

## SPECIFICATIONS

# ROOTS™ RAM™-DVJ WHISPAIR™ Dry Vacuum Exhausters

Frames 406J, 412J & 616J

RAM™ stands for Reliability, Availability and Maintainability. Today, more than ever, ROOTS is committed to supplying our customers with reliable products manufactured with state-of-the-art CNC machine tools. Production and inventory are being scheduled and controlled to ensure these units will be available when you need them. Design improvements such as repositionable rugged steel mounting feet and die-cast aluminum drive end covers and gear covers help to reduce installation costs and make normal maintenance easier.

## BASIC BLOWER DESCRIPTION

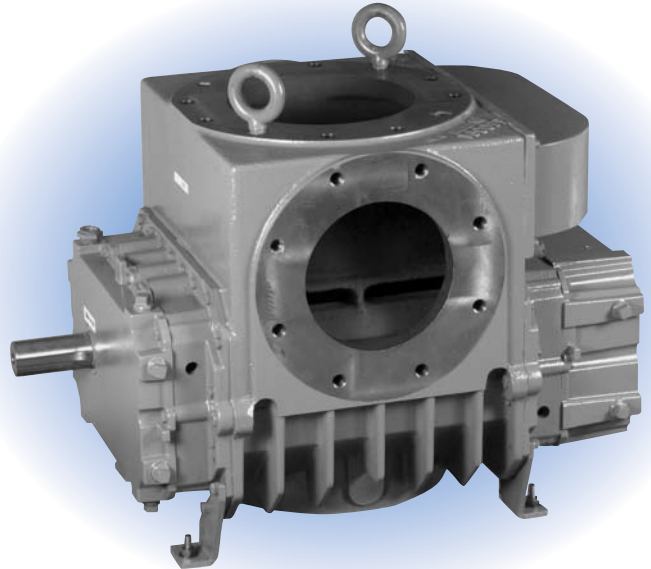
ROOTS™ RAM™-DVJ WHISPAIR™ dry exhausters have an exclusive discharge jet plenum design which allows cool, atmospheric air to flow into the cylinder. This unique design permits continuous operation at vacuum levels to blank-off with a single stage unit.

Standard dry vacuum exhausters are limited to approx. 16" Hg vacuum because operation at higher vacuum levels can cause extreme discharge temperatures resulting in casing and impeller distortion and possible failure. The RAM™ vacuum exhauster's integral cooling design eliminates the problems caused by high discharge temperatures at vacuum levels beyond 16" Hg.

The basic model is designed using integral-shaft ductile iron impellers with an involute profile. The casing and headplates are grey iron, while the drive end cover and gear cover are aluminum. 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 the drive end. Piston rings reduce air leakage through the head-plate bores and lip-type oil seals prevent lubricants from entering the air chamber. Units can be equipped with mechanical seals for gas applications.

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

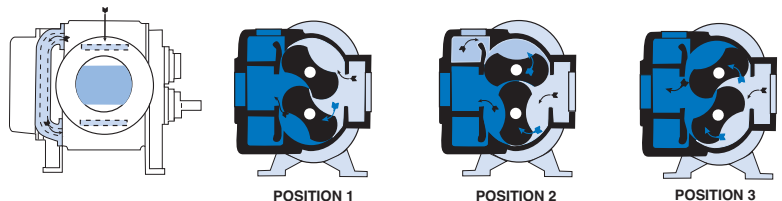
ROOTS™ DVJ WHISPAIR™ exhausters can be arranged to operate in two and three stage systems to achieve vacuum levels down to 1 Torr.



## DESIGN AND CONSTRUCTION FEATURES

1. Single stage operation to 27" HgV
2. No valves, vanes or Teflon rings to wear
3. Alloy steel timing gears
4. Cylindrical roller bearings
5. Piston ring air seals
6. Lip-type oil seals (optional mechanical seal)
7. Splash oil lubrication
8. Horizontal and vertical configurations available

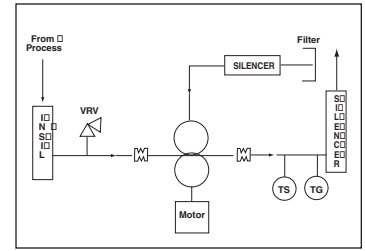
## OPERATING PRINCIPLE



**Position 1:** Incoming air is trapped between the impellers. Simultaneously, pressurized air is being discharged. **Position 2:** As the upper impeller passes the jet plenum, cooled, pressurized air flows into the space between the impeller and cylinder. This cools the trapped air, helps control thermal growth and allows higher discharge pressures. **Position 3:** The trapped air is then moved into the discharge flange (left). Backflow is reduced, resulting in lower operating noise level and reduced shock loading on the impellers.

## PERFORMANCE TABLE

FRAME SIZE	SPEED RPM	Maximum Free Air CFM	12" HgV		16" HgV		20" HgV		24" HgV		27" HgV	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
406J	2320	668	266	10.3	228	13.5	177	16.7	78	20.0	*	22.4
	2695		329	12.2	291	15.9	240	19.5	140	23.2	*	26.0
	3564		474	16.7	436	21.5	385	26.2	286	30.9	38	34.5
	4000		547	19.2	509	24.4	458	29.6	358	34.9	111	38.8
412J	2320	1332	530	20.2	456	26.7	353	33.2	155	39.7	*	44.5
	2695		655	23.6	580	31.1	478	38.6	280	46.1	*	51.8
	3564		945	32.0	870	41.7	767	51.5	569	61.3	77	68.6
	4000		1090	36.3	1015	47.2	912	58.0	715	68.9	222	77.0
616J	1750	2367	1015	35.8	902	47.5	747	59.1	448	70.8	*	79.6
	2124		1310	43.7	1197	57.8	1042	71.9	743	86.0	*	96.6
	2437		1557	50.5	1444	66.6	1289	82.7	990	98.8	245	110.9
	2860		1891	59.8	1777	78.6	1622	97.4	1323	116.2	579	130.2
	3000		2001	63.0	1888	82.6	1733	102.3	1434	121.9	689	136.7

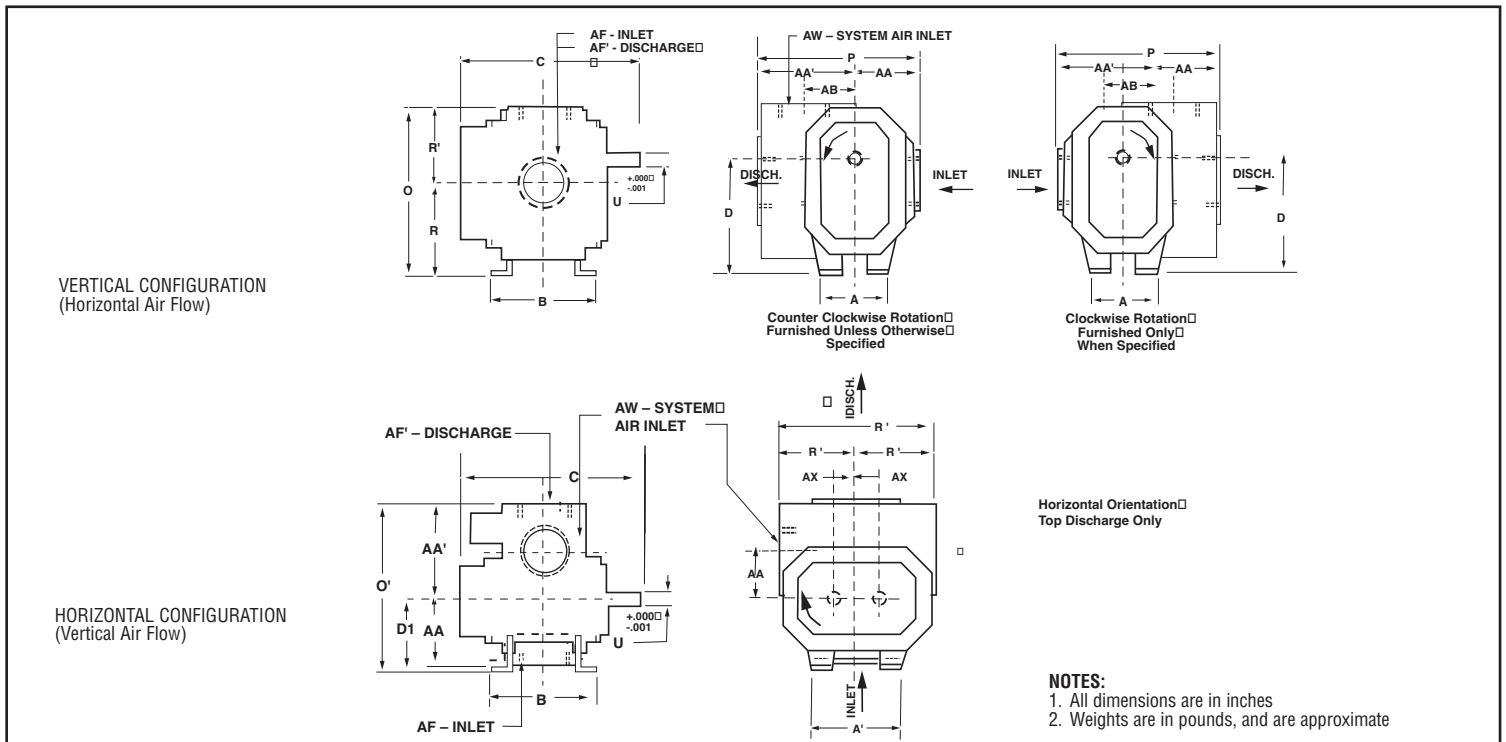


### NOTES:

- Vacuum 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" HgV.

\* Denotes blank-off.

## OUTLINE DRAWING & DIMENSIONAL TABLE



FRAME SIZE	A	A'	B	C	Drive Shaft Location		O	O'	P	P'	R	R'	U	Keyway	AA	AA'	AB	AF	AF'	AW	AX	WGT.
					D	D1																
406J	8.00	11.00	10.75	20.50	11.25	7.50	16.38	18.00	17.75	14.75	9.00	7.38	1.500	.375x.188	7.25	10.50	6.75	4 NPT	5 NPT	4 NPT	2.25	365
412J	8.00	11.00	16.75	26.50	11.25	7.50	16.63	19.25	17.75	15.25	9.00	7.63	1.500	.375 x .188	6.00	11.75	6.50	6 FLG	6 FLG	5 FLG	2.25	575
412J	10.00	16.00	21.44	32.50	15.00	9.00	21.63	22.75	21.25	19.25	12.00	9.63	2.000	.500 x .250	7.50	13.75	6.75	8 FLG	10 FLG	8 FLG	3.00	975

## WARRANTY PERIOD

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

### Dresser Roots

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