

ROOTS™ DVJ Whispair™ DRY EXHAUSTERS

Frames 1016J, 1021J, 1220J, 1428J, 1431J,
1833J & 1838J

BASIC BLOWER DESCRIPTION

ROOTS model DVJ Whispair™ Dry Exhausters have an exclusive Whispair™ 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, without water injection.

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

DVJ Whispair™ exhausters are heavy-duty units with forged steel stub shafts bolted to ductile iron impellers. The casing, headplates, gear cover and drive end covers are grey iron.



Carburized and ground alloy steel spur timing gears are mounted on the shafts of 1000 frame size units by a taper fit, while large sizes use a double taper ring locking assembly. Double-row spherical roller bearings are splash lubricated at both the gear end and drive end. Piston ring shaft seals and lip-type seals are used to restrict oil leakage into the air stream. The DVJ can be equipped with mechanical seals for gas applications.

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

VACUUM PERFORMANCE TABLE

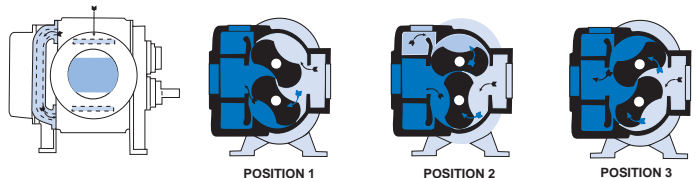
| Frame | Speed | Max. Free Air | 16" HgV | | 20" HgV | | 24" HgV | | 27" HgV | |
|-------|-------|---------------|---------|-----|---------|-----|------------------------------------|-----|-------------------------------|-----|
| Size | RPM | CFM | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP |
| 1016J | 980 | | 1557 | 77 | 1345 | 95 | 933 | 114 | * | 128 |
| | 1450 | | 2619 | 115 | 2407 | 142 | 1996 | 169 | 970 | 189 |
| | 1800 | 4068 | 3410 | 144 | 3198 | 177 | 2787 | 211 | 1761 | 235 |
| 1021J | 980 | | 1984 | 97 | 1714 | 121 | 1189 | 145 | * | 163 |
| | 1450 | | 3338 | 145 | 3067 | 180 | 2543 | 215 | 1236 | 241 |
| | 1800 | 5184 | 4346 | 183 | 4075 | 225 | 3551 | 268 | 2244 | 300 |
| 1220J | 880 | | 2627 | 120 | 2356 | 149 | 1831 | 178 | 523 | 200 |
| | 1170 | | 3770 | 161 | 3500 | 199 | 2974 | 237 | 1664 | 266 |
| | 1500 | 5910 | 5070 | 208 | 4800 | 257 | 4274 | 305 | 2964 | 342 |
| 1222J | 880 | | 2886 | 131 | 2588 | 163 | 2011 | 196 | Max. vacuum limited to 24" Hg | |
| | 1170 | | 4142 | 176 | 3843 | 218 | 3267 | 261 | | |
| | 1500 | 6645 | 5571 | 228 | 5272 | 282 | 4696 | 335 | | |
| 1428J | 880 | | 5207 | 230 | 4748 | 285 | Maximum vacuum limited to 22.5" Hg | | | |
| | 1170 | | 7390 | 310 | 6932 | 382 | | | | |
| | 1300 | 9789 | 8369 | 347 | 7911 | 427 | | | | |
| 1431J | 880 | | 5857 | 258 | 5341 | 321 | Maximum vacuum limited to 22" Hg | | | |
| | 1170 | | 8313 | 348 | 7797 | 429 | | | | |
| | 1300 | 11011 | 9414 | 389 | 8898 | 479 | | | | |
| 1833J | 705 | | 8472 | 365 | 7832 | 453 | 6554 | 540 | Max. vacuum limited to 24" Hg | |
| | 880 | | 11074 | 461 | 10425 | 569 | 9167 | 676 | | |
| | 1000 | 14870 | 12859 | 529 | 12209 | 650 | 10951 | 770 | | |
| 1838J | 705 | | 9612 | 414 | 8875 | 513 | Maximum vacuum limited to 21.5" Hg | | | |
| | 880 | | 12564 | 522 | 11827 | 644 | | | | |
| | 1000 | 16870 | 14588 | 588 | 13851 | 736 | | | | |

Notes: Ratings based on inlet and jet air 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.
Refer to the Factory for units and performances not listed.

DESIGN & CONSTRUCTION FEATURES

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

OPERATING PRINCIPLE



Shaded blue areas indicate air pressure variations from intake to atmospheric discharge.

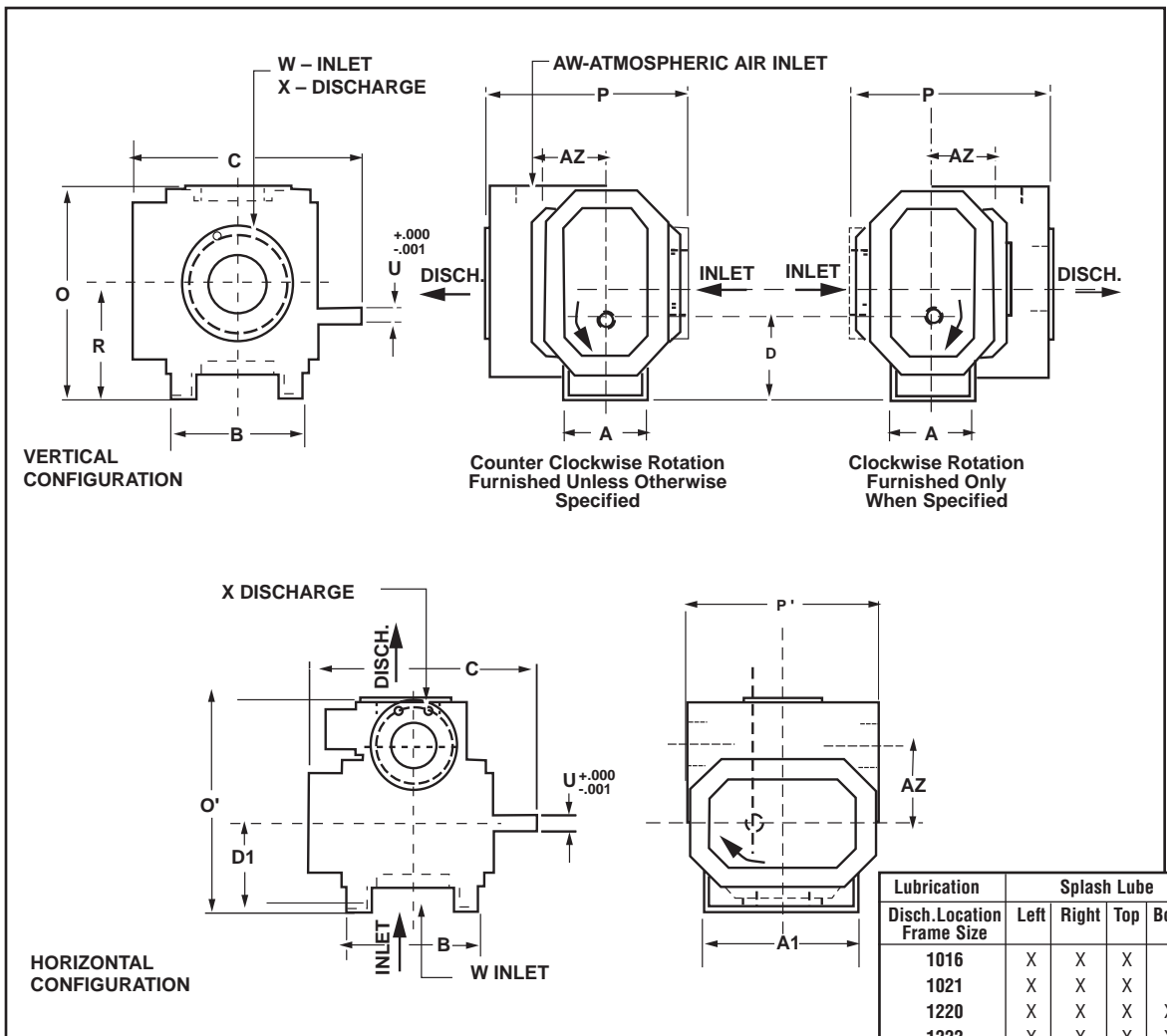
Position 1 - Incoming air is trapped between the impellers and the case, producing a vacuum in the application system. Simultaneously, air is discharged (right) from the exhauster.

Position 2 - As the impeller passes the Whispair™ jet plenum, atmospheric air flows into the space between the impeller and the case. This cools the trapped air, aids impeller movement and reduces shock and power loss.

Position 3 - The trapped air is then moved to the discharge flange (right). Backflow is reduced, resulting in lower discharge noise relative to conventional rotary exhausters.



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Consult Factory: 1. Manifold spacer required.
 2. Special headplates required.
 3. Modifications to cylinder required.

| Lubrication Disch. Location Frame Size | Splash Lube | | | | Pressure Lube | | | |
|--|-------------|-------|-----|--------|---------------|-------|-----|---------|
| | Left | Right | Top | Bottom | Left | Right | Top | Bottom |
| 1016 | X | X | X | | X | X | X | |
| 1021 | X | X | X | | | | X | |
| 1220 | X | X | X | X(2) | X | X | X | X |
| 1222 | X | X | X | X(2) | X | X | X | X(1)(2) |
| 1428 | X | X | X | | X | X(3) | X | |
| 1431 | X | X | X | | X | X(3) | X | |
| 1833 | X | X | X | | X | X | X | |
| 1836 | X | X | X | | X | X | X | |

| FRAME SIZE | A | A' | B | C | D | D' | O | O' | P | P' | R | U | Keyway | AZ | W | X | AW | WGT. |
|------------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|--------------|-------|--------|--------|--------|-------|
| 1016J | 27.00 | 27.00 | 23.25 | 49.88 | 14.500 | 14.500 | 34.88 | 31.88 | 31.63 | 30.75 | 19.50 | 2.250 | .500 x .250 | 8.50 | 12 FLG | 12 FLG | 10 FLG | 2400 |
| 1021J | 27.00 | 27.75 | 27.75 | 45.50 | 14.500 | 14.500 | 38.00 | 28.75 | 31.25 | 36.00 | 19.50 | 2.250 | .500 x .250 | 7.50 | 14 FLG | 14 FLG | 12 FLG | 2525 |
| 1220J | 30.50 | 30.50 | 27.50 | 52.38 | 16.625 | 16.625 | 40.63 | 35.88 | 35.75 | 36.00 | 22.63 | 2.625 | .625x .313 | 8.50 | 16 FLG | 14 FLG | 12 FLG | 3650 |
| 1222J | 30.50 | 30.50 | 30.00 | 54.88 | 16.625 | 16.625 | 40.63 | 35.88 | 35.75 | 36.00 | 22.63 | 2.625 | .625x .313 | 8.50 | 16 FLG | 14 FLG | 12 FLG | 4000 |
| 1428J | 34.00 | 34.00 | 36.25 | 57.88 | 18.750 | 18.750 | 47.56 | 46.60 | 46.75 | 42.19 | 25.75 | 3.000 | .750 x .375 | 14.75 | 20 FLG | 18 FLG | 16 FLG | 5900 |
| 1431J | 34.00 | 34.99 | 39.25 | 61.38 | 18.750 | 18.750 | 47.56 | 46.60 | 46.75 | 42.19 | 25.75 | 3.000 | .750 x .375 | 14.75 | 20 FLG | 18 FLG | 16 FLG | 6100 |
| 1833J | 41.00 | 41.00 | 43.50 | 69.81 | 23.250 | 23.250 | 59.25 | 56.60 | 56.75 | 52.80 | 32.25 | 4.188 | 1.000 x .500 | 15.00 | 24 FLG | 24 FLG | 20 FLG | 10500 |
| 1838J | 41.00 | 41.00 | 48.00 | 74.31 | 23.250 | 23.250 | 59.25 | 56.60 | 56.75 | 52.80 | 32.25 | 4.188 | 1.000 x .500 | 15.00 | 24 FLG | 24 FLG | 20 FLG | 10800 |

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

Dresser, Inc.



Roots

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