

SPECIFICATIONS

ROOTS™ Universal RAI-J™ WHISPAIR™ Rotary Positive Blowers

Frames 33J thru 56J

BASIC BLOWER DESCRIPTION

The ROOTS™ patented Universal RAI-J™ WHISPAIR™ blowers are heavy-duty rotary units featuring a compact, sturdy design, engineered for continuous service when operated within speed and vacuum/pressure ratings.

The basic model features a cast-iron casing with a computer-designed cast relief for noise and shock suppression, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast-iron involute impellers. Oversized anti-friction bearings are used with a cylindrical roller bearing at the drive shaft to withstand V-belt pull. Detachable rugged steel mounting feet permit easy in-field adaptability to either vertical or horizontal installation requirements.

The Universal RAI-J® incorporates grease lube on the drive end and splash lube on the gear end. Roots' exclusive "figure-eight" gearbox design improves oil distribution to maximize bearing and gear life.



LOWER AIR PULSATION

Patented WHISPAIR™ blowers operate with up to 40% less pressure pulsation than conventional blowers due to the pressure equalizing effect of the WHISPAIR™ jet design.

In conventional blowers, as the impeller opens up to the outlet port, the higher pressure air in the discharge line rapidly expands into the lower pressure pocket formed by the impeller and the blower case. The resulting shock wave strikes the advancing surface of the impeller at near-sonic velocity. Four pressure pulses occur during each revolution, transmitting shock loads to the gear and bearings.

LONGER BEARING LIFE

The pre-pressurization of the low pressure pocket through the WHISPAIR™

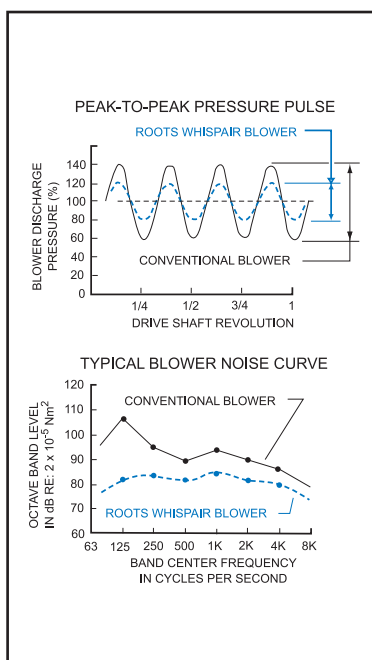
jet cavity smooths the pulsations, resulting in less shock being transmitted through the impellers to the bearings, providing longer bearing life.

LOWER VIBRATION

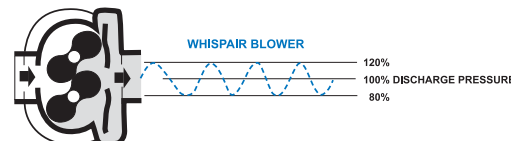
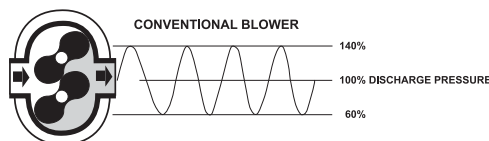
The reduction in the magnitude of the pressure pulsation results in smoother operation.

LOWER NOISE

The pressure pulses, inherent in the rotary-lobe design, are also the major source of blower noise. The rapid backflow of air into the blower from the discharge line, four times per revolution, results in high noise levels in a conventional blower. The WHISPAIR jet design controls the backflow of air into the blower, reducing noise by approximately 5 dBA vacuum, 3 dB pressure.



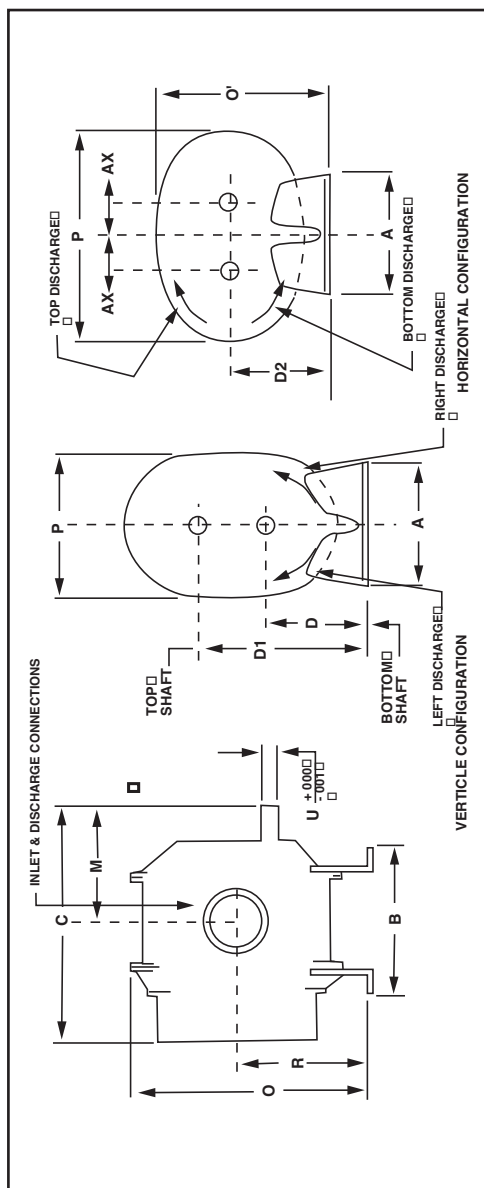
PRESSURE PULSES



DESIGN AND CONSTRUCTION FEATURES

1. Detachable steel mounting feet
2. Rigid one-piece, cast-iron casing
3. Anti-friction bearings
4. Splash oil lubricated spur timing gears
5. Connections in standard pipe sizes
6. Ground steel shafts
7. Straight, precision machined two-lobe impellers

OUTLINE DRAWING & DIMENSIONAL TABLE: ROOTS® UNIVERSAL RAI-J™



FRAME	A	A'	B	C	D	D1	D2	M	O	P	P'	R	U	INLET DISCH.	AX	WGT
33UJ	7.25	7.25	7.63	12.13	5.00	8.50	5.00	6.25	12.81	10.00	12.13	6.75	.750	2.0 NPT	1.75	84
36UJ	7.25	7.25	10.00	14.63	5.00	8.50	5.00	7.56	12.81	10.50	12.13	6.75	.750	2.5 NPT	1.75	112
45UJ	8.00	8.00	10.00	15.50	6.25	10.25	6.25	8.00	15.06	12.25	12.00	8.25	.875	2.5 NPT	2.00	119
47UJ	8.00	8.00	11.75	17.63	6.25	10.25	6.25	9.25	15.06	12.25	12.00	8.25	.875	3.0 NPT	2.00	138
56UJ	10.50	10.50	11.00	17.50	6.25	11.25	6.75	9.19	17.38	14.00	14.00	8.75	1.125	4.0 NPT	2.50	190

PERFORMANCE TABLE: ROOTS® UNIVERSAL RAI-J™

Frame Size	Speed	4 PSI		5 PSI		6 PSI		7 PSI		8 PSI		9 PSI		10 PSI		12 PSI		13 PSI		VACUUM DATA		
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	INHG	CFM	BHP
33UJ	1750	75	1.9	71	2.4	67	2.9	64	3.3	61	3.8	58	4.3	56	4.7	51	5.7	13	53			
	2950	149	3.3	145	4.1	141	4.9	138	5.7	135	6.5	132	7.3	130	8.1	125	9.7	15	119	5.9		
	3550	186	4.1	182	5.0	178	6.0	175	6.9	172	7.9	169	8.8	167	9.8	162	11.7	15	156	7.2		
36UJ	1750	132	3.2	126	3.9	121	4.7	117	5.5									14	95	5.4		
	2950	254	5.5	249	6.8	244	8.1	239	9.4									15	212	9.8		
	3550	316	6.7	310	8.3	305	9.9	300	11.5									15	273	11.9		
45UJ	1750	161	3.8	155	4.7	150	5.6	145	6.6	140	7.5	136	8.4	132	9.3			14	121	6.4		
	2950	306	6.7	300	8.2	295	9.8	290	11.3	285	12.9	281	14.4	277	16.0			16	253	12.5		
	3550	379	8.2	373	10.1	368	12.0	363	13.9	358	15.7	354	17.6	349	19.5			16	326	15.2		
47UJ	1750	215	5.0	208	6.2	201	7.4	195	8.6									14	165	8.4		
	2950	407	8.8	399	10.8	392	12.9	386	14.9									15	348	15.4		
	3550	502	10.9	495	13.3	488	15.8	482	18.3									15	444	18.8		
56UJ	1170	196	4.6	188	5.7	182	6.9	175	8.0	170	9.1	164	10.2	159	11.4	150	13.6		146	7.8		
	1750	324	7.0	316	8.7	310	10.4	304	12.1	298	13.8	292	15.5	287	17.2	278	20.5	273	266	12.6		
	2850	567	12.2	560	15.0	553	17.7	547	20.5	541	23.2	536	26.0	530	28.7	521	34.2	517	37.0	16	501	22.4

NOTES:

1. Performance based on inlet air at standard pressure of 14.7 psia, standard temperature of 68° F, and specific gravity of 1.0.
2. Vacuum ratings based on inlet air at standard temperature of 68° F, and specific gravity of 1.0.

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