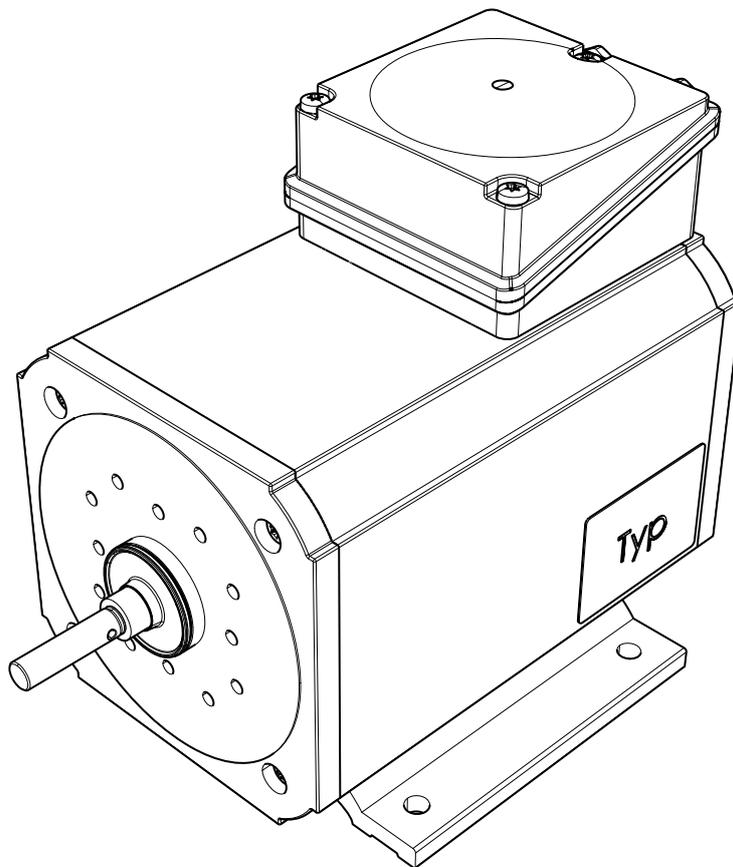


**Operating Instructions  
Three-Phase Motor  
IG Series**



<b>Revision index:</b>		
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## Table of contents

<b>1</b>	<b>General .....</b>	<b>5</b>
1.1	Subject of these operating instructions .....	5
1.2	Information on these operating instructions .....	5
1.3	Further information sources .....	5
1.4	Instructions on use .....	6
1.5	Copyright .....	6
1.6	Manufacturer specifications .....	7
1.7	Declaration of Conformity/Declaration of Incorporation .....	7
1.8	Guarantee terms .....	7
1.9	Limitation of liability .....	8
1.10	Explanation of symbols .....	9
1.11	Warnings .....	10
<b>2</b>	<b>Safety .....</b>	<b>12</b>
2.1	General .....	12
2.2	Intended use .....	12
2.3	Foreseeable misuse .....	12
2.4	Product monitoring .....	12
2.5	Fundamental safety instructions .....	13
2.6	Particular dangers/residual risks .....	13
2.6.1	Danger from electric current! .....	13
2.6.2	Danger from hot surfaces .....	14
2.6.3	Fire risk .....	14
2.6.4	Risk of shearing .....	14
2.6.5	Rotating components .....	14
2.6.6	Danger from noise .....	14
2.7	Emission .....	14
2.7.1	Noise emission .....	14
2.8	Responsibility of the machine manufacturer .....	14
2.9	Staff requirements .....	15
2.9.1	Qualification .....	15
2.9.2	Unauthorised persons .....	15
2.9.3	Instruction .....	15
2.10	Personal protective equipment .....	16
2.11	Safety appliances .....	17
2.12	Signs on the motor .....	17
2.13	Modification prohibited .....	17
2.14	Spare parts .....	17
2.15	Measures for preventing accidents .....	18
2.16	Environmental protection .....	18
<b>3</b>	<b>Technical data .....</b>	<b>19</b>
3.1	Note .....	19
3.2	Type plate .....	20
<b>4</b>	<b>Setup and function .....</b>	<b>21</b>
4.1	Description of functions .....	21

4.2	Overall view .....	21
4.3	Safety appliances .....	22
4.4	Accessories.....	22
<b>5</b>	<b>Transport, packaging and storage .....</b>	<b>24</b>
5.1	Safety instructions for transport.....	24
5.2	Transport inspection .....	24
5.3	Handling during transport.....	25
5.4	Storage .....	25
5.5	Packaging .....	26
<b>6</b>	<b>Improper assembly and initial startup.....</b>	<b>27</b>
6.1	Safety instructions .....	27
6.2	Setup/installation.....	27
6.3	Connection overview .....	28
6.4	Connection .....	28
	6.4.1 Electrical connection.....	28
	6.4.2 Connecting the output.....	29
6.5	Initial startup.....	29
	6.5.1 Checking prior to initial startup .....	29
	6.5.2 Test run .....	30
<b>7</b>	<b>Operation.....</b>	<b>31</b>
<b>8</b>	<b>Faults .....</b>	<b>32</b>
8.1	Safety instructions .....	32
8.2	Fault/troubleshooting.....	33
	8.2.1 Electrical.....	33
	8.2.2 Mechanical.....	35
	8.2.3 Brake .....	36
<b>9</b>	<b>Maintenance/cleaning .....</b>	<b>37</b>
9.1	Safety instructions .....	37
9.2	Cleaning.....	37
	9.2.1 Surface/cooling equipment .....	37
9.3	Maintenance .....	38
	9.3.1 General instructions .....	38
	9.3.2 Replacing worn parts/components .....	38
	9.3.3 Lubrication .....	38
	9.3.4 Customised versions .....	38
<b>10</b>	<b>Decommissioning and disposal .....</b>	<b>39</b>
10.1	Safety instructions .....	39
10.2	Dismantling .....	39
10.3	Disposal .....	40
<b>11</b>	<b>Appendix.....</b>	<b>41</b>
11.1	Document list.....	41

## General

### 1 General

#### 1.1 Subject of these operating instructions

The 2/4-pole versions of the three-phase motors in the IG series are described in these operating instructions.

Each type designation of the motors described here is listed and explained in the "Technical data" section (see [Technical data/Note](#)).

#### 1.2 Information on these operating instructions

These operating instructions enable safe and efficient handling of the motor. They are integral part of the motor and must be available to staff always. Staff must read the operating instructions of the motor thoroughly and understand them before commencing any work. Compliance with all safety instructions and guidelines stated in the operating instructions constitute the basic requirement for safe working practices. Furthermore, local accident prevention regulations and general safety directives apply to the scope of application of the motor. Illustrations in these operating instructions are only intended to convey the basic understanding and can deviate from the actual motor. In addition, pay attention to the motor documents in the appendix.



#### NOTE

These operating instructions also apply to the motors in the predecessor series with the type designation DM, ODM, WKM and ZM.

#### 1.3 Further information sources

For further information and solutions from Groschopp AG (see: [Manufacturer specifications](#), contact us or visit the homepage [www.groschopp.de](http://www.groschopp.de)).

## 1.4 Instructions on use

### Instructions and reactions

Actions to be taken by operating staff are illustrated consecutively. The order of the actions must be adhered to. The result of the respective action is marked by an arrow.

Example:

➔ Action 1

⇌ Result of action 1

### Lists

Lists without compulsory order are shown with an initial bullet point.

Example:

- Item 1
- Item 2

Lists with compulsory order are shown with initial numbering.

Example:

1. First
2. Second

### Referrals

Referrals to sections or text passages, in which procedures, instructions or further information are described, are depicted by blue text.

Example:

(see: [Instructions on use](#))

## 1.5 Copyright

These operating instructions and all other documentation supplied are protected by copyright law.

© 2016 Groschopp AG

Sharing or copying documents, even as excerpts, utilization and communication of its content are not permitted unless explicitly allowed. Infringements are punishable and damage compensation is mandatory.

We reserve all rights of exercising industrial protective rights.

## General

### 1.6 Manufacturer specifications

#### GROSCHOPP AG

Greefsallee 49

41747 Viersen

Germany

Phone: +49 (0)2162/374-0

Fax: +49 (0)2162/108-0

e-mail: [info@groschopp.de](mailto:info@groschopp.de)

[www.groschopp.de](http://www.groschopp.de)

#### Service information:

The following data is required for optimum service handling:

- Motor identification number
- Type and extent of a fault
- Time and circumstances of a fault
- Suspected cause

### 1.7 Declaration of Conformity/Declaration of Incorporation

The product is provided with the CE mark in accordance with "European Guidelines".



The Declaration of Conformity is deposited at the manufacturer (distribution company):

**Groschopp AG**

Greefsallee 49

41747 Viersen

Germany

### 1.8 Guarantee terms

The guarantee conditions are included in the general terms and conditions of the manufacturer.

**1.9 Limitation of liability**

All specifications and instructions contained in these operating instructions were compiled with respect to current standards and regulations and reflect the current state of technology as well as our longstanding knowledge and experience.

The manufacturer assumes no liability for damages resulting from:

- Failure to observe the operating instructions
- Use other for the intended purpose
- Deployment of untrained or insufficiently-trained staff,
- Unauthorised modifications
- Faulty connection,
- Technical modifications
- Failure to perform mandatory servicing,
- Use of non-approved spare parts

The responsibilities as agreed in the delivery contract, the general terms and conditions, the delivery conditions specified by the manufacturer as well as the applicable statutory regulations apply.

We reserve the right to make technical modifications resulting from improvements and further development.

## General

### 1.10 Explanation of symbols

#### Pictograms

The warnings used in these operating instructions are also indicated by a pictogram, which is intended to make a possible hazard clear.

The following pictograms are used:

Symbol	Meaning
	General warning
	Danger from electricity
	Danger from hot surfaces
	Danger of environmental pollution
	General instructions and useful suggestions on handling.

## 1.11 Warnings

The warnings used in these operating instructions are indicated by signal words such as DANGER, WARNING, CAUTION and ATTENTION and are intended to express the extent of the hazard. A warning symbol also refers to the type of hazard.

The following warning instructions are used throughout these operating instructions:

### Danger to life

	<b> DANGER</b>
	<p><b>Danger to life!</b></p> <p>Consequences of failure to observe ...</p> <p>▶ Instructions for avoiding</p>

A warning of this category indicates an impending dangerous situation. If the dangerous situation is not avoided, it may lead to serious or irreversible injury or even death.

Follow the instructions in this warning to avoid possible danger of serious injury or even death.

### Risk of injury

	<b> WARNING</b>
	<p><b>Risk of injury!</b></p> <p>Consequences of failure to observe ...</p> <p>▶ Instructions for avoiding</p>

A warning of this category indicates a potentially dangerous situation.

If the dangerous situation is not avoided, it may lead to serious injury or even death.

Follow the instructions in this warning to avoid possible danger of serious injury or even death.

### Injury to persons

	<b> CAUTION</b>
	<p><b>Injury to persons by...</b></p> <p>Consequences of failure to observe ...</p> <p>▶ Instructions for avoiding</p>

A warning of this category indicates a potentially dangerous situation.

If the dangerous situation is not avoided, it may lead to minor or moderate injury.

Follow the instructions in this warning to avoid possible danger of injury to persons.

## General

### Material damage

	ATTENTION
	<p><b>Damage to property by...</b></p> <p>Consequences of failure to observe ...</p> <p>▶ Instructions for avoiding</p>

A warning of this category indicates potential danger to property.  
 If the situation is not avoided, it may lead to damage to property.  
 Follow the instructions in this warning to avoid damage to property.

### Tips and recommendations

	NOTE
	<p>Descriptive text...</p>

A descriptive text contains additional information that is important for further processing or for simplifying the procedure step explained.

## **2 Safety**

### **2.1 General**

This section provides important instructions on all safety aspects for optimum protection of staff as well as safe and smooth operation.

Failure to observe the safety and handling instructions listed in these operating instructions can lead to considerable danger.

➔ Always pay attention to all warnings and instructions specified.

### **2.2 Intended use**

The motor serves only as drive element for machines (according to Machine Directive 2006/42/EC) and may only be put into operation as an integrated part of the machine.

The technical limits of the motor must be complied with. For this purpose, pay attention to the type plate on the motor and the technical data in the appendix of these operating instructions (see [Appendix](#)).

Any use other than previously stated is considered as improper use.

### **2.3 Foreseeable misuse**

Any use other than and/or going beyond the intended use of the motor can lead to dangerous situations.

➔ Only use the motor for its intended purpose.

➔ All information contained in these operating instructions must be strictly complied with.

➔ Do not make any modifications to the motor.

The operator is liable for all damage caused from use for other than the intended purpose.

### **2.4 Product monitoring**

Groschopp AG continues to monitor its motors after delivery.

Therefore, please inform us on:

- any accidents;
- problems that occur during use of the motor;
- malfunctions that occur during specific operating situations;
- experience that could be important for other users.

For contact data, see [Manufacturer specifications](#).

## Safety

### 2.5 Fundamental safety instructions

The motor is state-of-the-art and was built according the EC low-voltage directive and technical safety regulations.

However, risks and impairment can still occur when using the motor:

- for life and limb of the operator or third party
- for life and limb of the maintenance staff
- for the machine itself
- and other material assets

The basis for safety-related handling and trouble-free operation of the motor is knowledge of the safety and user instructions in this manual.

	<i>NOTE</i>
	The operating instructions are an integral part of the motor and must be available to staff always.

### 2.6 Particular dangers/residual risks

#### 2.6.1 Danger from electric current!

Contact with live wires or components can lead to serious injury or even death!

- Do not use the motor if electrical lines, plugs or insulating housings are damaged. Perform checks according to the deadlines for recurring checks/inspections specified in the operating instructions.
- Work on electrical equipment may only be carried out by a qualified electrician or trained staff under the supervision and instruction of a qualified electrician in accordance with the rules of electrical engineering.
- Defects detected in electrical systems/equipment must be repaired immediately. If the condition represents an acute danger, the defective system, component etc. may not be used.
- Machine parts undergoing inspection, maintenance or repair work must be disconnected from the voltage as prescribed. Check that those parts are disconnected from the voltage supply and insulate live adjacent parts before grounding and short-circuiting them!
- If work on live parts is necessary, a second person is required to switch off power at the main switch in case of emergency. Secure the work area with a red-white safety chain and a warning sign. Only use tools insulated against voltage!

## 2.6.2 Danger from hot surfaces

Hot surfaces can cause serious injuries.

The surface of the motor can heat up strongly during operation (surface temperature > 100 °C).

- ➞ Do not touch the motor during operation.
- ➞ Allow the motor to cool sufficiently after operation.

## 2.6.3 Fire risk

Fire and smoke can be caused by hot motor parts if operated improperly.

The motor can heat up strongly during operation.

- ➞ Never cover the motor with inflammable materials.
- ➞ Ensure sufficient ventilation of the motor during operation.

## 2.6.4 Risk of shearing

Depending on the version, the motor is equipped with a ventilator.

Risk of cutting and shearing injuries from the ventilator.

- Never operate the motor without ventilator cover.
- Never reach or put objects into the openings of the ventilator.

## 2.6.5 Rotating components

Rotating and/or linearly moving components can cause severe injury.

- ➞ Do not reach into or tamper with rotating components during operation.
- ➞ Do not open the covers during operation.
- ➞ Pay attention to run-down times:  
Make sure that components are not in motion when opening the cover.
- ➞ Wear close-fitting protective clothing in the danger zone.

## 2.6.6 Danger from noise

Noise can cause deafness.

- If the measured sound level exceeds 80 dB(A), the operator must make corresponding ear protection available.
- If the measured sound level exceeds 85 dB(A), the operator must make corresponding ear protection available.

## 2.7 Emission

### 2.7.1 Noise emission

The motor must only be operated as drive element of a machine.

To determine the noise level, the manufacturer of the machine ascertain the overall noise level.

## 2.8 Responsibility of the machine manufacturer

Because the motor may only be used as a drive element of a machine, the machine manufacturer must satisfy all regulations according to current regulations.

In this case, pay attention to all specifications in safety, accident prevention and environmental regulations.

## Safety

### 2.9 Staff requirements

#### 2.9.1 Qualification

Inappropriate handling of the machine can result in considerable damage to persons or property.

- All activities shall only be carried out by qualified staff.

The following qualifications are stated in these operating instructions for different fields of activities.

- Instructed persons  
were given instruction by the operator on his/her assigned tasks and possible dangers resulting from improper conduct.
- Specialist staff  
are considered specialists, who, due to their professional training, knowledge and experience as well as acknowledgement of relevant regulations, can judge the assigned work, and can recognise and avoid possible risks.
- Electrical specialist  
are employees who, due to their professional training, knowledge and experience as well as acknowledgement of relevant regulations, can judge the assigned work, and can recognise and avoid possible risks.  
The qualified electrician was trained for the specific work site to which he/she is deployed, and is familiar with the relevant standards and regulations.

Only permit members of staff if it can be expected that they will carry out their assigned tasks reliably. Those staff members whose responsiveness is affected by substances such as drugs, alcohol or medication shall not be permitted.

Staff to be trained, taught, instructed or involved in a general training program may only work under the constant supervision of an experienced person!

<b>i</b>	<i>NOTE</i>
	When selecting staff, pay attention to age and occupational-specific regulations at the location.

#### 2.9.2 Unauthorised persons

Unauthorised persons who do not fulfil the requirements are not familiar with the dangers at the work location.

- Do not permit unauthorised persons to be in the vicinity of the work area.
- In case of doubt, approach the persons and instruct them to leave the work area.
- Do not continue with work while the unauthorized person is in the vicinity of the work area.

#### 2.9.3 Instruction

Staff must be regularly instructed by the operator.

<b>i</b>	<i>NOTE</i>
	In order to keep track and log all instruction sessions, participating members of staff are required to acknowledge with their signature.

## 2.10 Personal protective equipment

To minimise health risks during work, it is necessary to wear personal protective equipment.

- The protective equipment corresponding to the work being carried out must be worn always.
- Worn out or defective protective equipment must be replaced immediately.
- Pay attention to all notices within the work area on personal protective equipment.

Always wear the following protective equipment during work:

	Close-fitting protective clothing with a low tear strength
	Gloves for protection against injuries
	Protective footwear with steel caps, puncture-resistant and oil-resistant soles
	Goggles to protect the eyes from flying parts and liquids

Special protective equipment is necessary when performing special work. This is dealt with in detail in individual sections.

Also wear the following protective equipment during special work:

	Helmet for protecting your head against falling objects
	Ear protection in areas with high noise emission > 80 dB(A)

## Safety

### 2.11 Safety appliances

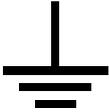
When installing, the motor must be integrated into the overall safety concept of the machine.

### 2.12 Signs on the motor

Over time, stickers and signs can become illegible due to dirt or other causes.

- All safety, warning and operating instructions must be maintained in legible condition.
- Damaged signs or stickers must be replaced immediately.

The following symbols and signs are on the motor. These apply to the area immediately surrounding where they are attached.

	<p>Grounding                  A ground connection is located at the indicated place.</p>
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------

### 2.13 Modification prohibited

Any modifications, additional extensions and changes to the motor, in particular, the removal or manipulation of the safety devices is forbidden.

No liability or warranty can be assumed by the manufacturer in the event of unauthorised modifications to the motor. This also applies to welding work.

The electromagnetic behaviour of the motor can be impaired by extensions or modifications of any type. For this reason, do not modify or make changes to the motor without written permission from the manufacturer.

### 2.14 Spare parts

Incorrect or defective replacement parts can lead to injury, damage, malfunction or total breakdown.

- Use original parts only.

	<p style="text-align: center;"><i>NOTE</i></p> <p>For further information and ordering replacement parts, contact Groschopp AG (see: <a href="#">Manufacturer specifications</a>).</p>
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## 2.15 Measures for preventing accidents

### Preventive measures

- Always be prepared for accidents or fire.
- Store first aid equipment (first aid kit, covers, etc.) and fire extinguishers so that they are easily accessible.
- Familiarise staff with accident reporting, first aid and rescue equipment.
- Keep access routes free for emergency vehicles.

### Measures to be taken in case of accident

- Trigger the Emergency-Stop system immediately.
- Initiate first aid measures.
- Remove persons from the danger area.
- Inform person responsible.
- Alert the emergency services.
- Keep access routes free for emergency vehicles.

## 2.16 Environmental protection

Severe damage to the environment can result from improper handling and in particular, improper disposal of environmentally hazardous materials.

- Pay attention to the instructions on disposal below.
- When the environment is inadvertently exposed to environmentally hazardous materials, immediate measures must be taken. In case of doubt, the local authorities responsible should be notified about the possible damage.

### Lubricants

Lubricants such as grease and oil contain poisonous substances. These must not be allowed to leak into the environment. Disposal must take place via a specialised disposal company.

- Pay attention to the manufacturer specifications on the respective lubricants!

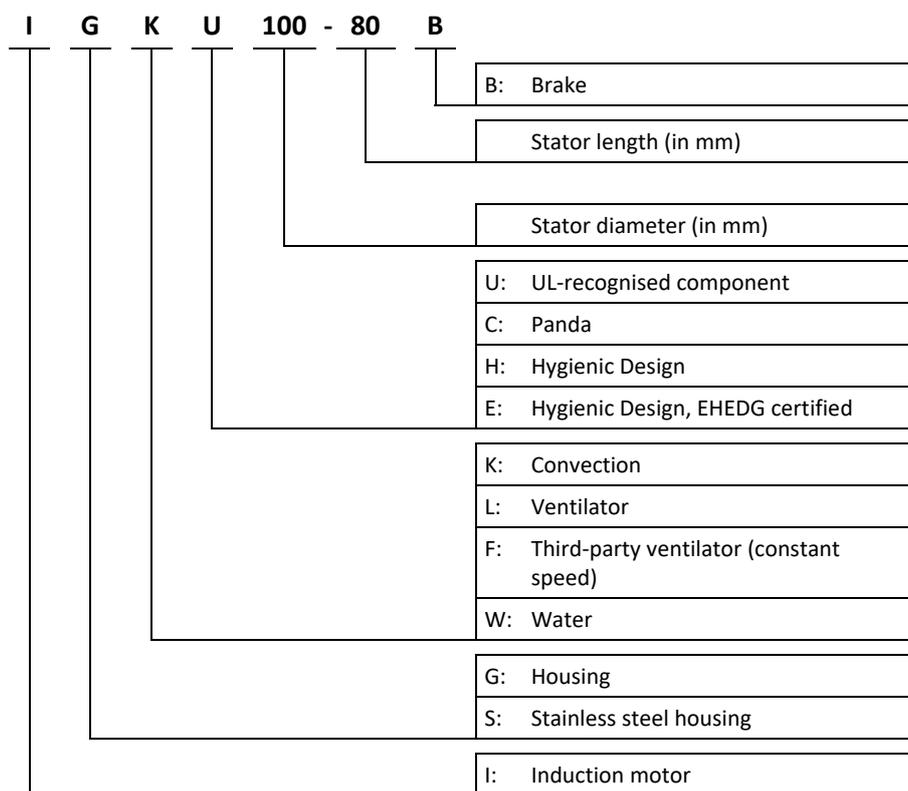
## Technical data

### 3 Technical data

#### 3.1 Note

The technical data for the respective three-phase motor in the IG series is in the appendix of these operating instructions (see: [Appendix](#)).

The motor type designation comprises the following:



#### NOTE

In addition to the standard versions stated above, Groschopp AG also manufactures different motor types as well as an extensive portfolio of add-on parts.

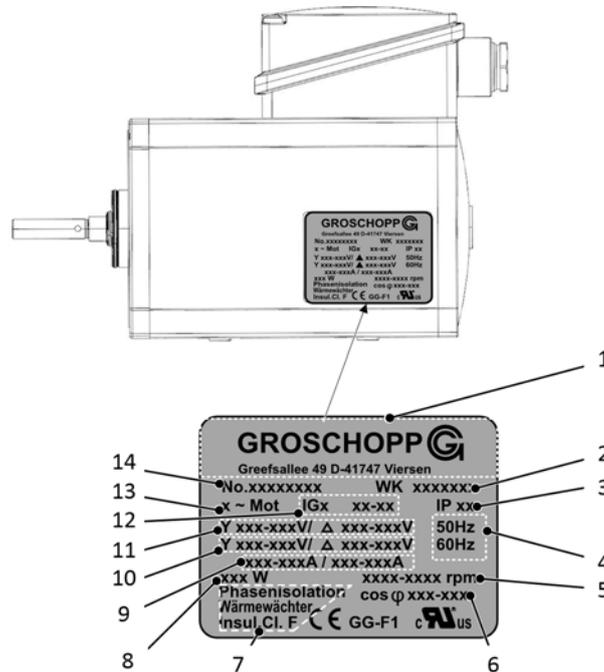
This includes:

- ▶ Induction motors as alternative version
- ▶ Add-on components such as: frequency inverters, encoder systems and speedometers

For details on the product range, please visit the homepage [www.groschopp.de](http://www.groschopp.de).

## 3.2 Type plate

The type plate with CE mark is on the motor housing.



(The illustration could be different from the actual location of the type plate)

Pos.	Meaning
1	Manufacturer specifications
2	Winding card number
3	Degree of protection (IP)
4	Frequency
5	Speed (in rpm)
6	Phase shift angle
7	Various technical information on the motor. In the example: <ul style="list-style-type: none"> <li>• Phase insulation</li> <li>• Heat monitor</li> <li>• Insulation class</li> </ul>
8	Power output (in W)
9	Current consumption, respectively for star and delta circuits (in A)
10	Operating voltage, respectively for star and delta circuits (in V) at 60 Hz
11	Operating voltage, respectively for star and delta circuits (in V) at 50 Hz
12	Motor type designation
13	Type of current
14	Serial number

## Setup and function

### 4 Setup and function

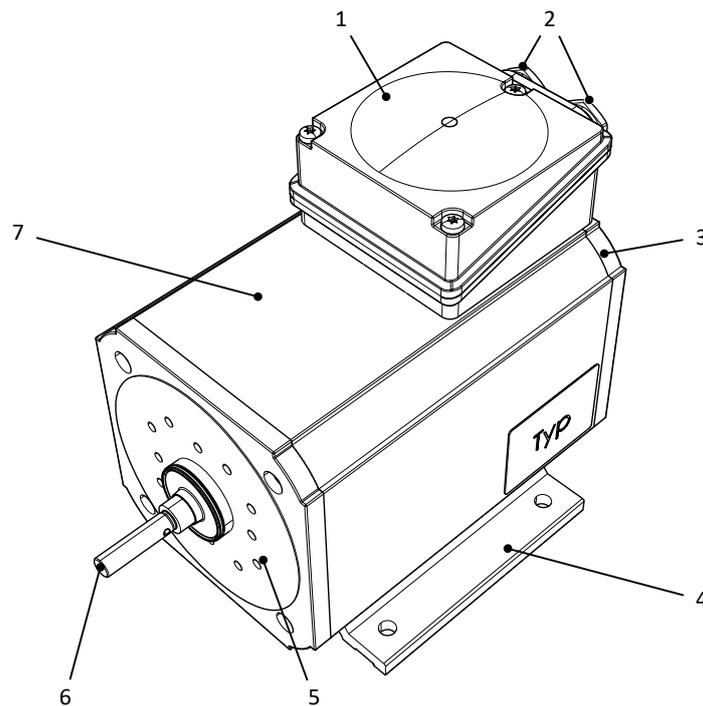
#### 4.1 Description of functions

The functional method of the individual motors in the IG series depends on the respective design e.g., induction motor, reluctance motor etc., (see: [Appendix](#) for more details).

#### 4.2 Overall view

Normally, the three-phase motors in the IG series consist of the following components.

For details, pay attention to the product datasheet of the respective motor in the [Appendix](#).



Pos.	Meaning
1	Terminal box
2	Cable insert
3	Bearing plate (for versions with ventilator: ventilator cover)
4	Mounting foot (optional)
5	Flange for connecting with a gearbox or for direct attachment
6	Output shaft
7	Housing

### 4.3 Safety appliances

<b>i</b>	<i>NOTE</i>
	The motor may only be put into operation as an integrated part of a machine. The motor must be integrated into the overall safety concept of the machine.

### 4.4 Accessories

#### Gearbox (optional)

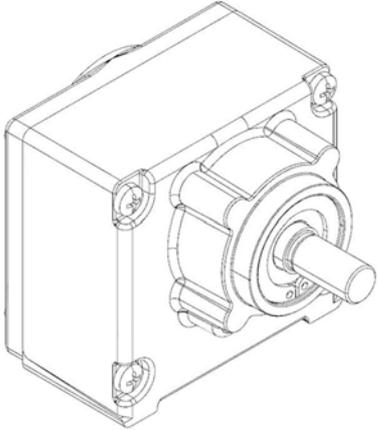
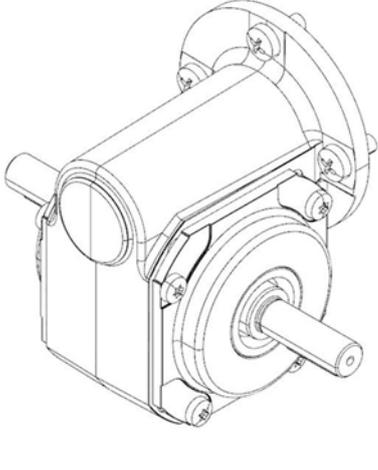
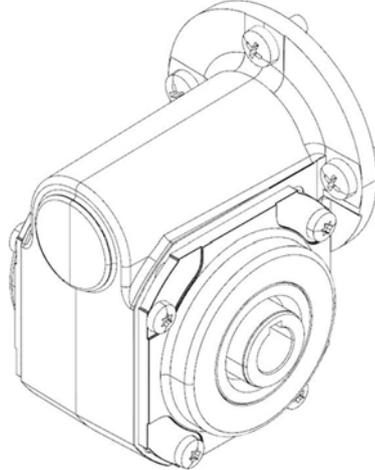
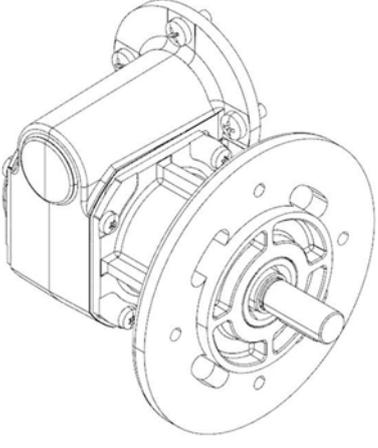
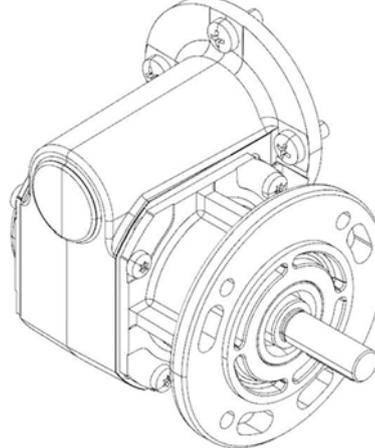
<b>i</b>	<i>NOTE</i>
	<p>When using gearboxes at the motor, other risks are possible in addition to those already mentioned in these operating instructions.</p> <ul style="list-style-type: none"> <li>▶ Pay attention to the safety instructions in the technical documentation for the respective gearbox.</li> </ul>

<b>i</b>	<i>NOTE</i>
	If the three-phase motor of the IG series is supplied by Groschopp AG as motor-gearbox combination, the technical data for the corresponding gearbox is in the appendix of these operating instructions (see: <a href="#">Appendix</a> ).

Various gearbox versions are available from Groschopp AG as optional accessories (see <http://www.groschopp.de/produkte/getriebe/>).

**Setup and function**

Various examples of available gearbox versions are shown here.

	
<p>Spur gear driven type SG80</p>	
	
<p>Simple worm gear type VE31-D-B-2</p>	<p>Simple worm gear type VE31-D-H</p>
	
<p>Simple worm gear type VE31-G-R (or: VE31-G-L) (version with large flange)</p>	<p>Simple worm gear type VE31-K-R (or: VE31-K-L) (version with small flange)</p>

### 5 Transport, packaging and storage

#### 5.1 Safety instructions for transport

##### Improper transport

The motor and the optional gearbox can be damaged considerably in the case of improper transport.

- Before transporting each time, make sure that the motor and where appropriate, the drive, are packaged properly and secured against slipping.
- When unloading the packaging on delivery as well as during in-house transport, proceed with care and pay attention to the symbols and instructions on the packaging.
- Remove the packaging only prior to installation.

#### 5.2 Transport inspection

The delivery should be checked immediately for completeness and for transport damage.

<b>i</b>	<i>NOTE</i>
	Failure to pay attention to the following instructions will invalidate claims to the insurer for damage.

In the case of visible transport damage, proceed as follows:

- Receipt of delivery should only be signed under reservation (e.g. on the shipping document) with corresponding information even if damage is only suspected.
- If goods are delivered in containers, make sure that container and locks or seals are checked by authorised persons of the shipping company or the carrier. If containers are damaged or locks and seals have been forced open, are missing or deviate from the shipping documents, the receipt should only be signed under reservation, damage must be documented and damaged or incorrect locks stored in a safe place.
- Secure claims against third parties for compensation. Ask shipping carrier, other carriers, haulage companies, warehouse keepers, customs and port authorities
  - to inspect damage jointly,
  - to certify any damage,
  - state liability in writing and describe the damage in detail.

Report any visible or concealed external damage immediately after detection.

- Determine and adhere to deadlines for submission of claims.

<b>i</b>	<i>NOTE</i>
	Register any claim as soon as a defect is detected. Claims for damages can be made only within the applicable reporting periods.

- Take steps to reduce existing damage and prevent any further damage.
- Immediately notify the claims agent indicated in the insurance documents, who will assess the damage and provide advice on how to safeguard compensation claims against third parties, as well as on measures to take to minimize the damage.
- Do not change the condition of the shipment and its packaging before the claims agent arrives unless this is necessary for the reduction and prevention of further damage.
- Report the insurance claim immediately to the insurer and provide him with complete documentation of the damage as soon as possible (however, at the latest before possible exclusion and/or limitation periods for compensation claims against third parties expire) to enable acceleration of the claim processing procedure.

## 5.3 Handling during transport

The motors and gearboxes are packaged by Groschopp AG and secured against damage. The packaged parts must be secured against slipping during transport.

	<i>NOTE</i>
	Use suitable safety accessories (e.g., straps) to secure the packaged parts. No attachment points are provided on the packaged parts.

- Use suitable aids for transporting the packaged parts.

## 5.4 Storage

Pay attention to the following for storing motors and gearboxes:

- Do not store outdoors.
- Store in a dry place.  
Avoid condensation always. If necessary, use long-term corrosion protection and dehumidifiers.
- Store at a dust-free location.
- Do not expose to aggressive media.
- Protect against solar radiation.
- Avoid mechanical vibration and damage.
- Storage temperature: -20 - 40 °C

When storing for longer than 3 months, check the general condition of all parts and the packaging regularly. Replenish or renew the conservation medium as necessary.

	<i>NOTE</i>
	The package may contain instructions for storage which exceed the specifications mentioned here. Follow these instructions accordingly.

### Storing up to one year

When storing the motor and gearbox up to one year, it is possible to install and start up the components without further measures.

### Storing for more than one year

The motor and gearbox may not be used without consulting Groschopp AG if they are stored for longer than one year.

- Contact the Groschopp AG service department for further information (see [Manufacturer specifications](#))

**5.5 Packaging**

The individual packages are packed according to the expected transport conditions. Packaging should protect the individual parts from transport damage, corrosion and other damage up until installation. For this reason, do not destroy the packaging and remove it only just prior to installation. Packing material should be disposed of in accordance with the respective current legal and local regulations.

**ATTENTION****Environmental damage due to improper disposal!**

Packing materials are valuable raw materials and can be used further in many ways or prepared meaningfully and can be used again.

- ▶ Dispose of packing materials according to environmental regulations.
- ▶ Pay attention to the local disposal regulations. If necessary, instruct a specialist company for disposal.

## 6 Improper assembly and initial startup

### 6.1 Safety instructions

#### Electrical system

Contact with live wires or components can lead to serious injury or even death!

- ➔ Switch off the electric power prior to starting work and secure it against being switched back on.

#### Staff

Installation and initial startup may only be performed by trained specialist staff.

- Work on electrical systems may only be carried out by specialist qualified electricians.

#### Personal protective equipment

Use personal protective equipment as described (see [Personal protective equipment](#)).

Also pay attention to the local specifications and regulations!

#### Improper assembly and initial startup

Improper assembly and initial startup can lead to severe personal injury or material damage.

- ➔ Before beginning work, make sure that sufficient installation workspace is available.
- ➔ Be careful when handling exposed, sharp-edged components.
- ➔ Pay attention to tidiness and cleanliness at the workplace! Parts and tools lying around or on top of each other can be sources of accidents.
- ➔ Parts must be properly installed. Adhere to specified torques for screw connections.
- ➔ Secure components so that they do not fall or topple.

### 6.2 Setup/installation

The motor must be fixed according to the technical specifications.

Pay attention to the corresponding product datasheet and the respective drawing of the motor (see the product information supplied in [Appendix](#)).

When installing the motor, pay attention to the following:

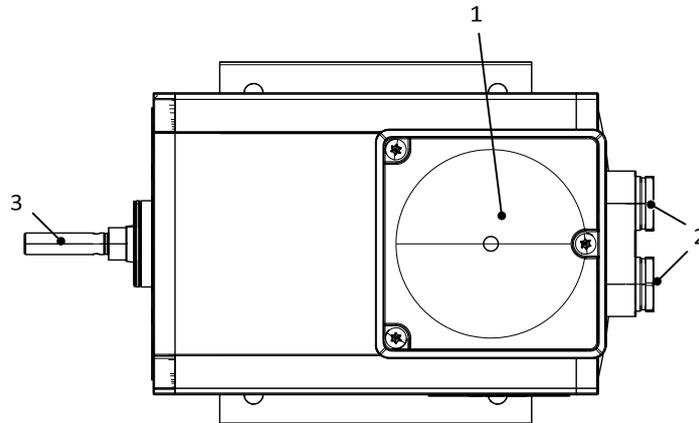
- Avoid structural resonance from the rotational frequency and double mains frequency.
- In the case of direct coupling, ensure even positioning and axial alignment of the motor.
- Provided sufficient ventilation for motor cooling. Make sure that exhaust air can dissipate unobstructed and that warm air is not sucked in.



#### NOTE

If solutions are required that deviate from the standard installation options, contact the Groschopp AG service department (see [Manufacturer specifications](#)).

### 6.3 Connection overview



The electrical connection of the motor is done via the cable inserts (2) of the terminal box (1) on the motor housing

Connection to the driving machine elements (e.g., gearbox) is done via the drive shaft (3).

### 6.4 Connection

#### 6.4.1 Electrical connection

Connect the motor according to the corresponding circuit diagram (see [Appendix](#)).

For this purpose, pay attention to the following:

- Technical data on the type plate of the motor.
- Technical data of the corresponding product data sheet (see [Appendix](#)).
- Use assembled and shielded lines according to the technical specifications for connection.

Connection:

- ➔ Open the terminal box with a suitable tool (screwdriver).
- ➔ Insert the connecting line through the screw connection of the cable insert opening in the terminal box.
- ➔ Tighten the screw connection so that the cable insert opening is sealed against dust and water.
- ➔ Make sure that the unused cable inlet is sealed against dust and water.
- ➔ Attach the connecting line according to the circuit diagram and check the wire connections.
- ➔ Check grounding/equipotential bonding of the motor housing.
- ➔ Close and seal the terminal box against dust and water. Make sure that there is no foreign matter, contamination or moisture in the terminal box.

## 6.4.2 Connecting the output

The output is connected via a corresponding gearbox from Groschopp AG flanged to the motor or directly via the output shaft of the motor equipped with a feather key. Pay attention to the corresponding detail drawing in the [Appendix](#) for information on the motor-specific dimensions and fittings.

For connection of a Groschopp AG gearbox:

- Check the compatibility of the gearbox with the motor or contact Groschopp AG for checking.
- Carry out gearbox assembly and connection to the motor according the specifications from Groschopp AG.

## 6.5 Initial startup

The motor may only be put into operation as an integrated part of a machine.

The machine manufacturer is solely responsible for compliance with standards and guidelines for manufacturing and operating the machine

The machine is operated via a controller. For this purpose, pay attention to the overall documentation of the distributing company of the machine.

### 6.5.1 Checking prior to initial startup

	<i>NOTE</i>
	The following tests ensure safety during initial startup. ▶ Rectify any faults detected before startup.

- Check all electrical connections of the motor.
- Check the motor protection equipment.
  - Present and functional?
- Check secure seating of the motor.
- Check the motor condition.
  - Motor undamaged?
  - No blockage?
- Check for uninhibited air supply and exhaust.
- Check for secure seating of the drive elements.

In the case of initial startup without drive elements, remove the feather key of the motor drive shaft or secure against removal.
- Check all other safety equipment.
  - Protective covers installed?
  - Motor integrated into the safety chain?
  - Safety chain functional?
- No persons in the danger zone

### 6.5.2 Test run

Initial startup usually takes place with functional checking of the machine, in which the motor is installed.

	 <b>WARNING</b>
	<p><b>Risk of injury!</b></p> <p>Risk of injury from flying parts, if the motor check is carried out without drive elements.</p> <p>▶ Remove the feather key of the drive shaft of the motor or secure against loosening.</p>

For this purpose, check the following items for the motor:

- Direction of rotation of the motor correct?
- Conspicuous vibration?
- Conspicuous noise generation?
- Strong temperature rise at the motor?  
(The surface temperature can rise over 100 °C during normal operation)

If one or more of the listed points occur:

- ➔ Stop operation of the motor.
- ➔ Allow the motor to cool down.

	 <b>CAUTION</b>
	<p><b>Risk of burns</b></p> <p>The temperature on surface of the motor can rise above 100 °C. Risk of burns if the motor is touched.</p> <p>Before any work on the motor:</p> <p>▶ Allow the motor to cool down and check the surface temperature.</p>

- ➔ Check the cause of the fault (see [Faults](#)).
- ➔ Eliminate the fault and check the function again.
- ➔ If the fault occurs again, contact the Groschopp AG service department (see [Manufacturer specifications](#)).

## Operation

### 7 Operation

The motor may only be put into operation as an integrated part of a machine. The machine is operated via a controller. For this purpose, pay attention to the overall documentation of the distributing company of the machine.



*NOTE*

For machine faults in conjunction with the motor, see [Faults](#).

## 8 Faults

The faults listed here refer directly to the motor.

Pay attention to the overall documentation for faults that are caused by the machine.

	<i>NOTE</i>
	Do not take the measures listed for troubleshooting, contact the Groschopp AG service department. See <a href="#">Manufacturer specifications</a> .

### 8.1 Safety instructions

Before troubleshooting:

- Pay attention to the overall documentation for the machine, in which the motor is installed, and pay particular attention to the safety regulations.
- Pay attention to run-down and allow the motor to run down completely.
- Allow the motor to cool down completely.

#### Electrical system

Contact with live wires or components can lead to serious injury or even death!

- Switch off the electric power prior to starting work and secure it against being switched back on.

#### Staff

Troubleshooting may only be performed by trained specialist staff.

- Work on electrical systems may only be carried out by specialist qualified electricians.

#### Personal protective equipment

Use personal protective equipment as described (see [Personal protective equipment](#)).

Also pay attention to the local specifications and regulations!

#### Improper troubleshooting:

Improper troubleshooting can lead to severe personal injury or material damage.

- Before beginning work, make sure that sufficient installation workspace is available.
- Be careful when handling exposed, sharp-edged components.
- Pay attention to tidiness and cleanliness at the workplace! Parts and tools lying around or on top of each other can be sources of accidents.
- Parts must be properly installed. Adhere to specified torques for screw connections.
- Secure components so that they do not fall or topple.

## Faults

### 8.2 Fault/troubleshooting

#### 8.2.1 Electrical

Fault	Cause	Action
Motor does not start running.	Supply cable interrupted.	<ul style="list-style-type: none"> <li>• Check connections and clamping points and correct if necessary.</li> </ul>
	Supply line fuse is tripped	<ul style="list-style-type: none"> <li>• Determine and eliminate error.</li> <li>• Replace fuse.</li> </ul>
	Motor protection switch was triggered	<ul style="list-style-type: none"> <li>• Determine and eliminate error. Also check connection data for current consumption (see type plate).</li> </ul>
	Overload	<ul style="list-style-type: none"> <li>• Reduce load.</li> </ul>
	A phase in the supply line is interrupted	<ul style="list-style-type: none"> <li>• Check switch, supply line and voltage supply.</li> </ul>
	Stator winding incorrectly connected	<ul style="list-style-type: none"> <li>• Check terminal board.</li> </ul>
	Brake was not triggered	<ul style="list-style-type: none"> <li>• Check brake control.</li> <li>• Check brake fault (see also <a href="#">Brake</a>).</li> </ul>
	Motor thermal switch was triggered	<ul style="list-style-type: none"> <li>• Allow the motor to cool down.</li> <li>• Subsequently determine and eliminate error.</li> </ul>
Motor does not start running or only with difficulty.	Overload	<ul style="list-style-type: none"> <li>• Reduce load.</li> </ul>
	A phase in the supply line is interrupted after switching on	<ul style="list-style-type: none"> <li>• Check voltage supply.</li> </ul>
	Voltage or frequency deviate strongly from target value during the switch-on process	<ul style="list-style-type: none"> <li>• Check the supply line cross-sections and enlarge if necessary.</li> <li>• Improve mains network conditions.</li> </ul>
	Motor performance designed for delta circuit but is connected in a star	<ul style="list-style-type: none"> <li>• Change the star to delta circuit, pay attention to the circuit diagram.</li> </ul>
Wrong phase direction.	Phase interchanged	<ul style="list-style-type: none"> <li>• Swap phase.</li> </ul>
Motor hums and increased current consumption	Brake does not vent.	<ul style="list-style-type: none"> <li>• Check brake fault (see also <a href="#">Brake</a>).</li> </ul>
	Coil is defective.	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Runner grinds	
Humming noise during startup	A phase in the supply line is interrupted after switching on	<ul style="list-style-type: none"> <li>• Check switch and supply line.</li> </ul>
	Stator winding incorrectly connected	<ul style="list-style-type: none"> <li>• Check terminal board.</li> </ul>
	Shorted coil	

Fault	Cause	Action
	Phase leak	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
Fuses or motor protection triggers immediately.	Short circuit in the supply line to the motor	<ul style="list-style-type: none"> <li>• Eliminate short-circuit</li> </ul>
	Supply line not correctly connected	<ul style="list-style-type: none"> <li>• Connect the supply line according to the electrical system documentation.</li> </ul>
	Short circuit in the motor.	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Ground fault on the motor.	
Strong rotation speed decrease during loading.	Motor overloaded	<ul style="list-style-type: none"> <li>• Check project planning and if necessary, use a larger motor or reduce the load.</li> </ul>
	Voltage drop	<ul style="list-style-type: none"> <li>• Check the supply line cross-sections and enlarge if necessary.</li> <li>• Improve mains network conditions.</li> </ul>
Temperature increase too high (measure temperature)	Overload	<ul style="list-style-type: none"> <li>• Check project planning and if necessary, use a larger motor or reduce the load.</li> </ul>
	Insufficient cooling	<ul style="list-style-type: none"> <li>• Pay attention to air supply or clear cooling channels. If necessary, install third-party ventilator.</li> </ul>
	Motor not connected in star circuit as intended	<ul style="list-style-type: none"> <li>• Perform connection of the motor according to the electrical system documentation.</li> </ul>
	Nominal operating mode exceeded	<ul style="list-style-type: none"> <li>• Adapt the nominal operating mode according to the operating conditions required (see also current standards).</li> </ul>
	Ambient temperature too high.	<ul style="list-style-type: none"> <li>• Adhere to the permissible temperature range and reduce load if necessary.</li> </ul>

**Faults**

**8.2.2 Mechanical**

Fault	Cause	Action
Motor does not rotate	Drive is blocked mechanically	<ul style="list-style-type: none"> <li>• Check mechanics.</li> </ul>
Brake does not grip	Required holding torque too high	<ul style="list-style-type: none"> <li>• Check design.</li> </ul>
	Brake defective	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
Grinding noise during operation	Grind rotating parts	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Ball bearing defective	
Strong heating	Ball bearing defective	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Air supply restricted	<ul style="list-style-type: none"> <li>• Check airways.</li> </ul>
Strong oscillation	Imbalanced runner	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Inadequate alignment	<ul style="list-style-type: none"> <li>• Align machine set, check coupling.</li> </ul>
Bearing temperature too high	Grind rotating parts	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	bearing is corroded	
	Grease, service life exceeded	
Noise emission too high	Ball bearings are strained, contaminated or damaged	<ul style="list-style-type: none"> <li>• Check alignment of the motor and machine and realign if necessary.</li> <li>• In the event of damage, contact the Groschopp AG service department (see <a href="#">Manufacturer specifications</a>)</li> </ul>
	Foreign matter in cooling air channels.	<ul style="list-style-type: none"> <li>• Clean cooling air channels.</li> </ul>
	Rotating parts vibrate	<ul style="list-style-type: none"> <li>• Possible imbalance, determine and eliminate cause. If necessary, contact the Groschopp service department (see <a href="#">Manufacturer specifications</a>).</li> </ul>

### 8.2.3 Brake

Fault	Cause	Action
Brake does not vent.	Voltage applied incorrectly	<ul style="list-style-type: none"> <li>• Connect the brake according to the electrical system documentation.</li> </ul>
	Max. permissible air gap exceeded	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Brake lining worn	
	Voltage drop along the supply line >10%	<ul style="list-style-type: none"> <li>• Connect the supply line according to the electrical system documentation.</li> </ul>
	Insufficient cooling, brake becomes too hot	<ul style="list-style-type: none"> <li>• Establish sufficient cooling or clean air cooling channels.</li> </ul>
	Brake coil short-circuited or ground fault	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Defective rectifier	
Brakes do not brake	Air gap out of order	<ul style="list-style-type: none"> <li>• Servicing by the Groschopp service department required (see <a href="#">Manufacturer specifications</a>).</li> </ul>
	Brake lining worn	
	Wrong brake torque	<ul style="list-style-type: none"> <li>• Check project planning.</li> </ul>

## Maintenance/cleaning

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### 9 Maintenance/cleaning

#### 9.1 Safety instructions

Before maintenance and cleaning work:

- Pay attention to the overall documentation for the machine, in which the motor is installed, and pay particular attention to the safety regulations.
- Pay attention to run-down and allow the motor to run down completely.
- Allow the motor to cool down completely.

#### Electrical system

Contact with live wires or components can lead to serious injury or even death!

- Switch off the electric power prior to starting work and secure it against being switched back on.

#### Staff

Maintenance and cleaning work may only be performed by trained specialist staff.

- Work on electrical systems may only be carried out by specialist qualified electricians.

#### Personal protective equipment

Use personal protective equipment as described (see [Personal protective equipment](#)).

Also pay attention to the local specifications and regulations!

#### Improper maintenance work

Improper maintenance work can lead to severe personal injury or material damage.

- Before beginning work, make sure that sufficient installation workspace is available.
- Be careful when handling exposed, sharp-edged components.
- Pay attention to tidiness and cleanliness at the workplace! Parts and tools lying around or on top of each other can be sources of accidents.
- Parts must be properly installed. Adhere to specified torques for screw connections.
- Secure components so that they do not fall or topple.

#### 9.2 Cleaning

##### 9.2.1 Surface/cooling equipment

Clean contamination on the surfaces and in cooling equipment (e.g.: ventilator) of the motor regularly.

The cleaning interval depends on the operating conditions of the motor

### 9.3 Maintenance

#### 9.3.1 General instructions

The three-phase motors in the IG series are maintenance free.

To increase the service life of the motor, pay attention to the following:

Time period	Action
Every 6000 operating hours*	Inspect motor and: <ul style="list-style-type: none"> <li>• perform visual inspection.</li> <li>• check running noises.</li> <li>• clean cooling air channels.</li> <li>• check housing surfaces and repair or renew corrosion protection/paintwork if necessary.</li> </ul>

The maintenance interval depends on the operating conditions of the motor. Wear can increase with strong load and make shorter maintenance intervals necessary.

#### 9.3.2 Replacing worn parts/components

<b>i</b>	<i>NOTE</i>
	Contact Groschopp AG to replace worn parts or components. (See <a href="#">Manufacturer specifications</a> )

#### 9.3.3 Lubrication

<b>i</b>	<i>NOTE</i>
	The motor bearings have lifetime lubrication.

#### 9.3.4 Customised versions

<b>i</b>	<i>NOTE</i>
	If the three-phase motor in the IG series was ordered as a customised version, other different maintenance instructions may apply. Read the information supplied in the appendix of these operating instructions for this and/or contact Groschopp AG (see: <a href="#">Appendix</a> ). (See <a href="#">Manufacturer specifications</a> )

## 10 Decommissioning and disposal

### 10.1 Safety instructions

Before decommissioning and dismantling:

- Pay attention to the overall documentation for the machine, in which the motor is installed, and pay particular attention to the safety regulations.
- Pay attention to run-down and allow the motor to run down completely.
- Allow the motor to cool down completely.

#### Electrical system

Contact with live wires or components can lead to serious injury or even death!

- Switch off the electric power prior to starting work and secure it against being switched back on.

#### Staff

Decommissioning and dismantling the motor may only be performed by trained specialist staff.

- Work on electrical systems may only be carried out by specialist qualified electricians.

#### Personal protective equipment

Use personal protective equipment as described (see [Personal protective equipment](#)).

Also pay attention to the local specifications and regulations!

#### Improper decommissioning and dismantling:

Improper decommissioning and dismantling can lead to severe personal injury or material damage.

- Before beginning work, make sure that sufficient installation workspace is available.
- Be careful when handling exposed, sharp-edged components.
- Pay attention to tidiness and cleanliness at the workplace! Parts and tools lying around or on top of each other can be sources of accidents.
- Parts must be properly installed. Adhere to specified torques for screw connections.
- Secure components so that they do not fall or topple.

### 10.2 Dismantling

To dismantle, proceed as follows:

- Shut down the machine according to the overall documentation of the machine manufacturer.
- Disconnect the voltage to the motor and secure against unintentional switch-on.
- Disconnect and remove the electrical connection at the terminals in the terminal box of the motor.
- Disconnect the drive elements from the motor.
- Remove the motor from the machine by loosening the fixing screws.

**10.3 Disposal**

Dispose of the motor according to the current local regulations.

	<p style="text-align: center;"><b>ATTENTION</b></p> <p><b>Environmental damage resulting from incorrect disposal!</b></p> <p>Incorrect disposal can cause environmental damage.</p> <ul style="list-style-type: none"><li>▶ Electrical scrap, electronic components, lubricants and other accessories are subject to special waste handling and must be disposed of by authorised specialist companies only!</li></ul>
	<p style="text-align: center;"><b>NOTE</b></p> <p>The local authorities or special waste disposal companies can provide information on proper disposal according to environmental regulations.</p>

## Appendix

### 11 Appendix

#### 11.1 Document list

- Product datasheet incl. circuit diagram
- .....





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Drives & More

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