

CAR-MON

INSTALLATION, OPERATION, & MAINTENANCE FOR CAR-MON EXHAUST FANS SERIES CMB, SL, & BXi

CONTENTS

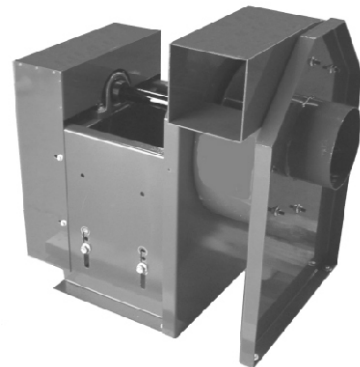
Topic	Location
General Information	Page 2
Installation	Page 3
Pre-operation inspection	Page 4
Start Up	Page 4
Maintenance	Page 5
Safety Precautions	Page 5
Lubrication	Page 6
CMB Parts List	Page 7
CMSL Parts List	Page 8
Wiring Diagram	Page 9-10
Rotation Guide	Page 11
Warranty	Page 2



SERIES CMB



SERIES SL



SERIES BXi

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.

GENERAL INFORMATION

RECEIVING & INSPECTION

When receiving fans, a thorough inspection of the fan must be made to assure no damage was incurred during shipment. Check fan completely for any dents or scratches. If any damage is found, report damage to carrier and notify factory immediately. Failure to report any shipping damage may result in additional costs to the customer. If possible, take pictures (preferably digital) of the damage. If there is minor damage and can be repaired at sight, contact factory for replacement parts or touch-up paint. Any damage to working parts of fan (wheel, shaft, motor,) may require a return to the factory. Call factory for a return goods authorization.

IDENTIFICATION INFORMATION

Every fan manufactured by Car-Mon products is thoroughly tested before it leaves the factory, and is assigned a manufacturing number.



Information on fan housing will include a rotation arrow, testing information, and fan identification tag. (see right)

CAR-MON		1225 Davis Road Elgin, IL 60123-1317 847-695-9000	
Model	①	Max. Fan RPM	Motor Phase/Hz. ④
No.	②	Max. Fan Temp	Motor Volts ⑤
	③	Max. Fan BHP	Motor HP/RPM ⑥

WARNING Do not install, operate or maintain this equipment unless you have read and understand the installation, operation and maintenance instructions and safety practices recommended for this equipment.

CAR-MON FAN IDENTIFICATION TAG

1. Fan model #
2. Factory order #
3. Tag# (Customer supplied.)
4. Phase
5. Voltage
6. Motor Horsepower, Motor RPM

When contacting factory on any information or when ordering replacement parts for the fan, it is necessary to have the factory order number found on the Car-Mon information label attached to the fan. (#2 on identification tag above)

WARRANTY INFORMATION

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.

CAR-MON PRODUCTS, INC. 1225 Davis Road, Elgin, IL 60123 Phone (847) 695-9000
Web Site: www.car-mon.com e-mail: info@car-mon.com

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. If fans are stored for a considerable period that may pass the time of the warranty agreement, the warranty will not apply.

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 in this manual. There should also be a wiring diagram on each motor plate. If you do not have the proper diagram, please contact the factory with the motor brand and model number and we will send a copy of the diagram 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. Check bearing alignment and make certain they are properly locked to the shaft and lubricated if applicable.
5. If fan is belt driven, check sheave alignment. Improper sheave alignment is one of the most frequent causes of excessive fan vibration. Check belt tension. Belt tension is the usual cause of shortened belt bearing life.
6. 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.
7. 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. Bearings: Misaligned or worn loose bolts or setscrews.
2. Motor: Misaligned or unbalanced, worn bearings, loose bolts or setscrews.
3. Bent shaft: Equipment dropped during shipment or installation.
4. Coupling: Misaligned
5. Loose foundation mounting bolts.
6. Wheel: Loose setscrews, material accumulation or wear and erosion causing imbalance.
7. Fan inlet or outlet volume control devices completely closed off.
8. External source of transmitted vibration.

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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. On a belt drive unit, fan should be equipped with either a belt guard or a weather hood.
2. If there is no inlet duct work, fan should be equipped with an inlet screen.
3. If there is no outlet duct work, fan should be equipped with an outlet screen.
4. 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.

MAINTENANCE & ADJUSTMENTS

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 important considerations:

1. Bearings are pre-lubricated at the factory. For grease recommendations see bearing manufacturer or consult factory.
2. Bolt and setscrew tightness. Check bolts and setscrews to assure they are still tight.
3. V belt drive, worn belts or sheaves, proper tension. Check periodically to see if these parts are showing excessive wear. If it is necessary to replace one belt on a multiple belt drive unit, replace **all** the belts with a matched set.
4. 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.

MODIFYING FAN PERFORMANCE-BELT DRIVE FANS

If you want to raise or lower a belt drive fan's performance by opening or closing the adjustable sheave, it is highly recommended that before making these adjustments you consult the factory or the Car-Mon Fan Catalog to assure the motor horsepower is adequate for the new performance. If you need an additional sheave or another motor, please contact your local Car-Mon representative. Please note that changing performance, drives, or motors may void the original factory warranty.



The adjustable sheave is mounted on the motor. The fan's performance can be increased or decreased by opening or closing the sheave. Before making adjustments, please call the factory. Improper adjustment may seriously damage the motor and void the warranty of the fan.

LUBRICATION MOTORS

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:

RELUBRICATION SCHEDULE

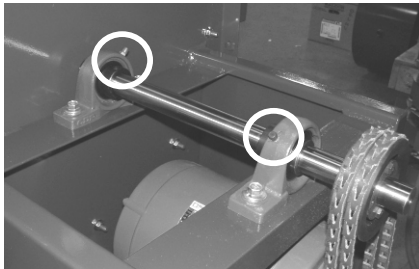
NEMA (IEC) FRAME SIZE	RATED SPEED - RPM		
	3600	1800	1200
Up to 210 including (132)	5500 hrs.	12000 hrs.	18000 hrs.
Over 210 to 2890 including (180)	3600 hrs.	9500 hrs.	15000 hrs.

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.)

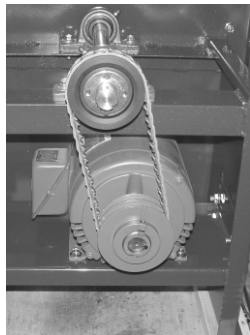
BEARINGS



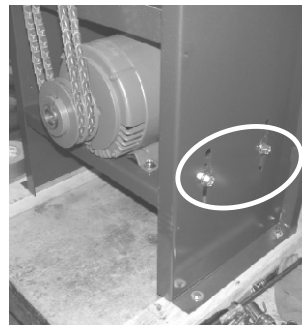
Bearings are greased at factory before the fan is tested. Under normal use, bearings need not be greased at regular intervals, but if needed, use a high quality bearing grease and grease at points indicated.

PHOTOS IN THIS SECTION APPLY TO CMB AND BXi SERIES ONLY

CHANGING FAN BELTS



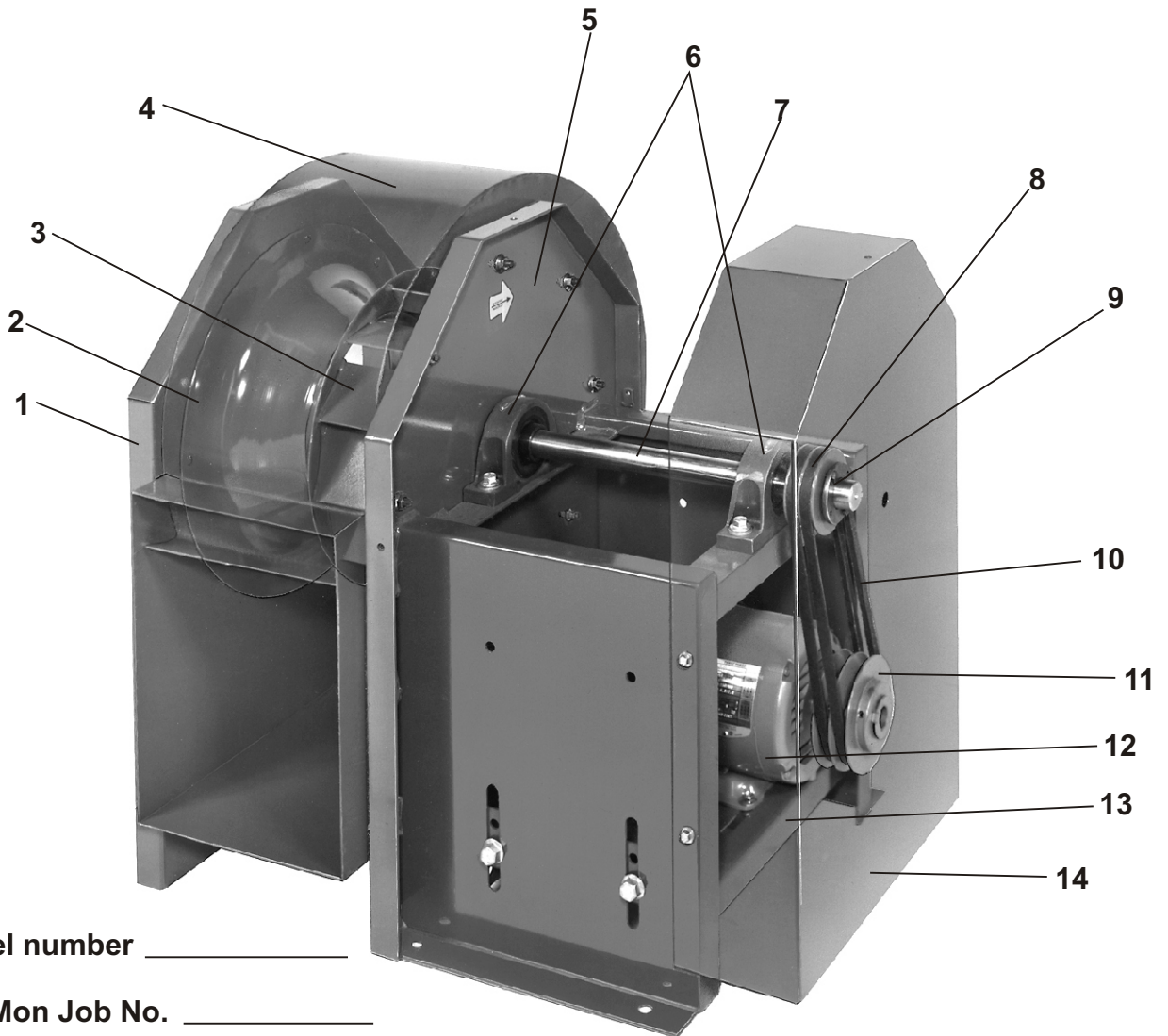
Under normal use, fan belts may last for years, however they should be checked annually for wear. Disconnect power from fan, remove belt cover, and check both belts carefully.



To change the fan belts, loosen the bolts on both sides of the motor base, raise base up several inches until belts are clear of drives. Remove old belts and install new belts. Untighten motor base and drop until tight. Make sure that belts are tight and aligned.

To get parts information from factory, you must reference the serial number on the Car-Mon label attached to the fan. See Page 2.

**CMB Series Fans
Parts Guide**
NOTE: Since BXi fans are similar in construction, parts will be noted with this illustration.



Model number _____

Car-Mon Job No. _____

Tag # _____

Fan performance set at _____

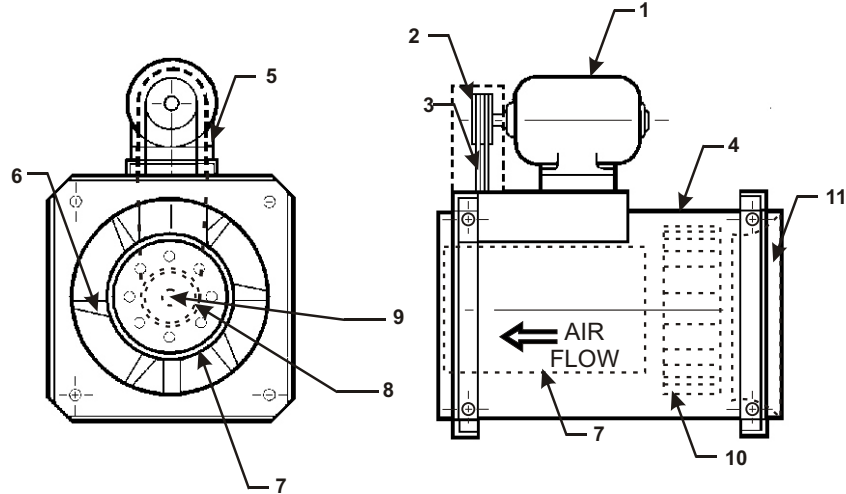
- 1. Inlet support
- 2. Inlet spinning
- 3. Wheel
- 4. Housing
- 5. Fan Frame
- 6. Shaft bearings (Consult Factory)
- 7. Shaft
- 8. Shaft sheave* _____

- 9. Split tapered bushing
- 10. Pulley belts* _____
- 11. Motor sheave* _____
- 12. Motor* _____
- 13. Motor base
- 14. Belt Guard

Weather cover not shown

*Indicates recommended spare parts

CMSL FAN PARTS LIST



MODEL # _____ SL CAR-MON # _____

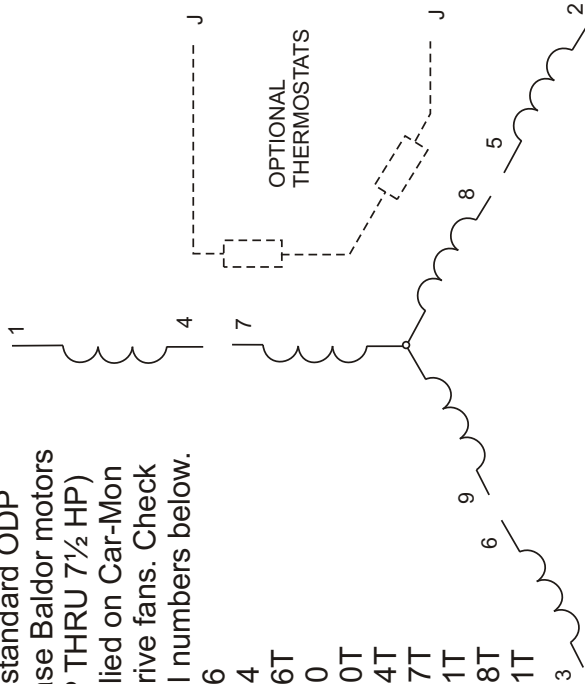
1. MOTOR* _____
2. MOTOR SHEAVE* _____
3. BELTS* (2 REQUIRED)* _____
4. HOUSING & SUPPORTS
5. BELT GUARDS
6. LOUVERS
7. DRIVE TUNNEL & COVER
8. SHAFT SHEAVE* _____
9. SHAFT
10. FAN WHEEL
11. INLET SPINNING

*Indicates replaceable parts

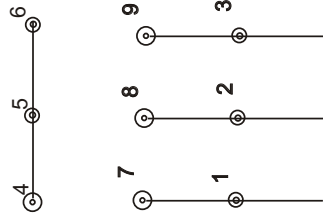
WIRING DIAGRAM FOR THREE PHASE BALDOR MOTORS

This diagram covers most standard ODP 3-phase Baldor motors (1 HP THRU 7½ HP) supplied on Car-Mon belt drive fans. Check model numbers below.

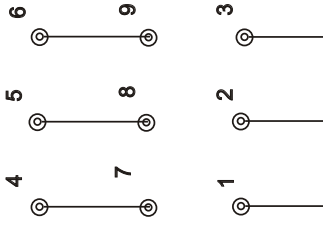
- M3116
- M3154
- M3116T
- M3120
- M3120T
- M3154T
- M3157T
- M3211T
- M3218T
- M3311T



LOW VOLTAGE
(2Y)



HIGH VOLTAGE
(1Y)



LINE

LINE

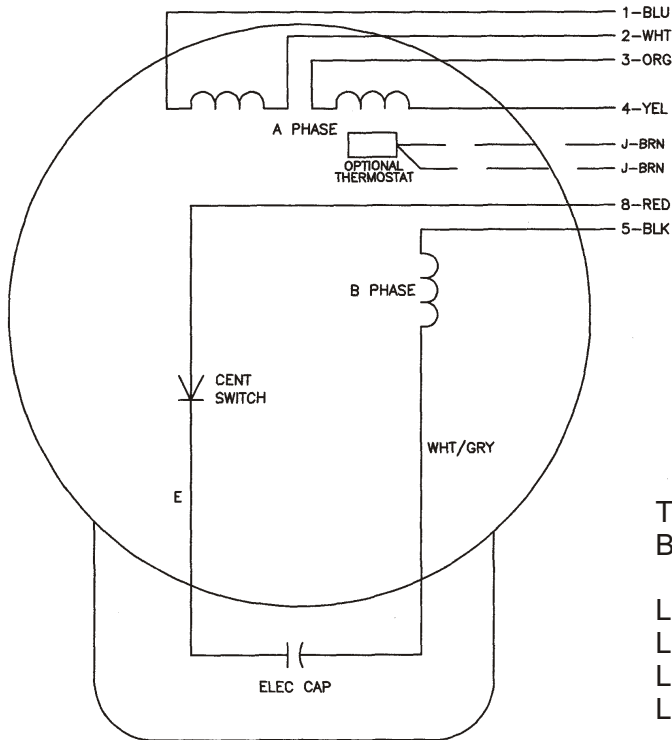
NOTES:

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.

DIAGRAM SUPPLIED BY BALDOR ELECTRIC
3PH DV, 9 LEADS

IF THE MOTOR ON YOUR FAN IS NOT LISTED IN THE MODEL NUMBERS LISTED BELOW, SEE PAGE 12. FOR SINGLE PHASE BALDOR MOTORS SEE PAGE 10.

WIRING DIAGRAM FOR SINGLE PHASE BALDOR MOTORS



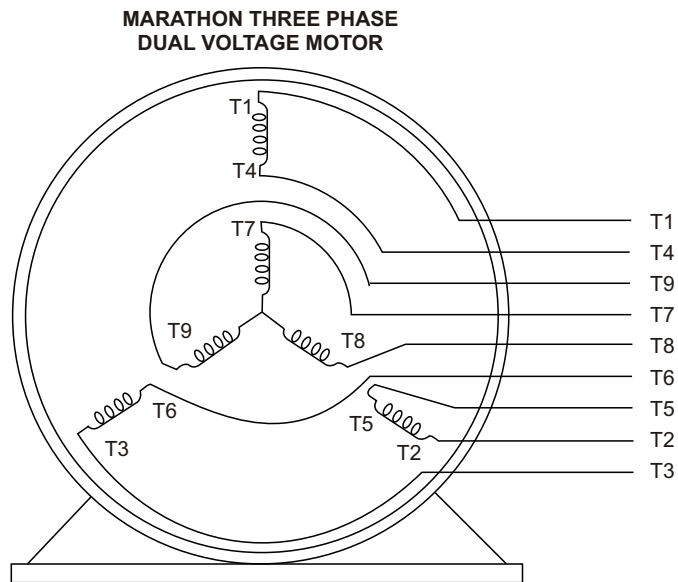
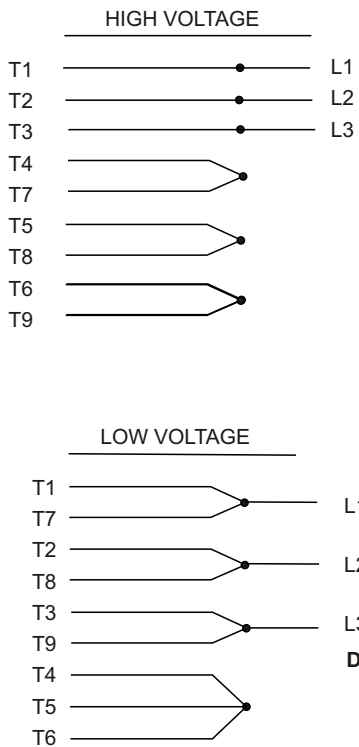
	LINE A	LINE B	JOIN
HIGH STD	1	4,5	2,3,8
HIGH OPP	1	4,8	2,3,5
LOW STD	1,3,8	2,4,5	-
LOW OPP	1,3,5	2,4,8	-

NOTES:

1. STANDARD ROTATION IS CCW FACING END OPPOSITE SHAFT EXTENSION.
2. OPTIONAL THERMOSTAT IS PROVIDED WHEN SPECIFIED.
3. MULTIPLE CAPACITORS ARE CONNECTED IN PARALLEL UNLESS OTHERWISE SPECIFIED.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

THIS DIAGRAM IS FOR THE FOLLOWING BALDOR MOTOR MODELS

- L1304, L1304T
 L1307, L1307T
 L1318, L1318T
 L1319, L1319T
- IF THE MOTOR ON YOUR FAN IS NOT LISTED IN THE MODEL NUMBERS LISTED BELOW, SEE PAGE 12

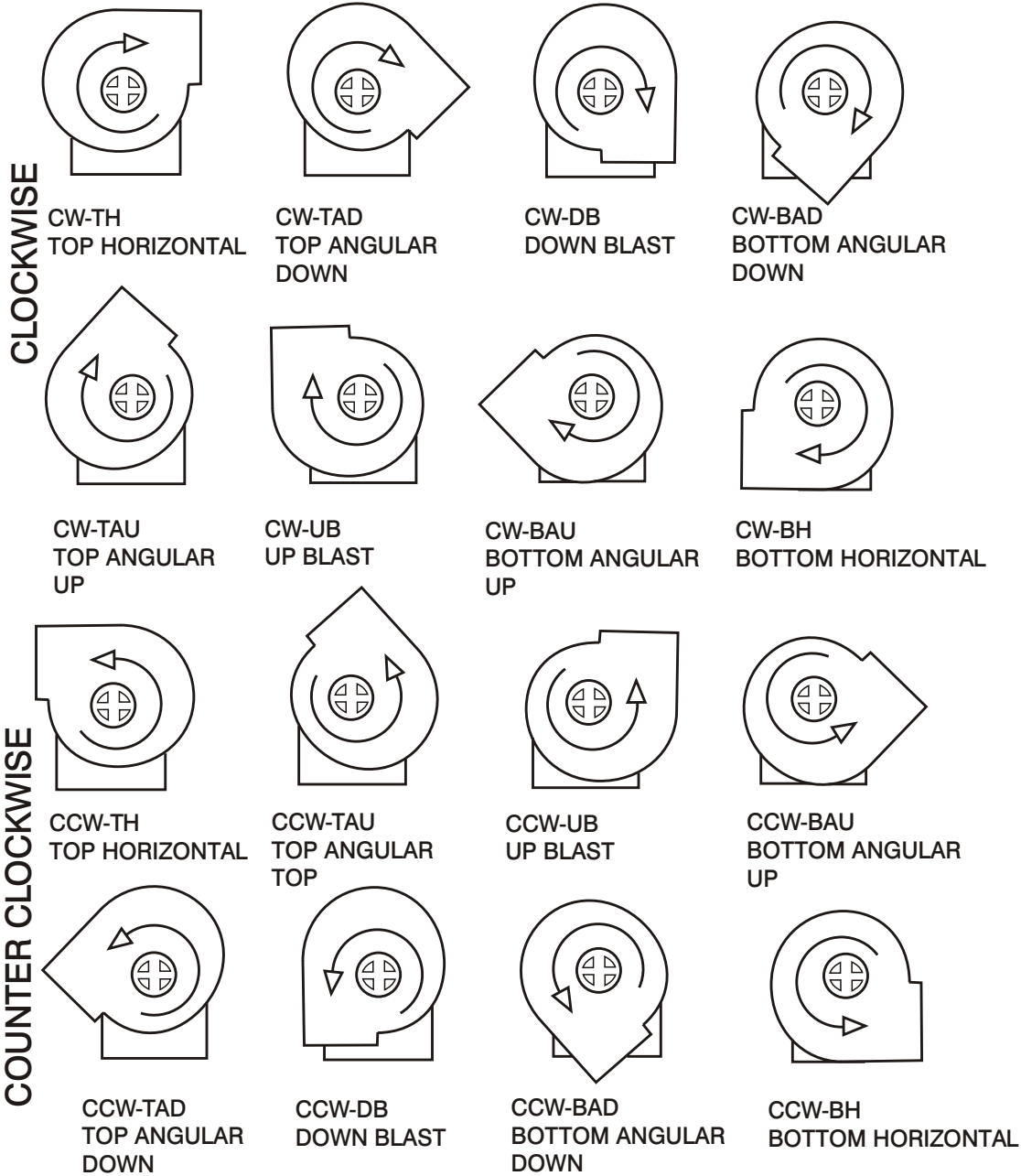


VIEW OF TERMINAL END

DIAGRAM IS FOR THE FOLLOWING MARATHON MOTORS: E716, E717, E718, E719

ROTATION AND DISCHARGE GUIDE

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



MOTOR WIRING GUIDES

If the motor on your fan does not match any of the wiring diagrams supplied, you may contact the factory or the motor manufacturer directly. All of the motor companies can be reached directly on the internet, with links to provide wiring diagrams. You may also contact them for the closest service center in the event you may need a warranty repair.

BALDOR MOTORS

www.baldor.com

Fax information to : 501-648-5791

WEG MOTORS

www.weg.net

Phone: 800-839-2529

LEESON MOTORS

www.leeson.com

Phone: 262.377.8810