



Roots

65 URAI-GAS

Part Number – 651160G0



- Detachable steel mounting feet (feet are different for horizontal and vertical mounting)
- Mechanical Seals
- 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
- URAI-DSL (Dual Splash Lube)
- URAI-Metric



816-741-0282



Quick Specs

Flow Range	to 526 CFM
Max Δ Pressure	15 PSI
Max Δ Vacuum	16" Hg
Maximum RPM	2350
Minimum RPM	636
Max Δ T	250°F
Connection Size	3" FPT
Shaft Dia.	1.375"
Min Sheave Dia.	8"
Drive End Lubrication	Grease
Gear End Lubrication	Oil
Oil Sump Gear End Horiz Config	~52 oz
Oil Sump Gear End Vert Config	~28.3 oz
Bare Unit Weight	280 lbs
Container	Wood Skid
Skid Size (L x W x H)	32" x 29" x 31"
Shipping Weight on Skid	~330 lbs
Recommended to Ship Via	Truck

**Universal RAI Series Gas Blowers Parts List
6" Gear Diameter**

(Refer to drawing #T3011023)

816-741-0282



Item Number	Part Name	Quantity
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
7*	Gasket DE Cover	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 Nylock	8
25	Breather (Plug Vent)	1
26	Screw, Hex	14**
27	Seal, Bearing	4
31	Screw, Hex	4
32	Screw, Hex	10
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
43	Plug	8
51	Shoulder Bolt	2
53	Oil Sight Glass	2

*DE cover gasket is not the same as the gasket used on the GE. You must specify the gasket required when ordering.

**Quantities vary by blower.

URAI GAS blower grease specifications.

- When servicing drive end bearings of a URAI GAS blower, use the specified NLGI #2 premium grade aluminum complex* grease, ROOTS P/N T20019001.
- Lithium based greases are not compatible with the specified and recommended ROOTS Synthetic grease used when assembling a GAS blower. **Lithium based grease is not approved for any ROOTS blowers.**

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.

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 65115GRK Kit without Gears for 65, 68, 615 URAI-GAS

Item	Qty	6" Kit Description	P/N
5	1	PLUG,OPENING	12957005
7	1	GSKT,GRBX 6 URAI TS9003	62745021
14	3	BRG,BALL	10987042
15	1	BRG,ROLLER	10222033
17	2	NUT,HEX ESNA 1 1/8-12	10319021
27	4	MECHANICAL SEAL	T20002004
29	2	WSHR,SPR WAVY	10135004
31	4	SCR,CAP HEXH NYL	10677012
33	1	SEAL,LIP (BUNA-N)	12877001
38	4	PLUG, VENT 1/8"	13002001
44	1	SHIM SET 6" URAI-G	T30126020

P/N 65114GRK Kit with Gears for 65, 68, 615 URAI-GAS

Item	Qty	6" Kit Description	P/N
4	1	GEAR, ASSY 6 URAI	64910021
5	1	PLUG,OPENING	12957005
7	1	GSKT,GRBX 6 URAI TS9003	62745021
14	3	BRG,BALL	10987042
15	1	BRG,ROLLER	10222033
17	2	NUT,HEX ESNA 1 1/8-12	10319021
27	4	MECHANICAL SEAL	T20002004
29	2	WSHR,SPR WAVY	10135004
31	4	SCR,CAP HEXH NYL	10677012
33	1	SEAL,LIP (BUNA-N)	12877001
38	2	PLUG, VENT 1/8"	13002001
44	1	SHIM SET 6" URAI-G	T30126020

ROOTS® Synthetic Oil: ISO-VG-320 Grade

	Part Number
Quart	13106004
Gallon	13106005
Case (12 qts)	13106007

ROOTS® Synthetic Oil: ISO-VG-220 Grade

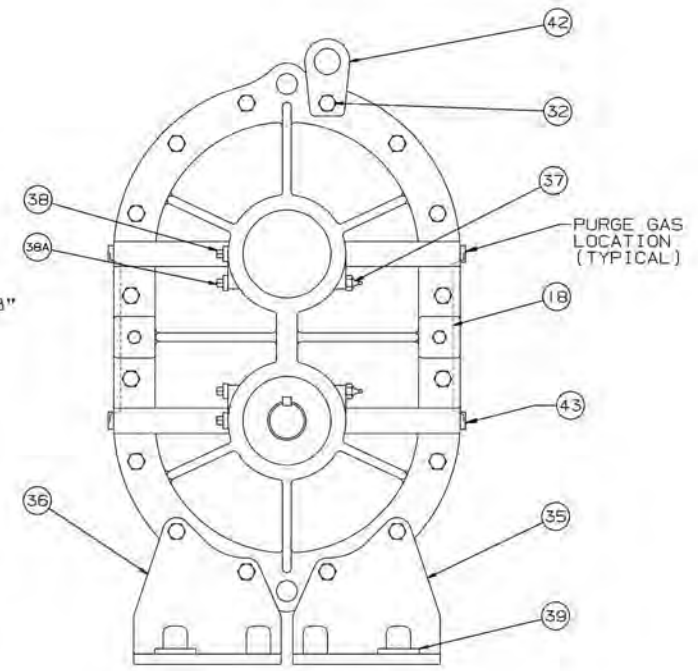
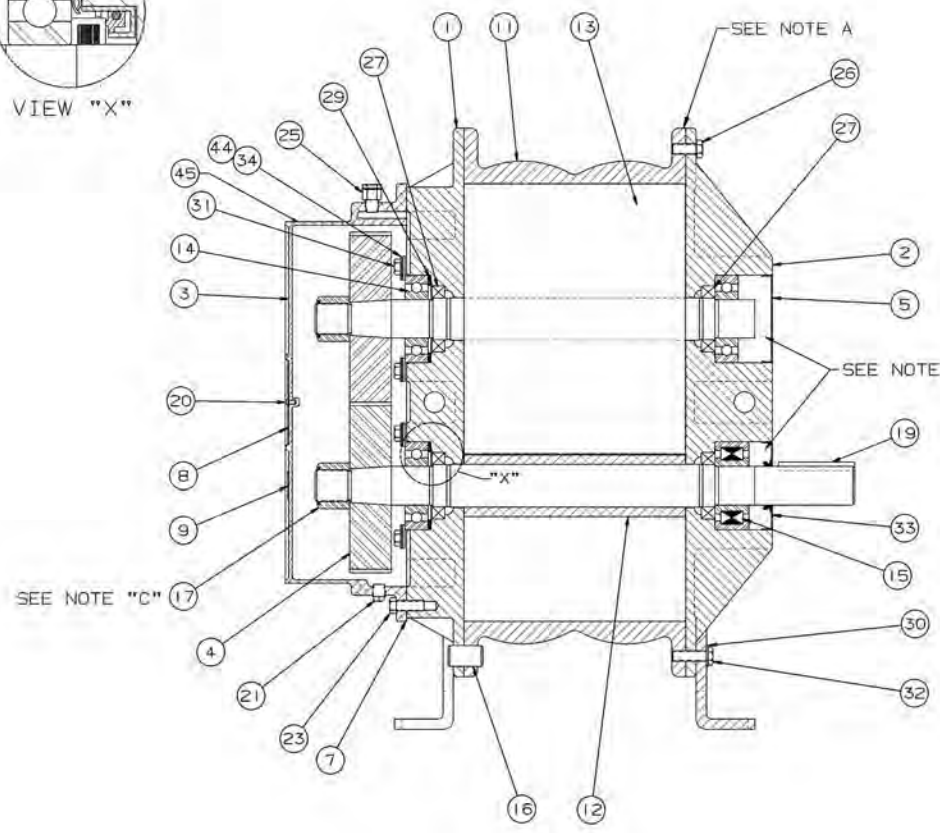
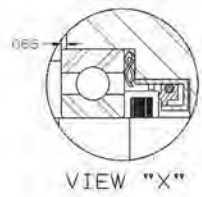
	Part Number
Quart	13106001
Gallon	13106002
Case (12 qts)	13106008

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

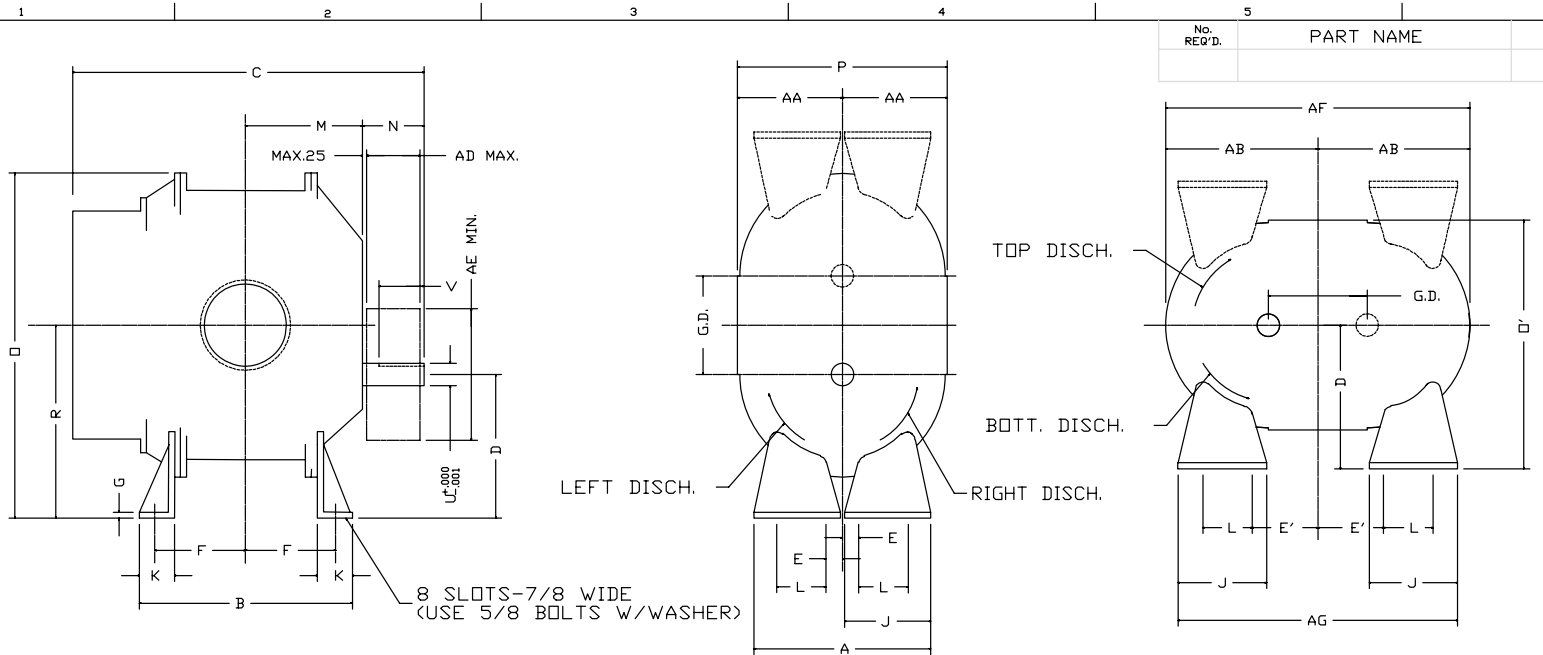
	Part Number
Quart	13106011
Gallon	13106012
Case (12 qts)	13106014
5 Gallon Pail	13106013
55 Gallon Drum	13106016



- NOTES
- A USE LOCKTITE #2 (30515) BETWEEN HEADPLATE AND CYLINDER JOINTS.
 - B SEE OPERATING MANUAL IRB-180 FOR LUBRICATION INSTRUCTION
 - C NUT TO BE TORQUED TO: 400 LB. FT.

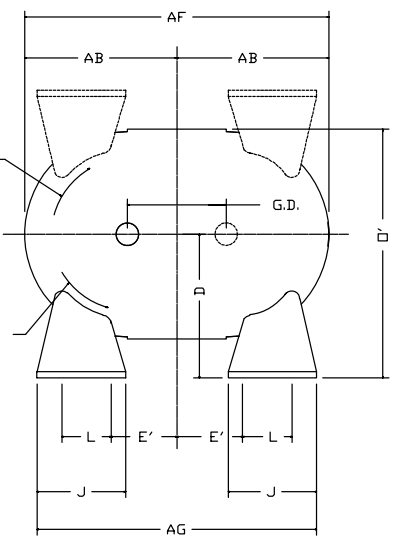
THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF ROOTS DIVISION, DRESSER INDUSTRIES, INC. IT SHALL BE HELD IN STRICTEST CONFIDENCE, AND BE USED ONLY IN CONNECTION WITH ROOTS DIVISION BUSINESS.		DO NOT SCALE FOR DIMENSIONS ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED	
CONFIDENTIAL		SECTIONAL ASSEMBLY FOR RT (1-5A) GAS BLOWERS	
REF. DIMS C/2 PLAINES Z PERPENDICULARITY A PROFILE OF LINE P PARALLELISM S SURFACE TEXTURE D DIAMETER R RADIUS	Q DIMENSIONALITY A PERPENDICULARITY A PROFILE OF LINE P PARALLELISM S SURFACE TEXTURE D DIAMETER R RADIUS	E REV TO MECHANICAL SEAL D ADD ITEM #38A C ADD ITEM # 3 & 20 B STRUCTURE CHANGE A ADDED DIMENSION (SEE REVISIONS)	DATE DR. 10/05 DRG. APP. TRN 8/06 1/00 YCO 1/00 WCO 8/06 WCO 8/07 1/00 10/05
REVISIONS BY DATE DWG. NO. DRG. APP.		DRESSER Roots Dresser ROOTS, Dresser Inc. Cincinnati, OH USA	
		T30110023 REV E	

Assembly of UNIVERSAL RAI Series Gas Blowers, 6" Gear Diameter



8 SLOTS-7/8 WIDE
(USE 5/8 BOLTS W/WASHER)

No. REQ'D.	PART NAME	PATT. No. PART No.	MAT'L.
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	6"FLG	8"FLG		
OPENING	6.00	8.00		
BOLT CIRCLE	9.50	11.75		
FLANGE O.D.	11.00	13.50		
NO. TAPPED HOLES	8	8		
SIZE HOLES	3/4-10	3/4-10		
TAP DEPTH	1.13	1.13		

W-INLET
W'-DISCHARGE
AD-SHEAVE WIDTH
AE-SHEAVE DIA.
ALL DIM. IN INCHES

FRAME SIZE	A	B	C	D	E	E'	F	G	J	K	L	M	N	O	O'	P	R	U	V	KEYWAY	W	W'	AA	AB	AD	AE	AF	AG	APPROX WEIGHT
65	11.00	10.00	18.38	8.75	1.00	4.00	3.81	.38	5.38	2.13	3.00	5.63	3.56	21.63	15.13	12.75	11.75	1.375	2.75	.312x.156	3"NPT	3"NPT	6.38	9.88	3.44	8.00	19.75	17.00	245 LBS
68		13.00	21.38				5.81					7.13	3.69								5"NPT	5"NPT							285 LBS
615		20.00	28.38				8.81					10.63			16.25	15.00					6"FLG	6"FLG	7.50						425 LBS
76	14.00	11.75	19.94	11.00	2.00	5.50	4.88	.50	6.75	2.38	3.50	5.94	4.06	26.13	20.69	19.38	14.5	1.562	3.00	.375x.188	4"NPT	4"NPT	9.69	11.63	3.75	9.50	23.25	21.00	400 LBS
711		16.75	25.19				7.38					8.44	4.31		19.50	17.00					6"FLG	6"FLG	8.50						530 LBS
718		23.75	32.19				10.88					11.94									8"FLG	8"FLG							650 LBS

MFG. REF. _____ DATE _____

CONFIDENTIAL

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REF: EP938 CONCENTRICITY
 □ FLATNESS ⊥ PERPENDICULARITY
 / ANGULARITY ∩ PROFILE OF LINE
 // PARALLELISM ∪ PROFILE OF A SURFACE
 ⊕ TRUE POSITION ∅ DIAMETER
 — STRAIGHTNESS ✓ FINISH IN MICRO INCHES

G REF 'F' DIM ON 68 RDR 6459V
 F BOLTS CLARIFIED DB

REVISIONS BY DATE CHANGE NOTICE CHKD. APP

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

UNIVERSAL
RAI BLOWER

DRESSER ROOTS

ROOTS DIVISION
DRESSER EQUIPMENT GROUP
A HALLIBURTON COMPANY
HOUSTON, TX USA

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED
FINISHED DIMENSIONS
TWO PLACE DECIMALS .000-+.0015 FRACTIONAL--11/64
THREE PLACE DECIMALS .000-+.0025

ORDER No. 62753021 REV G

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. The detachable rugged steel mounting feet, permit adaptability to either vertical or horizontal installation requirements. 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.

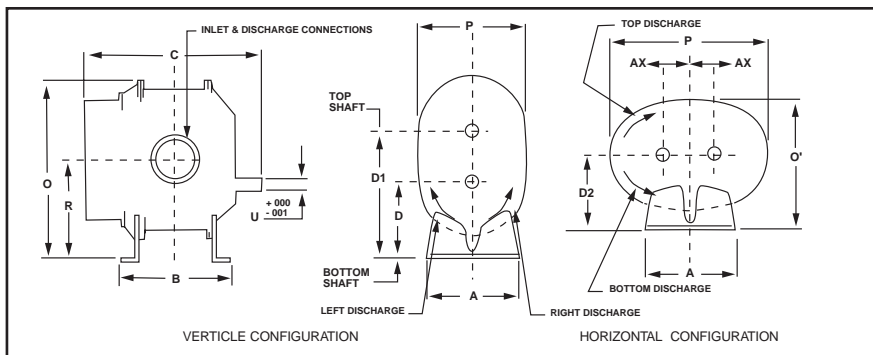
Accessories are available through our distributors.

ROOTS™ Synthetic Oil and grease is recommended to maintain warranty.

DESIGN AND CONSTRUCTION FEATURES

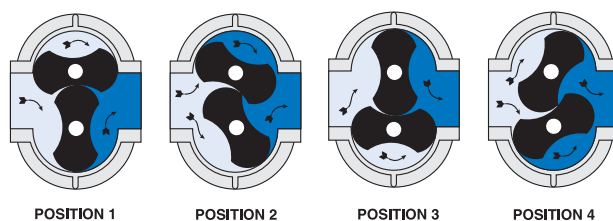
1. Mechanical seals
2. Rigid one-piece cast iron casing
3. Anti-friction bearings
4. Splash oil lubricated spur timing gears
5. Connections in standard pipe sizes
6. Straight, precision machined two-lobe impellers
7. Ground steel shafts
8. Detachable steel mounting feet

OUTLINE DRAWING & DIMENSIONAL TABLE



Frame Size	A	B	C	Drive Shaft Location			O	O'	P	P'	R	U	Keyway	Inlet & Disch. Dia	AX	Approx. Net Wt. (lbs.)
				D	D1	D2										
32	7.25	6.75	11.25	5.00	8.50	5.00	12.81	8.88	7.75	12.13	6.75	.750	.188 x .094	1.25 NPT	1.75	69
33	7.25	7.63	12.13	5.00	8.50	5.00	12.81	8.88	7.75	12.13	6.75	.750	.188 x .094	2.0 NPT	1.75	74
36	7.25	10.00	14.63	5.00	8.50	5.00	12.81	8.88	7.75	12.13	6.75	.750	.188 x .094	2.5 NPT	1.75	102
42	8.00	7.25	13.00	6.25	10.25	6.25	15.06	10.63	8.75	13.63	8.25	.875	.188 x .094	1.5 NPT	2.00	88
45	8.00	10.00	15.50	6.25	10.25	6.25	15.06	10.63	8.75	13.63	8.25	.875	.188 x .094	2.5 NPT	2.00	109
47	8.00	11.75	17.63	6.25	10.25	6.25	15.06	10.50	8.50	13.63	8.25	.875	.188 x .094	3.0 NPT	2.00	128
53	10.50	8.38	15.38	6.25	11.25	6.75	17.38	11.88	10.25	17.25	8.75	1.125	.250 x .125	2.5 NPT	2.50	143
56	10.50	11.00	18.00	6.25	11.25	6.75	17.38	12.25	11.00	17.25	8.75	1.125	.250 x .125	4.0 NPT	2.50	170
59	10.50	14.00	21.18	6.25	11.25	6.75	17.38	12.25	11.00	17.25	8.75	1.125	.250 x .125	4.0 NPT	2.50	204
65	11.00*	10.00	18.38	8.75	14.75	8.75	21.63	15.13	12.75	19.75	11.75	1.375	.312 x .156	3.0 NPT	3.00	245
68	11.00*	13.00	21.38	8.75	14.75	8.75	21.63	15.13	12.75	19.75	11.75	1.375	.312 x .156	5.0 NPT	3.00	285
615	11.00*	20.00	28.38	8.75	14.75	8.75	21.63	16.25	15.00	19.75	11.75	1.375	.312 x .156	6.0 FLG	3.00	425

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.

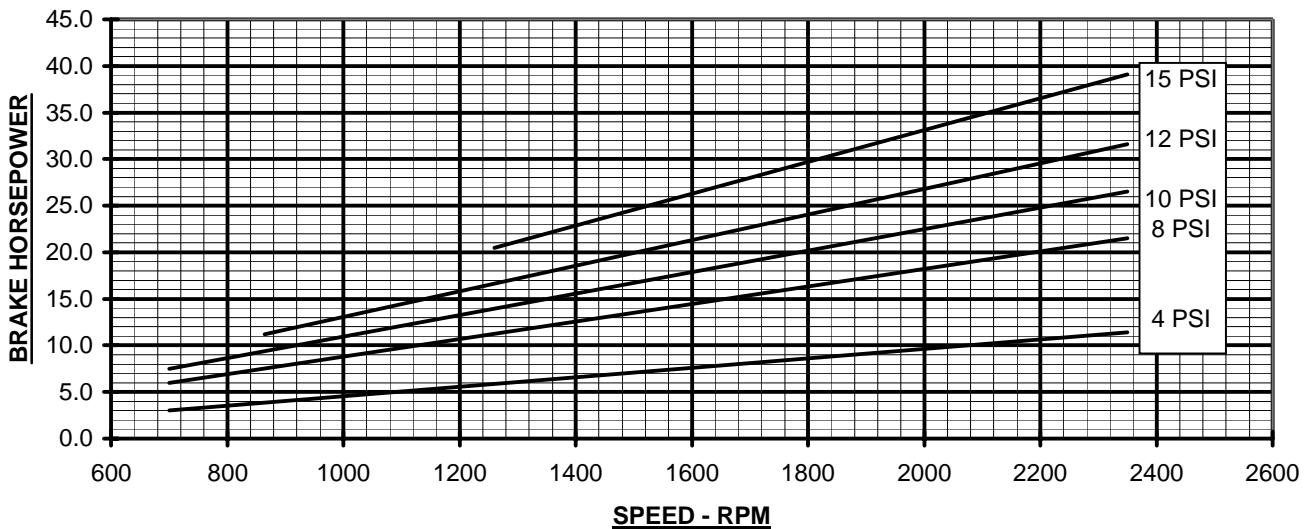
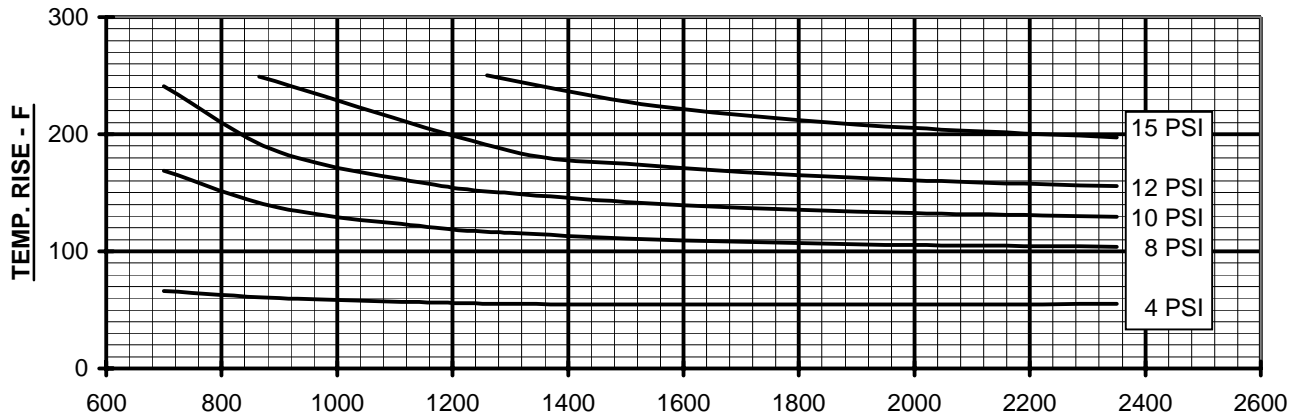
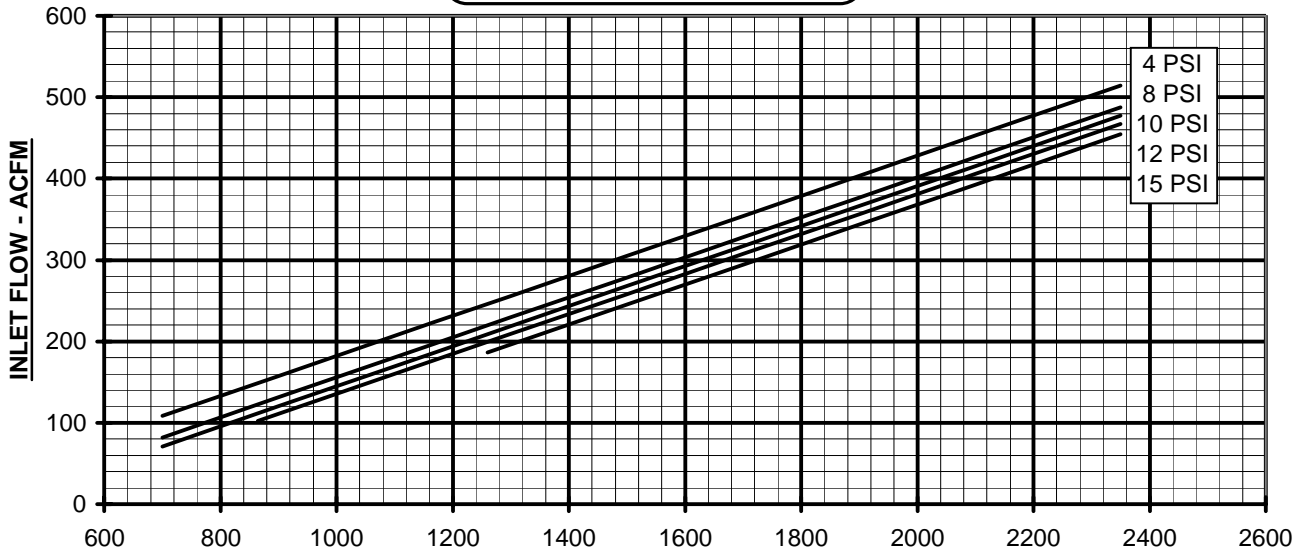
Timing gears control the relative position of the impellers to each other and maintain small but definite clearances. This allows operation without lubrication being required inside the gas casing.





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

PRESSURE PERFORMANCE
FRAME 65 U-RAI
MAX. PRESSURE RISE = 15 PSI
MAX. SPEED = 2350 RPM





VACUUM PERFORMANCE
FRAME 65 U-RAI
 MAX. VACUUM = 16" HG
 MAX. SPEED = 2350 RPM

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

