



**Authorized Howden Roots Distributor,  
Warranty, Service & Repair Facility**

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## **59 Universal RAI (URAI) PD Blower**

Call **1-780-962-1827** for technical, application and sales support.

The standard URAI blower features convenient grease lubrication on the drive end. The feet permit easy in-field adaptation to either vertical or horizontal installation requirements and any of four drive shaft positions – top, bottom, right or left hand. All frame sizes are center-timed to allow for rotation in either direction.

All Universal RAI (URAI) series blowers are heavy duty rotary blowers in a compact, sturdy design engineered for continuous duty and maximum reliability. These blowers have a time-tested lubrication system. Howden Roots exclusive “figure-8” gearbox design improves oil distribution to the timing gears and lengthens bearing life.

This series features a grey iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper fit and locknut, and grey iron involute impellers. Oversized anti-friction bearings are used, with a heavy duty cylindrical roller bearing at the drive shaft to withstand V-belt pull. Viton™ lip seals maintain proper lubricant at the bearings

- 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

### **Specifications**

Flow Range	To 857 CFM
Max ΔPressure	7 PSI
Max ΔVacuum	15” Hg
Maximum RPM	2850
Minimum RPM	763
Max ΔT	225°F
Connection Size	4” FPT
Shaft Dia.	1.125”
Min Sheave Dia.	6”
Drive End Lubrication	Grease
Gear End Lubrication	Oil
Oil Sump Gear End Horiz Config	27.6 oz
Oil Sump Gear End Vert Config	16 oz
Bare Unit Weight	204 lbs
Shipping Weight	254 lbs
Shipping Container	Box
Container Size (L x W x H)	24” x 20” x 20”
Shipping Options	Ground Freight, Air or Sea

#### **Also, available in:**

- URAI-DSL (Dual Splash Lube), URAI-G (Gas) and URAI-Metric

#### **Equivalent to:**

Sutorbilt Model 5LP and Tuthill Model 5009



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**59 URAI Approximate Oil Sump Capacities**

Model No. / Drive Shaft Location	Gear End Approx. Oil Sump Capacities	
	Fl. Oz.	Liters
59 URAI (left or right)	27.6	0.82
59 URAI (top or bottom)	16	0.47

These capacities are provided to assist stocking the correct amount of oil. Exact sump capacity may differ slightly. Review the proper filling instructions in OEM Manual.

**Recommended Oil Grades**

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

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

**59 URAI Parts List: 2-1/2" – 5" Gear Diameter**

Item Number	Part Name	Quantity
1	Headplate Gear End	1
2	Headplate Drive End	1
3	Gearbox	1
4	Timing Gears	2
5	Cover-Bind (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

Item Number	Part Name	Quantity
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

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:

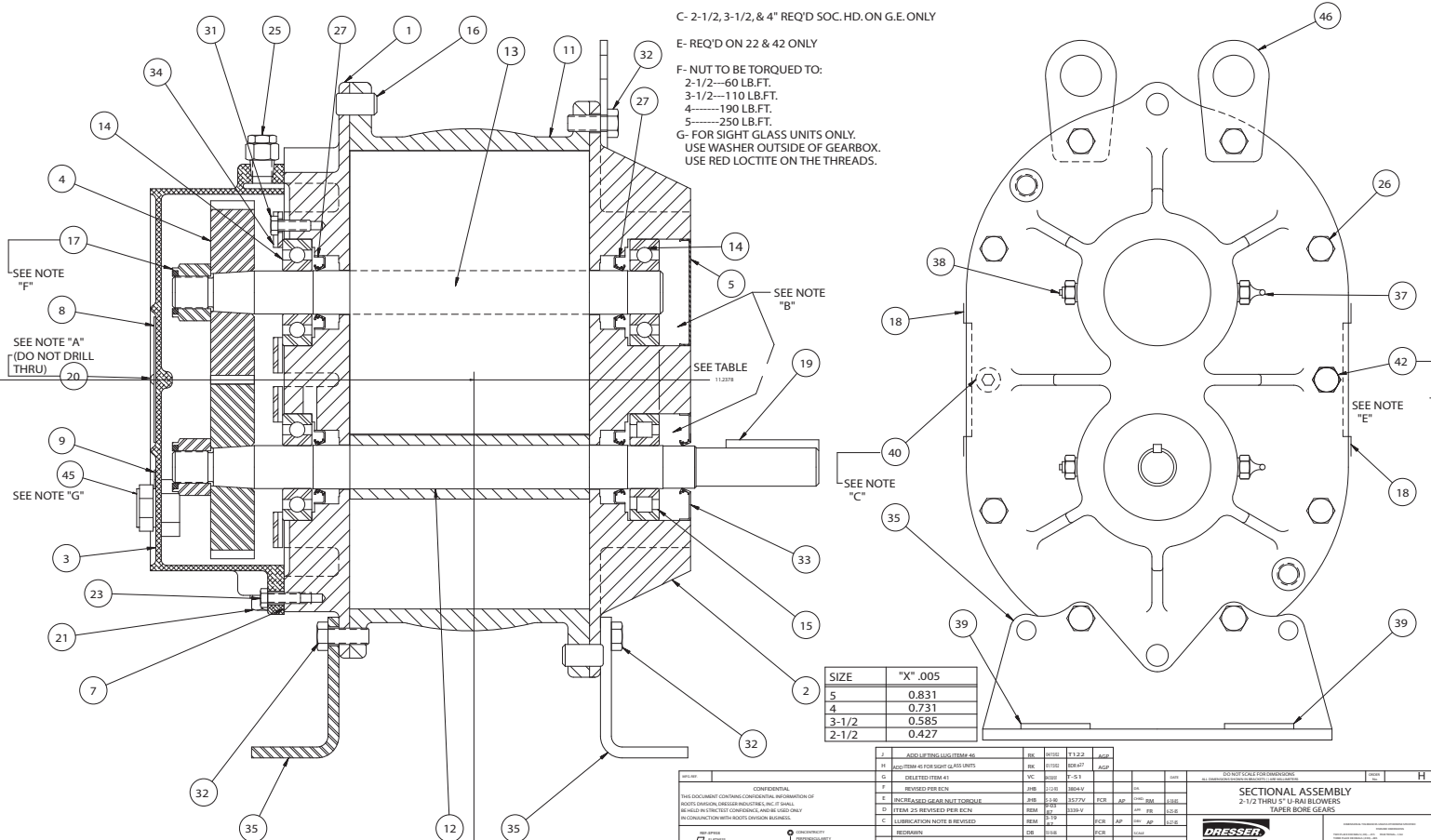
2-1/2---60 LB.FT.

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

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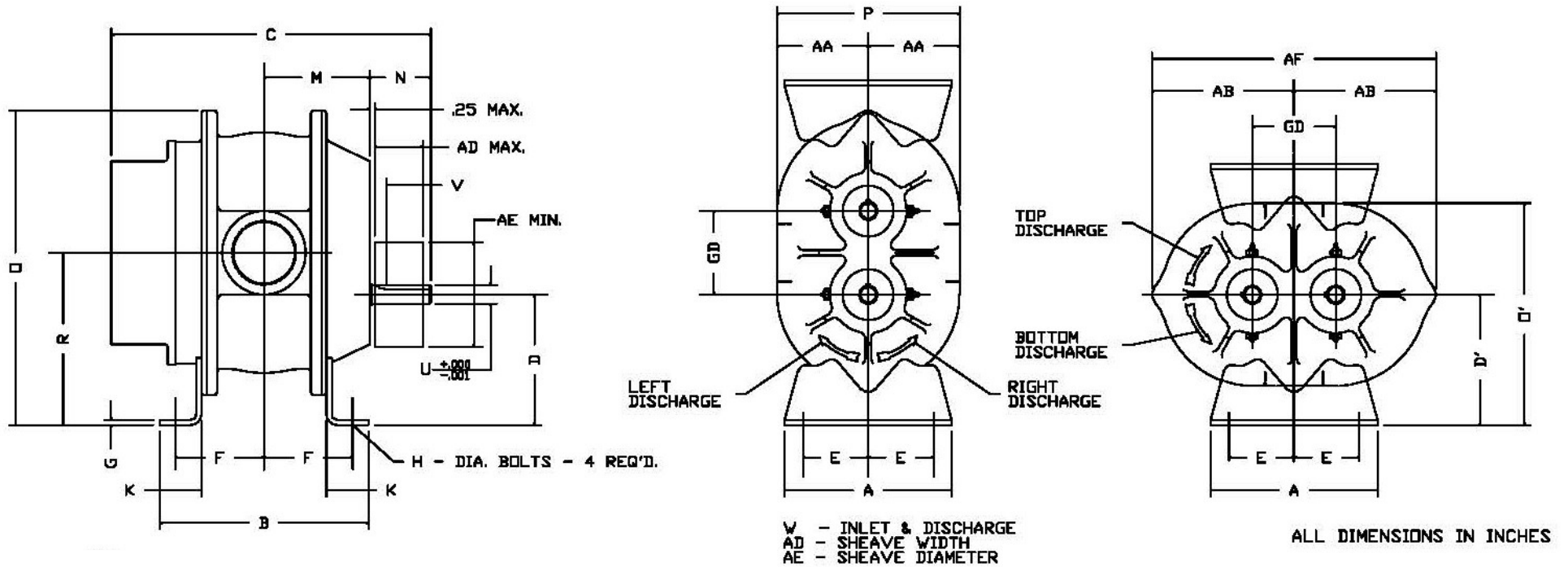
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SECTIONAL ASSEMBLY  
2-1/2 THRU 5" U-BAL BLOWERS  
TAPER ROSE GEARS

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

64720023 REV J

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 DATA		
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	INHG	V	BHP
59 URAI	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	



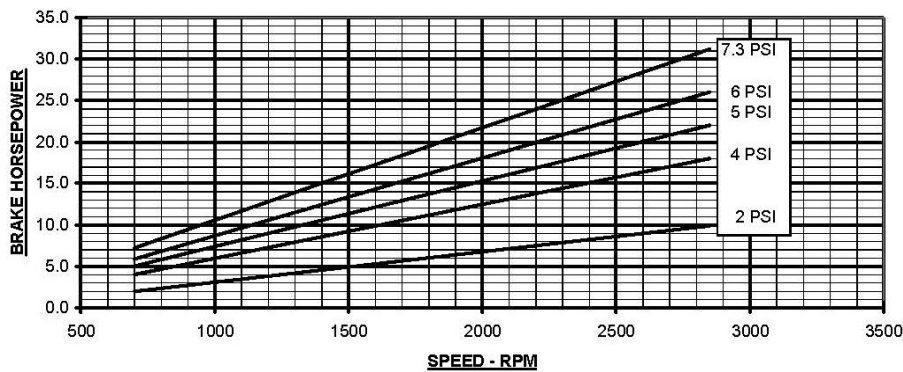
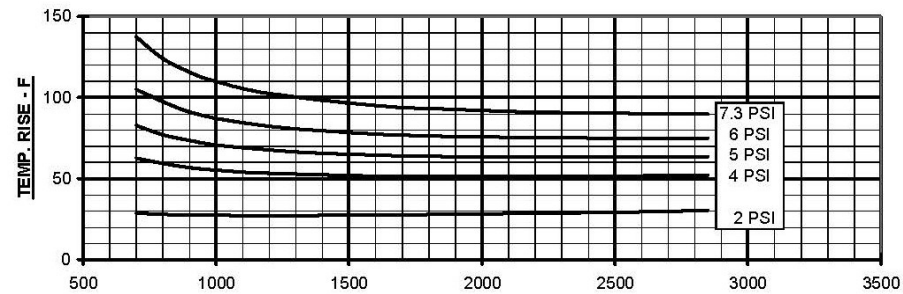
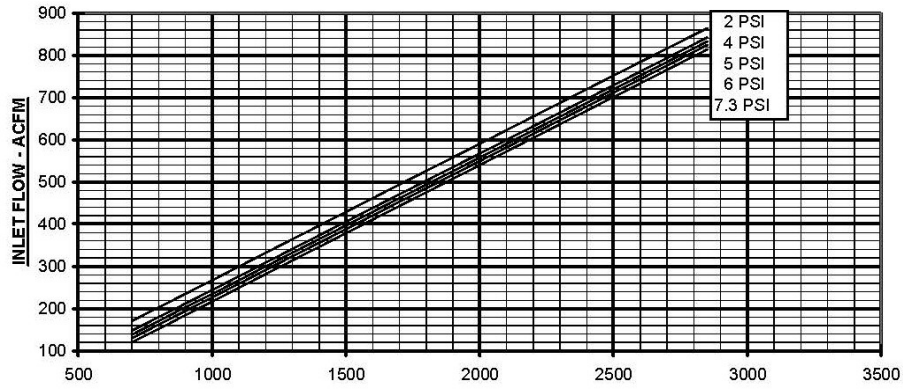
### 59 Universal RAI (URAI) Dimensions

GD	A	B	C	D	D'	E MIN	E MAX	F MIN	F MAX	G	H	K	M
5.00	10.50	14.0	21.00	6.25	6.75	3.50	3.50	6.00	6.50	.25	.50	1.88	7.31
N	O	O'	P	R	U	KEYWAY	W NPT.	V	AA	AB	AD	AE	AF
3.88	17.38	12.25	11.00	8.75	1.125	.25 x .125	4"	3.00	5.50	8.63	3.06	6.00	17.25

PRESSURE PERFORMANCE

**59 URAI**

MAX. PRESSURE RISE = 7.3 PSI / MAX. SPEED = 2850 RPM

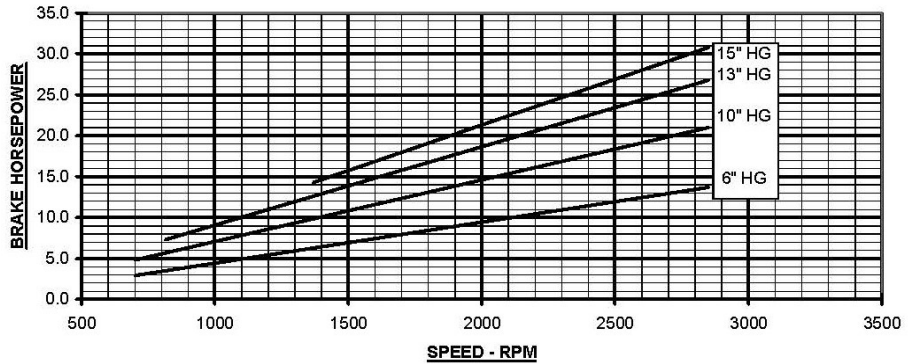
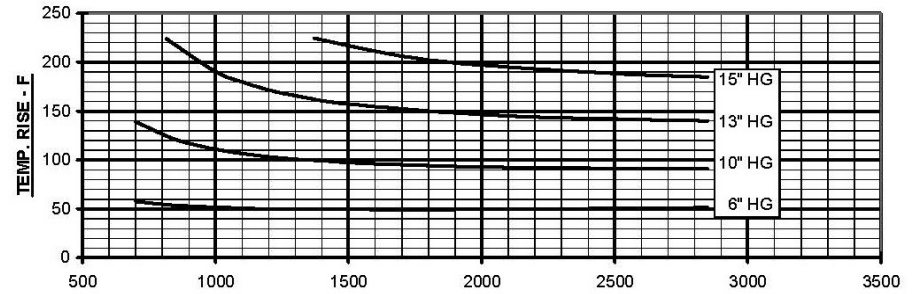
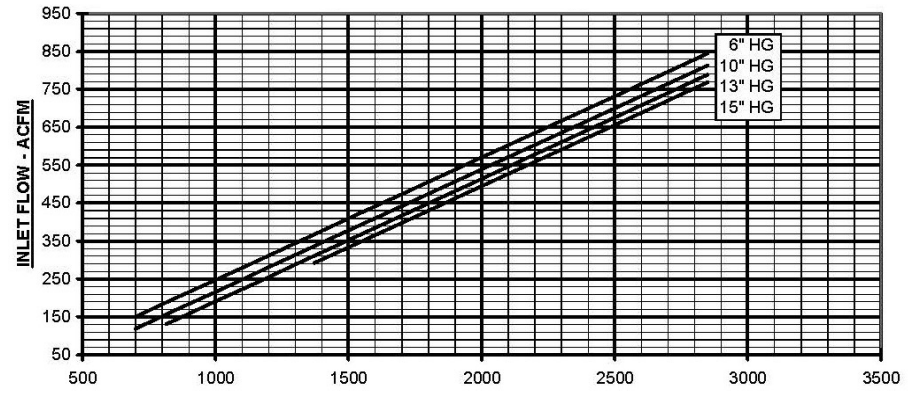


PERFORMANCE BASED ON AIR, INLET @ 14.7 PSIA & 68°F

VACUUM PERFORMANCE

**59 URAI**

MAX. VACUUM RISE = 15" Hg / MAX. SPEED = 2850 RPM



PERFORMANCE BASED ON AIR, INLET @ 68°F  
DISCHARGE PRESSURE = 30" Hg ABS.

## 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.

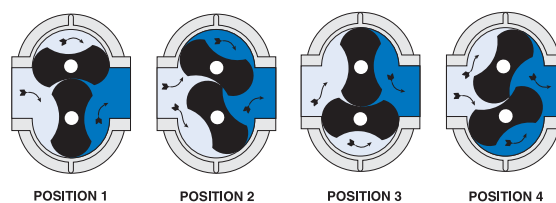
The basic model consists of a cast iron casing, carburized and ground alloy steel spur timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized antifriction bearings are used, with a cylindrical roller bearing at the drive shaft to withstand 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.

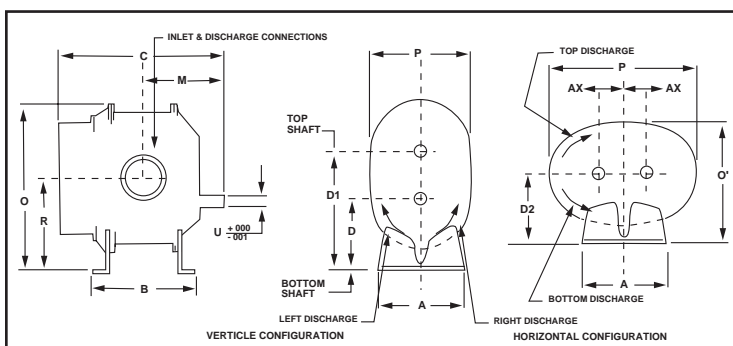
### OPERATING PRINCIPLE



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	170
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

