



ELECTRIC MOTOR

OWNER'S MANUAL



WARNING:

Read carefully and understand all **ASSEMBLY AND OPERATION INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Item#s 29559, 29560, 29624, 29625

Thank you very much for choosing an Ironton™ product! For future reference, please complete the owner's record below:

Model: _____ Purchase Date: _____

Save the receipt, warranty and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This machine is designed for certain applications only. The distributor cannot be responsible for issues arising from modification. We strongly recommend this machine not be modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted the distributor to determine if it can or should be performed on the product.

For technical questions please call **1-800-222-5381**.

INTENDED USE:

Motor model#s 29559, 29624 and 29625 is designed for compressor duty applications, which require high breakdown torque. Model# 29560 has a split-phase motor and is designed for commercial duty air fan motors for air circulators.

SPECIFICATIONS:	29624	29625	29559	29560
Motor HP	3	5	2	1/2
Rated speed	3450 RPM	3450 RPM	3450 RPM	1725 RPM
Volts	240	208-230	120/240	115/230
Amps	15@240V	23@208V-22@230V	15@120V/7.5@240V	7.2@115V/3.6@230V
Hertz	60Hz	60Hz	60Hz	60Hz
Motor Phase	Single	Single	Single	Split
Shank diameter(in)	5/8	7/8	5/8	1/2
Shank Length(in)	2 1/4	2 7/10	2 1/4	2
Frame Type	56	56	56	48
Rotation Direction	CCW-DC	CCW-DC	CCW-DC	Clockwise or counterclockwise
Open Drip Proof Housing	Yes	Yes	Yes	Yes
Capacitor	Cap Start & Cap Run	Cap Start & Cap Run	Cap Start & Cap Run	None
Manual Overload Protection	Yes	Yes	Yes	None

GENERAL SAFETY RULES



WARNING: Read and understand all instructions. Failure to follow all instructions listed below may result in serious injury.



CAUTION: Do not allow persons to operate or install this Electric Motor until they have read this manual and have developed a thorough understanding of how the Electric Motor works.



WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur. It must be understood by the operator that common sense and caution are factors that cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY CONSIDERATIONS

WORK AREA

- **Keep work area clean**, free of clutter and well lit. Cluttered and dark work areas can cause accidents.
- **Do not use your tool where there is a risk of causing a fire or an explosion;** e.g. in the presence of flammable liquids, gasses, or dust. Power tools create sparks, which may ignite the dust or fumes.
- **Keep children and bystanders** away while operating a power tool. Distractions can cause you to lose control, so visitors should remain at a safe distance from the work area.
- **Be aware of all power lines, electrical circuits,** water pipes and other mechanical hazards in your work area, particularly those hazards below the work surface hidden from the operator's view that may be unintentionally contacted and may cause personal harm or property damage.
- **Be alert of your surroundings.** Using power tools in confined work areas may put you dangerously close to cutting tools and rotating parts.

ELECTRICAL SAFETY



- **WARNING:** Always check to ensure the power supply corresponds to the voltage on the rating plate.
- **Do not abuse the cord.** Never carry a portable tool by its power cord, or yank tool or extension cords from the receptacle. Keep power and extension cords away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords may cause a fire and increase the risk of electric shock.

- **Grounded tools** must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.
- **Double insulated tools** are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still doesn't fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.
- **Avoid body contact** with grounded surfaces such as pipes, radiators, ranges, and refrigerators. There is an increased risk of electric shock if your body is grounded.
- **When operating a power tool outside**, use an outdoor extension cord marked "W-A" or "W." These cords are rated for outdoor use and reduce the risk of electric shock.
- **Extension Cord Use:**
- Use only 'Listed' extension cords. If used outdoors, they must be marked "For Outdoor Use." Those cords having 3-prong grounding type plugs and mating receptacles are to be used with grounded tools.
- Replace damaged or worn cords immediately.
- Check the nameplate rating of your tool. Use of improper size or gauge of extension cord may cause unsafe or inefficient operation of your tool. Be sure your extension cord is rated to allow sufficient current flow to the motor. For the proper wire gauge for your tool, see chart.

CHART FOR MINIMUM WIRE SIZE OF EXTENSION CORD:

Nameplate AMPS	CORD LENGTH			
	25ft.	50ft.	100ft.	150ft.
0-6	18 AWG	16 AWG	16 AWG	14 AWG
6-10	18 AWG	16 AWG	14 AWG	12 AWG
10-12	16 AWG	16 AWG	14 AWG	12 AWG
12-16	14 AWG	12 AWG	(NOT RECOMMENDED)	

If in doubt, use larger cord.

Be sure to check voltage requirements of the tool to your incoming power source.

- **Do not expose** power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- **Do not let your fingers** touch the terminals of plug when installing to or removing from the outlet.
- **Ground fault circuit interrupters.** If work area is not equipped with a permanently installed Ground Fault Circuit Interrupter outlet (GFCI), use a plug-in GFCI between power tool or extension cord and power receptacle.

PERSONAL SAFETY

- **Stay alert**, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.
- **Dress properly.** Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts. Air vents often cover moving parts and should be avoided.

- **Use safety apparel and equipment.** Use safety goggles or safety glasses with side shields which comply with current national standards, or when needed, a face shield. Use as dust mask in dusty work conditions. This applies to all persons in the work area. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate.
- **Do not overreach.** Keep proper footing and balance at all times.
- **Remove adjusting keys or wrenches** before connecting to the power supply or turning on the tool. A wrench or key that is left attached to a rotating part of the tool may result in personal injury.

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 Underwriters 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, Drip-proof Motor** – Clean dry locations with access to an adequate supply of cooling air.

- 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).



WARNING *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. Range hoods, circulating fans, pedestal fans and ceiling suspended fans are not included.

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.

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.
- Where a motor starter is used, follow the control manufacturer's recommendations on overload heater selection and setting. If an existing controller is to be used with a replacement motor, new heaters may be required.
- Any switching device used to control motor must have a horsepower rating equal to or greater than the motor.
- An electronic adjustable speed control must not be used unless the motor has been specifically designed for such applications.

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 overtighten belts.

Direct-coupled installations require a careful check of shaft and coupling alignment. Shim motor base as necessary. Do not depend on a flexible coupling to compensate for misalignment.

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 A – 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
1/8	14(18)*	14(18)*	14	14(18)*	12	14(18)*	10	14(16)*	8	14
1/6	14(16)*	14(18)*	12	14(18)*	10	14(16)*	6	14	6	12
1/4	14	14(18)*	10	14(16)*	8	14	6	12	4	10
1/3	14	14(18)*	10	14(16)*	8	14	6	12	4	10
1/2	12	14(18)*	8	14	6	12	4	10	3	8
3/4	10	14(16)*	6	12	4	10	2	8	1	6
1	10	14(16)*	6	12	4	10	2	8	1	6
1½	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
7½	—	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.

NEC Article 310-5 — Minimum conductor size for general wiring at 115-440VAC is No. 14AWG.

NOTE: 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 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, 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.

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.

Exercise caution with solvents; some solvents may attack motor insulation, finish or bearing lubricants; some are highly flammable. If solvents are used, make sure area is well ventilated.

Ironton 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 B for suggested regreasing intervals.

Table B – 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	1½ 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 of lithium, polyurea based #2 or synthetic-based. 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.

TROUBLESHOOTING CHART

This chart suggests common answers to electric motor problems. The information is not all-inclusive and does not necessarily apply in all cases.

When unusual operating conditions, repetitive failures, or other problems occur, consult an electric motor service firm for assistance.

Symptom	Possible Cause(s)	Corrective Action
Motor fails to start	<ol style="list-style-type: none"> 1. Blown fuses 2. Tight shaft 3. Voltage too low at motor terminals due to line drop 4. Overload in motor starter tripped 5. Overload (internal thermal protector) tripped 6. Improper line connections 7. Motor may be overloaded 8. Defective motor or starter 	<ol style="list-style-type: none"> 1. Replace with time-delay fuses. Check for grounded winding 2. Occasionally during shipment a sleeve bearing motor may be received with a shaft which does not rotate freely. It may be necessary to strike the motor, at the shell/endshield rabbet, with a rawhide or plastic mallet to align the bearings 3. Consult local power company. Increase wire size (refer to Tables A). Check for poor connections 4. Check and reset overload relay in starter. Check heater rating against motor nameplate current rating 5. Check motor load. If motor has an automatic or manual reset thermal protector, check if tripped 6. Check connections against diagram supplied with motor 7. Reduce load or increase motor size 8. Repair or replace
Motor does not come up to speed or takes too long to accelerate	<ol style="list-style-type: none"> 1. Not applied properly 2. Voltage too low at motor terminals 3. Starting load too high 4. Excess loading; tight belts 5. Defective motor 6. Inadequate starting torque. High inertia load 	<ol style="list-style-type: none"> 1. Consult motor service firm for proper type. Use larger motor 2. Increase wire size (refer to Table A). Check for poor connections. 3. Check load motor is carrying at start 4. Reduce load; adjust belts. Increase motor size 5. Repair or replace 6. Replace with larger motor
Motor stalls during operation	<ol style="list-style-type: none"> 1. Overloaded motor 2. Low motor voltage 	<ol style="list-style-type: none"> 1. Reduce load or increase motor size 2. Verify that nameplate voltage is maintained
Motor vibrates or is excessively noisy	<ol style="list-style-type: none"> 1. Motor shaft misaligned 2. High or unbalanced voltages 3. Worn, damaged, dirty or overloaded bearings 4. Defective winding. Bent or bowed shaft 5. Loose sheave or misaligned coupling 	<ol style="list-style-type: none"> 1. Realign 2. Check wiring connections. Consult local power company 3. Repair or replace motor; check loading and alignment 4. Repair or replace 5. Tighten setscrew(s); realign coupling

Symptom	Possible Cause(s)	Corrective Action
Motor overheats while running under load	1. Overloaded	1. Reduce load; adjust belts. Increase motor size
	2. Dirt blocking ventilation openings	2. Clean motor
	3. Unbalanced supply voltage	3. Excessive single phase loads
	4. Faulty connection	4. Clean, tighten, or replace
	5. High or low voltage	5. Check voltage at motor, should not be more than 10% above or below rated
	6. Defective motor	6. Repair or replace

For technical questions please call **1-800-222-5381**.



WARNING

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Some examples of these chemicals are:

- lead from lead-based paints,
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

WARRANTY

THIS WARRANTY FORM SHOULD BE RETAINED BY THE CUSTOMER AT ALL TIMES

PURCHASED FROM: _____

DATE PURCHASED: _____

The warranty is only made available by returning the tool to the place of purchase with a confirmed register receipt.

6-MONTH REPLACEMENT WARRANTY

Your IRONTON tool is covered by a 6-month replacement warranty from the date of purchase. Industrial or high-frequency use will void this warranty. The warranty covers faulty parts or workmanship.

WARNING

The following actions will result in the warranty being void.

- If the tool has been operated on a supply voltage other than that specified on the unit.
- If the tool shows signs of damage or defects caused by or resulting from abuse accidents or alterations.
- If the tool has been disassembled or tampered with in any way.

Warranty excludes consumable parts such as brushes, batteries, sanding pads, blades, discs and drill bits.



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