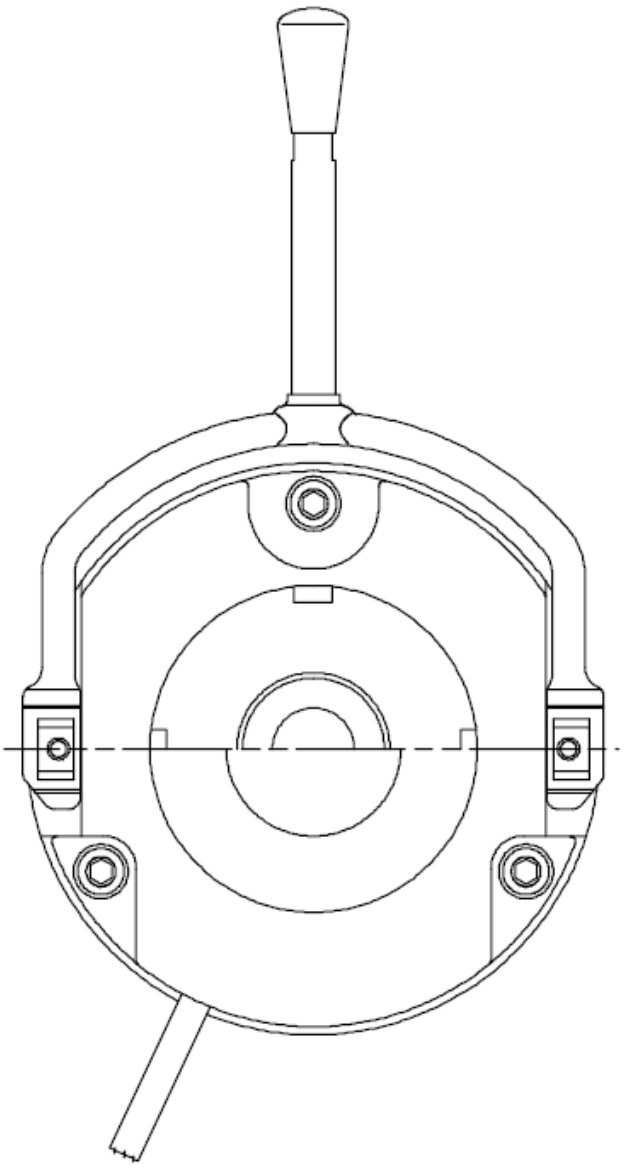
Dings Co.
DYNAMICS GROUP

D58 Series Brake Instructions



G061071-001

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2 Safety information

2.1 Persons responsible for the safety

Operator

- An operator is any natural or legal person who uses the drive system or on behalf of whom the spring-operated brake is used.
- The operator or his safety officer are obliged
  – to check whether all relevant regulations, notes, and laws are observed,
  – that only qualified personnel work on and with the drive system,
  – to ensure that the personnel have the Operating Instructions available for all corresponding operations and
  – to prohibit non-qualified personnel from working with and on the spring-operated brake.

Qualified personnel

Qualified personnel are persons who - because of their education, experience, instructions, and knowledge about the corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - are authorized by the persons responsible for the safety of the plant to perform the required actions and who are able to recognize the potential hazards. (see IEC 364, definition for qualified personnel)

2.2 General safety information

- These safety notes do not claim to be complete. In case of questions and problems please contact your Dings Co. representative.
- At the time of supply the spring-operated brake is state-of-the-art and ensures basically safe operation.
- The spring-operated brake is hazardous to persons, the spring-operated brake itself and other properties of the operator, if
  – non-qualified personnel work on and with the spring-operated brake.
  – the spring-operated brake is used improperly.
- The spring-operated brakes must be designed such that they perform their functions after proper installation and with application as directed in fault-free operation and that they do not cause hazards for persons. This also applies to the interaction with the whole system.
- The spring-operated brake must only be operated in a perfect state.
- Retrofittings or changes of the spring-operated brake are generally prohibited. In any case, Dings Co. must be contacted.
- The friction linings must be carefully protected from grease or oil since even small amounts of lubricants reduce the brake torque considerably.
- With application conditions according to enclosure IP54, the brake torque will usually not be reduced. Because of the multitude of possible applications, proper function of the mechanical components must be tested under the specific application conditions.

Possible applications of the spring-operated brake□□□:

- No explosive or aggressive atmosphere.
- Humidity, no restriction.
- Ambient temperature -20°C to +40 °C.
- With high humidity and low temperatures
  – Take measures to protect armature plate and rotor from freezing.
- Electrical connections must be protected against contact.
- Cooling-air flow must not be impeded.
- In reverse operation it is recommended to additionally glue the hub to the shaft.

2.3 Layout of the safety information

- All safety information given in these Operating Instructions has the same layout:

Signalword
Note

– The icon characterizes the type of danger.
– The signal word characterizes the severity of danger.
– The note text describes the danger and gives information how to prevent dangerous situations.

Warning of damage to persons

Icons used	Signal words	
 Warning of hazardous electrical voltage	**Danger!**	Warns of **impending danger** . Consequences if disregarded: Death or severe injuries.
	Warning!	Warns of **potential, very hazardous situations**. Possible consequences if disregarded: Death or severe injuries.
 Warning of a general danger	**Caution!**	Warns of **potential, hazardous situations**. Possible consequences if disregarded: Light or minor injuries.

Warning of material damage

Icons used	Signal words	
	**Stop!**	Warns of **potential damage to material**. Possible consequences if disregarded: Damage of the controller/drive system or its environment .

Other notes

Icons used	Signal words	
	**Note!**	Designates a general, useful note. If you observe it, handling of the drive system/device is made easier.

3 Technical data

3.1 Product description

1	Armature plate
2	Compression springs
3	Rotor
4	Hub
5	Shaft
6	Flange
7	Stator
8	Adjuster nut
9	Thhreaded sleeves
	$s_{Lü}$ = Air gap

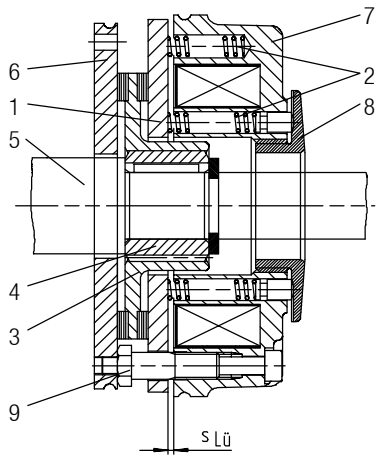
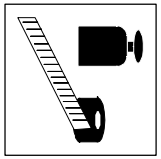


Fig. 1 Design of the spring-operated brake D58: basic module E (complete stator) + rotor + hub + flange

3.1.1 General

The spring-operated brake D58-□□□ is a single disc brake with two friction surfaces.
The brake torque is generated by several compression springs (2) by friction. The brake is released electromagnetically.□□□



3.3 Rated data D58

Size	$s_{Lürated}$ + 0,1mm - 0,05mm	$s_{Lü}$ max. operating brake	$s_{Lü}$ max. holding brake	max. adjustment, admissible wear	Rotor thickness [mm]		Excess of the adjuster nut h_{1max} (see.Fig. 18)	Pitch circle		Screws for flange installation DIN 912	Minimum depth of the clearing holes (installation flange)	Tightening torque Screws	Tightening torque Lever complete	Weight of stator complete
	[mm]	[mm]	[mm]	[mm]	min. [1]	max.	[mm]	∅ [mm]	Thread	[2]	[mm]	[Nm]	[Nm]	[kg]
72	0.2	0.5	0.3	1.5	4.5	6.0	4.5	72	3 x M4	3 x M4	0.5	2.8	2.8	0.75
90					5.5	7.0		90	3 x M5	3 x M5	1	5.5		1.2
112					7.5	9.0	7.5	112	3 x M6	3 x M6	2	9.5	4.8	2.1
132	0.3	0.75	0.45	2.0	8.0	1.0	9.5	132	3 x M6	3 x M6	3			3.5
145				2.5	7.5		11	145	3 x M8	3 x M8	1.5	23	12	5.2
170				3.5	8.0	11.5	10	170	3 x M8	3 x M8	0.5			7.9
196	0.4	1.0	0.6	3.0	10.0	13.0	15	196	6 x M8	4 x M8 [3]	0.8		23	12.0
230				4.0	12.0	16.0	17	230	6 x M10	4 x M10 [3]	2.1	46		19.3
278	0.5	1.25	0.75	4.5	15.5	20.0	19.5	278	6 x M10	6 x M10	5		40	29.1

1) The friction lining is designed such that the brake can be adjusted at least 5 times.

2) The screw length depends on the material and the thickness of the customer's mounting place.

3) The thread in the threading surface is offset by 30° in reference to the center axle of the manual release lever.

4 Installation

Warning!
Toothed hub or screws must not be lubricated with grease or oil

4.1 Required tools

Size	Torque wrench Meßbereich [Nm]	Insertion for hexagon socket screws Wrench size [mm] *	Wrench Wrench size [mm] Cap screws	Nuts / bolts	2kt lever	Hook wrench DIN1810 Design A for Diameter [mm]	Box spanner for flange installation, outside Wrench size [mm]
72	1 bis 12	3x1/4"square	8	7 / 5,5	7	45 - 55	7x1/4" square
90		4x1/4" square	9	10 / 7		52 - 55	8x1/4" square
112		5x1/4" square	12			68 - 75	10x1/4" square
132						80 - 90	
145	20 bis 100	6x1/2"square	15	12 / 8	9		13x1/2" square
170						95 - 100	
196				- / 10	10	110 - 115	
230		8x1/2" square	17		12	135 - 145	17x1/2" square
278					14	155 - 165	

* for flange mounting insertion with journal guide

Feeler gauge	Caliper gauge	Multimeter
		

4.2 Assembly

4.2.1 Preparation

1. Unpack spring-operated brake.
2. Check for completeness
3. Check nameplate data, especially rated voltage.

4.3 Installation

- When you have ordered a version with manual release, friction plate, or flange, attach these units first.

4.3.1 Installation of the hub onto the shaft

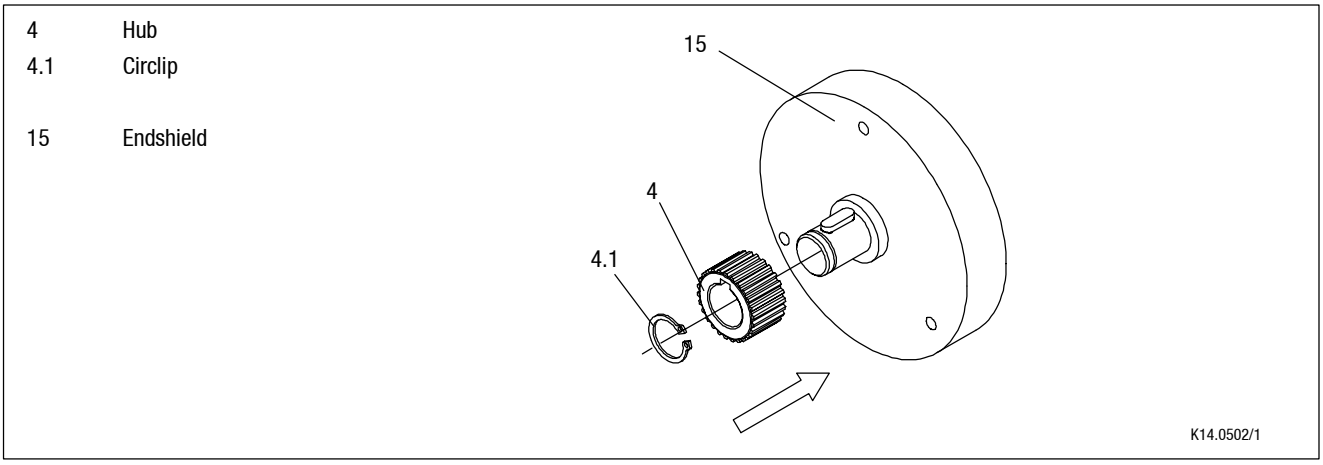


Fig. 5 Installation of the hub onto the shaft

1. Press hub (4) onto the shaft.
2. Secure hub against axial displacement, e.g. using a circlip (4.1, Fig. 5).

Stop!

In reverse operation it is recommended to additionally glue the hub to the shaft.

4.3.2 Installation of the brake

Stop!

- When dimensioning the thread depth in the endshield you must consider the permissible wear (see chapter 3.3).
- Check the condition of the endshield (15). It must be free of oil and grease.

3	Rotor
4	Hub
15	Endshield

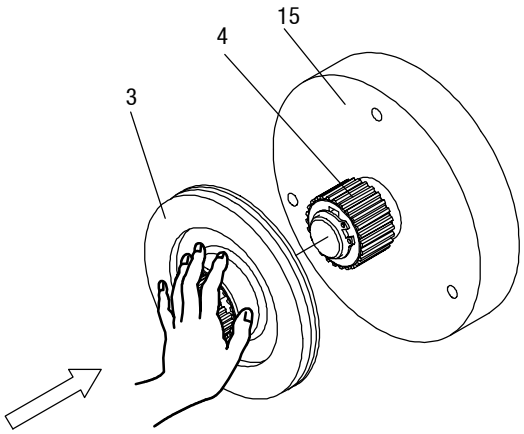


Fig. 6 Assembly of the brake

1. Push the rotor (3) onto the hub (4) and check whether it can be moved by hand (Fig. 6).

Stop!

Please note the following in the adjuster nut for versions with shaft seal:

2. Lightly lubricate the lip of the shaft seal with grease.
3. When assembling the stator push the shaft seal carefully over the shaft.
   - The shaft should be located concentrically to the shaft seal.

7	Stator complete
10	Allen screw
11	Clip
15	Endshield

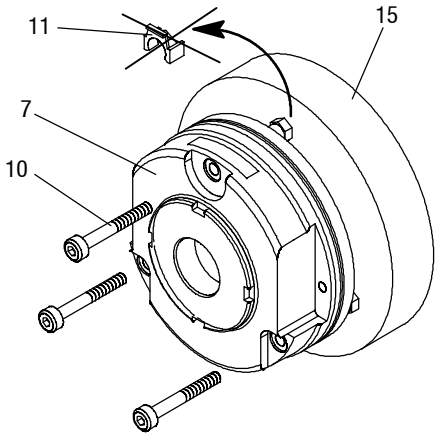


Fig. 7

4. Screw the complete stator (7) onto the endshield (15) using the screws (10) (Fig. 7).
5. Remove the clips (11) (throw away; Fig. 7).

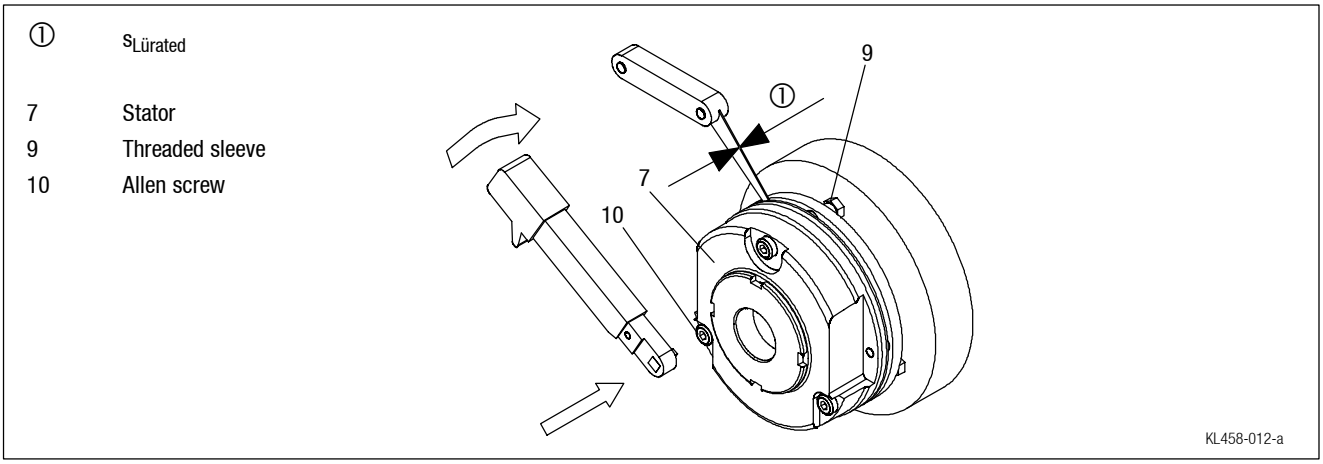


Fig. 8

6. Tighten the screws (10) evenly (for torques see rated data table chapter 3.3 and Fig. 8).
7. Check the air gap $s_{Lürated}$ near the bolts (10) by means of the thickness gauge ($s_{Lürated}$ see rated data table chapter 3.3 and Fig. 8).

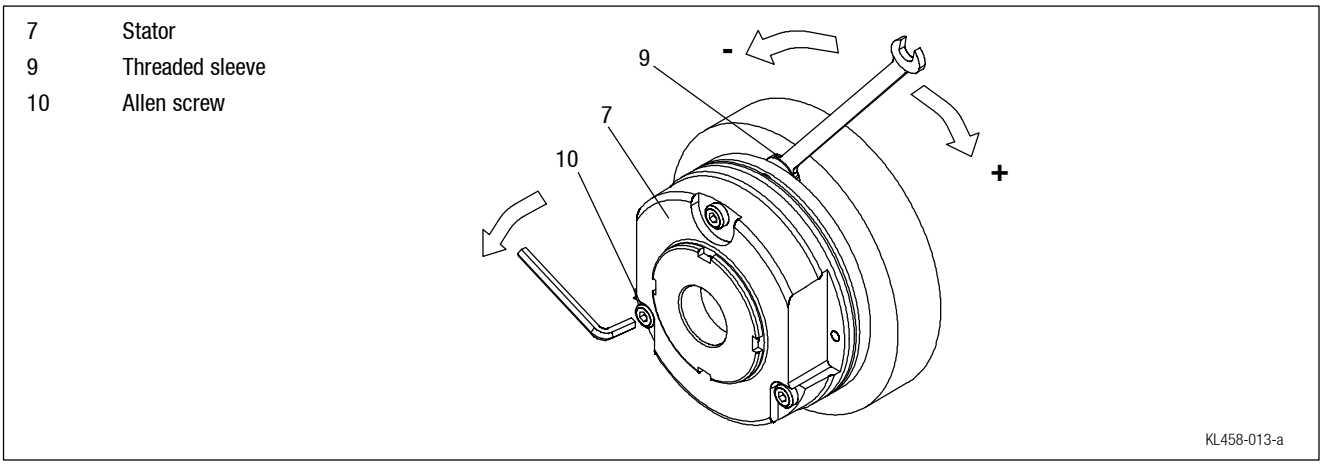


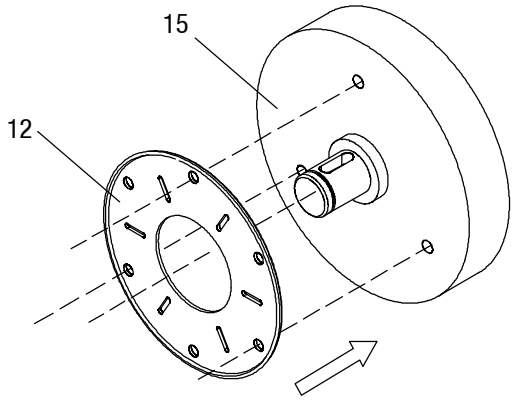
Fig. 9

- If the air gap is too large, readjust $s_{Lürated}$ as follows:

8. Unbolt screws (10).
9. Slightly turn threaded sleeve (9) using a spanner.
   – If the air gap is too large, screw them into the stator (7).
   – If the air gap it too small, screw them out of the stator (7)
   – $^1/_6$ turn changes the width of the air gap by approx. 0.15 mm.
10. Tighten the screws (10) (for torques see chapter 3.3).
11. Check air gap again and if necessary, repeat the adjustment.

4.3.3 Assembly of the friction plate sizes 72 to 170

12 Friction plate
15 Endshield



KL458-009-a

Fig. 10 Assembly of friction plate

1. Hold the friction plate (12) against the endshield.
2. Check the pitch circle and the threads of the fastening bore holes.

The lip edge must lie a way from the mounting surface.

4.3.4 Assembly of the flange

- The flange (6) can be screwed onto the endshield (15) with the outer pitch circle (for screw dimensions see chapter 3.3).

Flange assembly with additional screws

Stop!

- Behind the thread holes for the screws in the flange there must be clearing holes in the endshield. (see chapter 3.3). Without clearing holes the minimum rotor thickness cannot be used. Under no circumstances may the screws be pressed against the endshield.
- For sizes 196 and 230 the threads at the fastening surface are shifted by 30° with respect to the center axis of the manual release lever.

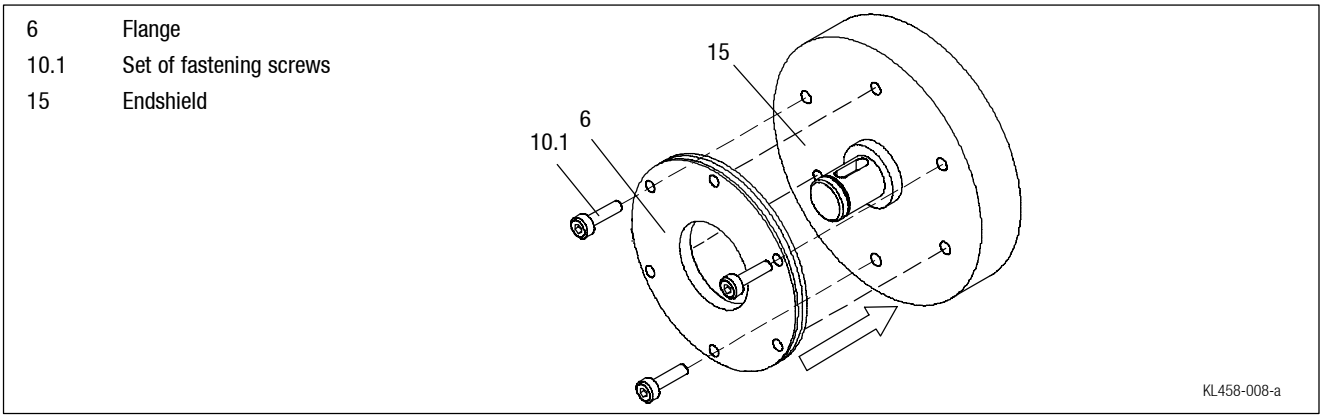


Fig. 11 Assembly of the flange

1. Hold the flange (6) to the endshield (15) and check the pitch circle and the threads of the fastening bore holes.
2. Screw the flange (6) onto the endshield (15) using the screws (10).
3. Tighten the screw evenly (for torques see chapter 3.3).
4. Check the height of the screw heads. On the outer pitch circle the screw head must not be higher than the minimum rotor thickness. We recommend to use screws according to DIN 912 (for dimensions see chapter 3.3).

Flange assembly without additional screws

(not possible with sizes 196 and 230)

STOP

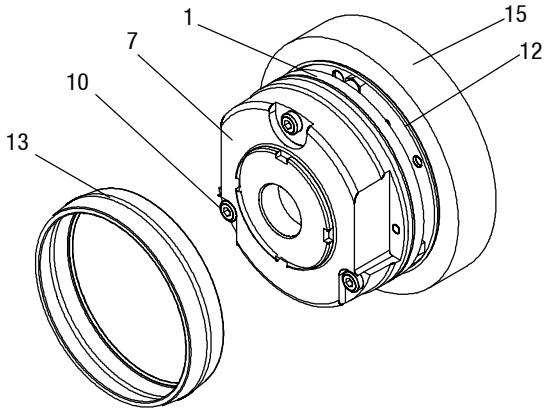
Stop!

When dimensioning the thread depth in the endshield you must consider the permissible wear (see chapter 3.3).

1. Hold the flange (6) to the endshield (15) and check the pitch circle and the threads of the fastening bore holes.
2. Assemble the brake with the corresponding screw set (see chapter 4.3.2).

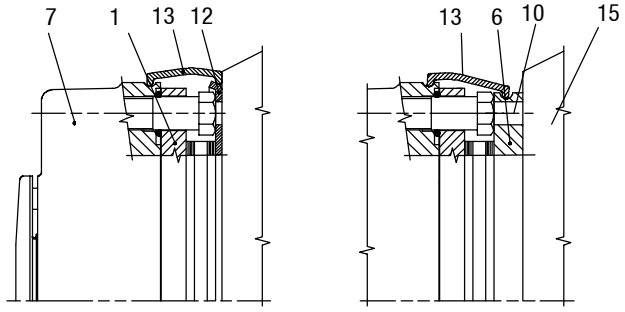
4.3.5 Assembly of the cover seal

1	Armature plate
7	Stator
10	Socket head screw
12	Friction plate
13	Cover seal
15	Endshield



KL458-010-a

1	Armature plate
6	Flange
7	Stator
10	Socket head screw
12	Friction plate
13	Cover seal
15	Endshield

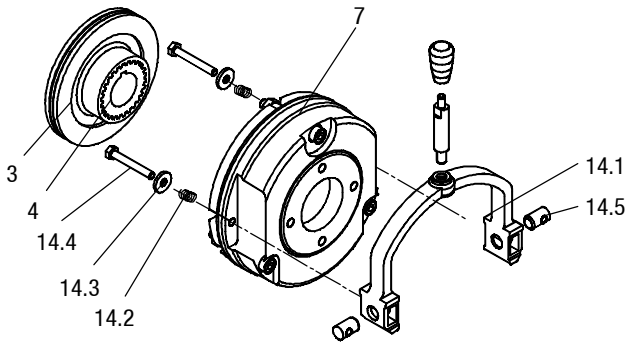


KL458-007-a

1. Pull the cable through the seal (13).
2. Push the seal (13) over the stator (7).
3. Press the lips of the cover seal (13) into the groove of stator (7) and flange (6).

4.3.6 Assembly of the manual release sizes 72 to 145

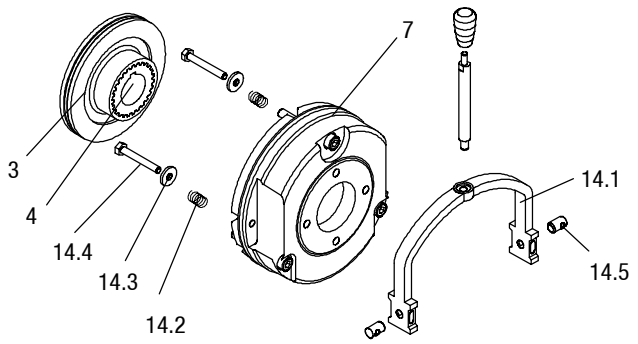
3	Rotor
4	Hub
7	Stator
14.1	Manual-release
14.2	Spring
14.3	Washer
14.4	Hexagon screw



K14.0630

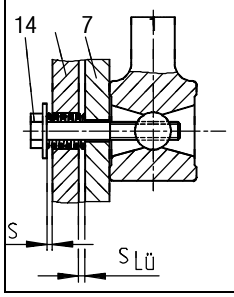
4.3.7 Assembly of the manual release sizes 170 to 278

3	Rotor
4	Hub
7	Stator
14.1	Manual-release
14.2	Spring
14.3	Washer
14.4	Hexagon screw



K14.0630/1

1. Insert the compression springs (14.2) into the bore holes of the armature plate.
2. Push the bolts (14.4) through the washers (14.3).
3. Push the screws and washers (14.4 and 14.3) through the compression springs (14.2), armature plate (1) and stator (7).
4. Locate the trunnions (14.5) in the shackle (14.1).
5. Screw the hexagon screws (14.4) into the trunnions (14.5) in the shackle (14.1).
6. Tighten hexagon screws (14.4) until armature plate (1) moves towards stator (7).
7. Remove and discard chips.

	Size	$s_{Lü}$ $^{+0,1}_{-0,05}$ (mm)	s $^{+0,1}$ (mm)	s + $s_{Lü}$ (mm)
	72	0.2	1	1.2
	90			
	112			
	132	0.3	1.5	1.8
	145			
	170			
	196	**0.4**	**2**	**2.4**
	230			
	278	0.5	2.5	3

Tab. 5 Adjustment setting for manual release

Values S and $S_{Lü}$ only apply to the brake in the assembled state with the coil deenergized.

Stop!

Dimension “s” must be observed! Check air gap “$s_{Lü}$”.

4.4 Electrical connection

Warning!

The brake must only be electrically connected when no voltage is applied.

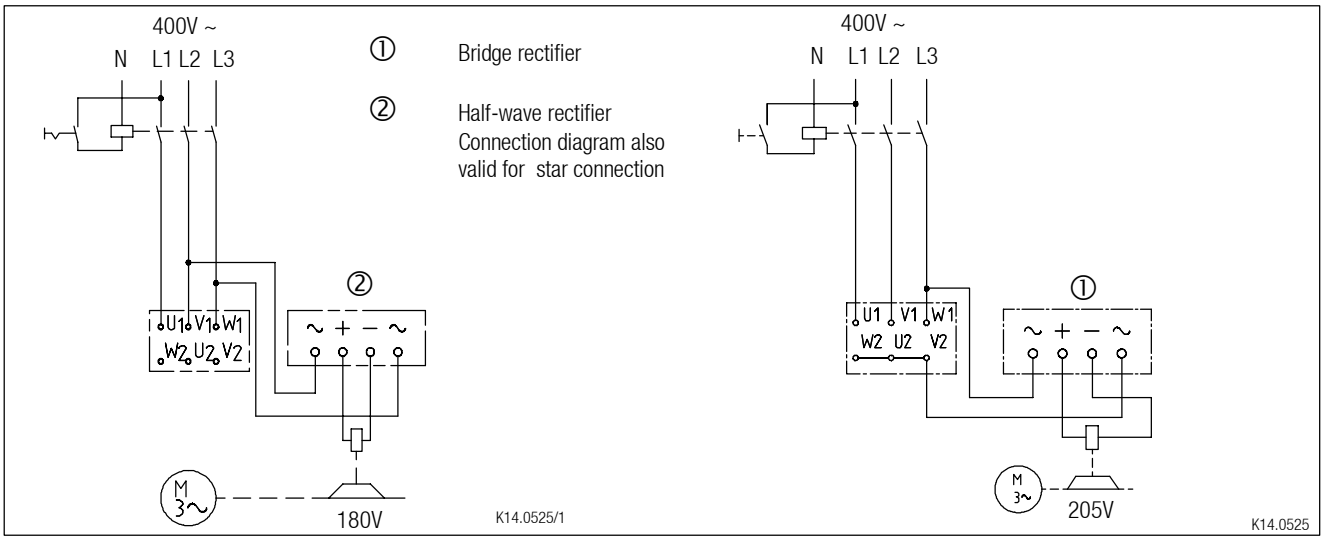


Fig. 12 Switching in parallel to motor, extremely delayed engagement

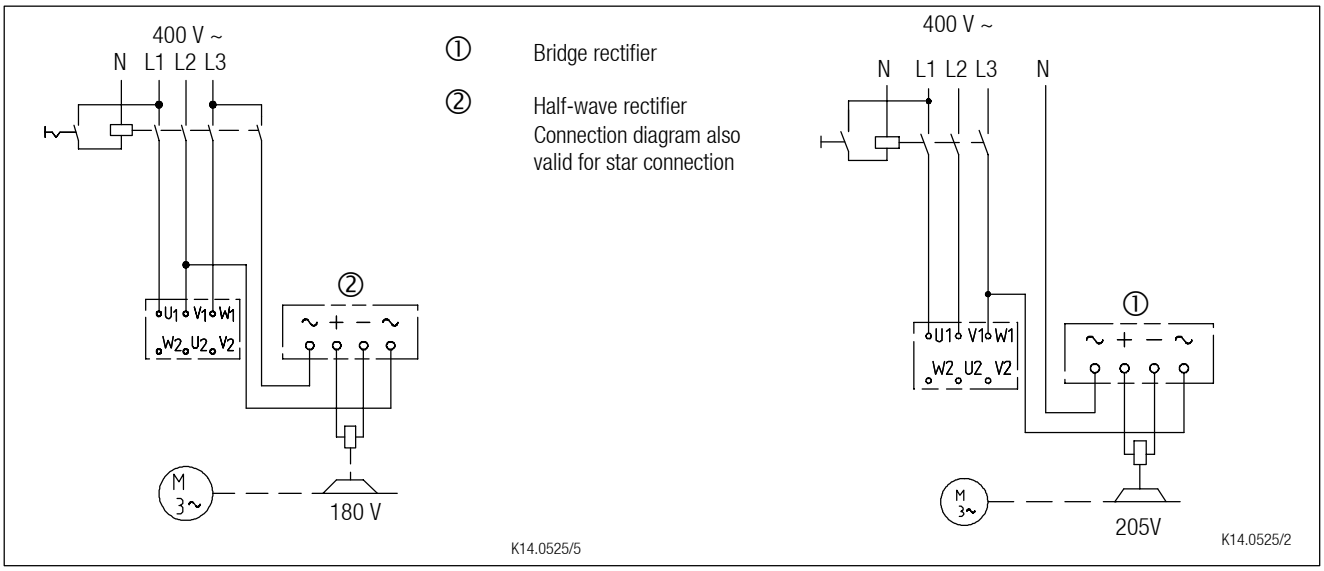


Fig. 13 AC switching, delayed engagement

① Bridge rectifier

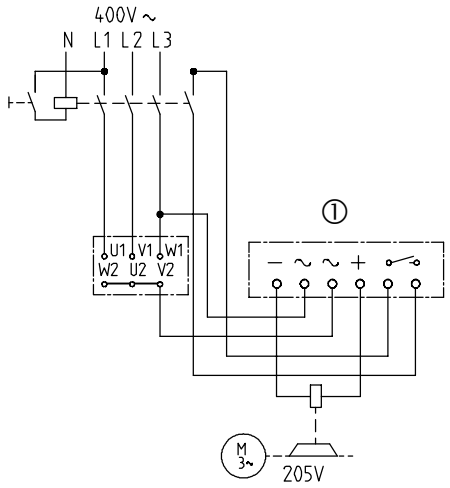


Fig. 14 DC switching, normal engagement

① DC voltage (e. g. 24V)

② Spark suppressor

Connection diagram also valid for star connection

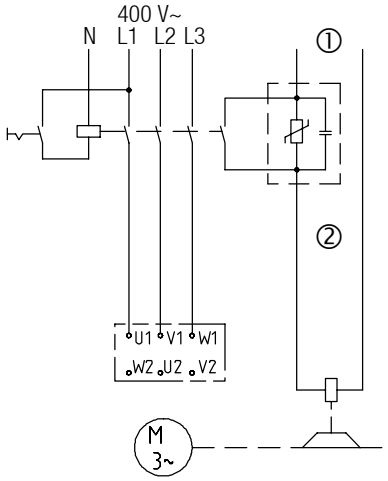


Fig. 15 Separated DC voltage, switching on the DC side

STOP

Stop!

For switching on the DC side the brake must be operated with a spark suppressor, to avoid impermissible overvoltages.

① DC voltage depending on coil voltage

② Spark suppressor

bl blue
sw black
Connection diagram also valid for star connection

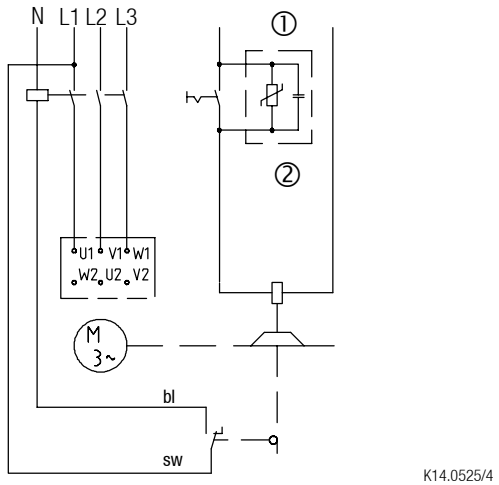


Fig. 16 With microswitch / release check

bl blue
sw black
Connection diagram also valid for star connection

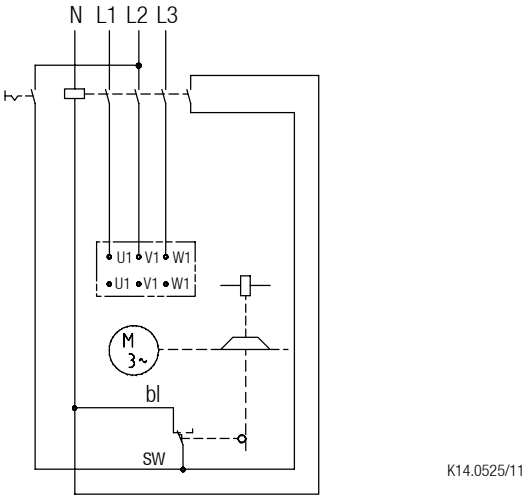
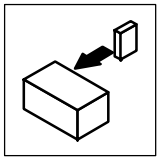


Fig. 17 With microswitch / wear check addition for all circuits

Note!

During operation according to fig. 17 the air gap is only monitored when no voltage is applied to the brake. This makes sense because it is possible that when the current flows only one side of the armature plate is attracted at first. This misalignment may cause a simulation of the maximum air gap and the actuation of the microswitch. If there is no closed contact in parallel to the microswitch contact, motor and brake will be switched off. The microswitch contact is closed again when the armature plate is completely released - the release is repeated again - because of the small difference-contact travel of the microswitch.

To avoid this misinterpretation of the microswitch signal, the signal should only be processed when no voltage is applied to the brake.

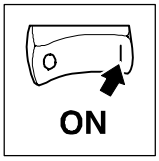


1. Install the rectifier in the terminal box. For motors with insulation class ”H”, the rectifier must be installed in the control cabinet. The permissible ambient temperature for the rectifier is -25°C to +80°C
2. Compare the coil voltage of the stator (7) to the DC voltage of the installed rectifier.
3. Select the suitable circuit diagram. Convert the values to deviating AC voltage, e.g. with a 380 V bridge rectifier:

   380/400x205 = 195V

Deviations up to 3% are tolerable.

4. Motor and brake must be wired according to the requirements of the engagement time. Special units are available for especially demanding requirements.



5 Commissioning and operation

Warning!

The live connections and the rotating rotor must not be touched!

The motor must not be connected when checking the brake.

5.1 Operational test

For faults see chapter 7 Troubleshooting and fault elimination.

5.1.1 Release / voltage check

For brakes without microswitch only

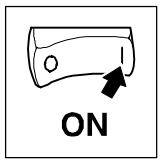
Warning!

The brake must be free of residual torque. The motor must not rotate.

Warning!

Live connections must not be touched.

1. Remove two bridges from the motor terminals. Do not switch off the DC brake supply. When connecting the rectifier to the neutral point of the motor, the PE conductor must also be connected to this point.
2. Connect the mains supply.
3. Measure the DC voltage at the brake.
4. Compare the DC voltage with the voltage indicated on the nameplate. A 10% deviation is permissible.
5. Check air gap "$s_{Lü}$". It must be zero and the rotor must rotate freely.
6. Switch off the current.
7. Bolt bridges to the motor terminals. Remove additional PEN conductor.



5.1.2 Microswitch - release check

Warning!

The brake must be free of residual torque. The motor must not rotate.

Warning!

Live connections must not be touched.

1. Remove two bridges from the motor terminals. Do not switch off the DC brake supply.
2. Apply DC voltage to the brake.
3. Measure the AC voltage at the motor terminals. It must be zero.
4. Connect the mains supply for the brake.
5. Measure the AC voltage at the motor terminals. It must be the same as the mains voltage.
6. Measure the DC voltage at the brake.
7. Compare the DC voltage with the voltage indicated on the nameplate. A 10% deviation is permissible.
8. Check air gap $s_{Lü}$. It must be zero and the rotor must rotate freely.
9. Disconnect the mains supply.
10. Bolt bridges to the motor terminals.

5.1.3 Microswitch - wear check

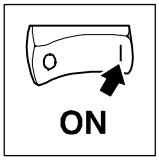
Warning!

The brake must be free of residual torque. The motor must not rotate.

Warning!

Live connections must not be touched.

1. Remove two bridges from the motor terminals. Do not switch off the DC voltage for the brake. When connecting the rectifier to the neutral point of the motor, the PE conductor must also be connected to this point.
2. Set air gap to "$s_{Lümax}$". See chapter 4.3.2 Step 5-6.
3. Disconnect the mains supply.
4. Measure the AC voltage at the motor terminals and the DC voltage at the brake. Both must be zero.
5. Disconnect the mains supply.
6. Set air gap to "$s_{Lürated}$". See chapter 4.3.2 Step 5-6.



7. Disconnect the mains supply.
8. Measure the AC voltage at the motor terminals. It must be the same as the mains voltage.
9. Measure the DC voltage at the brake.
10. Compare the DC voltage with the voltage indicated on the nameplate. A 10% deviation is permissible.
11. Check air gap "$s_{Lü}$". It must be zero and the rotor must rotate freely.
12. Do not switch off the DC brake current.
13. Bolt bridges to the motor terminals. Remove additional PEN conductor.

5.1.4 Manual release

This operational test is to be carried out additionally.

Warning!

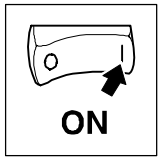
The brake must be free of residual torque. The motor must not rotate.

1. Pull the lever (Fig. 18) with approx. 150 N towards the motor until the resistances increase strongly.

Stop!

Additional tools to facilitate brake release are not allowed! (e.g. extension piece)

2. The rotor must rotate freely. Small residual torques are permissible.
3. Release the lever.



5.2 Decreasing brake torque (only for stators type E)

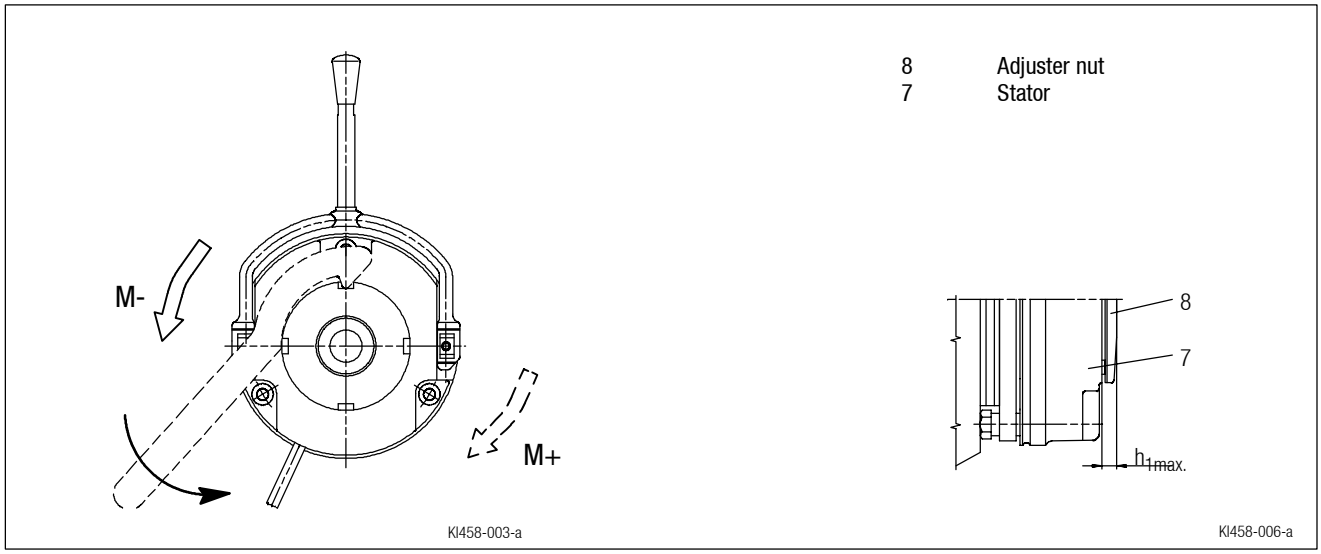


Fig. 18

1. Turn the adjuster nut (8) counterclockwise using the hook wrench.

- Observe the notches. Position between notches are impermissible. (Values for the brake torque reduction see chapter 3.2.1).
- The maximum permissible projection h_{1max} of the adjuster nut (8) to the stator (7) are to be observed (values for h_{1max} see chapter 3.3).

Warning!

The reduction of the brake torque does not increase the maximum permissible air gap "$s_{Lümax}$".

Do not change the manual release setting for models with manual release.

5.3 During operation

- Check the brake regularly during operation. Take special care of:
  – unusual noises and temperatures
  – loose fixing elements
  – the state of the cables.
- In the event of failures, refer to the troubleshooting table in chapter 7. If the fault cannot be eliminated, please contact Dings Co.

6 Maintenance / repair

6.1 Inspection intervals

The wear of the friction lining of the rotor depends of the operating conditions. The time until readjustment does not only depend on the friction work. The friction work per operation decreases steadily until readjustment takes place. High speed differences additionally reduce the friction work until readjustment. The inspection intervals must be adapted to the operating conditions and can be prolonged if the wear is small.

6.2 Inspections

6.2.1 Rotor thickness

Warning!

The motor must be at standstill when checking the rotor thickness.

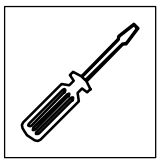
1. Remove motor cover and - if mounted - remove seal.
2. Measure the rotor thickness using a caliper gauge. For brakes with friction plate: observe the flared flange at the outer diameter of the friction plate.
3. Compare the measured rotor thickness with the minimum permissible rotor thickness (see table Rated Data, chapter 3.3).
4. If necessary, replace the rotor. See chapter 6.3.2.

6.2.2 Air gap

Warning!

The motor must be at standstill when checking the air gap.

1. Measure the air gap $s_{Lü}$ between armature plate and stator using a feeler gauge (Fig. 8).
2. Compare the measured air gap to the maximum permissible air gap "$s_{Lümax}$" (see table Rated Data, chapter 3.3).
3. If necessary, adjust air gap to "$s_{Lürated}$". See chapter 6.3.1.



6.2.3 Releasing / voltage

Warning!

The moving rotor must not be touched.

Warning!

Live connections must not be touched.

1. Observe air gap $s_{Lü}$ during operation of the drive. It must be zero.
2. Measure DC voltage at the brake during operation. It must be the same as the voltage indicated on the nameplate. A 10% deviation is permissible.

6.3 Maintenance

6.3.1 Readjustment of air gap

Warning!

Disconnect voltage. The brake must be free of residual torque.

Stop!

Mind the following when the model has a flange which is fixed with additional screws:
Behind the thread holes for the screws in the flange there must be clearing holes in the endshield. Without clearing holes the minimum rotor thickness cannot be used. Under no circumstances may the screws be pressed against the endshield.

1. Unbolt screws (Fig. 9).
2. Screw the threaded sleeves into the stator by using a spanner. $^1/_6$ revolution reduced the air gap by approx. 0.15 mm.
3. Tighten screws (for torques see table Rated data, chapter 3.3).
4. Check the air gap $s_{Lü}$ close to the screws using a feeler gauge ($s_{Lürated}$ see rated data table chapter 3.3).
5. If the difference between the measured air gap and $s_{Lürated}$ is too large, repeat the readjustment.

6.3.2 Exchange rotor

Warning!

Disconnect voltage. The brake must be free of residual torque.

1. Loosen connection cable.
2. Loosen the screws evenly and remove them.
3. Completely remove the stator from the endshield. Observe the supply cable.
4. Pull rotor from hub.
5. Check hub splining.
6. In case of wear, the hub must also be replaced.
7. Check the friction surface at the endshield. In case of strong scoring at friction plate or flange, replace the friction plate or flange. If scoring occurs at the endshield, re-finish end-shield or install a friction plate.
8. Measure the rotor thickness (new rotor) and head height of the threaded sleeves by means of a caliper gauge.
9. Calculate the distance between stator and armature plate as follows:

   Distance = Rotor thickness + $s_{Lürated}$ - head height
   ($s_{LüNenn}$ see rated data table chapter 3.3)
10. Loosen the threaded sleeves until the calculated distance between stator and armature plate is reached.
11. Install and adjust the new rotor and brake (see chapter 4.3.2).
12. Reconnect the supply cable.

6.4 Spare-parts list

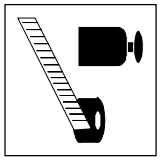
Only parts with order numbers available.

The order numbers are only valid for standard versions.

6.4.1 Spare parts list for spring-operated brake size 72 to 170

Pos.	Name	Variant
7	Stator complete, module E Stator complete, module N	Voltage / brake torque
3	Rotor (plastic) Rotor (aluminium)	
4	Hub	Bore
10	Set of fastening screws Allen screw DIN 912	- for installation at flange - for installation at motor / friction plate - for flange with through hole - for intermediate flange / double brake
13	Cover seal	
14	Manual release	
-----	Terminal box as attachment kit	
6	Flange	
	Flange hardchromed	
12	Friction plate	
-----	Tacho flange	
-----	Intermediate flange / double brake	
-----	Brake cover (enclosure acc. to IP65)	

Positions no. see Fig.20



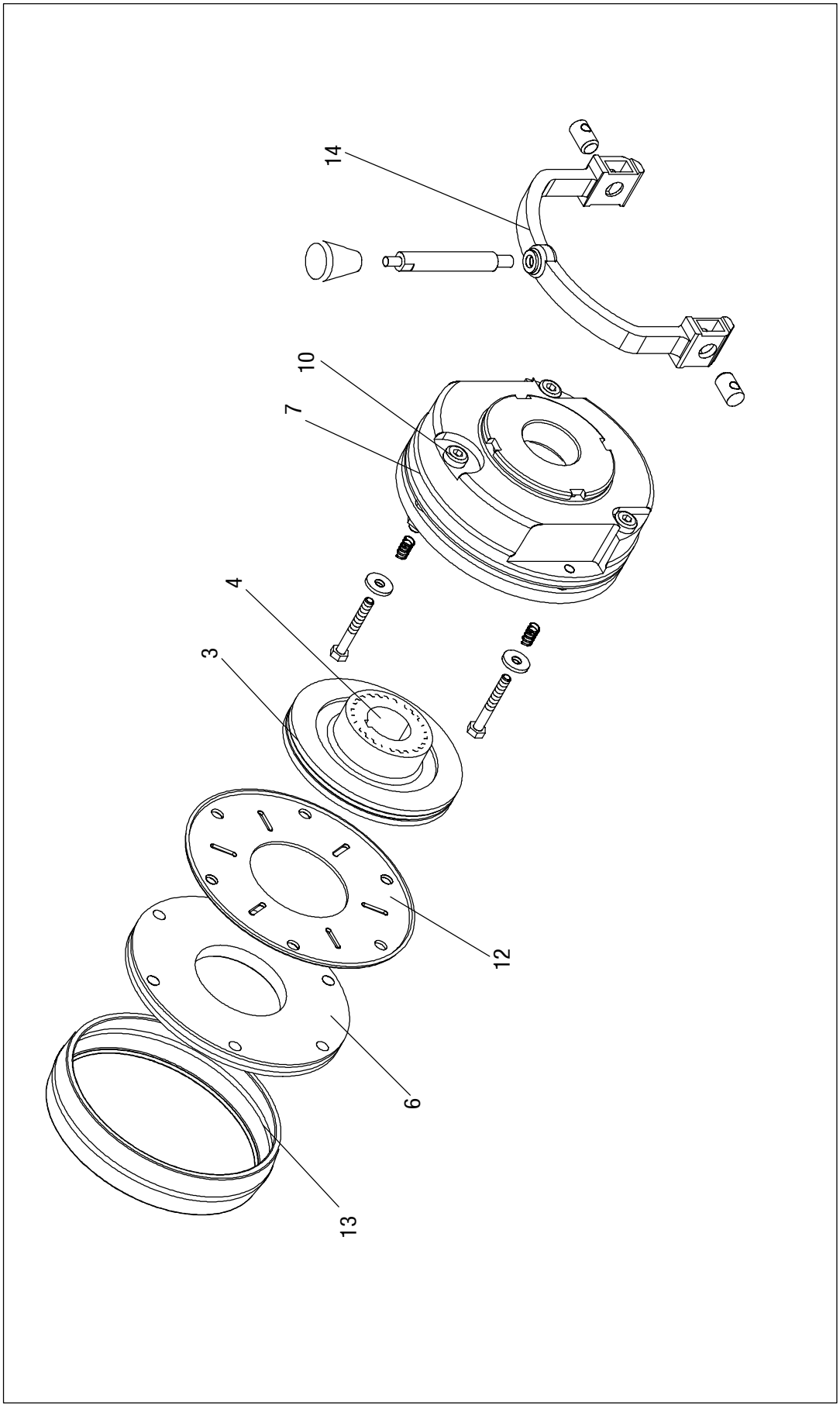


Fig.19

7 Troubleshooting and fault elimination

Fault	Cause	Remedy
Brake does not release, air gap is not zero	Coil is interrupted	• Measure the coil resistance using a multimeter: – If the resistance is too high, replace the entire stator.
	Coil has contact to ground or between the windings	• Measure the coil resistance using a multimeter: – Compare measured resistance to rated resistance. For values see rated data chapter 3.3. If the resistance is too low, replace the entire stator. • Check coil for contact to ground using a multimeter: – In case of contact to ground, replace the entire stator. • Check brake voltage (see defective rectifier, voltage too low).
	Wiring wrong or defective	• Check and correct wiring. • Check cable for continuity using a multimeter: – Replace defective cable.
	Rectifier defective or wrong	• Measure DC voltage at the rectifier using a multimeter: If DC voltage is zero: • Measure AC voltage at the rectifier. If AC voltage is zero: – Apply voltage, – check fuse, – check wiring If AC voltage is o.k.: – Check rectifier – replace defective rectifier If DC voltage is too low: – Check rectifier – Half-wave rectifier used instead of bridge rectifier. Install bridge-rectifier – If diode is defective, use suitable new rectifier. • Check coil for contact to ground or between the phases. • If rectifier defect occurs several times, replace the entire stator, even if a contact to ground or between the windings cannot be measured. The fault may occur only in the warm state.
	Incorrect wiring of microswitch	Check the wiring of the microswitch and correct it.
	Incorrect setting of microswitch	Replace the stator completely and complain to the manufacturer about the microswitch setting.
	Air gap too large	Readjust the air gap (chapter 6.3.1)
Rotor cannot rotate freely	Incorrect adjustment of manual release	Check $s+s_{Lü}$ when current is applied to the brake. The value must be the same at both ends. Correct if necessary.
	Air gap $s_{Lü}$ too small	Check air gap $s_{Lü}$ and if necessary readjust it (chapter 6.3.1).
Rotor thickness too small	Rotor was not replaced in time	Replace rotor (chapter 6.3.2)
Voltage is not zero when checking the operation (6.2.2 or 6.2.3)	Incorrect wiring of microswitch	Check the wiring of the microswitch and correct it.
	Defective microswitch or incorrect setting	Replace the entire stator and return it to the manufacturer.
Voltage too high	Brake voltage does not match with rectifier	Adapt rectifier and brake voltage to each other.
Voltage too low	Brake voltage does not match with rectifier	Adapt rectifier and brake voltage to each other.
	Defective rectifier diode	Replace rectifier by a suitable new one.
AC voltage is not mains voltage	Fuse missing or defective	Select connection where fuse has not been removed and is o.k.
	Incorrect wiring of microswitch	Check the wiring of the microswitch and correct it.
	Defective microswitch or incorrect setting	Replace the entire stator and return it to the manufacturer.