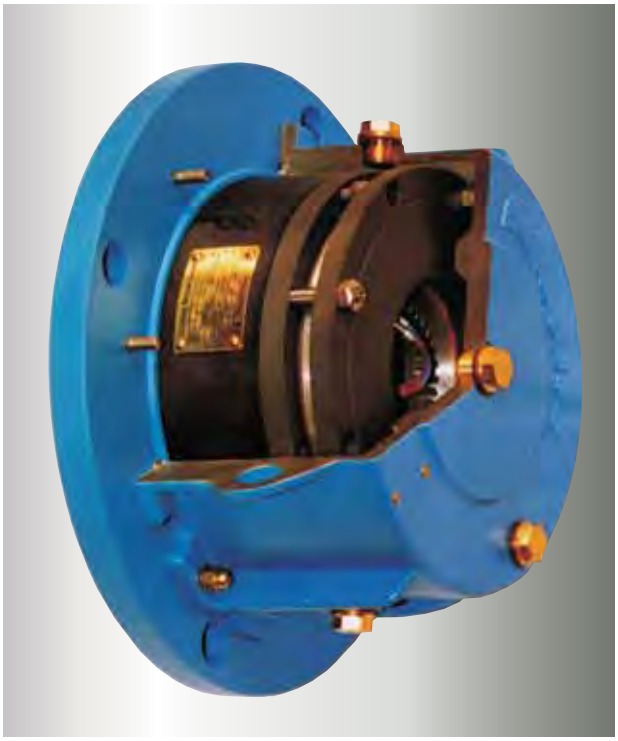
Stromag Dessau
safety in motion

Service Instruction

4 BZFM



Electromagnetic-
Double - Face
Spring - Applied Brake

These operating instructions are intended to enable the user to operate the Stromag Dessau product safely and effectively, to use it sensibly and to maintain it properly so as to exclude the possibility of any damage or incorrect operation.

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Service Instructions **4 BZFM** Stromag Dessau

IP 67 (IP 66)

safety in motion

Electromagnetic Double - Face Spring - Applied Brake

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1 Technical data

1.1 Nameplate data

The following data is stated on the nameplate. It is provided on the front side of the brake.

Type	
Article code	
Serial nr.	
Nominal torque	Nm
Nominal voltage	V DC
Idling speed switching speed	min^{-1}
Nominal current	A
nominal braking capacity	kW
Air gap “on”	mm
Air gap “off”	mm
Thermical class	
Protection classes	
Mass	kg

This data must comply with the identifications of the order acknowledgement.

1.2 Torque, speed, and other technical data

table 1

Size 4 BZFM	M_{dyn} Nm	M_{stat} Nm	n_0 min^{-1}	n_{zn} min_{-1}	U_n * V-DC	P_k W	Airgap min/max	W kJ	P_{VN} kW	J $kgcm^2$	m kg
6,3	63	69	6000	3300	110	110	0,4/1,2	80	0,16	12	23
10	100	110	6000	3000	110	122	0,4/1,2	100	0,21	19	32
16	160	175	6000	2700	110	142	0,4/1,2	120	0,26	26	40
25	250	275	5500	2100	110	164	0,4/1,2	150	0,31	50	60
40	400	440	4700	1800	110	214	0,4/1,5	220	0,38	133	73
63	630	690	4000	1500	110	249	0,4/1,8	300	0,46	271	98
100	1000	1100	3600	1300	110	332	0,5/2,1	350	0,57	366	135
160	1600	1750	3200	1100	110	403	0,5/2,4	400	0,7	600	205
250	2500	2750	2800	1000	110	530	0,5/2,8	590	0,85	1266	275
400	4000	4400	2400	1000	110	675	0,5/2,8	698	0,85	2670	380

* other voltages on request

M_{dyn}	dynamic torque (friction torque, nominal value for working brake) applies to dry operation with an oil- and grease-free friction lining after running-in
M_{stat}	static torque (torque of adhesion)
n_o	maximum idling speed
n_{zn}	nominal switching speed
P_k	excitation output at 20°C
P_{vn}	nominal braking capacity (S4-40% I.O.)
W	switch work per switching operation for z = 1-5 h^{-1}
J	mass moment of inertia of rotating parts
m	weight with smallest flange
Protection class	IP 67 in accordance with DIN 40050 in the installed state
Mode of operation	S1, S2, S4 - 40% I.O.
Thermical class	155 (F) in accordance with DIN VDE 0580
AC control	via rectifier with the modules type BG 270, EGV 500

The main parameters of the brakes are also given on the identification plate.

Admissible torques and other technical data are given in table 1.
Any technical parameters deviating from the values given in the table may be requested from the manufacturer or form part of the order acknowledgement.

1.3 Bore and keyway dimensions, connections

The connecting dimensions correspond to the IEC standard and DIN 42948, the fitting key dimensions to DIN 6885 sheet 1.

1.4. Field of application and utilization as per specification

a) on ships
on deck at gypsy winches, windlasses, shipboard cranes, cargo winches and trawler winches.

b) in docks
in harbour cranes, container loading facilities for crane, hoisting and trolley travel gears.

c) in rolling mills, metallurgical factories, cement mills and in mining.

Operating conditions:

Protection class IP 67 in accordance with DIN 40050 (VDE 0470) protected against water jets and flooding.
Electrical design of brakes in accordance with DIN VDE 0580 in thermical class 155 (F).
The brake corresponds to Directive 93/68/EEC (Low Voltage Directive).
The Directive 89/336/EEC (EMC) must be ensured by the user, taking into account the instructions given by the manufacturer.
The products are marked accordingly.
Mode of operation S1, S2, S4.
Horizontal installation. Vertical operation after consultation with manufacturer.

With the friction combination steel/ organic friction lining the brake may only be used for dry running under the conditions described in Chapters 7.1 and 7.3.
In addition, compliance with the assembly, dismantling, commissioning and maintenance conditions specified by the manufacturer must be ensured.
Non-compliance with these conditions or any use beyond this shall be deemed use not in accordance with the specification.
The manufacturer shall not be liable for any such use, the risk shall be exclusively borne by the user.
If the brake is to be used outside this contractual scope of operation, contact Stromag Dessau for further details (Address see Chapter 10.3).

2 Safety guidelines

2.1 Symbol for safety at work

This symbol denotes all the safety instructions in this manual which deal with danger to life and limb of personnel. These instructions must be adhered to and particular caution exercised in these cases. All users must be familiarised with the safety instructions.

2.2 Instructions **Caution!**

The term "Caution!" denotes those sections in this manual which require special attention, in order that the guidelines, recommendations and correct procedures are complied with to prevent damaging or destroying the brake.

2.3. Safety during operation

The following recommendations are of particular importance:
The brake has been manufactured to the highest up to date standard and is operationally safe.
However, the brake can become a risk to safety when used improperly by untrained personnel or for an application it is not designed for.
Every person involved in assembling, disassembling, commissioning, operating and maintaining (inspecting, servicing and repairing) the brake must be authorised, adequately trained and instructed. Each such person must have read and understood this instruction manual, especially in respect to the safety instructions.
We do not accept liability for damage or malfunctioning, resulting from non - adherence to this manual.
Repair and maintenance works must be carried - out by skilled and trained workmen only meeting the minimum requirements for aptitude and qualification according to DIN VDE 1000-10.
Any work process involving the brake which impairs safety is to be avoided.
The user is obliged to inform the supplier immediately of any change occurring to the brake which adversely affects safety; address see chap. 10.3.
The user is obliged to only operate the brake when it is functioning correctly.
Unauthorised changes and modifications which impair safety, as well as the use of non - authentic components are not permitted.
To exclude any danger to people, domestic animals and goods by parts in motion, the user has to take protective measures according to DIN 31000 / VDE 1000.

As protection against hazardous shock currents, the user has to take protective measures according to DIN VDE 0100 - 410 and DIN EN 50274.

To avoid dangerous influences due to heating of the units and in case of a failure, the user has to take suit-able protective measures according to DIN 31000 / VDE 1000 and DIN VDE 0100 - 420.
To exclude any danger to people, domestic animals and goods by direct or indirect effect of electromagnetic fields, the user has to take suitable measures according to DIN V VDE V 0848-4/A3.

Caution! In every case the local safety and accident prevention regulations are also applicable, the user must ensure that these are complied with.

We reserve the right to make modifications of a technical nature to this manual if required for brake development.
We recommend that these instructions are incorporated into the service manual of the user (machine manufacturer).

2.4 Electromagnetic Compatibility

The Electromagnetic Compatibility of Equipment Act (EMVG) demands to meet defined protective requirements when using electrical equipment so that this equipment can operate in its electromagnetic environment without mutual impairment of function.
Machine manufacturers, system and plant constructors must assure that the product is installed as required and that the installation of the pertinent current supply is made correctly in order to adhere to the protective requirements of the EMVG.
Please inquire our leaflet "EMC - notes", No. 900 - 00001 at Stromag Dessau GmbH; address as per chap. 10.3.

3 Transportation

3.1 Packing

The type of packing complies with the agreements with the orderer as stated in the order acknowledgement. If no type of packing has been agreed, it depends on the transportation route. The symbols marked on the packing must be adhered to.

3.2 Pre-mounting conditions

The brakes will be supplied completely mounted and with all settings made. The pinion (05) is supplied as a loose part. The sealing ring (31) according to figure 1 will be supplied as a loose part. The user shall select the fastening screws in accordance with the flange thickness and the counterpart.

3.3 Sensitivity

Caution!

Make sure to avoid damage as a result of shocks or impacts during transportation. Special care should be exercised with regard to the axial connecting cable. For **direct** transportation and assembly of the brake there is a support hole in the cover (11), see figure 1.

Caution!

The support hole shall **not** be used for transport and for mounting of the unit motor and flanged brake. Make sure to avoid the generation of condensation water as a result of strong temperature fluctuations.

3.4 In - process stocking

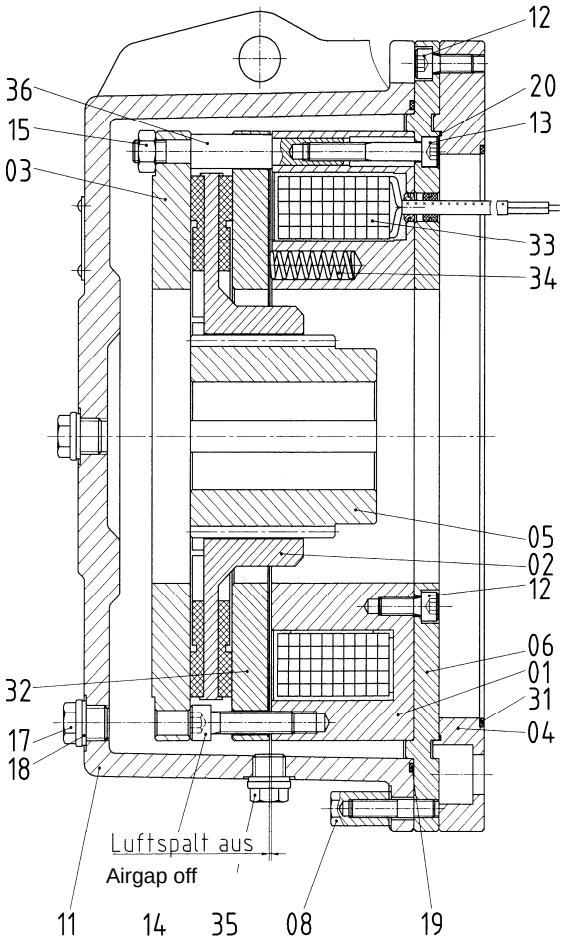
All parts are made of stainless material or are provided with a surface protection by gas nitro carburizing. In addition they are primed with a zinc phosphate painting.
Bore and keyway of the driving hub (05) are supplied greased.
Should it be intended to stock the brake in - process, another protection against corrosion has to be provided. Please consult our after - sales service (address given in chapter 10.3).

3.5 Delivery extent

On receipt check the consignment for completeness (see packing list).
Possible damage during transportation and/or missing parts must be advised immediately and in writing.

4. Setup, mode of operation and constructional characteristics

4.1 Designation of individual components



01	coilbody
02	friction disc (carrier with friction lining)
03	brake disc
04	flange
05	pinion
06	intermediate flange (with smallest flange per size only)
08	cup nut
11	cover
12	hexagonsocket screw for flange
13	hexagonsocket screw for intermediate flange
14	release screw for emergency release
15	hexagon nut for brake disc
17	cap screw for emergency release
18	seal for (17)
19	seal between cover and intermediate flange or flange
20	seal between intermediate flange and flange
31	sealing ring
32	armature disc
33	coil
34	compression spring
35	cap screw for air gap measurement
36	guiding studs

Fig.1

4.2 Function and design characteristics of the standard version

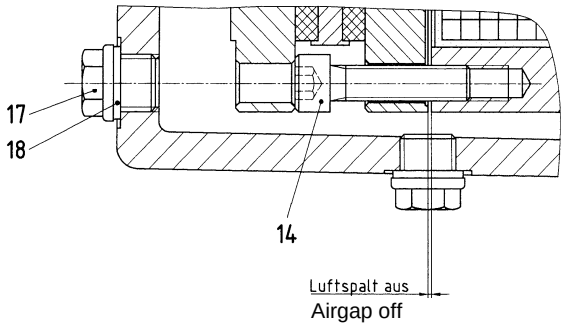
The brake 4 BZFM is a spring-loaded electromagnetic double-face brake which brakes without current and is released electromagnetically.
The brake type 4 BZFM meets highest requirements with regard to fatigue strength and robustness and is seawater-proof. The brakes are manufactured and tested in accordance
with DIN VDE 0580. Approval certificates are deposited with **Germanischer Lloyd, Lloyds Register of Shipping, Det Norske Veritas, American Bureau of Shipping and Bureau Veritas.**

The brake is screwed to a motor or any other machine part by means of cyl. screws via the flange (04).

The coil body (01) contains a coil (33) which is potted with a synthetic resin compound in accordance with thermical class F, (max. limit of temperature 155°C).

If the coil (33) is not excited, the springs (34) press the armature disc (32) against the friction disc (02), which is firmly clamped between the torsion-protected armature disc (32) and the brake disc (03) and thus prevented from rotating. The braking effect is transmitted from the geared friction disc (02) via the pinion (05) and a fitting key to the shaft. If the coil is connected to a direct voltage as specified on the identification plate, the magnetic force will draw the armature disc (32) to the coil body (01) overcoming the spring pressure. The friction disc (02) is released, the braking effect is cancelled and the brake is released.

4.3. Mechanical release by means of emergency release



14 screw for mechanical release
17 cap screw for mechanical release
18 seal

Fig. 2

For the mechanical release in case of emergency or for the adjustment of the system use screws (14) (up to size 4BZFM40 -2 screws, up size 4BZFM 63 –3 screws).
For release, unscrew the locking screws (17) from the cap (11). In the now free holes, the release screws (14) are accessible by a hexagon socket screw key. The release is made by alternating clockwise turning of the screws until the braking effect is cancelled.

Caution!

The emergency release is self-locking; for normal operation it must be re-turned into the initial position, i.e. the screws (14) are re-turned counter-clockwise up to limit stop at the brake disc (03). Then re-screw the locking screws (17) into the cap (11).

Take care that the sealing washers (18) are also re-fitted. This is necessary to assure the full electrical operation and **sealing effect (IP 67).**


Manual emergency release shall **not** be used to maintain temporary operation!

4.4 Current supplies and electrical connections

Make sure that the electrical connection is performed by expert personnel taking into account the installation regulations (such as DIN IEC 92).

The coil has been designed for 100% duty factor and connection to D.C. supply only, given on the identification plate (residual ripple < 0.5).
According to DIN VDE 0580 the permanently admissible voltage change is +5% to –10% of the nominal voltage.

To protect the coil or the power supply unit it is recommended to connect a varistor of the corresponding operating A.C. voltage range and with the required power to the rectifier output.

5 Assembly and dismantling

(individual parts with Item-No. see chap. 4.1)

Caution! The brake must only be operated, maintained and repaired by accordingly authorized, trained and instructed people. Each such person must have read and understood the complete instruction manual and must have been informed in particular about possible risks and danger.

5.1 Assembly

There are two different possibilities to install the brake depending on the flange size.

5.1.1 Direct assembly (flange is bigger than the outer diameter of the cover)

- Check the connecting dimensions of shaft and flange for compatibility with the brake.
- Remove any existing transportation or bearing protections devices, as well as any burr or impact damage.
- Check face runout of the flange mounting surface relative to the shaft to be braked (tolerance class N in accordance with DIN 42955 should not be exceeded).
- Slightly grease shaft and fitting key with assembly paste. Mount pinion (05) and secure it axially.
- Seal motor flange with supplied sealing ring (31).
- Use suitable slings (shackles or equivalent) to move the brake cautiously across the pinion and turn the shaft or swivel the brake to engage pinion teeth with the mating teeth of the friction disc. (The friction disc is pre-centered during the final acceptance of the brake).

Caution!

Do not use force! Do not tilt! Pay attention of the cable!

- If flange mounting of the brake is not possible in spite of the pre-centered friction disc (02), release the brake electrically or mechanically while the brake is still secured with the slings.
- Use suitable bolts to install and secure the brake at the flange of the motor in the position specified.
  Make sure that the electrical connection is performed by expert personnel taking into account the installation regulations (such as DIN IEC 92).

5.1.2. Mounting via intermediate flange (flange dia. nearly identical with cap outer dia.)

When using this mounting procedure, at first lay the loosely attached seal ring (31) onto the motor flange centering.
Then screw the also loosely attached flange (04) to the motor flange by means of the pertinent hexagon socket screws.
Assure that the seal ring (31) is lying in the counter-sinking of the flange (04) all over its periphery.
Then screw the brake to the flange (04) by the hexagon socket screws (12) which are also loosely attached to the consignment.

Caution!

When mounting always assure that all seal rings and sealings are properly lying in the accordingly provided positions (IP 67).

5.2 Mounting accuracy

The concentric run of the shaft piece on which the driving hub (05) is fixed as well as the coaxiality and the run - out of the fixing flange must comply with tolerance class "N" of DIN 42955.

5.3 Dimensions, space requirement and mass

The binding dimensions, the mass (weight) and the other technical data are stated on the dimensional drawing which is binding for the pertinent order. This drawing can be inquired at our after - sales service; address is given in chap. 10.3.

5.4. Dismantling

Dismantling is subject to the same instructions and regulations as installation. Carry out the operations in inversed order of succession!

Important note!

Check up: The brake must be torque-free on the output side.
Before removing the brake, disconnect it from the mains and secure with slings.

6 Initial setting into service

Caution!

During start-up, please note that a new friction lining will not transmit the full braking torque.
This will only be realized after a number of braking operations under normal operating conditions, i.e. after smoothening of the friction surfaces.

(Single parts with item designation as per chap. 4.1)

Before the initial setting into service, the following test measures are necessary:

- As the new friction lining does not yet dispose of optimum friction characteristics, some electric releases have to be carried - out to smooth the friction face pinpoints.
- The electric connection values on the nameplate, see chap. 1.1, must comply with the values at site
- The brake must be undamaged, i.e. it must not have any damage generated during transportation, stocking, etc.
- The prescribed service conditions (chap. 7.1) must comply with those ones at site
- The emergency manual release as per chap. 4.3 must not be active.

7 Operation

Notwithstanding any instructions given below, operation of the brake must always comply with local mandatory safety and accident prevention rules. Compliance with these rules shall be ensured by the user.

7.1 Operating conditions

The operating conditions to be maintained for a faultless operation of the brake are given below:

- The operating temperature should not be below **–30°C** and not above **+50°C**.

- In the case of higher and/or lower ambient temperatures, please contact our after-sales service (for address see Chapter 10.3).

- Air humidity may be 100%.

7.2 Protection classes

In completely mounted condition and under consideration of the following hints assembled, the brake as standard execution (as shown in fig 3) complies with **protection class IP 67,** in accordance with DIN 40050 and DIN VDE 0530.
When using original Stromag cable glands (see Fig. 1) the type of protection is maintained. The same applies when the speed encoder is rigidly connected to the cover by means of a flange gland which is sealed by round ring.
Sealings of through-shafts (by means of shaft seal ring), reduce the type of protection in relation to the execution. Please consult the manufacturer.

Caution

At execution with terminal box the brake complies with **protection class 66**!

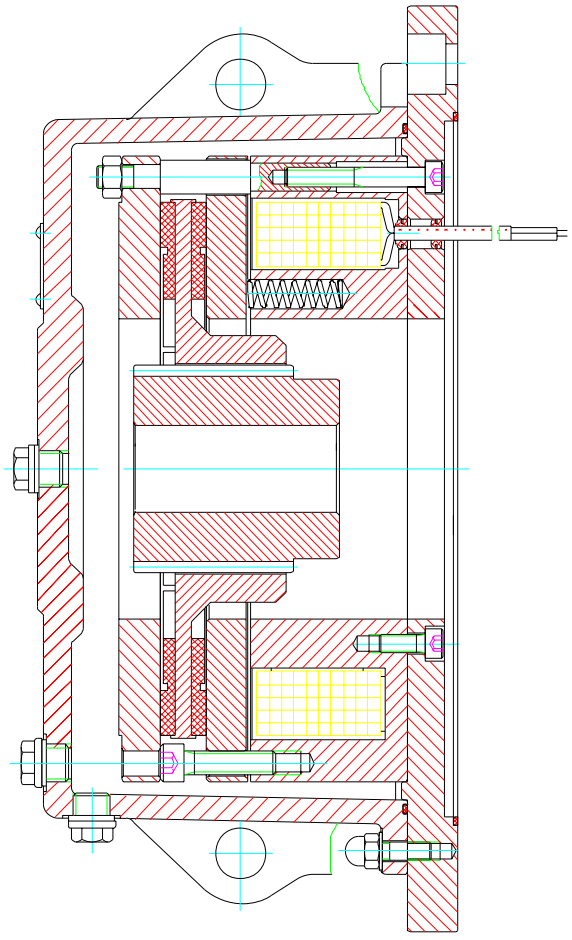


figure 3

Important note!

The contact surfaces of the brake to the motor, as well as the surfaces of the "speedometer connection" option shall be sealed with suitable means (e.g. Hylomar or sealing ring) to guarantee the protection class IP 67.
The user has to provide a sealing element on the shaft in direction to the motor side in order to prevent the penetration of grease from the motor bearing.

7.3 Duty cycle, switching frequency

The design as well as admissible loads on brakes as per braking torque, speed, switching capacity are given under „Technical Data“ (see Chapter 1) and the dimensional drawing (appendix). If any of these data are exceeded consult the manufacturer.

7.4 Trouble shooting (individual parts with Item-No. see chapter 4)

Fault	**Possible causes**	**Remedy**
Insufficient braking effect	Friction surfaces are not free from grease	replace carrier with friction lining (2)
	Max. Air gap “off” exceeded due to wear of friction lining	re-adjust brake (Chapter 8.3.), if necessary replace friction disc (02)
	Brake not completely run-in	Let brake run in
	Brake has been overloaded	Replace brake
	Spring rupture	Dismantling of brake contact manufacturer
No braking effect	Mechanical release (14) has been actuated and not re-set	See Chapter 4.3
Brake does not release	Max. airgap „off“ too large due to wear of friction lining	Re-adjust brake (chapter 8.3.) if necessary replace friction disc (02)
	friction disc (02) is stuck on pinion (05)	Replace friction disc (02) and pinion (05) (chapter 8.4.)
	Armature disc (32) distorted	Replace brake (chapter 5)
	Coil connecting voltage too low	Check DC voltage supply
	Coil (33) defective	Replace brake (chapter 5)
	Feed line defective	Renew feed line
	Contact points loose	Re-tighten contact points
	foreign particles in the air gap (e.g. spring rupture)	Dismantling of brake, contact manufacturer

8 Maintenance

8.1 Maintenance and inspection work

 Make sure to comply with Chapter 2 "Safety guidelines" during all maintenance and inspection work.

As the brakes work under varying operating conditions, it is not possible to pre-define wear check, inspection, maintenance and repair intervals.
Higher loads on the brake (e.g. as a result of torque, speed, switching frequency, ambient temperature etc.) require shorter maintenance intervals.
Therefore it is first of all necessary to observe the brake with regard to safety and wear, and then adapt the maintenance intervals in accordance with the observations made.
Wear of the friction lining will result in a greater air gap „off“.
Depending on the load on the brake, the air gap must be checked from time to time. This will be done by measuring the air gap according to chapter 8.2.
If the max. airgap as determined in chap. 1.1. is reached please readjust the airgap described in chap. 8.3.

Caution!

If wear re-adjustment is not carried out early enough, both the transmission of the rated load torque and the lifting of the brake will not be ensured.

8.2 Measurement of the airgap

The measurement of the airgap between coil body (01) and armature disc (32) can only be done when the coil (33) is currentless.

The measurement of the airgap must be taken on two places be opposited 180°. Therefore open the two cap screws (35) in the cover (11) and control with a finger gauge. The airgap between the armature disc (32) and coil body (01) must be between „off min.“ and „off max.“ described in chap.1.1.

After the measurement the thread hole must be closed with cap screw (35) and sealing ring for protection of IP 67.

8.3 Wear re-adjustment

When the maximum ‘airgap off’ has been reached in brakes (chap.1.1) a onetime wear re-adjustment is possible.

 **Important! Check up: the brake must be torque-free on the output side.**

Disconnect the brake from current.

Proceed as follows (fig. 1)

- Loosen the cap nuts (08) and remove the cap (11) and clean it inside
- Screw-in the hexagon socket screws (14) for emergency release up to limit stop
- Loosen the hexagon nuts (15) uniformly
- Remove the brake disc (03) from the stud bolts (36)
- Reverse the brake disc (03) and fit it onto the stud bolts (36)
- Screw the cap nuts (15) onto the stud bolts (36) and turn them clockwise alternately and uniformly up to limit stop

- Loosen the emergency release screws (14) by alternating and uniform counter-clockwise turning up to limit stop
- Fit the cap (11) and screw it with the cap nuts (08)
- Check the airgap „off". It must nearly comply with the value „off min" as per chap. 1.1.

Caution!

Reverse the brake disc (03) only after having reached the airgap „off max." as stated in chap. 1.1. With premature reversal of the brake disc, the airgap „off min." becomes insufficient, perhaps resulting in slipping or clamping of the friction disc (02).
After reversal of the brake disc (03) the torque may drop. The friction combination must be ground-in by a number of switchings.

8.4 Replacement of the friction disc

When already having reversed the brake disc (03) and the airgap „off max“ is reached again, the friction disc (friction carrier with friction lining) (02) is worn out and must be replaced.

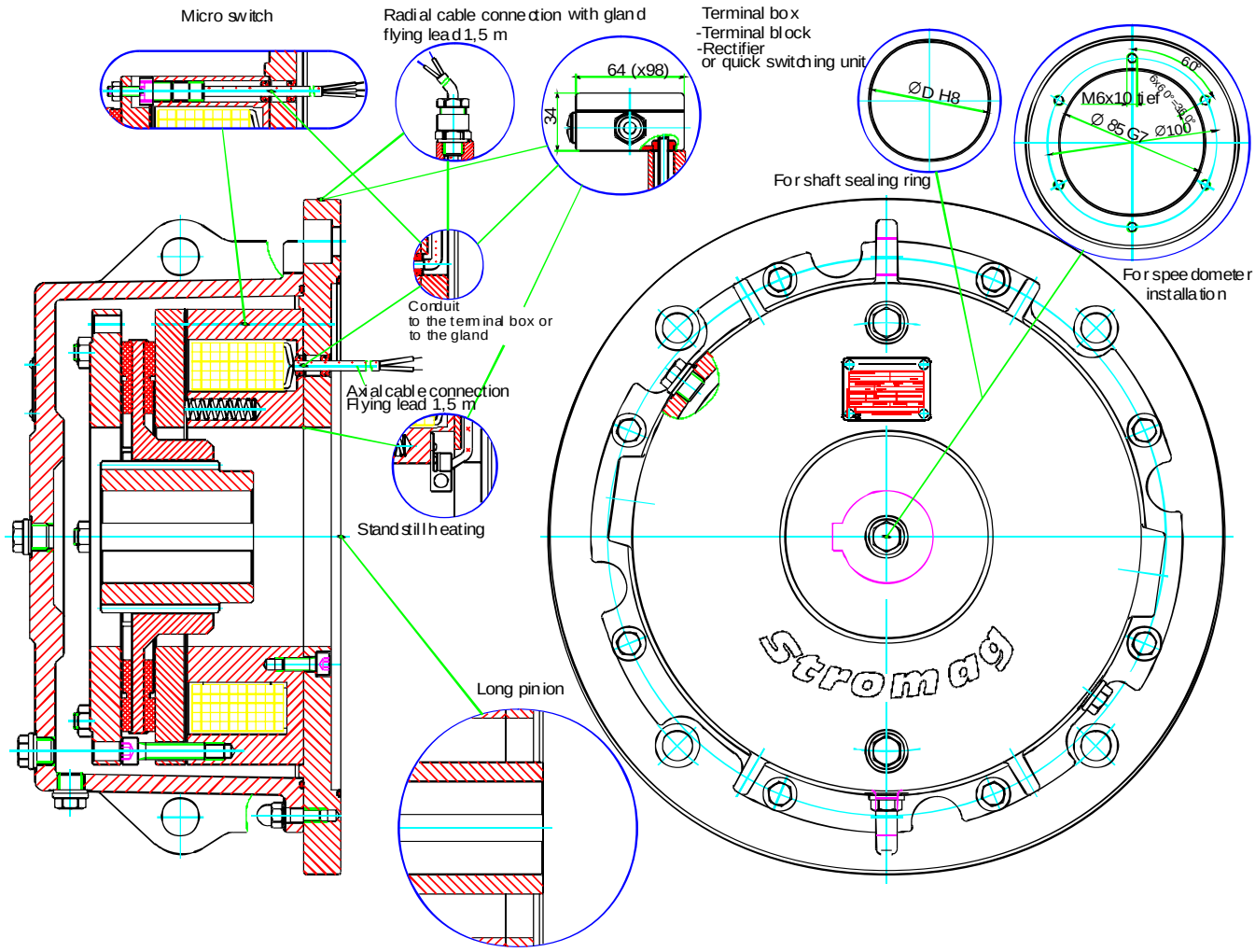
Proceed as follows:


Important ! Check up: The brake must be **torque-free on the output side.**

- proceed as per chap. 8.3. up to „removal of the brake disc (03)“
- take the friction disc (02) from the pinion (05)
- before re-assembly of the new friction lining clean all parts and control the steel parts. They must be evenly shiny, free from cracks, free from grease and without any grooves. If necessary replace these parts too
- push the friction disc (02) onto the toothing of the pinion (05)
- fit the brake disc (03) onto the stud bolts (36) whereat the smooth face is showing to the friction disc (02), so that the brake disc side with shoulder (03) shows towards the fitter.
- continue the assembly as per chapt. 8.3.


The new friction linings on the friction disc will transmit the full braking torque only after a certain run-in period.

9 Variants (optional)



9.1 Execution with micro switch

If the switching condition of the brake should be controlled, a micro switch could be used.
When the armature disc (32) is moved against the coil body (01) as a result of the electromagnetic force of the coil (33) or the actuation of the mechanical emergency release device, (chap.4.3), it will operate a micro switch. The micro switch may be included in the control circuit of the motor contactor as a normally open or normally closed contact.

The micro switch is preset in our works and should not require adjustment. If replacement of the micro switch is required this must be done by our agreed procedure (096-701:181)

9.2 Execution with condensation heater

If strong temperature fluctuations are expected, a condensation heater may be used to prevent the generation of condensation water. A special feed line will be provided accordingly.
In case of questions please contact the manufacturer.

9.3 Speedometer installation

If a speedometer connection is required for the brake, the brake cover is provided with connecting bores in accordance with „Euro dimensions“ (Diameter 85/100).

It is recommended to connect the tachometer or the encoder to the shaft through a plug-type coupling.

Caution!

The type of protection only maintains when the speed encoder is rigidly connected to the cover by means of a flange gland which is sealed by round ring.

10 Spare parts stocking, after-sales service

10.1 Spare parts stocking

Stocking of spare and parts subject to wear is an important precondition for permanent and reliable functioning of the brake.

Friction disc (02), armature disc (32), brake disc (03) and pinion (05) (for item see Chapter 4.1) are parts subject to wear.

Warranty will be provided only for the original spare parts supplied by us. We expressly state that the installation or use of spare parts other than the original ones supplied by us will negatively affect the design characteristics of the brake and thus have an impact on active and/or passive safety. Stromag Dessau GmbH shall have no warranty obligations for any damage caused by the use of spare parts or accessories other than the original ones supplied by us.

Please bear in mind that often particular manufacturing and delivery specifications exist for parts manufactured by us or bought from others, and that we offer spare parts to the up-dated technical conditions and the up-dated legal prescriptions.

10.2 Data for spare parts stocking

Please specify the following details when ordering spare parts:
- Series and size of brake
- Consignment / fabrication number
- Location and designation of spare part
- Number of pieces

Designation of individual parts

01	coil body
02	friction disc
03	brake disc
04	flange
05	pinion
06	intermediate flange
08	cap nut
11	cover
12	hexagon socket screw for connection to the flange
13	hexagon socket screw for connection of intermediate flange and coil body
14	release screw for emergency release
15	hexagon nut for connection of the brake disc
17	cap screw for emergency release
18	seal for cap screw (17)
19	seal for cover and intermediate flange
20	seal for intermediate flange and flange
31	sealing ring
32	armature disc
33	coil
34	springs
35	cap screw for airgap measurement
36	guiding studs

10.3 Address of after-sales service

This is our address for after-sales service and spare parts distribution:

Stromag Dessau GmbH
Dessauer Straße 10
D-06844 Dessau-Roßlau
Germany

Telephone: **(49) (0)340/2190-203**
Fax: **(49) (0)340/2190-201**
E-mail: **vertrieb.dessau@stromag.com**
Internet: **http://www.stromag-dessau.de**

If you require a service engineer, please contact our "Technical after-sales service" under the above address.

11 Listed standards and regulations

DIN 6885	Sheet 1 Fitting keys
DIN 40050	(VDE 0470) Protection classes
DIN 42948	Fastening flanges for electrical machines
DIN 42955	Concentricity of shaft ends, co-axial and true running of fastening flanges of rotating electrical machines
DIN IEC 92	Electrical equipment on ships
DIN VDE 0530	Rotating electrical machines
DIN VDE 0580	Regulations for electrical devices
VDE 0660 T 200/09.82,	Section 4.2.4, Table 1 - Inductive load
89/336/EEC (EMC)	Electromagnetic compatibility
93/68/EEC	Low Voltage Directive

Service Instructions **4 BZFM**

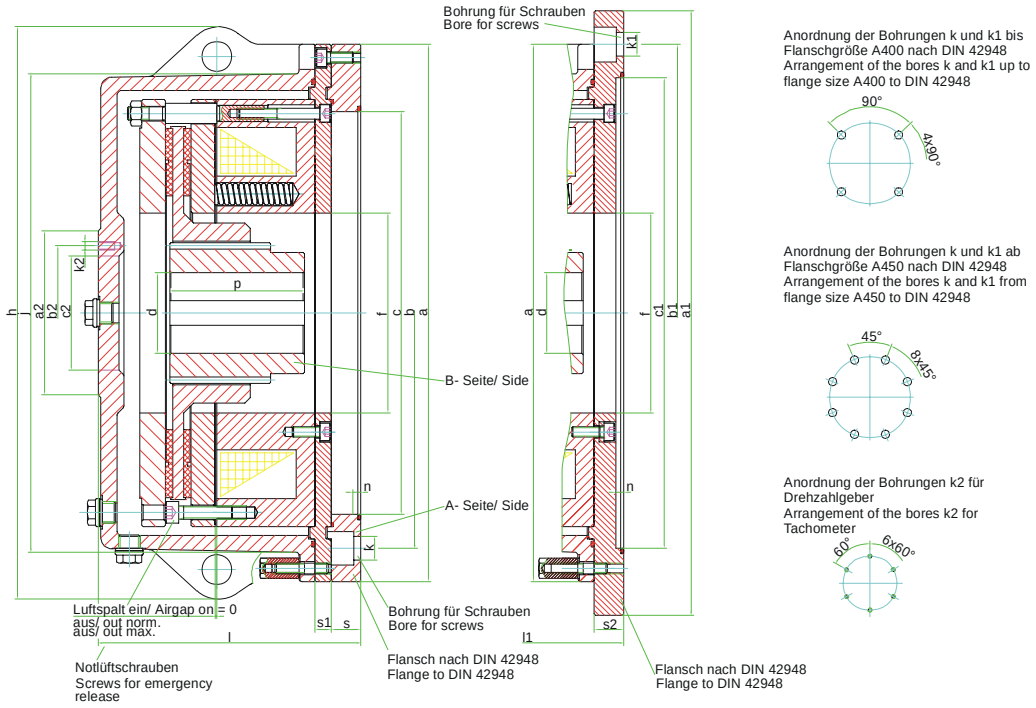
IP 67 (IP 66)

Stromag Dessau

safety in motion

Electromagnetic Double - Face Spring - Applied Brake

01.06.2009



Anordnung der Bohrungen k und k1 bis Flanschgröße A400 nach DIN 42948
Arrangement of the bores k and k1 up to flange size A400 to DIN 42948

Anordnung der Bohrungen k und k1 ab Flanschgröße A450 nach DIN 42948
Arrangement of the bores k and k1 from flange size A450 to DIN 42948

Anordnung der Bohrungen k2 für Drehzahlgeber
Arrangement of the bores k2 for Tachometer

Brake size **4BZFM**			6,3	10	16	25	40	63	100	160	250	400	630	1000
switchable torque	M_{SN}	Nm	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000
transferable torque	$M_Ü$	Nm	69	110	176	275	440	690	1100	1750	2750	4400	6930	11000
airgap off norm.		mm	0,4	0,4	0,4	0,4	0,4	0,4	0,5	0,5	0,5	0,5	0,5	0,6
airgap off max.		mm	1,2	1,2	1,2	1,2	1,5	1,8	2,1	2,4	2,8	2,8	2,8	3,0
max. speed	n	min^{-1}	6000	6000	6000	5500	4700	4000	3600	3200	2800	2400	2200	2000
mass mom. of inertia	J	kgm^2	0,0012	0,0019	0,0026	0,0050	0,0133	0,0271	0,0366	0,06	0,1266	0,267	0,47	0,76
weight	m	kg	23	32	40	56	73	107	138	205	275	380	574	725
nom. voltage	U	V DC	110	110	110	110	110	110	110	110	110	110	110	110
nom. power	P	W	110	122	142	164	214	249	332	403	530	675	698	827
nom. current	I	A	1.00	1,11	1,29	1,49	1,95	2,27	3,02	3,66	4,82	6,13	6,34	7,52
diameters	a	mm	A 250	A 250	-	A 300	A 350	A 400	A 450	A 550	A550	-	-	-
	a1	mm	A 300	A 300	A 300	A 350	A 400	A 450	A 550	A 660	A660	A660	A800	A800
	a2	mm	120	120	120	120	120	120	120	120	194	300	320	300
	b	mm	215	215	-	265	300	350	400	500	500	-	-	-
	b1	mm	265	265	265	300	350	400	500	600	600	600	740	740
	b2	mm	100	100	100	100	100	100	100	100	100	100	100	100
	cH7	mm	180	180	-	230	250	300	350	450	450	-	-	-
	c1H7	mm	230	230	230	250	300	350	450	550	550	550	680	680
	c2G7	mm	85	85	85	85	85	85	85	85	85	85	85	85
	dmin	mm	28	28	38	38	38	48	48	60	65	90	90	100
usual borings	d	mm	38	38	42	42	55	60	60	75	90	110	120	140
	dmax	mm	40	40	55	55	60	75	75	110	125	140	160	180
	f	mm	82	86	98	104	130	149	144	190	210	210	235	275
	h	mm	252	275	296	322	376	426	458	532	574	654	737	800
	j	mm	193	214	233	256	306	356	380	450	491	559	627	690
	k	mm	13,5	13,5	-	13,5	17,5	17,5	17,5	17,5	17,5	-	-	-
	k1	mm	13,5	13,5	13,5	17,5	17,5	17,5	17,5	22	22	22	22	22
	k2	mm	M6	M6	M6	M 6	M 6	M 6	M 6	M 6	M 6	M 6	M6	M6
lengths	l	mm	-	147	-	165	196	196	209	-	274	-	-	-
	l1	mm	126	141	145	165	184	184	203	232	252	305	354	381
	n	mm	6	6	6	6	6	6	6	7	6	7	7	7
	p	mm	70	70	80	80	90	100	100	130	171	205	245	245
	s	mm	-	15	-	15	22	22	19	-	29	-	-	-
	s1	mm	-	11	-	11	12	12	16	-	22	-	-	-
	s2	mm	18	20	20	26	22	22	29	24	29	30	33	33

Types with reinforced torques are available

Optionally special voltage