NATIONAL MOTORS

NFPA®

UL®

FIRE PUMP MOTOR
OPEN DRIP PROOF

INSTALLATION, OPERATION & MAINTENANCE

INSTRUCTION

Person responsible for the installation, Operation and Maintenance of this motor should be familiarized with:

NEMA Publication MG-2: Safety Standard for Construction and
Guide for Selection, Installation and Use of Electric Motors.
IEC 60072-1 Electrical and IEC72-1 Mechanical specifications
ANSI C51.5, the National Electrical Code (NEC) and local codes and practices.
OSHA standard 1910.147 titled: The Control of Hazardous energy (lockout/tag-out).

ACCEPTANCE

Each Shipment should be carefully inspected upon arrival. Immediately report any damage to the commercial carrier that delivered your motor.

Verify that the part number of the motor you received is the same as the part number listed on your purchase order.

HANDLING

Units must be lifted using correct material handling equipment to avoid injury. Use caution when removing the motor from its packaging. Sharp corners may exist on motor shaft, motor key, sheet metal and other surfaces.

SAFETY NOTICE

Only qualified personnel, should perform installation, operation and maintenance of this electrical machinery. When improperly installed or used, rotating equipment can cause serious or fatal injury. Equipment must be installed in accordance with the National Electrical Code (NEC), local codes and NEMA MG2 Safety Standards for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators and OSHA regulation standard 1910.147 titled: The control of hazardous energy (lockout/tag-out).

Use correct material handling equipment to avoid injury. Use caution when removing the motor from its packaging. Sharp corners may exist on motor shaft, motor key, sheet metal and other surfaces.

1. Connect Power and Ground to the motor according to NEC or IEC and local codes.
2. Provide a permanent guard to prevent accidental contact of body parts or clothing with rotating or moving parts of motor.
3. Shaft key must be secured before starting motor.
4. Mounting bolts should be high tensile steel. Be sure to use a suitable locking device on each bolt (spring washer or thread lock compound).
5. Do not apply power to the motor until the motor is securely mounted by its mounting holes.
6. This motor must only be connected to the proper line voltage, line frequency and load size.
7. Motors are not to be used for load holding or restraining unless a properly sized brake is installed. If a motor mounted brake is installed, provide proper safeguards in case of brake failure.
8. Disconnect all power services, stop the motor and allow it to cool before servicing.
9. For single phase motors, discharge the start and/or run capacitors before servicing.
10. Do not by-pass or render any inoperative safety devices.

GUARD

Upon completion of motor installation, a guard of suitable dimensions must be constructed and installed around the motor. This guard must prevent personnel from coming in contact with any moving parts of the motor or drive assembly, but must allow sufficient cooling air to pass over the motor. If a motor mounted brake is installed, provide proper safeguards for personnel in case of brake failure. **WARNING:** Guards must be installed to form a safe and uncompromising perimeter around rotating parts such as couplings, pulleys, external fans, and unused shaft extensions.

All parts should be permanently guarded to prevent accidental contact by personnel. Accidental contact

with body parts or clothing can cause serious or fatal injury. When this motor is installed according to these instructions, it complies with the EEC Machinery Directive. Electromagnetic Compatibility (EMC) requirements for CE compliance are met when the incoming power is purely sinusoidal.

LOCATION

Consideration should be given to environment and ventilation. Motors should be installed in an area that is protected from direct sunlight, corrosives, harmful gases or liquids, dust, metallic particles, and vibration. A motor with the proper enclosure for the expected operating condition should be selected. Provide accessible clearance for cleaning, repair, service, and inspections.

The free flow of air around the motor should not be obstructed.

AMBIENT TEMPERATURE LIMIT

The ambient temperatures of the air inlet to the motor should not exceed 40°C (104°F) or be less than -30°C (-22°F) unless the motor nameplate specifically states an ambient temperature outside of these limits. The ambient inside an enclosure built around the motor shall not exceed the nameplate ambient. For ambient temperatures outside of these limits consult the motor manufacturer.

MOTOR TYPE SELECTION AS PER LOCATION

OPEN DRIP PROOF are intended for use indoors where the atmosphere is relatively clean, dry, and non-corrosive. Recommended a minimum clearance of ½ the shaft height between vent openings and the nearest obstruction.

TOTALLY ENCLOSED FAN COOLED are suitable for indoor or outdoor standard service applications. Motors must meet a minimum distance of ½ the shaft height between the fan guard grill openings and the nearest obstruction.

MOUNTING

Foot mounted: Foot mounted motors should be mounted to a rigid foundation to prevent excessive vibration. Shims may be used if the location is uneven. Improper alignment may void the motor's warranty.

GROUNDING

Grounding should be accordance with National Electrical Code and Local Standards and consistent with sound practice, consult the National Electrical Code, Article 430 for information on grounding of motors and generators, and Article 250 for general information on grounding. In making the ground connection, the installer should make certain that there is a solid and permanent metallic connection between the ground point, the motor or generator terminal housing, and the motor or generator frame.

WIRING

Wiring Connections for the motor should be done as shown in the diagram on the name plate. Connect the motor as shown in the connection diagram on the motor nameplate. Be sure to identify the proper wiring diagram for the motor you are installing. If you have difficulty determining the proper wiring diagram for your motor, please contact factory for assistance. If this motor is installed as part of a motor control drive system, connect and protect the motor according to the control manufacturer's diagram. When using AC motors with frequency inverters, be certain that the motors maximum speed rating is not exceeded. The wiring, fusing and grounding must comply with the National Electrical Code and local codes.

Note: If improper rotation direction is detrimental to the load, check the rotation or 'bump' the motor prior to coupling the load to the motor shaft. When the motor is coupled to the load and started, it should start quickly and run smoothly.

If not, stop the motor immediately and determine the cause. Possible causes are: low voltage at the motor connections are not correct or the load is too heavy. Check the motor current after a few minutes of operation and compare the measured current with the nameplate rating.

WIRING DIAGRAM

Electrical connections should be made as per wiring diagram provided on the motor nameplate or separate connection plate. In making connections follow the applicable electrical code as well as local codes and practices.

ELECTRIC CONNECTION HAZARD : Motor lead connections can short and cause damage or injury if not well secured and insulated.

MAINTENANCE

WARNING : ELECTRICAL SHOCK HAZARD
Electrical connections are to be made by qualified electrical personnel in accordance with all applicable codes, ordinances and sound practices. Failure to follow these instructions could result in serious personal injury, death and/or property damage. Only qualified personnel who are familiar with the applicable national codes, local codes and sound practices should install or repair electric motors and their accessories

WARNING: Do not touch electrical connections unless you first ensure that power has been disconnected. Please refer to: OSHA standard 1910.147 titled: The Control of Hazardous energy (lockout/tag-out).

WARNING: Surface temperatures of motor enclosures may reach temperatures which can cause discomfort or injury to personnel coming in contact with hot surfaces. Protection should be provided by the user to protect against accidental contact with hot surfaces. Failure to observe this precaution could result in bodily injury.

Motor Should be inspected at regular intervals and Keep the motor clean and ventilation openings clear.

LUBRICATION

Caution: Keep grease clean. Mixing dissimilar grease is not recommended and may result in premature bearing failure.

- Re-lubrication is recommended when the motor is warm and the shaft is stationary.
- Use a shear stabilized polyurea or compatible grease such as Mobil Polyrex EM ™
- Remove all dirt and wipe the outside of the grease fills and drains.
- Clean the grease fitting (or area around grease hole, if equipped with slotted grease screws). If the motor has a purge plug, remove it. Motors can be re-greased while stopped (at less than 80°C) or while running.
- When applicable, locate the grease inlet at the top of the bearing hub. If the motor is not equipped with grease fitting, clean the area and replace the 1/8-inch pipe plug with grease fitting.
- Remove grease drain plug located opposite the grease inlet.
- Apply grease gun to fitting (or grease hole). Too much grease or injecting grease too quickly can cause premature bearing failure. Slowly apply the recommended amount of grease, taking a few minutes or so to apply.
- Operate the motor for 20 minutes and reinstall the purge plug if previously removed.
- Install grease drain plug located opposite the grease inlet.

SUGGESTED LUBRICATION INTERVALS			
NEMA Frame	RPM	DUTY	INTERVAL
254-365	2900 - 3000	Standard	6 months
254-365	2900 - 3000	Severe	3 months
404-449	2900 - 3000	Standard	3 months
404-449	2900 - 3000	Severe	1 month

SUGGESTED LUBRICANT VOLUME		
NEMA frame	Volume (Cubic in)	Volume fluid ounces
254 - 256	1.00	0.55
284 - 286	1.25	0.69
324 - 326	1.50	0.83
364 - 365	1.75	0.97
404 - 405	2.25	1.2
444 - 449	2.75	1.5

MAX SIDE LOADING

When application calls for significant side loading of the motor, the application may require roller bearings to avoid early life failure of motor. Properly asses the resultant side load before installing your motor.

If your side load exceeds the value shown in the table, please contact FACTORY to explore options for use of roller bearings

REPLACING SEAL

Seals should be inspected regularly for excessive wear that could lead to bearing failure. If significant wear is present, please contact FACTORY for replacement seals.

DRAIN HOLES

Drains may require periodic maintenance to keep them clean of debris and flowing freely. Occasionally, remove the brass drains and wash them thoroughly. Eliminate any built up debris which may be impeding their operation. For motors which are equipped with rubber plugs in their condensate drain holes, be sure to remove the plug (i.e. especially if the motor is installed in a location where condensate build up is likely). In all instances, ensure that the drain is in the lowest portion of the motor. Some motors may require rotation of the end plates (i.e. if the mounting location is not a typical horizontal mounting).

Sintered brass breather drains are provided in many National Motors that would allow them to expel liquids from the casing without allowing liquid to enter the motor. Make sure the drains are placed in the lower portion of the motor when the mounting configuration differs from a typical horizontal mounting position.

NOTES

Project Name	:.....
Location	:.....
Fire Pump Set Duty Point	:.....
Electric Fire Pump Sl. No(s).	:.....
Diesel Fire Pump Sl. No(s).	:.....
Commissioned By	:.....
Date of Commissioning	:.....
Signature of Commissioning Engineer	:.....

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In line with NAFFCO policy for continuous product development, NAFFCO has the right to change specifications without prior notice.

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FOR ANY ASSISTANCE, PLEASE CONTACT

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