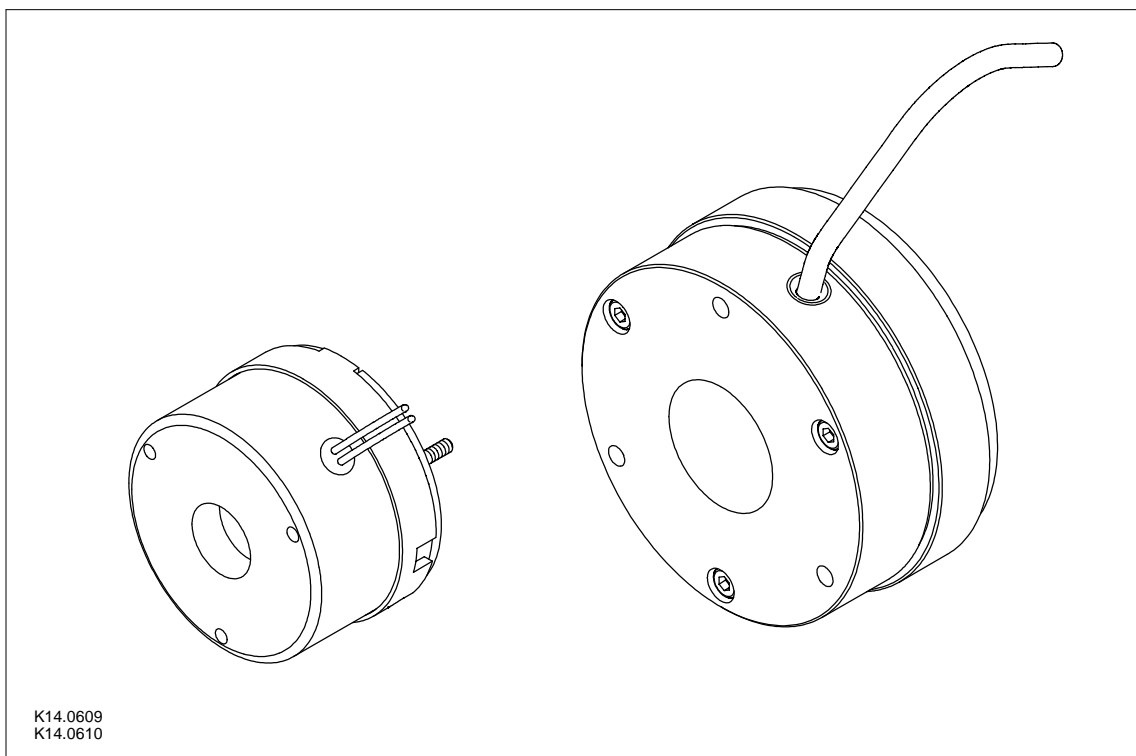


## *Operating Instructions*

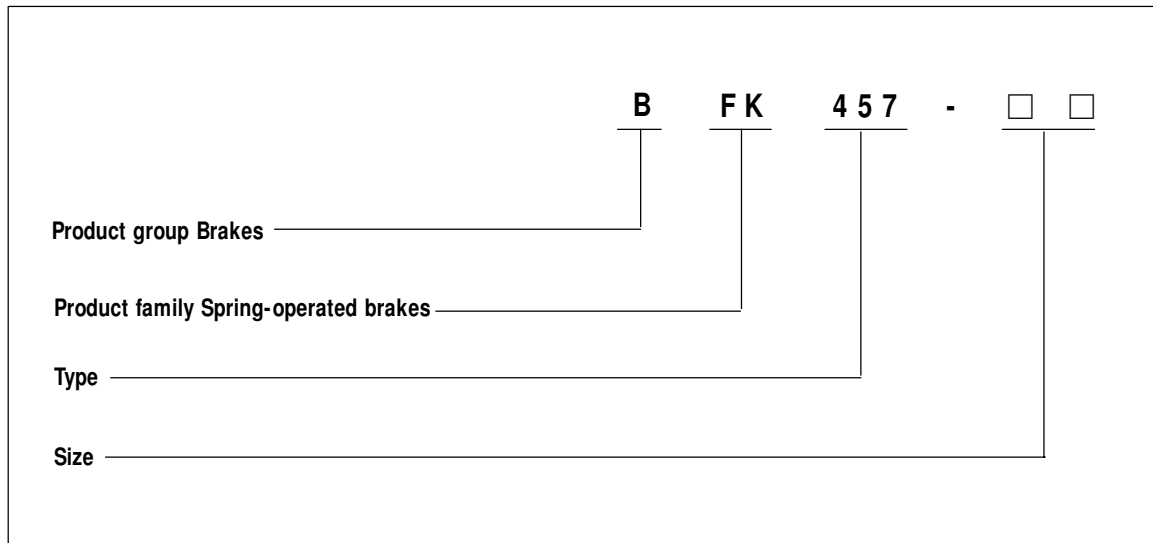


***Spring-operated brakes with  
electromagnetic release***

***Type BFK457- □□***



## Product key



- The data indicated in the product key and on the nameplate and stickers on the packaging are valid for spring-operated brakes of the series BFK457.

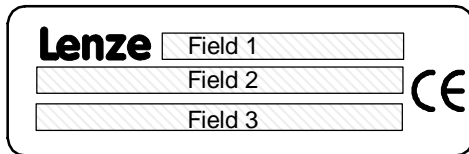
### **These Operating Instructions are valid for the following spring-operated brakes:**

BFK457-03  
BFK457-04  
BFK457-05  
BFK457-06  
BFK457-08

BA 14.0164  
Author: Lenze GmbH & Co KG, Division Brakes  
1st edition: 09/97

# Nameplate

## Layout

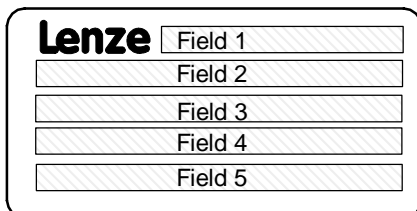


## Assembly

Field	Contents	Example
1	Manufacturer Brake type Order no.	
2	Rated voltage Rated power Rated brake torque/CE mark	
3	Date of manufacture	

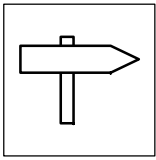
# Packaging sticker

## Layout



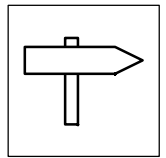
## Assembly

Field	Contents	Example
1	Manufacturer Barcode of no.	
2	Name Order no.	
3	Type see Product code Rated brake torque No. per box	
4	Rated voltage / rated power Packaging date	
5	Addition / CE mark	



# Contents

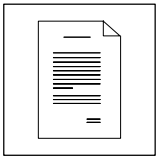
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**Declaration of Conformity / Manufacturer's Certification**

**Service addresses**



# **1 Preface and general information**

## **1.1 About these Operating Instructions ...**

- These Operating Instructions are intended for safety-relevant operation on and with electromagnetically released spring-operated brakes. They contain safety information which must be observed.
- All persons who work on and with electromagnetically released spring-operated brakes must have the Operating Instructions available and observe all relevant notes and instructions.
- The Operating Instructions must always be in a complete and perfectly readable state.

### **1.1.1 Terminology used**

#### **Brake**

In the following text, the term "spring-operated brake" is used for "electromagnetically released spring-operated brake".

#### **Drive system**

In the following text, the term "drive system" is used for drive systems with spring-operated brakes and other Lenze drive components.

## **1.2 Scope of supply**

- The drive systems are individually combined to the modular design. The scope of supply is indicated in the accompanying papers.
- After reception of the delivery, check immediately whether the scope of supply matches with the accompanying papers. Lenze does not accept any liability for deficiencies claimed subsequently. Claim
  - visible transport damage immediately to the forwarder.
  - visible deficiencies/incompleteness immediately to your Lenze representative.



## 1.3 Lenze drive systems

### 1.3.1 Labelling

- Lenze drive systems and components are unambiguously designated by the indications on the nameplate.
- Manufacturer: Lenze GmbH & Co KG  
Postfach 10 13 52  
D-31763 Hameln
- Site: Bösingfeld  
Breslauer Str. 3  
D-32699 Extertal

### 1.3.2 Application as directed

- Lenze drive systems
  - are intended for the use in machines and systems.
  - must only be used for the purposes ordered and acknowledged.
  - must only be operated under the conditions stated in the Operating Instructions.
  - must not be operated beyond the indicated power limits.

**Any other use shall be deemed inappropriate!**

### 1.3.3 Legal regulations

#### Liability

- The information, data and notes in these Operating Instructions met the state of the art at the time of printing. Claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations, and descriptions.
- Lenze does not accept any liability for damage and operating interference caused by:
  - must not be operated beyond the indicated power limits.
  - unauthorized modifications to the controller.
  - improper working on and with the controller.
  - operating mistakes
  - disregarding these Instructions.

#### Warranty

- Warranty conditions: see Sales and Delivery Conditions of Lenze GmbH & Co KG.
- Warranty claims must be made immediately after detecting defects or faults.
- The warranty is void in all cases where liability claims cannot be made.



## 2 Safety information

### 2.1 Persons responsible for the safety

#### Operator

- An operator is any natural or legal person who uses the spring-operated brake on behalf of whom the drive system 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 controller.

#### Qualified personnel

Qualified personnel are persons who are - because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize and avoid 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 Lenze 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
  - that only qualified personnel work on and with the spring operated brake.
  - that the spring operated brake is not used improperly.
- Spring-operated brakes must be designed so that they comply with their function and do not cause any hazards to persons when correctly installed and in fault-free operation as directed. This is also effective for the interaction with the entire system.
- The spring-operated brake must only be operated in perfect state.
- Retrofittings or changes of the spring-operated brake are generally prohibited. In any case, Lenze 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 great variety of applications, it is however necessary to check the functionality of all mechanical components under the specific conditions.

### **Possible applications of the spring-operated brake BFK457-□□:**

- No explosive or aggressive atmosphere.
- Humidity, no restriction.
- Ambient temperature -20°C bis +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.



## Safety information

### 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 describes the danger and suggests how to avoid the danger.


#### Warning of danger for persons

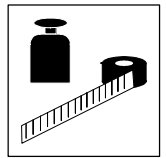
Icons used		Signal words	
 Warning of hazardous electrical voltage		<b>Danger!</b>	Warns of <b>impending danger</b> . Possible consequences if disregarded: Death or very severe injuries.
		<b>Warning!</b>	Warns of <b>potential, very hazardous situations</b> . Possible consequences if disregarded: Death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

#### Warning of material damage

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

#### Other notes

Icons used		Signal words	
		<b>Note!</b>	Indicates a general, useful note. If you observe it, handling of the controller/drive system is made easier.



### 3 Technical data

#### 3.1 Product description

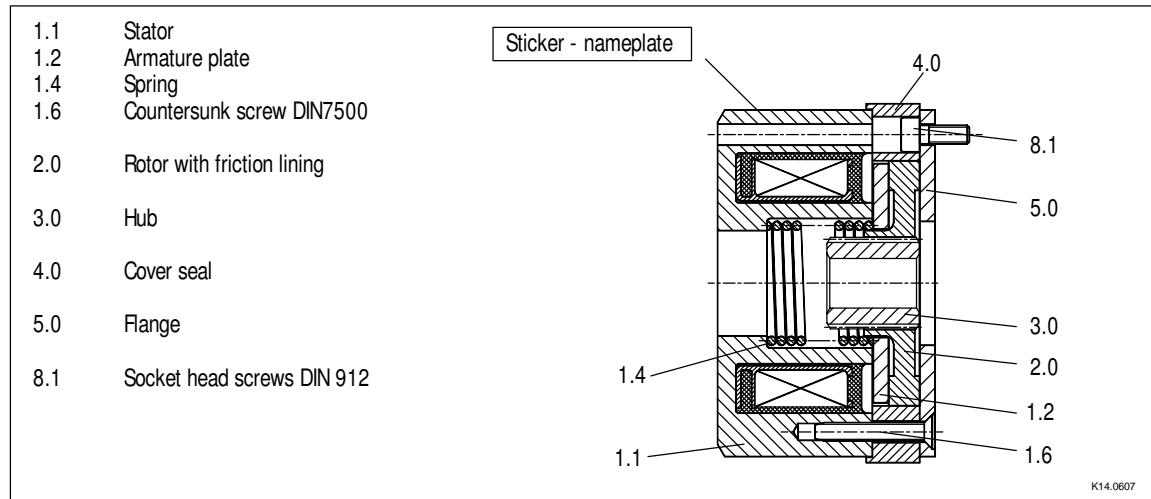


FIG 1 Spring-operated brake: BFK457-03...05

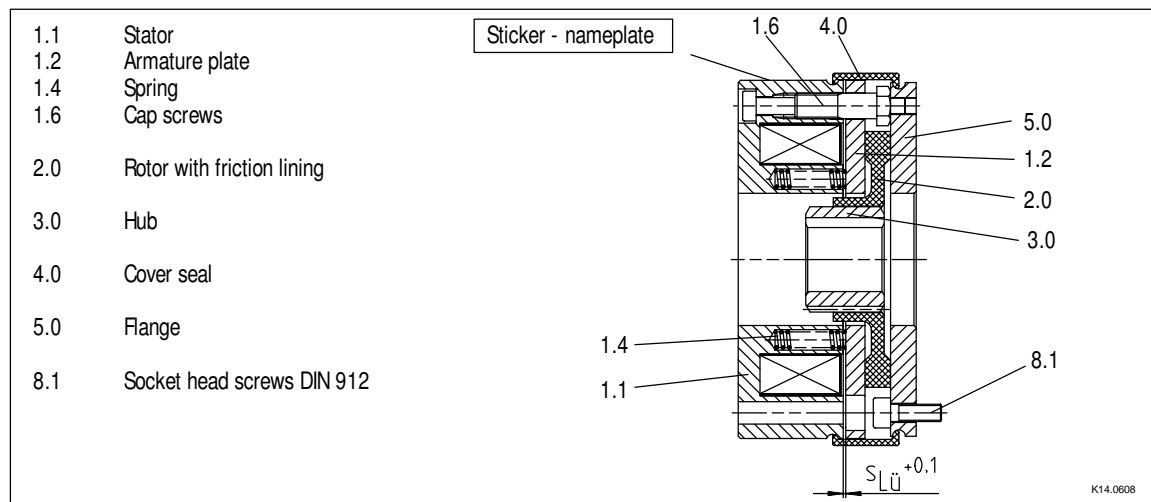
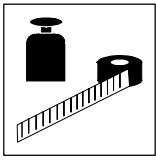


FIG 2 Spring-operated brake: BFK457-06 + 08

##### 3.1.1 General

The spring-operated brake type BFK457-□□ is a single disc pulley with two friction surfaces. The brake torque is generated by one (size 03...05) or several (size 06+08) pressure springs (1.4). The brake is released electromagnetically.

The spring-operated brake type BFK457-□□ is designed for the conversion of mechanical work and kinetic energy into heat energy. For operating speed see chapter 3.2 Rated data. Due to the static brake torque, the brake can hold loads without speed difference. Emergency braking is possible at high speed, see chapter 3.2, Rated Data. The more friction work, the higher the wear.



## Technical data

### 3.1.2 Braking

When braking, the rotor (2.0), which is moveable on the hub (3.0), is pressed against the friction surface by the central spring (size 03...05) or the inner and outer springs (1.4) (sizes 06+08) via the armature plate (1.2). The asbestos-free friction linings ensure a high brake torque with low wear. The brake torque is transmitted between hub (3.0) and rotor (2.0) via the splines.

### 3.1.3 Brake release

In braked state, there is an air gap  $s_{Lü}$  between stator (1.1) and armature plate (1.2). To release the brake, the stator coil (1.1) is excited with the DC voltage provided. The resulting magnetic force attracts the armature plate (1.2) towards the stator (1.1) against the spring load. The rotor (2.0) is released from the spring load and can rotate freely.

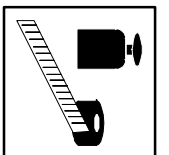
## 3.2 Kenndaten

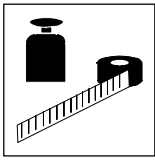
Type	Brake torque Rated value at $\Delta n = 100 \text{ min}^{-1}$  $M_K^{1)}$ [Nm]	Air gap $s_{Lü}$		Tightening torque of the fixing screws  [Nm]	Moment of inertial of the rotor  [kg cm <sup>2</sup> ]	Brake mass  [kg]
		rated	max.			
BFK457-03	0.5	0.12 <sup>2)</sup>	0.4	1.3	0.019	0.4
BFK457-04	1				0.031	0.5
BFK457-05	2				0.051	0.7
BFK457-06	4	0.2	0.5	2.8	0.13	1.15
	6		0.4			
BFK457-08	8		0.5	5.5	0.45	1.95
	12		0.4			

Type	Rotor thickness		Outer diameter  [mm]	Pitch circle	
	rated	min.		∅ [mm]	weight
BFK457-03	-----	-----	58	48	M3x8
BFK457-04			67	58	M3x8
BFK457-05			77	66	M4x8
BFK457-06	6	4.5	88	72	M4x14
BFK457-08	7	5.5	106	90	M5x16

Type	Electrical power $P_{20}$ [W]	Voltage $U$ [V]	Coil resistance $R_{20}$ [Ω]			Brake torque rated value at $\Delta n = 100 \text{min}^{-1}$ $M_K^{1)}$ [Nm]	Brake torque [Nm] at $\Delta n_0$ [min <sup>-1</sup> ]			Maximum speed $\Delta n_{0max}$ [min <sup>-1</sup> ]	
			Rated	Max.	Min.		1500	3000	max. horizontal	Braking during operation	Emergency braking
BFK457-03	9	24	64	66.7	60.5	0.5	0.45	0.42	0.35	3000	12400
		205	4669	5042	4295						
BFK457-04	12.5	24	46	43.5	48.6	1	0.89	0.82	0.68		
		205	3362	3631	3093						
BFK457-05	16	24	36	37.9	34	2	1.76	1.62	1.34		
		205	2626	2839	2415						
BFK457-06	20	24	28.8	30.2	27.3	4	3.5	3.2	2.6		
		205	2101	2270	1933	6	5.2	4.8	3.9		
						4	3.5	3.2	2.6		
						6	5.2	4.8	3.9		
BFK457-08	25	24	23	24.2	21.9	8	6.8	6.2	5.3		
		205	1681	1807	1554	12	10.2	9.3	7.9		
						8	6.8	6.2	5.3		
						12	10.2	9.3	7.9		

- 1) Minimum brake torque when all components are run in.
- 2) Minimum air gap, effective value results from the sum tolerances of the single components.





## Technical data

Type	Brake torque Rated value at $\Delta n = 100 \text{ min}^{-1}$  $M_K^{1)}$ [Nm]	Friction work with one switching operation $Q_E$ [J]	Transition frequency  $S_{Hü}$ [h <sup>-1</sup> ]	Switching times [s] at $S_{L\text{rated}}$				Spark suppressor  Order number
				DC engagement			Separation	
				$t_{11}$	$t_{12}$	$t_1$	$t_2$	
BFK457-03	0.5	800	100	0.009	0.006	0.015	0.016	00045798 (24V) 00045801 (205V)
BFK457-04	1	1200	90	0.017	0.008	0.025	0.019	
BFK457-05	2	1800	80	0.014	0.012	0.026	0.023	
BFK457-06	4	3000	79	0.023	0.01	0.033	0.045	
	6			0.007	0.012	0.019	0.051	
BFK457-08	8	7500	50	0.036	0.014	0.050	0.045	
	12			0.020	0.021	0.041	0.088	

1) Minimum brake torque when all components are run in.

### 3.3 Switching times

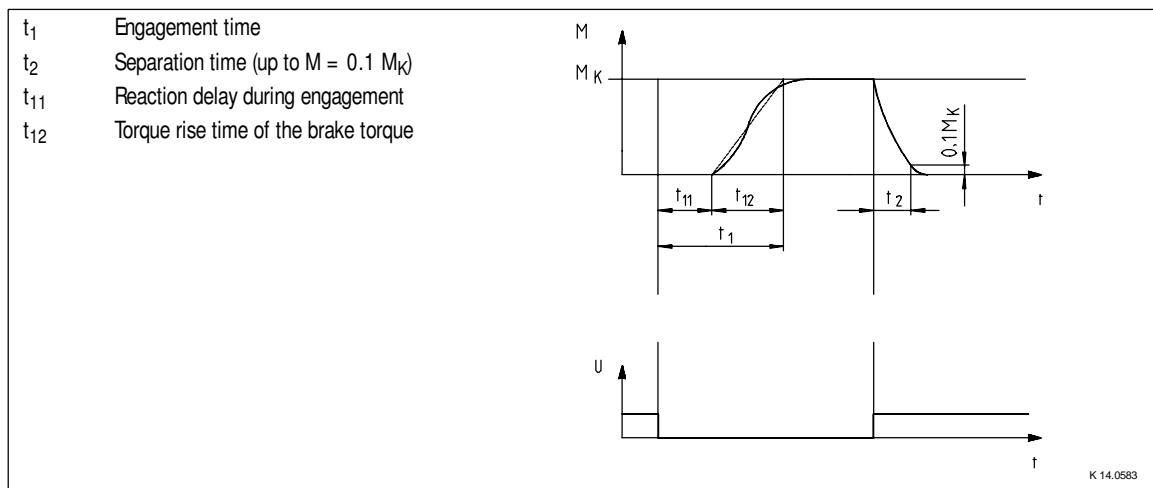
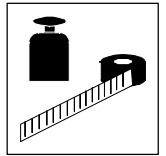


FIG 3 Switching times

The transitions from the state without brake torque to the steady brake torque is not without delay. The engagement times are valid for switching on the DC side with an induction voltage of approx. 5 to 10 times rated voltage. The diagramme shows the delay during engagement  $t_{11}$ , the rise time of the brake torque  $t_{12}$  and the engagement time  $t_1 = t_{11} + t_{12}$ , as well as the disengagement time  $t_2$ .

#### Disengagement time:

The disengagement time is not influenced by DC or AC switching operations. It can only be shortened by special equipment for fast-response excitation or overexcitation.



### Engagement time

With switching on the AC side, the engagement times are prolonged extremely. They are approx. 10 times longer, connection see FIG 11.

With the simplest connection of rectifier and brake directly parallel to the motor winding, the engagement times are prolonged because the motor is switched off but still rotating so that the brake is excited further. For connection see FIG 10.

For DC switching, spark suppressors or 24 V and 205 V rated voltage are available. These suppressors are to be connected in parallel to the contact. If, for safety reasons, for instance with lifting systems, this type of connection is not allowed, the spark suppressor can also be connected in parallel to the brake coil. For connection see FIG 12.

## 3.4 Operating frequency / friction work

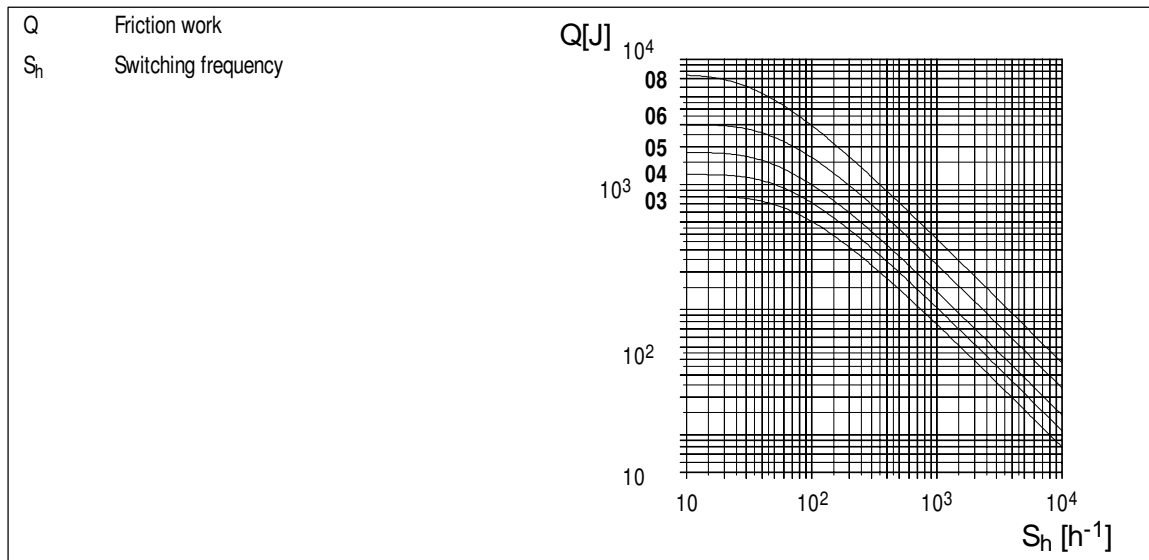
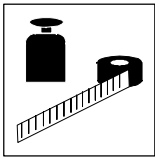


FIG 4 Friction work as function of the operating frequency, size 03...08

$$S_{hperm} = \frac{-S_h \ddot{u}}{\ln\left(1 - \frac{Q}{Q_E}\right)} \quad Q_{perm} = Q_E \left(1 - e^{-\frac{S_h \ddot{u}}{S_h}}\right)$$

The permissible operating frequency  $S_{hperm}$  depends on the friction work  $Q$  (see diagramme). An operating frequency of  $S_h$  results in the permissible friction work  $Q_{perm}$ .

With high speed and friction work, the wear increases strongly, because very high temperatures occur at the friction faces for a short time.



## Technical data

### 3.5 Emission

#### Electromagnetic compatibility

For normal circuits with unsmoothed DC voltage via bridge connection, the spring-operated brake type BFK457-□□ complies with the electromagnetic compatibility EN50081 Teil 1.

Please note, that the entire circuit only complies with the EMC Directive, if it is configured according to one of the following possibilities:

Circuit:		Rectifier		Spark suppressor parallel to AC voltage	Mains filters
		complies with standard	does not comply with standard		
DC switching	< = 5	•			
	Switching operations / minute		•	•	
	> = 5	•			•
	Switching operations / minute		•		•
AC switching	< = 5	•			
	Switching operations / minute		•	•	
	> = 5	•			
	Switching operations / minute		•	•	

Spark suppressor according to coil voltage on request.

#### Heat

Since the brake converts kinetic energy as well as mechanical and electrical work into heat energy, the surface heat depends on the operating conditions and the heat dissipation. Under unfavourable conditions, the surface temperature can reach 130 °C.

#### Noises

The switching noises during engagement and disengagement depend on the air gap  $s_{Lü}$  and the brake size.

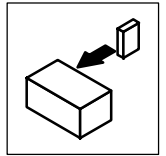
Depending on the natural oscillation after installation, operating conditions and state of the friction faces, the brake may squeak during braking.

#### Others

The abrasion of the friction parts produces dust.

With large loads, the friction face heats up so strongly, that odours may occur.










## 4 Installation






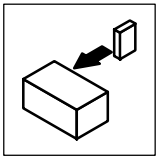
### Warning!

Toothed hub or screws must not be lubricated with grease or oil.

### 4.1 Required tools

Type	Torque wrench  Measuring range [Nm] 	Insert for hexagon socket screws  Opening [Inch] 	Wrench  Opening [mm]  Cap screws	BITS-holder  Opening [Inch] 	Insert for recessed head screws (Bits Phillips-recess) Opening [Inch] 
BFK457-03	0.3 - 4	2,5x <sup>1</sup> / <sub>4</sub> " square 50mm long	-----	-----	-----
BFK457-04		3x <sup>1</sup> / <sub>4</sub> " square 55mm long	8	1/4" square drive	1/4" - drive 1PH 70mm long
BFK457-05		3x <sup>1</sup> / <sub>4</sub> " square 55mm long			9
BFK457-06	1 - 12	3x <sup>1</sup> / <sub>4</sub> " square 55mm long	9	1/4" square drive	1/4" - drive 1PH 70mm long
BFK457-08		4x <sup>1</sup> / <sub>4</sub> " square 55mm long			1/4" - drive 2PH 70mm long

Feeler gauge	Caliper gauge	Multimeter
		



## Installation

### 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

#### 4.3.1 Installation of the hub onto the shaft

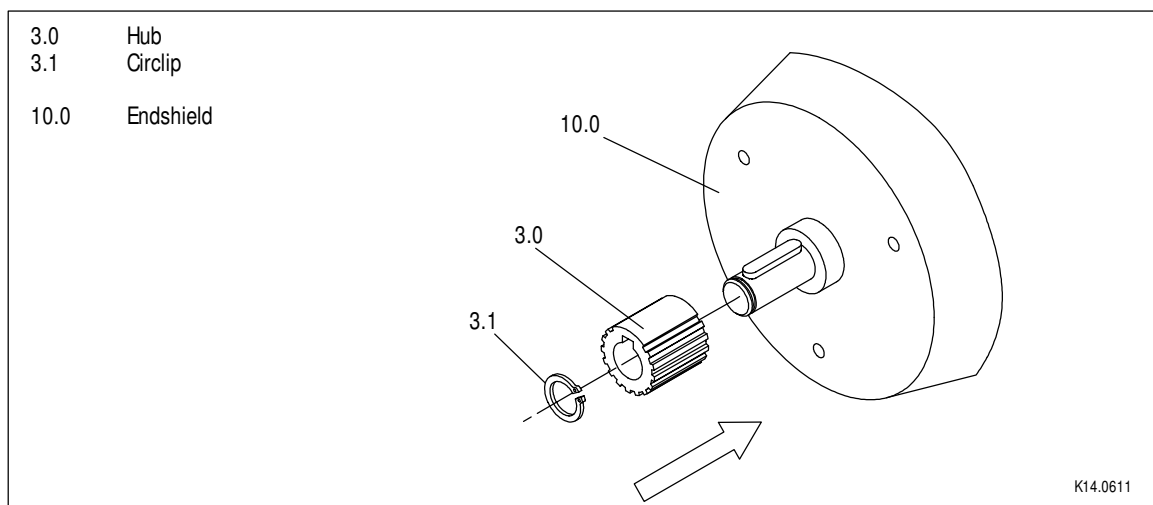


FIG 5 Installation of the hub onto the shaft

1. Press hub (3.0) onto the shaft.
2. Secure hub against axial displacement (e.g. using a circlip - 3.1).

#### 4.3.2 Installation of the brake BFK457-03...05

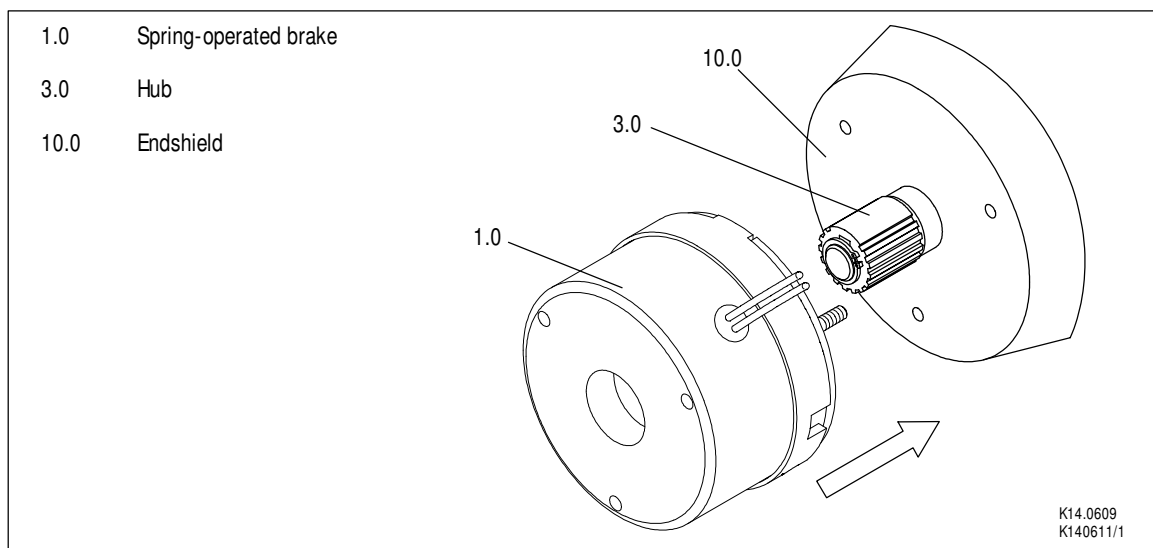
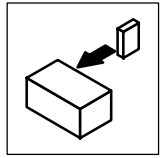


FIG 6 Installation of the brake



1. Hub (3.0) installation, chapter 4.3.1.
2. Push spring-operated brake (1.0) onto the hub (3.0) FIG 6
3. Bolt the spring-operated brake (1.0) to the endshield using the fixing screws (8.1) FIG 6
4. Tighten the screws (8.1) evenly (for torques see the table Rated data, chapter 3.2 and FIG 6)

### 4.3.3 Installation of the brake BFK457-06+08

1. Hub (3.0) installation, chapter 4.3.1.
2. Push spring-operated brake (1.0) onto the hub (3.0). Secure hub against axial displacement (e.g. using a circlip - 3.1).

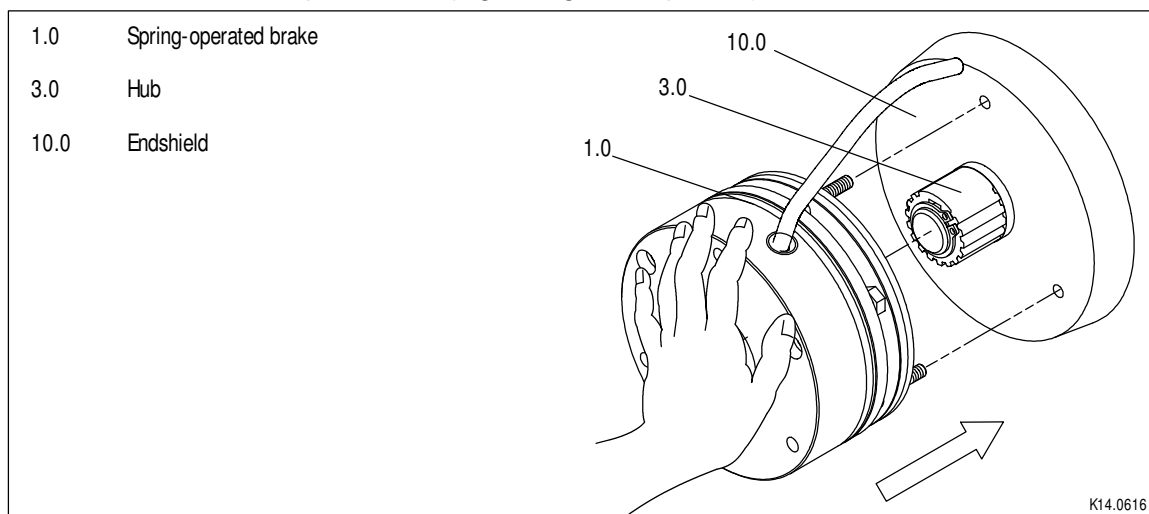


FIG 7

3. Bolt the spring-operated brake (1.0) to the endshield using the fixing screws (8.1).

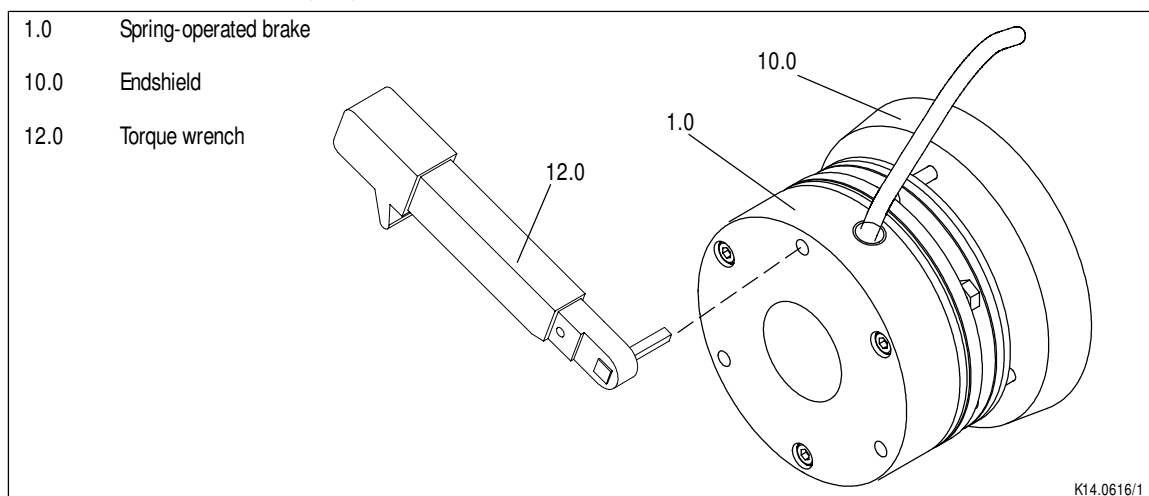
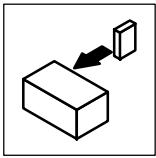


FIG 8

4. Tighten the screws (8.1) evenly (for torques see the table Rated data, chapter 3.2 and FIG 8).



## Installation

### 4.3.4 Installation of cover seal for brake sizes 06+08

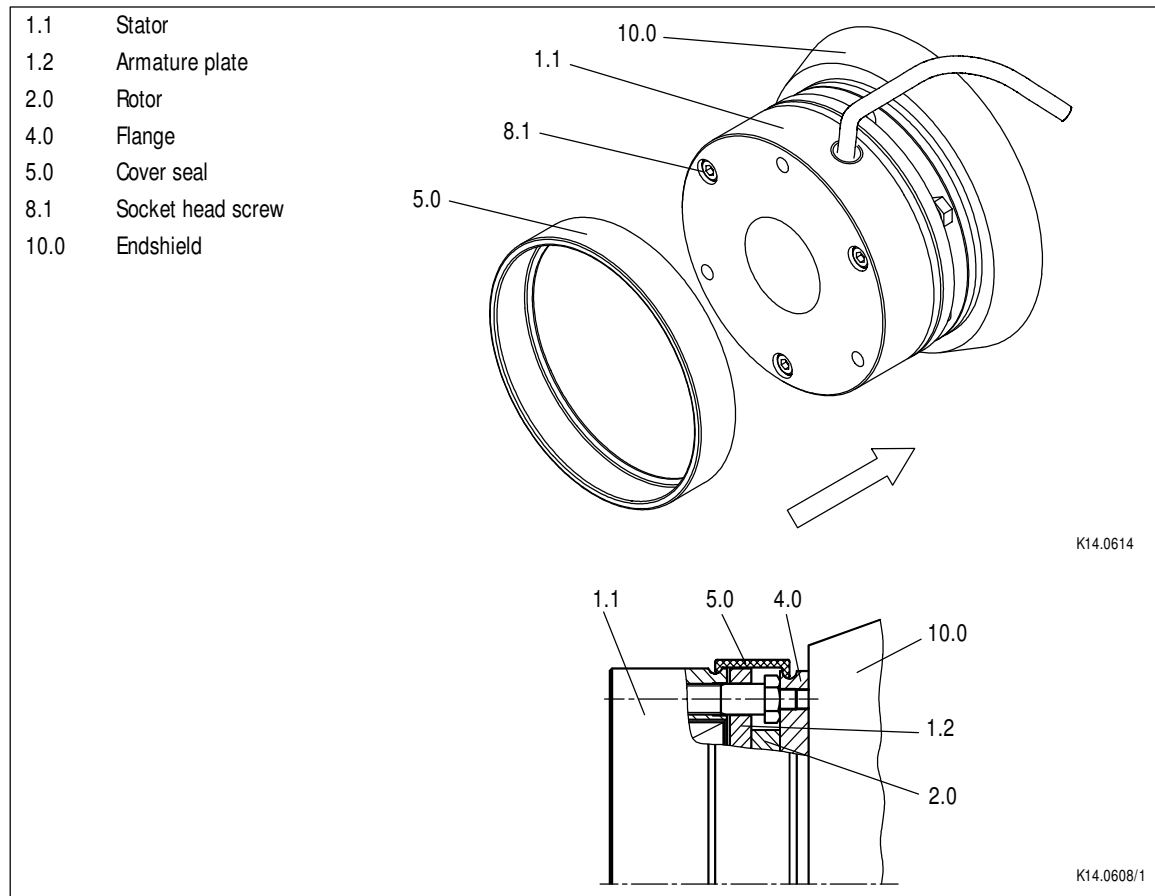
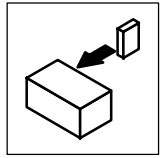


FIG 9 Installation - cover seal

1. Pull the cable through the seal (5.0).
2. Push the seal (5.0) over the stator (1.1).
3. Press the lips of the seal (5.0) into the groove of stator (1.1) and flange (4.0).



## 4.4 Electrical connection



### Warning!

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

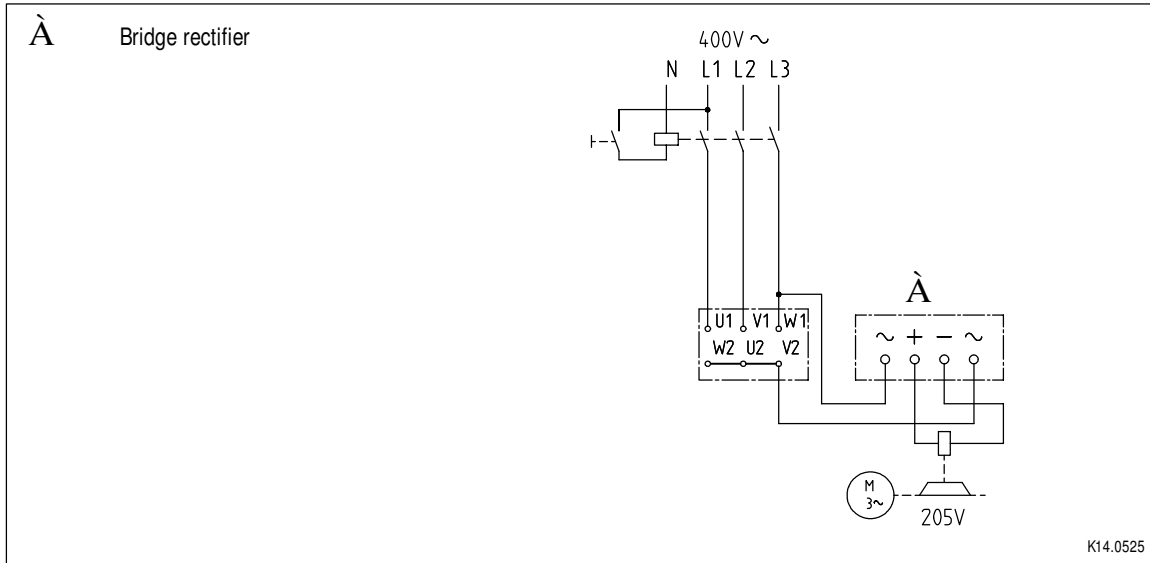


FIG 10 Switching parallel to motor, extremely delayed engagement

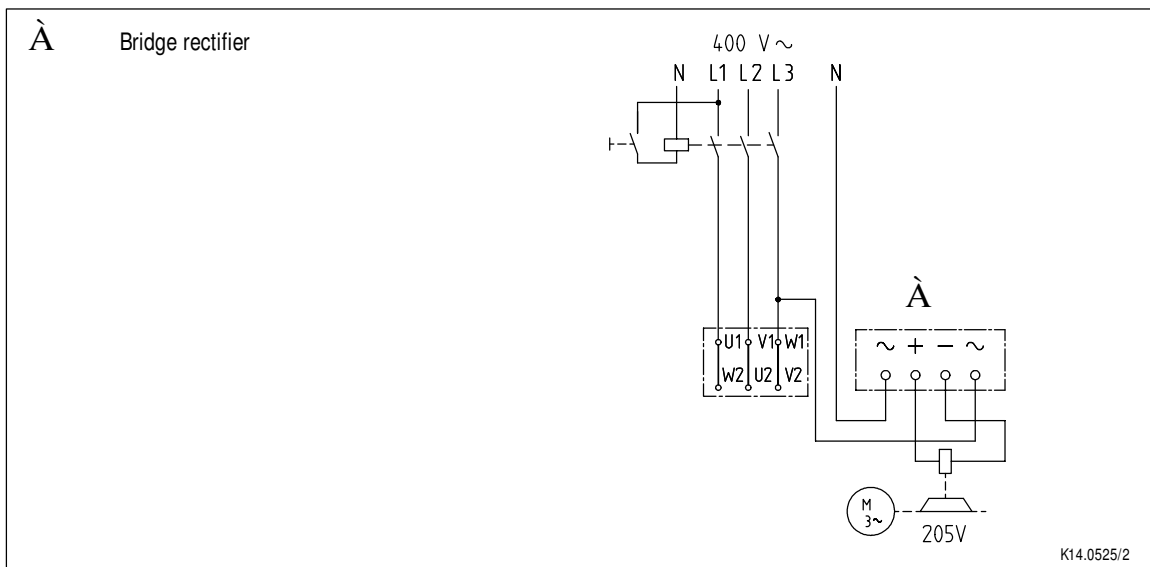
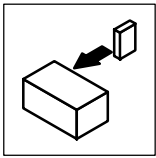


FIG 11 DC switching, delayed engagement



# Installation

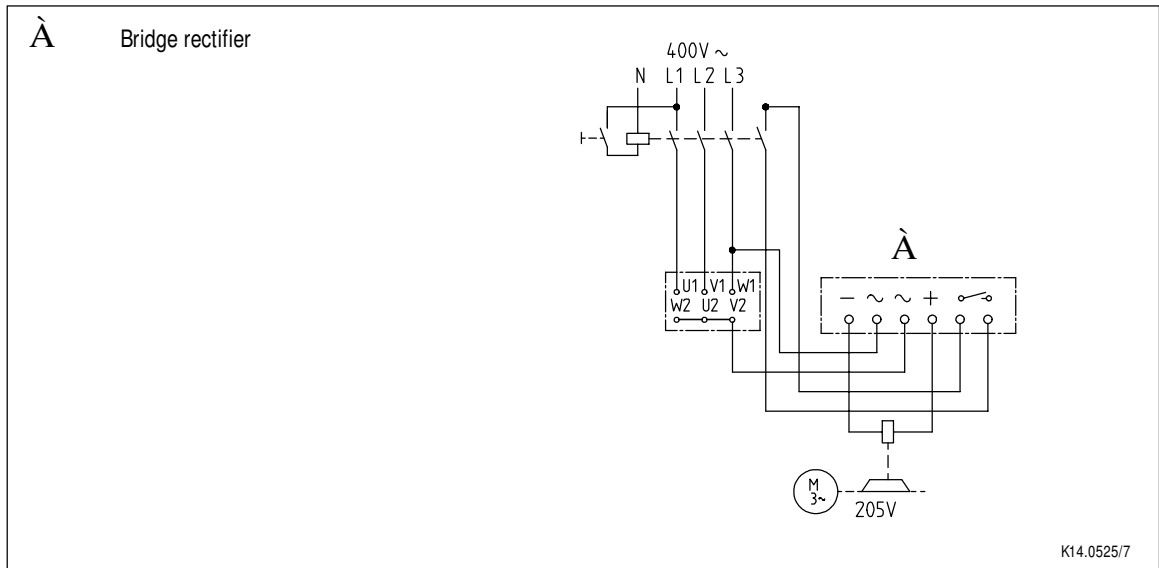


FIG 12 DC switching, normal engagement

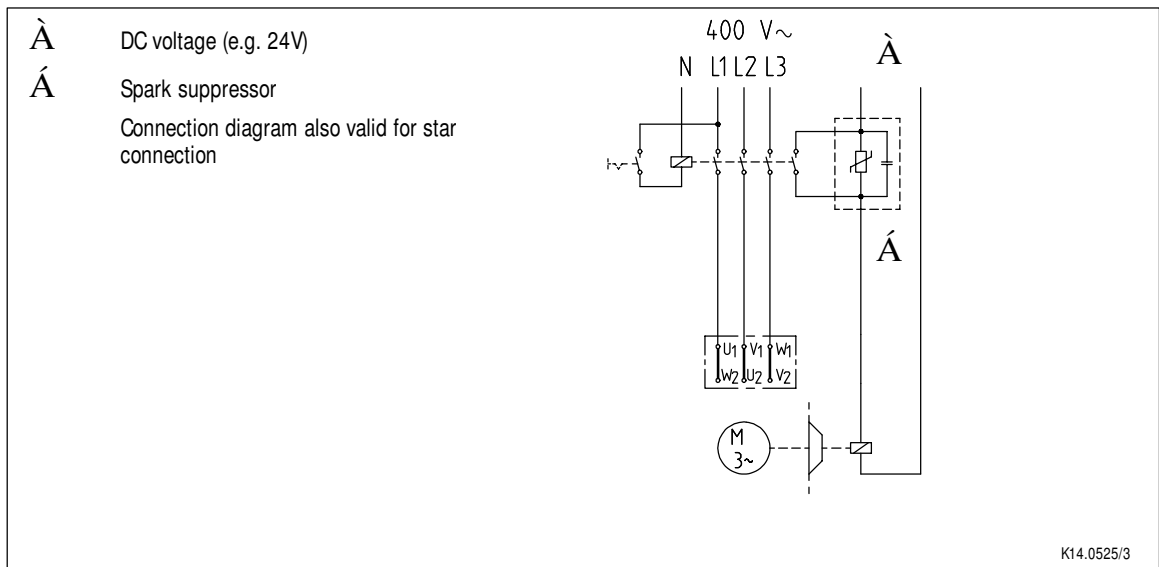
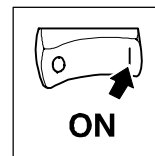


FIG 13 Separated DC voltage, DC switching.



## 5 Commissioning and operation

---



### **Warning!**

Live connections must not be touched.  
The motor must not be connected when checking the brake.

---

### 5.1 Operational test

In the events of faults see chapter 7 Troubleshooting and elimination.

#### 5.1.1 Release / voltage check

---



### **Warning!**

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

---

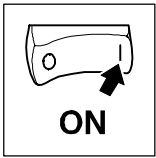


### **Warning!**

Live connections must not be touched.

---

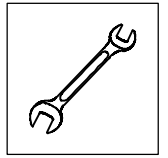
1. Remove two bridges from the motor terminals. Do not switch of the DC brake supply. When connecting the rectifier to the star point of the motor, the PEN conductor must also be connected at this point.
2. Switch on the current.
3. Measure the DC voltage at the brake.
4. Compare the DC voltage with the voltage indicated on the nameplate. A 10% deviation is permissible.
5. The air gap 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.



### **5.2 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 trouble shooting table in chapter 7. If the fault cannot be eliminated, please contact the Lenze Service.





## 6 Maintenance / repair

### 6.1 Inspection intervals

The wear of the friction lining of the rotor depends of the operating conditions. The running time of the brake depends on the friction work per switching operation and on the differential speed. The inspection intervals must be adapted to the operating conditions and can be prolonged if the brake shows minimum wear.

### 6.2 Inspections

#### 6.2.1 Inspection of brake BFK457-03...05

##### 6.2.1.1 Releasing / voltage

---

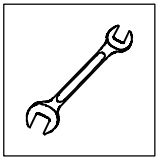


#### **Warning!**

Live connections must not be touched.

---

1. Remove motor cover.
2. Measure DC voltage at the brake during operation. The voltage must be the same as indicated on the nameplate. A 10% deviation is permissible.
3. Apply a DC voltage according to the indications on the nameplate.
  - Listen to noises generated by the armature plate when hitting on the pole faces of the stator.
  - When no hitting noises can be heard, remove the brake from the endshield and scrap it.
4. Assemble the new brake following the instructions given in chapter 4.3.1.



## Maintenance

### 6.2.2 Inspection of brake BFK457-06+08

#### 6.2.2.1 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.
3. Compare the measured rotor thickness with the minimum permissible rotor thickness (see table Rated Data, chapter 3.2).
4. If necessary, install new spring operated brake. See chapter 4.3.2.

#### 6.2.2.2 Air gap

---



##### Warning!

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

---

1. Measure the air gap  $s_{L\ddot{u}}$  between armature plate and stator using a feeler gauge.
2. Compare the measured air gap with the maximum permissible air gap  $s_{L\ddot{u}max}$ . (See table Rated Data, chapter 3.2).
3. If necessary, adjust air gap to  $s_{L\ddot{u}rated}$ . See chapter 6.3.2.1.

#### 6.2.2.3 Releasing / voltage

---



##### Warning!

The running rotor must not be touched.

---

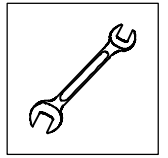


##### Warning!

Live connections must not be touched.

---

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



## 6.3 Maintenance

### 6.3.1 Maintenance of brake BFK457-03...05



#### Warning!

Switch off the voltage. The brake must be free of residual torque.

1. Loosen connection cable.
2. Unbolt fixing screws and remove brake from endshield. Observe connection cable.
3. Pull rotor from hub.
4. Check hub splining. In the event of wear, replace hub.
5. Check rake function according to the description of the inspection given in chapter 6.2.1.
6. If necessary, install new brake.

### 6.3.2 Maintenance of brake BFK457-06+08

#### 6.3.2.1 Re-adjustment of air gap



#### Warning!

Switch off the voltage. The brake must be free of residual torque.

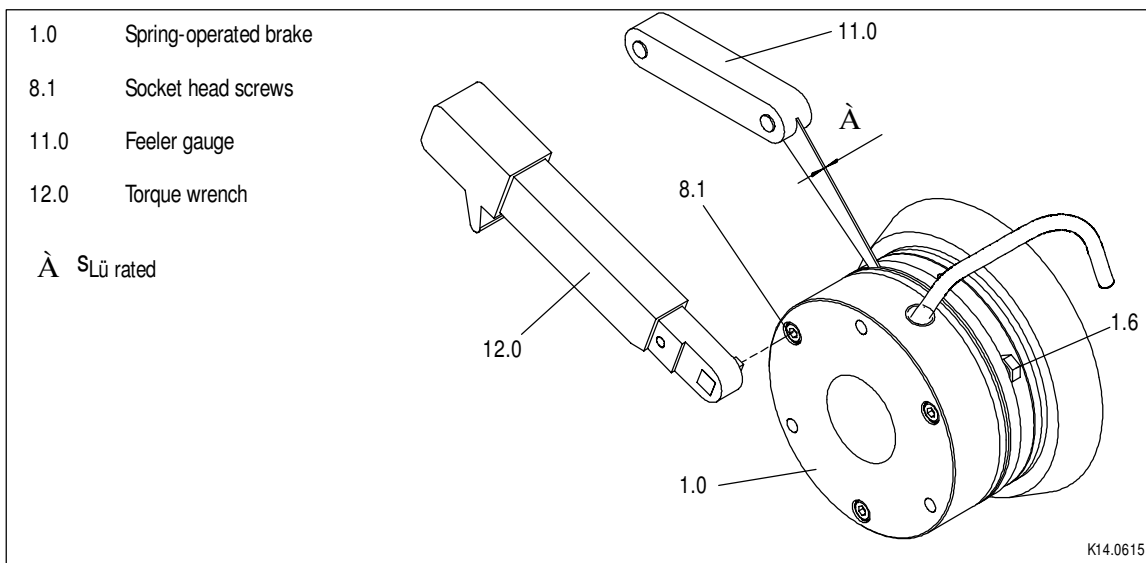
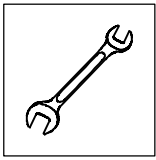


FIG 14 Air gap re-adjustment of brake BFK457-06+08



## Maintenance

1. Check air gap  $s_{Lü \text{ rated}}$  near the screws (8.1) using a feeler gauge, FIG 14 ( $s_{Lü \text{ rated}}$  see table Rated Data, chapter 3.2).
  - If the air gap is too large, readjust it as follows:
2. Unbolt screws (8.1).
3. Slightly turn hreaded sleeve (1.6) using a spanner.
  - If the air gap is too large, screw them into the stator (1.1).
  - If the air gap it too small, screw them out of the stator (1.1)
  - $1/6$  revolution changes the air gap by approx. 0.15mm.
4. Tighten screws (8.1) (for torques see table Rated data, chapter 3.2).
5. Check air gap againg and if necessary, repeat the adjustment.

## 6.4 Spare-parts list

Only parts with order numbers available.

The order numbers are only valid for standard versions.

- Bore diameter in mm
- Standard keyway to DIN 6885/1 P9

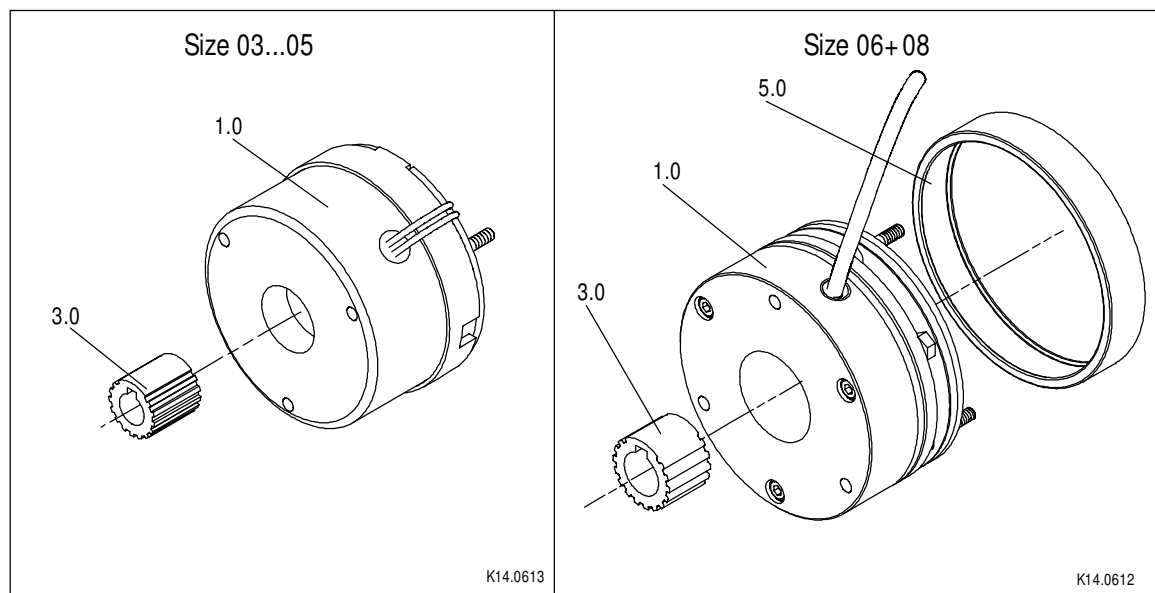
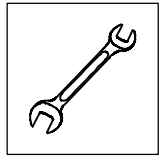


FIG 15 Spare parts for spring-operated brakes BFK Size 03...08

Pos.	Name	Variant		
		Size	Voltage	Brake torque
1.0	Spring-operated brake	Size	Voltage	Brake torque
3.0	Hub	Size	Bore	-----
5.0	Cover seal	Size	-----	-----



## 6.5 Order of spare parts

### 6.5.1 Spring-operated brake BFK457

Receiver: **Lenze**  
 Branch office/Subsidiary \_\_\_\_\_ Postal code/City: \_\_\_\_\_  
 Fax No.: \_\_\_\_\_

---

Sender  
 Company \_\_\_\_\_ Customer No. \_\_\_\_\_  
 Street / P.O. box \_\_\_\_\_ Order No. \_\_\_\_\_  
 Postal code / City \_\_\_\_\_ Issuer \_\_\_\_\_  
 Delivery address \* \_\_\_\_\_ Phone \_\_\_\_\_  
 \_\_\_\_\_ Fax \_\_\_\_\_  
 Invoice addressee\* \_\_\_\_\_  
 Date of delivery \_\_\_\_\_  
 \*Please indicate, if different from sender. Date \_\_\_\_\_ Signature \_\_\_\_\_

---

Order quantity \_\_\_\_\_ Batch size á 10 pcs. Price/item \_\_\_\_\_  
**Brake without hub**

Size  03  04  05  06  08

Mark the desired size with a cross and observe restrictions indicated for some versions.

Voltage  24V  205V

**Brake torque**

	03	04	05	06	08	
<input type="checkbox"/>	0.5	1	2	4	8	Rated torque $M_K$ in Nm
<input type="checkbox"/>	---	---	---	6	12	

Order quantity \_\_\_\_\_ Batch size á 10 pcs. Price/item \_\_\_\_\_  
**Hub**

	03	04	05	06	08	
<input type="checkbox"/>	6	6	8	10	10	Bore H7 [mm] with keyway DIN 6885/1 P9
<input type="checkbox"/>	6	7	8	11	15	
<input type="checkbox"/>	7	8	10	15	20	
<input type="checkbox"/>	9	10	11	---	---	
<input type="checkbox"/>	---	---	12	---	---	

Order quantity \_\_\_\_\_ Batch size á 10 pcs. Price/item \_\_\_\_\_  
**Seal**

	03	04	05	06	08
<input type="checkbox"/>	---	---	---	x	x

**Rotor, flange and fixing screws are included in the scope of delivery of brake BFK457.**  
 Price in DM/item - Germany: plus VAT

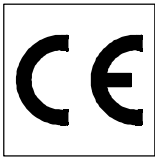


## 7 Troubleshooting and fault elimination

Fault	Cause	Remedy
Spring-operated brake does not release, air gap is not zero	Coil is interrupted	<ul style="list-style-type: none"> <li>• Measure the coil resistance using a multimeter:               <ul style="list-style-type: none"> <li>- If the resistance is too high, replace the spring-operated brake.</li> </ul> </li> </ul>
	Coil has contact to ground or between the windings	<ul style="list-style-type: none"> <li>• Measure the coil resistance using a multimeter:               <ul style="list-style-type: none"> <li>- Compare measured resistance to rated resistance. For values see chapter 3.2 Rated data. If the resistance is too low, replace the spring-operated brake.</li> </ul> </li> <li>• Check coil for contact to ground using a multimeter:               <ul style="list-style-type: none"> <li>- In case of contact to ground, replace the spring-operated brake.</li> </ul> </li> <li>• Check brake voltage (see defective rectifier, voltage too low).</li> </ul>
	Wiring wrong or defective	<ul style="list-style-type: none"> <li>• Check and correct wiring.</li> <li>• Check cable for continuity using a multimeter:               <ul style="list-style-type: none"> <li>- Replace defective cable.</li> </ul> </li> </ul>
	Rectifier defective or wrong	<ul style="list-style-type: none"> <li>• Measure DC voltage at the rectifier using a multimeter:               <ul style="list-style-type: none"> <li>If DC voltage is zero:                   <ul style="list-style-type: none"> <li>• Measure AC voltage at the rectifier.                       <ul style="list-style-type: none"> <li>If AC voltage is zero:                           <ul style="list-style-type: none"> <li>- Apply voltage,</li> <li>- check fuse,</li> <li>- check wiring</li> </ul> </li> <li>If AC voltage is o.k.:                           <ul style="list-style-type: none"> <li>- Check rectifier,</li> <li>- replace defective rectifier</li> </ul> </li> </ul> </li> </ul> </li> <li>If DC voltage is too low:               <ul style="list-style-type: none"> <li>- Check rectifier,</li> <li>- Use half-wave rectifier instead of bridge rectifier.</li> <li>- If diode is defective, use suitable new rectifier</li> </ul> </li> <li>• Check coil for contact to ground or between the phases.</li> <li>• If a rectifier defect occurs more than once, replace the spring-operated brake even if a contact to ground or between the windings cannot be measured. The fault may occur only in the warm state.</li> </ul> </li></ul>
	Air gap too large	Adjust air gap: <ul style="list-style-type: none"> <li>- Spring-operated brake BFK457-06+08 chapter 6.3.2.1</li> <li>- Spring-operated brake BFK457-03...05 Replace brake, chapter 4.3.1</li> </ul>



<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
Rotor cannot rotate freely	Air gap $s_{LÜ}$ too small	Check air gap $s_{LÜ}$ and if necessary readjust it (chapter 6.3.2.1).
Rotor thickness too small	Spring-operated brake was not replaced in time	Replace spring-operated brake (chapter 4.3.1 and 4.3.2)
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.



# Declaration of Conformity/Manufacturer's Certification

# Lenze

## Brakes

Lenze GmbH & Co KG  
Postfach 10 13 52  
D-31763 Hameln

Site: Bösingfeld  
Breslauer Straße 3  
D-32699 Extertal  
Telephone (05154) 82-0  
Telefax (05154) 82-11 07

## EC-Declaration of Conformity

for the purpose of the

### EC Low-Voltage Directive (73/23/EEC)

amended by: CE-mark Directive (93/68/EEC)

The following products were developed, designed, and manufactured in compliance with the above-mentioned EC Directive under the sole responsibility of

**Lenze GmbH & Co KG, Postfach 10 13 52, D-31763 Hameln**

#### Product:

#### Type:

Electromagnetically released spring-operated brakes	BFK457-□□ 14.442.□□ 14.449.□□	BFK458-□□ 14.444.□□ 14.450.□□	14.448.□□
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Permanent magnet brakes	14.118.□□
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#### Applied standards and regulations:

VDE 0470 (EN 60529)	Rotating electrical machines
VDE 0580	Electromagnetic devices

#### Product:

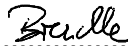
#### Type:

Rectifiers	14.630.13.□□ 14.630.32.□□	14.630.14.□□ 14.630.33.□□
Spark suppressors	14.198.00.02	14.198.00.03
SEGC Contact	14.611.30.□□□	14.611.38.□□□

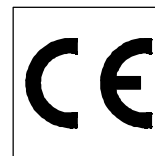
#### Applied standards and regulations:

VDE 0411, part 1 (EN 61010-1)	Safety requirements for electrical equipment for measurement, control and laboratory use
-------------------------------	--

Hameln, October 1, 1997

  
.....  
(i.A. Brendler)  
Head of division





## Lenze

### Manufacturer's Certification

#### for the purpose of the EC Machinery Directive (89/392/EEC)

We herewith certify that the below listed products are intended for assembly into a machine or for assembly with other elements to form a machine. Commissioning of the machine is prohibited before it is proven that it corresponds to the EC regulation 89/392/EEC with the amendments 91/368/EEC and 93/44/EEC.

#### Brakes

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Breslauer Straße 3  
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Telephone (05154) 82-0  
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#### Product:


#### Type:

Electromagnetically released spring-operated brakes	BFK457-□□ BFK458-□□ 14.442.□□ 14.444.□□ 14.448.□□ 14.449.□□ 14.450.□□
Permanent magnet brakes	14.118□□

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Hameln, October 1, 1997

  
.....  
(i.A. Brendler)  
Head of division

