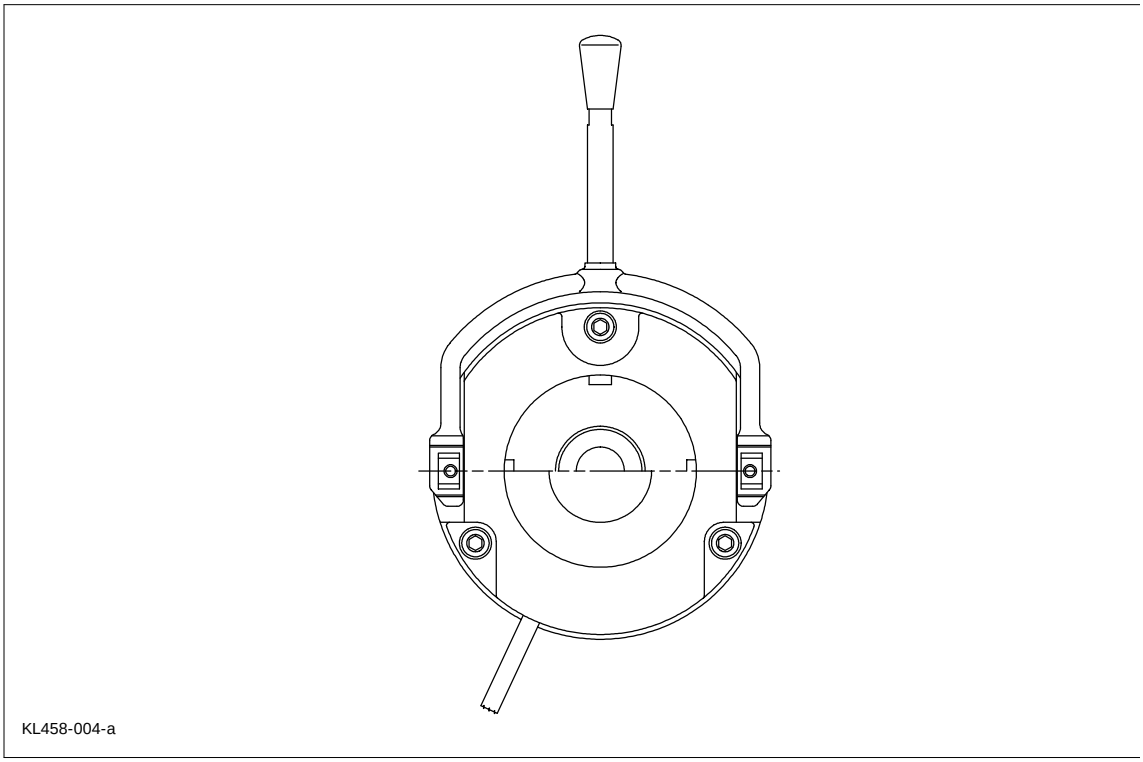
405 520 GB

Lenze

Operating Instructions

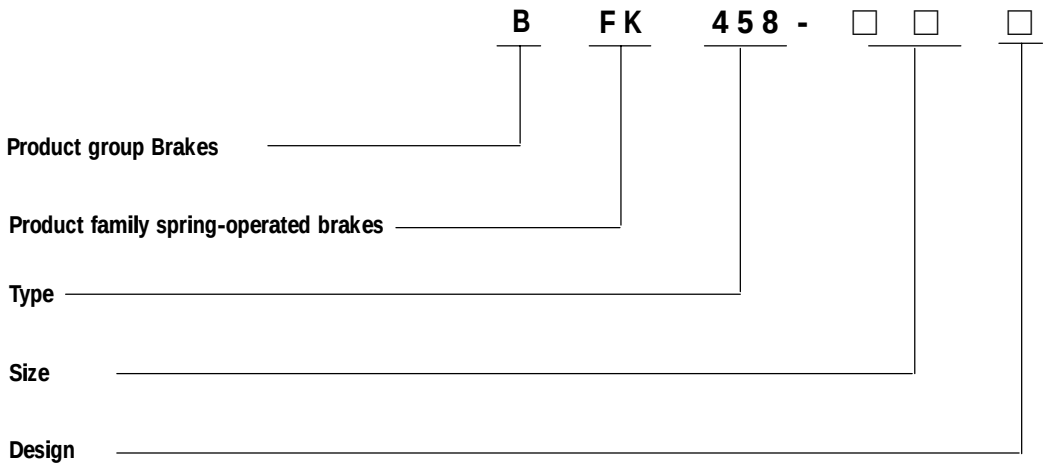


KL458-004-a

Spring-operated brake with electromagnetic release

Type BFK458- □□□

Product key



Size
06, 08, 10, 12, 14, 16,
18, 20, 25

Stator design
E - adjustable (brake torque can be reduced via adjuster nut)
N - not adjustable

Uncoded:
Supply voltage, hub bore, options

- 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 BFK458.

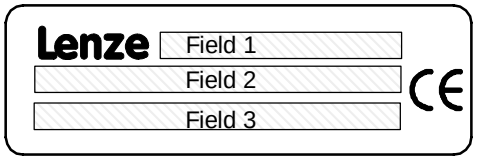
These Operating Instructions are valid for the following spring-operated brakes:

BFK458-06□
BFK458-08□
BFK458-10□
BFK458-12□
BFK458-14□
BFK458-16□
BFK458-18□
BFK458-20□
BFK458-25□

BA 14.0168
Author: Lenze GmbH & Co KG, Division Brakes and Clutches
1st edition: 01/99

Nameplate

Layout

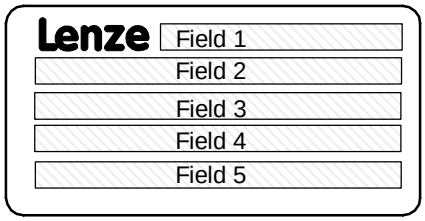


Sizes 06-16 and 18-25

Field	Content			Example: Size 06-16
1	Manufacturer	Brake type	Type no.	Lenze -D BFK458-06E Nr.519508
2	Rated voltage	Rated power	Rated brake torque/CE mark	205V DC 20W 4.0NM CE
3			Date of manufacture	80515
Field	**Content**			**Example: Size 18-25**
1	Manufacturer			Lenze D-Extertal
2	Brake type			Typ: BFK458-25E
3	Rated voltage	Rated power		205V DC 110W
4	Rated brake torque		Date of manufacture	400NM 80515
5	Type no.		CE mark	Nr. 521388 CE

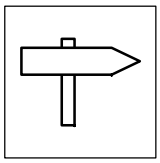
Packaging sticker

Layout



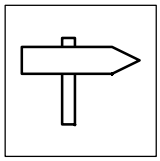
Assembly

Field	Content			Example
1	Manufacturer		Barcode of No.	Lenze D-Extertal
2	Name		Type no.	MAGNETTEIL KPL. Nr. 519508
3	Type see Product Key	Rated brake torque	No. per box	Typ: BFK458-06E 4,0NM 1 Stück
4	Rated voltage / rated power		Packaging date	205V DC 20W 80515 CE
5	Addition / CE mark			Rostschutzverpackung-Reibflächen fettfrei halten!



Contents

Contents



1 Preface and general information

1.1 How to use these Operating Instructions

- These Operating Instructions are intended for safety-relevant operations on and with the spring-operated brake with electromagnetic release. They contain safety instructions, which must be observed.
- All personnel working on and with the spring-operated brake with electromagnetic release must have the Operating Instructions available and observe the information and notes relevant for them.
- 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 ”spring-operated brake with electromagnetic release”.

Drive system

For drive systems with spring-operated brake with electromagnetic release and other Lenze drive components the term ”drive system” will be used in the following text.

1.2 Scope of delivery

- The drive systems are combined individually according to a modular design. The scope of delivery is indicated in the accompanying papers.
- After receipt of the delivery, check immediately whether it corresponds to the accompanying papers. Lenze does not grant any warranty for deficiencies claimed subsequently. Claim
  - visible transport damage immediately to the forwarder.
  - visible deficiencies / incompleteness immediately to the responsible Lenze subsidiary / agency.

1.3 Lenze drive systems

1.3.1 Labelling

- Lenze drive systems and components are uniquely designated by the content of their nameplates.
- Manufacturer:
  Lenze GmbH & Co KG
  Postfach 10 13 52
  D-31763 Hameln

  Site:
  Bösingfeld
  Breslauer Str. 3
  D-32699 Extertal
- The spring-operated brake BFK458-□□□ is also available as individual components. The user can build up the system as required. The following indications: packaging sticker, nameplate, and type code are valid for the spring-operated brake.
- When delivering single components, the labelling is missing!

1.3.2 Application as directed

- Lenze drive systems
  - are intended for use in machinery and systems.
  - must only be used for the purposes ordered and confirmed.
  - must only be operated under the ambient conditions prescribed in these Operating Instructions.
  - must not be operated beyond their corresponding 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.
- We do not accept any liability for damage or operating interference caused by:
  - inappropriate use
  - unauthorized modifications to the drive system
  - improper working on and with the drive system
  - operating faults
  - disregarding these Operating Instructions

Preface and general information

Warranty

- Conditions of warranty: see terms of sale and delivery of Lenze GmbH & Co KG.
- Warranty claims must be made immediately after detecting defects or faults.
- The warranty is void where liability claims cannot also be made.

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 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
  - 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, 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 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 BFK458-□□□:

- 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:

Signal word
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 Threaded sleeves
$s_{Lü}$ = Air gap

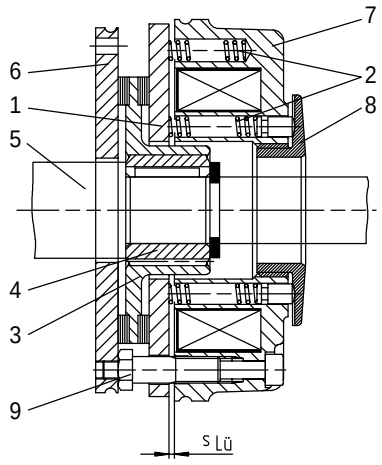


FIG 1 Design of the spring-operated brake BFK458: basic module E (complete stator) + rotor + hub + flange

1 Armature plate
2 Compression springs
3 Rotor
4 Hub
7 Stator
9 Threaded sleeves
$s_{Lü}$ = Air gap

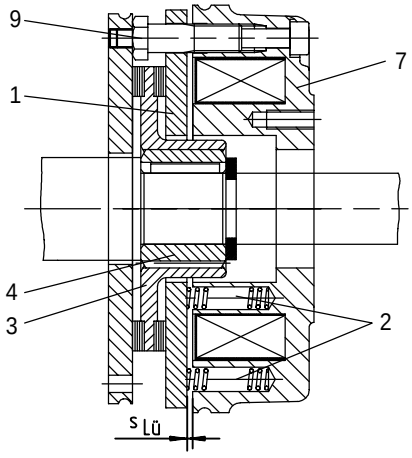
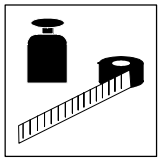


FIG 2 Design of the spring-operated brake BFK458: basic module N (complete stator) + rotor + hub + flange

3.1.1 General

The spring-operated brake type BFK458-□□□ 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.

The spring-operated brake type BFK458-□□□ is designed for the conversion of mechanical work and kinetic energy into heat. For operating speed see chapter 3.3 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 3.3 Rated data. The more friction work, the higher the wear.



3.1.2 Braking

During braking, the rotor (4), which is axially movable on the hub (3), is pressed against the friction surface - via the armature plate (1) - by means of inner and outer springs (2). The asbestos-free friction linings ensure a high brake torque with low wear. The brake torque is transmitted between hub (4) and rotor (3) via the splines.

3.1.3 Brake release

In braked state, there is an air gap $s_{Lü}$ between stator (7) and armature plate (1). To release the brake, the stator coil (7) is excited with the DC voltage provided. The magnetic force generated attracts the armature plate (1) towards the stator (7) against the spring force. The rotor (3) is then released and can rotate freely.

3.1.4 Decreasing brake torque

For basic module E (adjustable) the spring force and thus the brake torque can be reduced by unscrewing the adjuster nut (8) (see chapter 5.2).

3.1.5 Manual hand release (optional)

The manual hand release is optionally available for short-term releases when no voltage is applied. The manual hand release can be retrofitted.

3.1.6 Microswitch (optional)

The manufacturer offers the microswitch for air-gap or wear monitoring. The user must provide the corresponding electrical connection (see chapter 4.4).

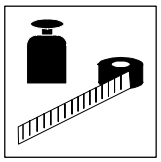
When air-gap monitoring, the motor does not start before the brake has been released. With this set-up, all possible faults are monitored. For example, in the event of defective rectifiers, interrupted connection cables, defective coils, or excessive air gaps the motor will not start.

When checking the wear, no current will be applied to the brake and the motor if the air gap is too large.

3.1.7 Encapsulated design (optional)

This design not only avoids the penetration of spray water and dust but also the spreading of abrasion particles outside the brake. This is achieved by:

- a cover seal over the armature plate and rotor,
- a cover in the adjuster nut,
- a shaft seal in the adjuster nut for continuous shafts (option).



3.2 Brake torques

Size	06	08	10	12	14	16	18	20	25
Rated torques [Nm], referring to the relative speed $\Delta n = 100\ min^{-1}$	2 N/E	3.5 N/E	7 N	14 N/E	25 N/E	45 N	80 N	115 N/E	175 N/E
	2.5 N/E	4 E	9 N/E	18 N/E	35 N	55 N/E	100 N/E	145 N	220 N
	3 N/E	5 N	11 N/E	23 N/E	40 N/E	60 N/E	115 N/E	170 N/E	265 N/E
	3.5 N/E	6 N/E	14 N/E	27 N	45 N/E	70 N/E	130 N/E	200 N/E	300 N/E
		7 N/E			55 N/E			230 N/E	350 N/E
	4 N/E	8 N/E	16 N/E	32 N/E	60 N/E	80 N/E	150 N/E	260 N/E	400 N/E
	4.5 N/E	9 N/E	18 N/E	36 N/E	65 N/E	90 N/E	165 N/E	290 E	445 N/E
	5 E	10 E	20 E	40 E	75 N/E	100 N/E	185 N/E	315 N/E	490 N/E
	5.5 E	11 E	23 N/E	46 N/E	80 N/E	105 N/E	200 N/E	345 N/E	530 N/E
	6 N/E	12 N/E			95 N/E	125 N/E	235 N/E	400 N/E	600 N/E

TAB 1 N.....Brake torque for module N (without adjuster nut)
E.....Brake torque for module E (with adjuster nut)

Holding brake with emergency stop operation ($s_{Lümax}$ ca. 1.5 x $s_{Lürated}$)

Operating brake ($s_{Lümax}$ ca. 2.5 x $s_{Lürated}$)

Standard brake torque

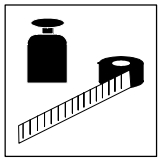
3.2.1 Basic module E, brake torque reduction

For basic module E the brake torque can be reduced by means of the adjuster nut in the stator. The adjuster nut may only be screwed out up to the maximum projection $h_{1max.}$ (see chapter 3.3).

Size	06	08	10	12	14	16	18	20	25
Torque reduction per detent position [Nm]	0.2	0.35	0.8	1.3	1.7	1.6	3.6	5.6	6.2

TAB 2

Stop!
Take into consideration that engagement times and disengagement times change depending on the brake torque.



3.2.2 Brake torques depending on the speed and permissible limit speeds

Type	Brake torque rated value at $\triangle n$ = 100 min^{-1}	Brake torque at $\triangle n_0$ [min^{-1}] [%]			max. speed $\triangle n_{0max}$ [min^{-1}]
	[%]	1500	3000	max. horizontal	
BFK458-06	100	87	80	65	12400
BFK458-08		85	78	66	10100
BFK458-10		83	76		8300
BFK458-12		81	74		6700
BFK458-14		80	73	67	6000
BFK458-16		79	72	66	5300
BFK458-18		77	70		4400
BFK458-20		75	68		3700
BFK458-25		73			3000

TAB 3

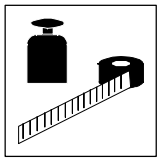
3.3 Rated data

Type	$s_{Lürated}$ + 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 page 36)	Pitch circle		Screws for flange installation DIN 6912	Minimum depth of the clearing holes (installation flange)	Tightening torque		Weight of stator complete
												Screws	Lever complete	
	[mm]	[mm]	[mm]	[mm]	min. 1)	max.	[mm]	Ø [mm]	Thread	2)	[mm]	[Nm]	[Nm]	[kg]
BFK458-06	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
BFK458-08					5.5	7.0		90	3 x M5	3 x M5	1	5.5		1.2
BFK458-10					7.5	9.0	7.5	112	3 x M6	3 x M6	2	9.5	4.8	2.1
BFK458-12	0.3	0.75	0.45	2.0	8.0	10.0	9.5	132	3 x M6	3 x M6	3			3.5
BFK458-14				2.5	7.5		11	145	3 x M8	3 x M8	1.5	23	12	5.2
BFK458-16				3.5	8.0	11.5	10	170	3 x M8	3 x M8	0.5			7.9
BFK458-18	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
BFK458-20				4.0	12.0	16.0	17	230	6 x M10	4 x M10 3)	2.1	46		19.3
BFK458-25	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.

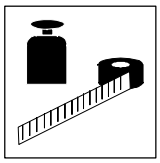
3) The thread in the threading surface is offset by 30° in reference to the center axle of the manual release lever.



3.3.1 Coil voltage to coil resistance

Type	Electrical Power P_{20} [W] 1)	Voltage U [V]	Coil resistance $R_{20} \pm 8\%$ [Ω]
BFK458-06	20	24	20
		96	460.8
		103	530.5
		170	1445
		180	1620
		190	1805
		205	2101
BFK458-08	25	24	23
		96	368
		103	424.4
		170	1156
		180	1296
		190	1444
		205	1681
BFK458-10	30	24	19.2
	31	96	297.3
	32	103	331.5
	30	170	963.3
	32	180	1013
	30	190	1203
	33	205	1273
BFK458-12	40	24	14.4
		96	230.4
		103	265.2
		170	722.5
		180	810
		190	902.5
		205	1051
BFK458-14	50	24	11.5
		96	184.3
	53	103	200.2
	50	170	578
	53	180	611.3
	50	190	722
	53	205	792.9

1) Coil power at 20 °C



Technical Data

Type	Electrical Power P_{20} [W] 1)	Voltage U [V]	Coil resistance $R_{20} \pm 8\%$ [Ω]
BFK458-16	55	24	10.5
		96	167.6
	56	103	189.5
	55	170	525.5
		180	589.1
	60	190	601.7
	56	205	750.5
BFK458-18	85	24	6.8
		96	108.4
		103	124.8
		170	340
		180	387.2
		190	424.7
		205	494.4
BFK458-20	100	24	5.76
		96	92.2
		103	106.1
		170	289
		180	324
	110	190	328.2
	100	205	420.3
BFK458-25	110	24	5.24
		96	83.8
		103	96.5
		170	262.7
		180	294.6
		190	328.2
		205	382.1

1) Coil power at 20 °C

3.4 Switching times

t_1 Engagement time
t_2 Disenganement time (up to M = 0.1 M_r)
t_{11} Reaction delay during engagement
t_{12} Torque rise time of the brake torque

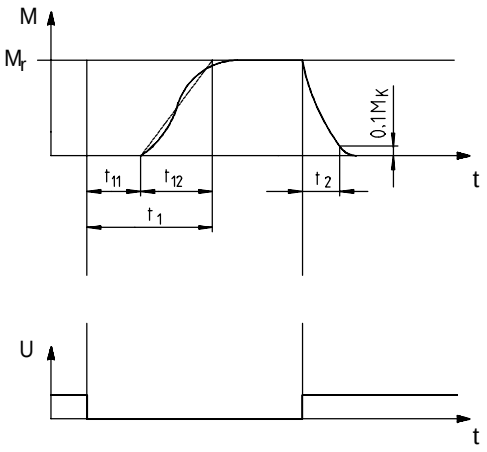


FIG 3 Switching times

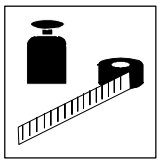
Type	Brake torque rated value at $\triangle n$ = 100 min^{-1} M_r 1)	Maximum permissible friction work per operation only Q_E	Transition operating frequency $s_{hü}$	Operating time [s] for $s_{Lürated}$			
				Engaging DC-switching			Disengaging
	[Nm]	[J]	[h^{-1}]	t_{11}	t_{12}	t_1	t_2
BFK458-06	4	3000	79	15	14	29	45
BFK458-08	8	7500	50	13	19	32	60
BFK458-10	16	12000	40	28	19	47	73
BFK458-12	32	24000	30	29	28	57	111
BFK458-14	60	30000	28	15	23	38	213
BFK458-16	80	36000	27	23	30	53	221
BFK458-18	150	60000	20	32	53	85	272
BFK458-20	260	80000	19	these times will be considered in the next issue			
BFK458-25	400	120000	15	108	111	219	375

TAB 4 1) Minimum brake torque when all components are run in.

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 nominal voltage. The chart 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. The change is approx. by the factor 6-10, for connection see FIG 13.

The most simple connection of rectifier and brake directly in parallel to the motor winding additionally prolongs the engagement time because the motor, which is already switched off but still running continues to excite the brake (for connection see FIG 12).

Spark suppressors for the rated voltages, which are to connected in parallel to the contact are available for engagement on the DC side. If this is not admissible for safety reasons, e. g. with hoists and lifts, the spark suppressor can also be connected in parallel to the brake coil (for connection see FIG 14).

A reduction of the brake torque via the adjuster nut prolongs the engagement time and reduces the disengagement time. If the prolongation is too long, an anti-magnetic plate - to be assembled between stator and armature plate - is available. The plate reduces the engagement time and prolongs the disengagement time.

3.5 Operating frequency / friction work

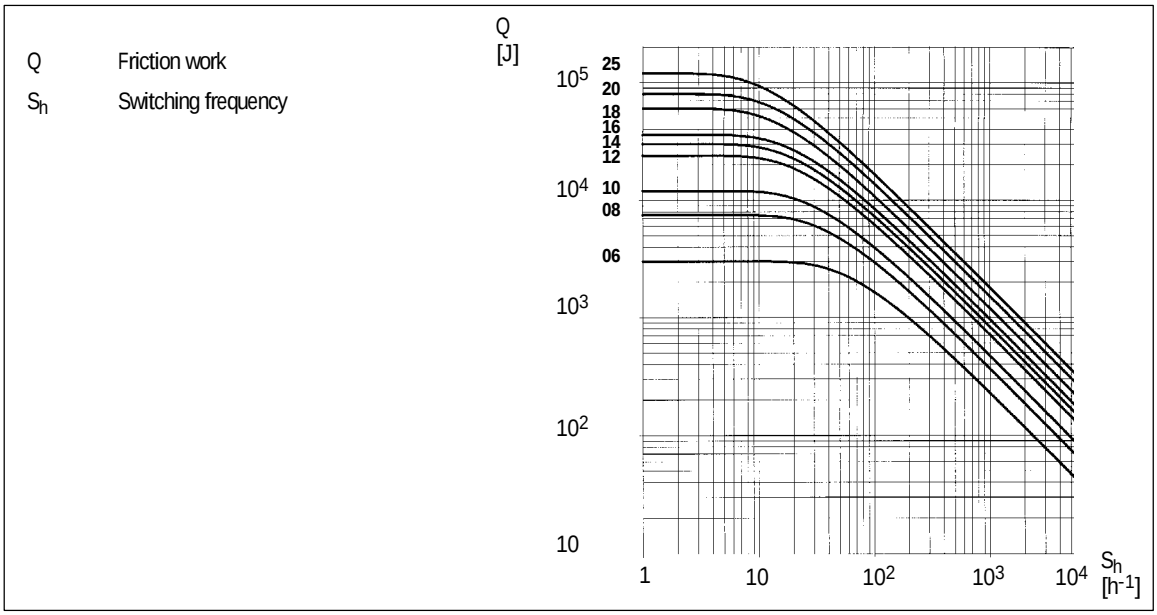
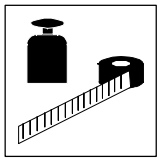


FIG 4 Friction work as function of the operating frequency, (sizes 06-25)

$$S_{hzul} = \frac{-S_{hü}}{\ln\left(1-\frac{Q}{Q_E}\right)} \qquad Q_{zul} = Q_E\left(1 - e^{\frac{-S_{hü}}{S_h}}\right)$$

The permissible operating frequency S_{hperm} depends on the friction work Q (see FIG 4). An operating frequency of S_h results in the permissible friction work Q.

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



3.6 Emission

Electromagnetic compatibility

Under normal switching conditions with an unfiltered DC voltage via a bridge circuit the spring-operated brake type BFK458-□□□ complies with the EMC standard EN50081 part 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:		With a rectifier that:		Spark suppressor in 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 suppressors according to coil voltage on request.

Heat

Since the brake converts kinetic energy as well as mechanical and electrical energy into heat, the surface temperature varies considerably, depending on the operating conditions and the possible heat dissipation. Under unfavorable conditions, the surface temperature can reach 130 °C.

Noises

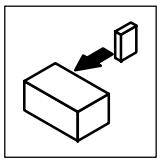
The switching noises during engagement and disengagement depend on the air gap $s_{Lü}$ and the brake size.

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 odors may occur.



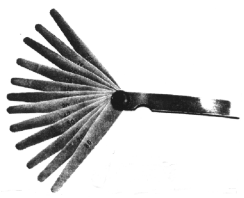
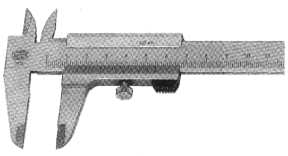
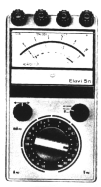
4 Installation

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

4.1 Required tools

Type	Torque wrench [Nm]	Insertion for hexagon socket screws Wrench size [mm] *	Wrench Wrench size [mm] Cap screws	Wrench Wrench size [mm] Nuts / bolts	Wrench Wrench size [mm] 2kt lever	Hook wrench DIN1810 Design A for Diameter [mm]	Box spanner for flange installation, outside Wrench size [mm]
BFK458-06	1 to 12	3x1/4" square	8	7 / 5.5	7	45 - 55	7x1/4" square
BFK458-08		4x1/4" square	9	10 / 7		52 - 55	8x1/4" square
BFK458-10		5x1/4" square	12			68 - 75	10x1/4" square
BFK458-12						80 - 90	
BFK458-14	20 to 100	6x1/2" square	15	12 / 8	9		13x1/2" square
BFK458-16						95 - 100	
BFK458-18				- / 10	10	110 - 115	
BFK458-20		8x1/2" square	17		12	135 - 145	17x1/2" square
BFK458-25					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

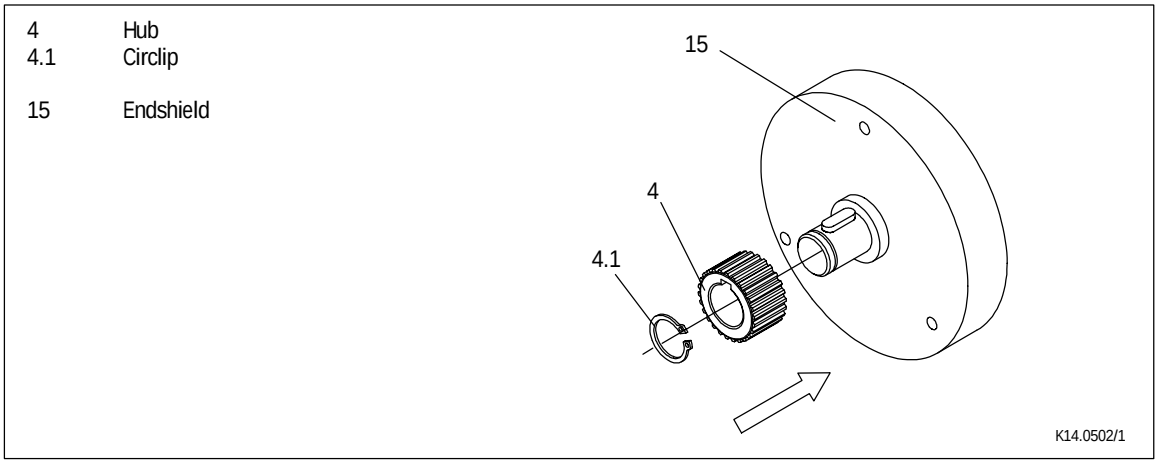
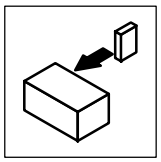


FIG 5 Installation of the hub onto the shaft

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

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

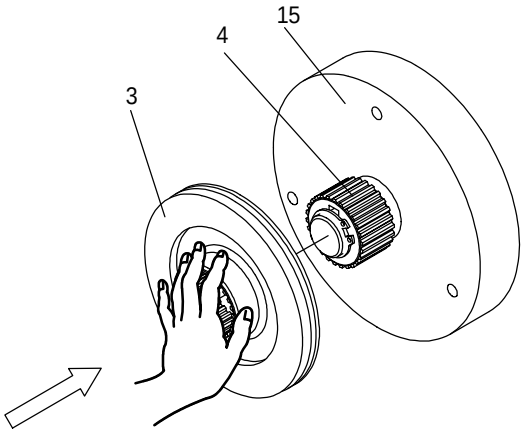


FIG 6 Assembly of the brake

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

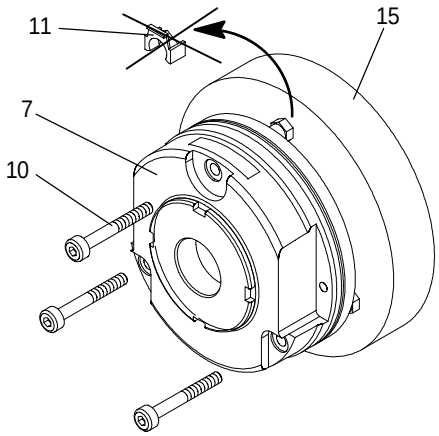
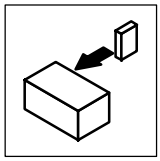


FIG 7



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).

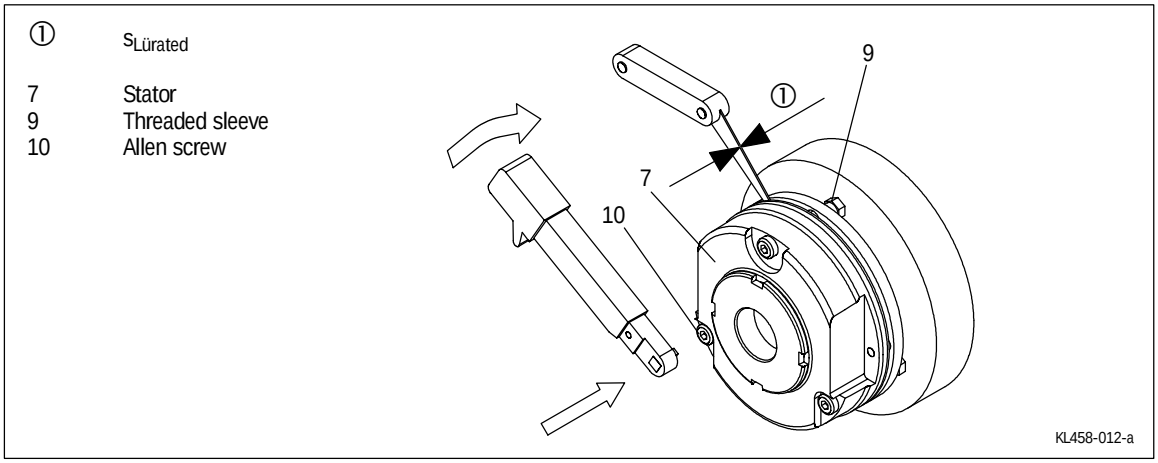


FIG 8

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).

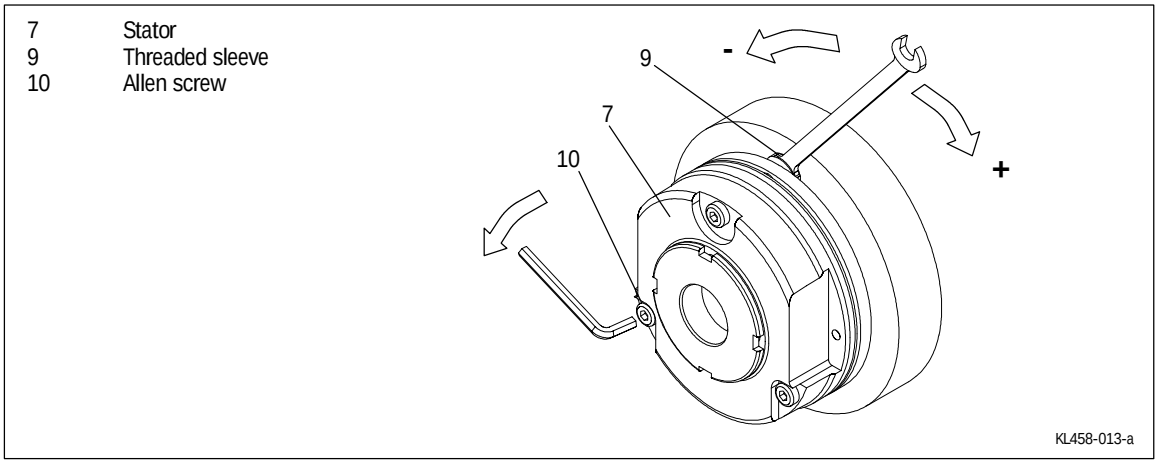


FIG 9

- 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 06 to 16

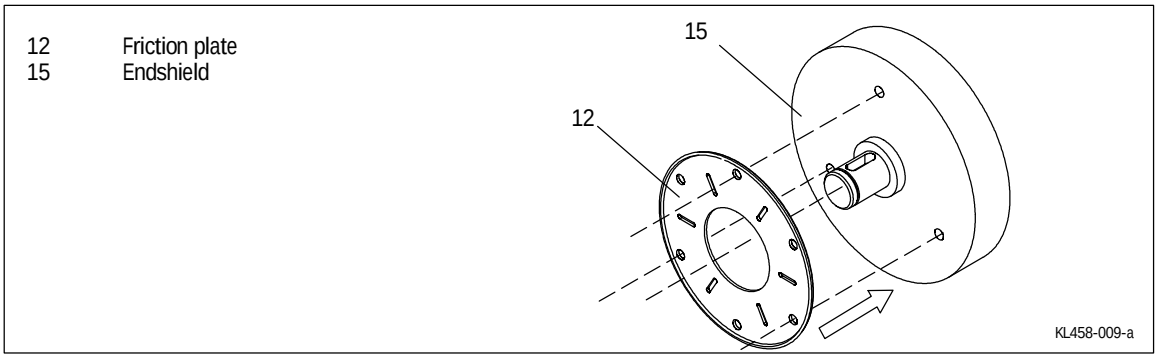


FIG 10 Assembly of friction plate

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 18 and 20 the threads at the fastening surface are shifted by 30° with respect to the center axis of the manual release lever.

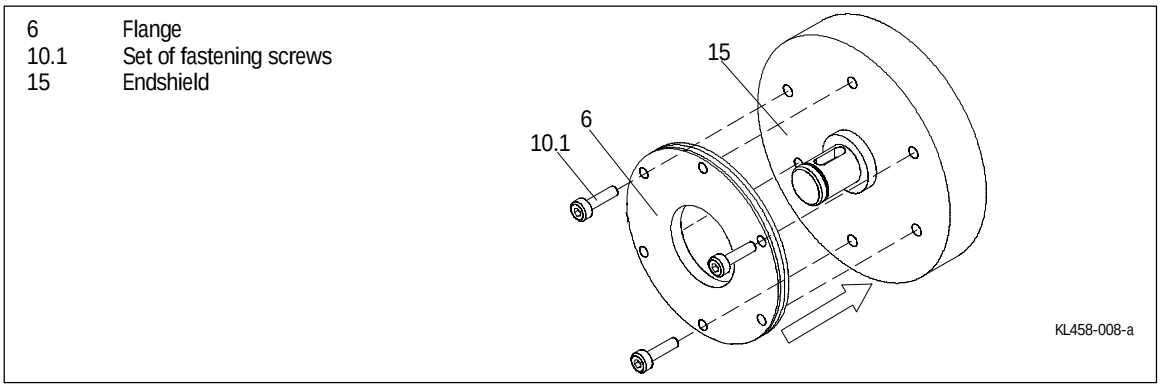
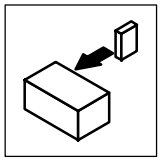


FIG 11 Assembly of the flange



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 DIN6912 (for dimensions see chapter 3.3).

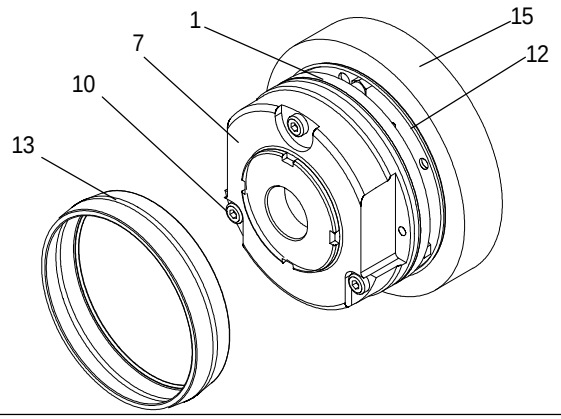
Flange assembly without additional screws
(not possible with sizes 18 and 20)

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

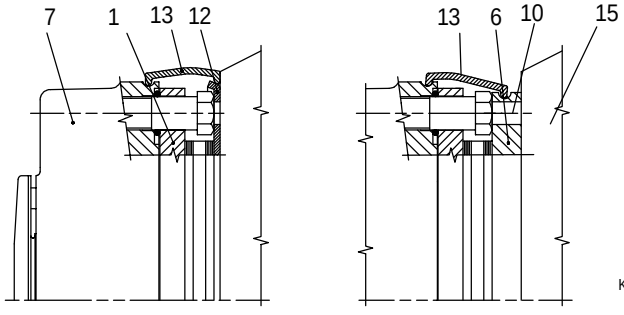
1. Hold the flange (6) to the endshield (15) and check the pitch circle and the threads of the fastening bore holes.
2. Assemble the brake with the corresponding screw set (see chapter 4.3.2).

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



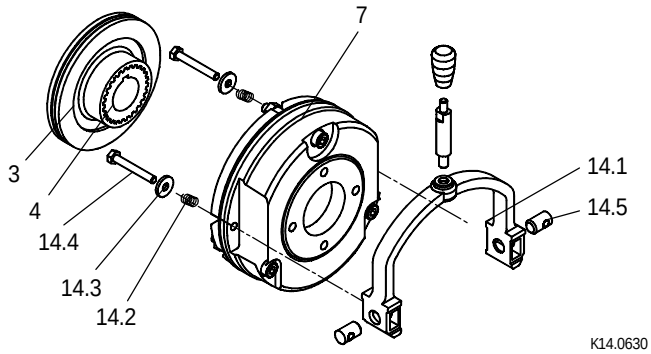
1	Armature plate
6	Flange
7	Stator
10	Socket head screw
12	Friction plate
13	Cover seal
15	Endshield



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).

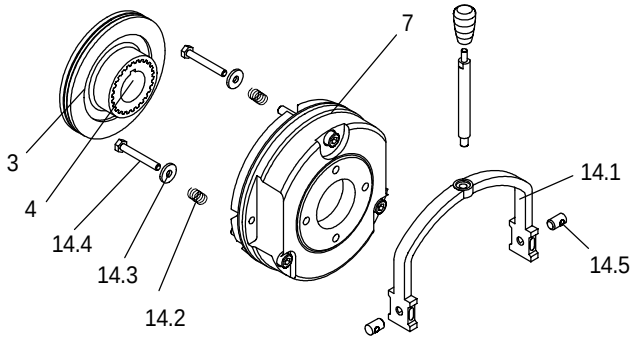
4.3.6 Assembly of the manual release sizes 06 to 14

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

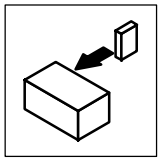


4.3.7 Assembly of the manual release sizes 16 to 25

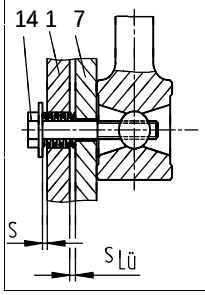
3	Rotor
4	Hub
7	Stator
14.1	Manual-release
14.2	Spring
14.3	Washer
14.4	Hexagon screw



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.



8. Adjust the gap between the armature plate (1) and the stator (7) using the hexagon screws (14.4) to achieve dimension S + $S_{Lü}$ (for values see TAB 5).
9. Assemble brake as per chapter 4.3.2.
10. Check and re-adjust (if necessary) gaps S and $S_{Lü}$ with hexagon screws (14.4). For values see TAB 5.
11. After assembly of the protection cover (if fitted) screw the lever and knob into the shackle (14.1) and tighten to specified torque (see chapter 3.3).



Size	$s_{Lü}$ (mm)	s $^{+0.1}$ (mm)	s + $s_{Lü}$ (mm)
06	0.2	1	1.2
08			
10			
12	0.3	1.5	1.8
14			
16			
18	0.4	2	2.4
20			
25	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.

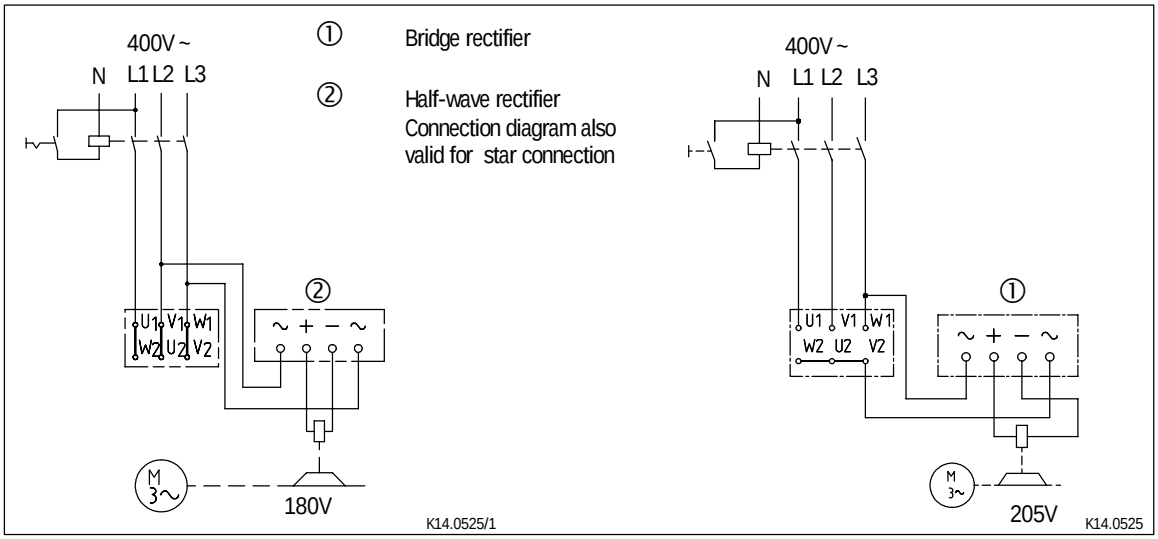


FIG 12 Switching in parallel to motor, extremely delayed engagement

Installation

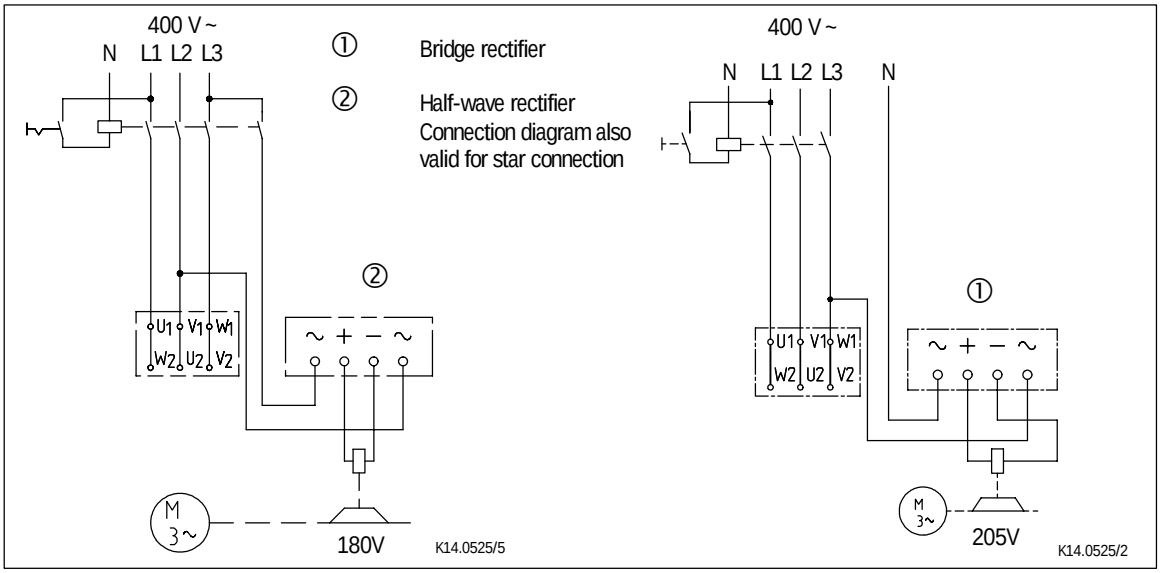


FIG 13 AC switching, delayed engagement

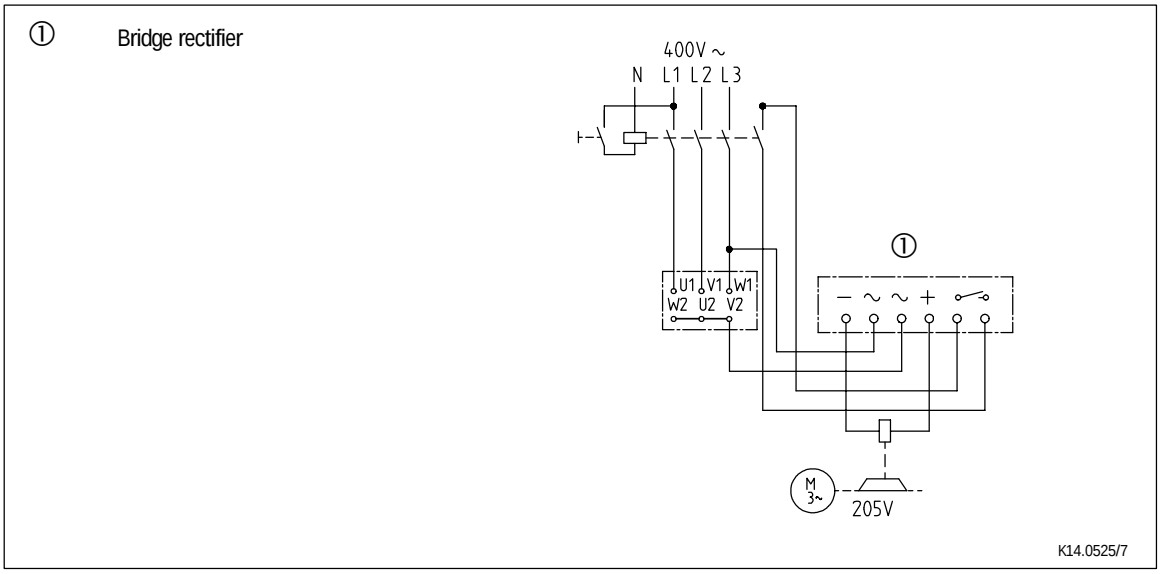
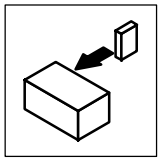


FIG 14 DC switching, normal engagement



① DC voltage (e. g. 24V)

② Spark suppressor

Connection diagram also valid for star connection

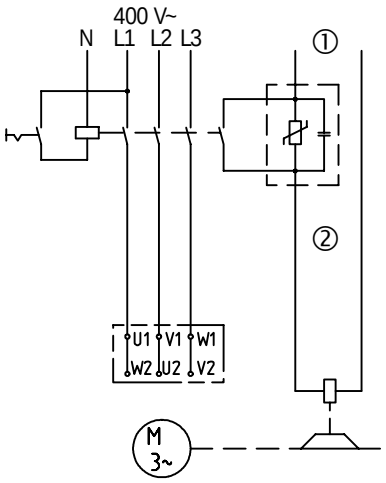


FIG 15 Separated DC voltage, switching on the DC side

Stop!

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

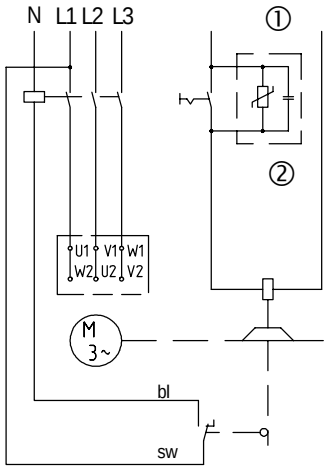
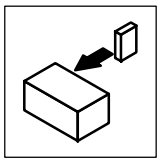


FIG 16 With microswitch / release check



Installation

bl blue
sw black
Connection diagram also valid for star connection

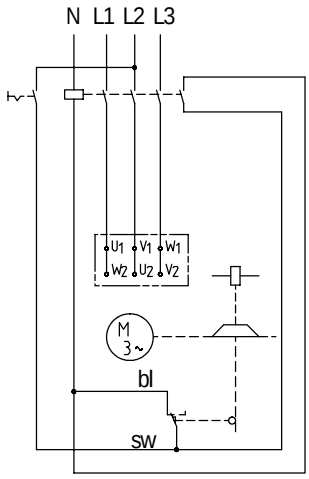


FIG 17 With microswitch / wear check addition for all circuits

Tip!

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.

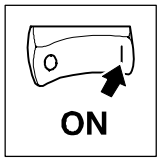
To avoid this misinterpretation of the microswitch signal, the signal should only be processed when no voltage is applied to the brake.

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.

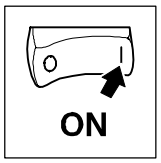
5.1.1 Release / voltage check

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.

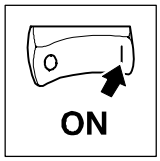
1. Remove two bridges from the motor terminals. Do not switch off the DC brake supply.
2. Apply DC voltage to the brake.
3. Measure the AC voltage at the motor terminals. It must be zero.
4. Connect the mains supply for the brake.
5. Measure the AC voltage at the motor terminals. It must be the same 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. Disconnect the DC voltage.
11. 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

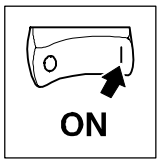
This operational test is to be carried out additionally.

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)

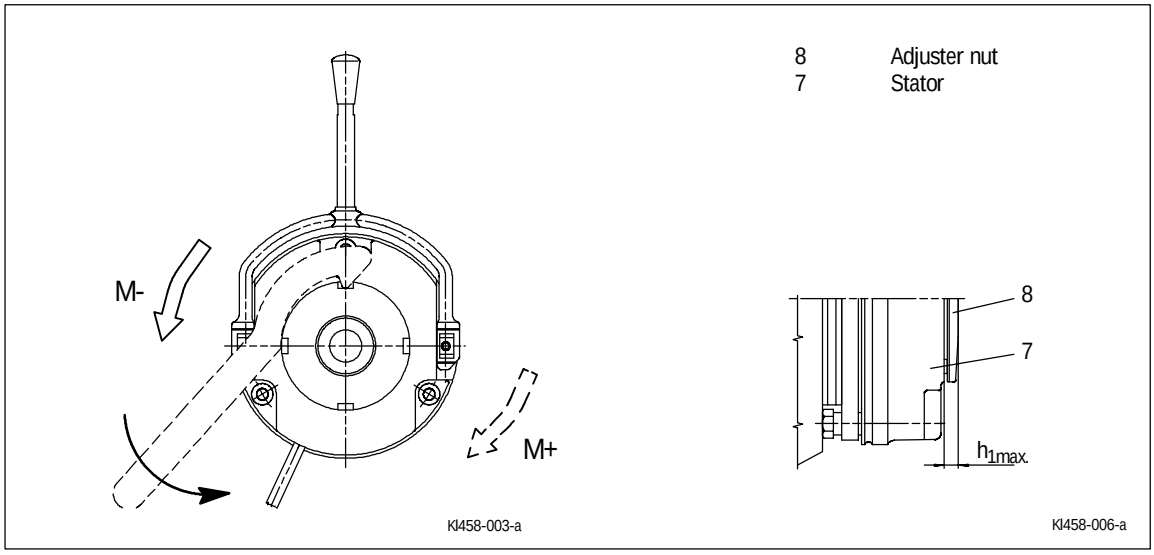


FIG 18

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).

Warnung!
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 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 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

6.2.1.1 Releasing / voltage

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.
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.
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

Warnung!
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 sizes 06 to 16

Pos.	Name	Variant	Order number for size					
			06	08	10	12	14	16
7	Stator complete, module E Stator complete, module N	Voltage / brake torque	398359	398360	398361	398362	398363	398364
3	Rotor (plastic) Rotor (aluminium)		384705 396186	387475 396200	----- 396202	----- 396214	----- 396215	----- 396252
4	Hub	Bore	372601	015350	015350	015351	028147	015352
10	Set of fastening screws Allen screw DIN 6912	for installation at flange - for installation at motor / friction plate - for flange with through hole - for intermediate flange / double brake	399492 399500 399501 399545	399502 399504 399505 399546	399506 399507 399508 399546	399507 399509 399510 399547	399511 399512 399513 399548	399512 399513 399514 399549
13	Cover seal		116107	116144	116736	116145	120589	120590
14	Manual release		401229	401232	401233	401235	401236	401238
-----	Terminal box as attachment kit		-----	-----	-----	399940	399945	399950
6	Flange		397398	397513	397683	397747	397878	398426
	Flange hardchromed		399853	399854	399855	399856	399843	399844
12	Friction plate		397383	397514	076260	397734	397755	076264
-----	Tacho flange		395780	395781	395782	395783	395784	395785
-----	Intermediate flange / double brake		395791	395792	395793	395824	397085	397086
-----	Brake cover (enclosure acc. to IP65)		391548	391549	391550	391551	391552	391553

Position no. see fig. 19 page 42

6.4.2 Spare parts list for sizes 18 to 25

Pos.	Name	Variant	Order number for size		
			18	20	25
7	Stator complete, module E Stator complete, module N	Voltage / brake torque	398365	398366	398367
3	Rotor (aluminium)		396253	396280	396288
4	Hub	Bore	015345	015346	015347
10	Set of fastening screws Allen screw DIN 6912	for installation at flange - for installation at motor / friction plate - for flange with through hole - for intermediate flange / double brake	399515 399516 ----- 399550	399517 399518 ----- 399551	399518 399520 ----- 399552
13	Cover seal		120591	120592	120593
14	Manual release		401239	401240	401241
-----	Terminal box as attachment kit		399954	399958	399962
6	Flange		398427	398428	398430
	Flange hardchromed		399845	399846	399847
12	Friction plate		-----	-----	-----
-----	Tacho flange		395786	395787	395788
-----	Intermediate flange / double brake		397088	397089	397090
-----	Brake cover (enclosure acc. to IP65)		391554	391555	391556

Position no. see fig. 19 page 42

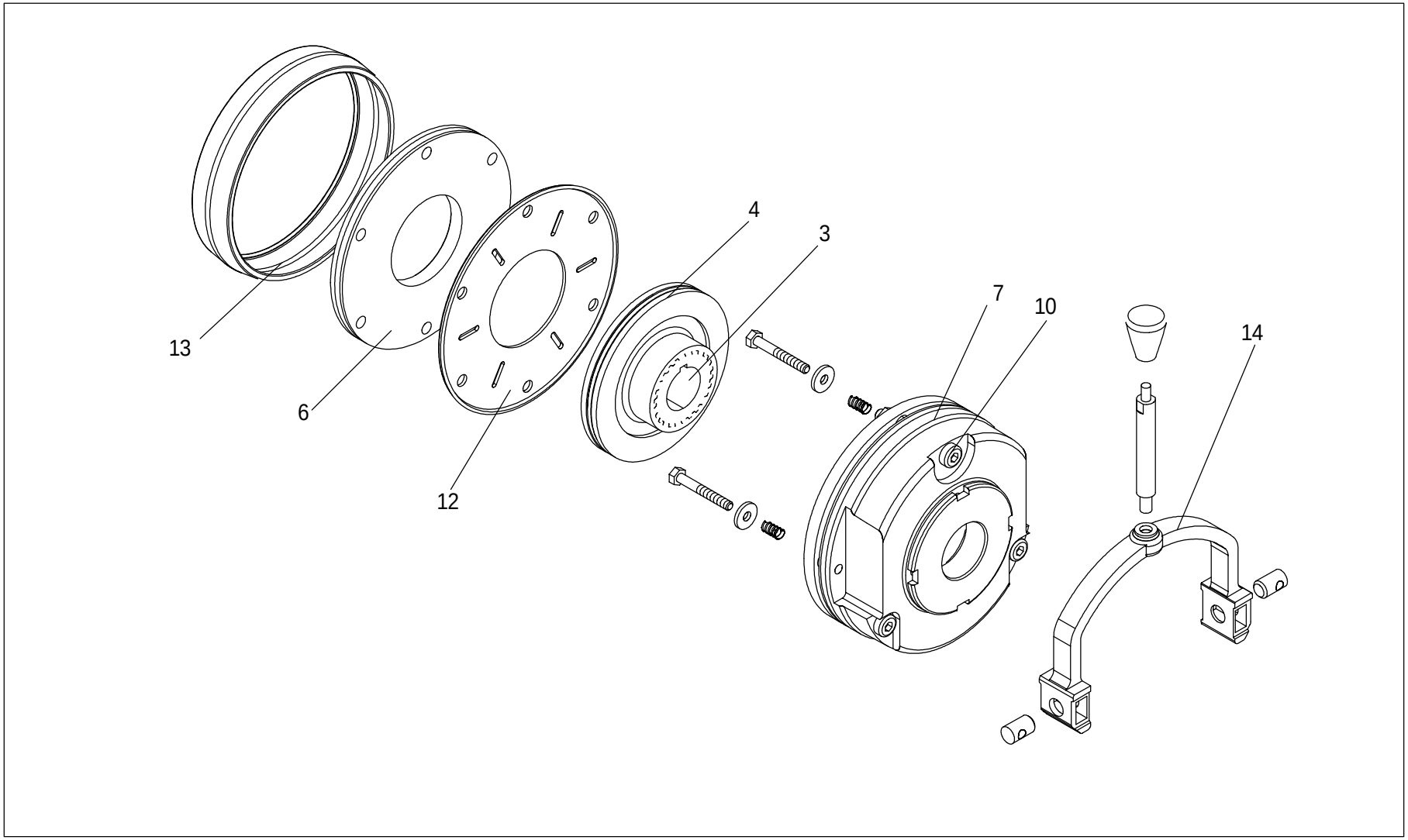


FIG 19 Spring-operated brakes BFK458-06 to 25

6.5 Order of spare parts

Receiver:

Lenze GmbH & Co. KG
Division
Brakes and Clutches
Postfach 10 13 52
D-31763 Hameln
Fax 49 51 54 - 82 11 07

Spring-applied brake BFK458 with accessories

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 _____

BFK 458-□□□ / Stator complete

Order quantity _____pcs.

Size ☐ **06** ☐ **08** ☐ **10** ☐ **12** ☐ **14** ☐ **16** ☐ **18** ☐ **20** ☐ **25**

Design ☐ **E** (with adjuster nut) ☐ **N** (without adjuster nut)

Voltage ☐ **24V** ☐ **96V** ☐ **103V** ☐ **170V** ☐ **180V** ☐ **190V** ☐ **205V**

Brake torque _____Nm (see torque ranges)

Cable length ☐ **Standard**
_____ mm (from 100 mm to 1000 mm in steps of 100 mm, from 1000 mm to 2500 mm in steps of 250 mm),

Hand release ☐ **mounted**

Armature plate ☐ **Standard**
☐ hardchromed (as from size 14)
☐ low noise (O-ring design)
☐ with pole shim / brass film

Microswitch ☐ Monitoring of the operation (as from size 12)
☐ Wear monitoring (as from size 12)

Terminal box ☐ mounted (as from size 12)

Maintenance

Accessories

Rotor	☐ **Plastic** (only for size 06/08) ☐ **Aluminium** ☐ **low-noise version** (Rotor with sleeve)
Hub	_____mm (for bore diameter, see dimensions)
Set of fixing screws	☐ for mounting to the flange ☐ for mounting to the motor / friction plate ☐ for flange with through hole (up to and incl. size 16) ☐ for intermediate flange / double brake
Hand release	☐ as attachment kit
Terminal box	☐ as attachment kit
Flange	☐ Friction plate (up to size 16) ☐ Flange ☐ Tacho flange ☐ intermediate flange / double brake
Sealing	☐ Seal ☐ Sealring (shaft diameter on request) ☐ Sealing cap ☐ Brake cover

Electrical accessories

Bridge rectifier	☐ 4-pole without stud ☐ 4-pole with stud ☐ 6-pole vertical, integrated spark suppressor ☐ 6-pole horizontal, integrated spark suppressor
Half-wave rectifier	☐ 4-pole without stud ☐ 4-pole with stud ☐ 6-pole vertical, integrated spark suppressor ☐ 6-pole horizontal, integrated spark suppressor
Spark suppressor	☐

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)

Troubleshooting and fault elimination

Fault	Cause	Remedy
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.

Declaration of Conformity/Manufacturer's Certification

CE

Lenze

Brakes and clutches

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	BFK454-☐☐ BFK457-☐☐ BFK458-☐☐ 14.442.☐☐ 14.444.☐☐ 14.448.☐☐ 14.449.☐☐ 14.450.☐☐
Permanent magnet brakes	14.118.☐☐
Electromagnetic clutches	14.101.☐☐ 14.105.☐☐
Electromagnetic brakes	14.111.☐☐ 14.115.☐☐
Clutch-brake units	14.137.☐☐ 14.138.☐☐ 14.800.☐☐ 14.810.☐☐ 14.820.☐☐ 14.830.☐☐ 14.852.☐☐ 14.853.☐☐ 14.855.☐☐ 14.856.☐☐ 14.857.☐☐ 14.862.☐☐ 14.863.☐☐ 14.865.☐☐ 14.866.☐☐ 14.867.☐☐
Applied standards and regulations:	
VDE 0470 (EN 60529)	Rotating electrical machines
VDE 0580	Electromagnetic devices

Product:	**Type:**
Rectifiers	14.630.13.☐☐ 14.630.14.☐☐ 14.630.32.☐☐ 14.630.33.☐☐ 14.630.21.☐☐☐ 14.630.22.☐☐☐
Spark suppressors	14.198.00.02 14.198.00.03
SEGC Contact	14.611.30.☐☐☐ 14.611.38.☐☐☐
Fast excitation devices	14.611.12.☐☐ 14.611.14.☐☐ 14.611.16.☐☐ 14.621.13.☐☐ 14.621.14☐☐
Electronic switch devices	14.610.11.048 14.640.10.048
Applied standards and regulations:	
VDE 0411, part 1 (EN 61010-1)	Safety requirements for electrical equipment for measurement, control and laboratory use

Hameln, July 1,1998

(i.A. Brendler)
Head of division

Declaration of Conformity/Manufacturer's Certification

Lenze

Brakes and clutches

Lenze GmbH & Co KG
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Telephone (05154) 82-0
Telefax (05154) 82-11 07

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.

Product:	**Type:**
Electromagnetically released spring-operated brakes	BFK454-□□ BFK457-□□ BFK458-□□ 14.442.□□ 14.444.□□ 14.448.□□ 14.449.□□ 14.450.□□
Permanent magnet brakes	14.118□□
Electromagnetic clutches	14.101.□□ 14.105.□□
Electromagnetic brakes	14.111.□□ 14.115.□□
Clutch-brake units	14.137.□□ 14.138.□□ 14.800.□□ 14.810.□□ 14.820.□□ 14.830.□□ 14.852.□□ 14.853.□□ 14.855.□□ 14.856.□□ 14.857.□□ 14.862.□□ 14.863.□□ 14.865.□□ 14.866.□□ 14.867.□□

Applied standards and regulations:

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

Hameln, July 1, 1998

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(i.A. Brendler)
Head of division