ROOTS

U-RAI®

rotary positive blowers/exhausters

DRESSER
Roots

B-12X95
April 2002

Versatile, reliable

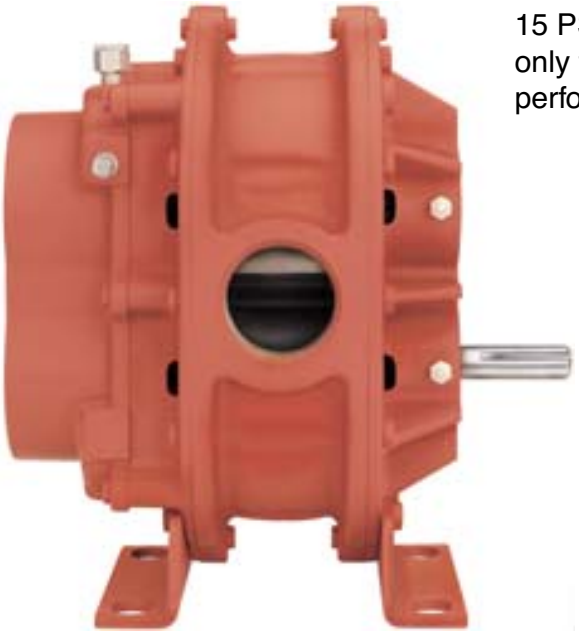
ROOTS™ Univers

Remarkably adaptable

You can mount the Universal RAI® blower upside down or rightside up, with vertical or horizontal flow, and with the drive shaft rotating in either direction. With 17 frame sizes to choose from, you have the perfect blower to fit your application with little or no modification.

More performance, too

Now the Universal RAI® line-up has a broader range and is more rugged than ever, with flows to 2460 CFM, vacuums to 16" Hg and pressures to 15 PSIG. You get a blower that not only fits but gives you the best performance in its class.



Greater pressu with proven

Universa

ersal RAI® blower

FITS your application

Low cost

The ROOTS Universal RAI® line of blowers is designed with the latest engineering technology and built using the most modern manufacturing processes. This results in cost savings we can pass along to you. This genuine ROOTS blower can actually cost less than ordinary competitive units.

Built-in reliability

Each Universal RAI® is precision machined on the latest CNC equipment, assuring close tolerances between the impellers, casing and headplates to minimize "slippage" of air, improving efficiency and reliability. ROOTS exclusive "Figure 8" gearbox design improves oil distribution and lengthens bearing and gear life. Oversize anti-friction bearings support the shaft, and, on the drive, cylindrical roller bearings will resist V-belt pull and extend service life.

Fast delivery

Thanks to over 45 stocking centers throughout North America, you'll get on-time delivery. You can schedule production, reduce your inventory, anticipate your costs —and meet your deadlines.

Better service

With nearly 100 sales and distribution locations, only ROOTS can offer the kind of responsive service and applications assistance that the industry's largest service network provides.

Iron-clad warranty

ROOTS is the leader in warranties, too — the first to introduce a full 2 year warranty. We'll protect you or your customer for a full 24 months after start-up, not to exceed 30 months after shipment.

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en reliability

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You get increased performance through ROOTS' extensive improvement program and life testing.

Here's how…

1. Exclusive gearbox design

"Figure 8" gearbox actually improves oil distribution for longer gear and bearing life with smoother operation.

2. Taper mounted timing gears

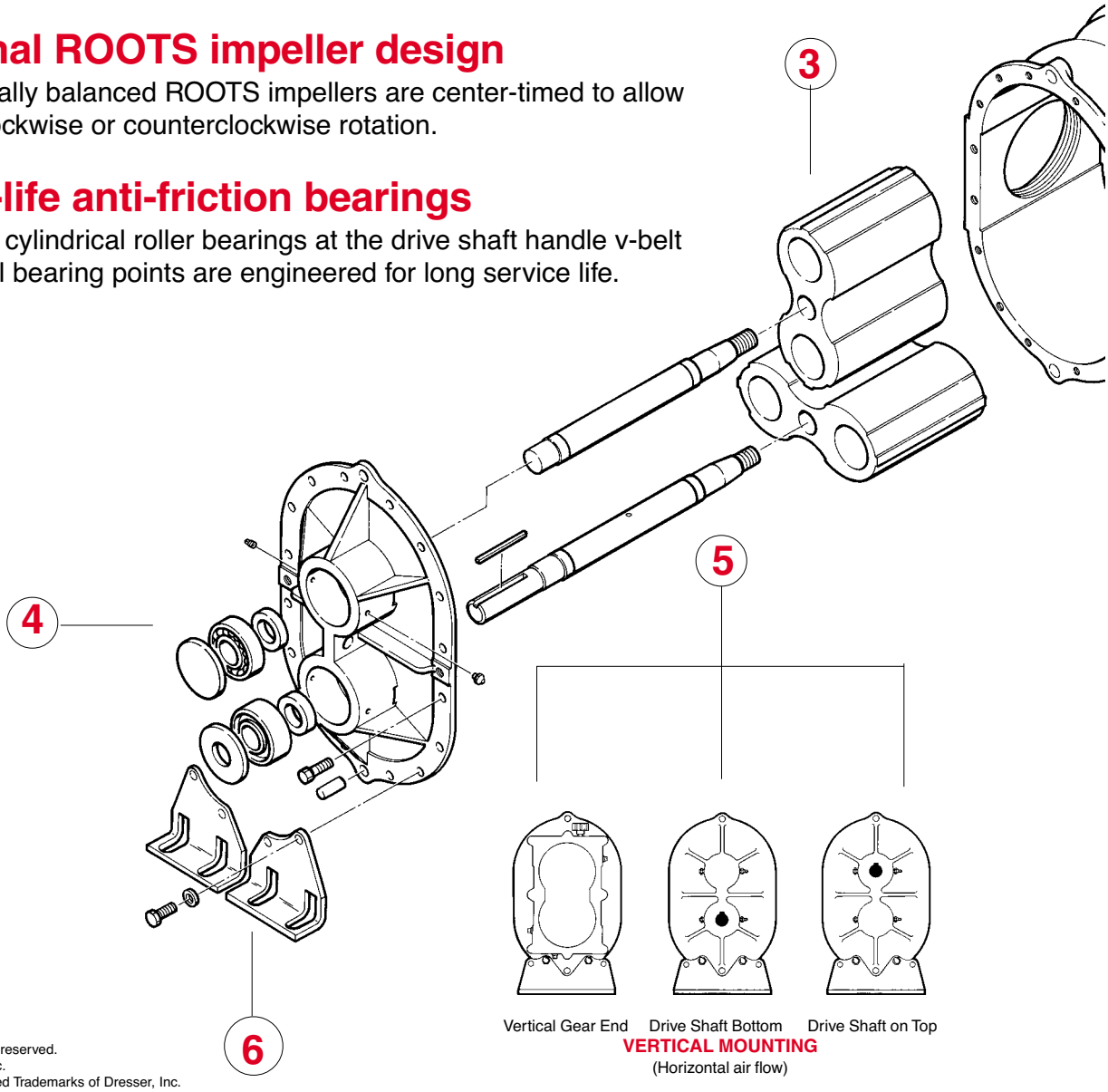
Carburized and ground alloy steel gears are precision machined and taper fitted to alloy steel shafts, eliminating the need for unreliable timing pins.

3. Original ROOTS impeller design

Dynamically balanced ROOTS impellers are center-timed to allow either clockwise or counterclockwise rotation.

4. Long-life anti-friction bearings

Oversize cylindrical roller bearings at the drive shaft handle v-belt stress; all bearing points are engineered for long service life.

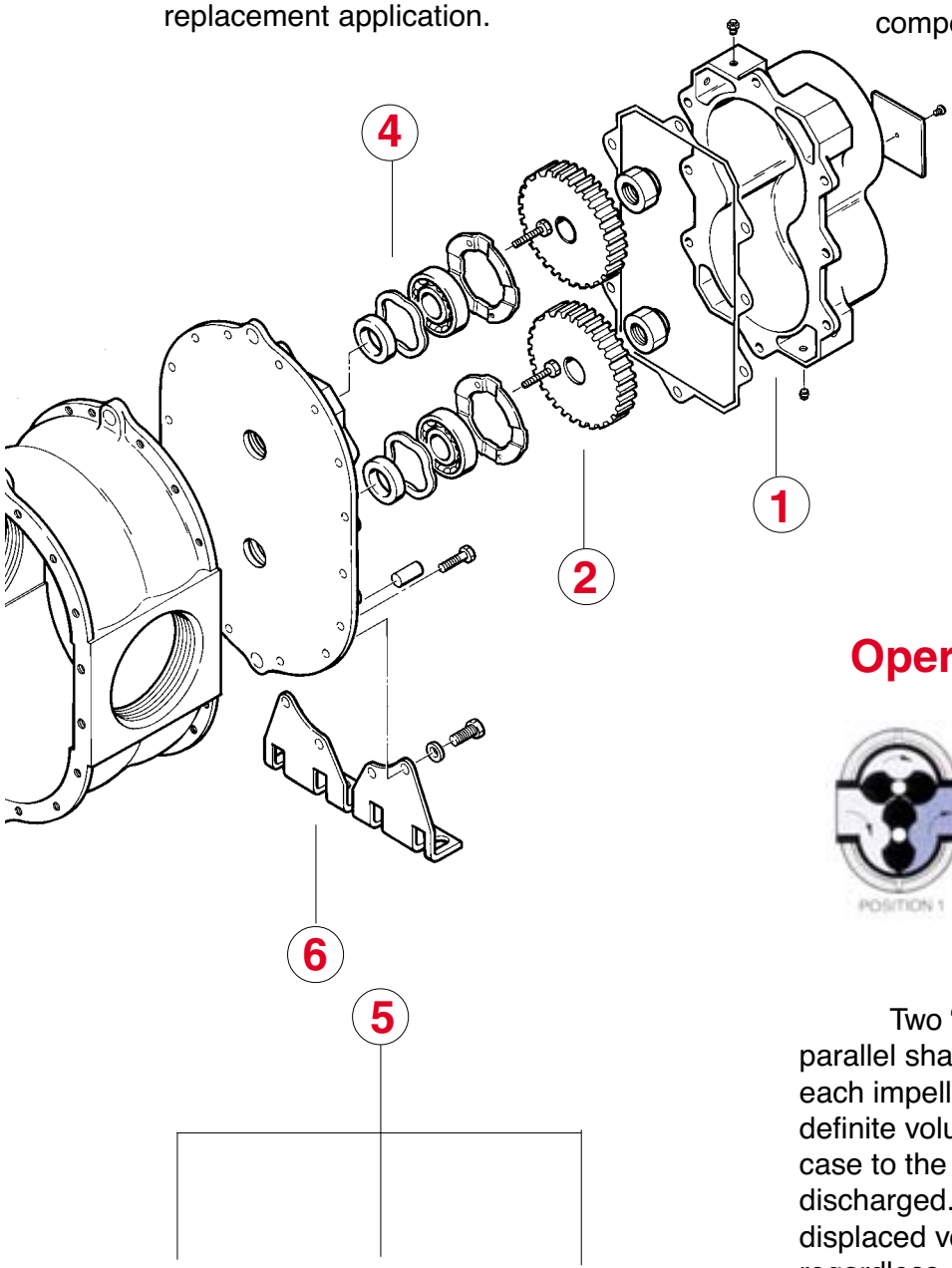


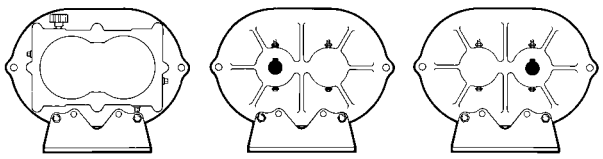
5. Versatile mounting

You can mount the Universal RAI® in multiple positions to accommodate your specific needs. With your choice of 17 frame sizes, there's a Universal RAI that fits right into your OEM or replacement application.

6. Rugged steel mounting feet

The Universal RAI can be easily changed from horizontal flow to vertical flow using the same mounting feet. They're even interchangeable with the mounting holes of competitive Roots-type blowers.





Horizontal Gear End Drive Shaft on Left Drive Shaft on Right

HORIZONTAL MOUNTING
(Vertical air flow)

Operating Principle

Two "Figure 8" lobe impellers, mounted on parallel shafts, rotate in opposite directions. As each impeller passes the blower inlet, it traps 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, temperature or barometric pressure.

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

Performance Specifications

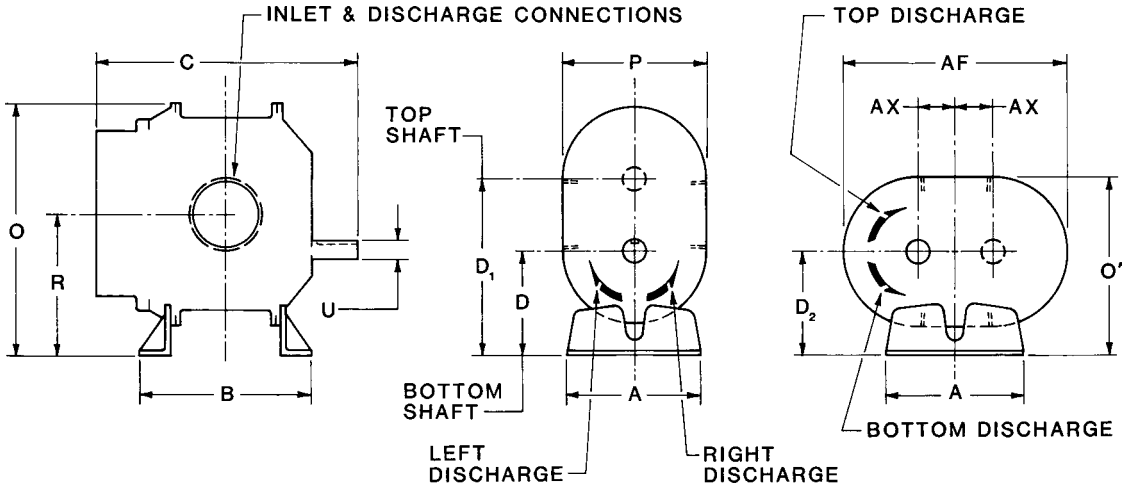
Universal RAI® Pressure Table

Frame Size	Speed RPM	2 PSI		4 PSI		5 PSI		6 PSI		7 PSI		10 PSI		11 PSI		12 PSI		13 PSI		14 PSI		15 PSI	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
22	1160	7	0.3	2	0.4																		
	3600	46	0.8	41	1.3	39	1.6	38	1.8	36	2.1	32	2.8	31	3.1	29	3.3						
	5275	73	1.2	68	1.9	66	2.3	64	2.7	63	3.1	59	4.2	57	4.5	56	4.9						
24	1160	19	0.4	11	0.8	8	0.9																
	3600	97	1.3	89	2.3	86	2.8	83	3.3	81	3.8												
	5275	150	1.9	143	3.4	140	4.2	137	4.9	135	5.6												
32	1160	34	0.6	27	1.1	24	1.3	21	1.6	19	1.8												
	2800	108	1.6	101	2.7	98	3.2	95	3.8	93	4.3	86	6.0	84	6.5	82	7.1	81	7.6	79	8.2	77	8.7
	3600	144	2.0	137	3.4	134	4.1	131	4.8	129	5.5	122	7.7	120	8.4	118	9.1	117	9.8	115	10.5	113	11.2
33	1160	48	0.8	39	1.4	35	1.7	31	2.1	28	2.4												
	2800	149	2.0	140	3.5	136	4.2	132	5.0	129	5.7	120	8.0	118	8.7	116	9.5						
	3600	199	2.5	189	4.5	185	5.4	181	6.4	178	7.4	170	10.3	167	11.2	165	12.2						
36	1160	85	1.2	72	2.3	66	2.8	61	3.3	57	3.8												
	2800	253	3.3	239	5.8	234	7.0	229	8.3	224	9.5												
	3600	334	4.5	321	7.7	315	9.3	310	10.9	306	12.5												
42	860	32	0.6	24	1.1	21	1.3	18	1.5	15	1.8												
	1760	87	1.3	78	2.2	75	2.7	72	3.1	69	3.6	62	5.0	60	5.5	58	5.9						
	3600	198	2.6	190	4.5	186	5.5	183	6.4	181	7.4	173	10.2	171	11.2	169	12.1	167	13.1	165	14.1	163	15.0
45	860	68	1.1	53	2.0	48	2.4	42	2.9	37	3.4												
	1760	177	2.2	162	4.1	156	5.0	151	5.9	146	6.9	133	9.6										
	3600	400	5.3	385	9.1	379	11.0	374	12.9	369	14.8	356	20.5										
47	860	92	1.4	73	2.6	66	3.2	59	3.8	53	4.4												
	1760	236	2.8	217	5.3	209	6.5	203	7.7	196	8.9												
	3600	529	7.0	510	12.0	503	14.3	496	17.0	490	19.5												
53	700	63	1.0	51	1.8	46	2.2	42	2.6	38	3.0												
	1760	203	2.7	191	4.7	186	5.7	181	6.7	177	7.7	167	10.8	163	11.8	160	12.8	157	14.2	155	15.2		
	2850	346	5.0	334	8.2	329	9.9	325	11.5	321	13.2	310	18.1	307	19.7	304	21.3	301	23.0	298	24.6	295	26.2
56	700	110	1.6	92	2.9	85	3.6	78	4.3	72	4.9												
	1760	345	4.6	326	7.7	319	9.4	312	11.1	306	12.8	290	17.9	285	19.6	280	276	23.0					
	2850	585	8.0	567	13.5	560	16.2	553	19.0	547	21.7	531	30.0	526	32.7	521	517	38.2					
59	700	170	2.2	147	4.2	138	5.1	130	6.1														
	1760	513	6.4	490	11.4	480	13.8	472	16.3	464	18.8												
	2850	865	11.8	842	19.9	832	23.9	824	27.9	816	31.9												
65	700	126	1.8	107	3.3	100	4.1	93	4.8	86	5.5	70	7.8										
	1760	387	5.3	368	9.1	360	11.0	353	12.8	347	14.7	330	20.4	325	22.3	320	24.2	316	26.1	311	27.9	307	29.8
	2350	523	7.7	513	12.8	506	15.3	499	17.8	492	20.3	475	27.4	470	30.4	466	32.9	461	35.5	457	38.0	452	40.5
68	700	203	2.7	172	5.1	160	6.3	149	7.5	139	8.7												
	1760	621	7.9	591	14.0	579	17.0	567	20.0	557	23.1	530	32.2	522	35.2	515	38.2	507	41.3	500	44.3		
	2350	855	11.4	824	19.5	812	23.5	801	27.6	790	31.6	763	43.8	755	47.8	748	51.9	740	55.9	733	60.0		
615	700	380	4.8	323	9.3	301	11.6	279	13.8	260	16.2												
	1760	1164	13.9	1107	25.2	1084	30.8	1063	36.5	1044	42.2												
	2350	1601	19.3	1544	34.6	1521	43.2	1500	49.8	1481	57.4												
76	575	179	2.3	158	4.3	150	5.4	142	6.4	134	7.4	115	10.4										
	1400	511	6.4	490	11.5	481	13.9	473	16.4	466	18.8	447	26.3	441	28.7	436	31.2	421	33.7	415	36.1	421	38.6
	2050	772	10.5	751	17.8	742	21.4	734	25.0	727	28.6	708	39.5	703	43.1	697	46.7	684	50.4	679	54.0	682	57.6
711	575	336	4.0	299	7.7	284	9.6	271	11.4	258	13.3	226	18.8										
	1400	944	11.0	908	20.0	893	24.5	880	29.0	867	33.5	835	47.1										
	2050	1424	17.5	1387	30.7	1373	37.3	1359	43.9	1347	50.5	1315	70.3										
718	575	563	6.3	510	12.3	489	15.4	470	18.4														
	1400	1553	17.0	1500	31.6	1479	39.0	1460	46.3														
	2050	2333	26.9	2280	47.9	2259	58.6	2240	69.4														

Universal RAI® Vacuum Table

Frame Size	Speed RPM	4" Hg Vacuum CFM	4" Hg Vacuum BHP	6" Hg Vacuum CFM	6" Hg Vacuum BHP	8" Hg Vacuum CFM	8" Hg Vacuum BHP	10" Hg Vacuum CFM	10" Hg Vacuum BHP	12" Hg Vacuum CFM	12" Hg Vacuum BHP	14" Hg Vacuum CFM	14" Hg Vacuum BHP	15" Hg Vacuum CFM	15" Hg Vacuum BHP	16" Hg Vacuum CFM	16" Hg Vacuum BHP
22	1160	6	0.3														
	3600	45	0.6	42	0.9	39	1.1	35	1.3	32	1.6	28	2.0				
	5275	72	1.1	69	1.4	66	1.8	62	2.0	59	2.4	55	2.7	53	3.1		
24	1160	18	0.3	12	0.6												
	3600	96	1.2	90	1.7	85	2.1	80	2.6	75	3.1	69	3.8				
	5275	149	1.9	144	2.6	139	3.3	134	3.9	128	4.6	122	5.3	119	5.8		
32	1160	33	0.5	28	0.7	23	0.9	18	1.3								
	2800	107	1.4	102	1.9	97	2.5	92	2.9	87	3.4	81	4.0	78	4.5		
	3600	143	1.9	138	2.6	133	3.3	128	3.8	123	4.5	117	5.2	114	5.6	110	5.9
33	1160	47	0.6	40	0.9	33	1.3	27	1.7								
	2800	148	1.9	141	2.6	134	3.4	128	4.0	121	4.7	113	5.6				
	3600	197	2.6	190	3.6	184	4.5	177	5.2	170	6.2	163	7.1	159	7.6		
36	1160	83	1.1	74	1.6	65	2.1	55	2.7								
	2800	251	3.2	241	4.4	232	5.6	223	6.6	213	7.9						
	3600	332	4.4	323	5.9	313	7.5	304	8.7	294	10.3	284	11.8	278	12.7		
42	860	31	0.4	25	0.7	19	1.1										
	1760	85	1.0	79	1.5	74	2.0	68	2.4	62	2.8	56	3.5				
	3600	197	2.6	191	3.5	185	4.5	180	5.2	174	6.1	167	7.0	164	7.5	160	8.0
45	860	66	0.9	56	1.4	46	1.9										
	1760	175	2.1	164	3.0	154	3.9	144	4.7	134	5.8						
	3600	398	5.2	387	7.0	377	8.9	367	10.3	356	12.1	345	14.0	339	14.9	332	15.9
47	860	89	1.2	76	1.8	63	2.5										
	1760	233	2.8	220	4.0	207	5.2	194	6.3	181	7.5						
	3600	526	6.8	513	9.3	501	11.7	488	13.6	475	16.0	460	18.5	452	19.8		
53	700	61	0.8	53	1.2	44	1.6	36	2.2								
	1760	201	2.6	192	3.6	184	4.6	176	5.3	167	6.3	158	7.5				
	2850	345	4.9	336	6.5	328	8.1	320	9.1	311	10.8	301	12.4	296	13.2	291	14.0
56	700	108	1.4	95	2.1	82	2.7	70	3.5								
	1760	342	4.2	329	5.9	316	7.5	304	8.9	291	10.6	276	12.3				
	2850	583	7.8	570	10.5	557	13.2	545	15.1	532	17.8	517	20.5	510	21.8	501	23.2
59	700	167	2.1	151	3.1	135	4.1										
	1760	509	6.2	493	8.7	477	11.1	462	13.1	445	15.6						
	2850	861	4.6	845	15.5	829	19.5	814	22.2	797	26.2	779	30.1	770	32.1		
65	700	123	1.7	110	2.4	97	3.1	84	3.8	71	4.7						
	1760	384	5.2	371	7.0	358	8.8	345	10.2	331	12.1	317	13.9	308	14.9	300	15.8
	2350	529	7.6	516	10.0	503	12.5	490	14.2	476	16.6	462	19.1	454	20.3	445	21.6
68	700	198	2.6	177	3.8	156	5.0	135	6.2								
	1760	617	7.7	595	10.7	575	13.7	554	16.1	532	19.0	508	22.0	495	23.5		
	2350	850	11.2	828	15.1	808	19.1	787	22.1	765	26.0	741	30.0	728	31.9	715	34.0
615	700	371	4.7	331	7.0	292	9.1										
	1760	1156	13.5	1115	19.0	1077	24.6	1038	29.4	997	35.0						
	2350	1592	19.1	1552	26.5	1513	33.9	1474	40.0	1433	47.5	1389	54.9				
76	575	172	2.2	155	3.2	139	4.2	123	5.1	117	6.2						
	1400	506	6.3	489	8.7	473	11.2	437	13.1	440	15.5	422	18.0	412	19.2	413	20.4
	2050	769	10.3	754	13.9	737	17.4	721	20.0	704	23.5	685	27.0	675	28.8	674	30.6
711	575	330	3.9	304	5.7	279	7.5	254	9.2	228	11.2						
	1400	939	10.8	913	15.2	888	19.6	863	23.4	837	27.8	808	32.2	793	34.4		
	2050	1419	17.2	1393	23.6	1368	30.1	1343	35.2	1317	41.7	1288	48.1	1272	51.3	1256	54.6
718	575	555	6.2	517	9.2	482	12.1	446	15.0								
	1400	1545	16.6	1507	23.8	1472	30.9	1436	37.4	1398	44.6						
	2050	2325	25.9	2287	36.4	2252	46.9	2216	55.9	2178	66.4						

Frame Sizes



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										
22	5.13	5.00	9.75	3.75	6.25	3.75	9.63	6.88	6.25	9.25	5.00	.625	.188 x .094	1.0 NPT	1.25	32
24	5.13	7.00	11.75	3.75	6.25	3.75	9.63	6.88	6.25	9.25	5.00	.625	.188 x .094	2.0 NPT	1.25	43
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
76	14.00**	11.75	19.94	11.00	18.00	11.00	26.13	20.69	19.38	23.25	14.50	1.562	.375 x .188	4.0 NPT	3.50	400
711	14.00**	16.75	25.19	11.00	18.00	11.00	26.13	19.50	17.00	23.25	14.50	1.562	.375 x .188	6.0 FLG	3.50	530
718	14.00**	23.75	32.19	11.00	18.00	11.00	26.13	19.50	17.00	23.25	14.50	1.562	.375 x .188	8.0 FLG	3.50	650

*17.00 in horizontal configuration
**21.00 in horizontal configuration

All dimensions in inches

Dresser, Inc.

DRESSER
Roots

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