



**Roots**

## 36 URAI

Part Number – 65106020



- Detachable steel mounting feet
- Rigid one-piece cast iron casing
- Connections in standard pipe sizes
- Straight, precision machined two-lobe impellers
- Splash oil lubricated gears
- Carburized and ground alloy steel spur timing gears
- Anti-Friction gears
- Ground steel shafts
- Center Timed for rotation in either direction

### Also Available in:

- URAI-DSL (Dual Splash Lube)
- URAI-J (Whispair)
- URAI-G (Gas)
- URAI-J-DSL
- URAI-Metric

### Equivalent to:

*Sutorbilt Model 3LP*

*Tuthill Model 3006\**

*\*Model size 3006 is supplied with 7/8" diameter drive shaft. When replacing with a Roots model you will need to adjust your drive components to accommodate the 3/4" drive shaft of the Roots blower.*



816-741-0282



### Quick Specs

|                                |                 |
|--------------------------------|-----------------|
| Flow Range                     | to 330 CFM      |
| Max ΔPressure                  | 7 PSI           |
| Max ΔVacuum                    | 15" Hg          |
| Maximum RPM                    | 3600            |
| Minimum RPM                    | 1090            |
| Max ΔT                         | 225°F           |
| Connection Size                | 2.5" FPT        |
| Shaft Dia.                     | 0.75"           |
| Min Sheave Dia.                | 5"              |
| Drive End Lubrication          | Grease          |
| Gear End Lubrication           | Oil             |
| Oil Sump Gear End Horiz Config | ~16 oz          |
| Oil Sump Gear End Vert Config  | ~8.5 oz         |
| Bare Unit Weight               | 76 lbs          |
| Shipping Weight                | 80 lbs          |
| Shipping Container             | Box             |
| Box Size (L x W x H)           | 17" x 16" x 12" |
| Can Ship via                   | UPS Insured     |



816-741-0282

**Universal RAI Series Blowers Parts List  
2-1/2" – 5" Gear Diameter**

(Refer to drawing #64720023)

| Item # | Part Name                  | Qty. |
|--------|----------------------------|------|
| 1      | Headplate Gear End         | 1    |
| 2      | Headplate Drive End        | 1    |
| 3      | Gearbox                    | 1    |
| 4      | Timing Gears               | 2    |
| 5      | Cover-Blind (Plug Opening) | 1    |
| 7      | Gasket, Gear Box           | 1    |
| 11     | Cylinder                   | 1    |
| 12     | Impeller & Shaft Drive     | 1    |
| 13     | Impeller & Shaft Driven    | 1    |
| 14     | Bearing, Ball              | 3    |
| 15     | Bearing, Roller            | 1    |
| 16     | Pin, Dowel                 | 4    |
| 17     | Gear Nut                   | 2    |
| 19     | Key                        | 1    |
| 21     | Plug, Pipe                 | 3    |
| 23     | Screw Hex                  | 6    |
| 25     | Breather (Plug Vent)       | 1    |
| 26     | Screw, Hex                 | *    |
| 27     | Seal, Lip Bearing          | 4    |
| 31     | Screw, Hex, Nylock         | 4    |
| 32     | Screw, Hex                 | 6    |
| 33     | Seal Lip-Drive             | 1    |
| 34     | Clamp Plate                | 2    |
| 35     | Foot                       | 2    |
| 37     | Fitting, Grease            | 2    |
| 38     | Fitting, Relief            | 2    |
| 39     | Washer Mounting            | 4    |
| 40     | Screw Socket               | 2    |
| 42     | Screw Hex                  | 2    |

\*Quantities vary by blower.

**Table 2 - Recommended Oil Grades**

| Ambient*<br>Temperature °F (°C) | ISO<br>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 blower and drive are located.

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

- When servicing drive end bearings of a AIR (Non the blower, use the specified and recommended Shell Darina SD 2 NLGI #2 product code 5067628.
- Lithium based greases are not compatible with specified and recommended Shell Darina SD 2 grease used when assembling the blower. **Lithium based grease is not approved for any ROOTS blowers.**

**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.

**P/N 651050RK Kit without Gears for 32, 33, 36 URAI, URAI-DSL, URAI-J, URAI-J-DSL, URAI-Metric, URAI-DSL-Metric**

| Item | Qty | 3" Kit Description       | P/N       |
|------|-----|--------------------------|-----------|
| 5    | 1   | PLUG,OPENING FOR 2.0474  | 12957003  |
| 7    | 2   | GSKT,GRBX 3-1/2 URAI TS9 | 62752021  |
| 14   | 3   | BRG,BALL                 | 10987002  |
| 15   | 1   | BRG,ROLLER               | 10222035  |
| 17   | 2   | NUT,HEX ESNA 5/8-18      | 10319007  |
| 27   | 4   | SEAL,LIP(VITON) 13/16 SF | 10005157  |
| 31   | 4   | SCR,CAP HEXH NYL 1/4-20X | 11540003  |
| 33   | 1   | SEAL,LIP for GREASE LUBE | 10005172  |
| 33A  | 1   | SEAL,LIP for DSL         | T20082001 |

**P/N 651040RK Kit with Gears for 32, 33, 36 URAI, URAI-DSL, URAI-J, URAI-J-DSL, URAI-Metric, URAI-DSL-Metric**

| Item | Qty | 3" Kit Description       | P/N       |
|------|-----|--------------------------|-----------|
| 4    | 1   | GEAR,ASSY 3-1/2 URAI T/  | 63889021  |
| 5    | 1   | PLUG,OPENING FOR 2.0474  | 12957003  |
| 7    | 2   | GSKT,GRBX 3-1/2 URAI TS9 | 62752021  |
| 14   | 3   | BRG,BALL                 | 10987002  |
| 15   | 1   | BRG,ROLLER               | 10222035  |
| 17   | 2   | NUT,HEX ESNA 5/8-18      | 10319007  |
| 27   | 4   | SEAL,LIP(VITON) 13/16 SF | 10005157  |
| 31   | 4   | SCR,CAP HEXH NYL 1/4-20X | 11540003  |
| 33   | 1   | SEAL,LIP for GREASE LUBE | 10005172  |
| 33A  | 1   | SEAL,LIP for DSL         | T20082001 |

**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    |

NOTES:

A- INSTALL ITEM #20 (SCREW) IN ASSEMBLY

B- SEE OPERATING MANUAL IRB-180 FOR LUBRICATION INSTRUCTION

C- 2-1/2, 3-1/2, & 4" REQ'D SOC. HD. ON G.E. ONLY

E- REQ'D ON 22 & 42 ONLY

F- NUT TO BE TORQUED TO:

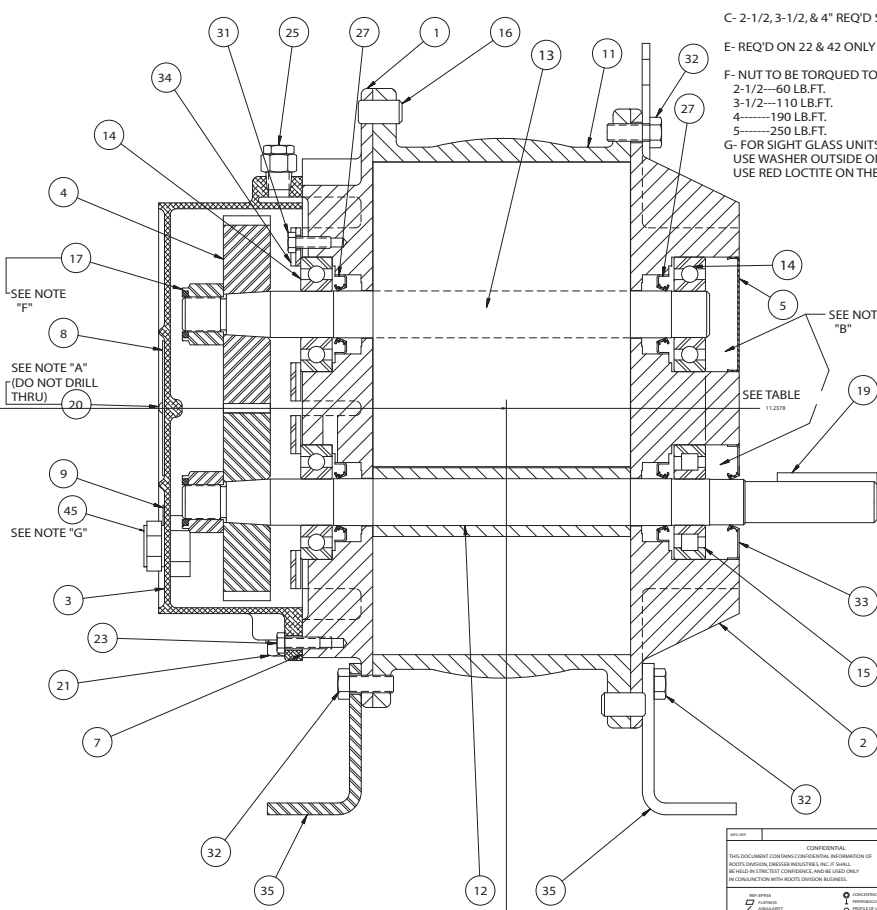
2-1/2---60 LB.FT.

3-1/2---110 LB.FT.

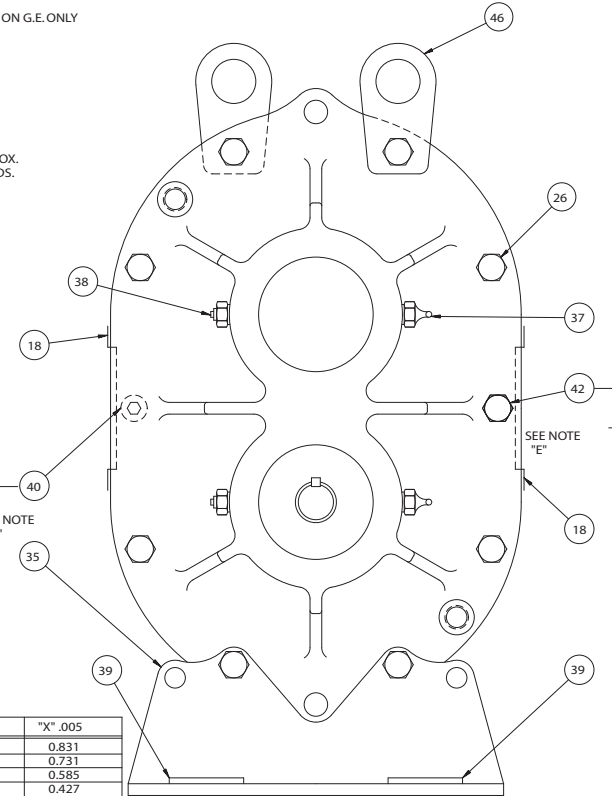
4---190 LB.FT.

5---250 LB.FT.

G- FOR SIGHT GLASS UNITS ONLY. USE WASHER OUTSIDE OF GEARBOX. USE RED LITTE ON THE THREADS.



| SIZE  | "X" .005 |
|-------|----------|
| 5     | 0.831    |
| 4     | 0.731    |
| 3-1/2 | 0.585    |
| 2-1/2 | 0.427    |



SEE NOTE "F"

SEE NOTE "A" (DO NOT DRILL THRU)

SEE NOTE "G"

SEE NOTE "B"

SEE TABLE 11.2378

SEE NOTE "C"

SEE NOTE "E"

CONFIDENTIAL  
 THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF  
 ROOTS DESIGN, DRESSER ROOTS, INC. IT SHALL  
 BE HELD IN STRICT CONFIDENTIAL SERVICE AND USED  
 IN CONNECTION WITH ROOTS DIVISION BUSINESS.

APPROVED  
 CALIBRATED  
 DIMENSIONS  
 FINISHES  
 MATERIALS  
 OPERATIONS  
 PARTS LIST  
 RELEASED FOR SALE  
 REVIEWED FOR DESIGN

| REV | DATE | BY | CHKD | APP'D | DESCRIPTION                |
|-----|------|----|------|-------|----------------------------|
| 1   |      |    |      |       | ADD LIFTING LUGS (ITEM #6) |
| 2   |      |    |      |       | REVISED FOR SIGHT          |
| 3   |      |    |      |       | REVISED FOR SIGHT          |
| 4   |      |    |      |       | REVISED FOR SIGHT          |
| 5   |      |    |      |       | INCREASE ASSEMBLY TORQUE   |
| 6   |      |    |      |       | ITEM #20 (SCREW) PER BLEN  |
| 7   |      |    |      |       | LUBRICATION NOTE & REVISED |
| 8   |      |    |      |       | REVISIONS                  |
| 9   |      |    |      |       | ITEM #42 (NUT)             |
| 10  |      |    |      |       | NEW PARTS LIST             |

DO NOT SCALE FOR DIMENSIONS

**SECTIONAL ASSEMBLY**  
 2-1/2 THRU 5" U-BAL BLOWERS  
 TAPER ROSE GEARS

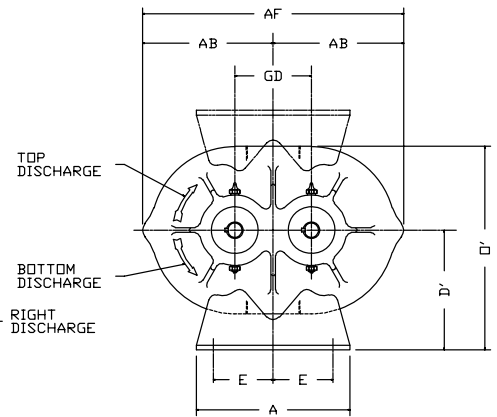
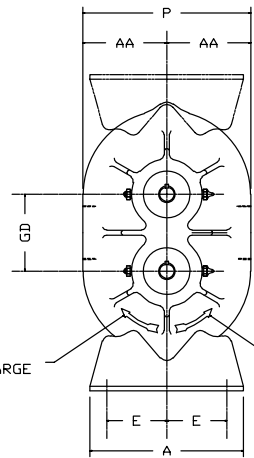
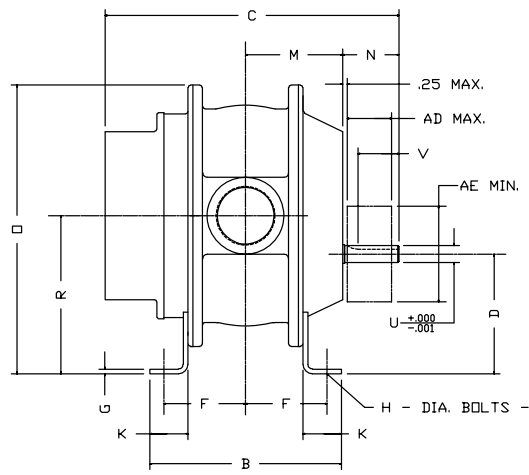
**DRESSER**  
 Roots  
 DRESSER ROOTS, DRESSER, INC.  
 INDUSTRIAL, TX

64720023

REV J

| FRAME | APPROX. OIL CAPACITY |              |
|-------|----------------------|--------------|
|       | VERTICAL             | HORIZONTAL   |
| 2-1/2 | 3.4 FL. OZ.          | 6.1 FL. OZ.  |
| 3-1/2 | 8.5 FL. OZ.          | 16 FL. OZ.   |
| 4     | 12.7 FL. OZ.         | 22.8 FL. OZ. |
| 5     | 16.0 FL. OZ.         | 27.6 FL. OZ. |

| No. REQ'D. | PART NAME | PATT. No. PART No. | MAT'L. |
|------------|-----------|--------------------|--------|
|            |           |                    |        |



W - INLET & DISCHARGE  
 AD - SHEAVE WIDTH  
 AE - SHEAVE DIAMETER

ALL DIMENSIONS IN INCHES

# UNIVERSAL<sup>®</sup> RAI BLOWER

| FRAME SIZE | GD   | A     | B     | C     | D    | D'   | E MIN. | E MAX. | F MIN. | F MAX. | G   | H   | K    | M    | N    | O     | O'    | P     | R     | U     | KEYWAY    | W NPT. | V    | AA   | AB   | AD   | AE   | AF    | APPROX. WT. LBS |
|------------|------|-------|-------|-------|------|------|--------|--------|--------|--------|-----|-----|------|------|------|-------|-------|-------|-------|-------|-----------|--------|------|------|------|------|------|-------|-----------------|
| 22         | 2.5  | 5.13  | 5.00  | 9.75  | 3.75 | 3.75 | 1.50   | 2.00   | 2.00   | 2.00   | .25 | .38 | 1.25 | 2.63 | 2.50 | 9.63  | 6.88  | 6.25  | 5.00  | .625  | .188x.094 | 1"     | 1.81 | 3.13 | 4.63 | 1.75 | 4.00 | 9.25  | 32              |
| 24         |      |       | 7.00  | 11.75 |      |      |        |        | 3.00   | 3.00   |     |     |      | 3.63 |      |       |       |       |       |       | 2"        |        |      |      |      |      |      |       | 43              |
| 32         | 3.50 | 7.25  | 6.75  | 11.25 | 5.00 | 5.00 | 2.50   | 2.88   | 2.56   | 2.81   | .25 | .44 | 1.75 | 3.38 | 2.44 | 12.81 | 8.88  | 7.75  | 6.75  | .750  | .188x.094 | 1-1/4" | 1.63 | 3.88 | 6.06 | 1.91 | 5.00 | 12.13 | 69              |
| 33         |      |       | 7.63  | 12.13 |      |      |        |        | 3.00   | 3.25   |     |     |      | 3.81 |      |       |       |       |       |       |           | 2"     |      |      |      |      |      |       | 74              |
| 36         |      |       | 10.00 | 14.63 |      |      |        |        | 4.18   | 4.44   |     |     |      | 5.00 | 2.56 |       |       |       |       |       |           | 2-1/2" | 1.75 |      |      |      |      |       | 102             |
| 42         | 4.00 | 8.00  | 7.25  | 13.00 | 6.25 | 6.25 | 3.00   | 3.13   | 2.50   | 3.13   | .31 | .44 | 2.00 | 3.68 | 3.18 | 15.06 | 10.63 | 8.75  | 8.25  | .875  | .188x.094 | 1-1/2" | 2.31 | 4.38 | 6.81 | 2.31 | 5.00 | 13.63 | 88              |
| 45         |      |       | 10.00 | 15.50 |      |      |        |        | 3.56   | 4.25   |     |     |      | 5.06 | 2.94 |       |       |       |       |       |           | 2-1/2" | 2.13 |      |      |      |      |       | 109             |
| 47         |      |       | 11.75 | 17.63 |      |      |        |        | 4.63   | 5.38   |     |     |      | 5.94 | 3.31 |       |       | 10.50 | 8.50  |       |           | 3"     | 2.50 | 4.25 |      |      |      | 128   |                 |
| 53         | 5.00 | 10.50 | 8.38  | 15.38 | 6.25 | 6.75 | 3.50   | 3.50   | 3.18   | 3.68   | .25 | .50 | 1.88 | 4.50 | 3.68 | 17.38 | 11.88 | 10.25 | 8.75  | 1.125 | .25 x.125 | 2-1/2" | 2.75 | 5.13 | 8.63 | 3.06 | 6.00 | 17.25 | 143             |
| 56         |      |       | 11.00 | 17.50 |      |      |        |        | 4.25   | 5.00   |     |     |      | 5.81 | 3.38 |       |       | 12.25 | 11.00 |       |           | 4"     | 2.50 | 5.50 |      |      |      | 170   |                 |
| 59         |      |       | 14.00 | 21.00 |      |      |        |        | 6.00   | 6.50   |     |     |      | 7.31 | 3.88 |       |       |       |       |       |           | 4"     | 3.00 |      |      |      |      | 204   |                 |

|   |                                     |                      |         |
|---|-------------------------------------|----------------------|---------|
| MFG. REF.   | CONFIDENTIAL                        | DATE                 | 8/29/84 |
| THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF ROOTS DIVISION, DRESSER INDUSTRIES, INC. IT SHALL BE HELD IN STRICTEST CONFIDENCE, AND BE USED ONLY IN CONJUNCTION WITH ROOTS DIVISION BUSINESS. | DR. DB                              | CHKD.                |         |
| REF: EP938  | REVISION ON 'C' FROM 18.00 TO 17.50 | APP. FCR             |         |
| ⊖ CONCENTRICITY   | D UPDATED TITLE BLOCK 9/25/91       | DBV                  |         |
| □ FLATNESS  | C CORRECTED FRAME 36 REM 8/14/90    | SCALE                |         |
| ∠ ANGULARITY  | B ADDED FRAME 32 RVE 6/22/90        | CAD FILE / DIRECTORY |         |
| ∥ PARALLELISM   | A REV. FRAM 59 REM 6/9/88           |                      |         |
| ⊕ TRUE POSITION   |                                     |                      |         |
| — STRAIGHTNESS  |                                     |                      |         |
| ⊙ PERPENDICULARITY  |                                     |                      |         |
| — PROFILE OF LINE   |                                     |                      |         |
| — PROFILE OF A SURFACE  |                                     |                      |         |
| ∅ DIAMETER  |                                     |                      |         |
| ✓ FINISH IN MICRO INCHES  |                                     |                      |         |
| /PARTS/XXAD 62795a21  |                                     |                      |         |

DO NOT SCALE FOR DIMENSIONS  
 ALL DIMENSIONS SHOWN IN BRACKETS ( ) ARE MILLIMETERS

ORDER No.

## ASSY DIM 22-59 URAI VH

ROOTS DIVISION  
 DRESSER EQUIPMENT GROUP  
 A HALLIBURTON COMPANY  
 CONNERSVILLE, IN USA

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED  
 FINISHED DIMENSIONS  
 TWO PLACE DECIMALS 000--.005 FRACTIONAL--1/64  
 THREE PLACE DECIMALS 0000--.005

62795021

REV E

## ROOTS™ UNIVERSAL RAI® ROTARY POSITIVE BLOWERS

Frames 22 thru 718

### BASIC BLOWER DESCRIPTION

Universal RAI® blowers are heavy-duty rotary blowers designed with detachable rugged steel mounting feet that permit easy, in-field adaptability to vertical or horizontal installation requirements.

Because of the detachable mounting feet, these units can be easily adapted to any of four drive shaft positions: right, left, bottom, or top. The compact, sturdy design is engineered for continuous service when operated in accordance with speed and pressure ratings.

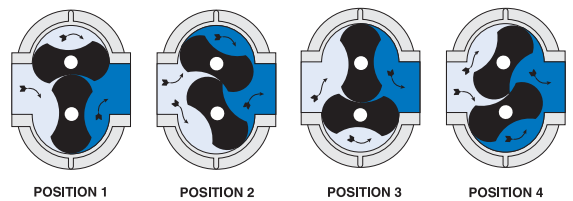
The basic model consists of a cast iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized antifriction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand V-belt pull. The Universal RAI® features splash oil lube on the gear end and grease lube on the drive end. ROOTS'



exclusive "figure-eight" gearbox design improves oil distribution to maximize gear and bearing life. After testing, the unit is sprayed with a protective paint, and boxed or skid mounted for delivery.

Available accessories include driver, relief valve, inlet and discharge silencers, inlet filter, check valve, extended base, V-belt or flexible coupling and drive guards.

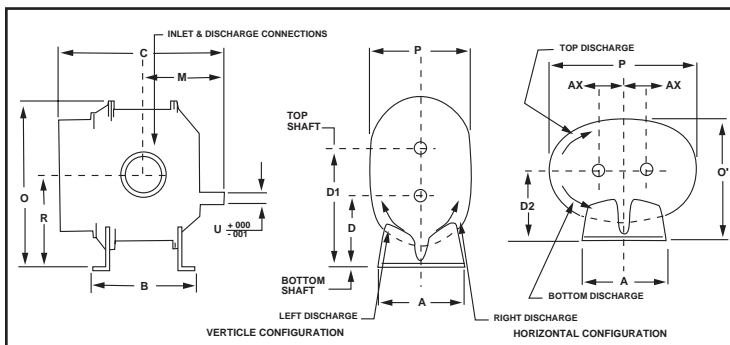
### OPERATING PRINCIPLE



POSITION 1      POSITION 2      POSITION 3      POSITION 4

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 air and carries it around the case to the blower outlet, where the air is discharged. With constant speed operation, the displaced volume is essentially the same regardless of pressure or temperature.

Timing gears control the impellers relative positions and maintain small but definite clearances. This allows operation without lubrication requirements inside the unit casing.



| Frame | A     | A'    | B     | C     | D     | D1    | D2    | M     | O     | O'    | P     | P'    | R     | U     | INLET DISCH. | AX   | WGT |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|------|-----|
| 22U   | 5.13  | 5.13  | 5.00  | 9.75  | 3.75  | 6.25  | 3.75  | 5.13  | 9.63  | 6.88  | 6.25  | 9.25  | 5.00  | .625  | 1.0 NPT      | 1.25 | 32  |
| 24U   | 5.13  | 5.13  | 7.00  | 11.75 | 3.75  | 6.25  | 3.75  | 6.13  | 9.63  | 6.88  | 6.25  | 9.25  | 5.00  | .625  | 2.0 NPT      | 1.25 | 43  |
| 32U   | 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  |
| 33U   | 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  |
| 36U   | 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 |
| 42U   | 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  |
| 45U   | 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 |
| 47U   | 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 |
| 53U   | 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 |
| 56U   | 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 | 109 |
| 59U   | 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 |
| 65U   | 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 |
| 68U   | 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 |
| 615U  | 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 |
| 76U   | 14.00 | 21.00 | 11.75 | 19.94 | 11.00 | 18.00 | 11.00 | 10.00 | 26.13 | 20.69 | 19.38 | 23.25 | 14.50 | 1.562 | 4.0 NPT      | 3.50 | 400 |
| 711U  | 14.00 | 21.00 | 16.75 | 25.19 | 11.00 | 18.00 | 11.00 | 12.75 | 26.13 | 19.50 | 17.00 | 23.25 | 14.50 | 1.562 | 6.0 FLG      | 3.50 | 530 |
| 718U  | 14.00 | 21.00 | 23.75 | 32.19 | 11.00 | 18.00 | 11.00 | 16.25 | 26.13 | 19.50 | 17.00 | 23.25 | 14.50 | 1.562 | 8.0 FLG      | 3.50 | 650 |



Roots

| Frame Size | Speed | 4 PSI |      | 5 PSI |      | 6 PSI |      | 7 PSI |      | 8 PSI |      | 9 PSI |      | 10 PSI |      | 12 PSI |      | 13 PSI |      | 14 PSI |      | 15 PSI |      | VACUUM DATA |      |      |
|------------|-------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|--------|------|--------|------|--------|------|--------|------|--------|------|-------------|------|------|
|            |       | CFM   | BHP  | CFM   | BHP  | CFM   | BHP  | CFM   | BHP  | CFM   | BHP  | CFM   | BHP  | CFM    | BHP  | CFM    | BHP  | CFM    | BHP  | CFM    | BHP  | CFM    | BHP  | INHGV       | CFM  | BHP  |
| 22         | 2950  | 31    | 0.9  | 29    | 1.1  | 27    | 1.3  | 26    | 1.5  | 24    | 1.7  | 23    | 1.9  | 21     | 2.1  |        |      |        |      |        |      |        |      | 13          | 20   | 1.3  |
|            | 3550  | 40    | 1.0  | 39    | 1.3  | 37    | 1.5  | 35    | 1.8  | 34    | 2.0  | 32    | 2.3  | 31     | 2.5  | 28     | 3.0  |        |      |        |      |        |      | 14          | 28   | 1.7  |
|            | 5275  | 68    | 1.6  | 66    | 2.0  | 64    | 2.4  | 63    | 2.7  | 61    | 3.1  | 60    | 3.5  | 59     | 3.8  | 56     | 4.6  |        |      |        |      |        |      | 15          | 53   | 2.8  |
| 24         | 2950  | 68    | 1.7  | 65    | 2.1  | 63    | 2.5  | 60    | 2.9  |       |      |       |      |        |      |        |      |        |      |        |      |        | 14   | 48          | 2.8  |      |
|            | 3550  | 88    | 2.0  | 85    | 2.5  | 82    | 3.0  | 79    | 3.5  |       |      |       |      |        |      |        |      |        |      |        |      |        | 14   | 67          | 3.4  |      |
|            | 5275  | 143   | 3.1  | 140   | 3.9  | 137   | 4.6  | 134   | 5.4  |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 119         | 5.5  |      |
| 32         | 1750  | 54    | 1.4  | 51    | 1.7  | 48    | 2.1  | 45    | 2.4  | 43    | 2.8  | 41    | 3.1  | 39     | 3.5  | 35     | 4.1  |        |      |        |      |        | 13   | 37          | 2.2  |      |
|            | 2950  | 108   | 2.4  | 105   | 3.0  | 102   | 3.6  | 99    | 4.2  | 97    | 4.7  | 95    | 5.3  | 93     | 5.9  | 89     | 7.1  | 87     | 7.6  | 86     | 8.2  | 84     | 8.8  | 15          | 84   | 4.3  |
|            | 3550  | 135   | 3.0  | 132   | 3.7  | 129   | 4.4  | 126   | 5.1  | 124   | 5.8  | 122   | 6.5  | 120    | 7.2  | 116    | 8.6  | 114    | 9.3  | 113    | 10.0 | 111    | 10.6 | 16          | 108  | 5.6  |
| 33         | 1750  | 75    | 1.9  | 71    | 2.4  | 67    | 2.9  | 64    | 3.3  | 61    | 3.8  | 58    | 4.3  | 56     | 4.7  | 51     | 5.7  |        |      |        |      |        | 13   | 53          | 3.0  |      |
|            | 2950  | 149   | 3.3  | 145   | 4.1  | 141   | 4.9  | 138   | 5.7  | 135   | 6.5  | 132   | 7.3  | 130    | 8.1  | 125    | 9.7  |        |      |        |      |        | 15   | 119         | 5.9  |      |
|            | 3550  | 186   | 4.1  | 182   | 5.0  | 178   | 6.0  | 175   | 6.9  | 172   | 7.9  | 169   | 8.8  | 167    | 9.8  | 162    | 11.7 |        |      |        |      |        | 15   | 156         | 7.2  |      |
| 36         | 1750  | 132   | 3.2  | 126   | 3.9  | 121   | 4.7  | 117   | 5.5  |       |      |       |      |        |      |        |      |        |      |        |      |        | 14   | 95          | 5.4  |      |
|            | 2950  | 254   | 5.5  | 249   | 6.8  | 244   | 8.1  | 239   | 9.4  |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 212         | 9.8  |      |
|            | 3550  | 316   | 6.7  | 310   | 8.3  | 305   | 9.9  | 300   | 11.5 |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 273         | 11.9 |      |
| 42         | 1750  | 78    | 1.9  | 74    | 2.4  | 71    | 2.8  | 69    | 3.3  | 66    | 3.7  | 64    | 4.2  | 61     | 4.7  | 57     | 5.6  | 55     | 6.0  |        |      |        | 14   | 55          | 3.2  |      |
|            | 2950  | 150   | 3.3  | 147   | 4.1  | 144   | 4.9  | 141   | 5.7  | 139   | 6.5  | 136   | 7.2  | 134    | 8.0  | 130    | 9.6  | 128    | 10.3 | 126    | 11.1 | 124    | 11.9 | 16          | 121  | 6.2  |
|            | 3550  | 187   | 4.1  | 183   | 5.1  | 180   | 6.0  | 177   | 7.0  | 175   | 7.9  | 172   | 8.8  | 170    | 9.8  | 166    | 11.6 | 164    | 12.6 | 162    | 13.5 | 160    | 14.4 | 16          | 157  | 7.6  |
| 45         | 1750  | 161   | 3.8  | 155   | 4.7  | 150   | 5.6  | 145   | 6.6  | 140   | 7.5  | 136   | 8.4  | 132    | 9.3  |        |      |        |      |        |      |        | 14   | 121         | 6.4  |      |
|            | 2950  | 306   | 6.7  | 300   | 8.2  | 295   | 9.8  | 290   | 11.3 | 285   | 12.9 | 281   | 14.4 | 277    | 16.0 |        |      |        |      |        |      |        | 16   | 253         | 12.5 |      |
|            | 3550  | 379   | 8.2  | 373   | 10.1 | 368   | 12.0 | 363   | 13.9 | 358   | 15.7 | 354   | 17.6 | 349    | 19.5 |        |      |        |      |        |      |        | 16   | 326         | 15.2 |      |
| 47         | 1750  | 215   | 5.0  | 208   | 6.2  | 201   | 7.4  | 195   | 8.6  |       |      |       |      |        |      |        |      |        |      |        |      |        | 14   | 165         | 8.4  |      |
|            | 2950  | 407   | 8.8  | 399   | 10.8 | 392   | 12.9 | 386   | 14.9 |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 348         | 15.4 |      |
|            | 3550  | 502   | 10.9 | 495   | 13.3 | 488   | 15.8 | 482   | 18.3 |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 444         | 18.8 |      |
| 53         | 1170  | 113   | 2.7  | 108   | 3.4  | 103   | 4.1  | 99    | 4.8  | 96    | 5.4  | 92    | 6.1  | 89     | 6.8  | 82     | 8.1  |        |      |        |      |        | 13   | 85          | 4.3  |      |
|            | 1750  | 189   | 4.2  | 184   | 5.2  | 180   | 6.2  | 176   | 7.2  | 172   | 8.2  | 168   | 9.2  | 165    | 10.3 | 159    | 12.3 | 156    | 13.3 | 153    | 14.3 |        | 15   | 151         | 7.5  |      |
|            | 2850  | 334   | 7.4  | 329   | 9.0  | 325   | 10.7 | 321   | 12.3 | 317   | 14.0 | 313   | 15.6 | 310    | 17.2 | 304    | 20.5 | 301    | 22.1 | 298    | 23.8 | 295    | 25.4 | 16          | 291  | 13.4 |
| 56         | 1170  | 196   | 4.6  | 188   | 5.7  | 182   | 6.9  | 175   | 8.0  | 170   | 9.1  | 164   | 10.2 | 159    | 11.4 | 150    | 13.6 |        |      |        |      |        | 14   | 146         | 7.8  |      |
|            | 1750  | 324   | 7.0  | 316   | 8.7  | 310   | 10.4 | 304   | 12.1 | 298   | 13.8 | 292   | 15.5 | 287    | 17.2 | 278    | 20.5 | 273    | 22.2 |        |      |        | 15   | 266         | 12.6 |      |
|            | 2850  | 567   | 12.2 | 560   | 15.0 | 553   | 17.7 | 547   | 20.5 | 541   | 23.2 | 536   | 26.0 | 530    | 28.7 | 521    | 34.2 | 517    | 37.0 |        |      |        | 16   | 501         | 22.4 |      |
| 59         | 1170  | 299   | 6.7  | 290   | 8.4  | 281   | 10.0 | 273   | 11.7 |       |      |       |      |        |      |        |      |        |      |        |      |        | 14   | 237         | 11.4 |      |
|            | 1750  | 486   | 10.3 | 477   | 12.8 | 469   | 15.2 | 461   | 17.7 |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 414         | 18.4 |      |
|            | 2850  | 842   | 18.0 | 832   | 22.0 | 824   | 26.0 | 816   | 30.0 |       |      |       |      |        |      |        |      |        |      |        |      |        | 15   | 770         | 30.8 |      |
| 65         | 1170  | 223   | 5.2  | 215   | 6.4  | 208   | 7.7  | 202   | 8.9  | 196   | 10.2 | 190   | 11.5 | 185    | 12.7 | 175    | 15.2 | 171    | 16.5 | 166    | 17.7 |        | 14   | 171         | 8.7  |      |
|            | 1750  | 365   | 8.0  | 358   | 9.9  | 351   | 11.8 | 344   | 13.7 | 339   | 15.6 | 333   | 17.4 | 328    | 19.3 | 318    | 23.1 | 313    | 24.9 | 309    | 26.8 | 305    | 28.7 | 16          | 297  | 15.1 |
|            | 2350  | 513   | 11.4 | 505   | 13.9 | 499   | 16.4 | 492   | 19.0 | 486   | 21.5 | 481   | 24.0 | 475    | 26.5 | 465    | 31.6 | 461    | 34.1 | 456    | 36.6 | 452    | 39.1 | 16          | 445  | 20.6 |
| 68         | 1170  | 358   | 8.3  | 345   | 10.3 | 334   | 12.3 | 324   | 14.3 | 314   | 16.3 | 305   | 18.3 | 297    | 20.3 | 281    | 24.4 | 274    | 26.4 | 267    | 28.4 |        | 14   | 275         | 13.9 |      |
|            | 1750  | 587   | 12.7 | 574   | 15.7 | 563   | 18.7 | 553   | 21.8 | 544   | 24.8 | 535   | 27.8 | 526    | 30.8 | 510    | 36.8 | 503    | 39.8 | 496    | 42.9 |        | 16   | 478         | 24.0 |      |
|            | 2350  | 824   | 17.8 | 811   | 21.8 | 800   | 25.9 | 790   | 29.9 | 781   | 34.0 | 772   | 38.0 | 763    | 42.1 | 747    | 50.2 | 740    | 54.2 | 733    | 58.3 |        | 16   | 715         | 32.8 |      |
| 615        | 1170  | 670   | 15.4 | 647   | 19.1 | 626   | 22.9 | 607   | 26.7 |       |      |       |      |        |      |        |      |        |      |        |      |        | 11   | 581         | 20.5 |      |
|            | 1750  | 1099  | 23.4 | 1076  | 29.1 | 1055  | 34.7 | 1036  | 40.4 |       |      |       |      |        |      |        |      |        |      |        |      |        | 12   | 989         | 33.7 |      |
|            | 2350  | 1543  | 32.4 | 1520  | 40.0 | 1499  | 47.6 | 1480  | 55.2 |       |      |       |      |        |      |        |      |        |      |        |      |        | 12   | 1433        | 46.0 |      |
| 76         | 1170  | 393   | 8.6  | 383   | 10.6 | 374   | 12.7 | 367   | 14.8 | 359   | 16.8 | 352   | 18.9 | 346    | 21.0 | 333    | 25.1 | 328    | 27.2 | 322    | 29.2 | 317    | 31.3 | 15          | 319  | 15.4 |
|            | 1750  | 628   | 13.4 | 618   | 16.5 | 609   | 19.6 | 601   | 22.7 | 594   | 25.8 | 587   | 28.9 | 580    | 32.0 | 568    | 38.1 | 562    | 41.2 | 557    | 44.3 | 552    | 47.4 | 16          | 543  | 24.9 |
|            | 2050  | 749   | 16.2 | 740   | 19.8 | 731   | 23.4 | 723   | 22.0 | 716   | 30.6 | 709   | 34.3 | 702    | 37.9 | 690    | 45.1 | 684    | 48.7 | 678    | 52.4 | 623    | 56.0 | 16          | 664  | 29.5 |
| 711        | 1170  | 738   | 15.5 | 723   | 19.2 | 710   | 23.0 | 697   | 26.8 | 686   | 30.5 | 675   | 34.3 | 665    | 38.1 |        |      |        |      |        |      |        | 15   | 623         | 27.9 |      |
|            | 1750  | 1166  | 23.9 | 1151  | 29.5 | 1138  | 35.2 | 1125  | 40.8 | 1114  | 46.4 | 1103  | 52.0 | 1093   | 57.7 |        |      |        |      |        |      |        | 16   | 1035        | 45.0 |      |
|            | 2050  | 1387  | 28.6 | 1372  | 35.2 | 1359  | 41.8 | 1347  | 48.4 | 1335  | 55.0 | 1324  | 61.6 | 1314   | 68.2 |        |      |        |      |        |      |        | 16   | 1256        | 53.1 |      |
| 718        | 1170  | 1224  | 25.0 | 1202  | 31.1 | 1183  | 37.2 |       |      |       |      |       |      |        |      |        |      |        |      |        |      |        | 12   | 1122        | 36.3 |      |
|            | 1750  | 1920  | 38.2 | 1898  | 47.4 | 1879  | 56.5 |       |      |       |      |       |      |        |      |        |      |        |      |        |      |        | 12   | 1818        | 54.8 |      |
|            | 2050  | 2280  | 45.5 | 2258  | 56.2 | 2239  | 66.9 |       |      |       |      |       |      |        |      |        |      |        |      |        |      |        | 12   | 2178        | 64.7 |      |

NOTES: 1. Performance based on inlet air at standard pressure of 14.7 psia, standard temperature of 68° F, and specific gravity of 1.0.  
2. Vacuum ratings based on inlet air at standard temperature of 68° F, discharge pressure of 30" Hg and specific gravity of 1.0.

**DESIGN AND CONSTRUCTION FEATURES**

1. Detachable steel mounting feet
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. Ground steel shafts
7. Straight, precision machined two-lobe impellers



**Roots**

S-12K84  
September 2003

**Dresser ROOTS**

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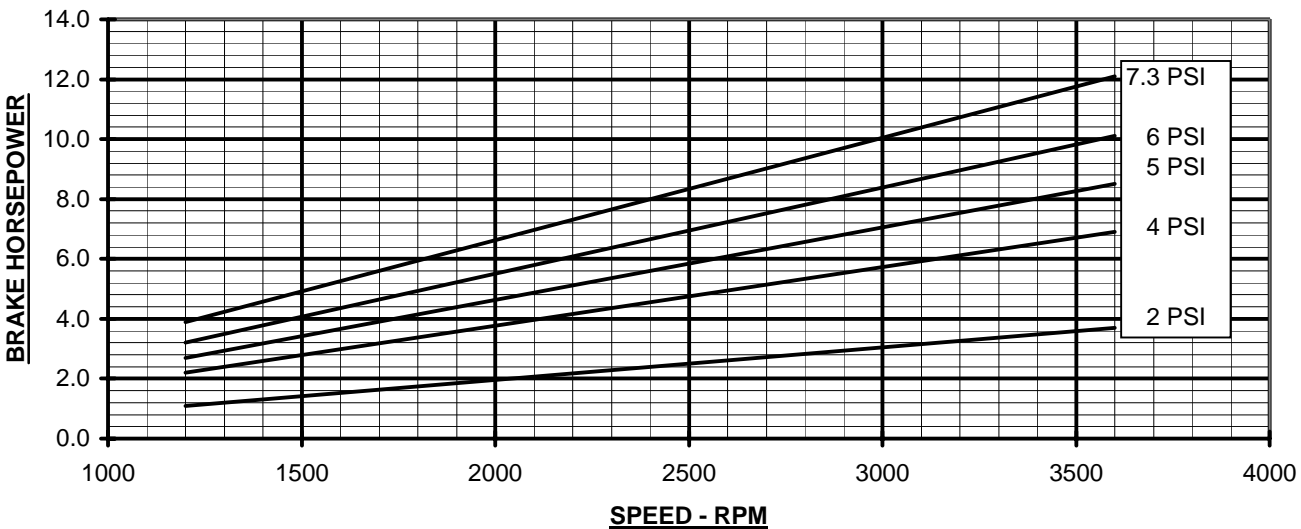
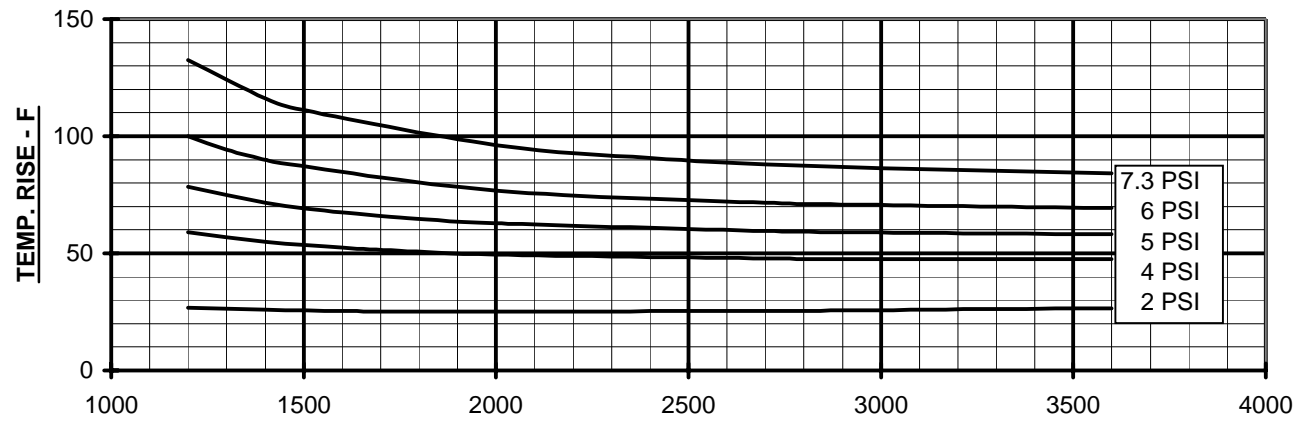
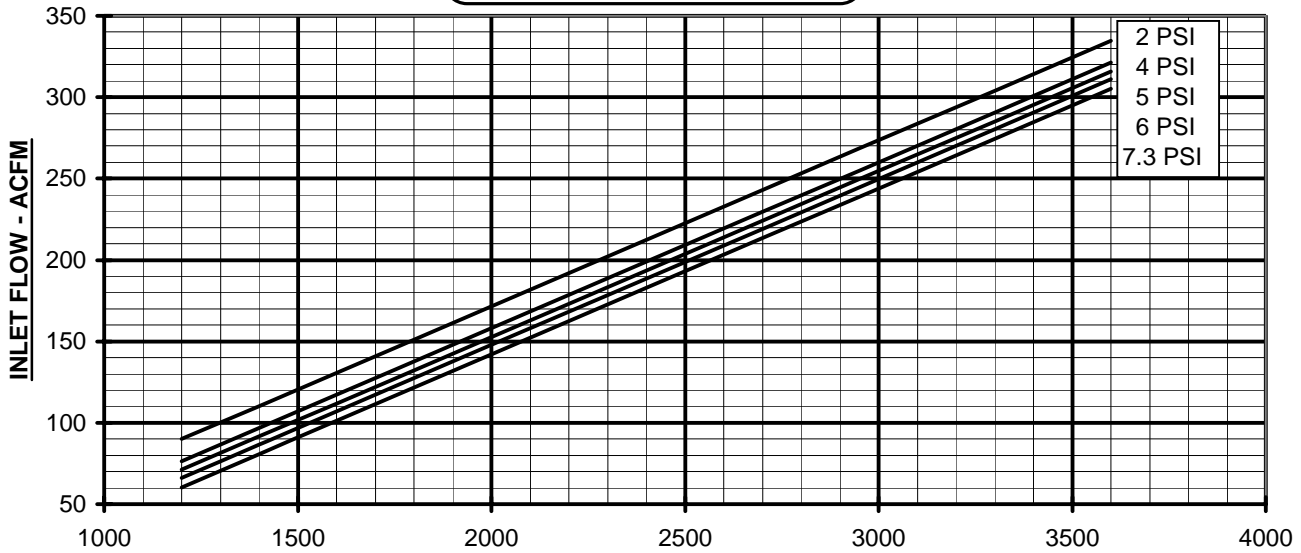
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PERFORMANCE BASED ON AIR,  
 INLET AT 14.7 PSIA & 68°F  
 DECEMBER 2004

**PRESSURE PERFORMANCE**  
**FRAME 36 U-RAI**  
 MAX. PRESSURE RISE = 7.3 PSI  
 MAX. SPEED = 3600 RPM





**VACUUM PERFORMANCE**  
**FRAME 36 U-RAI**  
 MAX. VACUUM = 15" HG  
 MAX. SPEED = 3600 RPM

PERFORMANCE BASED ON AIR,  
 INLET AT 68°F  
 DISCHARGE PRESSURE = 30" HG ABS.  
 DECEMBER 2004

