

INSTRUCTION MANUAL

COMBISTOP Type 38



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1 Introduction

This instruction manual provides all information required to properly operate the KEB brake and applies to the following brake types:

- COMBISTOP Type 38
 - COMBISTOP Type 38.11N
 without hand release for dynamic applications (regular rated torque)
 COMBISTOP Type 38.13N / DEN
 with hand release for dynamic applications (regular rated torque)
 COMBISTOP Type 38.11H
 without hand release for static applications (enhanced rated torque)
 COMBISTOP Type 38.13H / DEH
 with hand release for static applications (enhanced rated torque)

The type designation can be found on the type plate and/or the code number.

The instruction manual must be read, understood and applied by all persons responsible for the operation of the brake. This particularly applies to the safety instructions herein.

After reading the instruction manual, you can

- operate the brake safely,
- perform maintenance work according to regulations,
- take the corresponding measure in case of a malfunction.

Before starting to install the COMBISTOP type 38 brake, carefully read this instruction manual.

The following sections describe the functional principle, the mounting and the basic operation of the brake.

The information contained in the technical documentation, as well as any user-specific advice in spoken and written form and through tests, are made to best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third party.

Inspection of our units in view of their suitability for the intended use must be done generally by the user.

Application and use of our units in the target products is outside of our control and therefore exclusively in the area of responsibility of the user.

In addition to this instruction manual, observe all applicable legal regulations and other mandatory requirements applying to accident prevention as well as environmental protection in the country of utilisation.

Always keep the instruction manual at the site where the brake is used.



1.1 Means of Representation

For information purposes as well as to directly warn the operator of dangers, any information given in this instruction manual which needs to be strictly observed is marked as follows:







Warning - Dangerous Electrical Voltage!

This symbol is used to indicate electrical hazards.

Only qualified and authorised electricians may work on electrical equipment!

In addition, the following means of representation are used:

- Any text following this marking is considered a list.
- Any text following this marking describes the actions which need to be executed in the specified order or which are automatically executed.
- "..." Any text marked by quotation marks refers to other chapters or sections.

1.2 Safety Instructions



Note!

Carefully read the safety instructions and hazard warnings outlined in this section prior to mounting and start-up of the brake!



1.2.1 General Safety Instructions

Prior to mounting and start-up, carefully read the instruction manual, particularly observing the safety instructions and recommendations therein. Failure to comply with these instructions may result in personal injury and material damages. Furthermore, observe the state of the art as well as all applicable safety regulations and standards of the respective countries.

The spring-applied brake corresponds to the state of the art at the time of delivery and is generally safe to operate.

Only qualified personnel may transport, mount, start up, operate and maintain the brake.

Qualified personnel in the context of these general safety instructions refers to persons who are familiar with the transport, mounting, installation and commissioning of the brake as well as with the relevant standards, and who are sufficiently qualified in their field of expertise.

- Only trained personnel may commission the brake.
- Immediately put the brake out of operation in case of malfunctions. Have appropriately trained personnel or the manufacturer correct the malfunctions.
- Do not exceed the technical performance data (see section "9.1 Technical Data").
- Never use the brake in potentially explosive or aggressive atmospheres!
- The brake must not be converted, modified or misused.



1.2.2 Safety Instructions for Operation

Protective measures to be taken by the user:

- Protection against the ingress of foreign particles into the air gap. These particles may impede the movement of the armature.
- Protection against dangerous temperatures at the magnet of the brake.
 High temperatures may cause the torque to decrease.
- Protection against accidental contact with rotating or moving parts, i. e., protection against being crushed or caught.
- Never use the brake in potentially explosive or aggressive atmospheres!
- Protection against electric shock by installing a protective earth conductor between the magnet and the fixed installation incl. standardised inspection of the protective earth conductor connection to all exposed metal parts.
- Measures against freezing and/or formation of ice on the friction surfaces and the resulting loss of torque.
- The movement of the armature must not be impeded by the ingress of foreign particles into the air gap. If necessary, dust protection rings (accessories) are to be used or other protective measures are to be taken.
- Air humidity, aggressive vapours/liquids or the like may lead to corrosion and cause the lining to stick. In this case, the user needs to provide appropriate measures!

1.2.3 Safety Instructions for Maintenance

Protective measures to be taken by the user:

- Secure the brake against being switched on accidentally during maintenance work.
- When working on the brake, disconnect the brake from load to avoid uncontrolled movements!
- Protection against the ingress of foreign particles into the air gap. These particles may impede the movement of the armature.
- When carrying out maintenance and repair work, the brake must not be energised!
- The lining must not come into contact with cleaning agents or solvents.

1.2.4 Permissible Friction Work

When operating the brakes, adhere to the friction work values specified in the KEB catalogue "Electromagnetic Technology" taking the frequency of operation and the speed into account. Exceeding these specifications may result in thermal overload of the lining and a strong decrease in braking torque.

1.2.5 Special Risks when Using the Brake

The brake has been designed and built in accordance with the state-of-the-art technology and recognised safety regulations. Nevertheless, the following residual risks exist when using the brake:



Danger - Rotating Parts!
The brake is used to decelerate rotating axes.
There is a risk of body parts being caught or crushed. Depending on
installation, provide safety measures against being caught or crushed!Warning!Warning - Hot Surface!
The heat generated during the operation of the brake causes the
surfaces to heat up!
Due to the risks arising therefrom, always use appropriate personal
protective equipment when operating the brake (see section
"1.2.7 Personal Protective Equipment").

Always observe the safety information and/or warnings on the brake and in this instruction manual!

1.2.6 Risks Caused by Electric Power

- Only an electrician may work on the electrical power supply.
- The electrical equipment of the brake (connecting cable, upstream rectifier) needs to be checked by an electrician for proper functioning and defects such as, for example, loose connections or burned cables, at regular intervals. Have the defects remedied immediately.
- If work needs to be done on live parts, ask a second person to switch off the main power supply switch in case of emergency. Cordon off the working area with a redwhite safety chain and put up warning signs. Only use insulated tools.

1.2.7 Personal Protective Equipment

When using the brake, use the following personal protective equipment:

- long-sleeved protective clothing,
- safety gloves,
- safety shoes,
- safety goggles.

The personal protective equipment is to be provided by the operating company and must comply with the applicable requirements.

1.3 Obligation of the Operating Company

The operating company shall be obliged to

- only have personnel working on the brake who are familiar with the basic regulations applying to occupational health and safety as well as accident prevention and who have been instructed on the operation of the brake,
- instruct the personnel on the safe operation of the brake at regular intervals,
- provide the personal protective equipment required to operate the brake.

COMBISTOP Type 38



1.4 Obligation of the Personnel

All persons who are entrusted with the work on the brake shall be obliged to - before starting work -

- observe the basic regulations applying to occupational health and safety as well as accident prevention,
- read the safety instructions and warnings of this instruction manual and to confirm by signature to have understood them.

1.5 Specified Application

The operational reliability of the brake is only guaranteed when used according to specified application. In this context, specified application means that the brake is used for the ordered and confirmed purpose.

Any other use is considered a breach of specified application. It may pose unforeseeable risks and is solely and exclusively the responsibility of the operating company.

Any use beyond the technical specifications is also considered as not specified.

The actual use of the brake in the target products is beyond Karl E. Brinkmann GmbH's control and, therefore, shall be exclusively within the operating company's responsibility.



1.6 Guarantee and Liability

Our Terms and Conditions of Sale and Delivery shall exclusively apply to guarantee and liability. Any defects are to be reported to Karl E. Brinkmann GmbH immediately upon discovering them.

Guarantee and liability claims for personal injury and material damages shall be excluded if these were caused by one or more of the following causes:

- not specified or improper use of the brake,
- improper mounting, start-up, maintenance and cleaning of the brake,
- failure to observe the notes and/or instructions given in the instruction manual with regard to mounting, start-up, operation, maintenance and cleaning of the brake,
- structural modifications of the brake: The brake must not be converted or otherwise modified without the prior written consent of the manufacturer. The brake's EC Declaration of Conformity becomes invalid and liability claims against Karl E. Brinkmann GmbH will be rejected on grounds including failure to observe the stipulations listed above,
- improperly performed repairs,
- emergencies/disasters, catastrophic events beyond human control and force majeure.



2 Product Description

2.1 Overview/Parts List



- A size 02 to 06
- B size 07 to 11
- 1 magnetic system
- 1.1 magnet
- 1.2 adjusting spacer
- 1.3 armature
- 2 hub
- 3 lining
- 4 friction disc (optional)
- 5 flange (optional)
- 6 hand release (optional)
- 7 dust protection ring (optional)



2.2 Functional Description

The COMBISTOP type 38 brake is an electromagnetically actuated dual-surface spring-applied brake for dry running.

The braking force is generated in de-energised state by pressure springs which press the armature and the lining against the friction surfaces. The lining is twist-proof but can be axially moved while connected to the shaft.

After applying the nominal DC voltage, the coil inside the magnet creates a magnetic field which attracts the armature against the spring force. In this way, the linings are released and the shaft can rotate freely.

After disconnecting the voltage, the armature is de-energised. The pressure springs press the armature against the linings which generate the braking torque on the friction surfaces. This allows for decelerating downstream elements.

Using the optional hand release, the brake can be manually opened even in the event of a malfunction (see section "5.1 Actuating the Hand Release").

2.3 Safety Devices

2.3.1 Micro Switch (Option)

A micro switch can be used to monitor the switching state of the armature (brake open/closed). The user is responsible to connect the electrical equipment and to evaluate the signals! The drive control must not allow the motor to start until the armature was attracted by the magnet, i. e., the lining can rotate freely.

For more information on how to install and set the micro switch, refer to section "4.1.4 Micro Switch (Option)".



3 Transport and Storage

The brake is delivered to the customer by a transport company that has been authorised by the manufacturer.

3.1 Inspections on Acceptance by the Recipient

The brake is delivered to the customer in a cardboard packaging. On arrival at the customer's premises, the brake needs to be checked for visible transport damages.

 Immediately report the transport damages to the transport company and the manufacturer.

3.2 Notes on Transport

Depending on its design and weight (see section "9.1 Technical Data"), the brake must be lifted and transported using appropriate lifting devices.

3.3 Packaging

The packaging used to transport and protect the brake is normally made of cardboard.



Dispose of the packaging material according to the local regulations and/or make sure that the packaging material is reused in an environmentally responsible way!

3.4 Storage Instructions for Temporary Storage

If the brake is not installed immediately upon delivery or if the brake is not used in the meantime, it must be properly stored in a dry place. The brake must be stored temporarily so that neither dust nor moisture nor corrosive vapours can enter the brake.



Note!

Note!

In case of improper storage, no liability is assumed for resulting damages!



4 Mounting and Start-up

4.1 Mounting



Note!

The numbers given in the description below refer to the figure listed in section "2.1 Overview/Parts List".

4.1.1 Notes on Mounting

Inspections to be Done Prior to Mounting the Brake

Before mounting the brake, check the following:

- compliance of the ordered voltage and performance data with the type plate data
- no damage to the brake or contamination by foreign particles in the area of operation or in the air gap of the brake
- Provide a suitable second friction surface. Even friction surfaces made of cast iron or steel are best suited for use. The surface roughness R_z should not exceed 25 µm. Avoid sharp-edged interruptions in the friction surface. If such a surface is not available, a friction disc or a flange (available as an accessory) can be used.
- The friction surfaces must be free from grease and oil.
- Air humidity, aggressive vapours/liquids or the like may lead to corrosion and cause the lining to stick. In this case, the user needs to provide appropriate measures!
- The brake must be de-energised when being mounted.

Instructions to Be Observed during Mounting

During mounting, please observe the following notes/instructions:

- The friction surfaces of the brake must not come into contact with oil, grease, water or other fluids. Any contamination will result in loss of torque.
- Never use aggressive fluids (for example, cleaning agents) or the like to clean the brake.
- When mounting the hub and the magnetic system, the teeth of the hub and the lining must not be damaged.
- The lining must be easily movable on the hub.
- The movement of the armature must not be impeded by the ingress of foreign particles into the air gap. If necessary, dust protection rings (accessories) are to be used or other protective measures are to be taken.
- The eccentricity of the mounting hole circle relative to the shaft end must not exceed the following values: Size 02: 0.2 mm; Size 03 to 06: 0.4 mm; Size 07 to 10: 0.5 mm; Size 11: 0.6 mm.



 The angular deviation of the mounting surface relative to the shaft must not exceed the following values: Size 02 to 03: 0.04 mm; Size 04 to 05: 0.05 mm; Size 06 to 07: 0.06 mm; Size 08 to 10: 0.08 mm; Size 11: 0.1 mm (in relation to the mounting hole diameter).

4.1.2 Mounting the Brake

The following overview shows a detail of the fully assembled brake depending on its design; i. e., with flange or with friction disc:

Brake with Flange and Dust Protection Ring







• If necessary, install the optional components such as friction disc, flange and dust protection ring (4, 5 and 7) on the motor bearing assembly.



Step 1: Installing the Hub

Install the hub (2) on the motor shaft, then secure the hub on the motor shaft axially.

The hub and the linings must not be damaged!





Make sure that the hub cannot run against the second friction surface. Taking into account the axial play of the shaft, a distance of 0.5 mm to 1 mm is recommended.



Step 2: Mounting the Lining Slide the lining (3) onto the hub. While doing so, be careful not to

While doing so, be careful not to damage the lining by misaligned or tilted positioning. The lining must be easily movable on

the hub!



Step 3:

Mounting the Magnetic System

Slide the fully assembled magnetic system (1) over the hub and the lining. While doing so, make sure that the lining is easily movable. Use three socket head screws to fasten the magnetic system. In this process, use a feeler gauge to check the air gap X (in de-energised state) (see figure below).



Notes on Socket Head Screws!

To attach the magnetic system, we recommend using socket head screws of property class 8.8 which should be tightened with the tightening torques recommended by the manufacturer.





Checking the Air Gap X Use a feeler gauge (F) to check the air gap X as described in section "7.3.1 Checking the Air Gap". If the air gap X is larger than X_n, the air gap must be readjusted. To this end, follow the instructions in section "7.3.2 Readjusting the Air Gap".

Size	02	03	04	05	06	07	08	09	10	11
Design	N/H									
Nominal air gap										
Х	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6
[mm]										

For more information on how to check the air gap which becomes larger as a result of wear and how to readjust the air gap, refer to section "7.3 Maintenance Work".

4.1.3 Mounting the Hand Release (Option)

This section describes the subsequent mounting of the optional hand release to the brake.



Note!

The type of hand release attachment to the brake may vary depending on the ordered design (N/H) and size of the brake.

For information on the components (items 1 to 10) to be used for installation, refer to the exploded assembly drawing and the table on the next page.



	Size	02	03	04	05	05	06	06	07	08	09	10
	Design	N/H	N/H	N/H	Ν	Н	Ν	Н	N/H	N/H	N/H	N/H
Item	Designation											
1	hand release bracket	1x										
2	handle	1x										
3	hexagon head screw	2x										
4	pressure spring	2x										
5	locking plate	2x	2x	2x	2x		2x					
6	disc					2x		2x	2x	2x	2x	2x
7	disc	2x										
8	hexagon nut	2x										
9	coiled spring pin									2x	2x	2x
10	eye bolt									2x	2x	2x
'm'	adjustment dimension [mm]	0.8	1.0	1.4	1.5	1.5	1.8	1.8	2.0	2.0	2.3	2.7





- Screw the handle (2) onto the hand release bracket (1).
- Depending on the design and size of the brake (see table), slide the screws along with the discs and springs (3) to (10) through the provided holes in the magnet, armature disc and hand release bracket (1) as shown in the drawing.
- Use the disc (6 or 7) to secure the hand release bracket, then tighten it using selflocking hexagon nuts (8).



Loss of Braking Efficiency!

For the safe operation of the brake, the correct adjustment / inspection of the adjustment dimension 'm' is mandatory!

Improper adjustment and operation with overexcitation may result in loss of braking efficiency!

Checking the Adjustment Dimension 'm'

The adjustment dimension 'm' must be adjusted with attracted armature!



Note!

The adjustment dimension 'm' (see table on page 15) applies to rated torque and operation with rated voltage. In case of different operating conditions, please consult the manufacturer.

4.1.4 Micro Switch (Option)

A micro switch can be used to monitor the switching state of the armature (brake open/closed). The user is responsible to connect the electrical equipment and to evaluate the signals! The drive control must not allow the motor to start until the armature was attracted by the magnet, i. e., the lining can rotate freely.

The micro switch is factory-mounted to the brake as well as factory-set and secured.



Brake Malfunction!

Changing the settings of the micro switch may cause drive / brake malfunctions.

Warning!

In the event of any malfunction affecting the switching function, check the micro switch settings and, if necessary, replace the micro switch (see sections below).



4.1.4.1 Replacing the Micro Switch



Loss of Braking Efficiency!

Before replacing the micro switch, mechanically secure the load against unintended movements and disconnect the brake from load!

Warning!



- 1 micro switch
- 2 socket head screw
- 3 disc
- 4 hexagon head screw
- 5 hexagon nut

Dismounting

- Remove the two socket head screws (2).
- Remove the micro switch (1).

Mounting

- The micro switch is mounted in reverse order.
- Connect the micro switch according to the following connection diagram:



Connecting the Micro Switch

Connect the micro switch as a normally open contact (terminal 1 and 4).



- Strands for the Micro Switch 1 = ground (black) 2 = normally closed contact (brown)
- 4 = normally open contact (red)

• After installation, check the switching point of the micro switch. If necessary, readjust the micro switch (to this end, refer to the next sections).

4.1.4.2 Checking the Micro Switch Settings



Loss of Braking Efficiency!

Before checking the micro switch settings, mechanically secure the load against unintended movements and disconnect the brake from load!

By repeatedly switching the brake, check the two switching states:

- Brake energised: ON signal (micro switch closed)
- Brake de-energised: OFF signal (micro switch open)



4.1.4.3 Readjusting the Micro Switch



Loss of Braking Efficiency!

Before readjusting the micro switch, mechanically secure the load against unintended movements and disconnect the brake from load! The micro switch is adjusted with mounted but de-energised brake and preset air gap X.



Loosen the hexagon nut (5).

Turn the hexagon head screw (4) towards the micro switch (1) until it contacts the micro switch tappet.

Connect the measuring instrument to terminal 1 and 4 (normally open contact) of the micro switch. Turn the hexagon head screw (4) towards the micro switch (1) until the normally open contact is closed (ON signal).

Turn back the hexagon head screw (4) until the normally open contact opens again (OFF signal). Lock the hexagon head screw (4) with the hexagon nut (5).

• Check the setting again as described in section "4.1.4.2 Checking the Micro Switch Settings".

If the ON signal does not properly switch to the OFF signal, repeat the readjustment of the micro switch.



4.1.5 Electrical Connection

The COMBISTOP Type 38 brake is delivered with factory-preassembled connecting cables and factory-set micro switch (option) for position monitoring. The signals (ON/OFF and/or brake open/closed) are evaluated by the customer.

	Warning - Dangerous Electrical Voltage! Only qualified and authorised electricians may work on the electrical equipment when disconnected from the power supply (mounting, maintenance and repair)!
Danger!	Before each start-up, check the electrical equipment for visible defects such as, for example, loose connections or damaged insulations at the connecting cable! These must not come into contact with water or other liquids. Have an electrician remedy the defects immediately!



Risk of Damage to the Brake!

Before connecting the electrical equipment, the available supply voltage needs to be compared to the operating voltage of the brake! The brake must be operated with nominal DC voltage.

If no nominal DC voltage is available, it can be supplied by a rectifier.

• The supply voltage can be found on the drawings and the type plate. For more information on how to connect and switch the electrical equipment (also in connection with a rectifier), refer to the sections below.

The brake can be switched off on the DC side or on the AC side. Switching off on the DC side reduces the connection time, i. e., the period of time until the torque is reached.



Risk of Damage to the Brake!

When switching off the brake, voltage peaks might occur which could damage the brake or other units. Therefore, provide a protective circuit!

The protective circuit leads to longer connection times!



4.1.5.1 Connecting the Brake



COMBITRON rectifier manuals.

To connect the brake to an AC voltage source, a rectifier needs to be installed upstream of the brake. For more information in rectifiers, refer to the separate

AC Side Switching

Prior to start-up, attach the jumper according to the following figures [1] to [2].



Risk of Damage to the Brake!

For frequency converter operation, the wiring according to figure [2] and [3] is not allowed.

Caution!

For cables longer than 10 m between rectifier and brake, an appropriate switch is mandatory (figure [1]).

The voltage supply must not be picked off downstream of the motor contactor (figure [2]).





DC Side Switching



Risk of Damage to the Brake!

Switching takes place between rectifier and magnet. The rectifier is protected against the voltage peaks resulting from the switching.

The maximum permissible switching frequencies depend on the size of the brake (see catalogue).



Figure [4] shows the simultaneous switching on DC and AC side. This switching method guarantees the shortest disconnecting times and reduces the contact erosion.



4.2 Initial Start-up

4.2.1 Inspections prior to Start-up of Brake

Prior to start-up, check the following:

- Does the ordered voltage and performance data match the type plate data?
- Is the brake damaged or have foreign particles contaminated either the area of operation or the air gap of the brake?
- Check the release function of the brake by switching the brake (brake closed, brake open).



Loss of Braking Efficiency!

If the brake is damaged or contaminated, or if the switching function can no longer be guaranteed, the brake must not be put into operation.

4.2.2 Notes on Running-in Process



Limited Braking Efficiency!

The nominal braking torques are not reached until the running-in period is completed. The braking torques depends on the running-in state of the brake.

To reach the nominal braking torques, the emergency stop function must be actuated multiple times before operating the brake for the first time.

In most cases, we recommend using the motor rotating mass for five emergency stops at 1500 rpm.



5 Operation

5.1 Actuating the Hand Release

As an option, the brake can be equipped with a hand release.



Loss of Braking Efficiency!

Before actuating the hand release, mechanically secure the load against unintended movements! Secure the elevator car against falling down.

In the event of malfunctions, the brake can be actuated using the hand release. To this end, proceed as follows:



Steadily pull the hand release lever (1) in the direction of the arrow (2) until the brake is released.



6 Malfunctions

6.1 Safety Instructions

Danger!	Warning - Dangerous Electrical Voltage! Only authorised electricians may work on the electrical equipment of a machine! Before working on the machine, switch off and disconnect the power supply.
	Before working on the brake, mechanically secure the load against unintended movements and disconnect the brake from load!
Caution	Warning - Hot Surface!
	The heat generated during the operation of the brake causes the surfaces to heat up!



6.2 Troubleshooting

Malfunction	Cause	Measures
brake does not release	incorrect voltage	Only operate the brake with the correct voltage (see type plate of the brake).
	rectifier failed	Replace the rectifier.
	air gap too large, maximum air gap reached	Replace the lining.
	foreign particles between	Remove the foreign particles. Use
	armature and lining	non-greasing cleaning agents to clean the brake.
	magnet coil or connecting cable defective	Replace the brake.
	excessive heating	Install a high-speed circuit breaker (for example, KEB Powerbox).
no braking function	damaged teeth impede movement of armature	Replace the lining and the hub.
	friction surfaces contaminated	Clean the friction surfaces, replace if necessary.
brake operates with delay, long connection time	brake is switched on AC side	Switch the brake on DC side.
micro switch does not switch	The setting point of the micro switch has been changed due to external influences.	Check the micro switch and, if necessary, readjust or replace the micro switch. To this end, refer to section "4.1.4 Micro Switch (Option)".



Note!

If further malfunctions occur, please contact the after-sales service of Karl E. Brinkmann GmbH or return the brake to Karl E. Brinkmann GmbH.



7 Maintenance and Cleaning

7.1 Safety Instructions

- In addition, please observe the safety instructions listed in section "1.2 Safety Instructions".
- When maintaining or cleaning the brake, disconnect the brake from load to avoid uncontrolled movements!
- There is a risk when touching live wires!
- Prior to maintenance and cleaning work, switch off the machine and disconnect the power supply.
- When carrying out maintenance and repair work, the brake must not be energised!
- Air humidity, aggressive vapours/liquids or the like may lead to corrosion and cause the lining to stick. In this case, the user needs to provide appropriate measures!
- Always use the stipulated personal protective equipment when working (see section "1.2.7 Personal Protective Equipment").
- Protect electrical and electronic components from splash water.

7.2 Maintenance Intervals

The COMBISTOP brakes are almost maintenance-free. As a result of wear occurring during operation, the air gap increases. The function of the brake can only be ensured when the air gap X is checked at regular intervals (see section "7.3.1 Checking the Air Gap").

If a value larger than X_n is measured (see table on next page), the air gap must be readjusted (see section "7.3.2 Readjusting the Air Gap").

If, despite readjustment, the air gap cannot be adjusted to the required dimension, the linings must be replaced (see section "7.3.3 Replacing the Lining").

Furthermore, the teeth of the lining and the hub must be checked. Worn parts must be replaced.



7.3 Maintenance Work

7.3.1 Checking the Air Gap

The brakes are delivered ex works with pre-set air gap X (nominal air gap) ready for installation. As a result of wear, the air gap increases. To ensure proper functioning, the air gap X needs to be checked at regular intervals:

Checking the Air Gap X



Use a feeler gauge (F) to check the air gap X.

If the air gap X is larger than X_n , the air gap must be readjusted. To this end, follow the instructions in section "7.3.2 Readjusting the Air Gap".



	Nominal air gap X [mm]	Maximum permissible wear V [mm]	Readjustmen t required when X _n [mm]		Minimum permissible lining thickness g _{min} [mm]	R [mm]
Design/ size	N / H	N / H	N	Н	N / H	N / H
02	0.2	2.0	0.4	0.4	5.5	0.5
03	0.2	1.5	0.5	0.4	6.5	1.5
04	0.2	2.5	0.6	0.5	8.0	1.5
05	0.2	2.0	0.8	0.7	10.0	2.0
06	0.3	2.0	0.9	0.8	10.0	2.0
07	0.3	4.0	1.0	0.9	10.0	-
08	0.4	5.0	1.2	0.9	11.0	-
09	0.4	6.0	1.4	1.1	12.0	-
10	0.5	8.0	1.5	1.3	14.0	-
11	0.6	8.0	1.5	1.3	22.0	-



7.3.2 Readjusting the Air Gap



Loss of Braking Efficiency!

Before readjusting the air gap, mechanically secure the load against unintended movements and disconnect the brake from load! The air gap is readjusted when the brake is de-energised.



Note!

The numbers given in the description below refer to the figure listed in section "2.1 Overview/Parts List".



Loosen the three socket head screws. Turn the adjusting spacers (1.2) to readjust the air gap according to the table listed in section "7.3.1 Checking the Air Gap". Make sure that all locations (adjusting spacers) are adjusted equally. Retighten the three socket head screws. Check the air gap again and, if necessary, repeat the procedure.



Loss of Braking Efficiency!

If the minimum permissible lining thickness g_{min} cannot be reached, the switching function is no longer guaranteed or the rated torque is no longer reached.

This procedure can be repeated until the lining has reached its minimum permissible lining thickness g_{min} . When reached, the lining needs to be replaced (see section "7.3.3 Replacing the Lining").

• After checking the air gap X and tightening the socket head screws, the brake is ready for operation.



7.3.3 Replacing the Lining



Loss of Braking Efficiency!

Before readjusting the air gap, mechanically secure the load against unintended movements and disconnect the brake from load! The air gap is readjusted when the brake is de-energised.

Caution!	 Loss of Braking Efficiency! Prevent damage to the hub by all means. Be careful not to damage the lining by misaligned or tilted positioning. The lining must not come into contact with cleaning agents or solvents. As a general rule, contaminated linings must be replaced. When cleaning components (for example, flange, armature), this note must be observed without fail! 	
	note must be observed without fail!	
Caution!	 Prevent damage to the hub by all means. Be careful not to damage the lining by misaligned or tilted positioning. The lining must not come into contact with cleaning agents or solvents. As a general rule, contaminated linings must be replaced. When cleaning components (for example, flange, armature), this note must be observed without fail! 	



Note!

The numbers given in the figures below refer to the figure listed in section "2.1 Overview/Parts List".

- Disconnect the connecting cable(s) from the power supply.
- If necessary, remove the fan from the shaft (to this end, refer to the instruction manual of the motor).



Dismounting the Magnetic System

Remove the three socket head screws. Remove the magnetic system (1).





Replacing the Lining

Remove the lining (3) from the hub (2). Slide the new lining onto the hub. While doing so, be careful not to

damage the lining by misaligned or tilted positioning!

The lining must be easily movable on the hub!The teeth of the hub and the lining must not be damaged!

- The brake is mounted in reverse order of mounting (see section "4.1.2 Mounting the Brake").
- Check the air gap X and, if necessary, readjust the air gap (see sections "7.3.1 Checking the Air Gap" and "7.3.2 Readjusting the Air Gap").

Notes on Recommissioning

Prior to the start-up of the spring-applied brake, check the following again!

- Check the brake function by switching the voltage on and off (brake closed, brake open).
- No damage to the brake or foreign particles in the area of operation.
- To reach the rated torques, the running-in period must be completed prior to startup (see section "4.2.2 Notes on Running-in Process").



7.4 Notes on Cleaning

When cleaning the brake, observe the following notes/instructions:

As a general rule, contaminated linings must be replaced.

Loss of Braking Efficiency!

The friction surfaces must not come into contact with cleaning agents or solvents, grease, oil, water or other fluids. This results in loss of torque.

When cleaning components (for example, flange, armature), this note must be observed without fail!



Warning!

Warning - Hot Surface!

The heat generated during the operation of the brake causes the surfaces to heat up!

Caution!

Due to the risks arising therefrom, always use appropriate personal protective equipment when operating the brake (see section "1.2.7 Personal Protective Equipment").



8 Dismounting and Disposal

8.1 Dismounting

The brake is dismounted in reverse order of mounting (see section "4.1 Mounting").

8.2 Disposal



Note!

Separated according to the materials used, dispose of the electromagnetic brake components in compliance with the applicable local environmental regulations.

The corresponding key numbers are subject to change depending on the disassembling process (metals, plastics and cables).

The components can be disposed of as follows:

Magnet with coil, cables and all other steel parts:					
steel scrap	(Key No.: EAK 12 01 02)				
Aluminium components:					
nonferrous metals (this includes copper)	(Key No.: EAK 16 01 18)				
Lining (incl. steel or aluminium beams):					
brake linings	(Key No.: EAK 16 01 12)				



9 Annex

9.1 Technical Data

Weight		
	XX.38.11N-XXXX	XX.38.13N/23N/DEN/
		DEH-XXXX
Size:	Approx. inertia	of the brake [kg]
02	1.0	1.1
03	1.5	1.6
04	3.0	3.1
05	4.6	4.8
06	7.2	7.4
07	10.5	11.2
08	16.8	17.8
09	26.5	28.0
10	40.0	41.7
11	85.0	85.0



Note!

For more information on technical data such as, for example, dimensions, rated torques, power input, etc., please refer to the product catalogue/drawings.