

CAR-MON

CMD DIRECT DRIVE FAN BOOKLET

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This manual has been prepared to guide the users of Car-Mon fans in the proper installation, operation, and maintenance procedures to insure maximum equipment life with trouble free operation.

CAR-MON PRODUCTS, INC
1225 Davis Road, Elgin, Illinois 60123
Phone (847) 695-9000 Fax (847) 695-9078
www.car-mon.com

RECEIVING

All fans leaving the Car-Mon plant have been inspected and test run to insure that they are in satisfactory operating condition. The carrier assumes full responsibility for material from the time it leaves our plant until it is delivered to the user. Therefore, material received should be inspected for damage immediately so that any damage claims against the carrier can be made before acceptance of the shipment. No equipment is to be returned without an authorized returned goods tag.

HANDLING

Fans should be hoisted with slings placed around the fan housing. When a single hoist is used, a "spreader" will keep the sling from slipping on the housing. If it is necessary to use hooks placed in lifting holes of fans, BE CAREFUL NOT TO DISTORT OR BEND THE HOUSING. Large units may have lifting lugs or holes which should be used in place of the sling.

Chain or wire slings should be well padded where they contact the fan, especially where special coatings and paints are involved. Rubber, phenolic enamels, etc. require special care as they may easily be damaged by contact in lifting. Even a small chip will destroy the corrosion prevention seal of the coating and allow corrosion to start. Always repair scratched surfaces with touch-up like coating prior to installation.

STORAGE

If the fan is to be stored for any length of time, appropriate care should be taken to protect bearings, shaft and finished surfaces from moisture, dirt, dust, etc. Do not store other products on top of fan equipment. Periodic inspections of the unit should be made until it is ready to be put into service.

FOUNDATIONS-GENERAL

A rigid level foundation is a must for every fan. It assures permanent alignment of fan and driving equipment and freedom from excess vibration, minimizing maintenance costs. Foundation must be cast separate from any adjacent floor structure and separated around edges by at least 3/4" tar felt to prevent transmission of vibration in either direction. The sub-foundation (soil, stone, rock, etc.) should be stable enough to prevent uneven settling of fan foundation. Car-Mon is not responsible for foundation design. The natural frequencies of the foundation must be sufficiently removed from the rotational frequency of the fan to avoid resonant conditions.

EQUIPMENT MOUNTED FANS

If the fan is mounted on equipment having parts which cause vibration, it is very important that the fan support is rigid enough to prevent such vibration being carried to the fan. The resonant frequency of the support should avoid the fan running speed by at least 20%. It may be advisable to use vibration isolators under the fan.

STRUCTURAL STEEL FOUNDATION

When a structural steel foundation is necessary, it should be sufficiently rigid to assure permanent alignment. It must be designed to carry, with minimum deflection, the weight of the equipment plus the loads imposed by the centrifugal forces set up by the rotating elements. We recommend welded, riveted, or suitably locked structural bolted construction to best resist vibration. In certain applications, it is recommended that vibration isolators, selected specifically for weight and span conditions, be installed.

Fans installed above ground level should be located near to, or above a rigid wall or heavy column. An overhead platform or support must be rigidly constructed, level and sturdily braced in all directions.

POURED CONCRETE FOUNDATIONS RECOMMENDED

Poured concrete under the fan and all drive components is the best fan foundation. a generally accepted rule of thumb is that the weight of the concrete foundation be a least three (3) times the total weight of the equipment it will support. This weight acts as an inertia block to stabilize the foundation. Where the ground is soft the foundations should be flared or the footing course increased in size to resist settling. the top should extend at least size (6) inches outside the outline of the fan base and should be beveled on the edges to prevent chipping.

VIBRATION ISOLATION

Car-Mon recommends the use of vibration isolation. Rubber in shear (RIS) can be used with the fan mounted on grade with fan wheel diameters up to but not including 27 inches. At 27" and larger only spring isolation should be used. Other construction is available. On occasion it may be advisable to use an isolation base to better distribute the load to be isolated.

WIRING

Make sure that the fan is wired properly and the motor is running in the proper direction. Damage caused to motors by improper wiring will not be covered in the warranty. Wiring diagrams for most of the motors supplied on our fans are located on page 6. There should also be a wiring diagram on each motor plate. If you do not have the proper diagram, please contact the factory and they will send or fax a copy to you.

PRE-OPERATION INSPECTION

With the fan mounted in operating position:

1. Lock out electrical power to prevent accidental fan operation.
2. Recheck tightness of foundation bolts, wheel setscrews, motor mounting bolts, bearing bolts and setscrews, coupling setscrews, access door bolts, etc. Tighten to proper torque values if necessary. NOTE: Fan hub setscrews should be tightened when vertically below the shaft.
3. Rotate wheel manually to make sure it runs freely without binding or striking the inlet or housing. If the wheel strikes the housing, the wheel may have to be moved on the shaft.
4. If equipped with inlet vanes and/or dampers, check for correct linkage operation. Make sure that the operator opens and closes these control devices to the proper position.
5. If this product was furnished with a motor mounted by the factory, refer to and observe the motor manufacturer's instructions attached to the fan before removing the electrical lockout of the power source.

START UP

Check the correct direction of rotation by "hitting" the ON button and then the OFF button. Correct the rotation if necessary and the unit can be put into service. Keep a close watch for any unusual vibration, noise, etc.

If you observe any unusual vibration or noise, stop and lockout the unit and recheck all items in the preoperation inspection check list above before requesting assistance from our factor representative.

After 24 hours of satisfactory operation, shut down the equipment and check all foundation bolts and setscrews for looseness, tightening where required.

SOME CAUSES OF VIBRATION

1. Motor: Misaligned or unbalanced, worn bearings, loose bolts or setscrews.
2. Bent shaft: Equipment dropped during shipment or installation.
3. Coupling: Misaligned
4. Loose foundation mounting bolts.
5. Wheel: Loose setscrews, material accumulation or wear and erosion causing imbalance.
6. Fan inlet or outlet volume control devices completely closed off.
7. External source of transmitted vibration.

MAINTENANCE

A planned program of regularly scheduled maintenance will return dividends in averting a possible costly and unexpected period of down time. Following are some of the more imprint considerations:

1. Bolt and setscrew tightness. Check bolts and setscrews to assure they are still tight.
2. Wheel wear or material build up on wheel causing unbalance will quickly damage bearings or cause self-destruction of the fan wheel. Check for any build up of foreign material.

SAFETY PRECAUTIONS

Any piece of machinery should be treated with respect and not over confidence. Over confidence usually leads to carelessness and carelessness leads to injury. Following is a list of safety DO'S and DON'TS.

DO

1. If there is no inlet duct work, fan should be equipped with an inlet screen.
2. If there is no outlet duct work, fan should be equipped with an outlet screen.
3. Make sure fan is stopped and electrical power locked out before putting hands into fan inlet or outlet opening or near belt drive. We suggest a warning sign on START SWITCH cautioning not to start when fan is being serviced and a padlock on the disconnect.

DO NOT

1. Put hands near or allow loose and hanging clothing to be near belts, sheaves, couplings or cooling wheels while fan is running.
2. Put hands into inlet or outlet while fan is running.

It is sometimes difficult to tell whether or not a fan is running. BE SURE it is not running and cannot be operated before any inspection.

ADDITIONAL SAFETY PRACTICES

For additional safety practices on installation and operation, please consult AMCA Publication 410-96 "Safety Practices For Users and Installers of Industrial and Commercial Fans" A copy of this should be enclosed in the packet with these instructions. If copy was missing or you require extras, please contact Car-Mon Customer Services.

LUBRICATION

Motors are ball bearing motors and have been given any lubrication, if necessary, at the factory before the test run. No lubricant is necessary unless the motor has not been used over a year. (please note that some smaller Baldor motors up to ¾ HP, may not require any lubrication.

Type of Grease

A high grade ball and roller bearing grease. Recommended greases for standard service are:
Shell Dolium or Chevron SRI

RELUBRICATION SCHEDULE

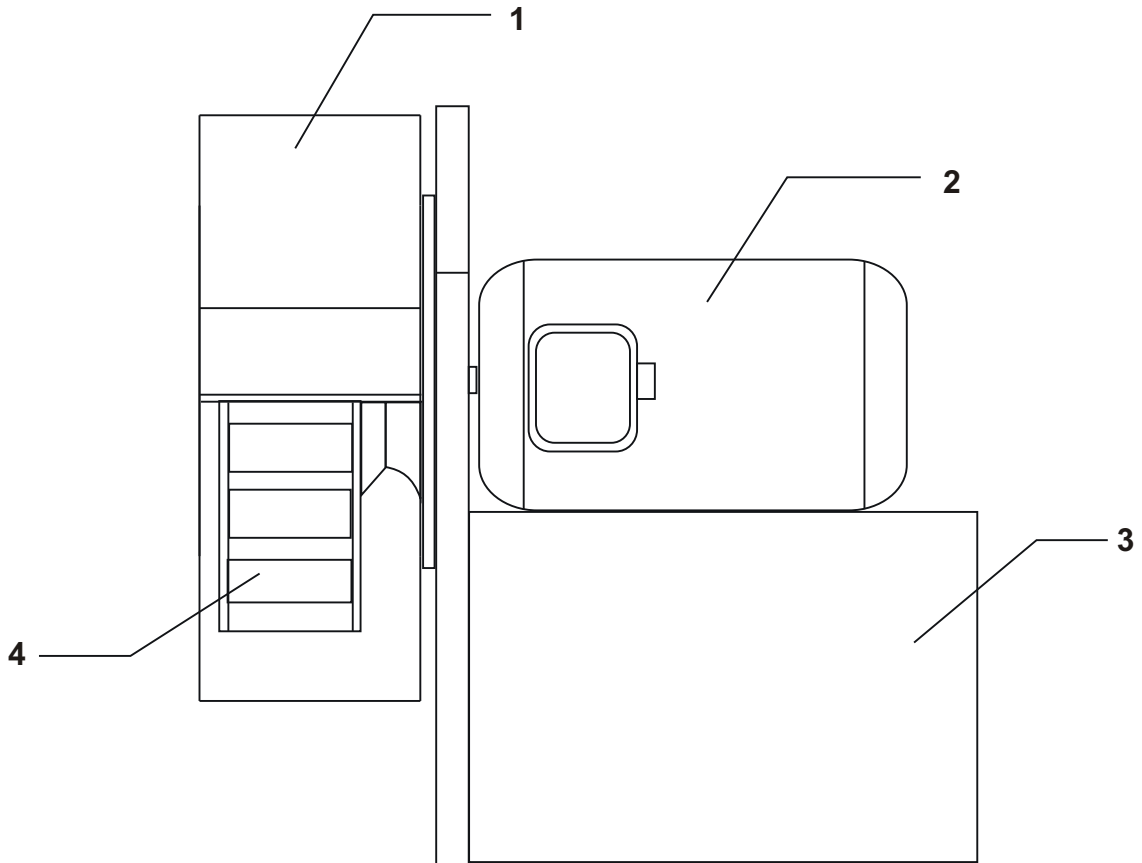
NEMA (IEC) FRAME SIZE	RATED SPEED - RPM		
	3600	1800	1200
Up to 210 including (132)	5500 hrs.	12000 hrs.	18000 hrs.
Over 210 to 2890 including (180)	3600 hrs.	9500 hrs.	15000 hrs.

Above table is for standard conditions. For Severe conditions, multiply above hours by .5. For Extreme conditions, multiply by .1

SERVICE CONDITIONS

STANDARD	40°C Maximum temperature, Clean Area, Little Corrosion Motors with Deep Groove Ball Bearing
SEVERE	50°C Maximum temperature, Moderate Dirt & Corrosion Motors with Ball Thrust, Roller Bearing
EXTREME	>50°C or Class H Insulation, Severe Dirt, Dust, or Abrasive Atmosphere-Motors with all Bearings. (Note for temperature of over 50°C, high temp grease must be used.)

CMD FAN PARTS



CAR-MON JOB # _____

1. FAN HOUSING

2. MOTOR _____

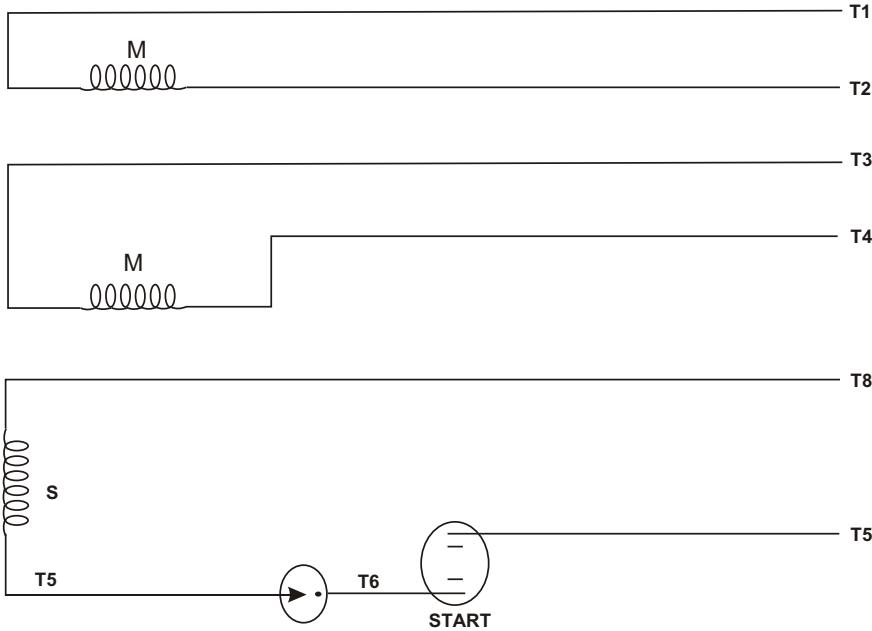
3. FAN BASE

4. FAN WHEEL

See page 6 for wiring diagram-If motor number is not listed on diagram, check motor plate. If diagram cannot be found, please call factory for assistance.

This diagram covers
 most standard ODP, 1-phase
 Leeson motors
 (½ HP THRU 1½ HP)
 supplied on Car-Mon CMD fans.
 Check model numbers below.
 100337
 100340
 110360
 110361
 110097

**SINGLE PHASE, CAPACITOR START
 TYPE C, NOT THERMALLY PROTECTED,
 DUAL VOLTAGE, DUAL ROTATION, 6 LEAD**



Rotation Facing Lead End		L1	L2	Join
High Volt	C.C.W. ROT.	T1	T4 T5	T2, T3. T8
	C.W. ROT.	T1	T4 T8	T2, T3. T5
Low Volt	C.C.W. ROT.	T1, T3 T8	T2, T4, T5	—
	C.W. ROT.	T1, T3 T5	T2, T4 T8	—

WIRING DIAGRAM FOR THREE PHASE BALDOR MOTORS

This diagram covers
 most standard ODP, 3-phase
 Baldor motors
 (½ HP THRU 1½ HP)
 supplied on Car-Mon CMD fans.
 Check model numbers below.

M3009
 M3111
 M3115
 M3120 (T)

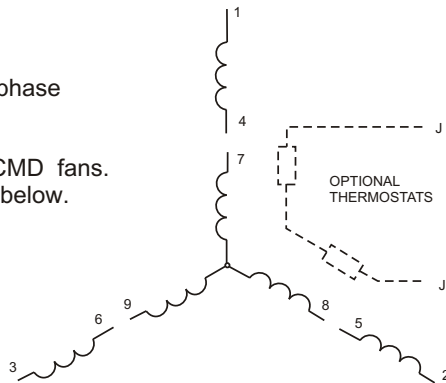
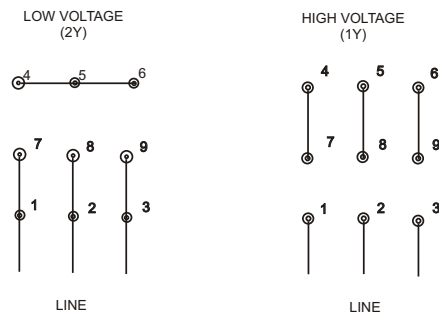


DIAGRAM SUPPLIED BY BALDOR ELECTRIC
 3PH DV, 9 LEADS

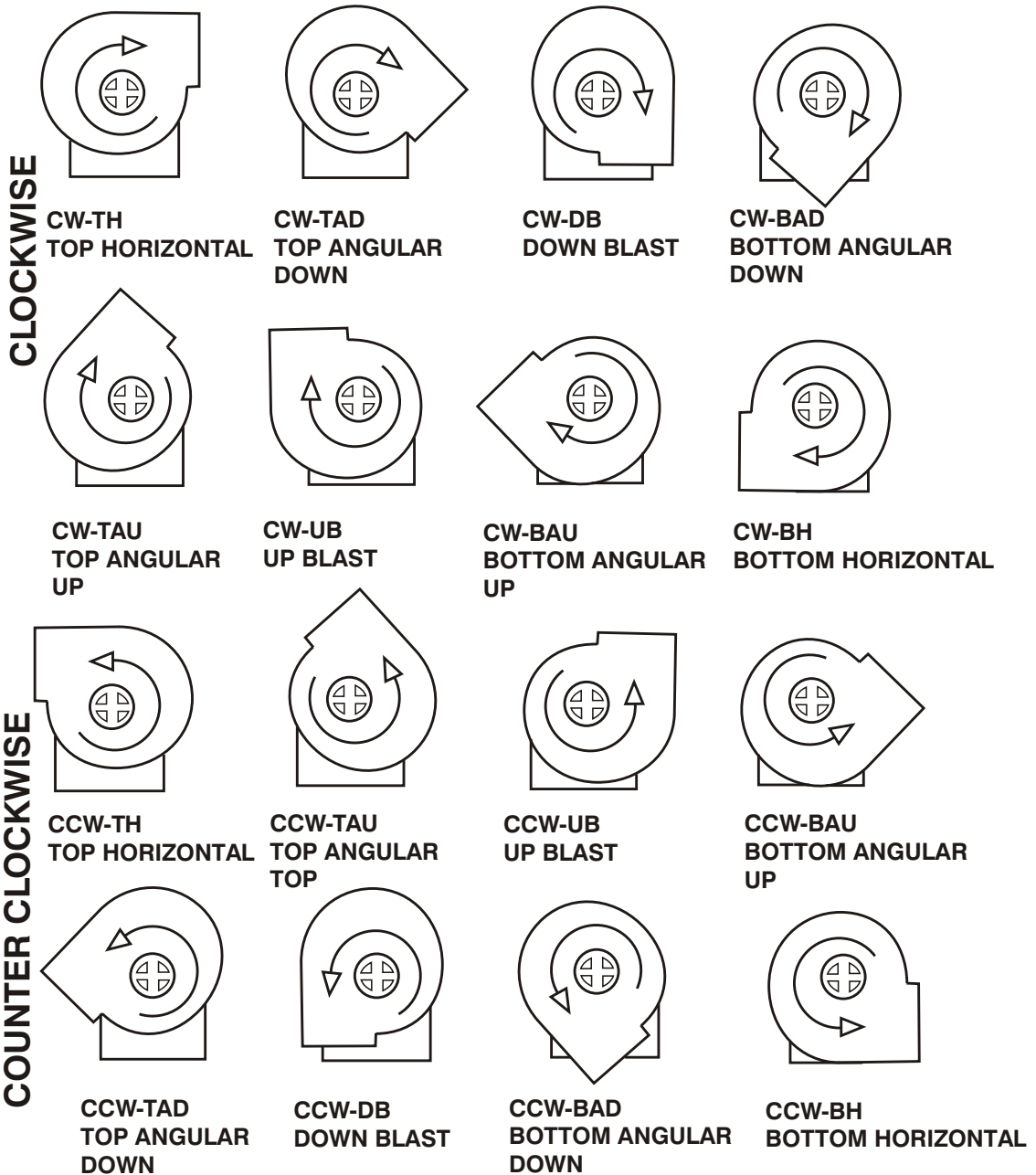


NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED ONLY WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.

ROTATION AND DISCHARGE GUIDE

When determining rotation and discharge, you will be looking at the fan from the MOTOR end.



LIMITED WARRANTY

Car-Mon Products, Inc. shall replace or repair at its discretion any products or components sold or manufactured which prove to be defective in workmanship or materials within 1 year from date of shipment.

The foregoing is in lieu of all warranties, expressed or implied, and all other obligations or liabilities on behalf of the company, regarding products it may manufacture or sell. Except as otherwise provided herein, the purchaser accepts the product "as is".

No warranty is made regarding the suitability or compatibility of any Car-Mon product for a particular application or purpose unless specifically stated. The Customer is responsible for the final selection and utilization of Car-Mon products for their use. The Customer assumes all liability for the consequences of performance, application, use and/or misuse by employees of products purchased from Car-Mon Products, Inc.

In no event shall Car-Mon Products, Inc. be liable for consequential or special damages; for transportation, labor, or other charges for adjustment, replacement, installation, incorrect electrical connections, overloading of motor, performance at low voltage, or other alterations which may be performed in connection with such products. The warranty specified herein is waived in the event that the Distributor, Contractor, or Purchaser perform any unauthorized repairs or modifications to the product.

With regard to products or components which are furnished by Car-Mon, Inc. but not manufactured by Car-Mon, Inc., the warranty obligation of Car-Mon shall be limited to and be the same as that of its supplier.

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