

SPECIFICATIONS

ROOTS™ UNIVERSAL RAI-G® Rotary Positive Gas Blowers

Frames 32 thru 615

BASIC BLOWER DESCRIPTION

Universal RAI-G® gas blowers are heavy duty rotary blowers designed with mechanical seals and rugged steel mounting feet. Optional feet are available for horizontal installations. The compact, sturdy design is engineered for continuous service when operated in accordance with speed and pressure ratings.

The basic model consists of a cast iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized anti-friction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand V-belt pull. The Universal RAI-G® features splash oil lube on the gear end and grease lube on the drive end. ROOT's exclusive "figure-eight" gearbox design improves oil distribution to maximize gear and bearing life.

Each unity is mechanically tested and given a 15 psig static leak test. A 1/8" NPT purge port is provided at each seal for buffer gas application as required. After testing, the unit is sprayed with a protective paint, and boxed or skid mounted for delivery.

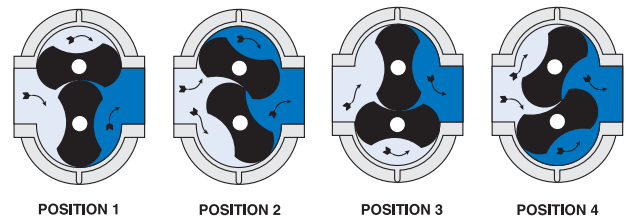
Accessories are available through our distributors. ROOTS™ Synthetic Oil and grease is recommended to maintain warranty.



DESIGN AND CONSTRUCTION FEATURES

1. Mechanical seals
2. Rigid one-piece cast iron casing
3. Anti-friction bearings
4. Splash oil lubricated spur timing gears
5. Connections in standard pipe sizes
6. Straight, precision machined two-lobe impellers
7. Ground steel shafts
8. Detachable steel mounting feet

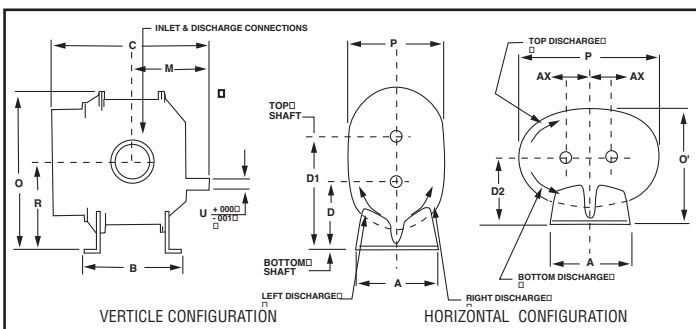
OPERATING PRINCIPLE



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 gas and carries it around the case to the blower outlet, where the gas 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 gas casing.

OUTLINE DRAWING & DIMENSIONAL TABLE



| Frame | A | A' | B | C | D | D1 | D2 | M | O | O' | P | P' | R | U | INLET DISCH. | AX | WGT |
|-------|-------|-------|-------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|--------------|------|-----|
| 32 | 7.25 | 7.25 | 6.75 | 11.25 | 5.00 | 8.50 | 5.00 | 5.81 | 12.81 | 8.88 | 7.75 | 12.13 | 6.75 | .750 | 1.25 NPT | 1.75 | 69 |
| 33 | 7.25 | 7.25 | 7.63 | 12.13 | 5.00 | 8.50 | 5.00 | 6.25 | 12.81 | 8.88 | 7.75 | 12.13 | 6.75 | .750 | 2.0 NPT | 1.75 | 74 |
| 36 | 7.25 | 7.25 | 10.00 | 14.63 | 5.00 | 8.50 | 5.00 | 7.56 | 12.81 | 8.88 | 7.75 | 12.13 | 6.75 | .750 | 2.5 NPT | 1.75 | 102 |
| 42 | 8.00 | 8.00 | 7.25 | 13.00 | 6.25 | 10.25 | 6.25 | 6.86 | 15.06 | 10.63 | 8.75 | 13.63 | 8.25 | .875 | 1.5 NPT | 2.00 | 88 |
| 45 | 8.00 | 8.00 | 10.00 | 15.50 | 6.25 | 10.25 | 6.25 | 8.00 | 15.06 | 10.63 | 8.75 | 13.63 | 8.25 | .875 | 2.5 NPT | 2.00 | 109 |
| 47 | 8.00 | 8.00 | 11.75 | 17.63 | 6.25 | 10.25 | 6.25 | 9.25 | 15.06 | 10.50 | 8.50 | 13.63 | 8.25 | .875 | 3.0 NPT | 2.00 | 128 |
| 53 | 10.50 | 10.50 | 8.38 | 15.38 | 6.25 | 11.25 | 6.75 | 8.18 | 17.38 | 11.88 | 10.25 | 17.25 | 8.75 | 1.125 | 2.5 NPT | 2.50 | 143 |
| 56 | 10.50 | 10.50 | 11.00 | 18.00 | 6.25 | 11.25 | 6.75 | 9.19 | 17.38 | 12.25 | 11.00 | 17.25 | 8.75 | 1.125 | 4.0 NPT | 2.50 | 170 |
| 59 | 10.50 | 10.50 | 14.00 | 21.18 | 6.25 | 11.25 | 6.75 | 11.19 | 17.38 | 12.25 | 11.00 | 17.25 | 8.75 | 1.125 | 4.0 NPT | 2.50 | 204 |
| 65 | 11.00 | 11.00 | 10.00 | 18.38 | 8.75 | 14.75 | 8.75 | 9.19 | 21.63 | 15.13 | 12.75 | 19.75 | 11.75 | 1.375 | 3.0 NPT | 3.00 | 245 |
| 68 | 11.00 | 11.00 | 13.00 | 21.38 | 8.75 | 14.75 | 8.75 | 10.82 | 21.63 | 15.13 | 12.75 | 19.75 | 11.75 | 1.375 | 5.0 NPT | 3.00 | 285 |
| 615 | 11.00 | 11.00 | 20.00 | 28.38 | 8.75 | 14.75 | 8.75 | 14.32 | 21.63 | 16.25 | 15.00 | 19.75 | 11.75 | 1.375 | 6.0 FLG | 3.00 | 425 |



PERFORMANCE TABLE: ROOTS Universal URAI-G

| Frame Size | Speed RPM | 4 PSI | | 5 PSI | | 6 PSI | | 7 PSI | | 8 PSI | | 9 PSI | | 10 PSI | | 12 PSI | | 13 PSI | | 14 PSI | | 15 PSI | | VACUUM | | | |
|------------|-----------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|-----|------|------|
| | | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | CFM | BHP | INHG | INHG |
| 32U | 1750 | 45 | 1.4 | 41 | 1.7 | 37 | 2.1 | 34 | 2.4 | 31 | 2.8 | 28 | 3.1 | 25 | 3.5 | 74 | 7.1 | 72 | 7.6 | 69 | 8.2 | 67 | 8.8 | 15 | 15 | 12 | 12 |
| | 2950 | 99 | 2.4 | 95 | 3.0 | 91 | 3.6 | 88 | 4.2 | 85 | 4.7 | 82 | 5.3 | 79 | 5.9 | 101 | 8.6 | 99 | 9.3 | 96 | 10.0 | 94 | 10.6 | 16 | 16 | 15 | 15 |
| 33U | 1750 | 64 | 1.9 | 58 | 2.4 | 54 | 2.9 | 49 | 3.3 | 45 | 3.8 | 41 | 4.3 | 38 | 4.7 | 105 | 9.7 | | | | | | | 12 | 12 | 12 | 12 |
| | 2950 | 138 | 3.3 | 132 | 4.1 | 128 | 4.9 | 123 | 5.7 | 119 | 6.5 | 115 | 7.3 | 112 | 8.1 | 142 | 11.7 | | | | | | | 15 | 15 | 15 | 15 |
| 36U | 1750 | 116 | 3.2 | 109 | 3.9 | 102 | 4.7 | 96 | 5.5 | | | | | | | | | | | | | | | 13 | 13 | 13 | 13 |
| | 2950 | 238 | 5.5 | 231 | 6.8 | 224 | 8.1 | 218 | 9.4 | | | | | | | | | | | | | | | 15 | 15 | 15 | 15 |
| 42U | 1750 | 68 | 1.9 | 64 | 2.4 | 59 | 2.8 | 56 | 3.3 | 52 | 3.7 | 49 | 4.2 | 46 | 4.7 | 113 | 9.6 | 110 | 10.3 | 108 | 11.1 | 105 | 11.9 | 14 | 14 | 14 | 14 |
| | 2950 | 141 | 3.3 | 136 | 4.1 | 132 | 4.9 | 128 | 5.7 | 125 | 6.5 | 122 | 7.2 | 119 | 8.0 | 149 | 11.6 | 146 | 12.6 | 144 | 13.5 | 141 | 14.4 | 16 | 16 | 16 | 16 |
| 45U | 1750 | 144 | 3.8 | 136 | 4.7 | 129 | 5.6 | 122 | 6.6 | 116 | 7.5 | 110 | 8.4 | 104 | 9.3 | | | | | | | | | 13 | 13 | 13 | 13 |
| | 2950 | 289 | 6.7 | 281 | 8.2 | 274 | 9.8 | 267 | 11.3 | 261 | 12.9 | 255 | 14.4 | 249 | 16.0 | | | | | | | | | 16 | 16 | 16 | 16 |
| 47U | 1750 | 193 | 5.0 | 183 | 6.2 | 174 | 7.4 | 166 | 8.6 | | | | | | | | | | | | | | | 14 | 14 | 14 | 14 |
| | 2950 | 385 | 8.8 | 375 | 10.8 | 366 | 12.9 | 357 | 14.9 | | | | | | | | | | | | | | | 15 | 15 | 15 | 15 |
| 53U | 1750 | 175 | 4.2 | 168 | 5.2 | 163 | 6.2 | 157 | 7.2 | 152 | 8.2 | 147 | 9.2 | 143 | 10.3 | 134 | 12.3 | 130 | 13.3 | 127 | 14.3 | 125 | 15.4 | 12 | 12 | 12 | 12 |
| | 2850 | 320 | 7.4 | 313 | 9.1 | 308 | 10.7 | 302 | 12.3 | 297 | 14.0 | 292 | 15.6 | 288 | 17.2 | 279 | 20.5 | 275 | 22.1 | 272 | 23.8 | 268 | 25.4 | 15 | 15 | 15 | 15 |
| 56U | 1750 | 174 | 4.6 | 164 | 5.7 | 155 | 6.9 | 147 | 8.0 | 139 | 9.1 | 132 | 10.2 | 125 | 11.4 | 112 | 13.6 | 112 | 13.6 | 109 | 14.3 | 105 | 15.4 | 13 | 13 | 13 | 13 |
| | 2850 | 302 | 7.0 | 292 | 8.7 | 283 | 10.4 | 275 | 12.1 | 267 | 13.8 | 260 | 15.5 | 253 | 17.2 | 241 | 20.5 | 235 | 22.2 | 232 | 23.8 | 228 | 25.4 | 15 | 15 | 15 | 15 |
| 59U | 1750 | 272 | 6.7 | 259 | 8.4 | 248 | 10.0 | 238 | 11.7 | | | | | | | | | | | | | | | 14 | 14 | 14 | 14 |
| | 2850 | 459 | 10.3 | 447 | 12.8 | 436 | 15.2 | 425 | 17.7 | | | | | | | | | | | | | | | 15 | 15 | 15 | 15 |
| 65U | 1750 | 201 | 5.2 | 190 | 6.4 | 181 | 7.7 | 172 | 8.9 | 164 | 10.2 | 157 | 11.5 | 150 | 12.7 | 137 | 15.2 | 130 | 16.5 | 127 | 17.2 | 125 | 18.7 | 14 | 14 | 14 | 14 |
| | 2850 | 343 | 8.0 | 333 | 9.9 | 324 | 11.8 | 315 | 13.7 | 307 | 15.6 | 300 | 17.4 | 293 | 19.3 | 279 | 23.1 | 273 | 24.9 | 267 | 26.8 | 261 | 28.7 | 15 | 15 | 15 | 15 |
| 68U | 1750 | 322 | 8.3 | 305 | 10.3 | 291 | 12.3 | 277 | 14.3 | 264 | 16.3 | 252 | 18.3 | 241 | 20.3 | 219 | 24.4 | 210 | 26.4 | 203 | 28.3 | 209 | 30.1 | 14 | 14 | 14 | 14 |
| | 2350 | 551 | 12.7 | 535 | 15.7 | 520 | 18.7 | 506 | 21.8 | 493 | 24.8 | 481 | 27.8 | 470 | 30.8 | 470 | 36.8 | 439 | 39.8 | 429 | 42.9 | 429 | 45.8 | 16 | 16 | 16 | 16 |
| 615U | 1750 | 603 | 15.4 | 572 | 19.1 | 544 | 22.9 | 519 | 26.7 | | | | | | | | | | | | | | | 11 | 11 | 11 | 11 |
| | 2350 | 1032 | 23.2 | 1001 | 29.1 | 973 | 34.7 | 948 | 40.4 | | | | | | | | | | | | | | | 12 | 12 | 12 | 12 |

NOTES:
 1. Performance based on inlet methane at standard pressure of 14.7 psia, standard temperature of 68°F, and specific gravity of 0.55.
 2. Vacuum ratings based on inlet methane at standard temperature of 68°F, discharge pressure of 30" Hg and specific gravity of 0.55.

Dresser Roots

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