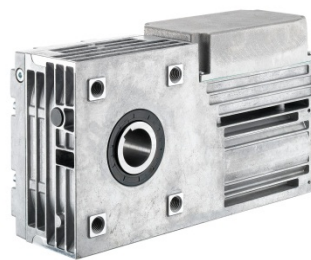


Mounting instructions

Slip-on geared motors
COMPACTA MR6, MS12, MR30, AG160



MS 12



AG 160



MR 6



MR 30

Please read the mounting instructions prior to any work!



Revision

Date	Chapter	Description	Responsible
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05/09/2013	3.6 / 7.1	Rephrased	F. Milkau
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2 General

2.1 Mounting instructions

The mounting instructions provide all necessary information for safe and efficient handling and mounting of the motor. It is an integral part of the motor and must be kept at hand, in order to be accessible at any time for the operating staff.

Compliance with all safety information and mounting instructions of this manual is a prerequisite for a safe work with the motor. For this reason the staff is to read thoroughly and understand these mounting instructions before carrying out any work.

Furthermore, all local accident prevention regulations and general safety provisions in force at the place of operation of the equipment are to be complied with.

2.2 Symbols, abbreviations, terminology

This document uses symbols, abbreviations and terms having the following meaning:

- Explanation about situations
- ▶ List
- List
- 1 Position number
- 1. Operation step



Refers to a document included in the supplied documentation. The location of the document is given in italics behind the symbol.

2.3 Explanation of symbols

Warnings and safety instructions

The warning and safety instructions in this manual are indicated with pictograms and highlighted with a grey background.

In addition, warning and safety instructions that indicate fundamental hazards begin with signal words indicating the extent of the damages. They are structured as follows:

SIGNAL WORD!

Origin of the hazard.

Consequences in case of ignorance of the hazard.

- Behaviour instructions to prevent the hazard.

- ▶ Comply imperatively with all warning and safety instructions!
- ▶ When working, always act carefully to avoid accidents, injury to persons and damages to materials!

The pictograms combined with the signal words have the following meanings:



WARNING!

...indicates a hazardous situation which could lead to injuries or material damages if it is not prevented



CAUTION!

...indicates a hazardous situation which could lead to minor injuries if it is not prevented



BEWARE!

...indicates a hazardous situation which could lead to material damages if it is not prevented

Hints and recommendations



NOTICE!

...highlights hints and recommendations for efficient and trouble-free operation.

Particular safety instructions

The following pictograms are used together with safety instructions to indicate particular hazards:



... hazards due to hot surfaces.

Risk of burns and skin injuries due to heat in case of non compliance with the safety instructions.



... hazards due to electricity.

Risk of severe or even lethal injuries in case of non compliance with the safety instructions.

2.4 Limitation of liability

All information and instructions in this manual have been compiled taking account of the applicable standards and regulations, the latest state of technology and our many years of experience.

The manufacturer shall not be liable for damages due to:

- ▶ Non-compliance with the mounting instructions
- ▶ Unintended use
- ▶ Operation by non properly trained and instructed personnel
- ▶ Modifications carried out by the user
- ▶ Technical changes
- ▶ Use of non-approved spare parts

The obligations agreed upon in the delivery contract, the General Terms and Conditions, the delivery conditions of the manufacturer and the legal regulations in force at the time of the conclusion of the contract apply.

General

Warranty

The manufacturer guarantees the correct functioning of the process technology used and the performance parameters identified.

The guarantee period begins at the fault-free handover.

During the guarantee period, the cover of the terminal box or of the limit switch systems may be opened only for connecting the motor. Any further disassembly releases the manufacturer of any guarantee obligation.

Wear parts

The wear parts are all components that are in direct contact with the material to be processed in case of normal intended use.

These components are excluded from the warranty and from claims for defects, since their signs of wear are due to normal operation.

2.5 Customer service

Our customer service is at your disposal for technical information. You can reach it at the phone number

0160 – 94184444 (please note that the usual fee will arise!) around the clock.

You can get information about the contact partner in charge of your region by phone; he can be reached at any time by telefax, e-mail or via the Internet.

2.6 Copyright protection

This document is protected by copyright.

The unauthorised transfer of the manual to third parties, copies of any kind and form, even as excerpts, as well as the use and/or disclosure of the contents without the written consent of the manufacturer is not permitted.

Infringements will lead to compensation. We reserve the right to further claims.

3 Safety

This section presents all safety aspects for the protection of the user and of the operator against any possible hazard and for the safe and trouble-free operation of the equipment.

Significant risks may appear in case of non-compliance with the stated mounting instructions, warnings and safety instructions.

3.1 Intended use

The motor is intended exclusively for the following purpose of use in the industry:

The slip-on geared motor COMPACTA is intended exclusively for driving machines, devices and plants that are not used for conveying living beings.



WARNING!

Hazard due to use for non-intended purposes!

Any use other than the intended use of the appliance may lead to hazardous situations.

- Use by principle the motor only according to its intended use, as stated in this document, complying especially with the operating limits stated in the Technical Specifications.
- Any further or different use of the motor is forbidden.
- Remodelling, refitting or changing of the appliance or parts of it with the intention to alter the functionality or scope of use of the motor is forbidden.

- ▶ Claims of any kind due to damages caused by use for non-intended purposes are excluded.
- ▶ Only the user will be liable for any damages caused by use for non-intended purposes.

3.2 Rationally foreseeable misuse



WARNING!

Risk of injury due to misuse!

A misuse of the motor may lead to hazardous situations for persons and to serious property damages.

- Refrain from any misuse of the appliance.

3.3 Responsibility of the operator

Operator

The operator is any natural or legal person using the motor or making it accessible to third parties for use, and who is responsible during the use for the safety of the user, of the personnel or of the third parties.

Obligations of the operator

The motor is used in the industry. Therefore, the operator of the motor is subject to the legal obligations concerning occupational safety.

In addition to the warnings and safety instructions of this manual, the safety, accident prevention and environmental protection provisions applicable to the field of operation of the appliance must be adhered to.

The operator must in particular:

- ▶ inform himself about the applicable occupational safety regulation.
- ▶ implement the necessary rules of conduct for the operation of the motor at the place of installation by means of mounting instructions.
- ▶ during the whole usage time of the motor, the operator must check regularly whether the mounting instructions created by him correspond with the current status of the regulations.
- ▶ if necessary, adapt the mounting instructions to the new provisions, standards and conditions of use.
- ▶ determine the responsibilities for the installation, operation, maintenance and cleaning of the motor in a clear and unambiguous way.
- ▶ make sure that all staff working with or at the motor have read and understood the mounting instructions. Furthermore, he has to train the staff periodically for the handling of the appliance and to inform them about the possible risks.
- ▶ provide the staff in charge of working with or at the motor with the mandatory and recommended protective equipment.

The operator is also responsible for keeping the motor always in perfect technical condition.

3.4 Responsibility of the personnel

The slip-on geared motor COMPACTA is used for industrial purposes. Therefore, the personnel are subject to the legal obligations concerning occupational safety.

In addition to the warnings and safety instructions of this manual, the safety, accident prevention and environmental protection provisions applicable to the field of operation of the appliance must be adhered to.

The personnel must in particular:

- ▶ inform themselves self about the applicable occupational safety regulation.
- ▶ comply with the rules of conduct for the operation of the motor at the place of installation stated in the mounting instructions.
- ▶ adhere to the responsibilities defined for the installation, operation, maintenance and cleaning of the motors.
- ▶ have read entirely and understood the mounting instructions before starting any work.
- ▶ use the mandatory and recommended protective equipment.

Furthermore, any person working with or at the motor is responsible for keeping the motor always in perfect technical condition.

3.5 Personnel requirements

Basics

Only persons able to carry out their work in a correct and reliable way and meeting the requirements applicable to the respective case are authorised to perform any activity with or at the motor.

- ▶ Persons whose reaction capability is impaired, e.g. through drugs, alcohol or medication are not allowed to carry out whatever work.
- ▶ During work, always adhere to the age and profession-specific provisions in force at the work site.

Qualification



WARNING!

Risk of injury in case of insufficient qualification!

Improper working may lead to injury to persons and damages to materials.

- Whatever activity may only be performed by persons having the required training, the necessary knowledge and the experience.

Trained personnel

Trained personnel means persons who have been informed in a comprehensive and verifiable way by the operator about the tasks entrusted to them and about the possible risks

Specialised personnel

Specialised personnel means persons who, due to their professional training, knowledge and experience, and to their knowledge of the applicable provisions, are able to carry out correctly the work they are entrusted with, to recognise possible risks on their own and to avoid injury to persons or damage to property.

Specialised electricians

Any work at the electrical equipment may by principle be carried out only by specialised electricians.

Specialised electricians means persons who, due to their professional training, knowledge and experience, and to their knowledge of the applicable provisions, are able to carry out correctly work at the electrical equipment, to recognise possible risks on their own and to avoid injury to persons or damage to property due to electricity.

Unauthorised persons



WARNING!

Risk of injury for unauthorised persons!

Non-trained persons do not know the risks in the working area and are considered as unauthorised persons.

- Keep unauthorised persons away fro the working area, in case of doubt approach these persons and instruct them to leave the working area.
- Interrupt the work activities as long as unauthorised persons are present in the working area.

3.6 Personal protection equipment

During transportation and mounting, safety shoes are to be worn.

3.7 Hazards

The motor has undergone a risk assessment. The identified hazards have been eliminated as far as possible and the detected risks have been reduced. Nevertheless, the inspection system showed residual risks, which are described in the following section.

- ▶ Comply imperatively with the warnings and safety instructions of this section and of the operating sections in order to avoid possible damages to health and hazardous situations.

3.7.1 Risks due to thermal hazards

Hot surfaces



CAUTION!
Risk of burns due to hot surfaces!

Contact with hot components may cause burns.

- Before starting any work, make sure that the motor cooled down/heated up to ambient temperature.

3.7.2 Risks due to mechanical hazards



WARNING!
Risk of injury due to the loss of the self-locking!

Self-locking IS NOT intended to satisfy safety-relevant characteristics!

- Use the brake or backstop offered optionally.

3.8 Spare parts



WARNING!
Risk of injury due to wrong spare parts!

Faulty spare parts may affect seriously safety and lead to damages, malfunctions, and up to the total breakdown.

- Use exclusively original spare parts.

Original spare parts can be purchased from your local agent or directly from the manufacturer.

3.9 Behaviour in case of hazards and accidents

Preventive measures

- ▶ Be always prepared for accidents and fire.
- ▶ Keep first-aid equipment (first-aid kit, blankets, etc.) and fire extinguishers at hand.
- ▶ Familiarise the personnel with the accident signalling, first-aid and rescue equipment.
- ▶ Always keep access routes clear for rescue vehicles.

Whenever necessary, act appropriately

- ▶ Initiate first-aid actions.
- ▶ Rescue the affected people from the danger zone.
- ▶ Inform the supervisor of the place of use.
- ▶ In case of severe injuries, call for medical help and alert the fire service.
- ▶ Always keep access routes clear for their use as escape routes.

3.10 Labelling

The following symbols and information labels are placed on the motor to indicate possible risks.



WARNING!

Risk of injury due to illegible labels!

Illegible labels lead to unrecognisable risk sources and may lead to hazardous situations for persons or lead to damages to property.

- Keep the labels clean and legible at any time.
- Replace defective labels immediately.

4 Technical specifications

Please also refer to the separated specific data sheet in addition to the technical specifications

4.1 Operating conditions

Item	Value	Unit
Temperature range	0 to + 60	°C
Relative air humidity	0 to 60 Without condensation	%
	Avoid direct moisture, dust accumulation and frost. Do not operate in strong electrical and magnetic fields! Do not operate in a potentially explosive environment!	
Service life, max.	3000 - 5000	operating hours



WARNING!
Risk of explosion due to sparking!

The drive shall in principle not be operated in areas subject to explosion hazards.

4.2 Storage requirements

Storage conditions

Store by principle the motor only under the following conditions:

- ▶ Do not store outdoors
- ▶ Store in a dry and dust-free place
- ▶ Do not expose to aggressive media
- ▶ Protect from direct sun light
- ▶ Avoiding mechanical shocks and vibrations
- ▶ Storage temperature 5 °C to 45 °C
- ▶ Relative air humidity max. 60 %

In case of storage longer than 3 months, check regularly the general condition of all elements and of the packaging. If necessary, refresh or renew the preservation.



NOTICE!
Adhere imperatively to the storage indications exceeding these requirements that are stated on the packages!

4.3 Equipment identification

The equipment identification is clearly visible on the nameplate of the motor.

4.4 Disposal

Dispose of the motor in compliance with the regulations, but not in the domestic waste. Framo Morat GmbH takes back and recycles free of charge all motors, provided they have been manufactured by Framo Morat GmbH and the customer delivers them at the Framo Morat GmbH premises. If the national laws in force require other services, we adapt our services in compliance with these provisions.

5 Construction and function

The slip-on geared motors COMPACTA MR6, MR30 and AG160 are made of a motor block.

These motors are designed exclusively for integration in complex plants whose intended use is not the conveying of living beings.

The manufacturer assumes no responsibility for the mounting in compliance with the intended use. This responsibility lies with the sole manufacturer of the plant.

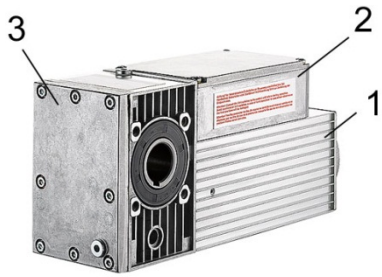
5.1 Scope of delivery

The motors have been developed and manufactured under the sole responsibility of Framo Morat GmbH.

Scope of delivery:

Element	Quantity
Motor	1
Mounting instructions	1
Technical data sheet	1
Electrical diagram	1

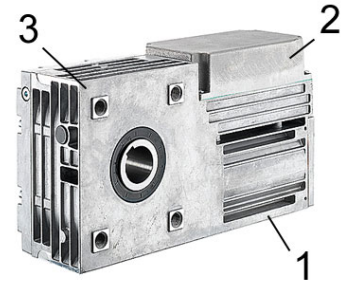
5.2 Components overview



MS 12



MR 30



AG 160



MR 6

Motor	Ref.	Description
MR6	1	Motor
	2	Limit switch system
	3	Reduction gear
MS12	1	Motor
	2	Limit switch system
	3	Reduction gear
MR30	1	Motor
	2	Limit switch system
	3	Reduction gear
AG160	1	Motor
	2	Limit switch system
	3	Reduction gear

6 Transportation



CAUTION!
Risk of injury!

Risk of injury due to a transported item falling down.
Wear safety shoes during transportation.

6.1 Transportation inspection

Upon receipt of the delivery, check immediately the condition of the received items for completeness and damages.

In the event of externally recognizable transportation damages:

- ▶ Do not accept the delivery or only under reserve.
- ▶ Note the extent of the damages on the transportation documents and on the delivery note of the transport company.
- ▶ File a complaint.



NOTICE!

*Claim any damage immediately upon receipt of the goods.
Claims for transportation damages may only be filed within the reclamation periods in force.*

6.2 Packaging materials

Handling of the packaging

The transported items are packaged in a safe and environmentally sound manner, according to the expected transport conditions. The packaging protects the components against damages and corrosion until the beginning of the assembly.

- ▶ Remove the packaging and transportation protections only before mounting.
- ▶ Dispose of the packaging material in compliance with the local provisions in force.



BEWARE!
Environmental damages due to improper disposal!

Packaging materials are valuable raw materials that can be used again or reconditioned and recycled.

- Always dispose of the packaging material in an environmentally friendly way.
- Adhere to the local provisions, if necessary assign a specialized firm for the disposal.

7 Mounting

The motor may be mounted exclusively by specialised electricians.



WARNING!

Risk of injury for unauthorised persons!

Non-trained persons do not know the risks in the working area and are considered as unauthorised persons.

- Keep unauthorised persons away from the working area, in case of doubt approach these persons and instruct them to leave the working area.
- Interrupt the work activities as long as unauthorised persons are present in the working area.



Danger!

Risk of injury due to electrical current!

Possible serious injuries due to electrical current.

- Before working on bare terminals or at the open terminal box, make sure that the power supply is switched off and secured against unintentional switching on.
- Only connect the motor to a network equipped with operating circuit breakers.



CAUTION!

Risk of burns due to hot surfaces!

Contact with hot components may cause burns.

- Do not touch the motor while it is in operation. (temperatures up to 90 degrees!)
- Before starting any work, make sure that the components cooled down/heated up to ambient temperature.



NOTICE!

The strength class of the fastening screws must be at least 8.8. The correct torque and screwing depth in the housing can be found in Table 1.



BEWARE!
Respect the correct screw length, since a wrong length would damage the housing.

Type	Torque	Min. screwing depth	Max. screwing depth
MR6	14 NM	10 mm	15 mm
MS12	14 NM	10 mm	12 mm
MR30	25 NM	12 mm	15 mm
AG160	25 NM	12 mm	16 mm

(Table 1)

Mount the motor with the four screws, without mechanical tensions. Comply with the above-mentioned torques.



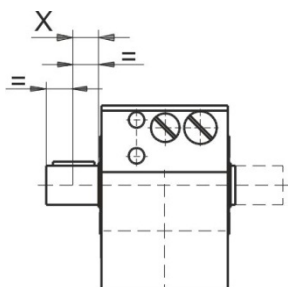
BEWARE!
Risk of damages to the bearings and securing rings
– Do not mount attachments such as couplings or chain wheels with the help of impacts or shocks.

Drive shaft forces



BEWARE!
Risk of damages to the drive shaft
– The authorised forces on the drive shaft can be found in Table 2.

The following forces on the drive shaft are authorised:



Type	Radial load	Axial load	X
MR 6	1500 N	750 N	20 mm
MS12	1500 N	750 N	20 mm
MR30	2000 N	1000 N	20 mm
AG160	2000 N	1000 N	25 mm

(Table 2)

7.1 Electrical commissioning

**NOTICE!**

Use the attached electrical diagram to carry out the electrical connections.

**NOTICE!**

When carrying out the electrical connection, make sure to use the right operating voltage (see the nameplate).

Connect all external control and power cables to the corresponding internal contacts, as shown on the electrical diagram.

**BEWARE!**

Risk of damages to the motor.

- Always connect the limit switches and/or a thermal motor protection.

**BEWARE!**

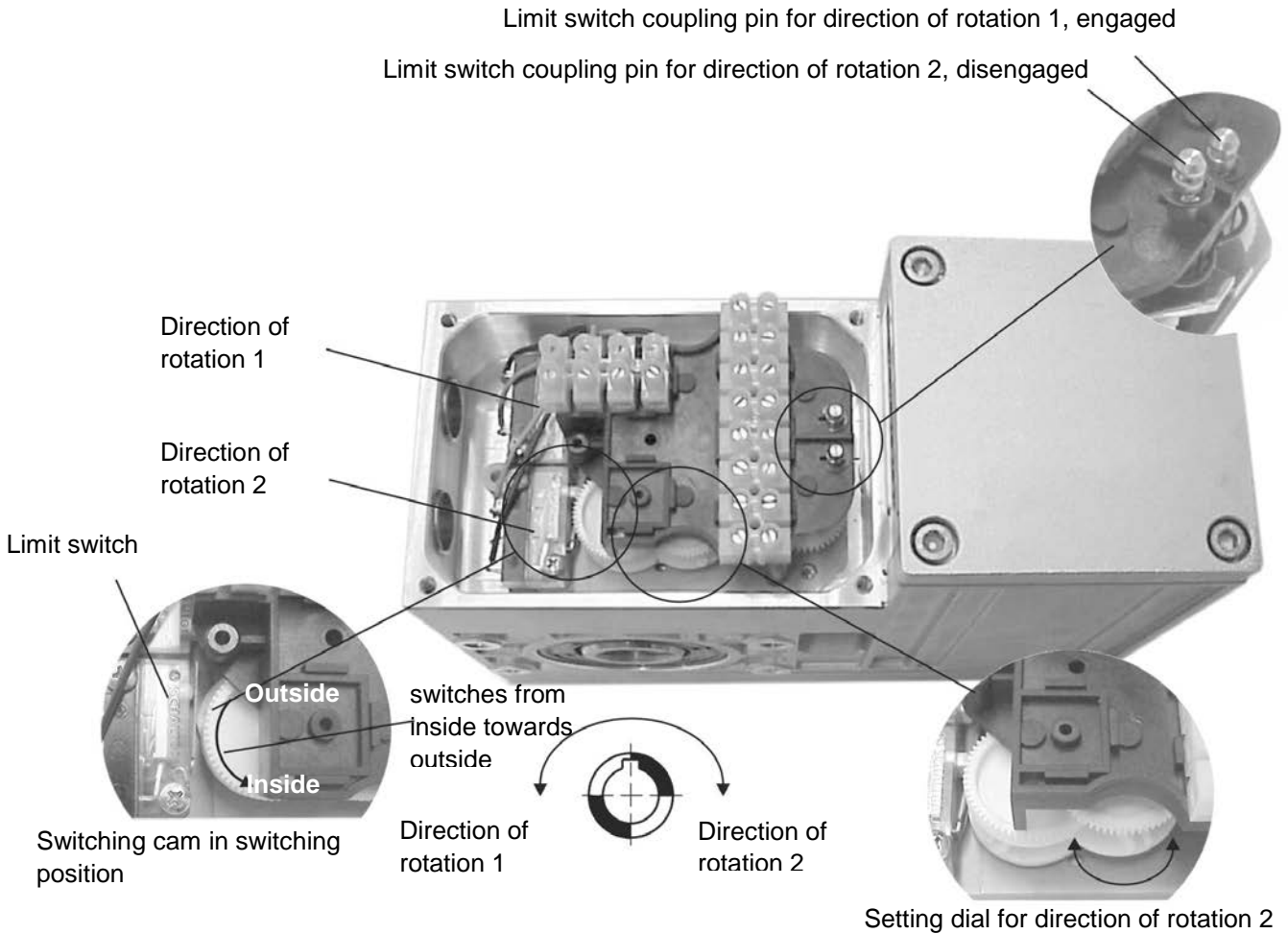
Risk of damages to the motor.

- When operating the geared motor manually with the crank handle, in no case exceed the limit switch position.

Connecting the thermal motor protection makes sure, in the event of overheating, that the power supply of the motor is switched off.

8 Setting

8.1 Setting MR 6



The slip-on geared motor COMPACTA type MR6 is supplied with disengaged limit switches. There is no mechanical link between the limit switches and the reduction gear.

The limit switch gear is adjusted at delivery so that the corresponding limit switches are immediately close to the switching position.

The switching cam is factory-positioned immediately before the switching position. Switching (limit switches) takes place from the inside towards the outside.



BEWARE!

Risk of damages to the motor.

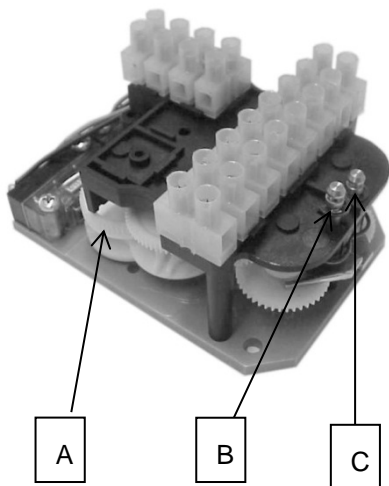
- Comply with the maximum limit witch range stated in the data sheet "Technical Data".

Proceed as follows for commissioning:

1. Move the motor to a limit position.
2. Press the coupling pin corresponding to the direction of rotation down.
3. For the other limit position, engage the corresponding coupling pin

The switching position can be corrected as follows:

1. Disengage the coupling pin corresponding to the limit position to be corrected.
2. Move to the desired limit position with the motor.
3. Turn the setting dial until the limit switch is actuated.
4. Press the coupling pin down again.



A	Modify the switching point here
B	Disengaged: Pin up – in this position, the switching position may be modified manually.
C	Engaged: Pin down – this is the operating position. The cam is moved by the drive. The drive stops when it reaches the set switching point.

8.3 Setting MS12, MR 30, AG 160



Risk of electric shock

- Work only at de-energized workplaces.
- Protect the workplace against unintentional switching-on of the power supply.
- Only connect the motor to a network equipped with operating circuit breakers.
- In case of AC power supply, make sure that the motor capacitor is energized also in the switched off state.
- Discharge the capacitor only through a suitable resistor.

The limit switches of the COMPACTA type MS12, MR30 and AG160 slip-on geared motors are factory-set to the maximum number of drive shaft revolutions specified by the customer. A reserve for "turning free" in case of faulty electrical connection (direction of rotation) is available.



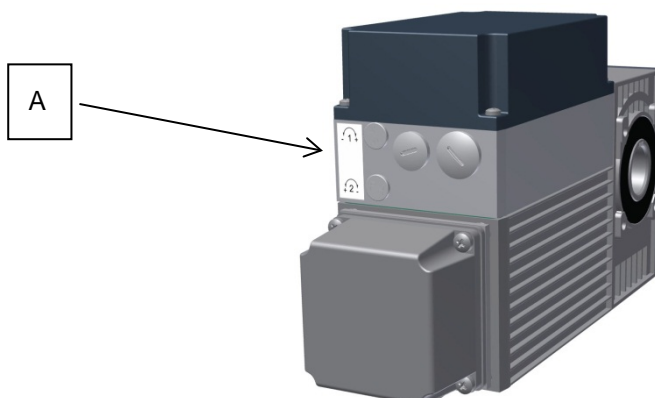
BEWARE!

Risk of destroying the limit switch mechanics and the motor.

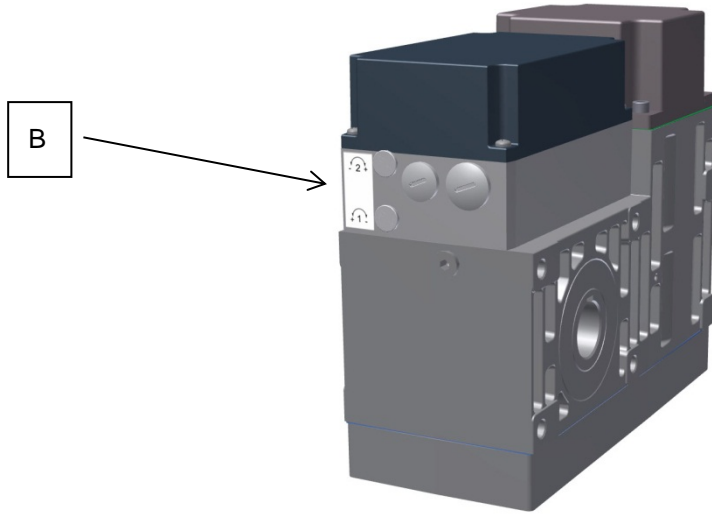
- The operation and safety limit switches, as well as the thermal motor protection, must be connected to the control circuit when carrying out whatever setting work.

The faceplate of the setting and work screw shows setup help information.

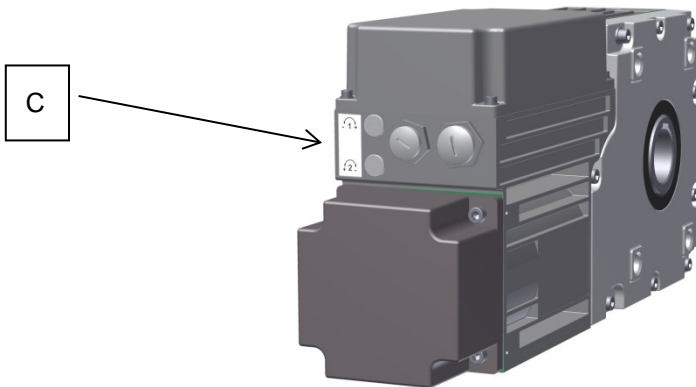
MS 12:



MR 30:



AG 160:



A	Direction of rotation information MS 12
B	Direction of rotation information MR 30
C	Direction of rotation information AG 160

8.4 Commissioning



WARNING!

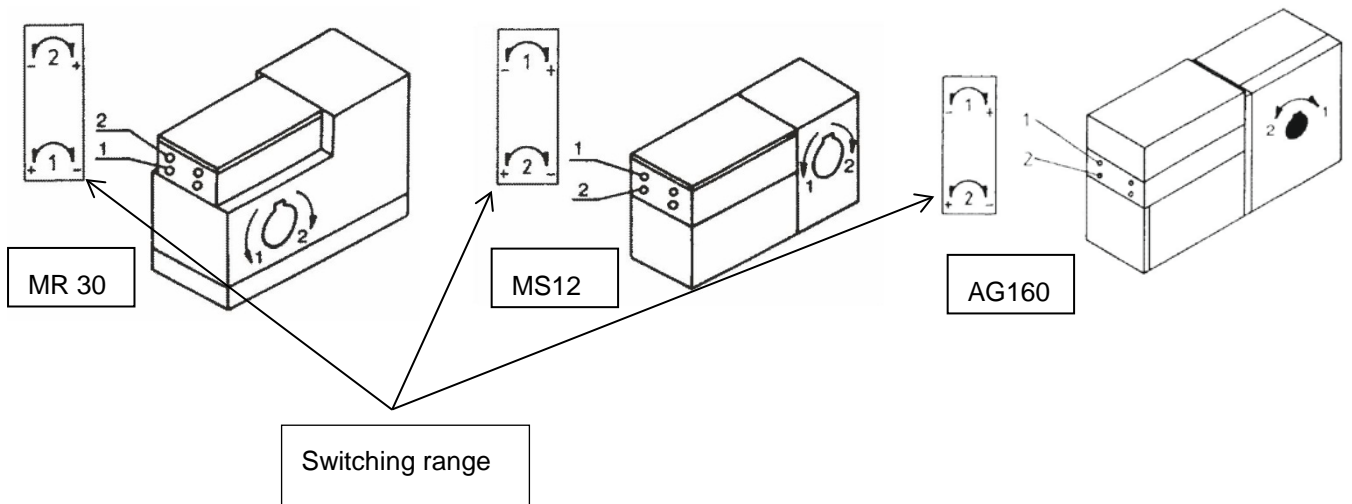
Risk of injury in case of insufficient qualification!

Improper working may lead to injury to persons and damages to materials.

- Whatever activity may only be performed by persons having the required training, the necessary knowledge and the experience.

There is no general procedure for commissioning all three motors. Connect the wires and the external control components such as switches, contactors, fans, potentiometers, brakes, etc., according to the attached wiring diagram.

8.5 Overview of the switching ranges



NOTICE!

If the motor stops and cannot be restarted any more, the control and the direction of rotation do not match!

Cause: Two phases are inverted.

Measure: Reverse the phases. Now the switching screw number and the numbers of the directions of rotation match.

Then turn the switching screw in the positive direction to release manually the actuated safety limit switch. The motor must be able to rotate in both directions.

The limit switch setting can then be carried out.

9 Operation

No specific operation is required for the COMPACTA slip-on geared motors MR6, MS12, MR30 and AG 160, since they have been designed for integration in plants.

10 Maintenance

The slip-on geared motors COMPACTA MR6, MS12, M30 and AG160 are factory-provided with lifetime lubrication and are maintenance-free.

11 Failures



WARNING!

Danger of slipping due to loss of lubricant

Loss of lubricant can lead to the risk of slipping if grease or oil gets onto the floor. Therefore:

- Secure the area around the location of the spill so as to prevent from slipping
- Remove immediately the spilled lubricant without leaving any residue.



WARNING!

Contact danger

Loss of lubricant can lead to contact danger if grease or oil gets onto the skin or close to the eyes. Therefore:

- Wear safety gloves to clean the area around the location of the spill
- Do not touch your face and wash your hands thoroughly with suitable cleaners after having removed the lubricant.

11.1 What to do in case of failures

Basically:

1. Switch off all energy supplies and secure them against switching on again.
2. Inform the supervisor of the place of use.
3. Depending on the kind of failure, have the cause determined and eliminated by competent and authorised specialised personnel.

11.2 Failures table

Failure	Remedy	Subsequent step	Personnel
Oil loss	Dismount the motor and check the seals	If necessary, replace the seals and re-mount the motor	Specialised electrician

12 Annex

- ▶ Electrical diagram
- ▶ Declaration of integration

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