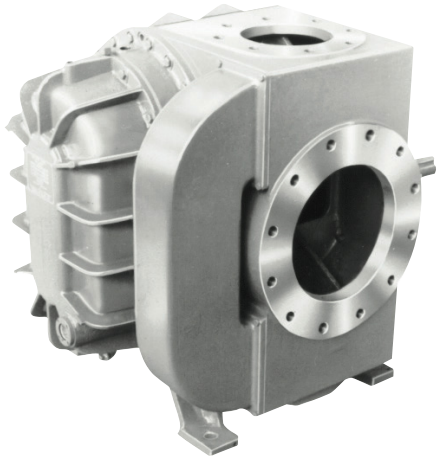
Frames 1016J 1021J 1220J 1428J 1431J 1833J 1838J

ROOTS® DVJ WHISPAIR™ Dry Vacuum Exhausters



Design and Construction Features

- Rigid cast iron cylinder and headplates
- Anti-friction spherical roller bearings
- Splash lubricated timing gears
- Inlet & discharge connections in standard pipe sizes
- Involute profile ductile iron impellers

ROOTS® DVJ WHISPAIR™ Dry Exhausters have an exclusive WHISPAIR discharge jet plenum design which allows cool, atmospheric air to flow into the cylinder. This unique design permits continuous operation at vacuum levels to blank-off with a single stage unit, without water injection.

Basic dry vacuum pump description

Standard dry exhausters are limited to approx. 16" Hg vacuum because operation at higher vacuum levels can cause extreme discharge temperatures resulting in casing and impeller distortion and possible seizure. The DVJ's cooling design eliminates the problems caused by high discharge temperatures at vacuum levels beyond 16" Hg.

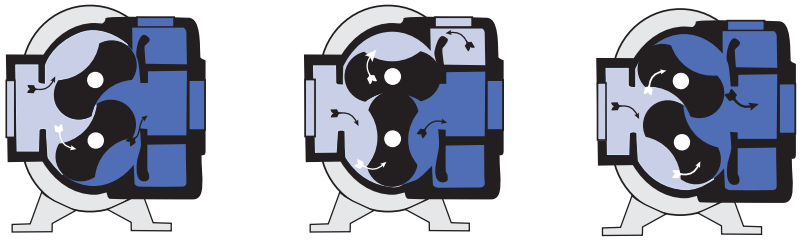
ROOTS® DVJ WHISPAIR™ exhausters are heavy-duty units withforged steel stub shafts bolted to ductile iron impellers. The casing, headplates, gear cover and drive end covers are grey iron.

Carburized and ground alloy steel spur timing gears are mounted on the shafts of 1000 frame size units by a splash taper fit, while large sizes use a double taper ring locking assembly. Double-row spherical roller bearings are lubricated at both the gear end and drive end. Piston ring shaft seals and lip-type seals are used to restrict oil leakage into the air stream. The DVJ can be equipped with mechanical seals for gas applications.

ROOTS DVJ WHISPAIR exhausters can be arranged to operate in two and three stage systems to achieve vacuum levels down to 1 torr.

Vacuum performance table

Frame size	Speed RPM	Max free air CFM	16"HgV		20"HgV		24"HgV		27"HgV	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
1016J	980	-	1557	77	1345	95	933	114	*	128
	1450	-	2619	115	2407	142	1996	169	970	189
	1800	4068	3410	144	3198	177	2787	211	1761	235
1021J	980	-	1984	97	1714	121	1189	145	*	163
	1450	-	3338	145	3067	180	2543	215	1236	241
	1800	5184	4346	183	4075	225	3551	268	2244	300
1220J	880	-	2627	120	2356	149	1831	178	523	200
	1170	-	3770	161	3500	199	2974	237	1664	266
	1500	5910	5070	208	4800	257	4274	305	2964	342
1222J	880	-	2886	131	2588	163	2011	196	Maximum vacuum limited to 24" Hg	
	1170	-	4142	176	3843	218	3267	261		
	1500	6645	5571	228	5272	282	4696	335		
1428J	880	-	5207	230	4748	285	Maximum vacuum limited to 22.5" Hg			
	1170	-	7390	310	6932	382				
	1300	9789	8369	347	7911	427				
1431J	880	-	5857	258	5341	321	Maximum vacuum limited to 22" Hg			
	1170	-	8313	348	7797	429				
	1300	11011	9414	389	8898	479				
1833J	705	-	8472	365	7832	453	6554	540	Maximum vacuum limited to 24" Hg	
	880	-	11074	461	10425	569	9167	676		
	1000	14870	12859	529	12209	650	10951	770		
1838J	705	-	9612	414	8875	513	Maximum vacuum limited to 22.5 Hg			
	880	-	12564	522	11827	644				
	1000	16870	14588	588	13851	736				



POSITION 1 POSITION 2 POSITION 3

Shaded blue areas indicate air pressure variations from intake to atmospheric discharge. Incoming air is trapped between the impellers and the case, producing a vacuum in the application system. Simultaneously, air is discharged (right) from the exhauster. As the impeller passes the WHISPAIR™ jet plenum, atmospheric air flows into the space between the impeller and the case. This cools the trapped air, aids impeller movement and reduces shock and power loss. The trapped air is then moved to the discharge flange (right). Backflow is reduced, resulting in lower discharge noise relative to conventional rotary exhausters.

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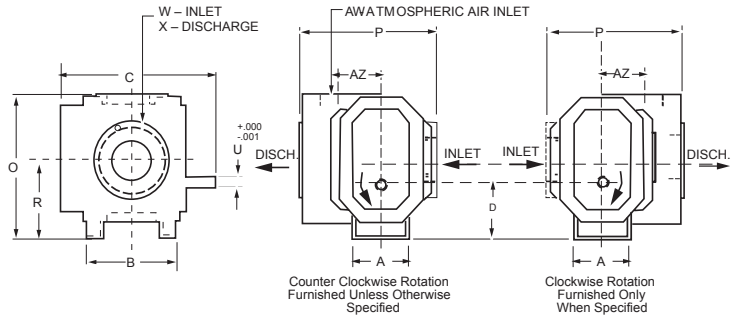
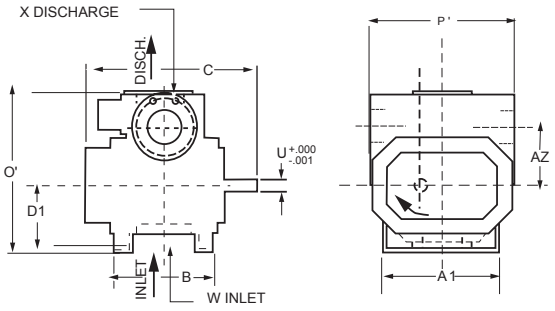
Vertical configuration



Horizontal configuration



Consult Factory:

1. Manifold spacer required
2. Special headplates required
3. Modifications to cylinder required

Lubrication	Splash lube				Pressure lube			
Disch location frame size	Left	Right	Top	Bottom	Left	Right	Top	Bottom
1016	X	X	X		X	X	X	
1021	X	X	X				X	
1220	X	X	X	X(2)	X	X	X	X
1222	X	X	X	X(2)	X	X	X	X(1)(2)
1428	X	X	X		X	X(3)	X	
1431	X	X	X		X	X(3)	X	
1833	X	X	X		X	X	X	
1836	X	X	X		X	X	X	

Dimensional table

Frame size	A	A_1	B	C	D	D_1	O	O_1	P	P_1	R	U	Keyway	AZ	W	X	AW	Wgt.
1016J	27	27	23.25	49.88	14.5	14.5	34.88	31.88	31.63	30.75	19.5	2.25	.500 x .250	8.5	12 FLG	12 FLG	10 FLG	2400
1021J	27	27.75	27.75	45.5	14.5	14.5	38	28.75	31.25	36	19.5	2.25	.500 x .250	7.5	14 FLG	14 FLG	12 FLG	2525
1220J	30.5	30.5	27.5	52.38	16.625	16.625	40.63	35.88	35.75	36	22.63	2.625	.625x .313	8.5	16 FLG	14 FLG	12 FLG	3650
1222J	30.5	30.5	30	54.88	16.625	16.625	40.63	35.88	35.75	36	22.63	2.625	.625 x .313	8.5	16 FLG	14 FLG	12 FLG	4000
1428J	34	34	36.25	57.88	18.75	18.75	47.56	46.6	46.75	42.19	25.75	3	.750 x .375	14.75	20 FLG	18 FLG	16 FLG	5900
1431J	34	34.99	39.25	61.38	18.75	18.75	47.56	46.6	46.75	42.19	25.75	3	.750 x .375	14.75	20 FLG	18 FLG	16 FLG	6100
1833J	41	41	43.5	69.81	23.25	59.25	59.25	56.6	56.75	52.8	32.25	4.188	1.000 x.500	15	24 FLG	24 FLG	20 FLG	10500
1838J	41	41	48	74.31	23.25	59.25	59.25	56.6	56.75	52.8	32.25	4.188	1.000x.500	15	24 FLG	24 FLG	20 FLG	10800

Notes:

1. All dimensions are in inches. 2. Weights are in pounds, and are approximate. 3. Do not use for construction.