ROOTS™ RCS-J WHISPAIR™
Rotary Positive Blowers
Frames 715J thru 832J

BASIC BLOWER DESCRIPTION

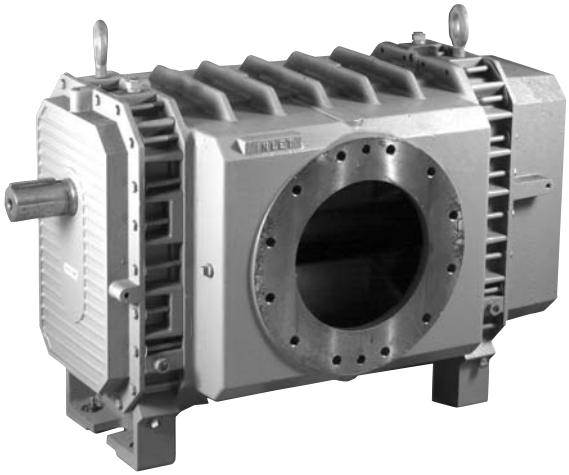
RCS-J WHISPAIR™ rotary blowers are heavy-duty units designed with integral-shaft ductile iron impellers having an involute profile. WHISPAIR blowers reduce noise and power loss by utilizing an exclusive wrap-around plenum and proprietary WHISPAIR jet to control pressure equalization – feeding backflow in the direction of impeller movement, thereby aiding rotation.

The headplates, gear cover, drive end cover and rigid, one-piece casing are grey iron. Carburized and ground alloy steel spur timing gears are taper mounted on the shafts, secured with a locknut. Cylindrical roller bearings are used.

Piston rings reduce air leakage through the shaft openings in the headplates, and lip-type oil seal prevent lubricant from entering the air chamber. The RCS-J incorporates thrust control, with splash oil lubrication at both ends of the blower.

Frame sizes 715J and 721J are designed with detachable rugged steel mounting feet that permit in-field adaptability to either vertical or horizontal installation requirements.

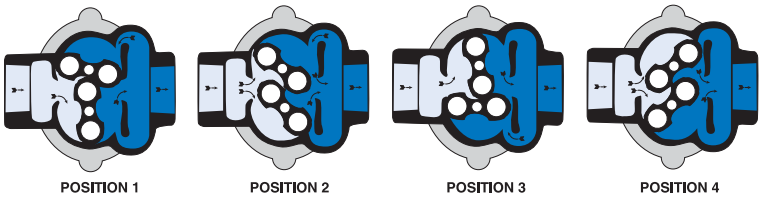
The top shaft is extended for drive on side outlet blowers, and either shaft can be extended for drive on top or bottom outlet blowers.



DESIGN AND CONSTRUCTION FEATURES

1. Low noise level, less operating power required
2. Alloy steel timing gears
3. Cylindrical roller bearings
4. Piston ring air seals
5. Lip-type oil seals
6. Splash oil lubrication
7. High volumetric efficiency
8. Horizontal and vertical configurations available

OPERATING PRINCIPLE



Incoming air is trapped by the impellers. Simultaneously, pressurized air (right) is being discharged. As the lower impeller passes wrap-around flange, Whispair jet equalizes pressure between trapped air and discharge area, aiding impeller movement and reducing power. Impellers move air into the discharge area (right). Backflow is controlled, resulting in reduction of noise relative to conventional blowers.

DRESSER Roots

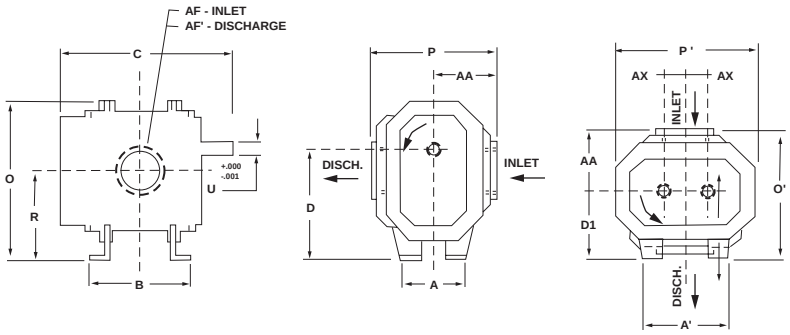
S-5197
February 2004

PERFORMANCE TABLE

FRAME SIZE	SPEED RPM	4 PSI CFM	4 PSI BHP	6 PSI CFM	6 PSI BHP	8 PSI CFM	8 PSI BHP	10 PSI CFM	10 PSI BHP	12 PSI CFM	12 PSI BHP	15 PSI CFM	15 PSI BHP	18 PSI CFM	18 PSI BHP	MAX. VACUUM "Hg	MAX. VACUUM CFM	MAX. VACUUM BHP
	1180	935	23.0	870	33.4	815	44.0	766	54.6	722	65.0	663	81.0			14.0	705	37.2
715J	1770	1548	37.3	1483	53.0	1428	68.8	1379	84.5	1335	100.3	1276	123.9			15.0	1281	61.4
	2600	2410	63.4	2345	86.0	2290	108.5	2241	131.0	2198	153.7	2138	187.5			15.0	2144	95.4
	1180	1266	30.5	1178	44.8	1103	59.0	1037	73.5	978	87.8	892	109.2			14.0	955	50.0
721J	1770	2096	49.1	2008	70.4	1933	91.7	1867	113.1	1808	134.4	1727	166.4			15.0	1735	81.7
	2600	3264	81.4	3176	112.0	3101	142.5	3035	173.1	2976	203.7	2895	249.5			15.0	2903	124.8
	880	982	24.9	895	36.8	821	48.7	756	60.6									
817J	1770	2368	55.0	2280	78.5	2206	102.0	2142	125.4	2083	148.9	2004	184.1	2055	219.4	16.0	1962	95.9
	2250	3116	75.6	3028	105.0	2955	134.0	2890	164.0	2830	193.0	2751	237.0	2680	281.0	16.0	2707	126.0
	880	1179	29.6	1074	43.9	985	58.1	907	72.4									
821J	1770	2842	65.7	2738	93.9	2648	122.1	2571	150.3	2500	178.4	2405	220.7			16.0	2354	114.8
	2250	3740	92.3	3635	127.0	3546	163.0	3468	198.0	3398	233.0	3302	286.0			16.0	3249	153.0
	880	1473	37.1	1342	55.0	1231	72.8	1134	90.7									
826J	1770	3554	81.4	3423	116.7	3311	151.9	3214	187.1	3126	222.3					16.0	2944	142.8
	2250	4676	105.0	4545	156.0	4434	200.0	4336	247.0	4248	288.0					16.0	4062	188.0
	880	1768	44.4	1610	65.8	1477	87.2	1360	108.6									
832J	1770	4264	97.5	4107	139.8	3972	182.0	3857	224.3							16.0	3531	168.4
	2250	5610	134.0	5452	186.0	5320	239.0	5202	292.0							16.0	4874	225.0

Notes:
1. Pressure ratings 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, discharge pressure of 30" Hg and specific gravity of 1.0.
3. 800J frame size only – Operation above 15 psi pressure rise, 15" Hg vacuum or 230° F temperature rise requires oil coolers – refer to Factory. Oil cooler not available on 600J and 700J frame sizes.

OUTLINE DRAWING & DIMENSIONAL TABLE



NOTES:
1. All dimensions are in inches.
2. Do not use for construction.

VERTICAL CONFIGURATION
(Horizontal Air Flow)

HORIZONTAL CONFIGURATION
(Vertical Air Flow)

FRAME SIZE	A	A'	B	C	Drive Shaft Location D	Drive Shaft Location D1	O	O'	P	P'	R	U	Keyway	AF Inlet Diameter	AF' Discharge Diameter	AA	AX	Approx. NetWt (lbs)
715J	19.00	26.00	21.50	33.38	17.00	10.00	25.13	19.00	18.00	23.25	13.50	2.375	.625 x.313	10.0 FLG	8.0 FLG	9.00	3.50	1100
721J	19.00	26.00	27.00	39.38	17.00	10.00	25.13	19.00	18.00	23.25	13.50	2.375	.625 x.313	12.0 FLG	10.0 FLG	9.00	3.50	1200
817J	13.75	22.00	24.25	38.63	21.00	13.00	30.00	25.75	25.50	25.00	1700	2.750	.625 x.313	10.0 FLG	10.0 FLG	12.75	4.00	1620
821J	13.75	22.00	27.88	42.25	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x.313	12.0 FLG	10.0 FLG	12.75	4.00	1800
826J	13.75	22.00	33.13	47.50	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x.313	12.0 FLG	12.0 FLG	12.75	4.00	2075
832J	13.75	22.00	38.50	52.88	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x.313	14.0 FLG	12.0 FLG	12.75	4.00	2325

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S-5197
February 2004

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ROOTS™ RCS
Rotary Positive Blowers
Frames 817 thru 827

BASIC BLOWER DESCRIPTION

RCS rotary blowers are heavy-duty units designed with integral-shaft ductile iron impellers having an involute profile. The headplates, gear cover, end cover and rigid, one-piece casing are grey iron. Carburized and ground alloy steel spur timing gears are taper mounted on the shafts, secured with a locknut. Cylindrical roller bearings are used on the drive end with ball bearings on the gear end.

Piston rings reduce air leakage through the shaft openings in the headplates, and lip-type oil seals prevent lubricant from entering the air chamber. The RCS incorporates thrust control, with splash oil lubrication at both ends of the blower.

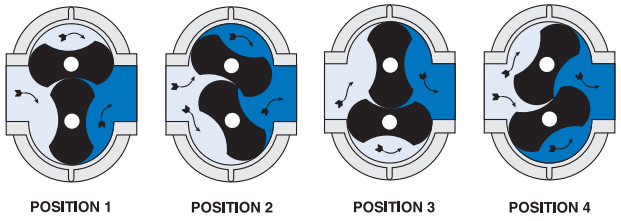
All units are designed with detachable rugged steel mounting feet which permit in-field adaptability to either vertical or horizontal installation requirements.

The top shaft is extended for drive on side outlet blowers, and either shaft can be extended for drive on top or bottom outlet blowers. All frame sizes are center-timed to allow rotation in either direction.

DESIGN AND CONSTRUCTION FEATURES

1. Center-timed for rotation in either direction
2. Alloy steel timing gears
3. Cylindrical roller bearings (Ball bearings on drive end of 800 frame sizes)
4. Piston ring air seals
5. Lip-type oil seals
6. Splash oil lubrication
7. High volumetric efficiency
8. Horizontal and vertical configurations available

OPERATING PRINCIPLE



Two figure-eight lobe impellers mounted on parallel shafts rotate in opposite directions. As each impeller passes the blower inlet, it traps a definite volume of air and carries it around the case to the blower outlet, where the air is discharged. With constant speed operation the displaced volume is essentially the same regardless of pressure, temperature or barometric pressure.

Timing gears control the relative position of the impellers to each other and maintain small but definite clearances. This allows operation without lubrication being required inside the air casing.

DRESSER Roots

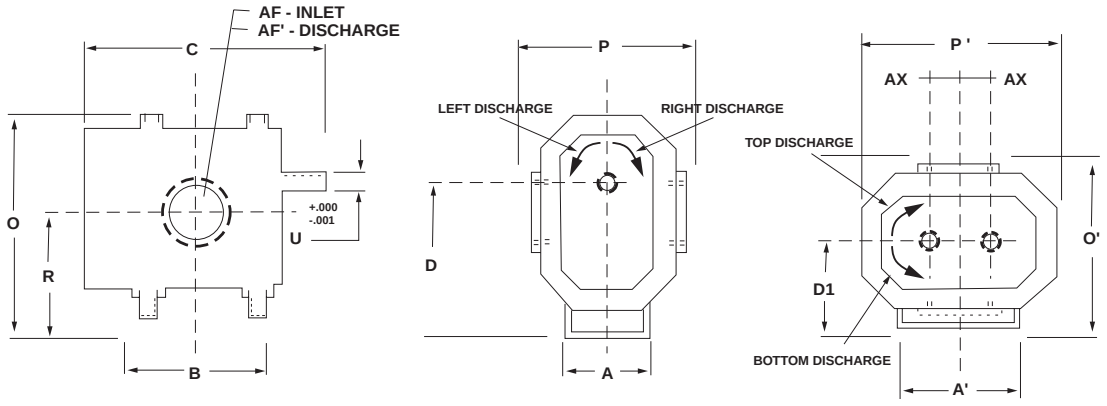
S-5283
February 2004

PERFORMANCE TABLE

FRAME SIZE	SPEED RPM	4 PSI CFM	4 PSI BHP	6 PSI CFM	6 PSI BHP	8 PSI CFM	8 PSI BHP	10 PSI CFM	10 PSI BHP	12 PSI CFM	12 PSI BHP	15 PSI CFM	15 PSI BHP	MAX. VACUUM "Hg	MAX. VACUUM CFM	MAX. VACUUM BHP
817	880	982	24.9	895	36.8	821	48.7	756	60.6					12.0	761	35.7
	1770	2368	55.5	2281	79.5	2207	103.5	2142	127.6	2083	151.6	2003	187.7	16.0	1959	101.4
	2250	3116	78.7	3028	109.2	2955	139.8	2890	170.4	2831	200.9	2751	246.8	16.0	2707	137.1
824	880	1326	33.1	1207	49.2	1108	65.4	1020	81.5					12.0	1028	48.2
	1770	3198	74.8	3080	107.2	2980	139.7	2892	172.2	2813	204.7	2705	253.4	16.0	2646	136.8
	2250	4208	105.6	4090	147.2	3990	188.5	3902	229.8	3823	271.1	3715	333.0	16.0	3656	184.9
827	880	1519	37.9	1383	56.4	1269	74.9	1169	93.4					12.0	1178	55.2
	1770	3665	85.5	3529	122.7	3415	159.9	3314	197.1	3223	234.3			16.0	3032	157.0
	2250	4822	120.9	4687	168.2	4572	215.5	4472	262.8	4381	310.1			16.0	4189	212.3

Notes: 1. Pressure ratings 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, discharge pressure of 30" Hg and specific gravity of 1.0.

OUTLINE DRAWING & DIMENSIONAL TABLE



NOTES:
1. All dimensions are in inches.
2. Do not use for construction.

VERTICAL CONFIGURATION
(Horizontal Air Flow)

HORIZONTAL CONFIGURATION
(Vertical Air Flow)

FRAME SIZE	A	A'	B	C	Drive Shaft Location D	Drive Shaft Location D1	O	O'	P	P'	R	U	Keyway	AF Inlet Diameter	AF' Discharge Diameter	AX	Approx. NetWt (lbs)
817	19.00	27.00	24.25	38.44	18.00	10.00	28.38	20.38	19.00	25.25	14.00	2.750	.625 x.313	10.0 FLG	10.0 FLG	4.00	1200
824	19.00	27.00	30.50	44.69	18.00	10.00	28.38	20.38	19.00	25.25	14.00	2.750	.625 x.313	12.0 FLG	12.0 FLG	4.00	1330
827	19.00	27.00	34.00	48.19	18.00	10.00	28.38	20.38	19.00	25.25	14.00	2.750	.625 x.313	14.0 FLG	14.0 FLG	4.00	1600

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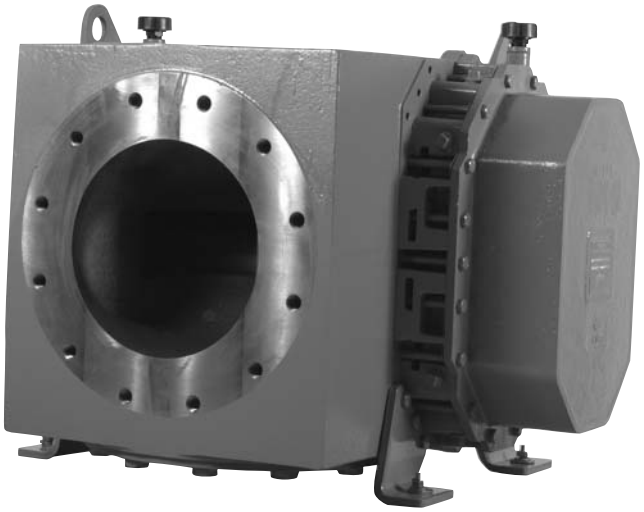
ROOTS™ DVJ WHISPAIR™ Dry Vacuum Exhausters

Frame 721J



BASIC DRY VACUUM PUMP DESCRIPTION

ROOTS™ DVJ WHISPAIR™ dry exhausters have an exclusive discharge jet plenum design which allows cool, atmospheric air to flow into the cylinder. This unique design permits continuous operation at vacuum levels to blank-off with a single stage unit.

Standard dry exhausters are limited to approximately 16” Hg vacuum because operation at higher vacuum levels can cause extreme discharge temperatures resulting in casing & impeller distortion and possible seizure. The DVJ vacuum exhauster’s integral cooling design eliminates the problems associated with high temperatures at vacuum levels beyond 16” Hg.

DVJ WHISPAIR™ exhausters are heavy-duty units with integral-shaft ductile iron impellers. The casing, headplates, gear cover and drive end cover are grey iron. Carburized and ground alloy steel spur timing gears are taper mounted on the shafts, secured with a locknut. Cylindrical roller bearings are splash lubricated at both the gear end and drive end. Piston rings reduce air leakage through the headplate bores and lip-type oil seals prevent lubricants from entering the air chamber. Rugged steel mounting feet permit infield adaptability to either vertical or horizontal installation requirements.

ROOTS™ DVJ WHISPAIR™ exhausters can be arranged to operate in two and three stage systems to achieve vacuum levels down to 1 Torr.

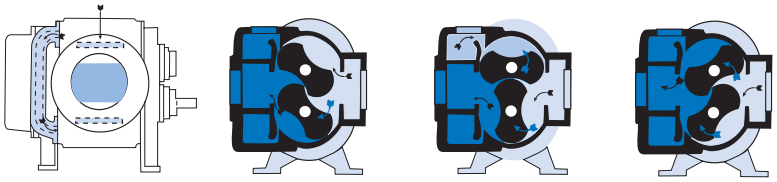
WARRANTY PERIOD

Twelve (12) months from date of original unit start-up or 18 months from date of original shipment, whichever occurs first.

DESIGN AND CONSTRUCTION FEATURES

1. Rigid cast iron cylinder and headplates
2. Anti-friction cylindrical roller bearings
3. Splash lubricated spur timing gears
4. Inlet and discharge connections in standard pipe sizes
5. Involute profile ductile iron impellers

OPERATING PRINCIPLE



Position 1: Incoming air (right) is trapped between the impellers and the case, producing a vacuum in the application system. Simultaneously, air is discharged (left) from the exhauster. **Position 2:** As the upper impeller passes the jet plenum, atmospheric air flows into the space between the impeller and the case.This cools the trapped air, aids impeller movement, and reduces discharge shock and power loss. **Position 3:** The trapped air is moved into the discharge flange (left). Backflow is reduced resulting in lower discharge noise relative to conventional rotary exhausters.

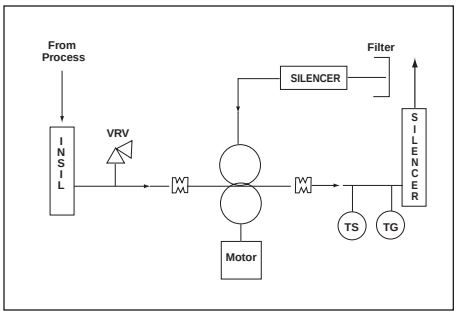
DRESSER Roots

S-5582.B
December 2002

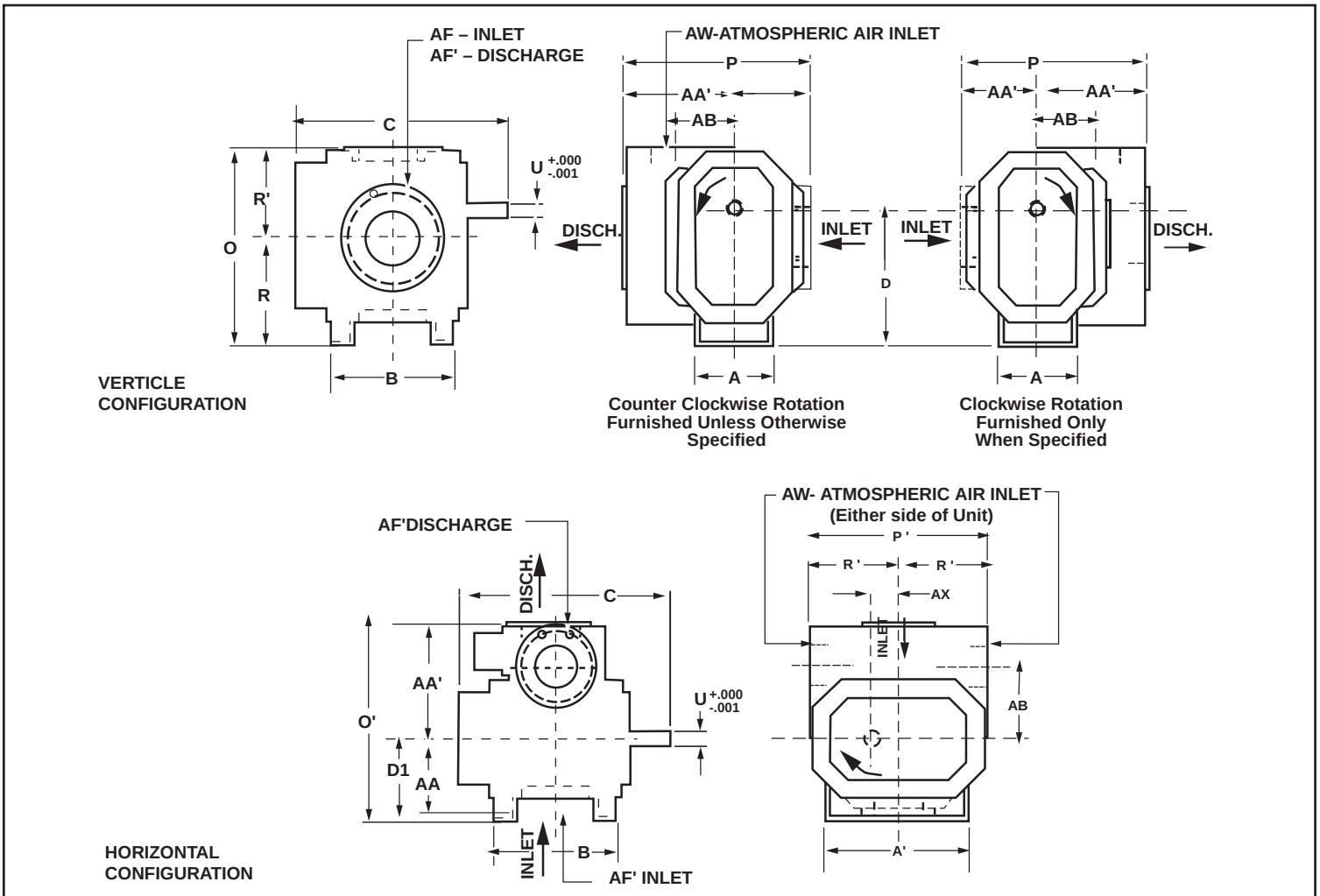
PERFORMANCE TABLE

FRAME SIZE	SPEED RPM	Maximum Free Air CFM	16" HgV CFM	16" HgV BHP	20" HgV CFM	20" HgV BHP	24" HgV CFM	24" HgV BHP	27" HgV CFM	27" HgV BHP
721J	1180		973	57	751	71	322	85	*	96
	1770		1803	87	1581	108	1152	128	85	144
	2200		2408	110	2186	135	1757	160	690	179
	2600	3658	2971	131	2749	161	2320	190	1252	212

* Denotes blank-off.
Ratings based on inlet and jet air at standard temperature of 68°F, discharge and jet pressure of 30"Hg and specific gravity of 1.0. Refer to factory for performance guarantee above 24" Hg.



OUTLINE DRAWING & DIMENSIONAL TABLE



FRAME SIZE	A	A'	B	C	Drive Shaft Location D	Drive Shaft Location D1	O	O'	P	P'	R	U	Keyway	AA	AA'	AB	AF	AF'	AW	AX	WGT.
721J	19.00	26.00	27.00	39.38	17.00	10.00	24.88	25.25	24.25	22.75	13.50	2.375	.625 x .313	9.00	15.25	5.50	12 FLG	12 FLG	12 FLG	3.50	1750

NOTES:
1. All dimensions are in inches. 2. Weights are in pounds, and are approximate. 3. Do not use for construction.

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December 2002

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ROOTS™ VJ WHISPAIR™ Water-sealed Vacuum Exhauster

Frames 817J, thru 832J

BASIC BLOWER DESCRIPTION

ROOTS™ WHISPAIR™ water-sealed vacuum exhausters are heavy-duty units designed with integral-shaft ductile iron impellers. WHISPAIR vacuum exhausters reduce noise and power loss by utilizing an exclusive wrap-around plenum and proprietary WHISPAIR™ jet to control pressure equalization – feeding backflow in the direction of impeller movement, thereby aiding rotation.

The headplates, one-piece casing and end covers are grey iron. Carburized and ground alloy steel spur timing gears are taper mounted on the shafts, secured with a locknut. Cylindrical roller bearings are used.

Piston rings reduce air leakage through the shaft openings in the headplates, and lip-type oil seals prevent lubricant from entering the air chamber. WHISPAIR™ vacuum exhausters incorporate splash oil lubrication at both ends of the units. A hydrodynamic seal on the drive shaft prevents shaft seal oil leaks.

The top shaft is extended for drive on side outlet vacuum exhausters, and the left or right shaft can be extended for drive on bottom outlet vacuum exhausters. An inlet spray nozzle and seal water flow meter are supplied for water injection.

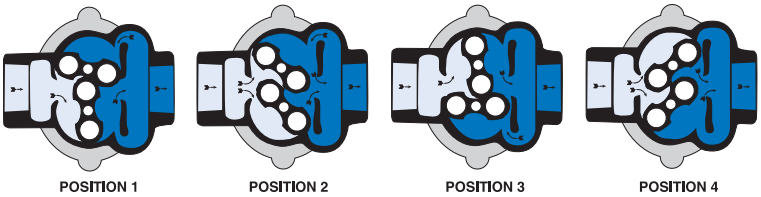
WARRANTY PERIOD

Twelve (12) months from date of original unit start-up or 18 months from date of original shipment, whichever occurs first.

DESIGN AND CONSTRUCTION FEATURES

1. Low noise level, less operating power required
2. Improved volumetric efficiency & reduced operating temperatures
3. Alloy steel timing gears
4. Cylindrical roller bearings
5. Piston ring air seals
6. Lip-type oil seals, hydrodynamic drive shaft seal
7. Splash oil lubrication
8. Horizontal and vertical configurations available

OPERATING PRINCIPLE



Incoming air is trapped by the impellers. Simultaneously, pressurized air (right) is being discharged. As the lower impeller passes wrap-around flange, Whispair jet equalizes pressure between trapped air and discharge area, aiding impeller movement and reducing power. Impellers move air into the discharge area (right). Backflow is controlled, resulting in reduction of noise relative to conventional blowers.

DRESSER Roots

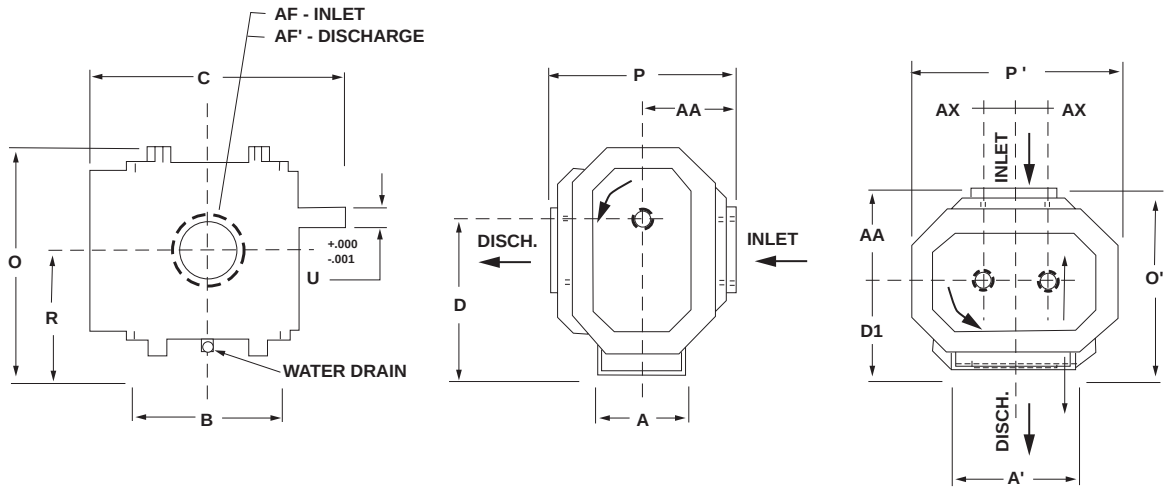
S-5597
December 2002

PERFORMANCE TABLE

FRAME SIZE	SPEED RPM	16" Hg VAC CFM	16" Hg VAC BHP	20" Hg VAC CFM	20" Hg VAC BHP	22" Hg VAC CFM	22" Hg VAC BHP	24" Hg VAC CFM	24" Hg VAC BHP
817J	850	948	47.8	840	59	737	64.5	564	70.0
	1170	1385	66.9	1258	82	1138	89.5	937	97.1
	1800	2265	105.9	2110	128	1962	139.2	1715	150.3
821J	850	1138	56.8	1008	70.2	885	76.8	677	83.5
	1170	1662	79.3	1510	97.5	1366	106.5	1124	115.6
	1800	2719	125.2	2532	151.9	2355	165.3	2058	178.6
826J	850	1423	70.4	1260	87.1				
	1170	2078	98.2	1888	120.8				
	1800	3400	154.2	3166	187.6				
832J	850	1707	84.0						
	1170	2493	116.8						
	1800	4079	182.9						

NOTES:
1. Vacuum ratings based on inlet air at standard temperature of 68°F, discharge pressure of 30" Hg and specific gravity of 1.0.

OUTLINE DRAWING & DIMENSIONAL TABLE



NOTES:
1. All dimensions are in inches.
2. Do not use for construction.

VERTICAL CONFIGURATION
(Horizontal Air Flow)

HORIZONTAL CONFIGURATION
(Vertical Air Flow)

FRAME SIZE	A	A'	B	C	Drive Shaft Location D	Drive Shaft Location D1	O	O'	P	P'	R	U	Keyway	AF Inlet Diameter	AF' Discharge Diameter	AA	AX	Approx. Net Wt (lbs)
817J	13.75	22.00	24.25	38.63	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x .313	10.0 FLG	10.0 FLG	12.75	4.00	1620
821J	13.75	22.00	27.88	42.25	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x .313	12.0 FLG	10.0 FLG	12.75	4.00	1800
826J	13.75	22.00	33.13	47.50	21.00	13.00	30.00	25.75	25.50	25.00	17.00	2.750	.625 x .313	12.0 FLG	12.0 FLG	12.75	4.00	2075
832J	13.75	22.00	38.50	52.88	21.00	13.00	30.00	15.75	25.50	25.00	17.00	2.750	.625 x .313	14.0 FLG	12.0 FLG	12.75	4.00	2325

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