



INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

CENTRIFUGAL LOW SILHOUETTE ROOF VENTILATORS

MODELS VL/VT/VK/VJ - BELT AND DIRECT DRIVE

CARNES COMPANY, 448 S. Main St., P. O. Box 930040, Verona, WI. 53593-0040 Phone: 608/845-6411 Fax: 608/845-6470 carnesh@arnesh.com http://www.carnesh.com

CAUTION! DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND UNDERSTOOD. READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE

RECEIVING, HANDLING AND STORAGE

1. Handle the fan with care. Avoid severe jarring or dropping of the unit.
2. Carefully inspect the unit for damage upon delivery. If the unit has been damaged in transit it is the responsibility of the recipient to make all claims against the carrier.
3. Provide adequate, protected storage prior to installation.

INSTALLATION

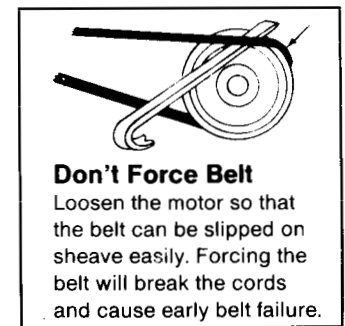
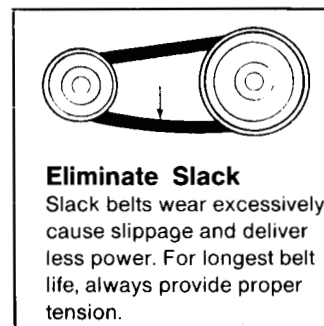
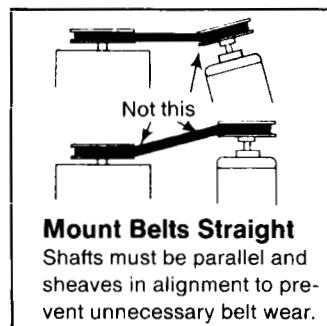
1. Upon unpacking, inspect the unit for any damage that may have occurred in transit. Check also for loose or missing parts.
2. **CAUTION!** This fan contains rotating parts and requires electrical service. Appropriate safety precautions should be taken during installation, operation and maintenance.
3. **WARNING!** Do not install or operate this fan in environment or atmosphere where combustible or flammable materials, gasses or fumes are present, unless it has been specifically designed and manufactured for use in that environment. **Explosion** or **Fire** could result!
4. This ventilator requires a minimum of four (4) mounting fasteners, or the appropriate size and type, in order to be securely fastened to the roof curb. Be sure to use an approved sealant between the fan and curb to prevent leaking.
5. A damper, if used, should be securely mounted in a manner which allows free and unobstructed operation. Fan wiring should not interfere with damper blades.
6. **CAUTION!** All electrical work must be done in accordance with local and/or national electrical code as applicable. If you are unfamiliar with methods of installing electrical wiring, secure the services of a qualified electrician.
7. **WARNING!** This product must be grounded.
8. **DANGER!** Make sure power is turned off and locked in **OFF** position at the service entrance before installing, wiring or servicing fan.
9. **CAUTION!** Before wiring the motor, check the supply voltage against the motor nameplate voltage. High or low voltage can damage the motor and void the motor warranty.
10. Power should be routed through the conduit openings provided.
11. Access to the motor is possible by removing the housing cover.
12. **WARNING!** Be sure to keep all wiring clear of rotating or moving parts.
13. **WARNING!** Before starting the fan, turn the wheel to assure it rotates freely. If needed, adjust the wheel/shaft/bearing/motor position as required to achieve necessary clearances.
14. **CAUTION!** On belt drive units assure belts are tensioned and aligned properly. (See Maintenance section).
15. **WARNING!** Check all fasteners and keys, tighten as necessary to fan startup. Do not over torque.
16. Remount housing cover, do not over torque fasteners (30in.-lb. maximum).

OPERATION

1. **CAUTION!** Check that the fan inlet/ductwork/exhaust openings are clean and free of obstructions. Poor inlet conditions will result in seriously reduced fan performance.
2. **WARNING!** This fan contains rotating parts. Appropriate safety precautions should be taken during operation.
3. Operate under power and check for correct wheel rotation direction (clockwise when looking at top of the wheel).
4. **CAUTION!** Incorrect rotation can damage the fan motor and seriously impede fan performance.

MAINTENANCE

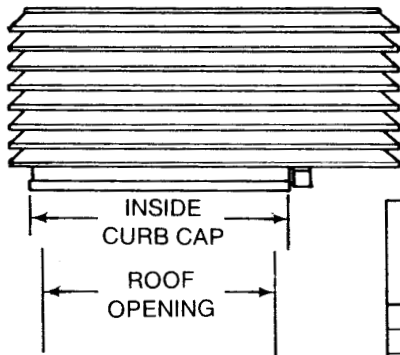
1. **DANGER!** Before performing any maintenance on the fan, be sure power is turned off and locked in the **OFF** position at the service entrance before servicing the fan.
2. Ventilators should be carefully checked at least once a year. For critical or rugged applications, a routine check every two or three months is suggested.
3. All motors supplied with CARNES ventilators carry a one year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your local CARNES representative for additional warranty details.
4. Access to the motor is possible by removing the housing cover.
5. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely and the bearings run smoothly. The belt on belt driven units should be removed from the motor sheave.
6. **CAUTION!** When removing or installing a belt, do not force the belt over the sheave. Loosen the motor mount so that the belt can be easily slipped over the sheave.
7. The belt on belt driven units should be removed and carefully checked for radial cracks, ply separation or irregular wear. A small irregularity in the contact surface of the belt will result in noisy operation. If any of these defects are apparent, the belt should be replaced. Check the sheaves also for chipping, dents or rough surfaces which could damage the belt.
8. **CAUTION!** The correct belt tension is important. Too tight a belt will result in excess bearing pressure on the motor bearings and shaft pillow blocks, and may also overload the motor. Too loose a belt will result in slippage which will quickly "burn" out belts. A belt should feel "live" when thumped, approximately 1/4" belt deflection when subjected to finger pressure (3 to 5 lbs.) at midpoint between sheaves.
9. **CAUTION!** The belt alignment should also be checked to be sure the belt is running perpendicular to the rotating shafts. Motor and drive shafts must be parallel. Improper alignment will result in excessive belt wear.



10. **CAUTION!** Check sheave set screws to ensure tightness. Proper keys must be in keyways.
11. **CAUTION!** Do not readjust variable pitch sheave without checking motor amps. Do not readjust variable pitch sheaves above the maximum catalog RPM for unit and motor. If fixed sheaves are replaced, use only sheaves of identical size and type.
12. **CAUTION!** If adjustment of two groove variable pitch sheaves is required, each sheave must be opened or closed at the same number of turns. Improper adjustment can cause excessive belt wear and premature failure.

13. If unit is to be left idle for an extended period (especially over summer months), it is recommended that belts be removed and stored in a cool, dry place to avoid premature belt failure.
14. The standard pillow block bearings on CARNES belt driven ventilators are permanently lubricated and are supplied with an oil base corrosion preventive compound. These should not require any service, except that during the first few months of operation it is recommended that set screws holding the shaft be checked to be sure they are tight. (Proper tightness will permanently deform Allen wrench.)
15. The centrifugal wheel should not require maintenance except for removing foreign materials that may accumulate on the blades. The balance weights should not be disturbed. If a wheel has to be removed from the shaft, do not apply force that will damage the bearings or warp the wheel. Use a wheel puller.
16. Access to the wheel for alignment purposes can be obtained by removing the housing lid. Lateral adjustment is made with the bearing mount. Vertical adjustment is made at the bearings.
17. Should it be necessary to remove the wheel, access is through the fan plate. Do not remove the motor/motor mount assembly. Carefully support the motor/motor mount assembly and remove all the fan plate fasteners. Carefully remove the entire assembly from the unit base. To rebuild, assemble in reverse order.

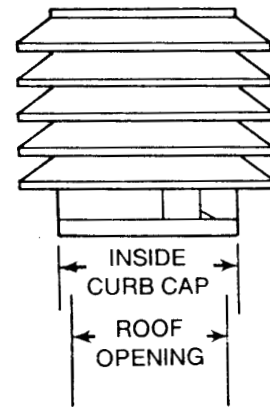
MODEL VLBK



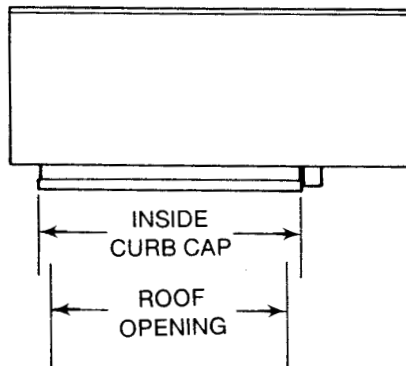
UNIT SIZE	DIMENSIONS LISTED IN INCHES	
	INSIDE* CURB CAP	ROOF* OPENING
06	15½	11
08	15½	11
10	17½	13
12	17½	13
15	20½	16
18	25	20½
21	28½	23½
24	31½	26½
30	40½	35½
36	46½	41½
42	54½	49½
48	58½	53½
54	64½	59½

*Same dimensions apply for symmetrical hood Models VJ & VK.

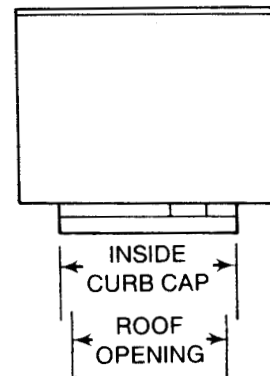
MODEL VLDK



MODEL VTBK

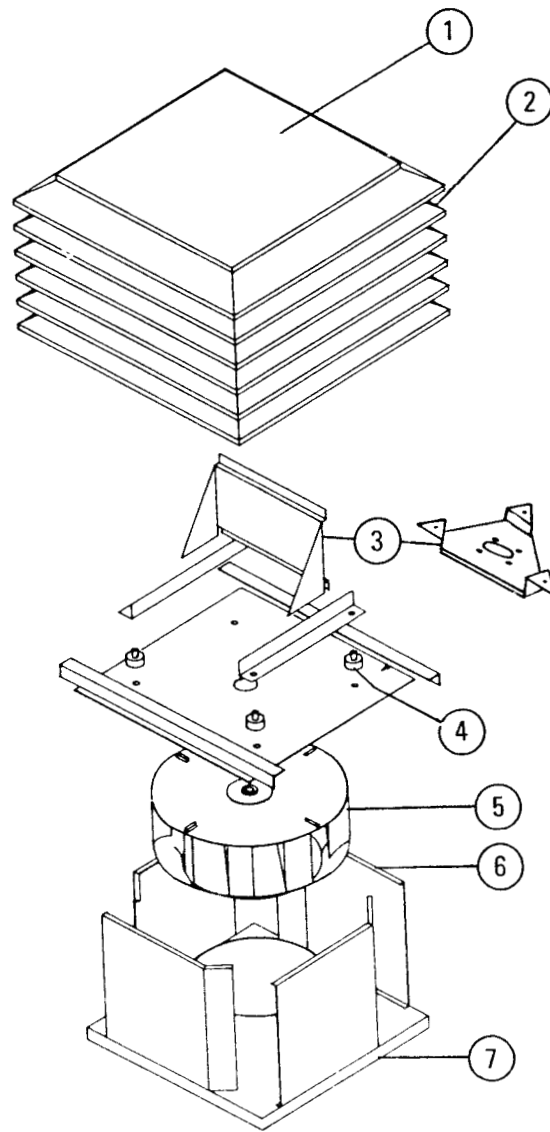


MODEL VTDK



MODEL VLDK

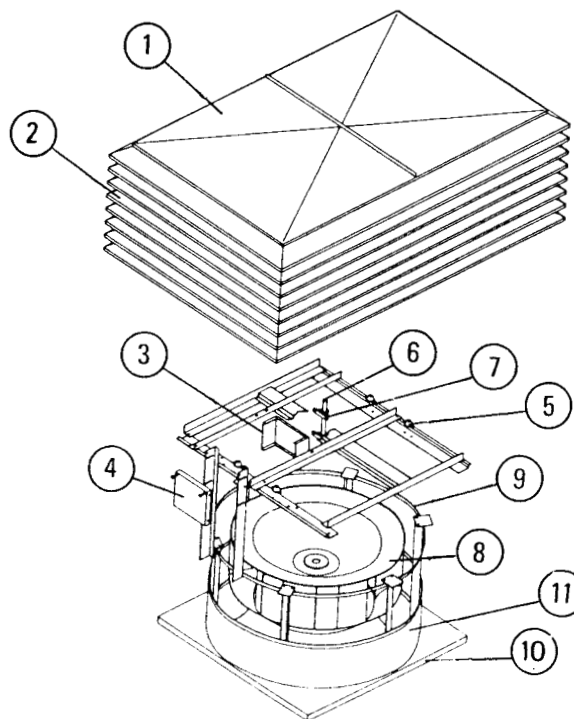
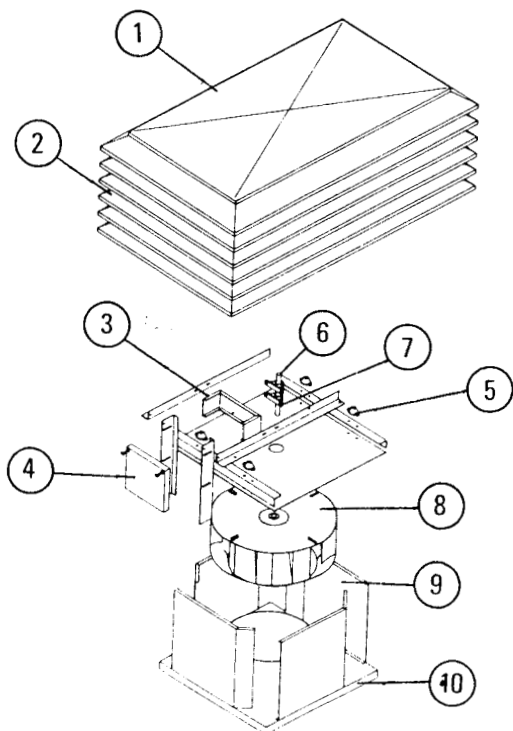
DIRECT DRIVE - PARTS LIST



Unit Size	1 Lid	2 Louvered Housing	3 Motor Mount Assembly	4 Vibration Isolators	Wheel (Bore Size) 5			6 Diffusers (Set of 4)	7 Curb Cap
					1/2	5/8	7/8		
06	384-3213	384-3423	632-0070	(3) 998-6126	384-0542	384-0543	—	384-2451	384-2401
08	384-3213	384-3424	632-0070	(3) 998-6126	384-0546	384-0547	—	384-2452	384-2401
10	384-3214	384-3425	384-0661	(4) 998-6126	384-0550	384-0551	—	384-2453	384-2402
12	384-3214	384-3425	384-0661	(4) 998-6126	384-0553	384-0554	384-0556	384-2454	384-2402
15	384-3214	384-3426	384-0663	(4) 998-6126	384-0557	384-0558	384-0560	384-2455	384-2403
18	384-3215	384-3427	384-0665	(4) 998-6126	384-0561	384-0562	384-0564	384-2456	384-2404

MODEL VLBK

BELT DRIVE - PARTS LIST

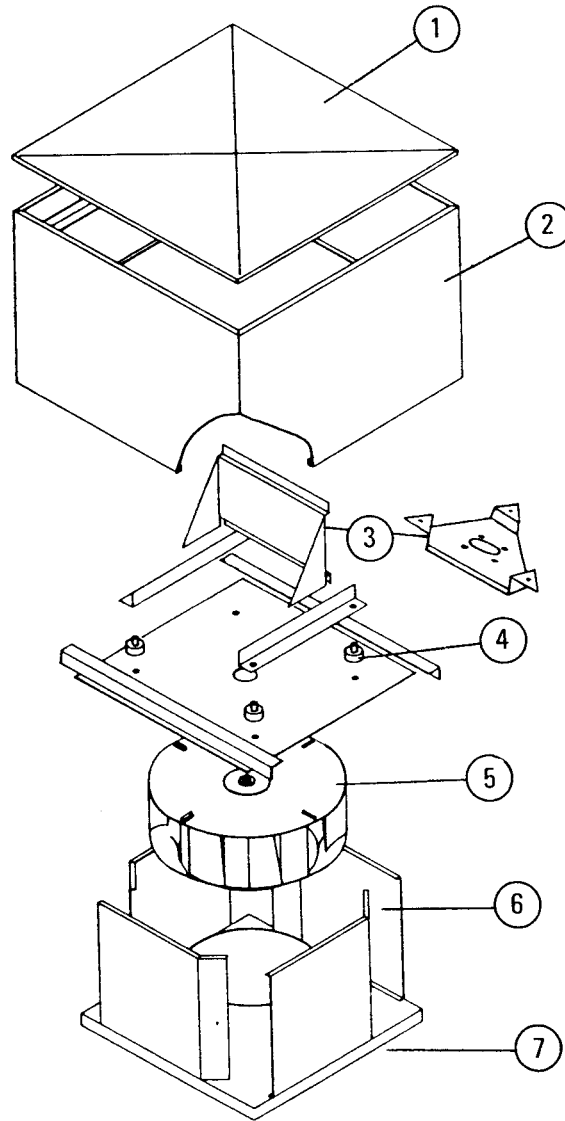


UNIT SIZE	LID 1		HOUSING 2		BEARING 3 MOUNT	MOTOR MOUNT 4 PLATE		VIBRATION 5 ISOLATORS (4) REQ'D	SHAFT 6
	VL STANDARD	VK SYMMETRICAL	VL STANDARD	VK SYMMETRICAL		3HP MOTOR AND BELOW	5HP MOTOR AND ABOVE		
06	384-3199	384-3206	384-3401	384-3412	384-3021	630-0461	384-2895	998-6126	998-5401
08	384-3199	384-3206	384-3401	384-3412	384-3021	630-0461	384-2895	998-6126	998-5401
10	384-3200	384-3207	384-3402	384-3413	384-3021	630-0461	384-2895	998-6126	998-5401
12	384-3200	384-3207	384-3402	384-3413	384-3021	630-0461	384-2895	998-6126	998-5401
15	384-3201	384-3208	384-3403	384-3414	384-3021	630-0461	384-2895	998-6126	998-5401
18	384-3202	384-3209	384-3404	384-3415	384-3022	630-0461	384-2895	998-6126	998-5401
21	384-3203	384-3210	384-3405	384-3416	384-3022	630-0461	384-2895	999-9748	998-5402
24	384-3204	384-3211	384-3406	384-3417	384-3022	630-0461	384-2895	999-9748	998-5402
30	384-3205	384-3212	384-3407	384-3418	384-3026	630-0461	384-2895	999-9748	998-5403
36	384-3249 (2)	384-3253 (2)	384-3408	384-3419	384-3026	630-0461	384-2895	999-9748	998-5404
42	384-3250 (2)	384-3254 (2)	384-3409	384-3420	384-3027	630-0461	384-2895	999-9748 (6)	998-5405
48	384-3251 (2)	384-3255 (2)	384-3410	384-3421	384-3027	630-0461	384-2895	999-9748 (6)	998-5406
54	384-3252 (2)	384-3256 (2)	384-3411	384-3422	384-3027	630-0461	384-2895	999-9748 (6)	998-5407

UNIT SIZE	PILLOW BLOCK 7 BEARINGS (2 REQ'D)	STANDARD 8 WHEEL	DIFFUSER/SUPPORT 9 FRAME		CURB 10 CAP	WIND 11 BAND
			DIFFUSERS (SET OF 4)	SUPPORT FRAME		
06	999-8606	384-0544	384-2451	—	384-2401	—
08	999-8606	384-0548	384-2452	—	384-2401	—
10	999-8606	384-0552	384-2453	—	384-2402	—
12	999-8606	384-0555	384-2454	—	384-2402	—
15	999-8606	384-0559	384-2455	—	384-2403	—
18	999-8606	384-0563	384-2456	—	384-2404	—
21	999-8616	384-0565	384-2457	—	384-2405	—
24	999-8616	384-0566	384-2458	—	384-2406	—
30	999-8602	384-0636	—	384-0521	384-2421	384-2591 (2)
36	999-8604	384-0637	—	384-0522	384-2423	384-2592 (2)
42	999-8603	384-0638	—	384-0526	384-2431	384-2593 (2)
48	999-8603	384-0639	—	384-0527	384-2433	384-2594 (2)
54	999-8603	384-0640	—	384-0531	384-2435	384-2595 (2)

MODEL VTDK

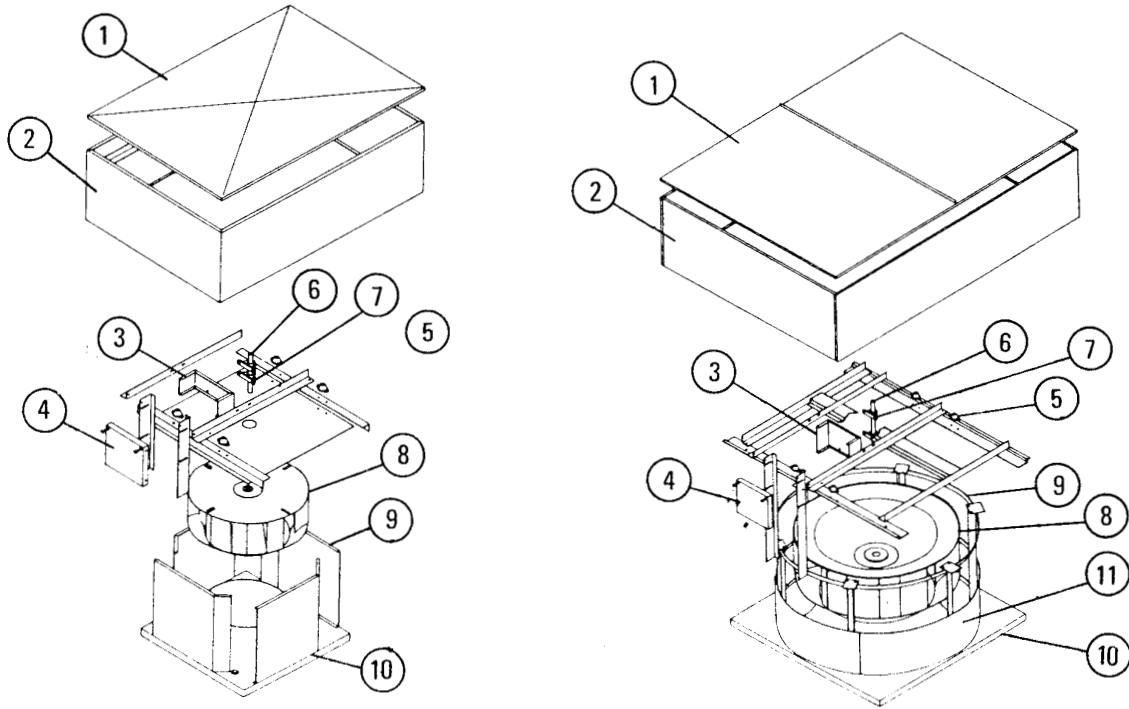
DIRECT DRIVE - PARTS LIST



Unit Size	Lid 1		Housing 2		3 Motor Mount Assembly	4 Vibration Isolator	Wheel (Bore Size) 5			Diffusers 6 (Set of 4)		7 Curb Cap
	Galv.	Alum.	Galv.	Alum.			1/2	5/8	7/8	Galv.	Alum.	
06	384-3235	384-3195	384-3523	384-3553	632-0070	(3) 998-6126	384-0542	384-0543	—	384-2461	384-2451	384-2401
08	384-3235	384-3195	384-3523	384-3553	632-0070	(3) 998-6126	384-0546	384-0547	—	384-2462	384-2452	384-2401
10	384-3236	384-3196	384-3524	384-3554	384-0661	(4) 998-6126	384-0550	384-0551	—	384-2463	384-2453	384-2402
12	384-3236	384-3196	384-3524	384-3554	384-0661	(4) 998-6126	384-0553	384-0554	384-0556	384-2464	384-2454	384-2402
15	384-3237	384-3197	384-3525	384-3555	384-0663	(4) 998-6126	384-0557	384-0558	384-0560	384-2465	384-2455	384-2403
18	384-3238	384-3198	384-3526	384-3556	384-0665	(4) 998-6126	384-0561	384-0562	384-0564	384-2466	384-2456	384-2404

MODEL VTBK

DIRECT DRIVE - PARTS LIST



Unit Size	Lid ¹				Housing ²				Bearing ³ Mount	Motor Mount Plate ⁴	
	Galvanized		Aluminum		Galvanized		Aluminum			3 HP Motor and Below	5 HP Motor and Above
	VT Standard	VJ Symmetrical	VT Standard	VJ Symmetrical	VT Standard	VJ Symmetrical	VT Standard	VJ Symmetrical			
06	384-3221	384-3228	384-3181	384-3188	384-3501	384-3512	384-3531	384-3542	384-3021	630-0461	384-2895
08	384-3221	384-3228	384-3181	384-3188	384-3501	384-3512	384-3531	384-3542	384-3021	630-0461	384-2895
10	384-3222	384-3229	384-3182	384-3189	384-3502	384-3513	384-3532	384-3543	384-3021	630-0461	384-2895
12	384-3222	384-3229	384-3182	384-3189	384-3502	384-3513	384-3532	384-3543	384-3021	630-0461	384-2895
15	384-3223	384-3230	384-3183	384-3190	384-3503	384-3514	384-3533	384-3544	384-3021	630-0461	384-2895
18	384-3224	384-3231	384-3184	384-3191	384-3504	384-3515	384-3534	384-3545	384-3022	630-0461	384-2895
21	384-3225	384-3232	384-3185	384-3192	384-3505	384-3516	384-3535	384-3546	384-3022	630-0461	384-2895
24	384-3226	384-3233	384-3186	384-3193	384-3506	384-3517	384-3536	384-3547	384-3022	630-0461	384-2895
30	384-3227	384-3234	384-3187	384-3194	384-3507	384-3518	384-3537	384-3548	384-3026	630-0461	384-2895
36	384-3261 (2)	384-3265 (2)	384-3241 (2)	384-3245 (2)	384-3508	384-3519	384-3538	384-3549	384-3026	630-0461	384-2895
42	384-3262 (2)	384-3266 (2)	384-3242 (2)	384-3246 (2)	384-3509	384-3520	384-3539	384-3550	384-3027	630-0461	384-2895
48	384-3263 (2)	384-3267 (2)	384-3243 (2)	384-3247 (2)	384-3510	384-3521	384-3540	384-3551	384-3027	630-0461	384-2895
54	384-3264 (2)	384-3268 (2)	384-3244 (2)	384-3248 (2)	384-3511	384-3522	384-3541	384-3552	384-3027	630-0461	384-2895

Unit Size	5 Vibration Isolators (4 Req'd Except As Noted)	6 Shaft	7 Pillow Block Bearings (2 Req'd)	8 Std. Wheel	Diffusers (Set of 4)/Support Frame ⁹			10 Curb Cap	11 Wind Band
					Galv. Diffusers	Alum. Diffusers	Support Frame		
06	998-6126	998-5401	999-8606	384-0544	384-2461	384-2451	—	384-2401	—
08	998-6126	998-5401	999-8606	384-0548	384-2462	384-2452	—	384-2401	—
10	998-6126	998-5401	999-8606	384-0552	384-2463	384-2453	—	384-2402	—
12	998-6126	998-5401	999-8606	384-0555	384-2464	384-2454	—	384-2402	—
15	998-6126	998-5401	999-8606	384-0559	384-2465	384-2455	—	384-2403	—
18	998-6126	998-5401	999-8606	384-0563	384-2466	384-2456	—	384-2404	—
21	999-9748	998-5402	999-8616	384-0565	384-2467	384-2457	—	384-2405	—
24	999-9748	998-5402	999-8616	384-0566	384-2468	384-2458	—	384-2406	—
30	999-9748	998-5403	999-8602	384-0636	—	—	384-0521	384-2421	384-2591 (2)
36	999-9748	998-5404	999-8604	384-0637	—	—	384-0522	384-2423	384-2592 (2)
42	999-9748 (6)	998-5405	999-8603	384-0638	—	—	384-0526	384-2431	384-2593 (2)
48	999-9748 (6)	998-5406	999-8603	384-0639	—	—	384-0527	384-2433	384-2594 (2)
54	999-9748 (6)	998-5407	999-8603	384-0640	—	—	384-0531	384-2435	384-2595 (2)

CARNES[®]
COMPANY

448 South Main Street
P. O. Box 930040
Verona, WI 53593-0040

Phone: 608/845-6411
Fax: 608/845-6470
E Mail: carnes@carnes.com
<http://www.carnes.com>