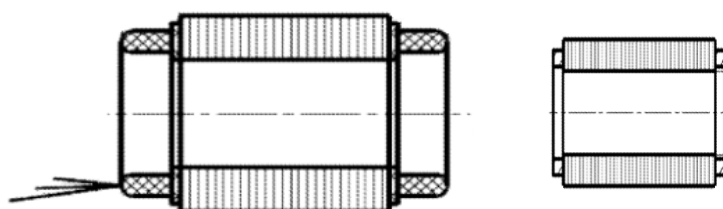


# Assembly / Installation Instructions SycoTec Motor Components

EN

Asynchronous (EV)  
Synchronous (SP)



INDUSTRIAL DRIVES

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## SAFETY DATA SHEET



**Safety and commissioning information for inverter-fed low-voltage three-phase motors (as per Low Voltage Directive 2014/35/EU)**



### 1. Danger

*Electric motors contain hazardous, voltage-bearing and rotating parts and may also have hot surfaces. All work in respect of transport, connection, starting up and regular servicing must be carried out by qualified, responsible workers (see VDE 0105; IEC 364). If a risk of crushing exists due to strong magnetic fields, all work must be carried out by at least two people (Section 3 Dangers due to strong magnetic fields).*



*Improper behavior can cause serious injuries to individuals and damage to property. The applicable national, local and system-specific rules and requirements must be taken into consideration.*

*Warning signs and notices on the motor must be followed.*

### 2. Intended use

These motors are intended for industrial or commercial installations.

They correspond to the harmonized norms of series EN60034 (VDE 0530). Use in areas at risk of explosion is prohibited unless explicitly intended for this purpose (see additional information). If increased requirements (e.g. protection against contact by children's fingers) are imposed in special cases, such as for use in non-commercial installations, it must be ensured that the installation meets these conditions during set-up.

The motors are designed for ambient temperatures of -15 to +40°C (5 to 104°F) and for installation elevations ≤ 1,000 m above sea level. Differing data on the rating plate must be followed.

The conditions in the place of use must correspond to all data on the rating plate.

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Low-voltage motors are components for installation in machines in the context of the Machinery Directive 2006/42/EC. Starting up is prohibited until conformity of the end product with this Directive has been established (see EN 60204-1 / EN 60034-1 and others). All motor elements have protection class IP00.

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The regulations of VDE 0100 and 0113 must be complied with when connecting the motor. Installations and machines with inverter-fed, low-voltage three-phase motors must fulfill the protective requirements of EMC Directive 2014/30/EU. The system installer is responsible for performing proper installation.

The inverter manufacturer's EMC information must be followed!

### 3. Dangers due to strong magnetic fields

Strong magnetic fields are generated by the permanent magnets in the rotors of synchronous motors. In a de-energized state, the magnetic field strength of synchronous motors results solely from the magnetic fields of the rotors. During operation, synchronous and asynchronous motors additionally generate electromagnetic stator fields.

See BGR B11 "Electromagnetic Fields".

Rotors containing permanent magnets must never be handled by people with pacemakers, metallic implants, insulin pumps and magnetically or electrically conductive foreign bodies. An occupational health assessment is required to determine exceptions in this regard. In accordance with the magnetic fields in the workplace, unambiguous access regulations must be put in place and the boundaries of permissible access areas clearly identified.

Humans are unable to sense strong magnetic fields and generally have no experience of them either. The magnetic attraction forces that emanate from strong magnetic fields are therefore often underestimated.

Strong attraction forces on magnetizable materials present a high risk of crushing in the vicinity of rotors containing permanent magnets (distance less than 100 mm).

Do not underestimate the strength of the attraction forces!

All work must be carried out by at least two people.

Do not use your hands to place any objects made from magnetizable materials (e.g. steel or iron) and/or permanent magnets in the vicinity of a permanent magnetic rotor!

In order to free body parts (hand, finger, foot, etc.) that become trapped during accidents involving work on rotors containing permanent magnets, the following items must be available:

- a hammer (approx. 3 kg) made from solid, non-magnetizable material
- two pointed wedges (angle approx. 10 - 15°) made from solid, non-magnetizable material (e.g. hardwood)

Each movement of electrically conductive materials within the vicinity of permanent magnets produces induced voltages.

Risk of electric shock!

Movements of the stator within the vicinity of rotors containing permanent magnets must be avoided.

Magnetic fields can lead to the loss of data held on magnetic or electronic data media. Do not carry any magnetic or electronic data media about your person!

#### Affixing of warning notices

All dangerous areas must be identified in the immediate vicinity by clearly visible warning and prohibition signs (pictograms). The associated texts must be available in the language of the country of use. Table 1 and Table 2 show relevant warning and prohibition signs applicable to the use of direct drives.

**Table 1 – Warning signs according to BGV A8 and DIN 4844-2 included with primary sections and their meaning**

Sign	Description	Sign	Description
	Warning: hazardous electric voltage (D-W008)		Warning: strong magnetic field (D-W013)
	Warning: hot surfaces (D-W026)		Warning: hand injuries (D-W027)

**Table 2 – Prohibiting signs according to BGV A8 and DIN 4844-2 included with primary sections and their meaning**

Sign	Description	Sign	Description
	No people with a pacemaker (D-P011)		No people with metal implants (D-P016)
	No metal objects or watches (D-P020)		No magnetic or electronic data media (D-P021)

#### 4. Transport, storage

Any damage discovered upon delivery must be reported to the transport company immediately; starting up must be postponed if necessary.

If motors are to be stored, ensure they are placed in a dry, dust-free and low-vibration ( $V_{eff} \leq 0.2$  mm/s) environment (damage caused while in storage).

Measure the insulation resistance prior to starting up.

Storage places used for parts with permanent magnets must be marked with the pictograms shown in Table 1 and Table 2.

## 5. Installation

Ensure an even installation surface, good foot/flange fastening and precise alignment for direct coupling (avoid tension). Turn rotor by hand, listen out for unusual grinding noises.

Push/pull output elements (pulley disk, coupling...) on/off using suitable devices only (poss. thermic joining, e.g. heating) and cover with a guard that provides protection against contact. Avoid impermissible loads (e.g. belt tension).

Pay attention to balance when installing the drive element (ISO 1940)!

Do not impede the convection process for self-cooled motors or the ventilation for ventilated motors. In the case of water cooling, check the flow rate.

Never use any magnetizable tools when working on rotors containing permanent magnets. If these tools are required, they must be held firmly using both hands and moved slowly towards the rotor containing the permanent magnets.

Prevent accidental movement of previously installed rotors containing permanent magnets.

Perform assembly work in a current-free and de-energized condition only.

Risk of electric shock!

## 6. Electrical connection

All work may only be undertaken by qualified workers on a motor that is at rest, deactivated and secured against reactivation.

This also applies to auxiliary circuits (e.g. brake, encoder).

Check no voltage is present!

Rotating parts must be stopped. High voltages can be present at the motor connections on the rotating shaft of synchronous servomotors and can cause injuries.



**WARNING:** *The motors must be operated at the associated inverters.*

*Connection to the three-phase network is not permitted and can lead to the destruction of the motor.*

*Check the compatibility of encoder and sensor signals using the evaluation equipment.*

*Encoders and sensors mainly contain electrostatically endangered components (EEC); follow EEC protection measures as required.*

The connection must be made so as to maintain a permanently safe electrical connection (no protruding cable ends); use allocated cable lugs or wire end ferrules.

Make a safe PE connection.

If the connection is made in a terminal box, ensure a minimum air gap of 5.5 mm for uninsulated energized parts.

Terminal boxes and plugs must not contain any foreign bodies, dirt or moisture. Unwanted cable inlet openings and the terminal box itself must be sealed against dust and water.

For motors fitted with a brake, check that the brake works perfectly before starting up.

## 7. Operation

Check the direction of rotation in a disconnected state.

If there are any changes compared to normal operation (e.g. increased temperatures, noises, vibrations), switch off the motor in case of doubt. Determine the cause, consult the manufacturer as necessary. Do not deactivate protective devices, not even during test operation.

Regularly clean airways in areas of heavy soiling.

## 8. Further information

The following assembly/installation instructions contain further details.





This safety data sheet may not be complete. Additional protection or tests may be necessary.

This safety data sheet must be stored in a safe place.




## A 1.0 User Information

### A 1.1 Symbols Used

#### Manual / safety data sheet

	Situations where failure to follow the instructions may lead to danger, damage to material or operating faults.
	Important information for operator and engineer
	Beware of dangerous electrical voltage
	Information on disposal


#### Packaging


	Fragile
	Keep dry
	Top

### A 1.2 Important Information

**Target group:** This document is intended for persons responsible for assembly, putting into service and operation of the product.

The technical specifications, illustrations and dimensions contained in this manual are given only as a guideline. They may not be the subject of any claim. The manufacturer reserves the right to make technical improvements to its product, without amending this manual. For all additional information, please contact SycoTec.

 *This manual should be read by the user before starting up the unit for the first time in order to avoid incorrect operation and other damage. Duplication and distribution of the manual require SycoTec's prior consent.*

 **Disposal of equipment and accessories after use:**  
*Based on EU directive (WEEE 2012/19/EU) on waste electrical and electronic equipment, we hereby inform you that this product is not subject to the aforementioned directive but may be disposed of through special channels within Europe.*

### A 1.3 Qualified Personnel

Transport, assembly, installation, starting up, maintenance, repair and operation of the product may only be performed by qualified workers. The product/system that belongs to this documentation may only be used by personnel qualified for the respective task, in compliance with the documentation belonging to the respective task, in particular the safety and warning information it contains. Qualified personnel are authorized by virtue of their training and experience to identify risks and avoid any dangers that may arise when using these products/systems.

### A 1.4 Intended Use

This product may only be used for the applications described in the data specification.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

By the assembly of the motor components a three phase induction motor is generated.

SycoTec does not accept any liability for damage caused by:

- external factors (poor quality of the media or faulty installation)
- use of incorrect information
- improper use
- improperly performed repairs.

### A 1.5 Exclusion of liability

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We have checked the contents of the publication for agreement with the described hardware. Nevertheless, deviations cannot be ruled out and as such we are unable to guarantee complete agreement. The data in this publication are regularly checked and any corrections required are made in the subsequent editions.

### A 1.6 Safety Advice

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#### General



*Motor elements are components for the manufacture of synchronous or asynchronous motors in the context of the Machinery Directive 2006/42/EC. Starting up is prohibited until the conformity of the end product with the Directive has been established.*

*After completion of the motor - e.g., installation in a housing, an electrical safety testing has to be carried out, in accordance with the respectively valid standards.*

- Ensure that your end product conforms to all currently valid legal requirements. Follow the compulsory national, local and installation-specific regulations.
- Ensure that the motors components are only used for their intended purpose in industrial or commercial installations.
- It is forbidden to use them in areas at risk of explosion.
- Safety instructions must be observed during the transport, storage, assembly and disassembly of the motors components.
- Failure to observe the instructions can lead to serious damage to health and property.
- All activities such as transport, storage, assembly, disassembly, starting up and routine maintenance must be performed by qualified, skilled workers who are aware of the dangers of the application.
- Observe the warning instructions as per Directive 92/58/EEC, Appendix II (VBG 125, Appendix 2) on the packaging and the labels.
- This marking also applies to the transport and storage of the motor components after removal of the external packaging.

#### Magnetic Dangers (SP motor components)

The rotor contains permanent magnets with a very high magnetic flux density. The strong forces of attraction to ferromagnetic objects cannot always be controlled by muscle power.

- Leave the motor components in their individual packaging until assembly.
- Mark the storage location with the symbol for magnetic dangers
- Store the unpacked rotor in a safe place. Secure the rotor with non-magnetic devices.
- Prevent the rotor from contacting ferromagnetic objects! E.g. your fingers are at greatest risk.
- Preferably use tools made of non-magnetic materials. Ferromagnetic assembly tools must have low mass. Work carefully!
- Have non-magnetic hammer and wedges (wedge angle ca. 10 to 15°) available for emergencies!
- The rotor is not subject to experiments!
- Persons with a pacemaker, insulin pump or ferromagnetic implants must not make contact with the rotor. Keep a minimum distance of 0.5 meters from the parts in their original packaging.
- The maximum permitted magnetic flux density for persons with pacemakers according to DIN V VDE V 0848-4/A3:  $B = 0.5 \text{ mT}$  or as stated by the pacemaker manufacturer.
- Do not bring any data carriers (e.g. diskettes, credit cards, company IDs), electronic circuits, watches or other sensitive devices anywhere near the rotor!


#### Mechanical Risks during Assembly and Disassembly Processes

Depending on the weight of the motor components, appropriate tools etc. are used for transport and assembly work.



#### **SP motor components**

*The bandage (textile fiber composite) of the rotor must not be damaged under any circumstances. Examine the bandage (textile fiber composite) for damage.*

 *The use, storage and assembly of the SP rotors are associated with risks. The parts may only be worked on by qualified workers who have been familiarized with the particular risks.*

- Lifting devices, ground conveyors and lifting tackle must correspond to the current valid regulations.
- The rotor is mounted by thermic joining. During which process, the surface temperatures can range between -192 and 300°C (-313.6 and 572°F).
- The stator is mounted by thermic joining. During which process, the surface temperatures can range between -192 and 300°C (-313.6 and 572°F).
- Caution when dealing with hot or cold surfaces.  
Use personal protective clothing!  
Do not place thermally endangered components on hot or cold surfaces.

### **Electrical Dangers**

Motor components of a synchronous motor must be connected to the electrical supply as shown in the circuit diagram in the data specification.

All electrical work must be performed by qualified electricians.

Safety rules for working in electrical installations:

- Isolate from electrical supply
- Secure against switching on again
- Check electrical deadness
- Earth and short-circuit
- Cover or cordon off adjacent parts which are electrically live.
- When doing so, pay attention to main electrical circuits and existing booster and auxiliary circuits.
- Never connect the motors components directly to a three-phase mains.
- When the rotor (SP) is rotating, the connecting cables carry a voltage of up to approx. 2 kV.
- Do not touch the terminals or cables while the rotor (SP) is rotating and do not use any electrically conductive tools.
- The temperature sensor and encoder contain electrostatically endangered components (EEC).
- Do not touch the connections with your hands or with tools which could be electrostatically charged.

## **A 2.0 General Information**

### **A 2.1 Scope of Delivery**

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Motor components are supplied in individual or bulk packaging according to the delivery note.

The scope of delivery of the motor components consists of:

- Rotor without sleeve (optionally with sleeve and/or shaft)
- Stator (optionally with cooling jacket)

The version and number of components are specified in the delivery note.

The technical details of special versions and design variants can vary.

Check that the delivery is complete!

Please address queries about the scope of the delivery and assembly to the responsible SycoTec department.

When replacing parts, only use the manufacturer's original components.

This manual (Material no. 2.001.1518) is part of the scope of delivery.



## A 2.2 Transport, Storage

During transport and storage, the motor components are kept in their original packing and remain there until the time they are assembled.

Storage conditions: dry, dustless and shock-free rooms.



### **SP motor components**

*Life-threatening danger to persons with pacemakers.*

*The danger comes from the rotor's magnetic field.*

**Mark the storage location clearly with warning notices as per the packaging of the motor components.**



(Example illustration)



### **Observe the warning instructions on the packaging and the labels!**

*This marking also applies after removal of the external packaging.*

## A 2.3 General Assembly Requirements

**The following assembly instructions are a recommendation by the manufacturer.**

The user can perform other actions and specify tools and equipment needed for assembly, whilst nevertheless adhering to the specified safety regulations.

Tools and equipment needed for the assembly are not included in the scope of the delivery. The user is responsible for their provision.

The following conditions are required for the assembly/disassembly of the motor components:

- Technically dust free and dry environment.

The usual cleaning processes in the machine tool industry are used to maintain dust free conditions.

The permitted relative air humidity lies in the range of 5 to 85%.

## A 3.0 Rotor Assembly/Disassembly

**Selection and execution of the joining process are the responsibility of the user!**

**Perform the following work before beginning the assembly:**

1. Check that the parts to be joined are correct and complete.
2. Clean the surfaces to be joined as a precondition for the later separation and re-use of the parts.  
The surfaces to be joined must be free from contamination, rust, sharp edges, damage and machining marks.



*Follow the relevant manufacturer's instructions for each of the cleaning products used.*

*The use of products containing solvents requires adequate ventilation.*

### A 3.1 Assembly

Rotor and shaft are bound to a motor by thermic joining.

For this:

1. The tempered shaft is inserted into the heated rotor heating process, shrinkage)  
Or
2. The rotor is put over the cooled shaft (cold process, stretching).



**Danger from heated or cooled surfaces!**

*Wear heat-resistant gloves, safety goggles and sealed work clothing.*

Depending upon the weight of the rotor, lifting gear and lifting tackle are used.



**Danger during lifting and transporting procedures!**

*Improper handling, unsuitable or defective devices, tools etc. can cause injuries and/or property damage.*

*Lifting devices, ground conveyors and lifting tackle must correspond to the valid regulations.*

When the **heating process** is used, the rotor is heated in a hot-air furnace and the shaft is tempered. Temperatures for the heating process see

Joining process	Temperature of rotor	Temperature of shaft
Hot process (shrink)	max. 140°C (284°F)	10 to 20°C (50 to 68°F)
Cold process (stretch)	20 to 30°C (68 to 86°F)	-160 to -190°C (-256 to -310°F)
Cold-hot process	After consultation with SycoTec	



**SP motor components**

*Damage to the permanent magnets in the rotor.*

*Exceeding a **temperature of 150°C (302°F)** leads to irreversible demagnetization of the permanent magnets in the rotor.*

*Make sure that the rotor is not heated to a temperature above 150°C (302°F).*

Testing when this temperature has been reached can be done with temperature-reactive dye or a temperature measuring device.

If the **cold process** is used, the shaft is cooled in liquid nitrogen and the rotor is tempered at 20 to 30°C (68 to 86°F).



**There is danger to life and limb if a cooling substance other than liquid nitrogen is used!**

*Liquid oxygen or liquid air can cause explosions.*

*Only use liquid nitrogen.*



*Lower temperatures can damage the bearing of the shaft.*

*Only use the cold process if the bearing lubricant is authorized for low temperatures.*

The joining procedure must be performed without delay in order to minimize the effects of the temperature equalization.

**With SP rotors the following points must be considered additionally:**



*Rotors have a bandage (textile fiber composite) at the rotor outside diameter, which must be not damaged in any case.*



*Avoid mispositioning.*

### A 3.2 Preparation

---

Perform the following work before beginning the assembly:

1. Check that the parts to be joined are correct and complete.
2. Clean the surfaces to be joined.  
All surfaces must be free from contamination, rust, sharp edges, cavities, damage and machining marks. In particular, the ring grooves for the O-ring seals, the transition beveling in the cooling jacket (models with a stator with cooling jacket), the housing, the cable duct in the housing and the leakage bore holes must not have any sharp edges.
3. A suitable anti-corrosion agent for steel is applied to those surfaces of the stator and housing which do not come into contact with cooling fluid.

### A 3.3 Assembly Stator With and Without Cooling Jacket

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A suitable joining process is thermal joining by warm shrinking.

The stator is connected by warm shrinking with the cooling jacket/housing (provided by the manufacturer) to a firm unit.



- *The temperature of the winding/insulation must not exceed 155°C (320°F) when the cooling jacket and casing are joined.*
- *Danger during lifting and transporting procedures. Improper handling, unsuitable or defective devices, tools etc. can cause injuries and/or property damage. Lifting devices, ground conveyors and lifting tackle must correspond to the valid regulations.*
- *There exists a danger due to hot surfaces when joining by means of warm shrinking. Wear heat-resistant gloves, safety goggles and sealed work clothing.*
- *Protect power cable and sensor line against damage from the hot cooling jacket. Avoid positioning errors. Perform the joining procedure without delay.*

### A 3.4 Motor Assembly With Rotor (SP)

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**Preparation:** Stator with housing and shaft with rotor are assembled to form the complete motor.



*Note directions according to chapter 1.0*

- Use extreme care when bringing the rotor close to the stator!  
Use non-magnetic joining aids as the magnetic forces are very difficult to estimate. In a motor with a larger air gap, a plastic pipe can often help to let the rotor slide in.
- Keep your hands well clear of regions where the stator and rotor could come into contact.
- For the assembly, are general requirements apply according to chapter 3.3



*The stator winding ends must not be damaged during assembly of rotor.*

### A 3.5 Motor Assembly With Rotor (EV)

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Perform the assembly in the following sequence:

1. Cleanse the modules from contamination and chips.
2. Use lifting means and lifting tackle to bring the shaft with the rotor carefully and centrally to the stator and slide it slowly in.
3. Complete the motor as per the project.



*The stator winding ends must not be damaged during assembly of rotor.*

## A 4.0 Electrical Connection

### A 4.1 High-voltage Test

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**⚠ Danger to life and limb from high electrical potential!**

*Against the leads high voltage rests.  
Pay attention to self protection.*

- ⚠** • Installation and connection only by qualified workers in accordance with the wiring documentation and the locally applicable safety regulations.
- Check electrical safety before enabling operation.

The stators of the motor components will undergo a high-voltage test prior to their shipping. The Standards Commission however recommends for the installation of electrical components, e.g. motor components, to accomplish another high-voltage after the final assembly!

- i** *In an additional high-voltage test by the user, the cable ends of the temperature sensors are to be short-circuited before the test.  
The application of the test voltage will otherwise destroy the temperature sensor.*

### A 4.2 Electrical Connections

---

**⚠ Danger to life and limb from electrical potential!**

*When the rotor is rotating, the connecting cables carry a voltage of up to 2 kV.  
This means that the feed lines from the inverter can also carry a voltage.*

During the assembly of the electrical connections, observe the current regulations (see EN 60364-4-41 and DIN EN 60204-1 for information on this):

- All work must be performed by qualified electricians.
- All work must be done with the equipment electrically dead.

#### Protective measure against residual voltage

- ⚠** *Residual voltages at motor connections present a risk of electric shock.  
Active parts of the motor can have a charge of more than 60  $\mu\text{C}$  when the power supply is switched off.  
In addition, a voltage of more than 60 V can be present at exposed conductor ends more than 1 sec after the power supply is switched off. Take measures to protect against residual voltage.*

Safety rules for working in electrical installations:

- Isolate from electrical supply
- Secure against switching on
- Check electrical deadness
- Earth and short-circuit
- Cover or cordon off adjacent parts which are electrically live.

The stator has the following connecting cables:

- Power connection with marks, according data specification
- Sensor line, according data specification (optional)  
Please observe the datasheet of the sensor.

The electrical connections are made by the user.

Observe the following when making the electrical connections:

- Maintain the minimum air gaps

Supply voltage [V]	Minimum air gap [mm]
< 500	4.5
500 – 600	6

### A 4.3 Protective earth

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A highly conductive protective earth must be connected to the housing.

EN 60204-1 (VDE 0113) provides information about the necessary minimum cross-sectional area of the protective earth.

The motor manufacturer is responsible for proper earthing of the entire motor.

### Power connection

The wires for the power connection are shown in the data specification.



#### **An improper connection can destroy the motor!**

- *Never connect the motors directly to a three-phase mains.*
- *Only connect the motor to the inverter provided.*
- *The temperature sensors and encoders can contain electrostatically endangered components (EEC). External voltage can cause damage.*
- *Observe the EEC protective measures: do not touch connecting cables, do not apply any external voltages.*
- *When making the connections note the data given in the data specification.*
- *Note the direction of rotation of the motor spindle (swap over two phases as necessary).*

### A 4.4 Preparations For Start-Up

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After completing the assembly work, perform at least the following tests:

- Check that the measures for protection against accidental contact with moving and live parts conform to the regulations.
- Check that the motor shaft rotates freely.
- The motor shaft must not lie against or rub against other parts.
- The fixing screws and the electrical connections must be tight or tightened in accordance with the data specification.
- The coolant must circulate with the accordant rate of flow (power loss has to be dissipated).
- Further specific tests of the motor (e.g. balancing) may be necessary and lie within the responsibility of the motor user.



- *Shut down the machine before installation of the motor elements and secure against reactivation. Secure hanging axles against lowering or changes in position.*
- *The motor elements must not be started up until they have been installed.*
- *The manufacturer of the machine into which the motor elements are installed must ensure that the fasteners can safely absorb the forces produced in all operating conditions.*

### A 4.5 Electromagnetic Compatibility (EMC)

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Systems and machines with inverter-fed three-phase motors must meet the protection requirements of the EMC Directive.

The machine manufacturer is responsible for performing proper installation.

The instructions of the inverter manufacturer must be followed for EMC-compliant installation.

Use guards or similar devices to ensure that the electromagnetic fields are reduced at their source.



*The EMC measurements must be taken and evaluated in the machine in conjunction with the inverter.*

## A 5.0 Technical Data

- i**
- Further installation dimensions, with tolerances, are available on request from SycoTec.
  - Applicable standard: EN 60034-1 "Rotating electrical machines".

Protection category	Motor elements have protection category IP 00. The protection category is defined by the housing of the manufacturer of the finished motor.
Protection Class	The manufacturer of the complete motor is responsible for proper compliance with the required protection class.

### Ambient Conditions

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Standard motor elements designed for a maximum operating elevation of less than 1,000 meters above sea level.

### Storage and Transport Conditions

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Ambient temperature	-30 - 60°C / (-22 - 140°F)
Relative humidity	5 - 95 %
Air pressure	700 - 1,060 hPa
Veff	≤ 0.2 mm/s

Keep dry!

**!** *Danger from the magnetic field of the rotor for people with active medical implants (e.g. pacemaker, insulin pump, metallic implants) and magnetically/electrically conductive foreign bodies.*

### Condensate

Factors such as sharp fluctuations in the ambient temperature, direct sunlight or high humidity levels during storage can cause condensate to collect in the machine.

- i** **Damage caused by condensate**  
*If the stator winding is damp, its insulation resistance will fall. This will result in flashovers and the possible destruction of the winding.  
 Condensate can also lead to the formation of rust.*

We reserve the right to make technical modifications.

### Warranty Conditions

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Under current of SycoTec's delivery and payment conditions, SycoTec undertakes warranty for satisfactory function and freedom from faults in material and manufacture for a period of 12 months from the date of sale certified by the vendor.

In the event of justifiable complaints, SycoTec shall supply spare parts or carry out repairs free of charge under warranty. SycoTec accepts no liability for defects and their consequences which have arisen or could have arisen as a result of natural wear and tear, improper handling, cleaning or maintenance, non-compliance with the maintenance, operating or connecting instructions, corrosion, impurities in the air supply or chemical or electrical influences which are unusual or not admissible in accordance with SycoTec's standards.

The warranty claims shall become null and void if defects or their consequences can be attributed to interventions in or modifications to the product. Warranty claims can only be validated if they are notified immediately in writing to SycoTec.

A copy invoice or delivery note clearly showing the manufacture number shall be attached if products are returned.



(DE = original)

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