Translation of original operating instructions

Electromagnetically actuated gear coupling

013/813 model series

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 gear coupling is intended for use in drivetrains. In these, it is intended for use as a connecting element between two shafts (one of which as a flanged shaft). The clutch is actuated by an electromagnetic force and is then designated as "closed". By means of springs, it is released when de-energised and is then designated as "open". The clutch can be used for both wet- and 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.

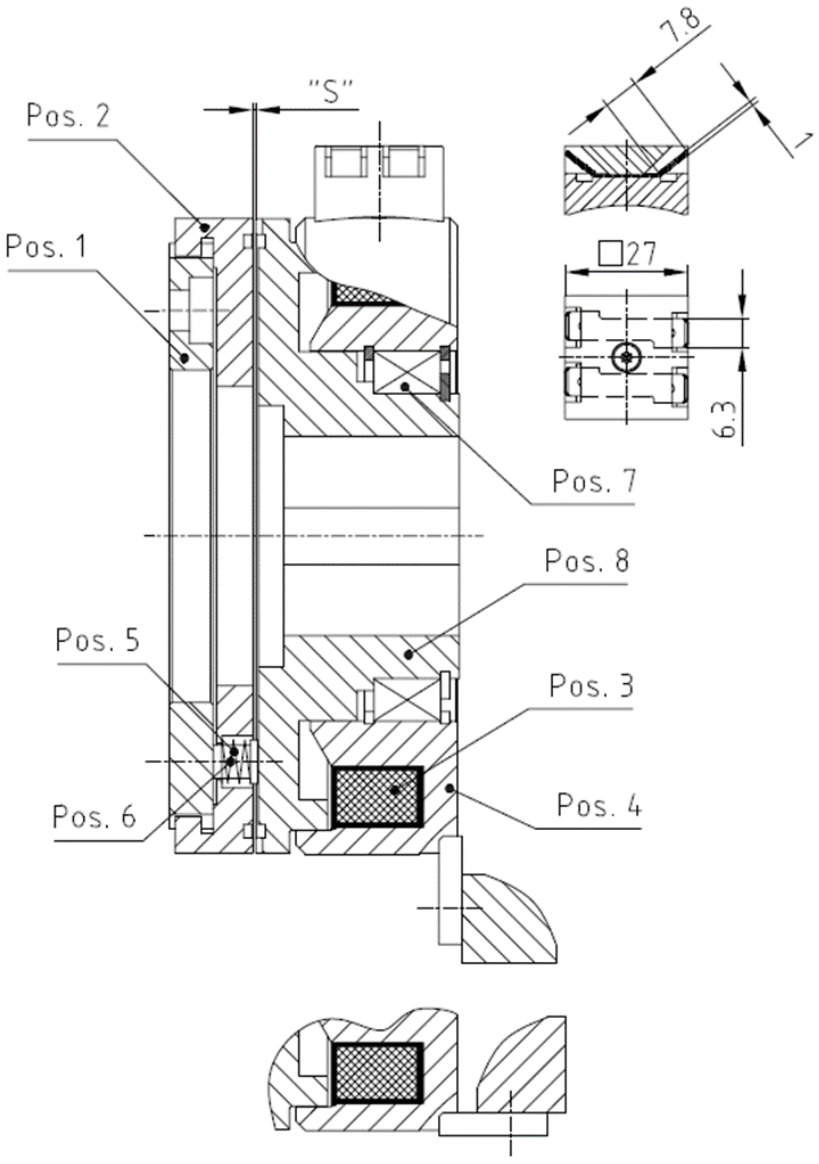
1.2 Non-intended use and foreseeable misuse

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.
- If our product is used outdoors without sufficient protection against environmental conditions.
- If our product is not operated according to 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 is switched with an impermissibly high differential speed.

1.3 Basic equipment of the product

1.3.1 Model series 013



Sectional drawing of model series 013

The slip-ring-free electromagnetic tooth clutch of the 013 model series consists of a magnet body (item 4) with magnet spool (item 3) on one side. This outer part of the clutch is mounted on the inner support plate (item 8) via a roller bearing (item 7). The support plate, in turn, is connected to the machine shaft via positive locking (e.g. key).

On the opposite side, a drive plate (item 1) is connected to the other machine shaft (flanged shaft) via a screw connection and dowel pins. The armature disc (item 2), in turn, is coupled to the drive plate by a spline in such a way that it permits axial relative movements and transmits torque.

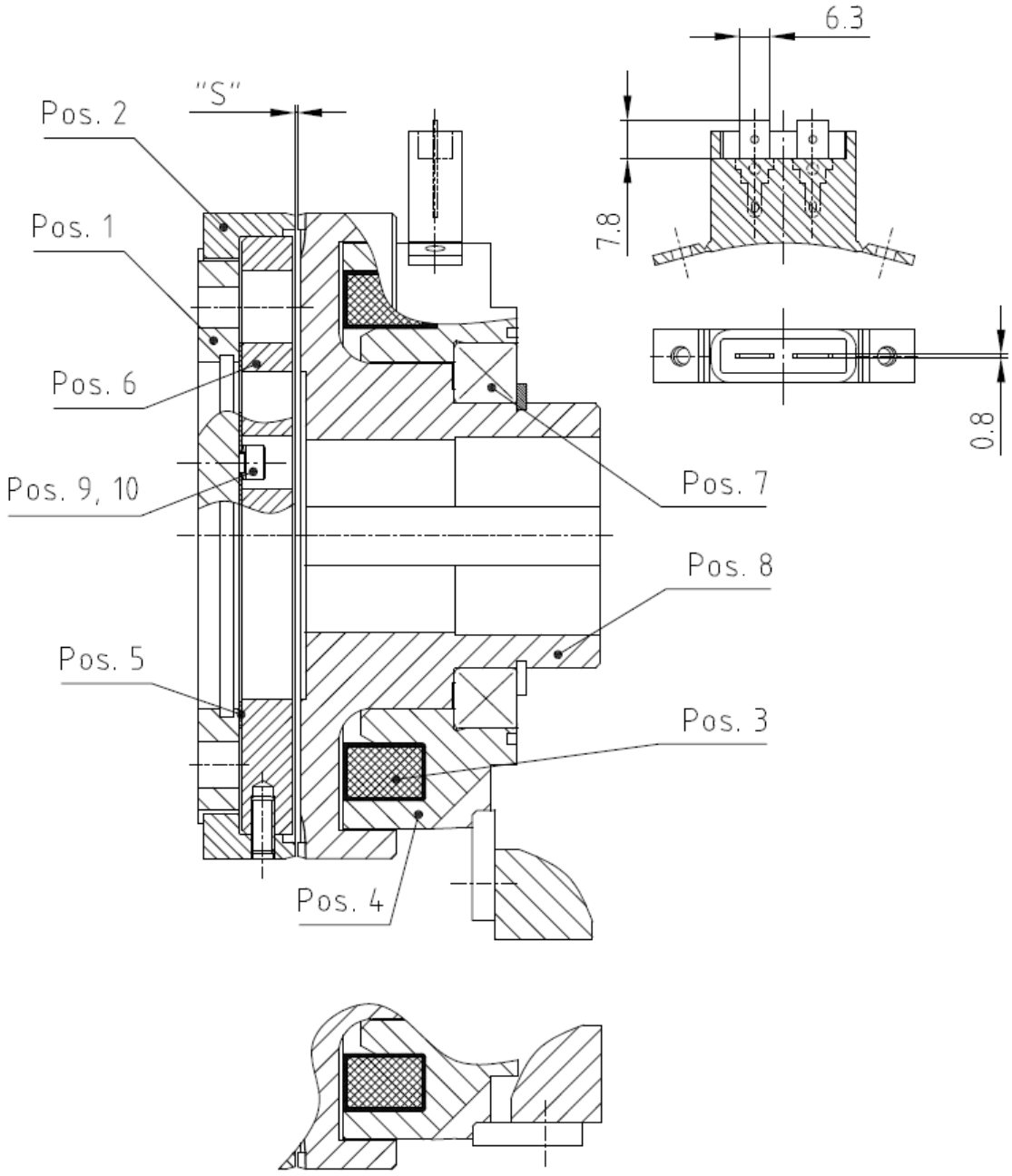
If the input and output are to be connected, 24 V (+10%) DC voltage must be applied so that the magnet moves the armature disc (item 2) against the pretension of the fitted springs (item 5) against the support plate (item 8) and the serration engages. This means that both shafts are positively connected to each other and the clutch is described as "closed".

If both shafts (input and output) are to be disconnected, the clutch must be de-energised. The springs (item 5) move the armature disc (item 2) axially away from the support plate (item 8). This releases the positive locking via serration and the clutch is "opened".

The 013 model series gear coupling is available as a wet-running (0013-000-) and a dry-running version (0013-050-). In the dry-running version, the roller bearing is pre-greased and sealed by a cover plate.

The electrical connection for the 013 model series is made using a flat connector on the 4-pin connector plug, and always from one side only. Please note that the contact tabs are connected through to the other side. Connecting the two supply cables to through-connected contact tabs leads to a short circuit.

1.3.2 Model series 813



Sectional drawing of model series 813

The gear coupling of the 813 model series consists of a magnet body (item 4) with magnet spool (item 3) on one side. This outer part of the clutch is mounted on the inner support plate (item 8) via a roller bearing (item 7). The support plate, in turn, is connected to the machine shaft via positive locking (e.g. key).

On the opposite side, a drive plate (item 1) is connected to the other machine shaft (flanged shaft) via a screw connection and dowel pins. The armature, consisting of the armature disc (item 6) and toothed ring (item 2), is in turn coupled to the drive plate by a spline in such a way that it permits axial relative movements and transmits torque..

If the shafts are to be connected, 24 V (+10%) DC voltage must be applied so that the magnet moves the armature (item 2 and 6) against the pretension of the fitted spring disc (item 5) against the support plate (item 8) and the serration engages. This means that the input and output are positively connected to each other, and the clutch is designated as "closed".

If both shafts (input and output) are to be disconnected, the clutch must be de-energised. The spring disc (item 5) pulls the armature (item 6) away from the support plate (item 8). This releases the positive locking via serration and the clutch is "opened".

The 813 model series gear coupling is available as a wet-running (0813-5.0-) and a dry-running version (0813-0.0-). In the dry-running version, the roller bearing is pre-greased and sealed by a cover plate.

The electrical connection for the 813 model series is made using a flat connector on the 2-pin connector plug.

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:

- 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.

Danger

- 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 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.

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 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.
- 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.

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.

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.

- Note the installation position in accordance with the product drawing.
- Avoid any kind of offset.

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. Assemble the clutch in accordance with the specifications for this model series. 2. For the necessary tightening torques, see the supplementary technical data of the product in the appendix. 3. The gear coupling can be installed both horizontally and vertically. With a vertical installation, where possible, the armature disc should lie at the bottom (recommendation). 4. Sufficient lubrication of the roller bearings must be ensured for wet-running clutches (0013-000- or 0813-5.0-). Depending on the operating conditions, we recommend an oil baffle plate or direct spraying of the bearings. The wet-running

	clutch should be immersed to a maximum of 10% of its outer diameter. 5. For dry-running clutches (0013-050- or 813-0.0-), the roller bearing is already greased and sealed.
Assembling the clutch of the BR013	**Assembling the drive plate (item 1) and armature disc (item 2)** 1. Remove the armature disc (item 2) by loosening the spring bolts (item 6) from the drive plate (item 1). Put the spring bolts (item 6) and springs (item 5) to one side for subsequent reassembly. 2. Screw the drive plate to the axial backlash-free customer shaft (flanged shaft). Use Loctite type 262 to tighten the bolt. 3. Drill the through holes – not the tapped holes of the spring bolts – of the drive plate at the pre-drilled positions together with the customer shaft and pin both of these together. 4. Place the armature disc back onto the drive plate, taking the spring bolt positioning into account. 5. Screw the drive plate (item 1) back in using the previously removed spring bolts (item 6) and springs (item 5) for the drive plate. Again, use Loctite type 262 to secure the bolts here. **Assembling the support plate (item 8) and the magnet body (item 4)** 6. Slide the support plate (item 8) together with the magnet body (item 4) onto the shaft and secure the coupling side against axial displacement. When positioning the support plate in relation to the armature disc, ensure that the air gap "S" between the two sides of the clutch specified on the product drawing is maintained. We recommend compensating for manufacturing inaccuracies with spacer sleeves or shims. 7. Secure the magnet body against twisting. For this purpose, the magnet body has grooves on the outer diameter into which an anti-rotation lock can engage. **Completing the assembly** 8. Check the concentricity of the support plate to the armature disc in accordance with the specifications on the product drawing. Particularly at high speeds, a lack of accuracy of movement affects the amount of transmissible torque, as continuous displacement of the serration has a detrimental effect.
Assembling the clutch of the BR813	**Fitting the drive plate (item 1) and the armature (items 2 and 6)** 1. Remove the armature (items 2 and 6) by loosening the bolts (item 9) from the drive plate (item 1) and put the bolts (item 9) and washers (item 10) to one side for subsequent re-installation. 2. Screw the drive plate to the axial backlash-free customer shaft (flanged shaft). Use Loctite type 262 to tighten the bolt. 3. Drill the through holes – not the tapped holes of the spring bolts – of the drive plate at the pre-drilled positions together

	with the customer shaft and pin both of these together. 4. Place the armature disc (item 2) back onto the drive plate, taking the spring disc positioning into account. 5. Screw the drive plate back in using previously removed bolts and washers (items 9 and 10) for the drive plate. Again, use Loctite type 262 to secure the bolts here. **Assembling the support plate (item 8) and the magnet body (item 4)** 6. Slide the support plate (item 8) together with the magnet body (item 4) onto the shaft and secure the coupling side against axial displacement. When positioning the support plate in relation to the armature disc, ensure that the air gap "S" between the two sides of the clutch specified on the product drawing is maintained. We recommend compensating for manufacturing inaccuracies with spacer sleeves or shims. 7. Secure the magnet body against twisting. For this purpose, the magnet body has grooves on the outer diameter into which an anti-rotation lock can engage. **Completing the assembly** 8. Check the concentricity of the support plate to the armature disc in accordance with the specifications on the product drawing. Particularly at high speeds, a lack of accuracy of movement affects the amount of transmissible torque, as continuous displacement of the serration has a detrimental effect.
Concluding the installation	1. Connect the power supply of 24 V (+ 10%) DC. Depending on the choice of switching element, it may be necessary to prevent contact pieces from burning off, for example. This can be achieved by connecting a protective device in parallel
Following the installation	1. Carry out a function test as described in chapter 6.

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

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.

Accelerations or decelerations within the product may cause injuries.

- Never engage the clutch below the speed differential.
- Ensure that there are no persons in the hazard area of the product. To do this, make provision for a product housing or barrier.

Accidental movements of the product may lead to injuries.

- Note the installation position in accordance with the product drawing.
- Check the alignment and fastening of the support plate to the armature disc in accordance with the specifications on the product drawing.
- Before commissioning, check the clearance and correct position of the components.
- Observe and monitor the minimum required actuating voltage and the maximum permissible voltage.
- If necessary, monitor the end position of the armature disc.

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.

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.

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.

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.

Faulty alignment of moving parts can cause discomfort and stress.

- Note the installation position in accordance with the product drawing.
- Check the alignment and fastening of the support plate to the armature disc in accordance with the specifications on the product drawing.
- Check the clearance of the product.
- Observe and monitor the minimum required actuating voltage.
- Observe and monitor the speed limits on the input and output sides.

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.

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.

- Note the installation position in accordance with the product drawing.
- Avoid any kind of offset.

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 clutch to the requisite switching current while it is stationary.

	2. Check whether the armature disc is pulled against the support plate and that the clutch is fully closed. 3. After the clutch has been de-energised, the armature disc must be released from the support plate by the spring force of the spring disc(s) and the clutch is open. 4. Check that there is no contact between the rotating parts and the stationary magnet body.

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

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.

Accelerations or decelerations within the product may cause injuries.

- Never engage the clutch below the speed differential.
- Ensure that there are no persons in the hazard area of the product. To do this, make provision for a product housing or barrier.

Accidental movements of the product may lead to injuries.

- Note the installation position in accordance with the product drawing.
- Check the alignment and fastening of the support plate to the armature disc in accordance with the specifications on the product drawing.
- Before commissioning, check the clearance and correct position of the components.

- Observe and monitor the minimum required actuating voltage and the maximum permissible voltage.
- If necessary, monitor the end position of the armature disc.

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.

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.

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.

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.

Faulty alignment of moving parts can cause discomfort and stress.

- Note the installation position in accordance with the product drawing.
- Check the alignment and fastening of the support plate to the armature disc in accordance with the specifications on the product drawing.
- Check the clearance of the product.
- Observe and monitor the minimum required actuating voltage.
- Observe and monitor the speed limits on the input and output sides.

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.

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.

- Note the installation position in accordance with the product drawing.
- Avoid any kind of offset.

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 clutch	1. Springs (BR013) and/or a spring disc (BR813) ensure that the armature disc is moved away from the support plate when the clutch is de-energised 2. The positive locking of the serration is released. 3. The clutch is "open".
Actuating the clutch	1. The gear coupling must only be engaged when it is stationary, running synchronously, or at low relative speeds of (< 10 rpm). 2. Applying the permissible switching current in accordance with the technical data causes positive locking of the serration. Since it is possible that the splines are positioned tooth on tooth, the drive shaft must be accelerated at low speed at the beginning so that the teeth can slip into the tooth gap. 3. The clutch is closed in this condition and the specified torque can be transmitted in accordance with the technical data. 4. The clutch is designed for 100% activation period. Depending on the installation conditions, an equilibrium temperature of approx. 80 °C occurs. Ensure free air circulation (dry-running) or cool with oil (wet-running). Heating to > 100 °C is not permitted. 5. Take the product- and application-specific layout into account.

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
Clutch slips (torque is not transmitted)	The voltage applied does not correspond to the specified 24 V (+10%) direct current	In the event of slipping, the splines are usually so damaged that the clutch must be replaced
Clutch does not switch and establish a frictional connection	Fault/interruption in the current path	Check the current path
Clutch transmits torque when open	Defective switching elements or insulation leads to residual voltage in the magnet body; Air gap set incorrectly or coupling halves not secured to each other so that they are free of axial play	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 ear defenders, e.g. ear muffs, ear plugs or ear moulds 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.

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.

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.

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.

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.

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.

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.

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 for noise and heat build-up as well as oscillations	Monthly	9.2
Check the magnet spool	if required	9.2
Check the air gap	Monthly	
Cleaning the product		
Cleaning the product	Annually	9.2

9.2 Description of the maintenance intervention

Danger

Danger!

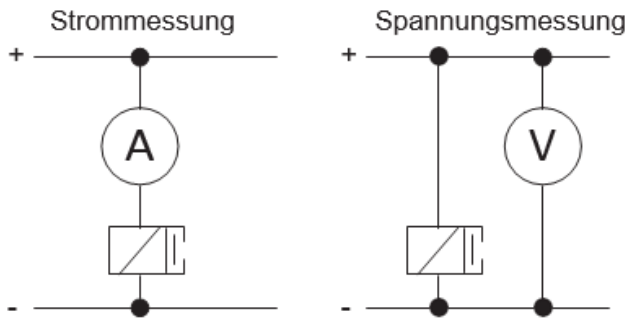
- Only use cleaning agents in accordance with the operating instructions from the manufacturer. Avoid contact with skin. Only use with good ventilation

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 clutch for mechanical damage, dirt and wear, as well as 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. 2. Tighten loose bolts and secure them using Loctite type 262.
Checking for noise and heat build-up	1. During operation, be alert to noise, vibration 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 from penetrating the inside of the clutch.
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.
Check the air gap	1. Check the air gap "S" between the two serrations and compare this with the specifications 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:

- 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.
- 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.
- 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.

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.

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.

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.

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:

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, this may result in injuries.

- 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.

- 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.

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

Note!

- All maintenance interventions for the replacement of spare 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

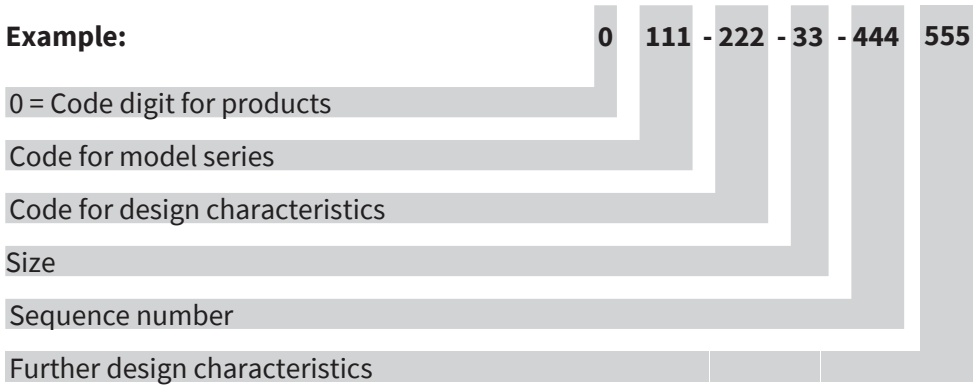
+41 (0) 81 77 22 500

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 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] *	
	BR013	BR813
07	1.60	1.10
11	2.50	1.90
15	3.80	2.90
23	5.90	4.90
31	8.80	9.68
43	14.00	-

* Please refer to the product drawing for the exact weight

BR 013 performance data

Size	Transferable torque M_s [Nm]	Maximum speed n_{max} [rpm]
07	40	4000
11	80	4000
15	200	3800
23	400	3700
31	800	3300
43	1600	3000

BR 813 performance data

Size	Transferable torque M_s [Nm]	Maximum speed n_{max} [rpm]
07	80	4000
11	120	4000
15	350	3800
23	600	3700
31	1000	3300

Oil requirements

The function of the lubricant used is of crucial importance for the long-term operation of our wet-running products.

- For wet-running systems, use a hydraulic oil (HL or HLP) with a viscosity of 32 mm^2/s (cSt), e.g. Chevron GST Oil 32. If other oils are used, consult Stüwe beforehand.

Restrictions may be caused by other components connected to the same oil circuit.

Note!

- Observe the oil approval list from the system/machine manufacturer.

Caution

Mixed lubricants may lead to functional impairments, such as a reduction in friction or foaming, as well as product damage.

- To prevent a negative change to the properties, never mix different lubricants together.

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.

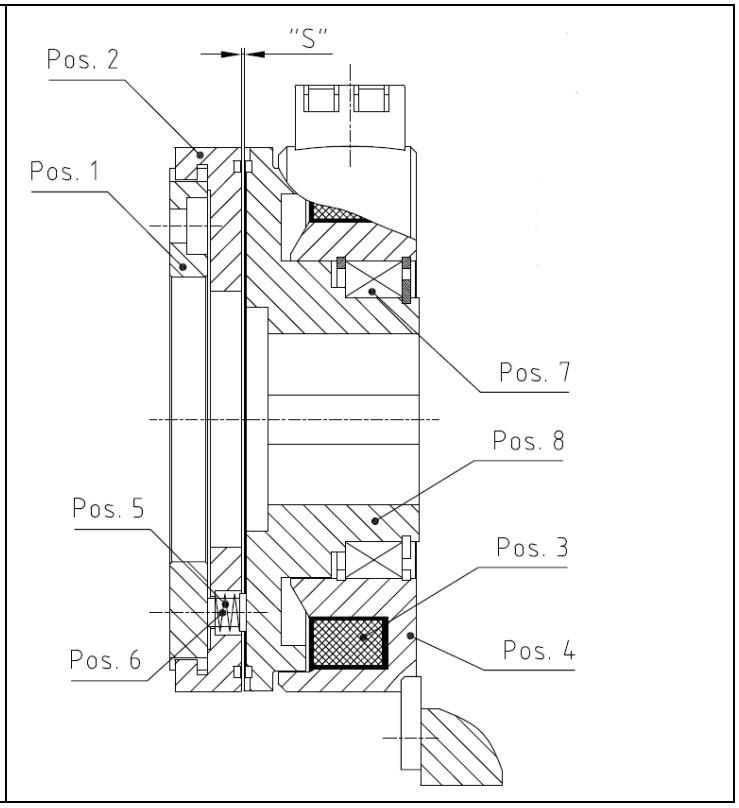
We are a manufacturer of clutches, brakes and systems for various areas of industry. Our items are classed as products according to item 3 (3) of the REACH regulation.

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.

This product contains lead (CAS number 7439-92-1) at a concentration of more than 0.1%.

Designation	Note/Explanation/SCIP no.
Drive plate	The material of the drive plate (item 1) contains lead.



For customer-specific products, see the shipping documents for deviating information.

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.