

Installation, Operation, and Maintenance Manual

W80 AXgen

Electric Motors

1 GENERAL CONSIDERATIONS



Document: 50168900 / 00



WARNING!
The installation, operation, and maintenance of the motor must always be performed by trained and authorized personnel, using appropriate tools and methods and following the guidelines contained in the documents supplied with the motor.

The instructions presented in this document apply to WEG motors with the following characteristics:

- Three-Phase Permanent Magnet Motors, with a water jacket on the housing.

The purpose of this manual is to provide important information that must be observed during the transportation, storage, installation, operation, and maintenance of W80AXgen motors. For this reason, we recommend that you carefully read the instructions contained herein before performing any work on the motor. Failure to follow the instructions in this manual and those referenced on the website www.weg.net voids the product warranty and may result in serious personal injury and property damage.



WARNING!
Electric motors have live circuits and exposed rotating parts that can cause injury.

2 TRANSPORTATION, STORAGE, AND HANDLING

Inspect the motor's condition upon receipt. If any damage is found, it must be documented in writing with the carrier and immediately reported to the insurance company and WEG. In such cases, no installation work should begin until the identified issue has been resolved.

The information on the nameplate must match that on the product invoice and the operating environment conditions where the motor will be installed.

If the motor is not installed immediately, it is recommended to store it in a clean, dry location, free from dust, vibrations, gases, and corrosive agents, with a relative humidity not exceeding 60%. In this case, the water-passage channels must be protected with an anti-corrosion protective agent, in accordance with the manufacturer's instructions.

If the motor is stored at subzero temperatures, the water jacket must be completely drained through the water inlet and outlet ports.

In these cases, or when the engine is stored for an extended period, before operation and with the engine shut off, water at 35°C must be recirculated at a flow rate of 20 l/min for at least 30 minutes.

Cooling water may remain inside the engine's water jacket for up to 10 days, provided its quality is maintained within the specified limits. For downtime periods exceeding 10 days, it is recommended to drain the water jacket whenever possible. If drainage is not feasible, the cooling water must be recirculated for a few minutes at least every 5 days to minimize the formation of deposits, incrustations, and localized corrosion. For downtime periods exceeding 30 days, the water jacket must be completely drained and dried.

To prevent oxidation of the rolling bearings and ensure uniform lubricant distribution, rotate the motor shaft manually at least once a month (turning it at least 5 revolutions) and always leaving it in a different position.

For motors with open bearings that have been in storage for more than six months, the bearings must be relubricated with the amount of grease indicated on the nameplate before the motor is put into operation.

If the motors are stored for more than 2 years, it is recommended to replace the rolling bearings, or else remove them, wash them, inspect them, and relubricate them before putting them into operation.



WARNING!
All handling of the motor must be performed gently to avoid impacts and damage to the bearings, and the shaft locking device (if supplied) must always remain installed. Always lift the motor using the lifting eyes, which are designed solely for the weight of the motor and must never be used to lift additional coupled loads. The eye bolts on individual component parts should only be used to handle these parts when they are disassembled.

Periodically measure the motor's insulation resistance, and do so before energizing it for the first time. Check the recommended values and measurement procedures on the website.

3 INSTALLATION



WARNING!
During installation, the motors must be protected against accidental startup.



WARNING!
Check the motor's rotation direction by running it under No Load conditions before connecting it to the load.



WARNING!
Permanent magnet motors, even when de-energized, pose a risk of electric shock at their terminals if the rotor moves. Make sure the rotor is locked before performing any operations on the terminals.

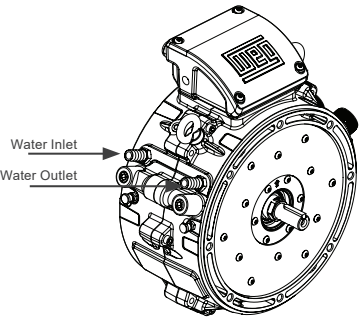
Remove the shipping and shaft locking devices (if provided) before beginning motor installation. Motors must only be installed in locations compatible with their design specifications and in applications and environments for which they were designed.

The motor shaft must be properly aligned with the machine shaft. Incorrect alignment, as well as improper tension in the drive belts, will certainly damage the bearings, resulting in excessive vibrations and even causing the shaft to break.

The permissible radial and axial loads on the shaft, as indicated in the general manual on the website, must be observed. Whenever possible, use flexible couplings.

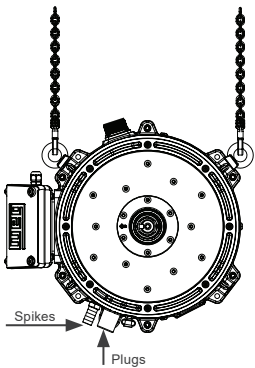
Remove the anti-corrosion grease from the shaft end and the flange only immediately before the motor installation.

Unless otherwise specified in the purchase order, WEG motors are dynamically balanced with a "half key" and in a No Load (decoupled) condition. Transmission elements, such as pulleys, couplings, etc., must be properly balanced before being installed on the motor shaft. The process for filling and draining the water jackets must be followed according to the schematic drawing shown below.



Cooling Circuit Filling Procedure

1. Connect the water inlet and outlet pipes to the respective motor ports, as indicated by the connection point labels.
2. Ensure that all connections are properly tightened and free of leaks.
3. Start water circulation in the cooling circuit, adhering to the flow rate and pressure specified on the nameplate or in the engine's technical documentation.
4. Maintain water circulation for at least 5 minutes before starting the motor to ensure that the cooling jacket is completely filled and that any air pockets are eliminated.
5. Check all hydraulic connections for leaks.
6. Only after confirming adequate water flow should you start the engine.



Cooling Circuit Drainage Procedure



IMPORTANT!
Perform this procedure with the engine turned off and with no pressure in the cooling system.

1. Disconnect the water supply line from the engine.
2. Remove the drainage plugs located next to the water inlet and outlet ports.
3. Position the motor so that the ports and plugs are facing downward, as shown.
4. Allow the water to drain naturally until the trickling stops.
5. Blow dry, clean compressed air through the inlet and outlet ports to remove residual water from inside the cooling jacket.
6. Continue the compressed air application until no more water comes out of the drainage points.
7. Reinstall the drain plugs after all water has been completely removed.
8. If the motor is to be stored or left out of operation for an extended period, make sure no liquid remains inside the cooling jacket.



NOTE!
For extended periods of downtime or when there is a risk of freezing, it is recommended to completely drain the cooling circuit to prevent damage to the engine's water jacket.



WARNING!
The water drain plugs on the covers must always be positioned to facilitate drainage (at the lowest point of the motor). Motors with rubber water drain plugs are shipped from the factory in the closed position and must be opened periodically to allow condensate to drain from inside the motor. For environments with high water condensation and motors with an IP55 protection rating, the drain plugs may be installed in the open position. For motors with an IP56, IP65, or IP66 protection rating, the drain plugs must remain in the closed position and should only be opened during motor maintenance.



WARNING!
All motors in the W80 series feature shaft grounding.



WARNING!
To prevent accidents, before starting the motor, ensure that the grounding has been performed in accordance with current standards and that the key is securely fastened.



WARNING!
Connect the motor correctly to the frequency inverter using secure and permanent connections, always observing the information provided on the nameplate, such as rated voltage, wiring diagram, etc.

When connecting the power supply cable, grounding system, installing the junction box cover, and mounting the canopy, the tightening torques specified in Table 3.1 must be followed.

Table 3.1: Tightening torques for fasteners [Nm]

Component Parts	M4	M5	M6	M8	M10	M12	M14	M16	M20	UNF 8x32	UNC 10x24
Terminal block pins	1.0 to 1.5	2.0 to 4.0	4.0 to 6.5	6.5 to 9.0	10.0 to 18.0	15.5 to 30.0	-	30.0 to 50.0	50.0 to 75.0	1.0 to 2.0	-
Grounding	1.5 to 3.0	3.0 to 5.0	5.0 to 10.0	10.0 to 18.0	28.0 to 40.0	45.0 to 70.0	-	115.0 to 170.0	-	-	2.5 to 3.0
TERMINAL BOX COVER	-	3.0 to 5.0	4.0 to 8.0	8.0 to 15.0	18.0 to 30.0	25.0 to 40.0	30.0 to 45.0	35.0 to 50.0	-	-	2.5 to 3.0

When sizing power supply cables and switching and protective devices, the following factors must be considered: the motor's rated current, the duty factor, the cable length, among others. For motors without a terminal block, insulate the motor's terminal cables using insulating materials compatible with the insulation class specified on the nameplate.

The minimum insulation distance between live parts that are insulated from each other and between live parts and ground must comply with the standards and regulations in effect in each country.



WARNING!

Take the necessary measures to ensure the degree of protection indicated on the motor's nameplate:

- At unused cable entries in junction boxes, which must be properly sealed with plugs.
- At cable entries used for motor power and control, which must employ component parts such as cable glands and conduit.
- For component parts supplied separately (such as separately mounted junction boxes).
- For fasteners mounted in the through-holes in the motor housing (such as on the flange).

The motor must be installed with overload protection devices. For three-phase motors, the installation of phase loss protection systems is also recommended.

If the motor is equipped with devices for monitoring the temperature of the winding coils and/or bearings, these must be connected during operation and also during testing.



WARNING!

For motors without a terminal block, do not push the excess length of the flexible cords into the motor to prevent the cords from coming into contact with the rotor.

Verify that the accessories (brake, encoder, thermal protection, forced ventilation, etc.) installed on the motor are functioning correctly before putting it into operation.



WARNING!

Motors equipped with automatic thermal protectors will automatically restart as soon as the motor cools down. Therefore, do not use motors with automatic thermal protection in applications where automatic restarting could pose a danger to people or equipment.



WARNING!

Motors equipped with manual thermal protectors must be manually reset after tripping. If either the automatic or manual thermal protector trips, disconnect the motor from the power supply line and check the cause of the trip.



WARNING!

Permanent magnet motors must be driven only by a frequency inverter.

When using a frequency inverter, you must follow the instructions in the motor manual and the technical guide "Induction Motors Powered by PWM Frequency Inverters 50029351", available at www.weg.net, as well as the frequency inverter manual.

4 OPERATION



WARNING!

During operation, do not touch live, bare parts, and never touch or stand too close to rotating parts. Ensure that the Space Heater is turned off during motor operation.

The rated performance values and operating conditions are specified on the motor nameplate. Variations in supply voltage and frequency must never exceed the limits established in current standards.

Any deviations from normal operation (tripping of thermal protections, increased noise levels, vibration, temperature, or current) must be evaluated by qualified personnel. If in doubt, shut down the motor immediately and contact the nearest authorized WEG Repair Shop.

To determine the voltage generated at the terminals of permanent magnet motors when the rotor is rotating freely, use the generated voltage coefficient "Ke," as indicated on the nameplate. This coefficient indicates the voltage generated for a rotation speed of 1000 rpm. For different rotational speeds, use the formula (rotational speed in rpm × 'Ke')/1000.

After the motor has stopped, the cooling and lubrication systems (if any) must be shut off.

The water parameters for operation are listed on a fluid nameplate located on the motor. Operation under conditions other than those specified on the engine plate may void the warranty.

Normal operating conditions for W80 AXgen engines include an ambient temperature not exceeding 40 °C and an altitude not exceeding 1,000 m.

Corrosion, incrustation, and freeze-prevention agents may be used provided that the materials of the component parts in contact are taken into account when selecting the additive. For ambient temperatures at or below 0 °C, the use of antifreeze agents is mandatory, and this is the customer's sole responsibility.

The water must meet the following criteria:

Parameters	Treated Water
Inlet Water Temperature	= 5 °C to 35 °C
Total water hardness	≤ 1.50 [mmol/L]
Carbonate hardness	≤ 1.10 [mmol/l]
Non-carbonate hardness stiffness	≤ 0.40 [mmol/l]
pH value	= 6.5 to 8.0
Electrical conductivity	≤ 200 [µS/cm]
Iron (Fe) content	≤ 0.30 [mg/L]
Manganese (Mn) content	≤ 1.0 [mg/l]
Calcium (Ca) content	≤ 50 [mg/L]
Magnesium (Mg) content	≤ 10 [mg/L]
Sodium (Na) content	≤ 50 [mg/L]
Chloride (Cl) content	≤ 20 [mg/l]
Sulphate (SO ₄) content	≤ 50 [mg/L]
Nitrate content (NO ₃)	≤ 10 [mg/L]
Sedimentable substances after 0.5 hours	≤ 1 [ml/l]

The maximum allowable operating pressure is 10 bar; it is the customer's sole responsibility to monitor and control the pressure level of the fluid used in the system. The motor is not equipped with any pressure relief or regulation device.

5 MAINTENANCE



WARNING!

Before performing any work on the motor, it must be completely stopped, disconnected from the Power Supply, and protected against accidental restarting. Even when the motor is stopped, voltage may still be present at the terminals of the Space Heaters.



WARNING!

For motors equipped with capacitors, discharge them before handling them or performing any service.



WARNING!

Disassembly of the motor during the warranty period must only be performed by an authorized WEG repair shop.



WARNING!

To ensure the water jacket seal remains intact under all conditions, 100% of the motors undergo factory leak tests. Therefore, under no circumstances may the seal flanges be disassembled. If they are, this will result in the immediate voiding of the motor's warranty. In special cases where such disassembly is necessary, it must be performed by a WEG Authorized Technical Assistant who has received specific training for this operation. Whenever one or both water jacket sealing flanges are disassembled, all corresponding sealing rings must be replaced with new ones, strictly adhering to the specifications and dimensions of the original design. Replacing the gaskets does not extend or renew the warranty period.



WARNING!

For permanent magnet motors, the assembly and disassembly of the motor require the use of appropriate devices due to the attractive or repulsive forces that occur between metal parts. This service must only be performed by an Authorized WEG Technical Assistant with specific training for this operation. Individuals with pacemakers must not handle these motors. Permanent magnets may also cause disturbances or damage to other electrical equipment and component parts during maintenance.



WARNING!

For motors supplied with a shaft grounding system, the condition of the grounding brush must be checked regularly, and when it reaches the end of its service life, it must be replaced with one of the same specification. If a motor is supplied with an internal grounding brush—identified by a label on the product—it must be inspected every time maintenance is performed on the bearings or any internal part of the motor.

The amount of grease and the lubrication interval are indicated on the motor's nameplate. It is extremely important that lubrication be performed as specified.

Excessive or insufficient lubrication causes a temperature rise during operation, resulting in premature wear of the bearings and a consequent reduction in their service life. The use of greases not recommended by WEG or in quantities different from those specified may void the motor warranty.

Inspection of the cooling water quality, in accordance with item 4, must be performed periodically in accordance with the water feeding supply system's maintenance plan; the frequency of these inspections and the procedures involved are the customer's sole responsibility.

Periodically check the motor's operation according to its application. Check the mounting bolts, bearings, vibration and noise levels, drains, etc.

6 ADDITIONAL INSTRUCTIONS

For more information on the transportation, storage, handling, installation, operation, and maintenance of electric motors, and to view the list of Authorized Repair Shops, visit www.weg.net.

For special applications and operating conditions, please consult the manual on the website or contact WEG. When contacting WEG, please have the motor's complete designation on hand, as well as its serial number and date of manufacture, which are indicated on the motor's NAMEPLATE. For motors supplied with a WEG Motor Scan sensor, refer to the installation guidelines in the Overview Manual from Receipt to Operation (10008475131) available at www.weg.net.

7 WARRANTY STATEMENT

WEG Equipamentos Elétricos S/A, Motors Division ("WEG"), offers a warranty against manufacturing defects and materials for its products for

a period of 12 months, effective from the date of issuance of the invoice by the factory or the distributor/reseller, limited to 18 months from the date of manufacture.

If a different warranty period is specified in the technical-commercial proposal for a specific supply, that period shall take precedence over the periods stated above.

The periods established above are independent of the product's installation date and the date it enters operation.

In the event of a deviation from the product's normal operation, the customer must "immediately notify WEG in writing of any identified deviations or defects and make the product available to WEG or its Authorized Repair Shop for the time necessary to identify the cause of the deviation, verify warranty covering, and perform the necessary repair."

To be eligible for warranty coverage, the customer must comply with the specifications set forth in WEG's technical documents, particularly those outlined in the products' Installation, Operation, and Maintenance Manual, as well as the applicable standards and regulations in each country.

Defects resulting from improper or inappropriate use, operation, and/or installation of the equipment, lack of preventive maintenance, as well as defects resulting from external factors or equipment and component parts not supplied by WEG are not covered by the warranty. The warranty does not apply if the customer, on their own initiative, performs repairs and/or modifications to the equipment without prior written consent from WEG.

The warranty does not cover equipment, parts, and/or component parts whose life time is lower than the warranty period. It also does not cover defects and/or problems resulting from force majeure or other causes that cannot be attributed to WEG, such as, but not limited to: incorrect or incomplete specifications or data provided by the customer; transportation, storage, handling, installation, operation, and maintenance not in accordance with the provided instructions; accidents; defects in civil engineering work; use in applications and/or environments for which the product was not designed; and equipment and/or component parts not included in WEG's scope of supply. The warranty does not cover disassembly services at the customer's facilities, product transportation costs, or travel, lodging, and feeding supply expenses for Repair Shop personnel when requested by the customer.

Warranty services will be provided exclusively at Repair Shops authorized by WEG or at WEG's own Factory. Under no circumstances will these warranty services extend the equipment's warranty period.

WEG's civil liability is limited to the product supplied; WEG shall not be liable for indirect or consequential damages, such as lost profits, loss of income, and similar losses that may arise from the contract entered into between the parties.