Translation of original operating instructions

Electromagnetically released spring pressure brake

Model series 207

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.

Stüwe Switzerland AG

Industriestraße 4
9473 Gams
Switzerland

Telephone +41 (0) 81 772 25 00
E-mail info@stuewe-ag.ch
Website www.stuewe-ag.ch

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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 207 model series spring pressure 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. The brake is actuated by springs and, when de-energised, is deemed to be "closed". It can be released by means of electromagnetic force and is then deemed to be "opened".

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.

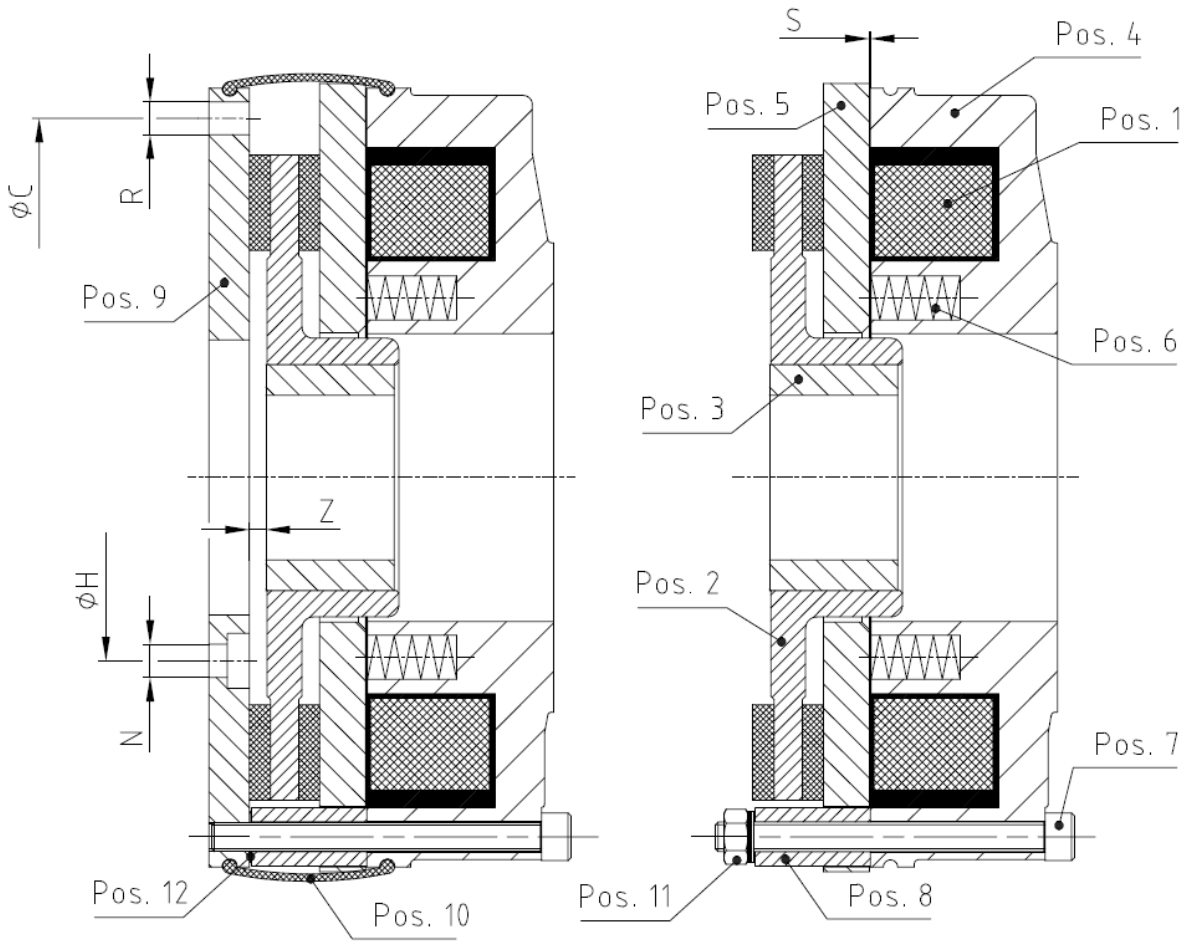
It is not intended for the product to be used as a "safety component" in terms of the EC Machinery Directive.

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



0207-102
Version with end plate and dust protection sleeve

0207-000
Version without end plate and dust protection sleeve

Sectional drawings of the 207 model series

The outer, fixed part of the multi-plate brake from the 207 model series in version 0207-102 consists of a magnet body (item 4) with magnet spool (item 1) and springs (item 6), the armature disc (item 5) and the end plate (item 9), which are connected to each other via the sleeves (item 8), shims (item 12) and bolts (item 7). The end plate (item 9) is again secured to the machine frame via a screw connection.

In the 0207-000 version, the end plate (item 9) is omitted and the brake is screwed directly to the machine frame using the bolts (item 7). In this case, the machine frame takes over the task of the end plate and becomes the friction surface.

In both versions, the inner, rotating part of the multi-plate brake consists of a plate (item 2), which is coupled to the hub (item 3) via a spline in such a way that it transmits torque but allows axial relative movements. The hub (item 3), in turn, is connected to the drive shaft via positive locking (e.g. key) and must be secured against axial displacement.

If the shaft is to rotate freely, 24 V (+10%) direct current must be applied so that the magnet moves the armature disc (item 5) in the direction of the magnet body (item 4) against the pretension force of the installed spring (item 6). The friction system is therefore released and the brake is "open".

If the shaft is to be braked or held, the brake must be de-energised. Spring-actuated (item 6) then presses the armature disc (item 5) onto the friction system. This axial tension creates a frictional connection between the plate (item 2) on the inner, rotatable part of the brake and the outer stationary part. The brake is described as "closed".

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 commissioning, operation, maintenance and repair, observe the notes in the corresponding chapters of these OI as well as the documentation of the system or the complete machine.

2.1 Symbols

Note!

- Pay special attention to this text.

Danger

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

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:

- Installation engineers of the system/machine 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.

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.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.
- Observe the location of the package (TOP direction!).
- Avoid premature release of the assembly aid.

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.

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.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.
- Observe the location of the package (TOP direction!).
- Avoid premature release of the assembly aid.

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.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.
- Avoid premature release of the assembly aid.

Sharp edges and pointed components may cause injuries.

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

A faulty electrical connection may lead to short circuits on the electromagnet and supply lines, and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that the connection is only carried out by qualified personnel.

Selecting the incorrect electrical control and connection components may lead to high currents, electric arcs, heating and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that any connectors and cables used are sufficiently insulated.
- Ensure that the components are selected 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.

Incorrect alignment of the product may lead to injuries.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

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. Carry out the assembly in accordance with this version. 2. For the requisite tightening torques, see the chapter "Supplementary technical data".
Assembling the brake in version 0207-102 with end plate and dust protection sleeve	1. Remove the dust protection sleeve (item 10) from the brake. 2. The brake is under the pretension of the springs (item 6). Release the spring pretension by applying magnetic force (observe the max. permissible tension) or using suitable mechanical aids. 3. Loosen the end plate (item 9) by removing the bolts (item 7) and put all loose parts such as sleeves (item 8) and shims (item 12) to one side for subsequent assembly. 4. Centre the brake via the inner centring of the end plate (item 9) to the machine frame and screw it to this either via the through hole "N" to diameter "H" or via the through hole "R" to diameter "C". Use bolts with a strength rating of 10.9 for this (bolts not included in the scope of delivery). 5. Coat the bolts with Loctite 262 to prevent them from working loose. 6. Fit the hub (item 3) on the shaft and secure it axially so that the installation dimension "Z" is maintained. 7. Slide the inner plate (item 2) onto the hub (item 3). 8. Refit the magnet body (item 4) together with the sleeves (item 8) and shim discs (item 12) that have been set aside using the bolts (item 7). 9. Coat the bolts with Loctite 262 to prevent them from working loose. 10. Check that the inner plate (item 2) can move freely in relation to the magnet body (item 4) and the securing bolts on diameter "H". 11. Fit the dust protection sleeve (item 10) and ensure that it is securely seated in the groove provided.
Assembling the brake in version 0207-000 without end plate and dust protection sleeve	1. The brake is under the pretension of the springs (item 6). Release the spring pretension by applying magnetic force (observe the max. permissible tension) or using suitable mechanical aids. 2. Loosen the nuts (item 11) and put all loose parts such as bolts (item 7), sleeves (item 8) and shims (item 12) to one side for subsequent assembly. 3. Fit the hub (item 3) on the shaft and secure it axially so that the installation dimension "Z" is maintained. 4. Slide the inner plate (item 2) onto the hub (item 3). 5. Fit the magnet body (item 4) on the machine frame together with the sleeves (item 8) and shim discs (item 12) that have been set aside using the bolts (item 7). 6. Coat the bolts with Loctite 262 to prevent them from working loose.

	7. Check that the inner plate (item 2) can move freely in relation to the magnet body (item 4).
Concluding the installation	1. Connect the power supply of 24 V (+10%) DC.
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 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 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.

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.

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.

A faulty electrical connection may lead to short circuits on the electromagnet and supply lines, and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that the connection is only carried out by qualified personnel.

Selecting the incorrect electrical control and connection components may lead to high currents, electric arcs, heating and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that any connectors and cables used are sufficiently insulated.
- Ensure that the components are selected 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 thermal radiation and cause injuries.

- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.

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 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.

Processes involving friction within the product can 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.

Faulty alignment of moving parts can cause discomfort, stress and increased wear.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

Low-frequency electromagnetic radiation may cause interference in nearby electronic components or devices.

- Take constructive measures or use magnetic field-resistant sensors to avoid interference.

Wear from friction surfaces can cause breathing difficulties.

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

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.
- Arrange for the use of a vacuum cleaner

Contamination or moisture can cause injuries.

- Ensure that the work surface is dry and clean when working on the product.
- Clean the product.
- Check load-bearing components for corrosion at suitable intervals.
- Provide a housing for the product if necessary and protect it against corrosion.
- Replace corroded or damaged parts.
- Check function, leak-tightness and torque at suitable intervals.

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.

Incorrect alignment of the product may lead to injuries.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

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 current while it is stationary. 2. Check whether the armature disc (item 5) is pulled against the magnet body (item 4) and that the brake is fully open. 3. Check that there is no contact between the rotating shafts and the stationary magnet body (item 4) and armature disc (item 5). Remove the dust protection sleeve for this.

	4. After the brake has been de-energised, the armature disc must be pressed against the friction unit by spring force and the brake must be applied.

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 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 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.

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.

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.

A faulty electrical connection may lead to short circuits on the electromagnet and supply lines, and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that the connection is only carried out by qualified personnel.

Selecting the incorrect electrical control and connection components may lead to high currents, electric arcs, heating and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that any connectors and cables used are sufficiently insulated.
- Ensure that the components are selected 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 thermal radiation and cause injuries.

- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.

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 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.

Processes involving friction within the product can 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.

Faulty alignment of moving parts can cause discomfort, stress and increased wear.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

Low-frequency electromagnetic radiation may cause interference in nearby electronic components or devices.

- Take constructive measures or use magnetic field-resistant sensors to avoid interference.

Wear from friction surfaces can cause breathing difficulties.

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

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.
- Arrange for the use of a vacuum cleaner

Contamination or moisture can cause injuries.

- Ensure that the work surface is dry and clean when working on the product.
- Clean the product.

Contamination or moisture can cause injuries.

- Check load-bearing components for corrosion at suitable intervals.
- Provide a housing for the product if necessary and protect it against corrosion.
- Replace corroded or damaged parts.
- Check function, leak-tightness and torque at suitable intervals.

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.

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. Apply the permissible switching current in accordance with the technical data. 2. The tension of the friction elements is released. 3. The brake is open.
Static brake actuation	1. When the brake is de-energised, compression springs (item 6) cause axial tensioning of the friction elements. 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.
Dynamic brake actuation	1. When the brake is de-energised, compression springs (item 6) cause axial tensioning of the friction elements. 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 friction system does not exceed a value of 120 °C during successive braking processes.
Use together with an electromagnetic Stüwe clutch	1. The spring-loaded, electromagnetic brake from the 207 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 unusual operating noises, vibrations, elevated temperatures or malfunctions occur, the system/machine must be taken out of operation immediately and measures taken to prevent it from being commissioned again while repairs are being 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/machine and include these in the fault finding process.

Malfunction	Reason	**Remedy**
Brake slips (Holding torque is not maintained and/or braking angle is increased)	Friction linings worn beyond wear limit (reduced spring force)	Stüwe Service to be contacted.
	Oily friction linings on a dry-running brake (reduced coefficient of friction)	
Brake switches too slowly	Insufficient operating voltage	Operate with a higher voltage for a limited time (fast-starting device or via time relay). Adjust the brake.
Overlapping of the clutch and brake	Switching times too fast	Installation of a time relay on the clutch side or microswitch on the brake side. Check the operating voltage. Adjust the brake.
Temperature rise of the plate pack	Air gap is too small	Set the air gap.
	Unaccountable machine/product 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.

- 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.

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

- Stop the system/machine before removing the product and secure it against accidental movements.
- Cordon off the hazard area.

If components under spring pressure are suddenly released, this may lead to injuries.

- Observe the instructions in the chapters relating to correct assembly and removal of the product.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.

Obstacles falling down may cause injuries.

- 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.

A faulty electrical connection may lead to short circuits on the electromagnet and supply lines,

and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that the connection is only carried out by qualified personnel.

Selecting the incorrect electrical control and connection components may lead to high currents, electric arcs, heating and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that any connectors and cables used are sufficiently insulated.
- Ensure that the components are selected 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 thermal radiation and cause injuries.

- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.

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 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.

Processes involving friction within the product can 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.

Faulty alignment of moving parts can cause discomfort, stress and increased wear.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

Low-frequency electromagnetic radiation may cause interference in nearby electronic

components or devices.

- Take constructive measures or use magnetic field-resistant sensors to avoid interference.

Wear from friction surfaces can cause breathing difficulties.

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

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.
- Arrange for the use of a vacuum cleaner.

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.

Contamination or moisture can cause injuries.

- Ensure that the work surface is dry and clean when working on the product.
- Clean the product.

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.

Incorrect alignment of the product may lead to injuries.

- Observe the information on the alignment and installation position of the product in accordance with the product drawing.

It is only possible to carry out maintenance operations 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.

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 opened 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		
Clean the surface	Annually	9.2
Changing wear parts		
Change the friction linings	When the wear limit (see information on the product drawing) and the resulting torque drop is reached	9.2

* If necessary, earlier change in consideration of oil change periods of system/machine manufacturer

9.2 Description of the maintenance intervention


Danger

Danger!

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


Caution

Caution!

The cleaning of plates is not permitted.

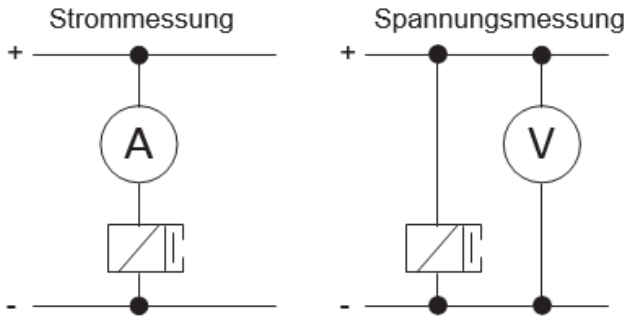
- In the event of contamination, replace the plates.

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 that all threaded connections are tightened to the specified torque in accordance with the specifications on the product drawing and in the technical data for the product in the appendix. 2. Tighten loose bolts.
Checking the air gap and readjusting the brake	1. Frictional wear of the plate (item 2) increases the air gap "S". Accordingly, the spring contact pressure and the torque increase. To raise the torque back to the original level, the brake can be readjusted as follows: 2. Remove the dust protection sleeve (item 10) from the brake if present. 3. Determine the current air gap. 4. The brake is under the pretension of the springs (item 6). Release the spring pretension by applying magnetic force (observe the max. permissible tension) or using suitable mechanical aids. 5. Loosen the bolts (item 7) that connect the magnet body to the end plate (item 9) or machine frame, depending on the version, and put all loose parts such as sleeves (item 8) and shims (item 12) to one side for subsequent assembly. 6. Remove the corresponding number of shims (item 12) from all positions to restore the required air gap "S" and refit the brake in reverse order 7. The "S" air gap has been established. 8. Refit the dust protection sleeve (item 10) if available for the current version and ensure that it is securely seated in the groove provided.
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. Castro 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.
Change the friction linings	1. The brake is under the pretension of the springs (item 6). Release the spring pretension by applying magnetic force (observe the max. permissible tension) or using suitable mechanical aids. 2. Loosen the bolts (item 7) that connect the magnet body to the end plate (item 9) or machine frame, depending on the version, and put all loose parts such as sleeves (item 8) and shims (item 12) to one side for subsequent assembly. 3. The plate (item 2) can now be replaced. 4. Assembly is carried out in reverse order.

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:

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



Danger

- 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.

If components under spring pressure are suddenly released, this may lead to injuries.

- Observe the instructions in the chapters relating to correct assembly and removal of the product.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.
- Observe the correct sequence for removing the product.
- Avoid premature release of the assembly aid.

Sharp edges and pointed components may cause injuries.

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

A faulty electrical connection may lead to short circuits on the electromagnet and supply lines, and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that the connection is only carried out by qualified personnel.

Selecting the incorrect electrical control and connection components may lead to high currents, electric arcs, heating and cause injuries.

- Observe the relevant safety standards for electrical appliances.
- Ensure that any connectors and cables used are sufficiently insulated.
- Ensure that the components are selected 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 thermal radiation and cause injuries.

- Make sure that the product cannot be touched by persons during operation.
- Make provision for sufficient supply of air and/or cooling.

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 parts.

Swirling dust may cause breathing difficulties and eye irritation.

- Avoid the use of compressed air.
- Arrange for the use of a vacuum cleaner

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.

Contamination or moisture can cause injuries.

- Ensure that the work surface is dry and clean when working on the product.
- Clean the product.

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.

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. 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.

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

Danger

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.

If components under spring pressure are suddenly released, this may lead to injuries.

- Observe the instructions in the chapters relating to correct assembly and removal of the product.

Obstacles falling down may cause injuries.

- Observe the accident prevention regulations when moving heavy loads.
- When moving the product, use safe lifting equipment with a sufficient load-bearing capacity and lifting gear with appropriate dimensions and the dedicated mounting points for the entire product in accordance with the product drawing.

Sharp edges and pointed components may cause injuries.

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

Note!

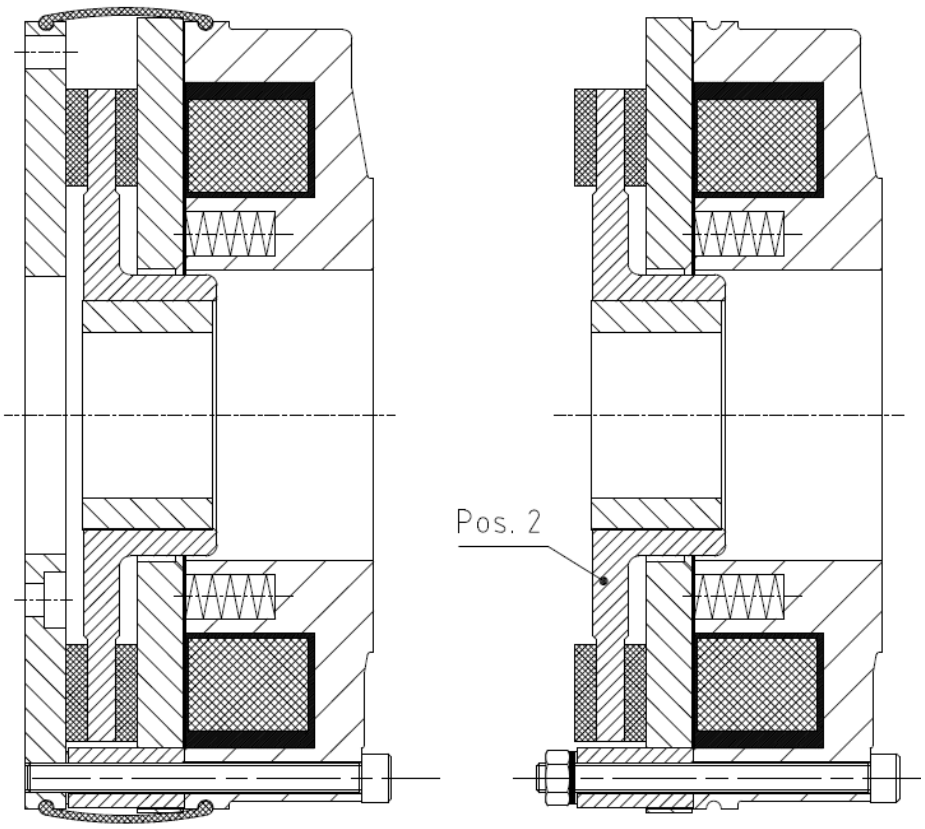
- Observe the applicable environmental regulations.

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

This chapter lists the available spare parts that the customers can replace themselves.



Spare parts drawing for the 207 model series

Item	Individual part
2	Inner plate

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

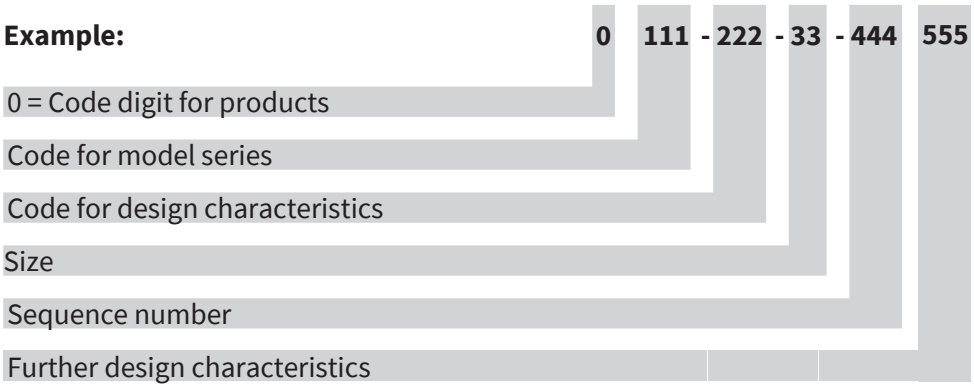
+41 (0) 81 77 22 500

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 technical data of the product may differ for special versions. Refer to the product configuration for the exact details.

Product weights

Size	Approx. weight [kg] *
02	1
03	1.5
07	3.5
11	5.2
15	8.5
17	10.2
23	15
31	25

* Refer to the product drawing for the position of the transport thread and the precise weight

Performance data

Size	Selectable torque M_s [Nm]	Maximum speed n_{max} [rpm]
02	4	3000
03	8	3000
07	16	3000
11	32	3000
15	60	3000
17	80	3000
23	150	3000
31	240	2500

Maintenance data

Size	Min. air gap "S" [mm]	Carrier installation dimension "Z" [mm]
02	0.2	1.8 ±0.1
03	0.2	2.5 ±0.1
07	0.2	3.5 ±0.1
11	0.3	3.0 ±0.1
15	0.3	3.0 ±0.1
17	0.3	3.0 ±0.1
23	0.3	4.5 ±0.1
31	0.4	6.5 ±0.1

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.

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.

14.3.2 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.

14.3.3 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).

14.3.4 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.

14.3.5 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.