

# ROOTS™ Universal RAI-G™



## Design and Construction Features

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

**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.**

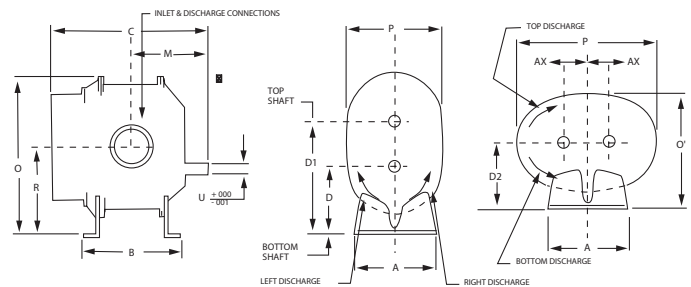
### Basic blower description

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 rollerbearing 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.

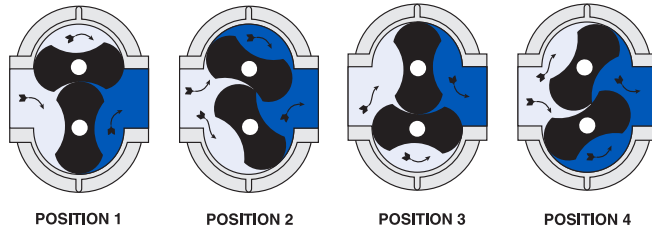
Each unit is mechanically tested and given a 15 psig static leak test. A 1/8" NPT purge port is provided at each seal for buffer gas application as required. After testing, the unit is sprayed with a protective paint, and boxed or skid mounted for delivery.

Accessories are available through our distributors. ROOTS™ synthetic oil and grease is highly recommended.

### Outline drawing & dimensional table



Frame size	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	8.5	5	5.81	12.81	8.88	7.75	12.13	6.75	0.75	1.25 NPT	1.75	69
33	7.25	7.25	7.63	12.13	5	8.5	5	6.25	12.81	8.88	7.75	12.13	6.75	0.75	2.0 NPT	1.75	74
36	7.25	7.25	10	14.63	5	8.5	5	7.56	12.81	8.88	7.75	12.13	6.75	0.75	2.5 NPT	1.75	102
42	8	8	7.25	13	6.25	10.25	6.25	6.86	15.06	10.63	8.75	13.63	8.25	0.875	1.5 NPT	2	88
45	8	8	10	15.5	6.25	10.25	6.25	8	15.06	10.63	8.75	13.63	8.25	0.875	2.5 NPT	2	109
47	8	8	11.75	17.63	6.25	10.25	6.25	9.25	15.06	10.5	8.5	13.63	8.25	0.875	3.0 NPT	2	128
53	10.5	10.5	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	2.5	143
56	10.5	10.5	11	18	6.25	11.25	6.75	9.19	17.38	12.25	11	17.25	8.75	1.125	4.0 NPT	2.5	170
59	10.5	10.5	14	21.18	6.25	11.25	6.75	11.19	17.38	12.25	11	17.25	8.75	1.125	4.0 NPT	2.5	204
65	11	11	10	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	245
68	11	11	13	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	285
615	11	11	20	28.38	8.75	14.75	8.75	14.32	21.63	16.25	15	19.75	11.75	1.375	06.0 FLG	3	425



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**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 table**

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	IN-HGV	CFM	BHP	
32U	1750	45	1.4	41	1.7	37	2.1	34	2.4	31	2.8	28	3.1	25	3.5	-	-	-	-	-	-	-	-	-	12	26	2
	2950	99	2.4	95	3	91	3.6	88	4.2	85	4.7	82	5.3	79	5.9	74	7.1	72	7.6	69	8.2	67	8.8	15	68	4.3	
	3550	126	3	122	3.7	118	4.4	115	5.1	112	5.8	109	6.5	106	7.2	101	8.6	99	9.3	96	10	94	10.6	16	90	5.6	
33U	1750	64	1.9	58	2.4	54	2.9	49	3.3	45	3.8	41	4.3	38	4.7	-	-	-	-	-	-	-	-	-	12	39	2.8
	2950	138	3.3	132	4.1	128	4.9	123	5.7	119	6.5	115	7.3	112	8.1	105	9.7	-	-	-	-	-	-	-	15	97	5.9
	3550	174	4.1	169	5	165	6	160	6.9	156	7.9	152	8.8	149	9.8	142	11.7	-	-	-	-	-	-	-	15	134	7.2
36U	1750	116	3.2	109	3.9	102	4.7	96	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	74	5
	2950	238	5.5	231	6.8	224	8.1	218	9.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	181	9.8
	3550	300	6.7	292	8.3	286	9.9	279	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	243	11.9
42U	1750	68	1.9	64	2.4	59	2.8	56	3.3	52	3.7	49	4.2	46	4.7	-	-	-	-	-	-	-	-	-	14	42	3
	2950	141	3.3	136	4.1	132	4.9	128	5.7	125	6.5	122	7.2	119	8	113	9.6	11	10.3	10.8	11.1	105	11.9	16	101	6.2	
	3550	177	4.1	172	5.1	168	6	165	7	161	7.9	158	8.8	155	9.8	149	11.6	146	12.6	144	13.5	141	14.4	16	137	7.6	
45U	1750	144	3.8	136	4.7	129	5.6	122	6.6	116	7.5	110	8.4	104	9.3	-	-	-	-	-	-	-	-	-	13	98	5.9
	2950	289	6.7	281	8.2	274	9.8	267	11.3	261	12.9	255	14.4	249	16	-	-	-	-	-	-	-	-	-	16	218	12.5
	3550	362	8.2	354	10.1	346	12	340	13.9	333	15.7	328	17.6	322	19.5	-	-	-	-	-	-	-	-	-	16	291	15.2
47U	1750	193	5	183	6.2	174	7.4	166	8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	126	8.4
	2950	385	8.8	375	10.8	366	12.9	357	14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	307	15.4
	3550	480	10.9	470	13.3	461	15.8	453	18.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	402	18.8
53U	1170	99	2.7	92	3.4	86	4.1	81	4.8	76	5.4	71	6.1	66	6.8	-	-	-	-	-	-	-	-	-	12	67	4.3
	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	-	-	15	124	7.5	
	2850	320	7.4	313	9.1	308	10.7	302	12.3	297	14	292	15.6	288	17.2	279	20.5	275	22.1	272	23.8	268	25.4	16	262	13.4	
56U	1170	174	4.6	164	5.7	155	6.9	147	8	139	9.1	132	10.2	125	11.4	112	13.6	-	-	-	-	-	-	-	13	117	7.2
	1750	302	7	292	8.7	283	10.4	275	12.1	267	13.8	260	15.5	253	17.2	241	20.5	235	22.2	-	-	-	-	-	15	225	12.6
	2850	546	12.2	536	15	527	17.7	518	20.5	511	23.2	503	26	496	28.7	484	34.2	478	37	-	-	-	-	-	16	468	21
59U	1170	272	6.7	259	8.4	248	10	238	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	188	11.4
	1750	459	10.3	447	12.8	436	15.2	425	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	363	18.4
	2850	815	18	802	22	791	26	780	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	718	30.8
65U	1170	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	-	-	-	-	-	14	132	8.7
	1750	343	8	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	16	252	15.1	
	2350	491	11.4	481	13.9	471	16.4	463	19	455	21.5	447	24	426	26.5	427	31.6	421	34.1	415	36.6	409	39.1	16	400	20.6	
68U	1170	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	-	-	-	-	-	14	211	13.9
	1750	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	-	-	-	16	405	24
	2350	788	17.8	772	21.8	757	25.9	743	29.9	703	34	718	38	707	42.1	707	50.2	676	54.2	666	58.3	-	-	-	16	642	32.8
615U	1170	603	15.4	572	19.1	544	22.9	519	26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	483	20.5
	1750	1032	23.2	1001	29.1	973	34.7	948	40.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	885	33.7
	2350	1476	32.4	1445	40	1417	47.6	1392	55.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	1329	46

**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.