Translation of original operating instructions

Electromagnetically actuated single-surface brake

Model series 009

Production order number 000000000–999999999

In the course of further technical development, we reserve the right to make technically related changes to these operating instructions. Keep for future reference.

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1 General notes

This chapter describes how the product and the available accessories are used.

These operating instructions, hereinafter referred to as OI, are part of the product and contain important information. The operator is responsible for ensuring that the OI are accessible to every person charged with working at or with the product and that these OI are read and understood before undertaking the activities.

Upon receipt, the delivery must be checked for transport damage and obvious defects. Stüwe must be notified in the event of damage. Only install/commission products that are in a technically sound condition.

1.1 Description of the product and its intended use

The single-surface brake is intended for use in drivetrains. In these, it is intended for use as a holding brake for the stationary drive shaft and for dynamic braking of the rotating shaft/flanged shaft. The brake is actuated by an electromagnetic force and is then designated as "closed". By means of a spring disc, it is released when de-energised and is then designated as "open". The brake can only be used for dry-running.

Our products are designed to be used exclusively according to their technical data and the application scenarios agreed with Stüwe. The order-specific configuration for the application carried out by Stüwe must be adhered to. If this is missing from the documentation, please request this immediately from Stüwe.

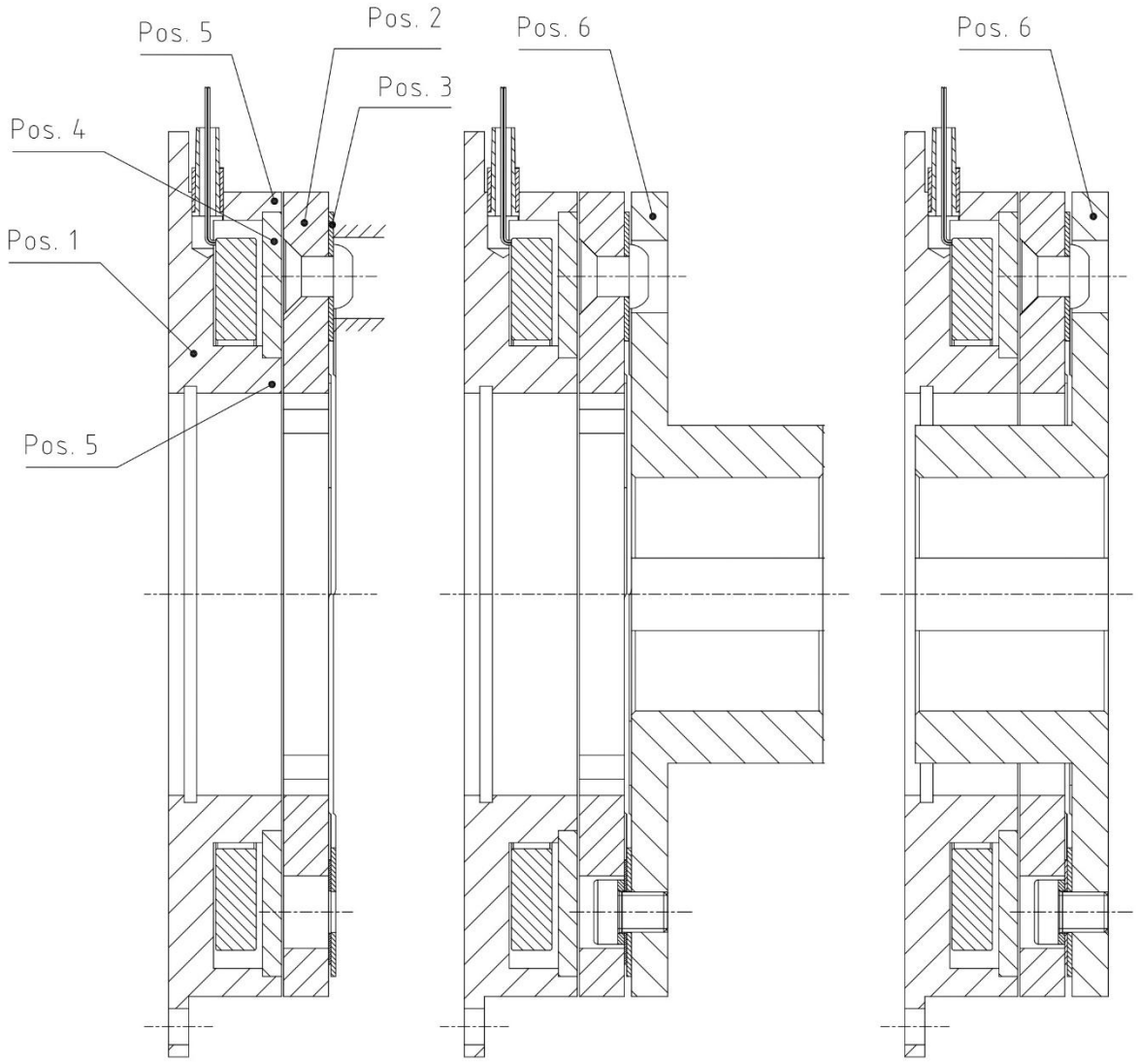
It is not intended for the product to be used as a "safety component" in terms of the EC Machinery Directive.

1.2 Non-intended use and foreseeable misuse

Stüwe shall not be held liable for non-intended use and any damage arising from this. In particular, but not exclusively, non-intended use is where:

- Our product is used as a bearing in the sense of supporting and guiding machine parts against the stationary part.
- Non-original Stüwe parts are used as accessories.
- Unauthorised modifications are made.
- Our product is used outdoors without sufficient protection against environmental conditions.
- Our product is not operated in accordance with the technical data defined in the design/product drawing.
- Our product is overloaded by too high a speed and/or too high a drive torque.
- Our product must decelerate an impermissibly high moment of inertia.
- Our product is subjected to undue stress from unacceptable sliding actions on the friction surfaces (e.g. by overloading).
- Our product is operated with oil in a dry-running system.

1.3 Basic equipment of the product



0009-100
Armature disc without drive flange

0009-101
Armature disc with drive flange (external hub)

0009-102
Armature disc with drive flange (internal hub)

Sectional drawings of the 009 model series

The single-surface brakes in the 009 model series consist of an outer part that is connected to the fixed machine frame via a screw connection.

Depending on the version, the inner part of the brake has an interface in which the armature disc (item 2) is either screwed directly to a flanged shaft via the spring disc (item 3), or the positive locking to the other shaft side is realised via an additional drive flange (item 7).

If the shaft is to be braked or held, 24 V (+10%) DC voltage must be applied so that the magnet moves the armature disc (item 2) in the direction of the magnet body (item 1) against the pretension force of the installed spring disc(s) (item 3). The axial force that is applied in this way creates a frictional connection between the armature disc on the inner, rotatable part of the brake and the lining plate

(item 4) as well as the pole faces (item 5), which are connected to the outer stationary part. The brake is described as "closed".

If the shaft is to rotate freely, the brake must be de-energised. The spring disc(s) (item 3) move the armature disc away from the lining plate (item 4) and the pole faces (item 5). The friction system is therefore optional and the brake is described as "open".

The electrical connection is made via two cables that are routed out of the brake.

2 Safety regulations

This chapter describes the applicable symbols relating to the safety instructions as well as the requirements of the personnel.

No claim to completeness is made regarding the instructions and safety instructions included in these OI. For start-up and operation, maintenance, repair and shutdown, observe the instructions in the relevant chapters of these operating instructions as well as the documentation for the system or the complete machine.

2.1 Symbols

Note!

- Pay special attention to this text.

Danger!

- Danger when performing the described activity or during active operation from hazard sources that could result in (severe) physical injuries or health hazards

Caution!

- Danger when performing the described activity or during active operation from hazard sources that could result in material damage

2.2 Requirements of the personnel

The operator is responsible for ensuring that work on our products is only carried out by specialists who have the relevant knowledge and are suitably qualified or have been trained to carry out the activity and know and understand the contents of these OI. Qualified specialists include, in particular, the following:

- assembly fitters of the machinery/plant system manufacturer;
- Industrial mechanics/fitters of the machine operator
- Other qualified and properly trained specialist personnel, responsible for and thereby entrusted with project planning, assembly, commissioning, operation, maintenance, decommissioning, storage and disposal of the product.

Furthermore, the applicable national safety engineering standards must be observed and suitable personal protective equipment worn.

Note!

- As the operator, make sure that the specialist personnel have a translation of the operating instructions (or selected chapters) at their disposal in their native language.

2.3 Additional hazards

Despite measures having been taken to integrate safety in the design, the foreseeable safety precautions and the supplementary protective equipment that is explained in these operating instructions, risks still exist in relation to handling.

3 Transport

This chapter describes the procedure required by the manufacturer to transport the equipment to the final installation site.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are permitted to transport the product. The personnel must be trained accordingly and have the necessary skills for transport.

Personal protective equipment

Make provision for the following prescribed (personal) protective equipment for activities involved with transport:

Danger

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the product is not stable, this may result in injuries.

- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- Observe the position of the packaging (TOP direction!) in order to avoid loose parts falling.

Sharp edges and pointed components may cause injuries.

- Secure the components during transport.

- Before removing the components, check them for damage and sharp edges.

For details about the position of the transport threads and the precise weight, refer to the product drawing accompanying the product and the technical data of the product in the appendix. Tighten the transport bolts as prescribed for transport and only use lifting equipment with sufficient load-bearing capacity.

4 Storage

This chapter describes the temporary or long-term storage of the product. The item is supplied in a preserved state. Check the corrosion protection before placing in storage. If necessary, supplement or renew it.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are permitted to store the product. The personnel must be trained accordingly and have the necessary skills for storage.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with storage:

Danger

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the product is not stable, this may result in injuries.

- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- Observe the position of the packaging (TOP direction!) in order to avoid loose parts falling.

Sharp edges and pointed components may cause injuries.

- Secure the components during transport.
- Before removing the components, check them for damage and sharp edges.

For longer periods of storage, suitable measures for additional corrosion protection must be taken

in agreement with Stüwe.

For storage periods exceeding five years, the product must be inspected by Stüwe. In the process, the product is partially dismantled, inspected and reassembled. Any parts found to be damaged are replaced. The product subsequently undergoes an acceptance test.

5 Assembly

This chapter describes all assembly processes within the course of initial assembly or repeat assembly following maintenance or conversion work.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are permitted to assemble the product. The personnel must be trained accordingly and have the necessary skills for assembly.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with assembly:

Danger

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question

Failure to observe the instructions in the operating manual may impair safe operation, e.g. impermissible heat build-up or low torque. This may lead to complete failure of the product functions and cause injuries.

- Ensure that the product is assembled in accordance with the specifications provided in these operating instructions.

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

If the product is not stable, this may result in injuries.

- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.

Sharp edges and pointed components may cause injuries.

- Secure the components during transport.
- Before removing the components, check them for damage and sharp edges.

Incorrect selection and incorrect connection of electrical control and connection components may lead to high currents, electric arcs and heating.

- Observe the relevant safety standards for electrical appliances.

- Only use sufficiently insulated connectors and cables for the connection.
- Ensure that the components are selected only by a specialist.

Live parts or parts that have become live due to a fault may lead to injuries.

- Observe the relevant safety standards for electrical appliances.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the securing elements are not tightened correctly or inappropriate securing elements are selected, this may lead to injuries.

- Observe and check the installation instructions in the operating instructions. If there is no information, the applicable guidelines are to be observed according to current engineering practices.
- Also observe the instructions in the operating manual for the system/machine manufacturer.
- Check the tightening torque, number and strength ratings of the bolts according to the specifications on the product drawing and in the technical data of the product in the appendix.
- Make sure that the bolts cannot become loose accidentally.

Caution

Electromagnetic processes may lead to product damage in sensitive environments.

- Enclose the product in a housing made of magnetically conductive materials if surrounding products are very sensitive to magnetism.

The supplier or operator is responsible for assembly of the product described. Comply with the applicable regulations and requirements as well as these operating instructions. Check the operational readiness before installation. During the assembly work, note also the information provided in the "Transport" chapter.

5.1 Assembling the product – basic equipment

General notes	1. The brake can be mounted on the "armature disc without drive flange" or "armature disc with drive flange (hub inside/outside)" attachment types. Carry out the installation in accordance with the desired attachment type. 2. For the requisite tightening torques, see the chapter "Supplementary technical data".
When assembling the brake in the attachment type **"Armature disc without drive flange"**	1. Insert either the outer or inner centring of the magnet body (item 1) into the counter-centring of the machine frame. 2. Insert securing bolts (not supplied) through the magnet body (item 1). Use bolts with a strength rating of 10.9. 3. Screw the magnet body (item 1) to the machine frame. Use Loctite type 262 to tighten the bolt. 4. Insert the securing bolts (not supplied) through the spring disc (item 3) mounted on the armature disc (item 2). Use bolts with a strength rating of 10.9. 5. Screw the spring disc (item 3) to the shaft. Use Loctite type

	262 to tighten the bolt. 6. Ensure that the air gap between the magnet body (item 1) and armature disc (item 2) is correct when the brake is open (see product drawing).
When assembling the brake in the attachment type **"Armature disc with drive flange"**	1. Insert either the outer or inner centring of the magnet body (item 1) into the counter-centring of the machine frame. 2. Insert securing bolts (not supplied) through the magnet body (item 1). Use bolts with a strength rating of 10.9. 3. Screw the magnet body (item 1) to the machine frame. Use Loctite type 262 to tighten the bolt. 4. Slide the drive flange hub (item 6) onto the shaft and secure this against axial movement. 5. Ensure that the air gap between the magnet body (item 1) and armature disc (item 2) is correct when the brake is open (see product drawing).
Concluding the installation	1. Connect the power supply.
Following the installation	1. Carry out a function test as described in the chapter "Commissioning".

6 Commissioning

This chapter describes all processes for initial commissioning as well as recommissioning.

Only persons who meet the requirements from the chapter "Requirements of the personnel" are authorised to commission the product. The personnel must be trained accordingly and be in possession of the necessary skills for commissioning.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with commissioning:

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable ear defenders, e.g. ear muffs, ear plugs or ear moulds with a safety rating relevant to the activity in question
- Suitable respiratory protection, e.g. masks with a safety rating relevant to the activity in question

Danger

Failure to observe the instructions in the operating manual may impair safe operation, e.g. impermissible heat build-up or low torque. This may lead to complete failure of the product functions and cause injuries.

- Make sure that the product is operated according to the specifications in these operating instructions.

Parts of the product moving towards each other may cause injuries.

- Make sure that openings to the product are covered and provision has been made to protect against reaching into components that are moving towards each other.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

Processes involving switching and friction within the product may generate noise for short periods and cause discomfort and stress.

- Provide appropriate noise protection measures such as damping or encapsulation of the product if the noise generation cannot be corrected.

Hazards during commissioning or operation of the product may lead to injuries.

- Ensure that there are no persons in the hazard area of the product. To do this, make provision for a product housing or barrier.

Incorrect selection and incorrect connection of electrical control and connection components may lead to high currents, electric arcs and heating.

- Observe the relevant safety standards for electrical appliances.
- Only use sufficiently insulated connectors and cables for the connection.
- Ensure that the components are selected only by a specialist.

Live parts or parts that have become live due to a fault may lead to injuries.

- Observe the relevant safety standards for electrical appliances.

When operating electromagnetic products, magnetic fields may cause interference with electronic components/devices (e.g. proximity switches) placed in the vicinity.

- Constructive measures or magnetic field-resistant sensors must be used.

High operating temperatures of the product may lead to burn injuries.

- Observe the instructions from the operator.
- Make sure that the product cannot be touched by persons during operation.

- Make provision for sufficient supply of air and/or cooling.
- Observe and monitor the speed limits on the input and output sides.

Moving and rotating parts of the product may lead to injuries.

- Make sure that any openings to the product are covered and provision has been made to protect against reaching into rotating components.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the securing elements are not tightened correctly or inappropriate securing elements are selected, this may lead to injuries.

- Observe and check the installation instructions in the operating instructions. If there is no information, the applicable guidelines are to be observed according to current engineering practices.
- Also observe the instructions in the operating manual for the system/machine manufacturer.
- Check the tightening torque, number and strength ratings of the bolts according to the specifications on the product drawing and in the technical data of the product in the appendix.
- Make sure that the bolts cannot become loose accidentally.

Wear from friction surfaces can cause breathing difficulties.

- Prevent any dust associated with plate wear from escaping by encapsulating the friction lining.

Caution

Electromagnetic processes may lead to product damage in sensitive environments.

- Enclose the product in a housing made of magnetically conductive materials if surrounding products are very sensitive to magnetism.

If, during commissioning, irregularities such as unusual noises, vibrations and oscillations or an unusual increase in operating temperature are encountered, bring the system/machine immediately to a halt.

Before commissioning and after maintenance or repair with the system/machine at standstill	1. Check the connection of all components to ensure that they are secured correctly. 2. Carry out the function test.
Function test	1. Charge the brake to the requisite switching voltage while it is stationary. 2. Check whether the armature disc (item 2) is pulled against the magnet body (item 1) and that the brake is fully closed. After the brake has been de-energised, the armature disc (item 2) must be released from the magnet body (item 1) by the spring force of the spring disc(s) (item 3) and the brake is released. 3. Check that there is no contact between the rotating shaft and the stationary magnet body (item 1).

7 Operation

This chapter describes the operation and operating principle as well as the handling instructions in the event of irregularities.

Only persons who meet the requirements in the "Requirements of the personnel" chapter are authorised to operate the product. The personnel must be trained accordingly and have the necessary skills for operation.

Personal protective equipment

Make provision for the following prescribed (personal) protective equipment for activities involved with operation:

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable ear defenders, e.g. ear muffs, ear plugs or ear moulds with a safety rating relevant to the activity in question
- Suitable respiratory protection, e.g. masks with a safety rating relevant to the activity in question

Danger

Failure to observe the instructions in the operating manual may impair safe operation, e.g. impermissible heat build-up or low torque. This may lead to complete failure of the product functions and cause injuries.

- Make sure that the product is operated according to the specifications in these operating instructions.

Parts of the product moving towards each other may cause injuries.

- Make sure that openings to the product are covered and provision has been made to protect against reaching into components that are moving towards each other.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

Processes involving switching and friction within the product may generate noise for short periods and cause discomfort and stress.

- Provide appropriate noise protection measures such as damping or encapsulation of the product if the noise generation cannot be corrected.

Hazards during commissioning or operation of the product may lead to injuries.

- Ensure that there are no persons in the hazard area of the product. To do this, make provision for a product housing or barrier.

Incorrect selection and incorrect connection of electrical control and connection components may lead to high currents, electric arcs and heating.

- Observe the relevant safety standards for electrical appliances.
- Only use sufficiently insulated connectors and cables for the connection.
- Ensure that the components are selected only by a specialist.

Live parts or parts that have become live due to a fault may lead to injuries.

- Observe the relevant safety standards for electrical appliances.

When operating electromagnetic products, magnetic fields may cause interference with electronic components/devices (e.g. proximity switches) placed in the vicinity.

- Constructive measures or magnetic field-resistant sensors must be used.

High operating temperatures of the product may lead to burn injuries.

- Observe the instructions from the operator.
- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.
- Observe and monitor the speed limits on the input and output sides.

Moving and rotating parts of the product may lead to injuries.

- Make sure that any openings to the product are covered and provision has been made to protect against reaching into rotating components.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

If the securing elements are not tightened correctly or inappropriate securing elements are selected, this may lead to injuries.

- Observe and check the installation instructions in the operating instructions. If there is no information, the applicable guidelines are to be observed according to current engineering practices.
- Also observe the instructions in the operating manual for the system/machine manufacturer.
- Check the tightening torque, number and strength ratings of the bolts according to the specifications on the product drawing and in the technical data of the product in the appendix.
- Make sure that the bolts cannot become loose accidentally.

Worn components may result in discomfort and stress.

- Check the friction linings regularly for wear.
- If necessary, change the plates and replace worn components.

Wear from friction surfaces can cause breathing difficulties.

- Prevent any dust associated with plate wear from escaping by encapsulating the friction lining.

Caution

Electromagnetic processes may lead to product damage in sensitive environments.

- Enclose the product in a housing made of magnetically conductive materials if surrounding products are very sensitive to magnetism.

If irregularities are detected during operation, such as unusual noises, vibrations or oscillations, or an unusual increase in operating temperature, bring the system/machine to a standstill immediately.

Open brake	1. When the brake is de-energised, a spring disc (item 3) ensures that the armature disc (item 2) is moved away from the magnet body (item 1). 2. The tension in the friction system is released. 3. The brake is open.
Actuating the brake statically (initial situation: Shaft does not rotate)	1. Applying the permissible switching voltage in accordance with the technical data causes axial tensioning of the friction system. 2. The brake is closed in this condition and the specified static braking torque can be transmitted in accordance with the technical data. 3. Take the product- and application-specific layout into account.
Actuating the brake dynamically (initial situation: Shaft rotates)	1. Applying the permissible switching current in accordance with the technical data causes axial tensioning of the friction system. 2. The brake is closed in this condition and the specified dynamic braking torque can be transmitted in accordance with the technical data. 3. Take the product- and application-specific layout into account. 4. After each dynamic braking process performed by the brake, allow sufficient cooling time to cool the brake down to the initial temperature before the braking process. Operation without observing a sufficient cooling time is not permitted. 5. Ensure that the equilibrium temperature measured on the brake does not exceed a value of 100 °C during successive engaging processes.
Use together with an electromagnetic Stüwe clutch	1. The electromagnetic brake from the 009 model series is often used together with an equally electromagnetic Stüwe clutch. 2. Prevent the closed state of the clutch and brake from overlapping, and the clutch (and therefore the drive) from having to move against a closed brake.

8 Malfunctions

This chapter describes instructions for actions to be carried out by you as the operator in the event of malfunctions.

If usual operating noises, vibrations, elevated temperatures or malfunctions occur, the system must be decommissioned immediately and measures taken to prevent it from being recommissioned while repairs are carried out.

In the event of malfunctions, the product must be sent back to Stüwe for inspection or, alternatively, you should arrange for our trained fitters to carry out an inspection on-site.

The following malfunctions are merely reference points for troubleshooting. Always take into account the other components of the system and include these in the troubleshooting process.

Malfunction	Reason	Remedy
Brake slips (Holding torque is not maintained)	Friction linings worn beyond the wear limit (increase in the spring return forces)	Stüwe Service to be contacted.
	Oily friction linings on a dry-running brake (reduced friction coefficient)	
	The voltage applied does not correspond to the specified 24 V (+ 10 %) DC voltage	Set the applied voltage to the specified value
Brake does not switch and establish a frictional connection	Fault/interruption in the current path	Check the current path
Brake brakes when open	Defective switching elements or insulation leads to residual voltage in the magnet body	Stüwe Service to be contacted.
	Air gap is too small	Readjust the air gap and secure the coupling halves against axial displacement.
Brake switches too slowly	Operating voltage too low	Operate with a higher voltage for a limited time (fast-starting device or via time relay). Readjust the air gap and secure the coupling halves against axial displacement.
Overlapping of the clutch and brake	Switching times too fast	Installation of a time relay on the clutch side or micro-switch on the brake side. Check the operating voltage. Readjust the air gap and secure the coupling halves against axial displacement.
Temperature rise of the brake	Air gap is too small	Readjust the air gap and secure the coupling halves against axial displacement.
	Unaccountable machinery damage	Stüwe Service to be contacted.

After completion of the maintenance or repair work, observe the commissioning notes.

9 Maintenance

This chapter describes the time- or event-based maintenance activities.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are

permitted to service the product. The personnel must be trained accordingly and have the necessary skills for maintenance.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with maintenance:

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question
- Suitable eyewear, e.g. safety glasses or goggles with a safety rating relevant to the activity in question
- Suitable ear defenders, e.g. ear muffs, ear plugs or ear moulds with a safety rating relevant to the activity in question
- Suitable respiratory protection, e.g. masks with a safety rating relevant to the activity in question

Danger

Failure to observe the instructions in the operating manual may impair safe operation, e.g. impermissible heat build-up or low torque. This may lead to complete failure of the product functions and cause injuries.

- Make sure that the product is assembled in accordance with the specifications provided in these operating instructions.

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

Parts of the product moving towards each other may cause injuries.

- Make sure that openings to the product are covered and provision has been made to protect against reaching into components that are moving towards each other.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

If the product is not stable, this may result in injuries.

- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.
- Stop the system/machine before removing the product and secure it against accidental movements.
- Cordon off the hazard area.

Hazards during commissioning or operation of the product may lead to injuries.

- Ensure that there are no persons in the hazard area of the product. To do this, make provision for a product housing or barrier.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.

- Observe the correct sequence for removing the product.

Moving and rotating parts of the product may lead to injuries.

- Make sure that any openings to the product are covered and provision has been made to protect against reaching into rotating components.
- Wear tight-fitting clothing and tie-up or cover hair to prevent it from being pulled in.

Sharp edges and pointed components may cause injuries.

- Secure the components during transport.
- Before removing the components, check them for damage and sharp edges.

Incorrect selection and incorrect connection of electrical control and connection components may lead to high currents, electric arcs and heating.

- Observe the relevant safety standards for electrical appliances.
- Only use sufficiently insulated connectors and cables for the connection.
- Ensure that the components are selected only by a specialist.

Live parts or parts that have become live due to a fault may lead to injuries.

- Observe the relevant safety standards for electrical appliances.

High operating temperatures of the product may lead to burn injuries.

- Observe the instructions from the operator.
- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.
- Observe and monitor the speed limits on the input and output sides.

Processes involving switching and friction within the product may generate noise for short periods and cause discomfort and stress.

- Provide appropriate noise protection measures such as damping or encapsulation of the product if the noise generation cannot be corrected.

Worn components may result in discomfort and stress.

- Check the friction linings regularly for wear.
- If necessary, change the plates and replace worn components.

When operating electromagnetic products, magnetic fields may cause interference with electronic components/devices (e.g. proximity switches) placed in the vicinity.

- Constructive measures or magnetic field-resistant sensors must be used.

Wear from friction surfaces can cause breathing difficulties.

- Prevent any dust associated with plate wear from escaping by encapsulating the friction lining.

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the securing elements are not tightened correctly or inappropriate securing elements are selected, this may lead to injuries.

- Observe and check the installation instructions in the operating instructions. If there is no information, the applicable guidelines are to be observed according to current engineering practices.
- Also observe the instructions in the operating manual for the system/machine manufacturer.
- Check the tightening torque, number and strength ratings of the bolts according to the specifications on the product drawing and in the technical data of the product in the appendix.
- Make sure that the bolts cannot become loose accidentally.

Caution

Electromagnetic processes may lead to product damage in sensitive environments.

- Enclose the product in a housing made of magnetically conductive materials if surrounding products are very sensitive to magnetism.

It is only possible to carry out maintenance operations when stationary. Move the system/machine to a secure position and lock it in place. Switch the main motor off and secure the system/machine against unintended movements.

9.1 Maintenance overview

Intervention	Frequency/event	Chapter
Checking product		
General visual inspection	Weekly	9.2
Check the threaded connections	Annually	9.2
Check the air gap and readjust the brake.	If the brake can no longer be switched due to an excessive air gap, but at least once a year	9.2
Check for noise and heat build-up as well as oscillations	Monthly	9.2
Check the magnet spool	if required	9.2
Cleaning the product		
Cleaning the product	Annually	9.2

9.2 Description of the maintenance intervention


Danger

Danger!

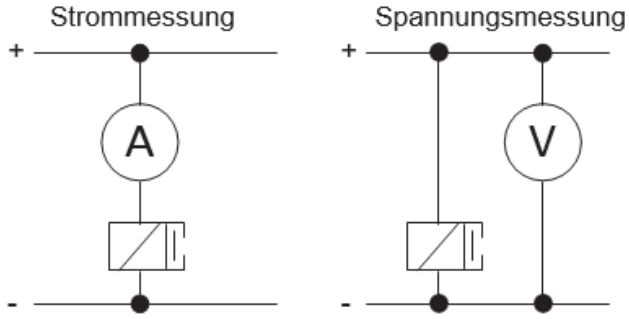
- Only use cleaning agents in accordance with the manufacturer's operating instructions. Avoid contact with skin. Only use with good ventilation.


Caution

Incorrect care and cleaning may cause damage to the product.

- Do not use any corrosive, acidic or alkaline cleaning agents and abrasives.
- Electrical components may be damaged or destroyed by cleaning agents. Clean these with extreme care.
- Do not use water or agents that may damage the corrosion protection or parts of the product.

General visual inspection	1. Check the brake for mechanical damage, dirt, wear and corrosion. 2. Check load-bearing components for corrosion. 3. Check the function. 4. House the brake if necessary and protect it against corrosion.
Check the threaded connections	1. Check all threaded connections are tightened to the specified torque according to the specifications on the product drawing and in the technical data for the product in the appendix. Tighten loose bolts.
Checking the air gap and readjusting the brake	1. By using a friction lining that is extremely resistant to wear, readjustment is only necessary under extremely high load. 2. Measure the air gap between the magnet body and the armature disc, and compare it with the information on the product drawing. 3. If the air gap deviates from the specifications on the product drawing, move the armature disc (item 2) or the drive flange

	(item 6) axially on the machine side until the required air gap is set and then secure it again against axial displacement.
Check for noise and heat build-up as well as oscillations	1. Check for unusual noises, vibrations and oscillations. 2. Monitor the operating temperature. If unusual heating is detected during the test, it must be cancelled. 3. Before continuing operation, find the cause of the noise, vibration, oscillations and heat build-up, and rectify this.
Cleaning the product	1. Remove loose dirt, corrosion, and deposits of dust or dirt. 2. To clean our products, you can use petroleum, for example, for all parts (with the exception of friction surfaces), petroleum ether or a substance with additional anti-corrosive function, such as e.g. Castrol Rustilo DW 180 HF for external use. 3. When using the liquids mentioned, only use them on a cleaning cloth, which will prevent liquid penetrating the inside of the brake.
Check the magnet spool	1. To check the magnet spool, you can check the power consumption. 2. Measure the current using an ammeter and the applied voltage using a voltmeter in accordance with the following connection diagram:  3. Compare the resulting performance specifications with the data on the product drawing.

10 Removal

This chapter describes removal for a service event and disposal.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are permitted to remove the product. The personnel must be trained accordingly and have the necessary skills for removal.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with removal:

Danger

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question
- Suitable eyewear, e.g. safety glasses or goggles with a safety rating relevant to the activity in question
- Suitable respiratory protection, e.g. masks with a safety rating relevant to the activity in question

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

If the product is not stable, this may result in injuries.

- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.
- Stop the system/machine before removing the product and secure it against accidental movements.
- Cordon off the hazard area.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- Observe the correct sequence for removing the product.

Sharp edges and pointed components may cause injuries.

- Secure the components during transport.
- Before removing the components, check them for damage and sharp edges.

Incorrect selection and incorrect connection of electrical control and connection components may lead to high currents, electric arcs and heating.

- Observe the relevant safety standards for electrical appliances.
- Only use sufficiently insulated connectors and cables for the connection.
- Ensure that the components are selected only by a specialist.

Live parts or parts that have become live due to a fault may lead to injuries.

- Observe the relevant safety standards for electrical appliances.

High operating temperatures of the product may lead to burn injuries.

- Observe the instructions from the operator.
- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.
- Observe and monitor the speed limits on the input and output sides.

Wear from friction surfaces can cause breathing difficulties.

- Prevent any dust associated with plate wear from escaping by encapsulating the friction lining.

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

If the securing elements are not tightened correctly or inappropriate securing elements are selected, this may lead to injuries.

- Observe and check the installation instructions in the operating instructions. If there is no information, the applicable guidelines are to be observed according to current engineering practices.
- Also observe the instructions in the operating manual for the system/machine manufacturer.
- Check the tightening torque, number and strength ratings of the bolts according to the specifications on the product drawing and in the technical data of the product in the appendix.
- Make sure that the bolts cannot become loose accidentally.

Caution

Electromagnetic processes may lead to product damage in sensitive environments.

- Enclose the product in a housing made of magnetically conductive materials if surrounding products are very sensitive to magnetism.

Note!

- These operating instructions are only relevant to the scope of delivery from Stüwe. Also observe the operating instructions of the system/machine manufacturer.

Removal is generally only possible when stationary. Bring the system/machine to a secure position and lock it in place. Switch the main motor off and secure the system/machine against unintended movements.

Remove the product in the reverse order of assembly as per the respective installation situation (see "Assembling the product – basic equipment" chapter).

11 Disposal

This chapter describes correct disposal of the product.

Only persons who meet the requirements from the "Requirements of the personnel" chapter are permitted to dispose of the product. The personnel must be trained accordingly and have the necessary skills for disposal.

Personal protective equipment

Provide the following prescribed (personal) protective equipment for activities associated with disposal:

- Suitable hand protection, e.g. gloves with a safety rating relevant to the activity in question
- Suitable footwear, e.g. safety shoes with a safety rating relevant to the activity in question
- Suitable eyewear, e.g. safety glasses or goggles with a safety rating relevant to the activity in question
- Suitable ear defenders, e.g. ear muffs, ear plugs or ear moulds with a safety rating relevant to the activity in question
- Suitable respiratory protection, e.g. masks with a safety rating relevant to the activity in question

Danger

If moving parts approach a fixed part, injuries can ensue.

- Observe the accident prevention regulations.
- Protect yourself using suitable (personal) protective equipment, such as gloves.
- Do not reach into the components while the product is being transported.
- Secure loose components to prevent unintended movements.

If the product is not stable, this may result in injuries.

- Protect yourself using suitable (personal) protective equipment, such as safety shoes and gloves.
- Make sure that the ground is firm and the location is stable before placing the product down.
- Secure the product or components against rolling or toppling over.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- Protect yourself using suitable (personal) protective equipment, such as safety shoes and gloves.

Sharp edges and pointed components may cause injuries.

- Protect yourself using suitable (personal) protective equipment, such as gloves and safety shoes.
- Secure the components during transport.

- Before removing the components, check them for damage and sharp edges.

Swirling dust may cause breathing difficulties and eye irritation.

- Protect yourself with suitable (personal) protective equipment, such as a breathing mask and safety goggles.
- Avoid the use of compressed air.

Physical strain or poor posture due to the weight of the product may lead to injuries.

- Observe the weight specifications.
- Use suitable transport equipment when moving the product.
- Only carry out work on the product when it is in an upright position.

Note!

- Observe the applicable environmental regulations.

The product consists of various materials that can be recycled or need to be disposed of separately. After removal, separate the individual parts of the product according to the type of material.

Dispose of the individual parts according to the provisions of the relevant country of the user and according to the national and local regulations.

12 Spare parts

Note!

- All maintenance interventions for the replacement of wear parts must be carried out by Stüwe Service.
- Contact Stüwe Service for further information.

13 Service

For the replacement of components, repairs or a conversion on site, contact Stüwe Service. To be able to advise you in the best possible way, please have the article number or the order number ready, e.g. 100123456.

Contact us via e-mail or telephone:

info@stuewe-ag.ch

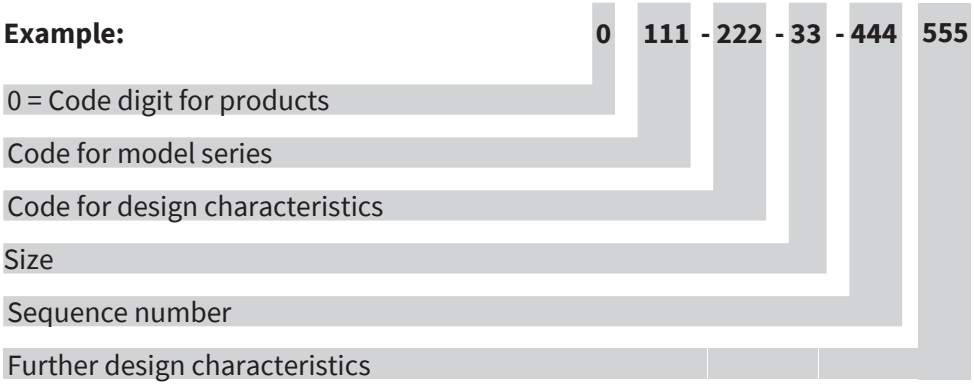
+41 (0) 81 77 22 500

The warranty entitlement can only be honoured if original spare parts are used.

14 Appendix

14.1 Stüwe code

The product numbers from Stüwe drawings are structured as follows.



14.2 Technical data

Note!

- The product's technical data may differ for special versions. Refer to the product design for the exact details.

Product weights

Size	Approx. weight [kg] *	
	0009-100	0009-101 0009-302
00	0.165	0.210
01	0.260	0.370
05	0.490	0.690
09	0.910	1.310
13	1.690	2.380
17	3.200	4.500
25	6.300	9.300
33	11.700	17.200

* Please refer to the product drawing for the exact weight

Performance data

Size	Switchable torque M_s [Nm]	At speed n [rpm]	Maximum speed n_{max} [rpm]
00	1.7	450	8000
01	7.5	300	7000
05	15.0	240	6000
09	30.0	200	5000
13	60.0	150	4000
17	120.0	120	3000
25	240.0	100	2500
33	480.0	80	2000

Maintenance data

Size	Air gap [mm]
00	$0.2^{+0.1}$
01	$0.2^{+0.1}$
05	$0.3^{+0.1}$
09	$0.3^{+0.1}$
13	$0.3^{+0.2}$
17	$0.4^{+0.2}$
25	$0.5^{+0.2}$
33	$0.6^{+0.2}$

14.3 Standards and directives

Where our products come under the area of application of an EU directive, we produce a declaration of conformity and confirm compliance with this declaration of conformity.

- **Machinery Directive 2006/42/EU/Low Voltage Directive 2014/35/EU:** The products have a CE mark if required under the directive.
- **RoHS Directive**: The products receive a CE mark on request.

14.3.1 REACH regulation

Stüwe actively tracks the REACH requirements of the EU and has to the best of its knowledge and belief identified its duties and obligations. We unreservedly support the aim of the REACH regulation in improving the protection of human health and the environment.

We are a manufacturer of clutches, brakes and systems for various areas of industry. Our items are classed as products according to item 3 (3) of the REACH regulation.

Stüwe acknowledges its duty to supply information to all of its customers according to item 33 of the REACH regulation if the product that we supply exceeds the defined value of the mass concentration of a substance of very high concern (SVHC).

Stüwe regularly checks the published and updated list of SVHC substances on the website of the European Chemicals Agency ECHA.

14.3.2 SCIP database

The SCIP duty to inform applies to all items that are circulated in the EU.

Stüwe Switzerland AG will provide you with the necessary information for entry in the SCIP database. Entry in the database is to be carried out by you as an EU importer. This information contains the product, component and the affected substance from the SVHC substance list. If SCIP numbers are partially present from the supply chain, we will inform you of these as well.

You can find this information in these operating instructions in the "REACH regulation" chapter and/or in the order documents.

14.3.3 RoHS Directive

Electronic, electromagnetic and electrohydraulic products, as well as products with integrated electronic components, from Stüwe may fall under this EU directive if they are not installed in large-scale, fixed installations.

Other products, e.g. hydraulic and pneumatic products, are not subject to this EU directive, i.e. we are not permitted to produce a declaration of conformity. However, should you require confirmation that a product of this kind is within the substance limits of this EU directive, we are able to provide this confirmation for certain order and material numbers.

The lead substance limits of RoHS Directive 2011/65/EU for aluminium alloys, steel alloys and copper alloys are complied with.

Lead cannot be removed from these alloys.

14.3.4 Machinery directive 2006/42/EC

Products of the Stüwe standard series are components. They do not fall under the area of application of the machinery directive because, although they are intended for installation in machines, they are not designed for a specific application (for a special type of machine).

Customer-specific products are specially designed in terms of connection and performance data. However, these modified products are based on the designs of the standard series and are also components.

For this reason, a declaration of conformity or installation is not produced for these products.

It goes without saying that the products satisfy all applicable legal requirements, particularly with regard to further relevant regulations concerning CE marking as well as the Product Safety Act ProdSG (DE) and the Federal Product Safety Act PrSG (CH).

14.3.5 Low Voltage Directive 2014/35/EU

Electronic, electromagnetic and electrohydraulic products from Stüwe may fall under this EU directive if the voltage is > 50 V AC and > 75 V DC and another specific directive does not exclude this NRL.

14.3.6 EMC test

The product is a component/assembly and not designed for the end user to install in a device.

Adherence to the EMC directive is the responsibility of the (industrial) user who will install or mount

the device.

14.4 Supplementary technical data

Tightening torques for the bolts *

Strength class	10.9		12.9	
Thread	**M_A [Nm]**	**± M_A [Nm]**	**M_A [Nm]**	**± M_A [Nm]**
M4	4.6	0.2	5.1	0.2
M5	8.6	0.3	10	0.4
M6	14.9	0.6	17.4	0.7
M8	36.1	1.4	42.2	1.7
M10	71	2.8	83	3.3
M12	123	4.9	144	5.8
M14	195	7.8	229	9.2
M16	302	12.1	354	14.2
M18	421	16.8	492	19.7
M20	592	23.7	692	27.7
M22	807	32.3	945	37.8
M24	1017	40.7	1190	47.6
M27	1496	59.8	1750	70
M30	2033	81.3	2380	95.2
M33	2747	109.9	3214	128.6
M36	3535	141.4	4136	165.4

* For deviating tightening torques, please refer to the supplied product drawing.

Scope: DIN EN ISO 4762 (formerly DIN 912) cylinder head bolt (with hexagon socket head)

DIN EN ISO 4014 (formerly DIN 931) hexagon head bolt (with shank)

DIN EN ISO 4017 (formerly DIN 933) hexagon head bolt (with thread up to head)

14.5 Declarations

If declarations exist for this product (declaration of conformity, declaration of installation, etc.), these can be found on the Stüwe homepage.