation type B - Free inlet, Ducted outlet.

Wheel Diameter = 36.25 in.
 Outlet Area = 2.86 sq. ft. inside
 Maximum BHP = 8.07 x (RPM/1000)³
 Tip Speed, fpm = 9.49 x RPM

Size

3300 sisw

Model 40 Maximum RPM 2525
 Maximum Belt Drive Motor HP 125

Design 4270 Centrifugal BCI Fans

Volume O.Vel		10"SP		12"SP		14"SP		16"SP		18"SP		20"SP		25"SP		30"SP		35"SP		40"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7000	2450	1296	14.0	1391	16.6	1480	19.4	1565	22.2												
7200	2520	1305	14.4	1398	17.1	1487	19.9	1571	22.8												
7400	2590	1314	14.9	1407	17.6	1494	20.5	1579	23.4	1657	26.3										
7600	2660	1324	15.4	1415	18.2	1502	21.1	1585	24.0	1664	27.0										
7800	2730	1335	15.9	1424	18.7	1510	21.6	1593	24.6	1671	27.7	1745	30.8								
8000	2800	1345	16.5	1433	19.3	1518	22.2	1599	25.3	1677	28.4	1752	31.5								
8500	2975	1374	17.9	1458	20.8	1540	23.8	1619	26.9	1695	30.1	1769	33.4								
9000	3150	1404	19.5	1485	22.4	1564	25.5	1640	28.7	1715	32.0	1787	35.4	1956	44.1						
9500	3325	1435	21.3	1514	24.2	1590	27.3	1664	30.6	1736	34.0	1806	37.5	1973	46.5						
10000	3500	1468	23.2	1544	26.2	1618	29.4	1690	32.6	1760	36.1	1828	39.7	1990	49.0	2142	58.6				
10500	3675	1503	25.3	1576	28.3	1648	31.6	1717	34.9	1785	38.4	1851	42.0	2009	51.5	2159	61.4	2300	71.7		
11000	3850	1539	27.5	1609	30.6	1679	33.9	1746	37.3	1812	40.8	1876	44.5	2030	54.2	2177	64.4	2316	74.9		
11500	4025	1577	29.8	1644	33.1	1711	36.5	1776	39.9	1840	43.5	1903	47.2	2052	57.0	2196	67.4	2333	78.2	2461	89.2
12000	4200	1616	32.3	1680	35.8	1744	39.2	1808	42.7	1870	46.4	1931	50.1	2076	60.0	2216	70.6	2351	81.6	2478	93.0
12500	4375	1657	35.0	1718	38.6	1779	42.1	1841	45.7	1901	49.4	1960	53.2	2102	63.2	2238	73.9	2369	85.2	2496	96.8
13000	4550	1699	37.8	1757	41.5	1816	45.2	1875	48.9	1933	52.7	1990	56.5	2129	66.7	2262	77.5	2390	88.8	2514	100.8
13500	4725	1742	40.8	1797	44.6	1853	48.5	1910	52.3	1966	56.1	2022	60.1	2158	70.3	2287	81.3	2412	92.7		
14000	4900	1786	44.0	1839	47.9	1892	51.9	1946	55.8	2001	59.8	2055	63.8	2187	74.2	2313	85.2	2435	96.9		
14500	5075	1830	47.4	1881	51.4	1932	55.5	1984	59.6	2036	63.7	2089	67.8	2217	78.3	2340	89.4	2460	101.2		
15000	5250	1875	51.0	1924	55.1	1973	59.3	2023	63.5	2073	67.7	2123	71.9	2248	82.7	2369	93.9	2485	105.7		
16000	5600	1967	58.9	2013	63.2	2058	67.5	2104	72.0	2150	76.4	2197	80.9	2314	92.1	2429	103.6				
17000	5950	2062	67.7	2104	72.2	2146	76.7	2189	81.3	2232	86.0	2275	90.7	2384	102.5	2493	114.4				
18000	6300	2157	77.6	2197	82.1	2237	86.8	2277	91.6	2316	96.5	2356	101.4	2457	113.8						
19000	6650	2254	88.5	2292	93.1	2329	98.0	2366	102.9	2404	108.0	2441	113.1								
20000	7000	2352	100.4	2388	105.3	2423	110.3	2458	115.3	2493	120.5										

Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream. Performance shown is for installation type B - Free inlet, Ducted outlet.



Wheel Diameter = 88.75 in.

Outlet Area = 17.07 sq. ft. inside

Maximum BHP = 708 x (RPM/1000)³

Tip Speed, fpm = 23.2 x RPM

Model 40 Maximum RPM 1032

Maximum Belt Drive Motor HP 350

Size

8075 SISW

Design 4270 Centrifugal BCI Fans

Volume O.Vel		10"SP		12"SP		14"SP		16"SP		18"SP		20"SP		25"SP		30"SP		35"SP		40"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
42000	2455	530	83.9	569	99.9	605	116.3	640	133.0												
44000	2572	536	88.6	574	104.9	610	121.7	644	139.1	677	156.5										
46000	2689	543	93.6	580	110.1	615	127.4	649	145.2	681	163.3										
48000	2806	550	99.0	586	115.7	621	133.3	654	151.5	686	170.2	716	189.2								
50000	2923	558	104.7	593	121.6	627	139.6	659	158.1	691	177.3	721	196.9								
52000	3040	566	110.8	600	127.9	633	146.0	665	164.9	696	184.6	726	204.7	795	255.4						
54000	3156	574	117.4	607	134.7	639	152.9	671	172.1	701	192.1	730	212.4	800	264.8						
56000	3273	583	124.4	615	141.9	647	160.3	677	179.8	707	199.8	736	220.6	804	274.6						
58000	3390	591	131.7	623	149.4	654	168.1	684	187.6	713	207.9	741	229.1	809	284.1	872	340.6				
60000	3507	601	139.4	632	157.4	662	176.4	691	196.0	719	216.6	747	238.1	814	293.7	876	351.5				
62000	3624	610	147.6	640	165.9	670	185.0	698	204.9	726	225.8	753	247.2	819	303.9	880	363.0	938	423.0		
64000	3741	620	156.1	649	174.9	678	194.1	706	214.3	733	235.2	760	256.9	825	314.5	885	374.9	942	436.1		
66000	3858	630	165.1	658	184.2	687	203.8	714	224.1	741	245.3	767	267.3	830	325.0	890	386.2	947	449.7		
68000	3975	640	174.4	668	194.0	695	213.9	722	234.5	749	255.9	774	277.9	836	336.3	895	398.4	951	462.4	1004	528.0
70000	4092	651	184.2	677	204.2	704	224.6	731	245.3	757	266.8	782	289.1	843	348.2	901	410.9	956	476.2	1008	542.6
72000	4209	661	194.3	687	214.9	714	235.6	739	256.7	765	278.5	790	301.1	849	360.2	906	423.5	961	489.9	1013	557.6
76000	4442	684	215.9	708	237.6	733	259.2	757	281.0	782	303.3	806	326.2	863	386.4	918	450.6	972	518.7	1022	588.3
80000	4676	707	239.3	730	262.0	753	284.6	776	307.3	800	330.3	823	353.7	878	414.9	932	480.0	983	548.9		
84000	4910	731	264.9	752	288.2	774	311.9	796	335.6	818	359.4	841	383.5	894	445.7	946	511.8	996	581.4		
88000	5144	755	292.3	776	316.5	796	341.2	817	366.0	838	390.8	859	415.7	911	479.0	961	546.0	1009	616.4		
92000	5378	780	322.3	800	347.3	819	372.7	839	398.4	859	424.2	879	450.0	928	514.9	977	582.8	1024	654.2		
96000	5611	805	354.4	824	380.0	842	406.2	861	432.8	880	459.5	899	486.3	947	553.4	994	622.3				
100000	5845	831	389.3	849	415.5	866	442.5	884	469.8	902	497.4	920	525.0	965	594.3	1011	664.7				
110000	6430	896	487.9	912	515.6	928	543.9	944	572.9	960	602.4	976	632.6	1016	708.0						
120000	7014	963	604.6	978	633.7	992	663.5	1006	693.8	1020	725.0										

Power rating (BHP) does not include drive losses.

Performance ratings do not include the effects of appurtenances in the airstream.

Performance shown is for installation type B - Free inlet, Ducted outlet.

Wheel Diameter = 27.00 in.
 Outlet Area = 2.06 sq. ft. inside
 Maximum BHP = 2.21 x (RPM/1000)³
 Tip Speed, fpm = 7.07 x RPM

Size

2450 sisw

Model 30 Maximum RPM 3047
 Maximum Belt Drive Motor HP 75

Design 4370 Centrifugal BCI Fans

Volume O.Vel		12"SP		14"SP		16"SP		18"SP		20"SP		22"SP		24"SP		26"SP		28"SP		30"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	2454	1884	12.0																		
5200	2552	1900	12.5	2017	14.5																
5400	2650	1915	13.0	2033	15.1																
5600	2748	1930	13.6	2049	15.7	2158	17.8														
5800	2847	1946	14.1	2064	16.3	2173	18.5														
6000	2945	1963	14.7	2079	16.9	2189	19.2	2292	21.5												
6200	3043	1983	15.3	2094	17.6	2205	19.9	2307	22.2	2402	24.6										
6400	3141	2003	15.9	2112	18.2	2219	20.6	2322	23.0	2419	25.4										
6800	3337	2047	17.3	2149	19.6	2252	22.1	2352	24.6	2449	27.1	2541	29.6	2627	32.2						
7200	3534	2092	18.7	2192	21.1	2288	23.7	2385	26.2	2479	28.9	2571	31.5	2659	34.2	2743	37.0				
7600	3730	2136	20.1	2237	22.7	2330	25.3	2421	28.0	2512	30.7	2602	33.5	2690	36.3	2774	39.1	2853	41.9	2928	44.8
8000	3926	2177	21.6	2282	24.4	2374	27.1	2462	29.9	2548	32.7	2635	35.6	2720	38.5	2804	41.4	2884	44.3	2960	47.3
8400	4123	2214	23.1	2325	26.1	2420	29.0	2507	31.9	2589	34.8	2671	37.7	2753	40.7	2834	43.7	2913	46.7	2991	49.8
8800	4319	2251	24.6	2364	27.8	2464	30.9	2552	34.0	2633	37.0	2712	40.0	2789	43.1	2867	46.1	2944	49.3	3020	52.4
9200	4515	2290	26.3	2401	29.6	2505	32.9	2596	36.1	2678	39.2	2755	42.4	2830	45.5	2904	48.7	2978	51.9		
9600	4712	2335	28.1	2437	31.4	2543	34.9	2638	38.3	2722	41.6	2799	44.9	2873	48.1	2945	51.4	3015	54.7		
10000	4908	2385	30.1	2478	33.3	2579	36.9	2677	40.5	2765	44.0	2844	47.4	2918	50.8	2988	54.2				
10500	5153	2454	32.8	2535	36.0	2626	39.6	2722	43.3	2814	47.1	2898	50.8	2973	54.3	3044	57.9				
11000	5399	2528	35.8	2600	39.0	2680	42.5	2769	46.3	2860	50.2	2947	54.1	3027	58.0						
11500	5644	2605	39.1	2671	42.3	2741	45.7	2820	49.5	2906	53.4	2993	57.5								
12000	5890	2685	42.7	2745	45.9	2809	49.3	2879	53.0	2956	56.9	3038	61.1								
12500	6135	2767	46.5	2823	49.8	2882	53.2	2944	56.8	3013	60.7										
13000	6380	2850	50.6	2903	54.0	2957	57.5	3014	61.1												
13500	6626	2934	54.9	2984	58.4	3035	62.0														
14000	6871	3019	59.6																		

Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream. Performance shown is for installation type B - Free inlet, Ducted outlet.

Wheel Diameter = 29.75 in.
 Outlet Area = 2.49 sq. ft. inside
 Maximum BHP = 3.60 x (RPM/1000)³
 Tip Speed, fpm = 7.79 x RPM

Size

2700 sisw

Model 30 Maximum RPM 2765
 Maximum Belt Drive Motor HP 100

Design 4370 Centrifugal BCI Fans

Volume O.Vel		12"SP		14"SP		16"SP		18"SP		20"SP		22"SP		24"SP		26"SP		28"SP		30"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	2425	1705	14.4																		
6400	2586	1728	15.4	1836	17.9																
6800	2748	1752	16.5	1859	19.0	1958	21.6														
7200	2910	1776	17.6	1881	20.3	1982	23.0	2074	25.7												
7600	3071	1804	18.8	1905	21.6	2004	24.4	2098	27.3	2185	30.1										
8000	3233	1836	20.1	1931	22.9	2027	25.8	2121	28.8	2208	31.8	2291	34.8								
8400	3395	1869	21.4	1961	24.4	2052	27.3	2143	30.4	2231	33.5	2314	36.7	2394	39.9						
8800	3556	1903	22.8	1993	25.9	2080	29.0	2168	32.1	2253	35.3	2337	38.6	2417	41.9	2492	45.2				
9200	3718	1936	24.3	2027	27.5	2112	30.6	2195	33.9	2277	37.2	2359	40.5	2439	43.9	2516	47.4	2587	50.8		
9600	3880	1968	25.8	2061	29.1	2145	32.4	2225	35.7	2304	39.1	2383	42.5	2461	46.0	2538	49.6	2611	53.2	2680	56.7
10000	4041	1996	27.3	2094	30.8	2179	34.3	2257	37.7	2333	41.1	2409	44.7	2484	48.2	2559	51.9	2633	55.6	2703	59.2
10500	4243	2030	29.2	2132	33.0	2220	36.7	2299	40.2	2373	43.8	2445	47.4	2517	51.1	2589	54.9	2661	58.7	2731	62.5
11000	4445	2065	31.2	2167	35.1	2260	39.1	2341	42.9	2415	46.6	2485	50.4	2554	54.2	2622	58.0	2691	61.9	2759	65.8
11500	4647	2105	33.3	2201	37.4	2296	41.6	2381	45.6	2457	49.6	2527	53.5	2594	57.4	2659	61.3	2725	65.3		
12000	4849	2150	35.8	2237	39.8	2330	44.1	2418	48.4	2498	52.6	2569	56.7	2635	60.7	2699	64.8	2762	68.9		
12500	5051	2201	38.4	2278	42.4	2364	46.7	2453	51.2	2536	55.7	2610	60.0	2677	64.2	2741	68.4				
13000	5254	2254	41.3	2323	45.2	2402	49.5	2487	54.0	2572	58.8	2650	63.4	2720	67.9						
13500	5456	2310	44.4	2374	48.3	2444	52.5	2523	57.1	2605	61.9	2685	66.7	2758	71.5						
14000	5658	2368	47.7	2427	51.6	2491	55.8	2562	60.3	2639	65.1	2718	70.1								
14500	5860	2428	51.3	2483	55.2	2541	59.4	2605	63.8	2677	68.6	2752	73.6								
15000	6062	2488	55.0	2540	59.0	2595	63.2	2653	67.6	2718	72.3										
15500	6264	2550	59.0	2599	63.1	2651	67.3	2704	71.7	2763	76.3										
16000	6466	2612	63.3	2659	67.4	2708	71.6	2758	76.0												
16500	6668	2675	67.7	2720	71.9																
17000	6870	2739	72.3																		

Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream. Performance shown is for installation type B - Free inlet, Ducted outlet.



Wheel Diameter = 88.75 in.
 Outlet Area = 22.25 sq. ft. inside
 Maximum BHP = 939 x (RPM/1000)³
 Tip Speed, fpm = 23.2 x RPM

Size

8075 sisw

Model 30 Maximum RPM 925
 Maximum Belt Drive Motor HP 350

Design 4370 Centrifugal BCI Fans

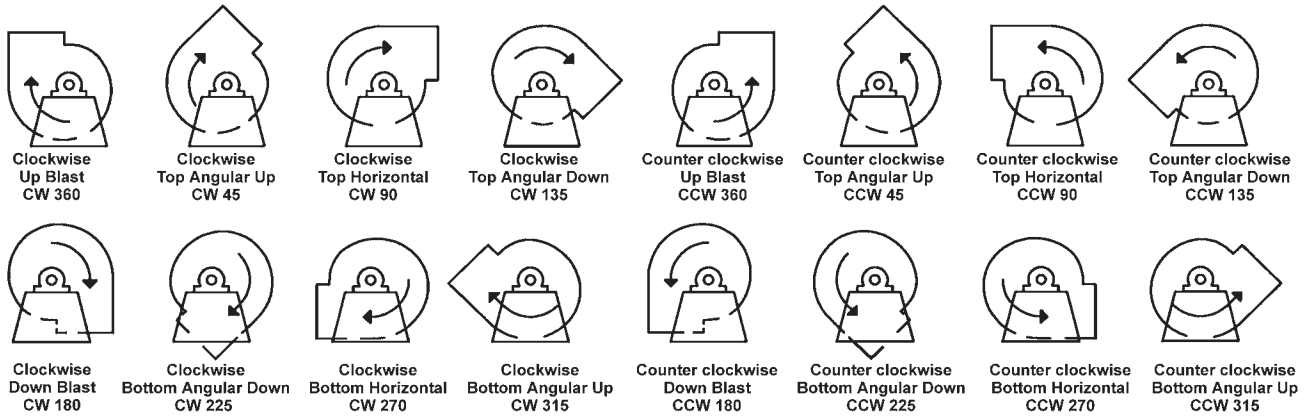
Volume O.Vel		12"SP		14"SP		16"SP		18"SP		20"SP		22"SP		24"SP		26"SP		28"SP		30"SP	
CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
56000	2517	569	135.2																		
58000	2606	573	140.4	609	162.7																
60000	2696	577	145.9	613	168.6																
62000	2786	581	151.5	617	174.7	651	198.5														
64000	2876	585	157.1	621	181.1	654	205.1														
68000	3056	594	169.0	629	193.9	662	219.2	694	244.8	723	270.8										
72000	3236	605	181.6	638	207.4	671	234.0	701	260.6	731	287.6	759	315.0								
76000	3415	616	194.8	648	221.7	679	249.2	710	277.1	739	305.2	767	333.6	794	362.5						
80000	3595	628	208.8	658	236.8	689	265.2	718	294.3	747	323.4	775	352.9	802	382.9	828	413.3				
84000	3775	640	223.6	670	252.7	699	282.1	728	312.1	756	342.4	783	373.0	809	404.0	835	435.4	860	466.4	883	497.9
88000	3955	652	239.1	682	269.4	710	299.9	738	330.9	765	362.1	791	393.7	817	425.8	843	458.3	867	490.4	891	522.9
92000	4134	665	255.4	694	286.9	722	318.5	749	350.6	775	382.7	801	415.3	826	448.3	851	481.9	875	515.2	898	548.7
96000	4314	677	272.3	706	305.1	734	338.1	760	371.1	786	404.2	810	437.7	835	471.7	859	506.2	883	540.9	906	575.4
100000	4494	690	290.1	719	324.1	746	358.5	772	392.4	797	426.6	821	461.2	845	496.1	868	531.5	892	567.4	915	603.0
105000	4719	707	313.8	735	348.9	762	385.0	787	420.5	812	456.2	835	492.0	858	528.2	881	564.8	903	601.9		
110000	4943	724	339.6	751	375.4	778	412.7	803	449.9	827	487.1	850	524.4	872	561.9	894	599.7	916	638.0		
115000	5168	742	367.7	768	403.8	793	441.8	818	480.5	842	519.5	865	558.3	887	597.1	908	636.2				
120000	5393	762	398.3	785	434.5	810	472.8	834	512.7	858	553.2	881	593.7	902	634.0	923	674.4				
125000	5617	782	431.4	804	467.6	827	506.2	850	546.8	874	588.6	896	630.7	918	672.5						
130000	5842	802	466.8	823	503.5	845	542.3	867	583.3	890	625.9	912	669.3								
135000	6067	824	505.1	843	542.1	863	581.0	884	621.9	906	664.7										
140000	6291	845	545.7	864	583.3	883	622.5	903	663.5	923	706.5										
145000	6516	868	589.2	885	627.4	903	667.1	922	708.3												
150000	6741	890	635.5	907	674.2	924	714.2														
155000	6966	913	684.3																		

Power rating (BHP) does not include drive losses.

Performance ratings do not include the effects of appurtenances in the airstream.

Performance shown is for installation type B - Free inlet, Ducted outlet.

Designations for Rotation and Discharge of Centrifugal Fans



Notes:

- Direction of rotation is determined from the drive side of the fan.
- Direction of discharge is determined in accordance with the diagrams. Angle of discharge is referred to the vertical axis of the fan and designated in degrees from such standard reference axis. Angle of discharge may be any intermediate angle as required.
- For a fan inverted for ceiling suspension, or side wall mounting, the direction of rotation and discharge is determined when the fan is resting on the floor.

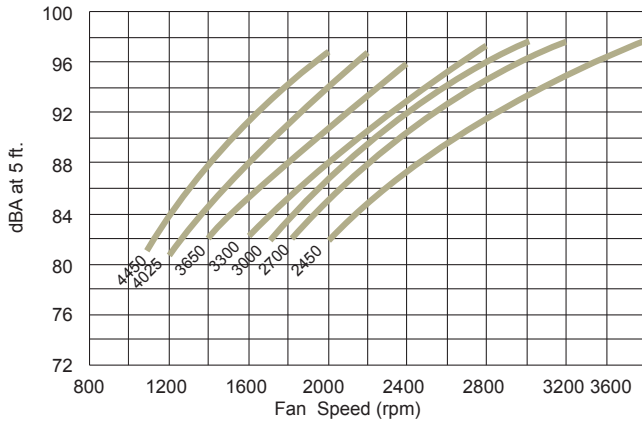
Sound Pressure Levels

- The sound pressure level ratings shown are decibels referred to 10^{-12} watt. The ratings were obtained from tests performed in accordance with AMCA Standard 300.
- Sound pressure levels are calculated per AMCA standards 301 and 303, Installation Type B (free inlet, ducted outlet) and Type D (ducted inlet, ducted outlet).
- Sound pressure levels apply to the normal range of selection for high efficiency, as shown in the capacity tables, and are at 5 ft. from the acoustic center of the fan.
- The sound pressure levels shown are for fans with 110% of nominal diameter wheels. For fans with wheels between 95 and 110% of nominal diameter, use Northern Blower's **Fan-Finder™** computer program to determine the sound levels and performance.
- The sound pressure levels are based on standard construction and operating conditions. All data assumes the ducted outlet and/or ducted inlet and are of the same material and thickness as the fan casing and that any expansion joints are acoustically treated.
- Ratings do not include the effect of fan appurtenances, such as dampers and belt guards, or of air density. The motor and any other auxiliary equipment sound are not included.

Design 4170, Model 45

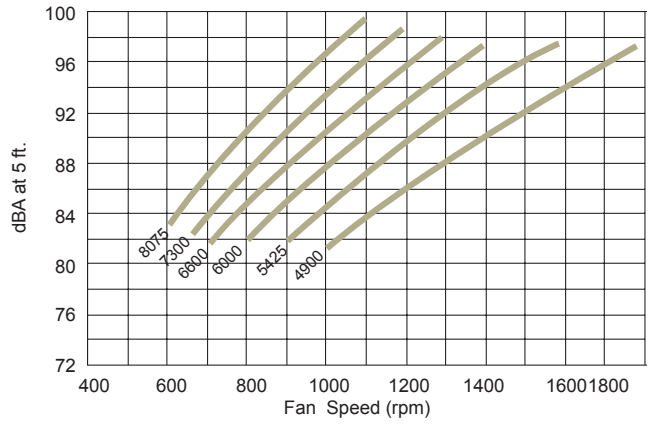
Sizes 2450 to 4450

Free Inlet, Ducted Outlet Sound Pressure Levels



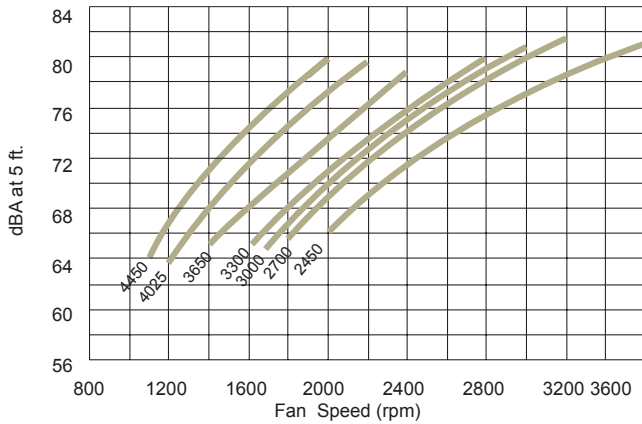
Sizes 4900 to 8075

Free Inlet, Ducted Outlet Sound Pressure Levels



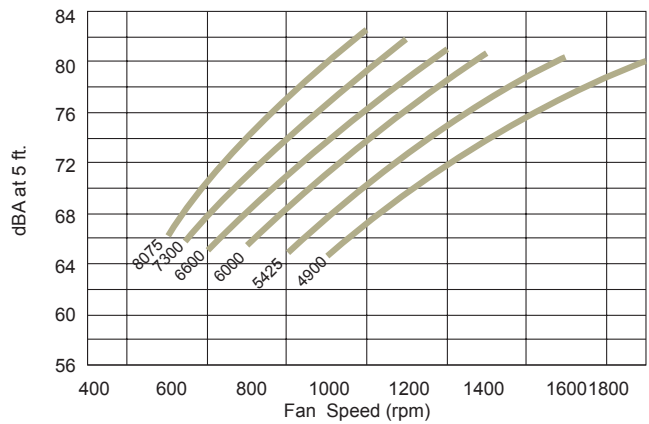
Sizes 2450 to 4450

Ducted Inlet, Ducted Outlet Sound Pressure Levels



Sizes 4900 to 8075

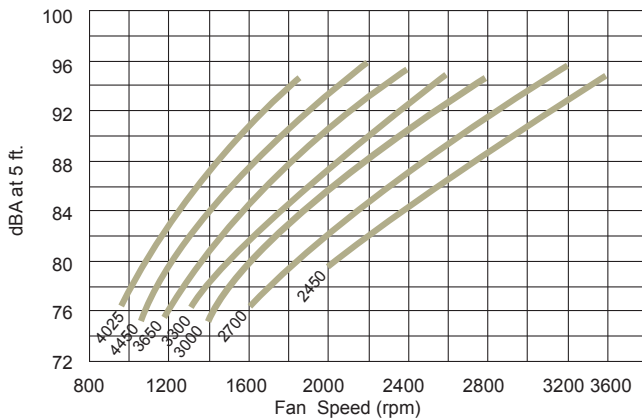
Ducted Inlet, Ducted Outlet Sound Pressure Levels



Design 4270, Model 40

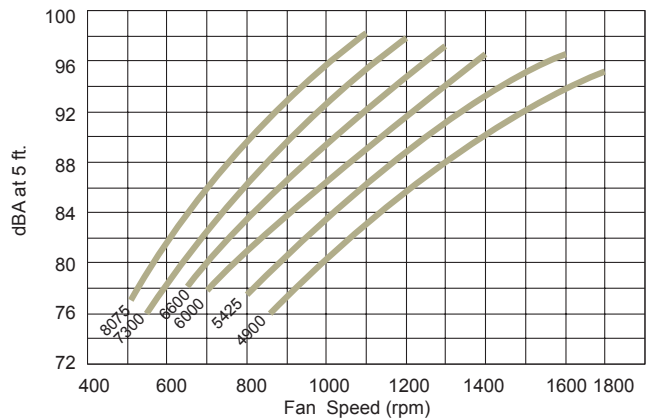
Sizes 2450 to 4450

Free Inlet, Ducted Outlet Sound Pressure Levels



Sizes 4900 to 8075

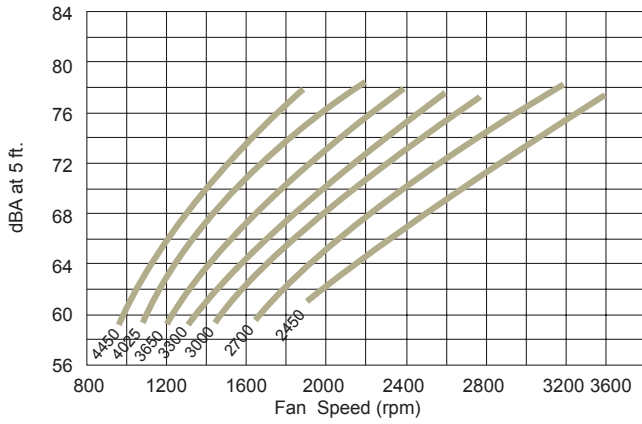
Free Inlet, Ducted Outlet Sound Pressure Levels



Design 4270, Model 40

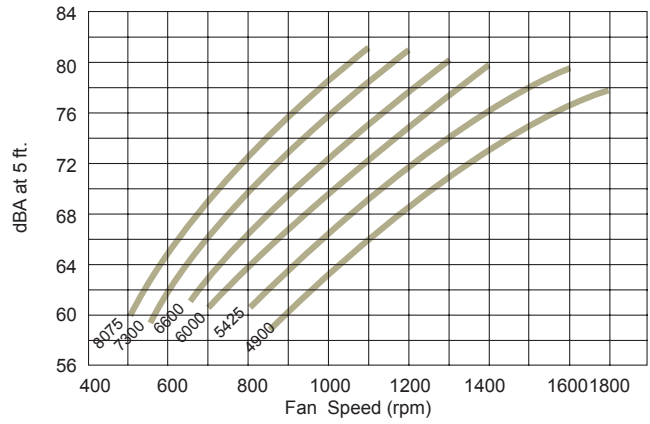
Sizes 2450 to 4450

Ducted Inlet, Ducted Outlet Sound Pressure Levels



Sizes 4900 to 8075

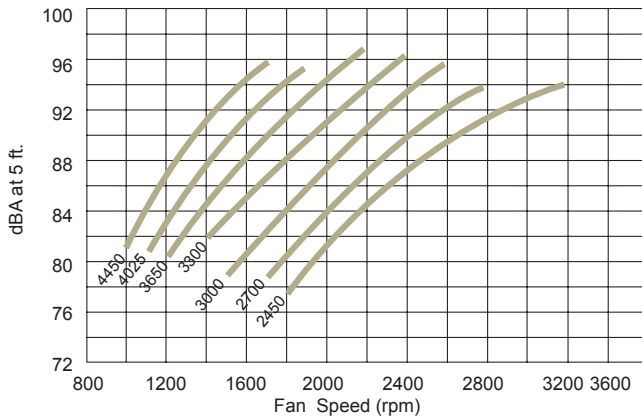
Ducted Inlet, Ducted Outlet Sound Pressure Levels



Design 4370, Model 30

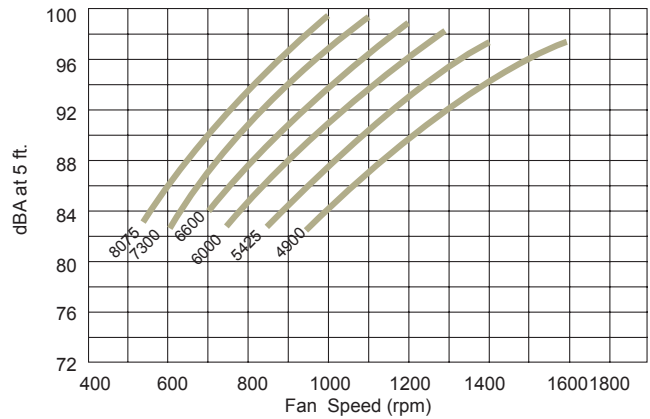
Sizes 2450 to 4450

Free Inlet, Ducted Outlet Sound Pressure Levels



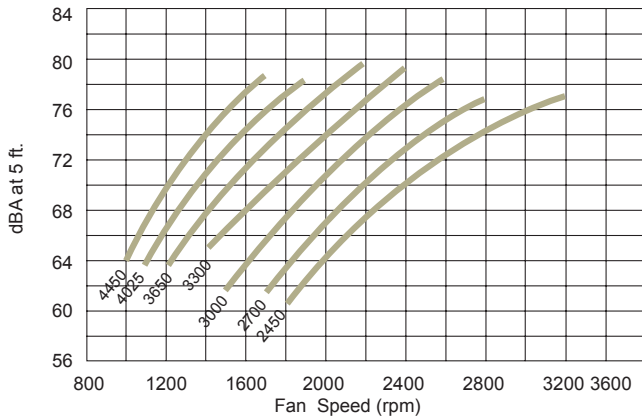
Sizes 4900 to 8075

Free Inlet, Ducted Outlet Sound Pressure Levels



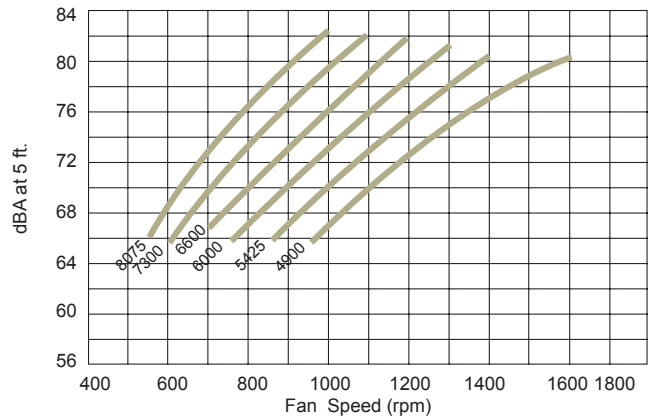
Sizes 2450 to 4450

Ducted Inlet, Ducted Outlet Sound Pressure Levels



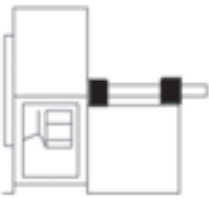
Sizes 4900 to 8075

Ducted Inlet, Ducted Outlet Sound Pressure Levels



SI - Single Inlet
SW - Single Width

DI - Double Inlet
DW - Double Width



1 SWSI

For belt drive or direct connection. Impeller overhung. Two bearings on base.



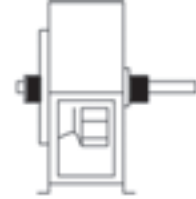
1 SWSI c/w BOX

For belt drive or direct connection. Impeller overhung. Two bearings on base. Inlet box may be self-supporting.



2 SWSI

For belt drive or direct connection. Impeller overhung. Bearings in bracket supported by fan housing.



3 SWSI

For belt drive or direct connection. One bearing on each side and supported by fan housing.



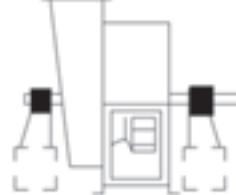
3 SWSI c/w BOX

For belt drive or direct connection. One bearing on each side and supported by fan housing and inlet box. Shaft extending through inlet box.



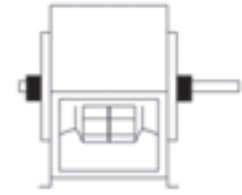
3 SWSI c/w IND. PED.

For belt drive or direct connection. Housing is self-supporting. One bearing on each side supported by independent pedestals.



3 SWSI c/w BOX & IND. PED.

For belt drive or direct connection. Housing is self-supporting. One bearing on each side and supported by independent pedestals with shaft extending through inlet box.



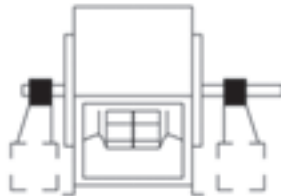
3 DWDI

For belt drive or direct connection. One bearing on each side and supported by fan housing.



3 DWDI c/w BOXES

For belt drive or direct connection. One bearing on each side and supported by inlet boxes. Shaft extending through inlet boxes.



3 DWDI c/w IND. PED.

For belt drive or direct connection. Housing is self-supporting. One bearing on each side and supported by independent pedestals.



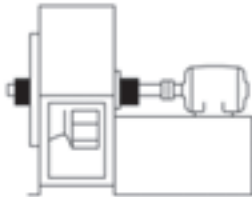
3 DWDI c/w BOXES & IND. PED.

For belt drive or direct connection. Housing is self-supporting. One bearing on each side supported by independent pedestals with shaft extending through inlet box.



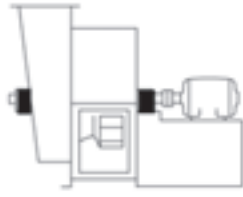
4 SWSI

For direct drive. Impeller overhung on prime mover shaft. No bearings on fan. Prime mover base mounted or integrally directly connected.



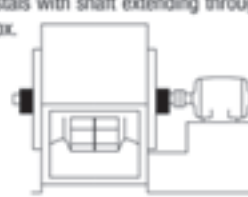
7 SWSI

For belt drive or direct connection. Arrangement 3 plus base for prime mover.



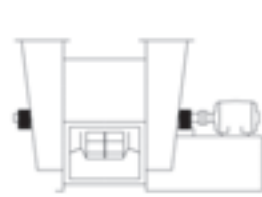
7 SWSI c/w BOX

For belt drive or direct connection. Arrangement 3 plus base for prime mover. Shaft extending through inlet box.



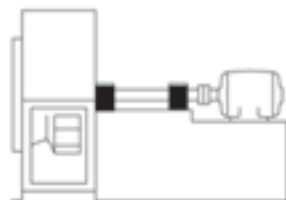
7 DWDI

For belt drive or direct connection. Arrangement 3 plus base for prime mover.



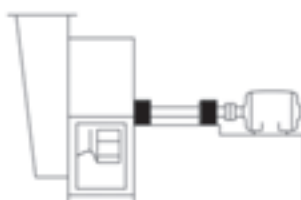
7 DWDI c/w BOXES

For belt drive or direct connection. Arrangement 3 plus base for prime mover. Shaft extending through inlet box.



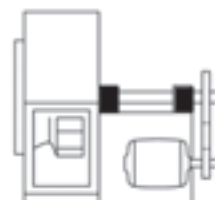
8 SWSI

For belt drive or direct connection. Arrangement 1 plus extended base for prime mover.



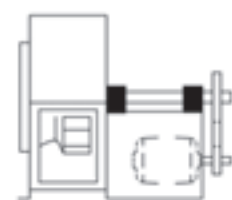
8 SWSI c/w BOX

For belt drive or direct connection. Arrangement 1 plus extended base for prime mover.



9 SWSI

For belt drive. Impeller overhung, two bearings, with prime mover outside base.



10 SWSI

For belt drive. Impeller overhung, two bearings, with prime mover inside base.



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