

Dayton Integral HP Motors

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Motor Installation and Maintenance Information

*Please read and save these instructions.
Read carefully before attempting to assemble,
install, operate or maintain the product described.
Protect yourself and others by observing all safety
information. Failure to comply with instructions
could result in personal injury and/or property
damage! Retain instructions for future reference.*

Dayton®

Initial Inspection and Handling

- After opening carton, look for concealed damage. If concealed damage is found, immediately file claim with carrier.
- Check the nameplate to verify that data conforms to specifications of motor ordered.

▲ WARNING *Eyebolts are intended for lifting motor only and must not be used to lift any other weight or attached equipment such as a pump or gearbox. Lifting and handling in the U.S.A. must be in accordance with NEMA-MG-2.*

▲ DANGER *High voltage and moving parts around motors and motor driven equipment can cause serious or fatal injuries. Always disconnect power source before working*

on a motor or its connected load. Installation must conform to all OSHA requirements and the National Electrical Code (NEC) in the United States, and all local codes.

Electrical – Motor must be securely and adequately grounded by wiring with a grounded metallic conduit, or other grounding method approved by the NEC and local codes.

Insulate all connections carefully to prevent grounding or short circuits. Reinstall all conduit and terminal box covers. Do not force connections into the conduit box.

Thermal Protection – Use thermally protected motors or a motor starter incorporating thermal overload protection wherever required by safety regulations such as NEC or Underwriter Laboratories (UL) Standards in the United States; or where overloading, jamming or other abnormal operating conditions may occur. Under low temperature conditions, manual reset protectors may reset automatically, causing motor to start unexpectedly. **Always disconnect power before working on equipment.**

Mechanical – Guard all moving parts. Remove the shaft key before running the motor without a connected load. Be careful when touching the exterior of an operating motor! Motor may be hot enough to be painful or cause injury. This condition is normal for most motors when operated at rated load and voltage. Do not use the motor in a hazardous location [as defined by Article 500 of the National Electrical Code (NEC) unless labeled for that location.

Storage – Motor should be stored indoors in a clean, dry location.

Location

- **Open, Dripproof Motor** – Clean dry locations with access to an adequate supply of cooling air.
- **Totally Enclosed Motor** – Harsher environments where damp and dirty conditions may exist. Totally enclosed motors are not waterproof.
- Use only UL listed Hazardous Location motors for service in Hazardous Locations (as defined in Article 500 of the NEC).
- Temperature around the motor (ambient) should not exceed 104°F (40°C) unless motor nameplate states otherwise. Minimum temperature is -20°F (-29°C).

▲ CAUTION *Not for fans in unattended areas. Refer to the following for proper thermal protection, and other motor selection information.*

UL 507 STANDARD – FANS FOR USE IN UNATTENDED AREAS (PARAGRAPHS 125 & 126)

Any motor used in a fan product, such as bathroom exhaust fans, wall-insert fans, ceiling-insert fans, attic exhaust fans, whole house fans and duct fans, etc., which are built into or within the building structure and which are likely to operate unattended or in situations in which the operator may not detect a locked rotor (stalled motor) condition must have either a manual reset thermal protector or a thermal cut-off (one-shot) device. Rangehoods, circulating fans, pedestal fans and ceiling suspended fans are not included. Agricultural

fans are included, if they are built into the building structure and are likely to operate unattended or in situations in which the person operating the fan may not detect a locked rotor (stalled motor) condition.

Power Source

- Voltage, frequency and phase of the power supply must correspond to that shown on the motor nameplate. Low voltage can reduce performance and cause overheating.
- Line voltages on all three lines should be balanced within 1%. Unbalanced voltages cause motor overheating and poor performance.

Motor Control Devices

- Use of a suitable motor starter, either manual or magnetic, incorporating thermal overload protection is advisable and usually required by local electrical codes.
- Power supply must have fuses or circuit breakers to provide short circuit protection for the motor and controller.
- Follow the control manufacturer's recommendations on overload heater selection or setting. If an existing controller is to be used with a replacement motor, new heaters may be required.

Motor Mounting

Motor must be securely fastened to a rigid, flat surface to prevent vibration and minimize noise. For secure mounting use high-quality bolts of the largest possible diameter.

Belt-drive sheaves must be in-line. Use a straight edge to check. Do not over-tighten belts.

Direct-coupled installations require a careful check of shaft and coupling alignment, shaft offset and/or angular misalignment should be less than .002". Shim motor base as necessary. Do not depend on a flexible coupling to compensate for misalignment.

Table A – Minimum Wire Sizes for 3-Phase Motors

Motor HP	25 to 50 Feet			100 Feet			150 to 200 Feet		
	200V	230V	460V	200V	230V	460V	200V	230V	460V
1/3	14	14(16)*	14(18)*	12	12	14(18)*	8	10	14(18)*
1/2	14	14(16)*	14(18)*	12	12	14(18)*	8	10	14(18)*
3/4	14	14(16)*	14(18)*	12	12	14(18)*	8	10	14(18)*
1	14	14(16)*	14(18)*	12	12	14(18)*	8	10	14(16)*
1 1/2	12	14	14(18)*	10	10	14(16)*	6	8	14
2	12	12	14(18)*	8	10	14(16)*	6	6	12
3	10	12	14(18)*	6	8	14	4	6	12
5	8	10	14(16)*	4	6	12	2	4	10
7 1/2	6	8	14	4	4	10	1	2	8
10	6	6	12	3	4	10	1/0	1	6
15	4	4	10	1	2	8	3/0	2/0	4
20	3	4	10	1/0	1	6	4/0	3/0	4
25	2	3	8	2/0	1/0	6	250kcmil	4/0	3
30	1	3	8	3/0	1/0	6	300kcmil	4/0	3
40	1/0	1	8	4/0	3/0	4	400kcmil	300kcmil	1
50	2/0	1	6	250kcmil	3/0	3	500kcmil	350kcmil	1
60	3/0	1/0	6	300kcmil	4/0	3	600kcmil	400kcmil	1/0
75	4/0	2/0	4	350kcmil	250kcmil	2	700kcmil	500kcmil	2/0
100	250kcmil	3/0	4	500kcmil	350kcmil	1	900kcmil	700kcmil	3/0
125	300kcmil	4/0	3	600kcmil	400kcmil	1/0	1250kcmil	800kcmil	4/0
150	350kcmil	250kcmil	2	700kcmil	500kcmil	2/0	1500kcmil	900kcmil	250kcmil
200	500kcmil	350kcmil	1/0	1250kcmil	800kcmil	4/0	1750kcmil	1250kcmil	350kcmil
250	600kcmil	400kcmil	2/0	1500kcmil	900kcmil	250kcmil	2000kcmil	1500kcmil	400kcmil

NOTE: kcmil denotes thousand circular mils. AWG sizes formerly given in MCM.

(*) Type S, SO, SJ, SJO, etc. flexible cable wire sizes. See NEC Article 400 for ampacity.

Connecting Power to Motor

To connect motor for proper voltage and rotation, refer to the connection diagram on the nameplate or inside the terminal/conduit box.

Table B – Minimum Wire Sizes for Single-Phase Motors

Motor HP	— 25 Feet —		— 50 Feet —		— 100 Feet —		— 150 feet —		— 200 feet —	
	115V	230V	115V	230V	115V	230V	115V	230V	115V	230V
1	10	14(16)*	6	12	4	10	2	8	1	6
1 1/2	8	14	6	12	3	8	1	6	1/0	6
2	8	14	4	10	2	8	1/0	6	2/0	4
3	6	12	3	8	1/0	6	2/0	4	4/0	3
5	—	10	—	6	—	4	—	2	—	1
7 1/2	—	8	—	6	—	3	—	1	—	1/0
10	—	8	—	4	—	2	—	1/0	—	2/0

(*) Type S, SO, SJ, SJO, etc. flexible cable wire sizes. See NEC Article 400 for ampacity.

NOTE:

- NEC Article 310-5 — Minimum conductor size for general wiring at 115-440VAC is No. 14AWG.
- Above wire sizes based on approximate 5% voltage drop during starting; copper conductors; and 75°C type THHW, THW, THWN, RH, RHW insulation, etc. For aluminum wire, increase two wire size steps minimum. See NEC Article 310 for ampacities of aluminum conductors.

▲ WARNING *All aspects of the installation must conform to the requirements of the NEC, including Article 430 (Motor Circuits and Controllers), and all local codes. Wherever possible, each motor should be powered from a separate circuit of adequate capacity to keep voltage drop to a minimum during starting and running. Increase wire size where motor is located a distance from the power source. Wire size must be adequate to minimize voltage drop during starting and running. Refer to Tables A and B for suggested wire sizes. Distances shown are one-way between source and motor. Portable cords, if used, should be as short as possible to minimize voltage drop. Long or inadequately sized cords, especially on hard starting loads, can cause motor failure. All electrical connections in system must be secure to prevent voltage drop and localized heating.*

- Determine direction of rotation before connecting driven equipment to prevent damage.
- To prevent bearing damage, do not strike shafts with hammer or other tool.
- If the motor has been damp or wet, then have motor serviced by a qualified motor repair shop before operating.

Starting Motor

Be sure motor is properly grounded.

Connect motor to load and run briefly. Check for unusual noises and vibration (see Troubleshooting). Check motor current; it should be close to nameplate.

Visually reinspect the installation. Make sure that the guards and other protective devices are securely in place. All covers and gaskets must be reinstalled to minimize the entry of dirt and moisture.

▲ DANGER *Before performing any maintenance, disconnect power and allow motor to come to a complete stop. Discharge capacitors, if any, to prevent electric shock.*

Recommended Maintenance

Remove dirt accumulations in and around vent openings, by vacuuming. **Dirt accumulations can cause motor overheating and a fire hazard.** Enclosed motors can be cleaned with an air jet; wear eye protection.

Periodically inspect the installation. Check for dirt accumulations; unusual noises or vibration; overheating; worn or loose couplings, sheaves and belts; high motor current; poor wiring or overheated connections; loose mounting bolts or guards; and worn motor starter contacts.

Dayton ball-bearing motors without lubrication provision do not require periodic relubrication. Where motor has provision for bearing lubrication, lubricate as follows:

1. After stopping motor and disconnecting power, thoroughly wipe the housing around both of the motor bearings, filler and drain plugs (on TEFC ratings, remove fan cover for access to plugs).
2. Remove filler and drain plugs and install a 1/8" pipe thread lube fitting in filler hole.
3. Using a low pressure grease gun, pump new grease into motor until it appears at the drain hole.
4. Run motor for several minutes to discharge excess grease. Shut motor OFF, replace filler and drain plugs, and reinstall fan cover.

See Table C for suggested regreasing intervals.

Table C – Suggested Regreasing Intervals

Type of Service	— Motor HP at 1800 RPM Max. —		
	Under 50	50 to 100	Over 100
Infrequent operation or light duty in clean atmosphere	2 Years	2 Years	1 Year
8 to 16 hours per day in clean, relatively dry atmosphere	2 Years	1 1/2 Years	1 Year
12 to 24 hours per day heavy duty use, or if moisture is present	1 Year	1 Year	6 Months
Heavy duty use in dirty, dusty locations; high ambients; moisture laden atmosphere; constant vibration	4 Months	4 Months	3 Months

Note 1: Motors operating faster than 1800 RPM should be relubricated on a more frequent maintenance schedule. Use a reputable brand lithium or synthetic-base grease intended for electric motor ball bearings. Recommended greases include: Standard Oil of California (Chevron) SRI#2, and Exxon Corp. PolyRex-EM. Keep grease container clean and covered.

Note 2: For motors used on food or drug handling applications, select a grease acceptable to the Food and Drug Administration in the U.S.A., and similar government bodies.

Note 3: For Class F insulated motors, select a grease with adequate high temperature rating to withstand high motor operating temperatures.

For Repair Parts, call 1-800-323-0620
24 hours a day – 365 days a year

Please provide following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:
Grainger Parts
P.O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

LIMITED WARRANTY

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DAYTON ONE-YEAR LIMITED WARRANTY. Dayton® electric motors are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately; however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

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PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co.
5959 W. Howard St.,
Niles, Illinois 60714 U.S.A.

Printed in U.S.A. © 2001 W.W. Grainger, Inc.

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Dayton®

Motores de potencia integral Dayton

Información para instalación y mantenimiento del motor

Por favor lea y guarde estas instrucciones. Léalas cuidadosamente antes de tratar de montar, instalar, operar o dar mantenimiento al producto aquí descrito. Protéjase usted mismo y a los demás siguiendo toda la información de seguridad. ¡El no cumplir con las instrucciones puede ocasionar daños, tanto personales como en la propiedad! Guarde estas instrucciones para referencia en el futuro.

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