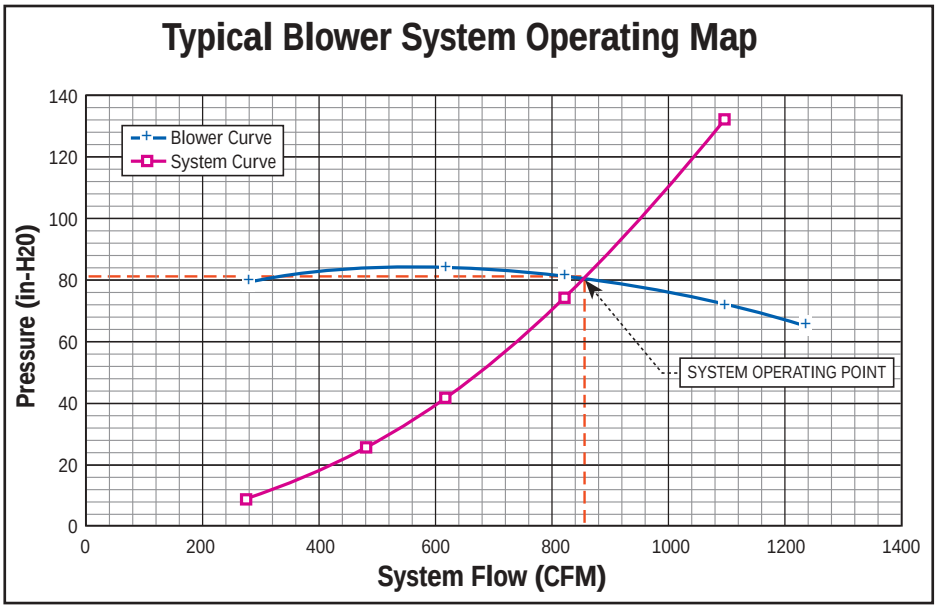
Select the RIGHT AIRPOWER™ BLOWER FOR YOUR APPLICATION!

Proper blower selection is highly dependent on system design and the ultimate performance objective, be it for air-knife use, fluidized bed, pond aeration, or one of many other possible applications. Vortron is always available to assist with system development and application recommendations. Guidelines specific to air-knife applications are also available.

In all cases, it is the piping and discharge system characteristic that determines the blower selection. In general, the piping system will exhibit a rising pressure vs. flowrate characteristic, where P~Flow^2.

Blowers, on the other hand, exhibit the opposite characteristic where pressure tends to drop-off with increasing flowrate. Where the system and blower curves intersect defines the operating point for the entire system.



Once the Performance Requirements Are Known...

Selecting the best *AIRPOWER*™ model for the application is straightforward. From the chart below, find the system operating pressure in one of the left-hand columns, then move over to the required flowrate, selecting the operating point "box". This is the proper *AIRPOWER*™ unit for the application, preselected to deliver best possible efficiency.

Chart #1 — AIRPOWER™ Selection

Pressure - psig	Pressure - in-Hg	Pressure - in-H20		100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
4.70	9.56	130		J70-265	J70-253	J70-253	J70-253	J70-253	J70-265	Z40e-215	Z40e-220	Z40e-220	Z40e-220	Z40e-225	Z40e-230	
4.34	8.83	120		J70-250	J70-245	J70-240	J70-240	J70-240	J70-245	Z40e-210	Z40e-210	Z40e-210	Z40e-215	Z40e-220	Z40e-220	
3.97	8.09	110		J70-240	J70-235	J70-230	J70-230	J70-230	J70-235	Z40e-200	Z40e-200	Z40e-200	Z40e-210	Z40e-210	Z40e-215	
3.61	7.35	100	X40-250	X40-250	X40-245	X40-240	X40-240	X40-245	Z40e-193	Z40e-193	Z40e-193	Z40e-193	Z40e-200	Z40e-200	Z40e-210	
3.25	6.62	90	X40-235	X40-235	X40-230	X40-230	X40-230	X40-235	Z40e-185	Z40e-185	Z40e-185	Z40e-185	Z40e-193	Z40e-193	Z40e-200	
2.89	5.88	80	X40-220	X40-220	X40-215	X40-215	X40-220	X40-220	Z40e-177	Z40e-177	Z40e-177	Z40e-182	Z40e-187	Z40e-187	Z40e-193	
2.53	5.15	70	X40-210	X40-200	X40-200	X40-210	X40-210	X40-215	Z40e-165	Z40e-165	Z40e-165	Z40e-172	Z40e-177	Z40e-182	Z40e-187	
2.17	4.41	60	X40-200	X40-195	X40-190	X40-190	X40-195	X40-195	Z40e-155	Z40e-155	Z40e-160	Z40e-165	Z40e-170	Z40e-177	Z40e-182	
1.81	3.68	50	X40-190	X40-187	X40-182	X40-182	X40-182	X40-182	Z40e-144	Z40e-144	Z40e-150	Z40e-155	Z40e-160	Z40e-165	Z40e-177	
1.45	2.94	40	X40-175	X40-175	X40-165	X40-165	X40-165	X40-165	Z40e-140	Z40e-140	Z40e-140	Z40e-150	Z40e-150	Z40e-160	Z40e-170	
			100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	
			Flow - SCFM													

Determine Power Requirements...

The final step in the selection process is to determine power required to operate the system, *AT* the operating point of interest. This is highly important as motor sizing, overall utility requirements, and operational costs will depend upon the system power. To assist this assessment, Vortron has tabulated shaft power requirements to operate *AIR*POWER™ units. Here, by selecting the system operating point in the same fashion as the previous excercise, actual blower power is readily obtained:

1. **Find the operating point "box" knowing system pressure and airflow**
2. **Read the blower power (HP) directly**

Chart #2 — Motor Power

Pressure - psig	Pressure - in-Hg	Pressure - in-H2O	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
4.70	9.56	130		6.3	8.4	10.3	12.3	14.4	16.8	19.2	21.1	23.1	25.4	27.7	30.0
4.34	8.83	120		5.7	7.7	9.4	11.3	13.4	15.6	17.6	19.5	21.5	23.6	25.8	27.9
3.97	8.09	110		5.2	7.0	8.6	10.4	12.3	14.3	16.2	17.9	19.8	21.8	23.8	25.8
3.61	7.35	100	2.5	4.5	6.1	7.5	9.2	11.0	13.2	14.7	16.3	18.2	20.0	21.8	23.8
3.25	6.62	90	2.2	4.0	5.5	6.8	8.3	10.0	11.9	13.3	14.8	16.5	18.1	19.8	21.5
2.89	5.88	80	1.9	3.6	4.8	6.0	7.5	9.1	10.7	11.9	13.3	14.7	16.2	17.7	19.4
2.53	5.15	70	1.7	3.1	4.2	5.3	6.6	8.2	9.4	10.5	11.7	13.0	14.3	15.8	17.3
2.17	4.41	60	1.4	2.6	3.6	4.6	5.7	7.2	8.2	9.0	10.1	11.2	12.5	13.7	15.0
1.81	3.68	50	1.2	2.2	3.0	3.8	4.8	6.0	7.0	7.6	8.6	9.7	10.6	11.5	12.7
1.45	2.94	40	1.0	1.7	2.4	3.1	4.0	5.0	5.7	6.2	7.0	7.9	8.8	9.5	10.6
			100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
			Flow - SCFM												

NOTE: *Blower power tabulated at air density of 0.075 lbm/ft^3; inlet temperature of 528°R. All power readings correspond to the specific AIRPOWER™ Model, performance tested at the operating point. (30 HP and larger units are currently unavailable.)*

Application Example

An air-knife drying system has been specified for high performance in-line drying, with a knife manifold pressure of approximately 73 in-H2O. This is to achieve a discharge velocity of approximately 33,500 feet-per-minute. A quadrant of four 24-inch long knives (96" total) with 0.042" gap is proposed, with a total air consumption of approximately 925 CFM. Plant environment inlet air at approximately 68°F is assumed. Select a blower for this application.

Solution — Referring to Chart #1, 70 in-H2O pressure at 900 CFM indicates a Z40e-165 selection as the initial choice. Chart #2 indicates the Z40e-165 will be operating at approximately 12 HP, thus, a 15 HP motor is selected for this particular operating point. At 15 HP, flows up to 1,000 CFM and approaching 80 in-H2O can be achieved. Therefore, sufficient margin is available for tuning purposes.

VORTRON INDUSTRIAL

805 240-2516

1650 Pacific Avenue, Channel Islands, CA 93033-9901

Fax: 805 487-5468 • www.vortron.com