

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

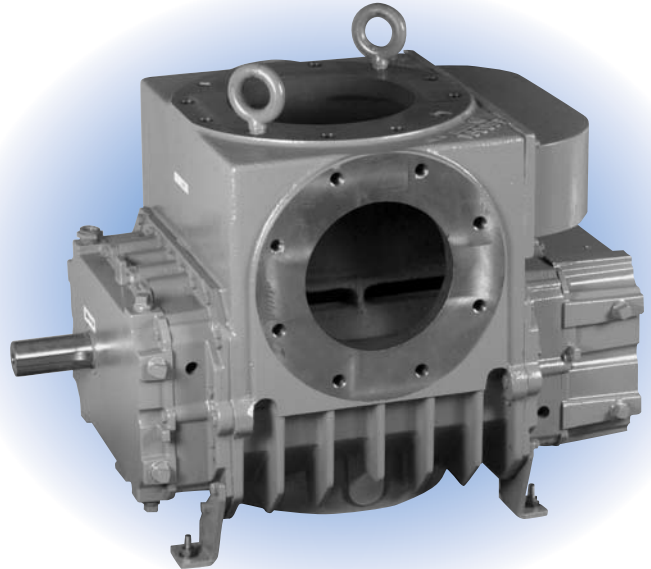
ROOTS™ RAM™-DVJ WHISPAIR™ dry exhausters have an exclusive discharge jet plenum design which allows cool, atmospheric air to flow into the cylinder. This unique design permits continuous operation at vacuum levels to blank-off with a single stage unit.

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.

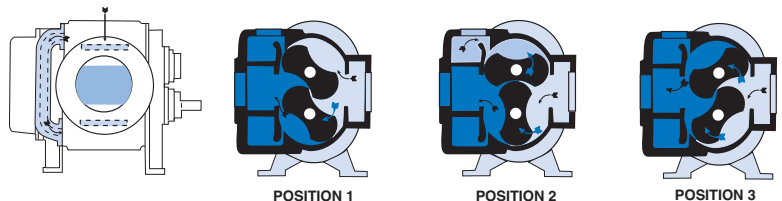
The basic model is designed using integral-shaft ductile iron impellers with an involute profile. The casing and headplates are grey iron, while the drive end cover and gear cover are aluminum. Carburized and ground alloy steel spur timing gears are taper mounted on the shafts, secured with a locknut. 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**

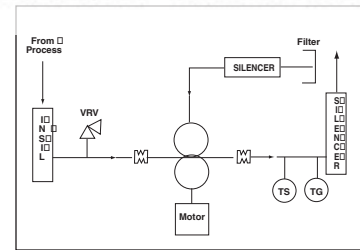
1. Single stage operation to 27" HgV
2. No valves, vanes or Teflon rings to wear
3. Alloy steel timing gears
4. Cylindrical roller bearings
5. Piston ring air seals
6. Lip-type oil seals (optional mechanical seal)
7. Splash oil lubrication
8. Horizontal and vertical configurations available

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.

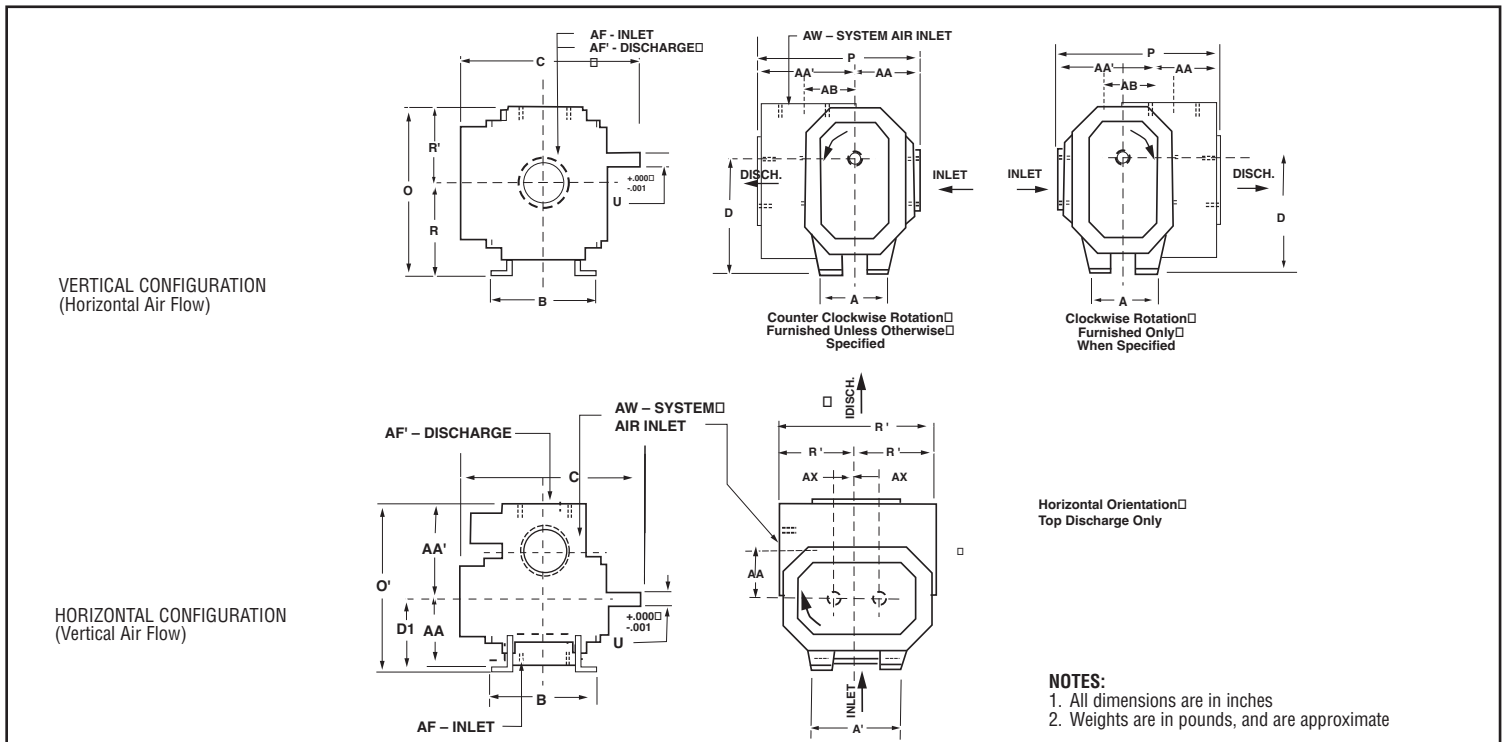


| FRAME SIZE | SPEED RPM | Maximum Free Air CFM | 12" HgV | | 16" HgV | | 20" HgV | | 24" HgV | | 27" HgV | |
|------------|-----------|----------------------|---------|------|---------|------|---------|-------|---------|-------|---------|-------|
| | | | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP |
| 406J | 2320 | | 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 | 668 | 547 | 19.2 | 509 | 24.4 | 458 | 29.6 | 358 | 34.9 | 111 | 38.8 |
| 412J | 2320 | | 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 | 1332 | 1090 | 36.3 | 1015 | 47.2 | 912 | 58.0 | 715 | 68.9 | 222 | 77.0 |
| 616J | 1750 | | 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 | 2367 | 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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