

# MOTORS RECEIVING HANDLING AND STORAGE



**VALIADIS**  
HELLENIC MOTORS

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1 RECEIVING .....	3
2 HANDLING .....	3
3 STORAGE .....	4
3.1 Outdoor storage .....	4
3.2 Extended storage .....	4
3.2.1 Storage location .....	4
3.2.1.1 Indoor storage .....	4
3.2.1.2 Outdoor storage .....	5
3.2.2 Separate parts .....	5
3.3 Preservation during the storage .....	6
3.3.1 Space heater .....	6
3.3.2 Insulation resistance .....	6
3.3.3 Exposed machined surfaces .....	6
3.3.4 Sealing .....	6
3.3.5 Bearings .....	6
3.3.5.1 Grease-lubricated rolling bearing .....	6
3.3.5.2 Sleeve bearing .....	6
3.3.6 Terminal boxes .....	7
3.3.7 Air-water heat exchanger .....	7
3.3.8 Cleanliness and conservation of the motor during storage .....	8
3.3.9 Inspections and records during storage .....	8
3.3.10 Predictive / preventive maintenance .....	8
3.3.11 Maintenance plan during storage .....	9
3.4 Preparation for commissioning .....	10
3.4.1 Cleaning .....	10
3.4.2 Bearing inspection .....	10
3.4.3 Bearing lubrication .....	10
3.4.4 Insulation resistance verification .....	10
3.4.5 Air-water heat exchanger .....	10

## 1. RECEIVING

All our motors are tested and in perfect operating condition. The machined surfaces are protected against corrosion. The package must be inspected upon receipt for any damage incurred during transportation.

### ATTENTION

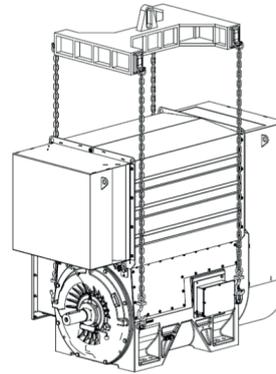
Any damage must be photographed, documented, and reported immediately to the carrier, the insurer, and Valiadis SA. Failure to report this damage will void the warranty.

### ATTENTION

Parts supplied in additional packages must be checked upon receipt.

- When lifting the package (or container), the proper hoisting points, the weight indicated on the package or nameplate, and the operating capacity and conditions of the hoisting equipment must be observed.
- Motors packed in wooden crates must always be lifted by their own lifting lugs or a proper forklift; they must never be lifted by the package.
- The package must never be overturned. It should be placed on the floor carefully (without impact) to avoid damage to the bearings.
- Do not remove the grease that protects against corrosion from the shaft end, or the closing plugs present in the terminal box holes. These protections must remain in place until the final assembly.
- A complete visual inspection of the motor must be carried out after removing the package.
- The shaft locking system must be removed just before installation and stored for future transportation of the motor.

## 2. HANDLING



- Lift the motor according to the figure above, using the four lifting lugs designed specifically for this purpose. If necessary, remove the heat exchanger to lift the motor.
- Check the motor's indicated weight. Avoid lifting the motor in a way that causes jolts or putting it down abruptly, as this may damage the bearings.
- The lifting lugs on the heat exchanger, end shields, bearings, radiator, terminal box, etc., are designed to handle only those specific components separately.
- The shaft must never be used to lift the motor.
- Before moving the motor, ensure the shaft is locked using the locking device provided with the motor.

### ATTENTION

Steel cables, clevises, and lifting equipment must be capable of withstanding the motor's weight.

### 3. STORAGE

If the motor is not installed immediately upon receipt, it must remain inside the package and be stored in a location protected against moisture, vapors, sudden temperature changes, rodents, and insects. The motor must be stored in a location free from vibrations to prevent damage to the bearings.

#### ATTENTION

During storage, space heaters must remain powered to prevent moisture condensation and maintain acceptable winding insulation resistance.

Any damage to the paint or corrosion protection on the machined parts must be repaired.

#### 3.1 Outdoor Storage

- Store the motor in a dry location, free from flooding and vibrations.
- Any damage to the packaging must be repaired before storage to ensure proper storage conditions.
- Place the motor on platforms or foundations that provide protection against ground moisture and prevent it from sinking into the soil. Free air circulation beneath the motor must be ensured.
- The cover used to protect the motor from bad weather must not come into direct contact with its surfaces. To allow free air circulation between the motor and the cover, use wooden blocks as spacers.

#### 3.2 Extended Storage

When the motor is stored for an extended period (two months or more) before start-up, it is exposed to external factors such as temperature variations, moisture, and aggressive agents.

The empty spaces inside the motor — including rolling bearings, terminal boxes, and windings — are vulnerable to humidity,

which can cause condensation. Depending on the level of air contamination, aggressive substances may also penetrate these spaces.

Consequently, after prolonged storage, the winding insulation resistance may fall below acceptable levels, internal components such as rolling bearings may oxidize, and the lubricant's effectiveness may be reduced. All of these factors increase the risk of damage before starting the motor.

#### ATTENTION

To ensure the motor warranty remains valid, it is necessary to verify that all preventive measures described in this manual—such as construction aspects, maintenance, packaging, storage, and periodic inspections—are followed and properly documented.

The extended storage instructions apply to motors stored for long periods (two months or more) before start-up, or to motors that have already been installed but are in prolonged stoppage for the same period.

#### 3.2.1 Storage Location

To ensure optimal storage conditions for the motor during extended periods, the selected location must strictly meet the criteria described in sections 3.2.1.1 and 3.2.1.2.

##### 3.2.1.1 Indoor Storage

To ensure better storage conditions for the motor, the storage site must strictly comply with the criteria outlined below:

- The storage site must be enclosed, covered, dry, free from air contaminants (moisture, vapor, dust, particles, and aggressive fumes), and protected from flooding.
- The site should be safeguarded against sudden temperature changes, humidity, rodents, and insects.

- It must be vibration-free to avoid damage to the motor bearings.
- The floor should be leveled concrete with a strong structure capable of supporting the motor's weight.
- The site must be equipped with a fire detection and extinguishing system.
- Electricity must be available to supply power to the space heaters, with a power failure detection system.
- The site must be exclusively dedicated to storing electrical machines (do not store other equipment or products that could compromise motor storage conditions).
- The site must have facilities for cargo handling services, allowing for easy motor handling and removal.
- No gases such as chlorine, sulfur dioxide, or acids should be present.
- The site must have a ventilation system with an air filter.
- The ambient temperature must be between 5°C and 50°C and should not experience sudden fluctuations.
- The relative air humidity should be less than 50%.
- Prevention against dirt and dust deposition must be in place.
- The motor should be stored on a suitable metal base that prevents the absorption of moisture from the floor.

If any of these requirements are not met at the storage site, additional protections for the motor package are recommended during the storage period, such as:

- A closed wooden crate or similar enclosure with electrical wiring that allows for space heater energization.
- If there is a risk of infestation or fungus formation, the package must be treated with appropriate chemicals, either through spraying or painting.
- The package should be prepared carefully by an experienced individual.

### 3.2.1.2 Outdoor Storage

#### ATTENTION

Outdoor storage of the motor is not recommended.

If outdoor storage is unavoidable, the motor must be packed in specific packaging suited for such conditions, as follows:

- In addition to the packaging recommended for indoor storage, the package must be covered with protective material, such as durable canvas or plastic, to guard against dust, moisture, and other external elements.
- The package must be placed on platforms or foundations that provide protection from dirt and moisture and prevent it from sinking into the soil.
- Once covered, a shelter must be erected to protect the package from direct rain, snow, and excessive sunlight.

#### ATTENTION

If the motor remains stored for an extended period (two months or more), it is recommended to contact Valiadis SA for further instructions.

### 3.2.2 Separate Parts

- If parts are supplied separately (e.g., terminal boxes, heat exchangers, end shields), they must be mounted on the motor before storage.
- Spare parts must be stored in an appropriate location, as specified in sections 3.2.1.1 and 3.2.1.2 of this manual.
- The relative humidity inside the package must not exceed 50%.
- Rolling bearings must not be exposed to shocks, falls, vibrations, or humidity, as these can cause marks on the internal tracks or balls, reducing their service life.

### 3.3 Preservation During Storage

#### 3.3.1 Space Heater

- Space heaters must stay powered during storage to prevent moisture condensation and maintain the winding insulation resistance within acceptable levels.
- The space heater drive circuit must be dedicated, and the voltage and current of this circuit must be measured and recorded monthly.
- It is recommended to install a signal near the motor to indicate when the space heaters are energized.

#### 3.3.2 Insulation Resistance

- Measure and record the insulation resistance of the motor windings every two months during storage, as well as before installation or if there is any change in the preservation process (e.g., prolonged loss of power).
- The measurement procedures and acceptance criteria must follow the IEEE-43 Standard.
- Any reduction in insulation resistance must be investigated.

#### 3.3.3 Exposed Machined Surfaces

All exposed machined surfaces (e.g., shaft ends and flanges) are protected at the factory with a temporary rust inhibitor.

This protective coating must be reapplied at least every six months or whenever it is removed or damaged.

For further instructions on recommended protective products, contact Valiadis SA.

#### 3.3.4 Sealing

The rubber seals, gaskets, plugs, and cable glands of the motor must be inspected annually and replaced if necessary.

### 3.3.5 Bearings

#### 3.3.5.1 Grease-lubricated Rolling Bearings

- The rolling bearings are pre-lubricated at the factory before motor testing.

#### ATTENTION

To keep the bearings in good condition during storage, the shaft locking device must be removed every two months, and the motor rotor must be rotated at least 10 complete turns at 30 rpm to circulate the grease and preserve the internal parts of the bearings.

- Before the motor is put into operation, the rolling bearings must be lubricated.
- If the motor remains stored for more than two years, the rolling bearings must be disassembled, washed, inspected, and relubricated.

#### 3.3.5.2 Sleeve Bearings

- Depending on the machine's mounting position and lubrication type, the machine can be transported with or without oil in the bearings.
- The machine must be stored in its original operating position and with oil in the bearings when specified.
- The oil level must be maintained at the middle of the sight glass.

To keep the bearings in good condition during the storage period, the following preservation procedures must be performed:

- Close all threaded holes with plugs.
- Check if all flanges (e.g., oil inlet and outlet) are closed. If not, they must be closed with blind covers.
- Ensure the oil level remains at the middle of the oil sight glass.

Remove the shaft-locking device every two months and rotate the motor rotor 10 com-

plete turns at 30 rpm to circulate the grease and protect the bearings' internal parts.

#### NOTES

- For bearings equipped with a high-pressure oil injection system (jacking), the system must be activated before rotating the machine rotor.
- For bearings without an oil tank (dry crankcase), the oil circulation system must be activated before rotating the machine shaft.
- Shaft rotation must always be performed in the machine's operating rotation direction.

After six months of storage, the following procedure must be followed to protect both the internal bearing components and the contact surfaces from corrosion:

- Close all threaded holes with plugs.
- Seal the gaps between the shaft and the bearing seal by applying water-proof adhesive tape.
- Ensure all flanges (e.g., oil inlet and outlet) are closed. If not, close them with blind covers.
- Remove the upper sight glass from the bearing and apply a corrosion inhibitor spray (TECTYL 511 or equivalent) inside the bearing.
- Reinstall the upper sight glass to close the bearing.

#### NOTES

If the bearing does not have an upper sight glass, the top cover of the bearing must be disassembled to apply the corrosion inhibitor spray.

- Every six months during storage, repeat the procedure described above.
- If the storage period exceeds two years, the bearing oil must be replaced.

### 3.3.6 Terminal Boxes

When the insulation resistance of the motor windings is measured, the main terminal box and other terminal boxes must also be inspected, ensuring the following conditions:

- The interior must be dry, clean, and free of any dust accumulation.
- The contact elements must not show any signs of corrosion.
- The seals must be in proper condition.
- The cable inlets must be properly sealed.

#### ATTENTION

If any of these items are not in proper condition, perform the necessary maintenance and replace any damaged parts, if required.

### 3.3.7 Air-water Heat Exchanger

To ensure optimal conditions for long-term radiator storage, the following criteria must be strictly followed:

- Remove the flanged connections from the radiator to gain access.
- Completely drain the water from the radiator tubes and heads.
- Blow hot air through one of the nozzles for 15 to 20 minutes to eliminate humidity inside the radiator. For this procedure, the radiator tubes must be placed horizontally, and the inlet and outlet water flanges positioned to allow all water to drain.
- Once dried, cover the nozzles with blind flanges and new sealing gaskets to ensure a proper seal.
- Install a pressure gauge on one blind flange and a globe valve on the other.
- Pressurize the cooler with inert gas (such as nitrogen) to a pressure of 1.2 bar abs.
- Check the pressure monthly during the storage period, ensuring the radiator is not exposed to temperatures exceeding 50°C.

- If the storage procedure is followed, the radiator seals must be replaced every three years, as recommended by the radiator supplier.

### ATTENTION

The pressurized radiator must be handled with care. Attach a warning plate indicating that the equipment is pressurized and must not be exposed to temperatures exceeding 50°C.

### NOTE

During short operation stoppages, instead of draining the water, it is preferable to maintain circulation at low speeds through the heat exchanger. This ensures that harmful substances, such as ammonia compounds and hydrogen sulfide, are removed from the radiator rather than deposited inside.

### 3.3.8 Cleanliness and Conservation of the Motor During Storage

To ensure the motor remains in optimal condition during storage, follow these guidelines:

- Keep the motor free from oil, water, dust, and dirt.
- Clean the exterior of the motor with compressed air at low pressure.
- Remove any signs of rust from exposed surfaces using a clean cloth soaked in petroleum solvent.
- Ensure that the bearings and lubrication hollows are free of dust and dirt, and that the bearing plugs are properly tightened.
- Carefully remove any marks, rust, or risks on the shaft end.

### 3.3.9 Inspections and Records during Storage

Inspect the stored motor periodically, and document and file all inspection records appropriately. The following items must be inspected:

- Inspect the motor for any physical damage and repair as necessary.
- Inspect the cleanliness conditions.
- Look for signs of water condensation inside the motor.
- Inspect the protective coating on exposed machined parts.
- Check the paint condition and repair if necessary.
- Look for signs of aggressive agents.
- Check the operation of the space heaters.
- Measure and record the ambient temperature and relative humidity around the motor.
- Measure and record the temperature, insulation resistance, and polarization index of the stator winding.
- Ensure the storage location complies with the criteria described in section 3.2.1.

### 3.3.10 Predictive / Preventive Maintenance

Valiadis SA recommends that every three years of storage, the motor be sent to the factory for a complete predictive maintenance procedure.

This maintenance involves disassembling the motor for inspection, followed by reassembly and a routine test in the laboratory.

### 3.3.11 Maintenance Plan During Storage

During the storage period, motor maintenance must be performed and recorded according to the plan outlined in the following table.

Storage Plan						
	Monthly	2 months	6 months	2 years	Before start-up	Notes
<b>STORAGE LOCATION</b>						
Inspect the cleanliness conditions		X			X	
Inspect the humidity and temperature conditions		X				
Inspect for insect infestation signs		X				
<b>PACKAGE</b>						
Inspect for damage			X			
Check the internal relative humidity		X				
Replace the desiccant in the package (if applicable)			X			Whenever necessary
<b>SPACE HEATER</b>						
Check the operating conditions	X					
Measure the circuit voltage and frequency	X					
Verify the function of the signal system (if applicable)			X			
<b>WHOLE MOTOR</b>						
Perform external cleaning			X		X	
Inspect the paint condition			X			
Check the rust inhibitor on exposed parts			X			
Reapply the rust inhibitor			X			
Inspect the rubber seals and gaskets			X			
Perform predictive maintenance						According to section 3.3.10
<b>WINDINGS</b>						
Measure the winding temperature		X			X	
Measure the insulation resistance		X			X	
Measure the polarization index		X			X	
<b>TERMINAL BOX AND GROUNDING TERMINALS</b>						
Clean the interior of the terminal boxes				X	X	
Inspect the seals and gaskets				X	X	
<b>ROLLING BEARINGS</b>						
Rotate the shaft		X				
Relubricate the bearing					X	
Disassemble and clean the bearing						If storage period exceeds 2 years
<b>SLEEVE BEARINGS</b>						
Rotate the shaft		X				
Apply corrosion inhibitor spray			X			
Clean the bearings					X	
Change the oil						If storage period exceeds 2 years

### 3.4 Preparation for Commissioning

#### 3.4.1 Cleaning

- Ensure that the internal and external parts of the motor are free of oil, water, dust, and dirt.
- Remove the rust inhibitor from exposed surfaces using a cloth dampened with a petroleum-based solvent.
- Make sure that the bearings and cavities used for lubrication are free of dirt and that the cavity plugs are correctly sealed and tightened. Oxidation and marks on the bearing seats and on the shaft must be carefully removed.

#### 3.4.2 Bearing Inspection

##### ATTENTION

- If the motor storage period exceeds six months, the sleeve bearings must be disassembled, inspected, and cleaned before starting motor operation.
- Sleeve bearings without an oil tank (dry crankcase), regardless of the storage period, must also be disassembled, inspected, and cleaned before motor operation.
- After inspection, reassemble the sleeve bearings and perform lubrication.

**Contact Valiadis SA to carry out this procedure.**

#### 3.4.3 Bearing Lubrication

Apply the specified lubricant for bearing lubrication.

Information on the bearings and lubricants is provided on the bearing nameplates. For detailed bearing lubrication instructions, contact Valiadis SA.

#### 3.4.4 Insulation Resistance Verification

Before the motor is put into operation, the insulation resistance must be measured in accordance with section 3.3.2 of this manual.

#### 3.4.5 Air-water Heat Exchanger

- When starting the motor, ensure that water circulates freely through the radiator.
- The radiator bolts must be tightened to a torque of 40 to 50 Nm.
- Ensure there are no water leaks. Check the radiator gaskets and replace them if necessary.
- Check the heat exchanger sealing rubbers and replace them if needed.



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