



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™

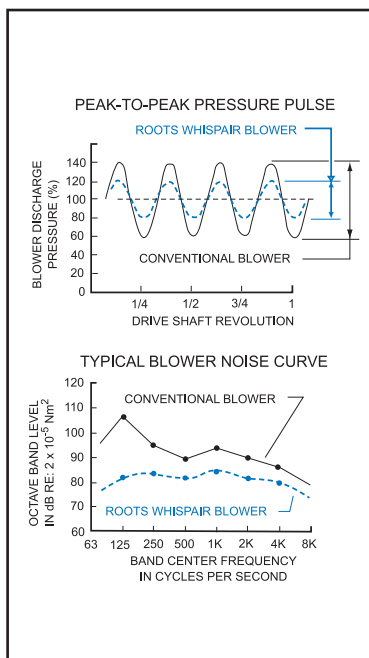
jet cavity smooths the pulsations, resulting in less shock being transmitted through the impellers to the bearings, providing longer bearing life.

LOWER VIBRATION

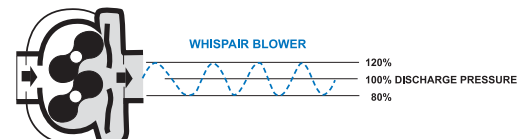
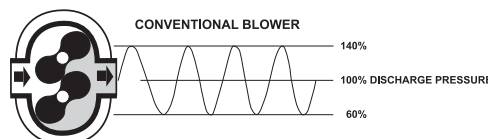
The reduction in the magnitude of the pressure pulsation results in smoother operation.

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.



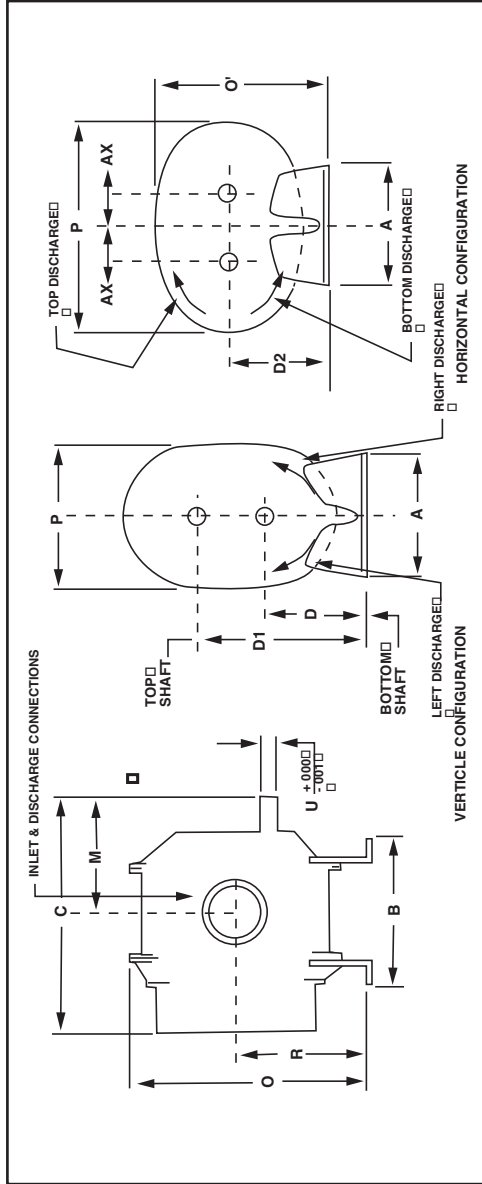
PRESSURE PULSES



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	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	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	11.00	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	13.63	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	13.63	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	17.25	8.75	1.125	4.0 NPT	2.50	190

PERFORMANCE TABLE: ROOTS® UNIVERSAL RAI-J™

Frame Size	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	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	3.0		
36UJ	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		
45UJ	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		
47UJ	132	3.2	126	3.9	121	4.7	117	5.5	114	6.4	110	7.3	107	8.2	103	9.1	14	95	5.4		
56UJ	254	5.5	249	6.8	244	8.1	239	9.4	235	10.8	231	12.2	227	13.6	223	15.0	15	212	9.8		
	316	6.7	310	8.3	305	9.9	300	11.5	295	13.1	290	14.7	285	16.3	280	18.0	15	273	11.9		
	161	3.8	155	4.7	150	5.6	145	6.6	140	7.5	136	8.4	132	9.3	128	10.2	14	121	6.4		
	306	6.7	300	8.2	295	9.8	290	11.3	285	12.9	281	14.4	277	16.0	273	17.6	16	253	12.5		
	379	8.2	373	10.1	368	12.0	363	13.9	358	15.7	354	17.6	349	19.5	345	21.4	16	326	15.2		
	215	5.0	208	6.2	201	7.4	195	8.6	190	9.9	184	11.2	178	12.5	173	13.8	14	165	8.4		
	407	8.8	399	10.8	392	12.9	386	14.9	380	17.0	373	19.1	367	21.2	360	23.3	15	348	15.4		
	502	10.9	495	13.3	488	15.8	482	18.3	475	20.8	468	23.2	461	25.7	454	28.2	15	444	18.8		
	196	4.6	188	5.7	182	6.9	175	8.0	170	9.1	164	10.2	159	11.4	150	13.6	14	146	7.8		
	324	7.0	316	8.7	310	10.4	304	12.1	298	13.8	292	15.5	287	17.2	278	20.5	15	266	12.6		
	567	12.2	560	15.0	553	17.7	547	20.5	541	23.2	536	26.0	530	28.7	521	34.2	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.

Dresser Roots

Houston, Texas Headquarters • U.S. Toll Free Phone: 1-877-363-ROOT(S) (7668) • Direct Phone: +1 832-590-2600
 Connersville, Indiana Operations • U.S. Toll Free Phone: 1-877-442-7910 • Direct Phone: +1 765-827-9285
 United Kingdom Operations • Phone: +44 (0) 1484 422 222
 USA/Canada Sales • Phone: +1 773-444-3360
 Houston, Texas Factory Service • Phone: +1 713-896-4810
 Mexico City Sales and Factory Service • Phone: +52 55 5889 5811
 Dubai Sales and Factory Service • Phone: +971 4-8830831
 Malaysia Sales • Phone: +60 3 2163 0480
 China Sales • Phone: +86 10 8486 2440
 Shanghai Factory Service • Phone: +86 21 5858 7638



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