



Roots

406 RAM-DPJ

Part Number – call 816-741-0282



The ROOTS™RAM™-DPJ WHISPAIR™ rotary blower has an exclusive discharge jet plenum design which allows cool, pressurized system air to flow into the cylinder. This unique design permits operation at high pressure levels with a single stage unit.

The RAM high pressure blower is designed for continuous operation at discharge pressures up to 30 psig. It has no valves, vanes or Teflon rings. Clean, dry discharge air or gas provides usable heat for your process.

- Single stage operation to 30 PSIG
- Heavy-duty unit with integral-shaft ductile iron impellers with an involute profile
- Rigid one-piece casing and headplates are grey iron
- Drive end cover and end cover are aluminum
- Carburized and ground alloy steel spur timing gears
- Cylindrical roller bearings
- Piston rings reduce air leakage
- Lip type oil seals prevent lubrication from entering the air chamber.
- Splash oil lubricated gears on drive and gear ends
- Detachable steel mounting feet
- Horizontal and vertical configurations available
- Mechanical seals are optional



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Quick Specs

| | |
|---------------------------|-----------------|
| Flow Range | to 518 CFM |
| Max ΔPressure | 30 PSI |
| Max ΔVacuum | 22" Hg |
| Maximum RPM | 3820 |
| Minimum RPM | 1750 |
| Max ΔT | 275°F |
| Pressure Drop to Jet | 0.73 PSI |
| Pressure Drop to Jet | 1.5" Hg |
| Jet Inlet Connection Size | 4" NPT |
| Discharge Connection Size | 5" NPT |
| System Air Inlet Size | 4" NPT |
| Shaft Dia. | 1.5" |
| Min Sheave Dia. | 7.1" |
| Drive End Lubrication | Oil |
| Gear End Lubrication | Oil |
| Oil Sump Horiz Config | ~55 oz |
| Oil Sump Vert Config | ~27 oz |
| Bare Unit Weight | 365 lbs |
| Container | Wood Skid |
| Skid Size (L x W x H) | 42" x 29" x 36" |
| Shipping Weight on Skid | ~405 lbs |
| Recommended to Ship Via | Truck |



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Repair Kits

Repair kits are bundled with the parts you need to complete a standard repair. It is more cost effective to buy a repair kit than to purchase individual parts. However, if you need parts not listed in the kit, it is recommended that you call Pathfinder Systems for parts pricing.

Top, Left, or Right Drive Shaft (Bottom Shaft order P/N 524574RK)

P/N 524573RK Kit for 400 AIR RAM/RAM-J/RCS/RCS-J/DVJ/DPJ

| Item | Qty | Kit Description | P/N |
|-------|-----|------------------------------|-----------|
| | | ASSY Slinger 400/600 | TK10002 |
| 7 | 2 | Gasket 400 RCS Gearbox/Cover | 52381021 |
| 7 | 2 | Gasket 400 RAM Gearbox/Cover | 78365021 |
| 10 | 1 | Shim Set 400 RAM/Roots-Flo | 52378020 |
| 14 | 4 | Bearing, Roller | T30054020 |
| 55 | 2 | Plug, Vent 3/8" | 13005003 |
| 21 | 2 | Breather, Mini MB Style 1 | T20013004 |
| 27 | 4 | Seal, Lip(Viton),Main | 10460030 |
| 28 | 4 | Piston, Ring Seal | 12283001 |
| 29 | 2 | Washer, Spring, Wavy | 10135018 |
| 31 | 2 | Nut, Hex ESNA 1-1/4"-12 | 10319019 |
| 33 | 1 | Seal, Lip, Drive | 10460034 |
| 37 | 2 | Sight, Plug Oil Level, 1/2" | 12066003 |
| 38 | 4 | Sleeve, Piston Ring | 52418020 |
| 40 | 1 | DRIVE END SLINGER | 54710020 |
| 46 | 1 | GEAR END OIL SLINGER | T20029001 |
| 60/87 | 3 | CAP SCREW 1/2-13x1 | 12800001 |
| 70 | 1 | Shim (0.035) 400 RAM | 10619141 |
| 88 | 4 | Anti Rotation Ball | T20001001 |
| 91 | 2 | BUSH ING STL | T20031001 |
| 93 | 1 | GEAR END WASHER | 90185020 |

**RAM series parts list 4" & 6" gear diameter
for Gas, DVJ, DPJ & JV**
(Refer to drawing #81881023)

| Item # | Part Name | Qty. |
|--------|-------------------------------------|------|
| 1 | Headplate | 2 |
| 2 | Spray nozzle assembly | 1 |
| 3 | Gearbox | 1 |
| 4 | Timing Gears | 2 |
| 5 | End Cover | 1 |
| 7 | Gasket – Gearbox/Cover | 2 |
| 10 | Shims | Lot |
| 11 | Cylinder | 1 |
| 12 | Impeller & Shaft Drive | 1 |
| 13 | Impeller & Shaft Driven | 1 |
| 14 | Bearing Roller | 4 |
| 16 | Pin, Dowel (Pull Out) | 4 |
| 17 | Pin, Dowel | 2 |
| 19 | Key Square | 1 |
| 21 | Plug - Vent | 2 |
| 22 | Plug, Pipe | 12 |
| 23 | Screw, Cap Hex Hd. | * |
| 27 | Seal, Lip Headplate DVJ, DPJ, VJ | 4 |
| 27 | Seal-Mech-Viton Gas | 4 |
| 28 | Piston, Ring-Seal | 4 |
| 29 | Washer, Wavy Spring | 2 |
| 31 | Gear Nut | 2 |
| 32 | Scr, Cap Hex Hd. | 16 |
| 33 | Seal, Lip Drive | 1 |
| 34 | Brg. Clamp Plate - D. E. | 2 |
| 35 | Lock Washer - Spring | 16 |
| 37 | Oil Level Gauge | 2 |
| 38 | Sleeve, Shaft DVJ, DPJ, JV | 4 |
| 38 | Sleeve - Gas | 4 |
| 40 | Slinger - D.E. (Top Drive) | 1 |
| 46 | Slinger - G.E. | 1 |
| 49 | Oil Leader L/S | 1 |
| 50 | Oil, Leader-R/S | 1 |
| 54 | Brg Clamp Plate - G. E. | 2 |
| 60 | Screw, Cap Butt. HD. | 1 |
| 64 | Pin, Spring | 1 |
| 66 | Screw, Cap Hex HD. | * |
| 66.1 | Whispair, Spring Lock 3/8M | * |
| 70 | Shims D.E. Brg. | 1 |
| 75 | Screw, Cap - Hex HD. | * |
| 76 | Blower Foot - RH | 2 |
| 77 | Blower Foot - LH | 2 |
| 85 | Elb, Pipe-Black | 2 |
| 85.1 | Plug, Pipe | 2 |
| 87 | Scr, Cap BH | 2 |
| 88 | Anti Rotation Ball | 4 |
| 90 | BSHG-RDCG | 2 |
| 91 | Washer, Plain Flat | 2 |
| 92 | Washer, Plain Flat | 2 |
| 93 | Washer | 2 |
| 94 | Oil Leader | 2 |
| 95 | Cap Screw | 4 |



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Table 2 - Recommended Oil Grades

| Ambient* Temperature °F (°C) | ISO Viscosity No. |
|---------------------------------|----------------------|
| Above 90° (32°) | 320 |
| 32° to 90° (0° to 32°) | 220 |
| 0° to 32° (-18° to 0°) | 150 |
| Below 0° (-18°) | 100 |

*Ambient temperature is defined as the temperature of the space in which the blower and drive are located.

Use a good grade of **industrial type** non-detergent, rust inhibiting, anti-foaming oil and of correct viscosity per Table 2. Roots synthetic oil (Roots P/N 813-106-) is **specified and recommended**. Roots does not recommend automotive type lubricants, as they are not formulated with the properties mentioned above.

Due to sludge build-up and seal leakage problems, Roots recommendation is DO NOT USE Mobil SHC synthetic oils in ROOTS blowers.

| ROOTS® Synthetic Oil: ISO-VG-320 Grade | |
|--|-------------|
| | Part Number |
| Quart | 13106004 |
| Gallon | 13106005 |
| Case (12 qts) | 13106007 |
| ROOTS® Synthetic Oil: ISO-VG-220 Grade | |
| | Part Number |
| Quart | 13106001 |
| Gallon | 13106002 |
| Case (12 qts) | 13106008 |
| ROOTS® Synthetic Oil: ISO-VG-150 Grade | |
| | Part Number |
| Quart | 13106020 |
| Gallon | 13106021 |
| Case (12 qts) | 13106023 |
| 5 Gallon Pail | 13106022 |
| 55 Gallon Drum | 13106025 |
| ROOTS® Synthetic Oil: ISO-VG-100 Grade | |
| | Part Number |
| Quart | 13106011 |
| Gallon | 13106012 |
| Case (12 qts) | 13106014 |
| 5 Gallon Pail | 13106013 |
| 55 Gallon Drum | 13106016 |

ROOTS™ RAM™-DPJ WHISPAIR™ High-Pressure Rotary Positive Blowers

Frame 406 DPJ

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

The ROOTS™ RAM™-DPJ WHISPAIR™ rotary blower has an exclusive discharge jet plenum design which allows cool, pressurized system air to flow into the cylinder. This unique design permits operation at high pressure levels with a single stage unit.

The RAM high pressure blower is designed for continuous operation at discharge pressures up to 30 psig. It has no valves, vanes or Teflon rings. Clean, dry discharge air or gas provides usable heat for your process.

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 and cover and gear cover are die cast 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 drive end.

Piston rings reduce air leakage through the headplate bores and lip-type oil seals prevent lubricants from entering the air chamber. Mechanical seals are available upon request.

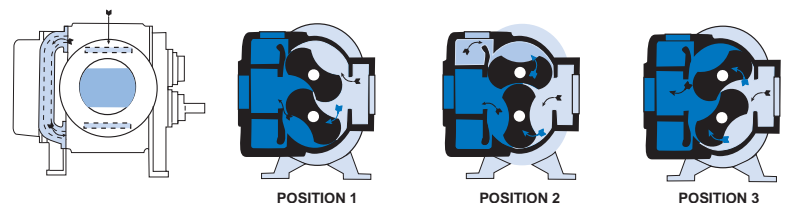
WARRANTY PERIOD

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. Single stage operation to 30 psig
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



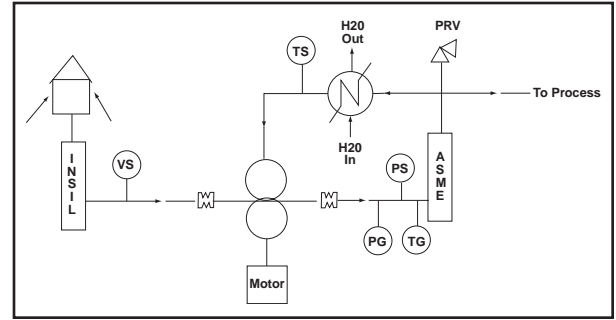
Position 1: Incoming air is trapped between the impellers. Simultaneously, pressurized air is being discharged. **Position 2:** As the upper impeller passes the jet plenum, cooled, pressurized air flows into the space between the impeller and cylinder. This cools the trapped air, helps control thermal 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.



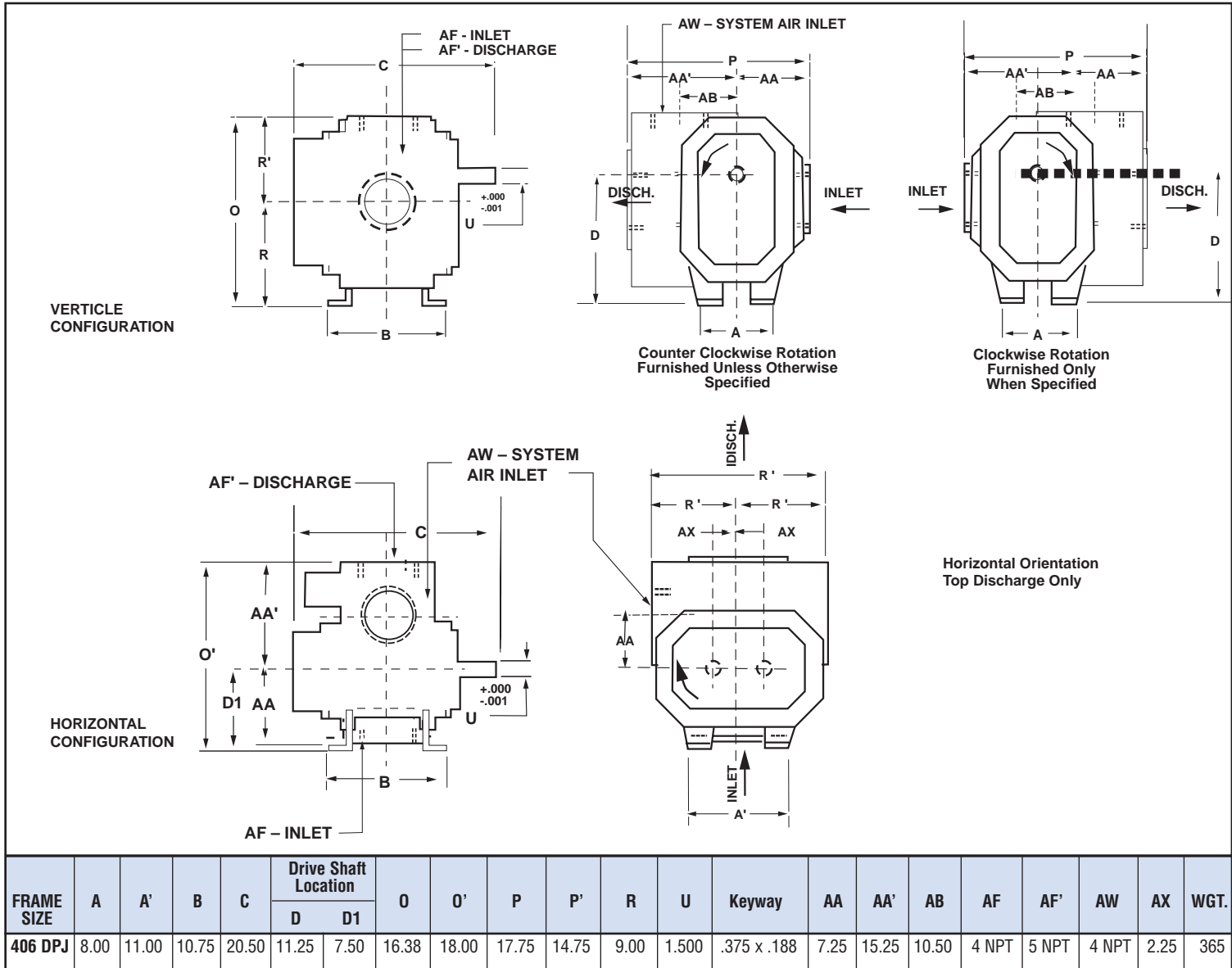
PERFORMANCE TABLE

| FRAME SIZE | SPEED RPM | 15" PSI | | 20" PSI | | 25" PSI | | 30" PSI | |
|------------|-----------|---------|-----|---------|-----|---------|-----|---------|-----|
| | | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP |
| 406 DPJ | 4000 | 518 | 47 | 494 | 62 | 474 | 76 | 455 | 91 |
| | 3070 | 362 | 35 | 339 | 46 | 319 | 57 | 300 | 69 |
| | 2320 | 237 | 26 | 214 | 35 | 193 | 43 | 195 | 51 |
| | 1750 | 142 | 19 | 119 | 26 | 98 | 32 | 80 | 39 |

Ratings based on inlet air at standard pressure of 14.7 psia, standard temperature of 68°F, and specific gravity of 1.0



OUTLINE DRAWING & DIMENSIONAL TABLE



NOTES:

1. All dimensions are in inches. 2. Weights are in pounds, and are approximate.

Dresser, Inc.



Roots

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S-16K97
December 2002

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