

COMBISTOP M

INSTRUCTIONS FOR USE | INSTALLATION TYPE 08 SIZE 0B, 00

Translation of the original manual
Document 20351416 EN 02



Preface

The described devices or add-on parts are products of the KEB Automation KG. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.

Signal words and symbols

Certain operations can cause hazards during the installation, operation or thereafter. There are safety informations in the documentation in front of these operations. Security signs are located on the device or machine. A warning contains signal words which are explained in the following table:

⚠ DANGER	Dangerous situation, which will cause death or serious injury in case of non-observance of this safety instruction.
⚠ WARNING	Dangerous situation, which may cause death or serious injury in case of non-observance of this safety instruction.
⚠ CAUTION	Dangerous situation, which may cause minor injury in case of non-observance of this safety instruction.
NOTICE	Situation, which can cause damage to property in case of non-observance.

RESTRICTION

Is used when certain conditions must meet the validity of statements or the result is limited to a certain validity range.



Is used when the result will be better, more economic or trouble-free by following these procedures.

More symbols

- ▶ This arrow starts an action step.
- / - Enumerations are marked with dots or indents.
- => Cross reference to another chapter or another page.



Note to further documentation.
www.keb.de/service/downloads



Laws and guidelines

KEB Automation KG confirms with the EU declaration of conformity and the CE mark on the device nameplate or the signing that it complies with the essential safety requirements.

The EC declaration of conformity can be downloaded on demand via our website.

Warranty and liability

The warranty and liability on design, material or workmanship for the acquired device is given in the general sales conditions.



Here you will find our general sales conditions.
www.keb.de/terms-and-conditions



Further agreements or specifications require a written confirmation.

Support

Through multiple applications not every imaginable case has been taken into account. If you require further information or if problems occur which are not treated detailed in the documentation, you can request the necessary information via the local KEB Automation KG agency.

The use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the customer.

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the intended use. However, they are regarded as being only informal and changes are expressly reserved, in particular due to technical changes. This also applies to any violation of industrial property rights of a third-party. Selection of our units in view of their suitability for the intended use must be done generally by the user.

Tests can only be done within the intended end use of the product (application) by the customer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.

Copyright

The customer may use the instructions for use as well as further documents or parts from it for internal purposes. Copyrights are with KEB Automation KG and remain valid in its entirety.

Other wordmarks or/and logos are trademarks (™) or registered trademarks (®) of their respective owners.

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Glossary

0V	Earth-potential-free common point
1ph	1-phase mains
3ph	3-phase mains
AC	AC current or voltage
Application	The application is the intended use of the KEB product.
AWG	American wire gauge
B2B	Business-to-business
Customer	The customer has purchased a KEB product from KEB and integrates the KEB product into his product (customer product) or resells the KEB product (dealer)
DC	DC current or voltage
DIN	German Institut for standardization
EMC	Electromagnetic compatibility
EN	European standard
End customer	The end customer is the user of the customer product.
FE	Functional earth
GND	Reference potential, ground
IEC	International standard
IP xx	Degree of protection (xx for level)
KEB product	The KEB product is subject of this manual.
Manufacturer	The manufacturer is KEB, unless otherwise specified (e.g. as manufacturer of machines, engines, vehicles or adhesives).
MCM	American unit for large wire cross sections
MTTF	Mean service life to failure
NN	Sea level
PE	Protective earth
PELV	Protective Extra Low Voltage
SELV	Safety Extra Low Voltage (<60 V)

Standards for mechanical components

VDE 0580	Electro magnetic devices and components
DGUV regulation 3	Electrical installations and equipment
DIN 46228-1	Tubular end-sleeves without plastic sleeve
DIN 46228-4	Tubular end-sleeves with plastic sleeve
DIN IEC 60364-5-54	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors
EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 44/709/CDV)
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529)
EN 60664-1	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1)
EN 60721-3-1	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 1: Storage (IEC 104/648/CD)
EN 60721-3-2	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 2: Transportation and handling (IEC 104/670/CD)
EN 60721-3-3	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities; section 3: Stationary use at weatherprotected locations (IEC 60721-3-3)
DIN 748-3	Cylindrical shaft ends - Part 3: For rotating electrical machinery
DIN SPEC 42955	Shaft extension run out and of mounting flanges for rotating electrical machinery, frame size larger then 315 - Tolerances, test
DIN EN 50347	General purpose three-phase induction motors having standard dimensions and outputs - Frame numbers 56 to 315 and flange numbers 65 to 740
DIN 6885-1	Drive type fastenings without taper action, parallel keys, keyways - Deep pattern
DIN 6885-3	Drive type fastenings without taper action, parallel keys, keyways - Low pattern
DIN 332-2	Center holes 60° with thread for shaft ends for rotating electrical machines

1 Basic safety instructions

The following safety instructions have been created by the manufacturer for the area of drive technology. They can be supplemented by local, country-specific or application-specific safety instructions. This list is not exhaustive. Non-observance will lead to the loss of any liability claims.

NOTICE



Hazards and risks due to ignorance.

- ▶ Read the instructions for use!
- ▶ Observe the safety and warning instructions!
- ▶ If anything is unclear, please contact KEB!

1.1 Target group

This manual is determined exclusively for technical staff. Technical staff for the purpose of this manual must have the following qualifications:

- Knowledge and understanding of the safety instructions.
- Skills for installation and assembly, start-up, operation and maintenance of the product.
- Understanding of the function in the used machine.
- Detection of hazards and risks of the drive technology.
- Knowledge about work safety and accident prevention (e.g. *DIN 6885-3*).

1.2 Transport, storage and proper use

The transport is carried out by qualified persons in accordance with the environmental conditions specified in this manual.

Upon delivery the devices are to be checked for visible signs of transport damages. Immediately report transport damages to the transport company and the manufacturer.

Depending on its design and weight appropriate lifting devices must be used for handling.

NOTICE

Damage due to improper storage.

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

Don't storage devices or parts

- in the environment of aggressive and/or conductive liquids or gases.
- with direct sunlight.
- outside the specified ambient conditions.
- in environments that can lead to corrosion and contamination.

1.3 Installation and mounting

NOTICE

Squeezing and pinching of fingers by self-rotation.

- ▶ Before installation, make sure that the drive is load-free.
- ▶ Secure drive against rotation.

Consider the following installation measures to prevent faults

- ▶ Do not operate the brake in an explosive environment.
- ▶ Provide measures against freezing or ice formation on the friction surfaces.
- ▶ Take appropriate measures against high air humidity, aggressive vapours/liquids or similar that lead to corrosion and 'rusting' of the pole surfaces.

1.4 Electrical connection

⚠ DANGER



Electrical voltage at brake and motor!

Danger to life due to electric shock!

- ▶ Any work on the electrical power supply may only be carried out by a qualified electrician.
- ▶ When carrying out any work on the brake, switch off the supply voltage and secure it against switching on.
- ▶ Never bridge upstream protective devices, not even for test purposes.
- ▶ Standard-compliant testing of the protective conductor connection to all touchable metal parts.

1.5 Start-up and operation

The operation must not be started until it is determined that the installation complies with the machine directive; Account is to be taken of [EN 60204-1](#).

⚠ CAUTION

Pay attention to friction work (speed and the frequency of operation)!

Loss or decrease of braking torque!

- ▶ Exceeding the technical specifications can lead to thermal overload of the lining or magnet and to severe signs of wear on the gearing of the hub and lining. This can lead to failure of the brake (=> „[6.1.3.1 Friction work switching frequency type 08](#)“).

⚠ CAUTION**High temperatures due to braking****Burning of the skin!**

- ▶ Cover hot surfaces safe-to-touch.
- ▶ If necessary, attach warning signs on the system.
- ▶ Check the temperature and let the brake cool down if necessary.

⚠ CAUTION**Rotating Parts****Shock or crushing of body parts!**

- ▶ Wear protective goggles against ejected parts and dirt particles, especially during first start-up.
- ▶ Take measures against being pulled into the machine.

NOTICE**Malfunctions of the brake!**

Surrounding magnetic fields or magnetically conductive materials can impair the function of the brake.

1.6 Maintenance

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

In case of malfunction, unusual noises or smells inform a person in charge!

⚠ DANGER**Unauthorized exchange, repair and modifications!****Unpredictable malfunctions!**

- ▶ The brake must not be converted, modified or misused.
- ▶ Only use original manufacturer parts.
- ▶ Infringement will annul the liability for resulting consequences.

2 Product description

The COMBISTOP Type 08 brake is an electromagnetically actuated dual-surface spring-applied brake for dry running. It is designed for small loads and holding functions. The brakes are designed in such a way that the air gap is defined by the dimensionally stable components.

2.1 Intended use

Spring-applied brakes are used to brake rotating masses or to hold shafts.

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.

The technical data and the information on the connection conditions must be taken from the nameplate and the instructions for use and must be observed. Any use beyond the technical specifications is also considered as not specified.

The actual use of the brake in the target products is beyond the control of KEB Automation KG and, therefore, shall be exclusively within the operating company's responsibility.

Restriction

If the product is used in machines which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

2.2 Residual risks

The brake can overheat or be damaged due to wrong design, improper handling or changed operating requirements. This may lead to failure of the brake.

2.3 Improper use

Improper use exists, if

- the product is operated outside the limit values specified in the technical data.
- unauthorized structural changes have been made to the brake.
- improper repairs have been carried out.
- the product has been incorrectly installed or serviced.

In case of infringements, the brake loses its EU conformity and the liability claims against KEB Automation KG expire.

2.4 Type code

The type designation and the version can be taken from the nameplate or the marking.

xx	08	1xx	-xxx	
				Variant
				Hand release
				Type
				Size
Table 1: Type code				

Customer versions
10: Without hand release
30: With hand release
COMBISTOP Type 08
0B, 00



The type code is not used as order code, but only for identification purposes.



The complete material number is not printed on the brake. Only the magnet is marked with a material number. An assignment of the coupling based on the magnet marking is only possible to a limited extent.

2.5 Type code magnet and magnet system

The magnet designation can be taken from the signing.

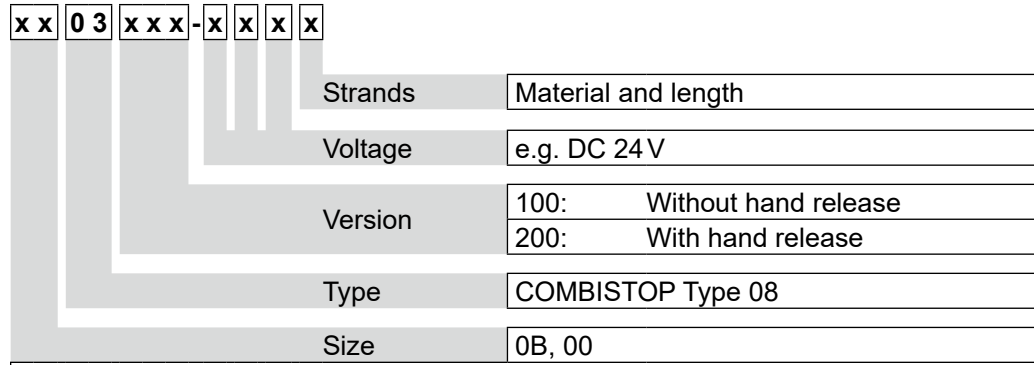
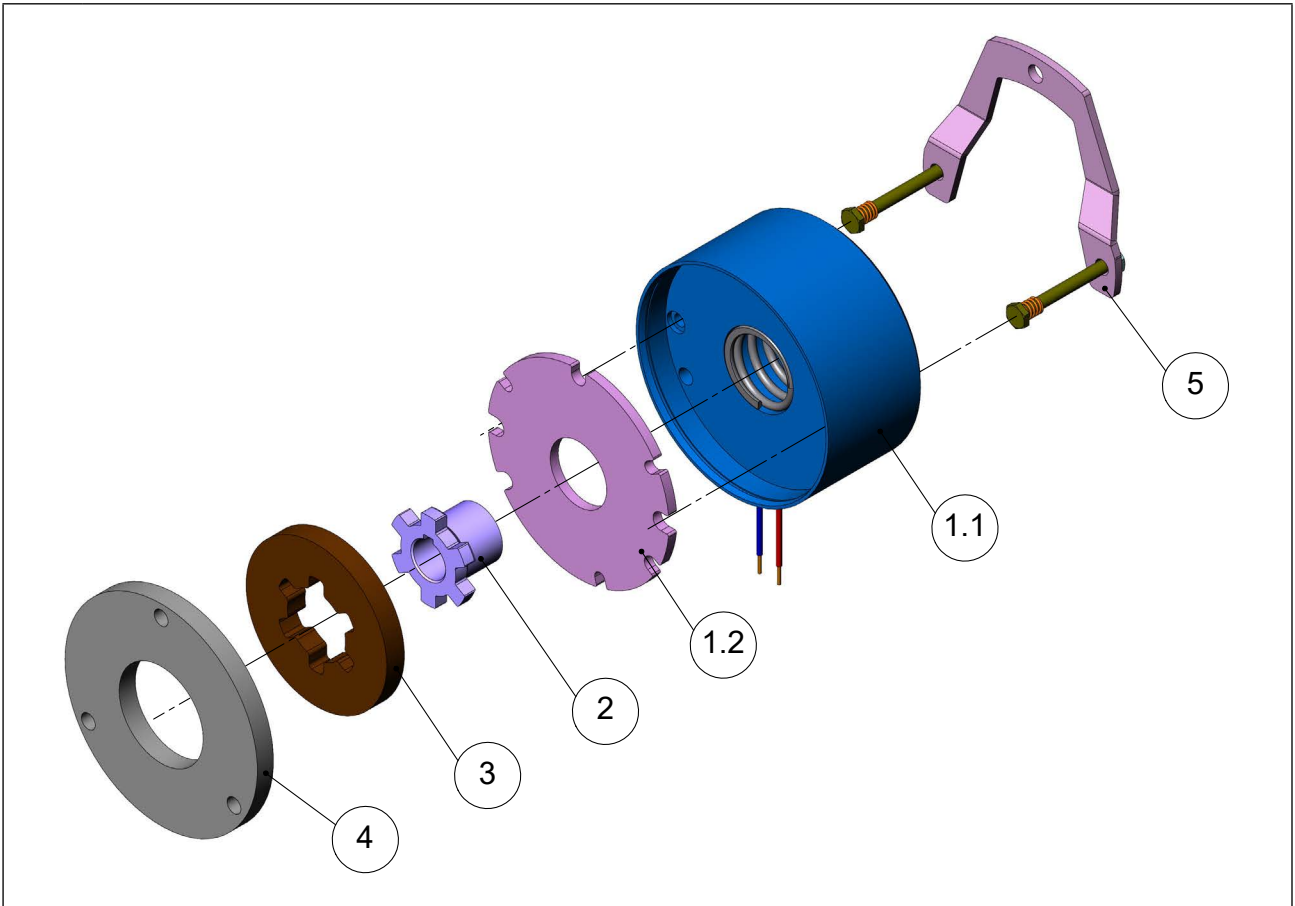


Table 2: Type code magnet and magnet system



The type code is not used as order code, but only for identification purposes.

2.6 Overview COMBISTOP M Type 08



Legend

1.1	Magnet
1.2	Armature
2	Hub
3	Lining
4	Flange (optional)
5	Hand release (optional)

Figure 1: Overview COMBISTOP M Type 08

2.7 Functional description

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.

By applying the rated voltage, the coil generates a magnetic field in the magnet, 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.

3 Technical data

3.1 Operating conditions

3.1.1 Climatic environmental conditions

Operation	Standard	Class	Size	Notes
Ambient temperature	VDE 0580	–	0B08	-5...35°C
	–		0008	-5...60°C
Table 3: Ambient temperature				

Operation	Standard	Installation situation ¹⁾	Class	Notes
Construction and degree of protection	EN 60529	On free machine wall	IP11	Without options
		Under fan cover without hand release	IP54	
		Under fan cover with hand release	IP22	
Table 4: Construction and degree of protection without options				

Operation	Standard	Installation situation ¹⁾	Class	Notes
Construction and degree of protection	EN 60529	On free machine wall	IP55	With dust protection ring and shaft sealing ring ¹⁾ or plug
		Under fan cover without hand release	IP55	
		Under fan cover with hand release	IP55	
Table 5: Construction and degree of protection with dust protection ring, shaft sealing ring or plug				

¹⁾ The degree of protection of the shaft sealing rings is subject to the respective manufacturer.

3.1.2 Electrical operating conditions

Requirement	Standard	Class	Notes
Overvoltage category	EN 60664-1	III	–
Table 6: Device classification			

3.2 Device data COMBISTOP M Type 08

3.2.1 Overview

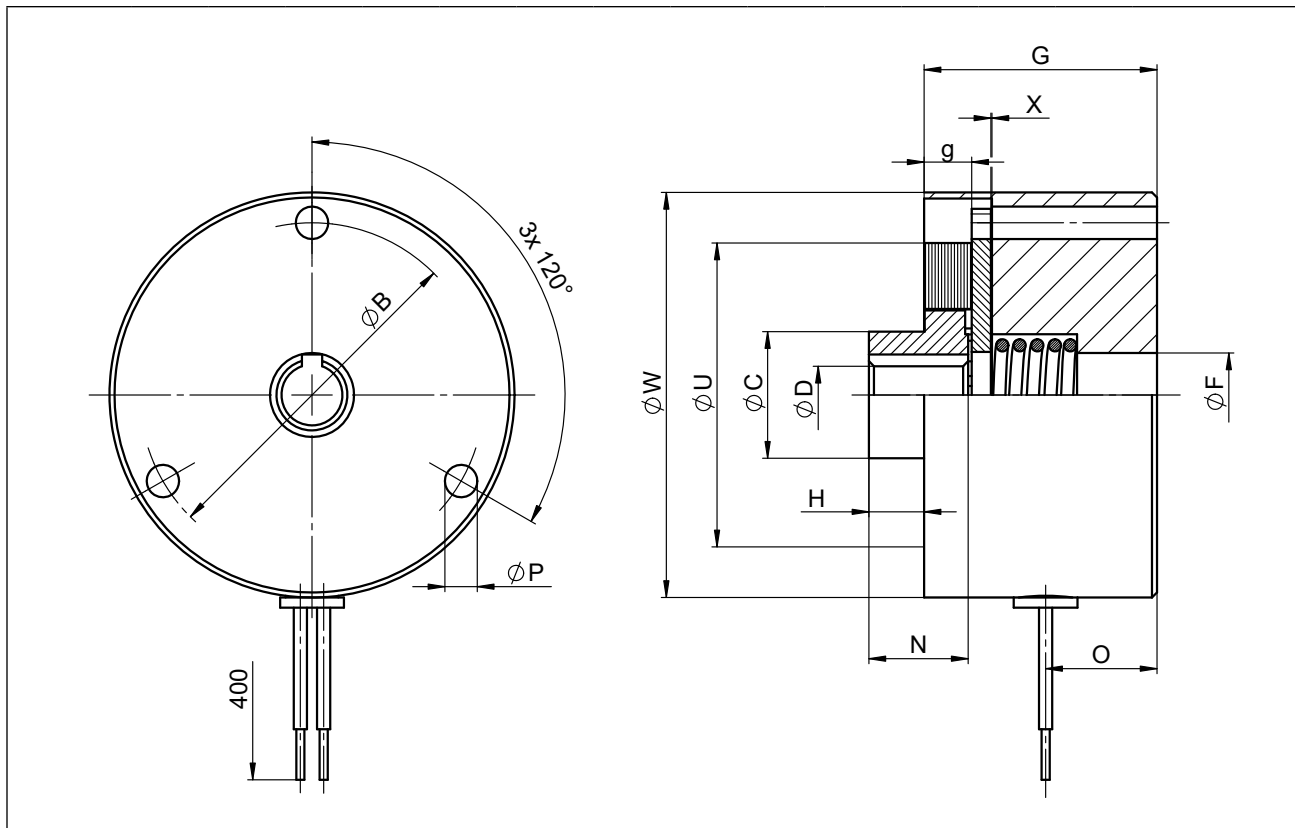
Device size		0B	00
Rated torque	¹⁾ M_2 / Nm	0.3	1 ²⁾
Rated power	P_{20} / W	6	11 ³⁾
Rated voltage	⁴⁾ U_{N_dc} / V	24/105/180/205 ⁵⁾	
Cyclic duration factor	<i>c.d.f.</i> / %	100	
Speed for service braking	n / rpm	3000	
Max. speed for emergency braking	n_{max} / rpm	6000	
Mass moment of inertia	$J / 10^{-6} \text{kgm}^2$	0.8	4.18
Nominal air gap	X / mm	0.1	0.15
Switching cycles for half-wave rectifier	⁶⁾ SC_1 / rpm	70	70
Switching cycles for bridge rectifier	⁶⁾ SC_2 / rpm	140	140
Switching cycles with power box DC	SC_3 / rpm	—	—
Separation time	⁷⁾ t_2 / ms	25	35
Separation time with power box	⁷⁾ t_2 / ms	—	—
Response delay AC	⁸⁾ t_{11_ac} / ms	50	120
Response delay DC	⁸⁾ t_{11_dc} / ms	10	25
Engaging time AC	⁹⁾ t_{1_ac} / ms	60	100
Engaging time DC	⁹⁾ t_{1_dc} / ms	15	25
Feather key		according to <i>DIN 6885-1</i>	
Keyway			
ISO class			

Table 7: Device data COMBISTOP M Type 08

- ¹⁾ After conditioning run-in of the friction parts. Measured at quasi-static differential speed of 25rpm and 20 °C.
- ²⁾ Possible steps: 0.5...2Nm.
- ³⁾ With increased rated torque, increased coil power up to 15 W may be necessary.
- ⁴⁾ Special voltage upon request.
- ⁵⁾ 105V/180V/205V fall under the Low-Voltage Directive => „11.1 EU declaration of conformity“.
- ⁶⁾ Maximum permissible switching cycles for DC-switching, continuous operation (100 % c.d.f.) and max. operating temperature of 80 °C.
- ⁷⁾ Separation time from switching on the current to the beginning of the torque drop. The values are to be regarded as guidelines.
- ⁸⁾ Time from switching off the current until increase in torque. The values are to be regarded as guidelines.
- ⁹⁾ Time from switching off the current until reaching 0.9xrated torque M_2 . The values are to be regarded as guidelines.

3.3 Dimensions and weights

3.3.1 Version 0B without options



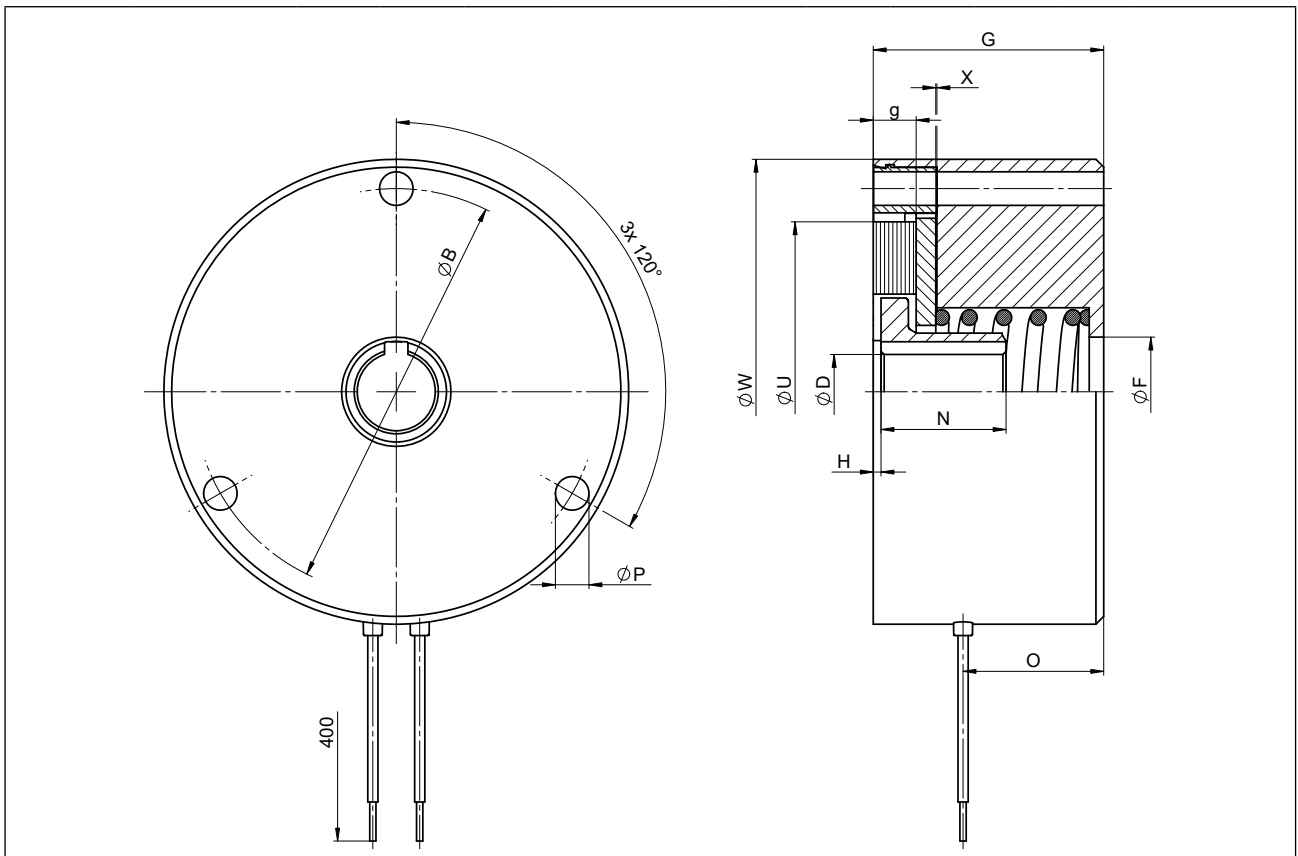
Size ¹⁾	Dimensions / mm													Weight / kg
	B	C	D ²⁾ max.	F	G	H	N	O	P	U	W	X	g	
0B	34	12.5	8	8.3	23	5.5	9.8	11	3.2	30	40	0.1	4.7	0.15

Figure 2: Dimensions COMBISTOP M Type 0B 08 without options

¹⁾ Keyway according to DIN 6885-3, VDE 0580, ISO class "B".

²⁾ Bore 10 mm tolerance H7, otherwise H8.

3.3.2 Version 00 without options



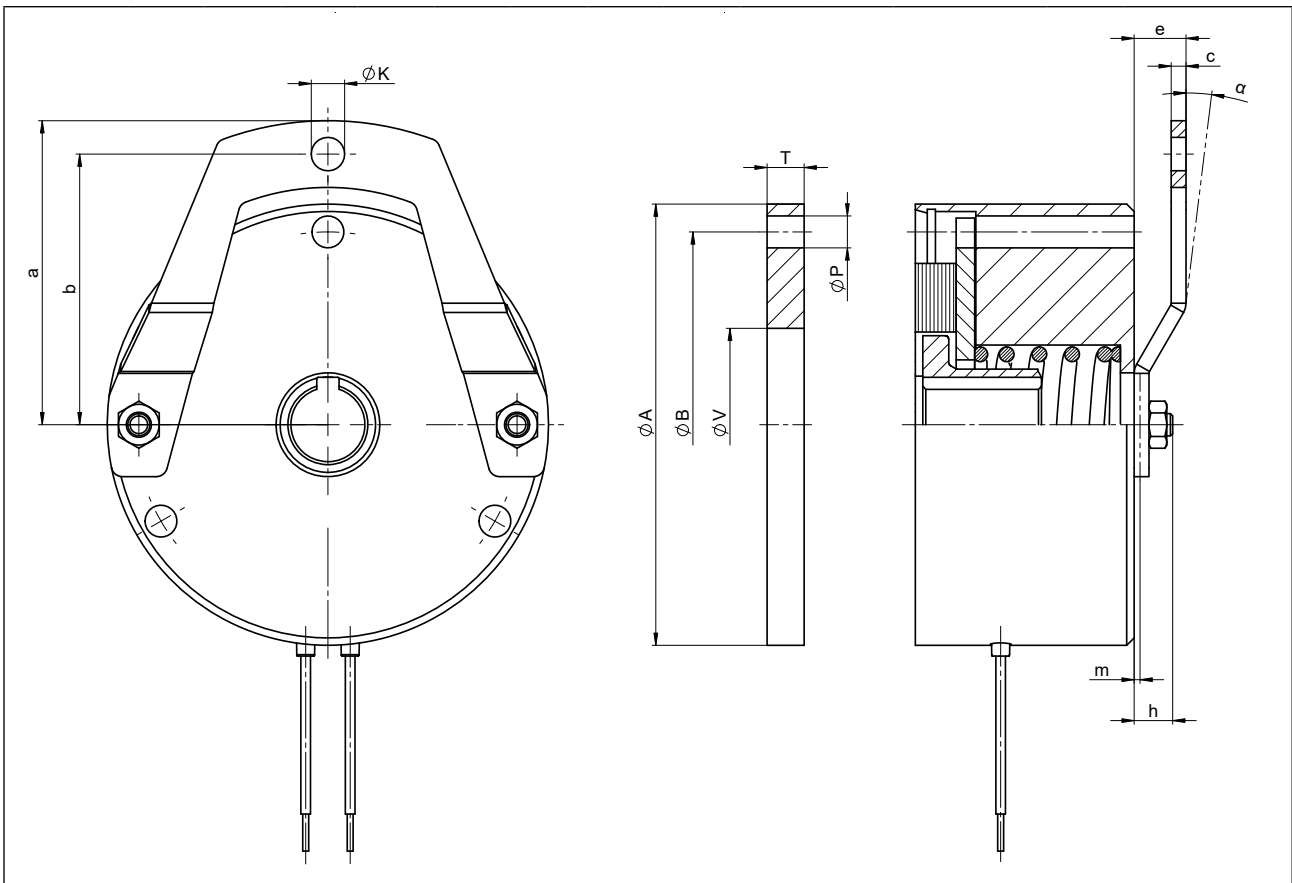
Size ¹⁾	Dimensions / mm												Weight / kg
	B	D ²⁾ max.	F	G	H	N	O	P	U	W	X	g	
00	52	10	14	29.5	0.5..1	16	18	4.3	43.5	59.5	0.15	5.5	0.4

Figure 3: Dimensions COMBISTOP M Type 00 08 without options

¹⁾ Keyway according to DIN 6885-3, VDE 0580, ISO class "B".

²⁾ Bore 10 mm tolerance H7, otherwise H8.

3.3.3 Dimensions with hand release and flange



Size ¹⁾	Dimensions / mm												L / °		Weight / kg
	A	B	K	P	T	V	a	b	c	e	h	m ²⁾	α		
0B 08	40	34	–	3.2	–	18	–	–	–	–	–	–	–	–	0.15
00 08	59.5	52	4.5	4.3	5	26	41	36.5	2	7	10.2	0.8	7	0.4	

Figure 4: Dimensions COMBISTOP M Type 08 with hand release and flange

¹⁾ Keyway according to DIN 6885-3, VDE 0580, ISO class "B".

²⁾ Mounting dimension "m" with attracted armature.

4 Mounting



Unless otherwise stated, the numbers mentioned in this chapter refer to => „*Figure 1: Overview COMBISTOP M Type 08*“.

4.1 Notes on mounting

4.1.1 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.
- ▶ A suitable second friction surface (steel or cast iron) must be provided. The type of counter friction surface affects the torque. Recommendation for the friction surface: Surface quality Rz6,3 and flatness <0.04 mm.
- ▶ 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 first be de-energised when being mounted.
- ▶ Readjustment of the air gap is not possible! If necessary, check the air gap before mounting => „*9.2.2 Check the braking energy*“.

4.1.2 Observe 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. Take appropriate safety measures as required.
- ▶ The eccentricity of the mounting hole circle relative to the shaft end must not exceed the following values:

COMBISTOP M	0B	00
Eccentricity / mm	0.2	0.2

- ▶ The angular deviation of the mounting surface relative to the shaft must not exceed the following values (in relation to the mounting hole diameter):

COMBISTOP M	0B	00
Angular deviation / mm	0.04	0.04

4.2 Mounting the brake

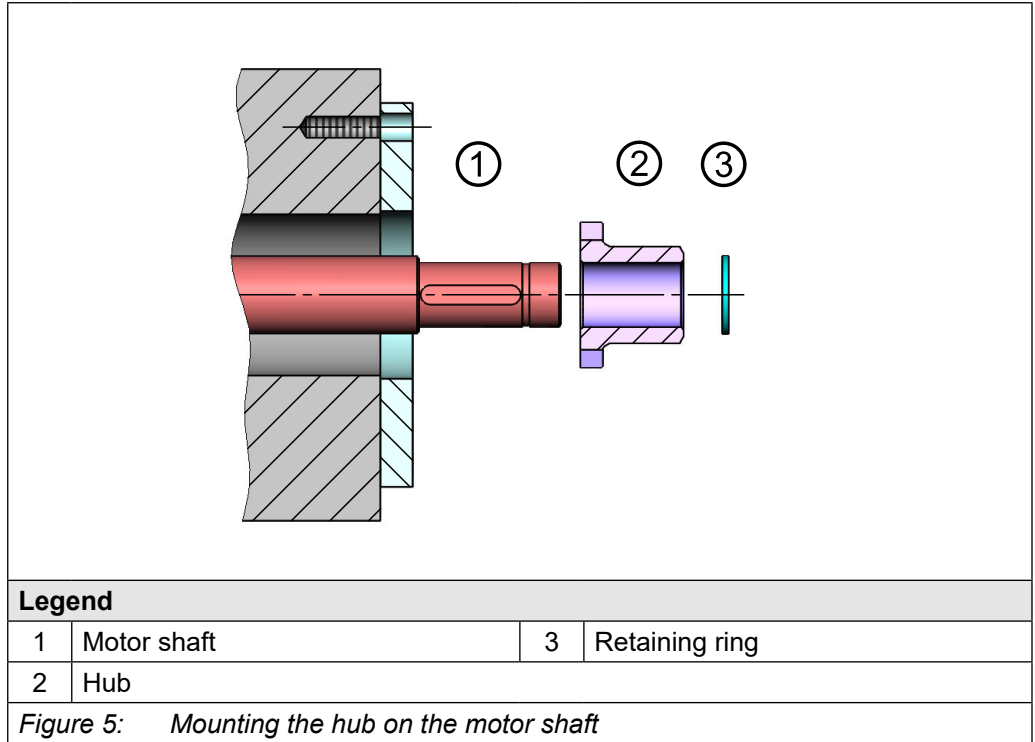
NOTICE

No suitable friction surface available!

- ▶ Mount optional flange at motor endshield.

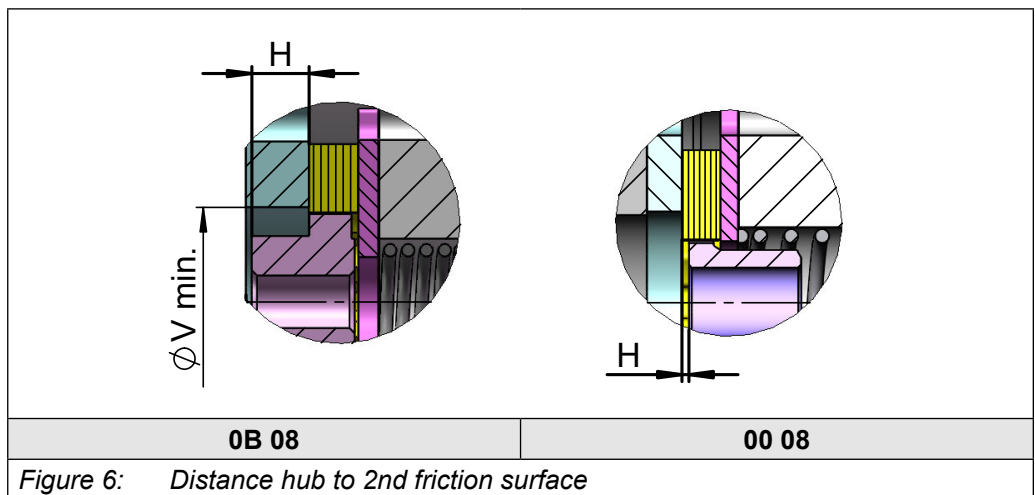
4.2.1 Step 1: Mounting the hub

- ▶ If available, attach the flange to the motor housing.
- ▶ Mount the hub on the motor shaft.
- ▶ Secure the hub axially on the motor shaft.
- ▶ The hub must not be damaged.



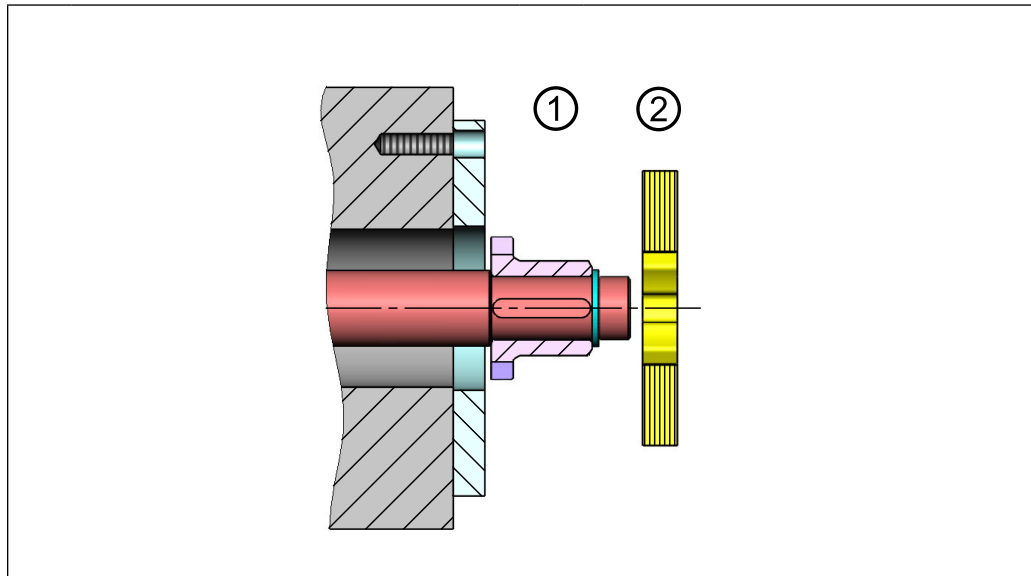
Make sure that the hub cannot run against the second friction surface. For size 0B 08, dimension V must be observed for the flange. Taking into account the axial clearance of the motor shaft, we recommend the distance H.

Size	V	H	
0B 08	-	0.5...1	
00 08	18	5.5	



4.2.2 Step 2: Mounting the lining

- ▶ Slide the 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.



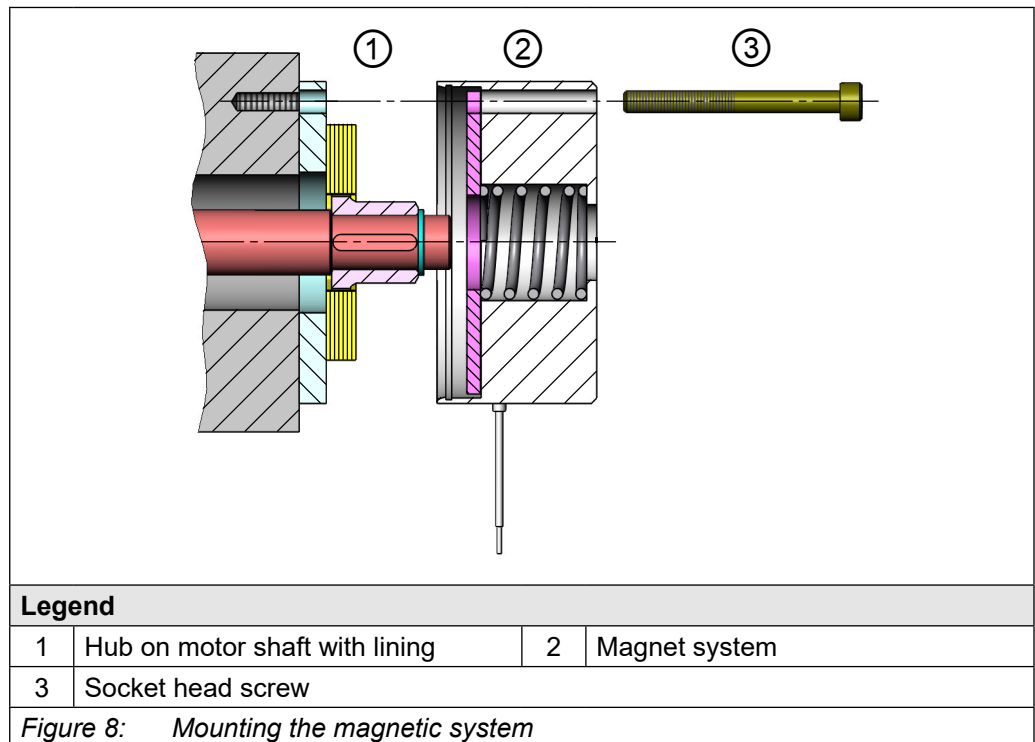
Legend

1	Hub on motor shaft	2	Lining
---	--------------------	---	--------

Figure 7: Mounting the lining

4.2.3 Step 3: Mounting the magnetic system

- ▶ Slide the magnet system with the armature over the hub and the lining.
- ▶ While doing so, make sure that the lining is easily movable
- ▶ Fix the magnet system with three socket head screws without defined torque.
- ▶ Apply rated voltage. Thus the armature is pulled towards the housing in the opposite direction to the spring forces.
- ▶ Tighten the screws alternately piece by piece to the defined tightening torque. Observe the notes to the socket head screws!



Notes to the socket head screws

For fastening the magnetic system, we recommend socket head screws of strength class 8.8, which should be tightened with the tightening torques recommended by the manufacturer.

5 Electrical connection

⚠ DANGER



Electrical voltage at brake and motor!

Danger to life due to electric shock!

- ▶ When carrying out any work on the brake, switch off the supply voltage and secure it against switching on.

NOTICE

Voltage peaks when switching off!

- ▶ Install protective circuit for brake and control.
- ▶ The protective circuit extends the engaging times.

5.1 Connection of the brake

NOTICE

Loss of braking efficiency!

- ▶ Improper adjustment and operation with overexcitation may result in loss of braking efficiency.

NOTICE

Destruction of the brake in case of incorrect voltage supply!

- ▶ The brake is operated with DC voltage.
- ▶ Read the rated voltage from the magnet marking of the brake.
- ▶ Compare with existing voltage source.
- ▶ The maximum input voltage U_{in} must not be exceeded.
- ▶ Only connect if the values are the same.

If no suitable DC voltage is available, the following KEB accessories can be used:

- Half and full-wave rectifier (COMBITRON 91)
- Fast acting rectifier (COMBITRON 98)

The COMBISTOP M brake is delivered from the factory with pre-assembled connecting wires:

COMBISTOP M	0B	00
Wire cross-section	2 x 0.25 mm ²	2 x 0.25 mm ²
Connection length	400 mm + 100 mm	400 mm + 100 mm
<i>Table 8: Preassembled connecting wires</i>		

NOTICE**Connection for drive controller operation.**

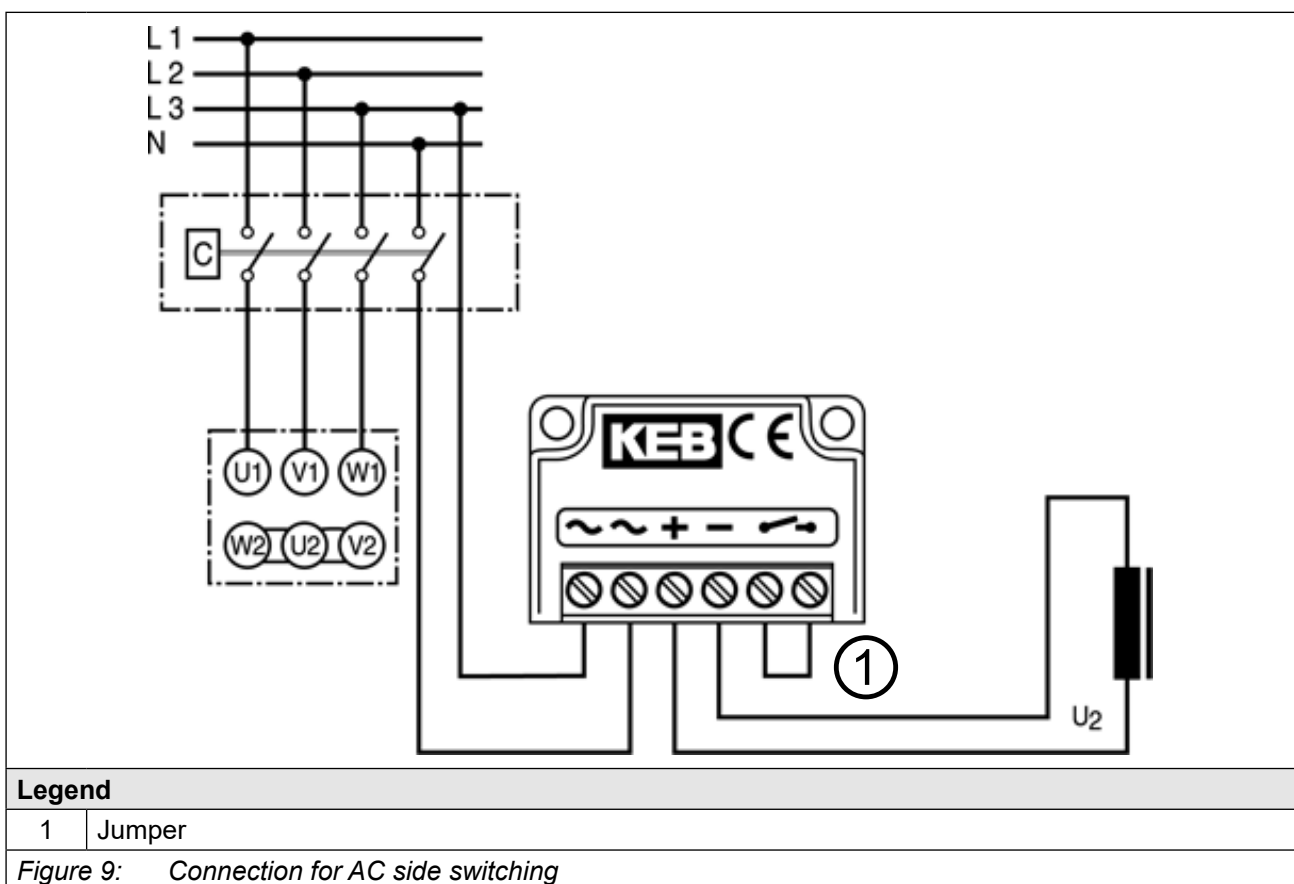
- ▶ Rectifiers or power boxes are destroyed when operated on drive controllers.
- ▶ Rectifiers or power boxes may only be connected directly to the mains.

**Influence on the engaging time!**

The brake can be switched off on the DC side or on the AC side. Switching off on the DC side reduces the engaging time, i.e. the time until the torque is built up for braking.

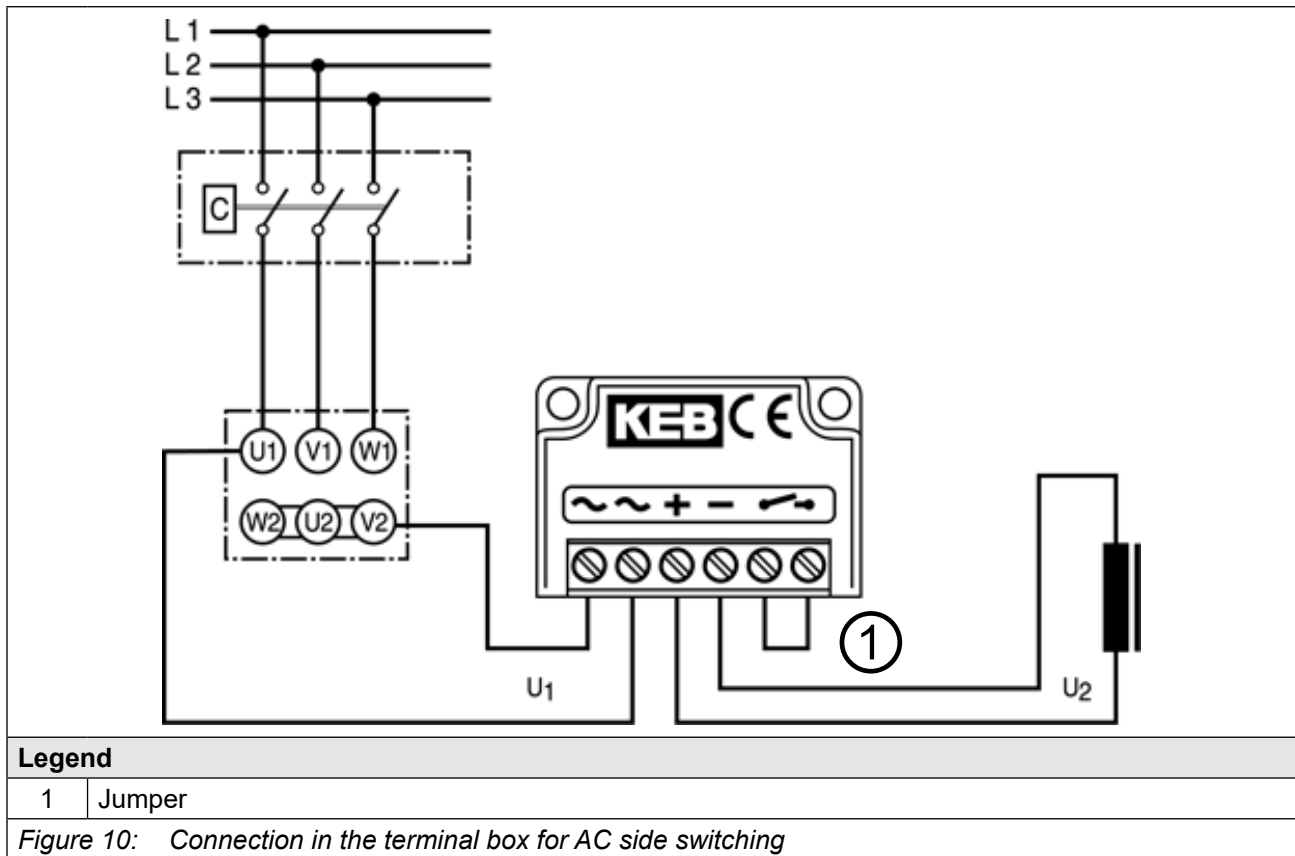
5.1.1 AC side switching

5.1.1.1 Connection for AC side switching



- For cables longer than 10 m between rectifier and brake, an appropriate switch is mandatory.
- Drive controller operation possible, because the power box or the rectifier is supplied from the mains.
- Install wire jumper so that the motor does not work against the brake. For drive controller operation, switch the switch via digital output during ramp-up => „Figure 12: Connection for DC and AC switching“.

5.1.1.2 Connection in the terminal box for AC side switching



- Not permitted for drive controller operation, since the power box or the rectifier would be destroyed.
- Install wire jumper so that the motor does not work against the brake.

5.1.2 DC side switching

Switching occurs between rectifier and brake. KEB rectifiers and power boxes are protected against the voltage peaks resulting from the switching.

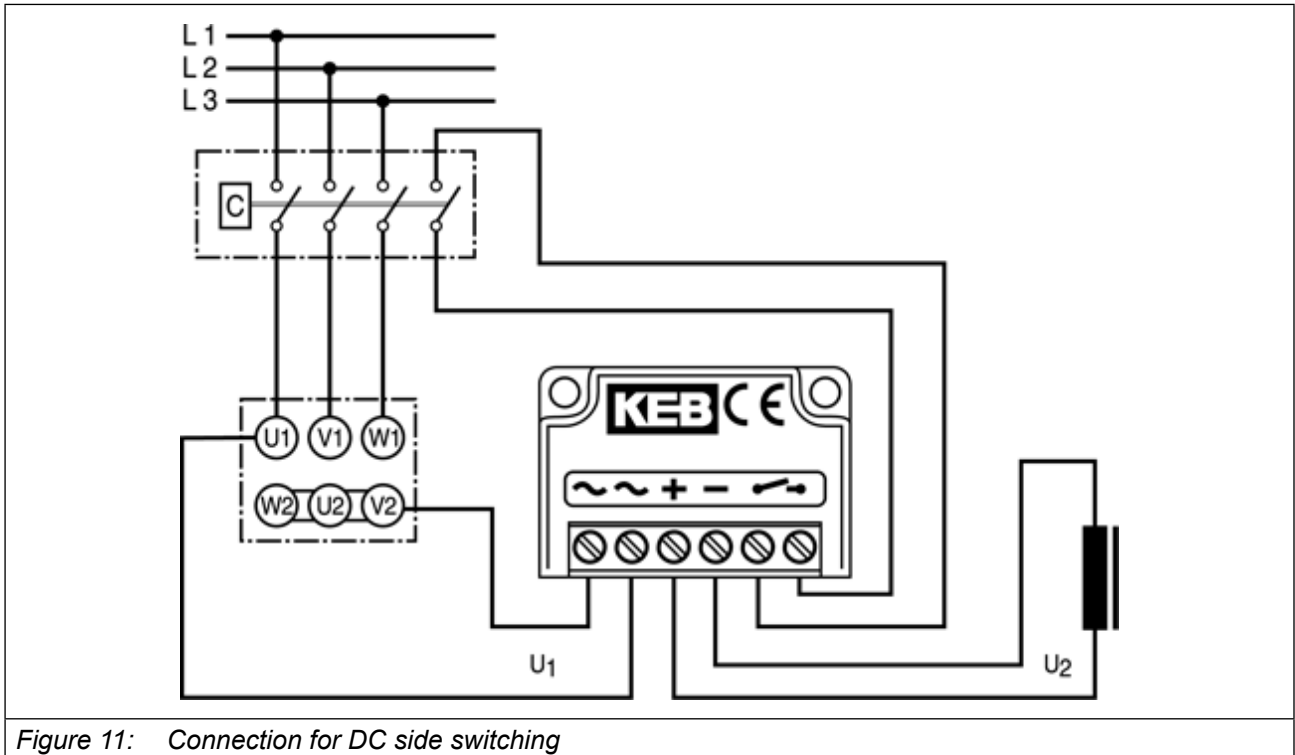


Figure 11: Connection for DC side switching

- Not permitted for drive controller operation, since the power box or the rectifier would be destroyed..

5.1.3 DC and AC side switching

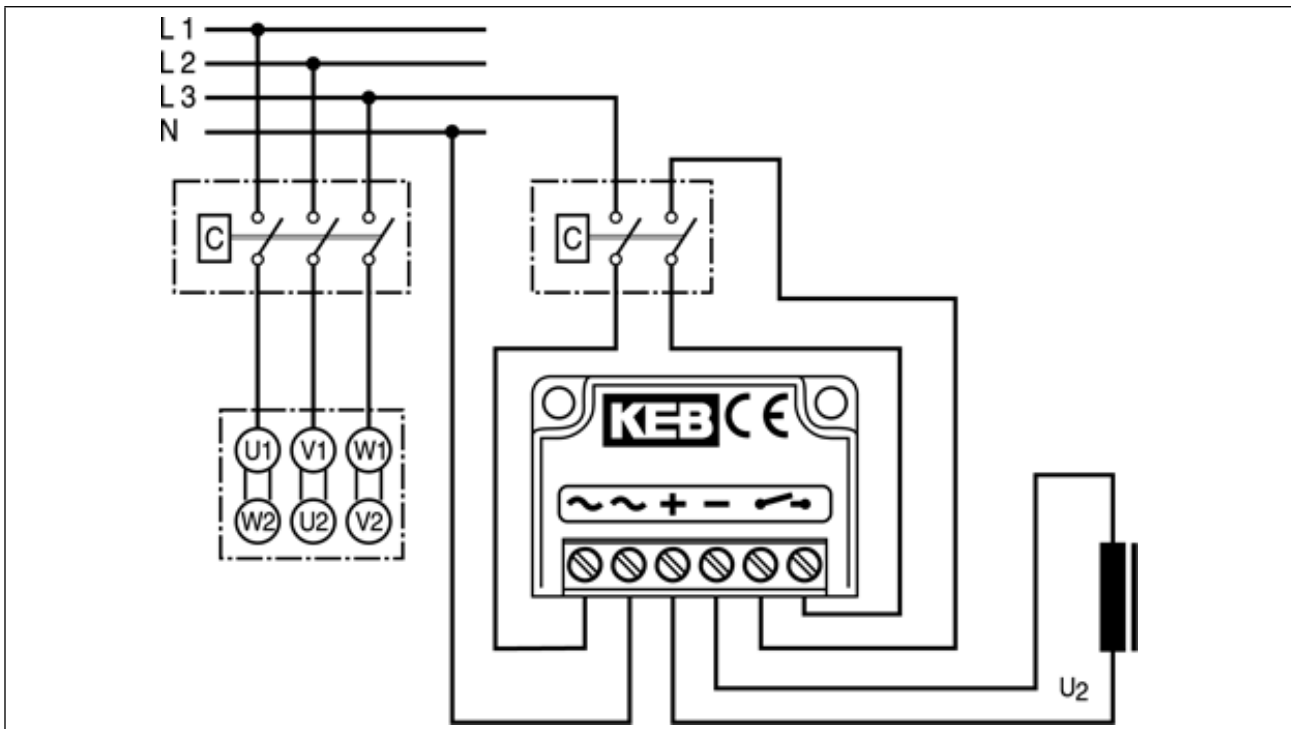


Figure 12: Connection for DC and AC switching

- Drive controller operation possible, because the power box or the rectifier is supplied from the mains.
- For drive controller operation, switch the switch via digital output during ramp-up.
- Enables the shortest switch-off times.
- Reduces the contact erosion.

5.1.4 Protective earth

The brake does not have its own PE connection. The low-resistance connection required for this must be made via the metallic attachment to the grounded motor housing. If necessary, this must be checked by a measurement. In addition, the brake is usually covered by the mounted fan cover and can therefore not be touched directly.

6 Start-up

6.1 Inspections prior to start-up of the brake

6.1.1 Visual inspection

- Do connection and rated voltage (magnet marking) agree?
- Are external damages visible?
- Are there impurities in the functional area or foreign bodies in the air gap of the brake?

6.1.2 Load-free testing

- Ensure that the brake is unloaded.
- Release/close the brake by switching the voltage supply.

NOTICE

Damage due to non-compliance!

- ▶ Do not put into operation if one of the tests is not OK.

6.1.3 Run in of the brake

NOTICE

Damage due to insufficient braking torque!

- ▶ The characteristic torque is only reached after the brake has run in.

To run in the brake, some dynamic braking must be carried out. Depending on the brake size and corresponding speed, we recommend a slip and idle time of 2 seconds each for 10 switching operations.

Size	0B	00
Speed in rpm	350	250

Table 9: Run in of the brake

NOTICE

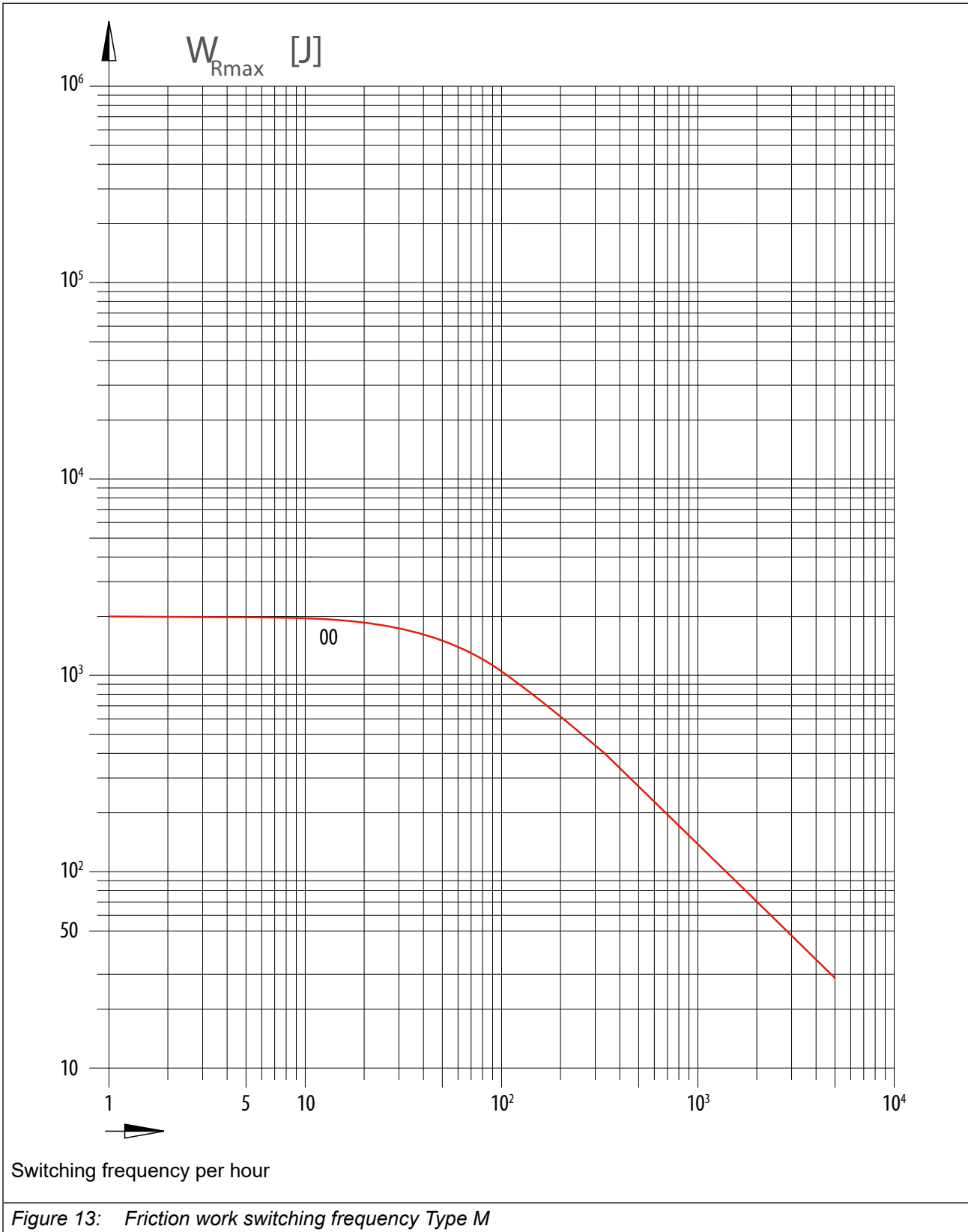
Influences on the brake torque!

- ▶ The braking torque may deviate from the specified values depending on the mounting situation as well as the environmental conditions such as temperature, contamination or corresponding ageing.
- ▶ Using the brake purely as a holding brake can lead to a drop in braking torque, so that regular refreshment must be carried out as part of maintenance.



A maintenance interval of 4 weeks is recommended for normal industrial applications.

6.1.3.1 Friction work switching frequency Type M



7 Operation

The brake is switched via the voltage supply => „5.1 Connection of the brake“. The max. number of switching cycles must not be exceeded => „3.2 Device data COMBIS-TOP M Type 08“ .

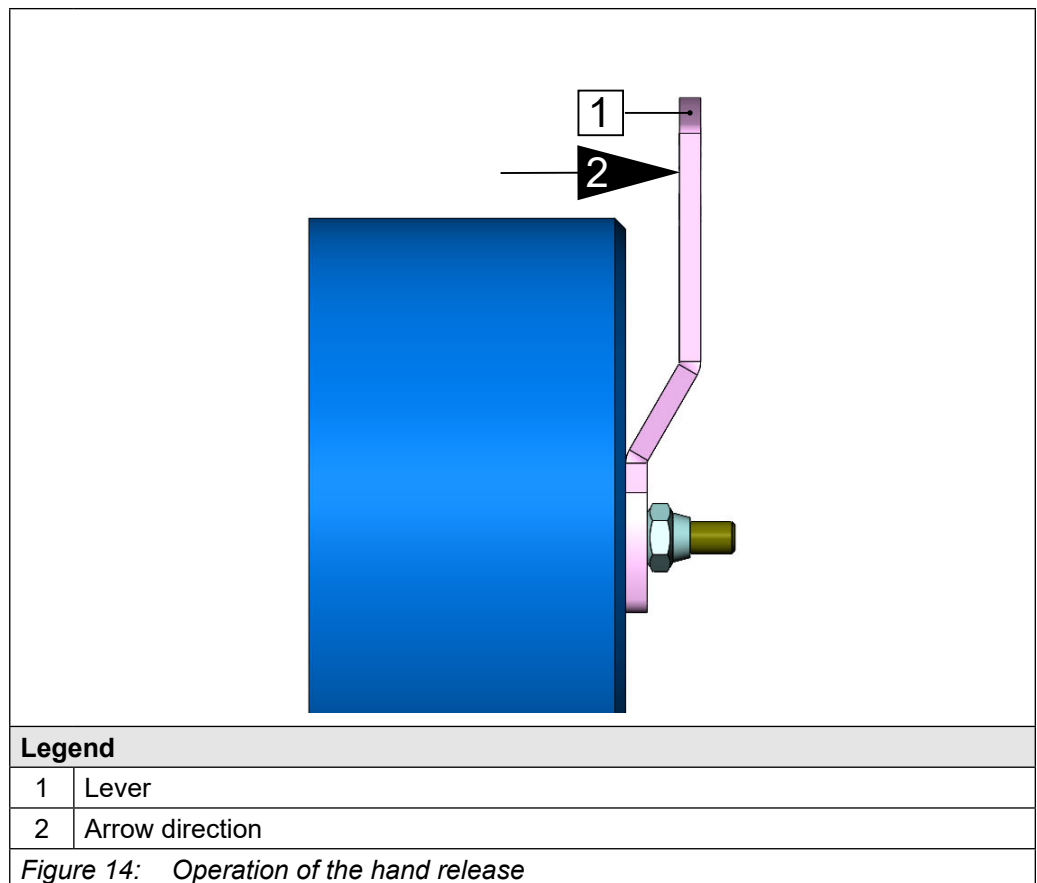
7.1 Hand release (option)

As an option, the brake can be delivered with a hand release. In the event of malfunctions, the brake can be actuated using the hand release.

⚠ CAUTION

Loss of braking effect due to actuation of the hand release!

- ▶ Before actuating the hand release, secure the load mechanically against unintended movement.
- ▶ If necessary, secure downstream elements against falling.



- ▶ To release the brake, pull / press the lever of the hand release evenly in arrow direction.
- ▶ The lever does not engage. To engage the brake, simply release the lever.

8 Troubleshooting

The following table shows some causes and solutions of malfunctions during brake operation. If this does not solve the problem or if other malfunctions occur, please contact our service department.

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	Change wearing parts.
	Foreign particles between armature and lining	Remove the foreign particles. Clean the brake.
	Magnet coil or connecting cable defective	Replace the brake.
	Excessive heating	Insert a quick switch (e.g. 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 them if necessary.
Brake operates with delay, long engaging time	Brake is switched on AC side	Switch the brake on DC side.
<i>Table 10: Troubleshooting</i>		

9 Maintenance and service

- ▶ Observe the general safety instructions.
- ▶ Disconnect the brake from the power supply during maintenance and repair work.
- ▶ Protect electrical and electronic components from splash water.

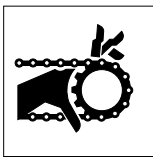
9.1 Maintenance intervals

Due to its design, the brake COMBISTOP M can only be checked when it has been removed. If correctly designed, the brake is maintenance-free.

9.2 Service

Service is required if, in accordance with the fault table, there are symptoms of damaged or soiled linings, unusual noises or smells.

⚠ CAUTION



Limbs crushed!

Securing the load!

- ▶ Mechanically secure the load against unintended movement.
- ▶ Release brake from load.
- ▶ Dismount the brake according to the manual.

9.2.1 Dismount the brake

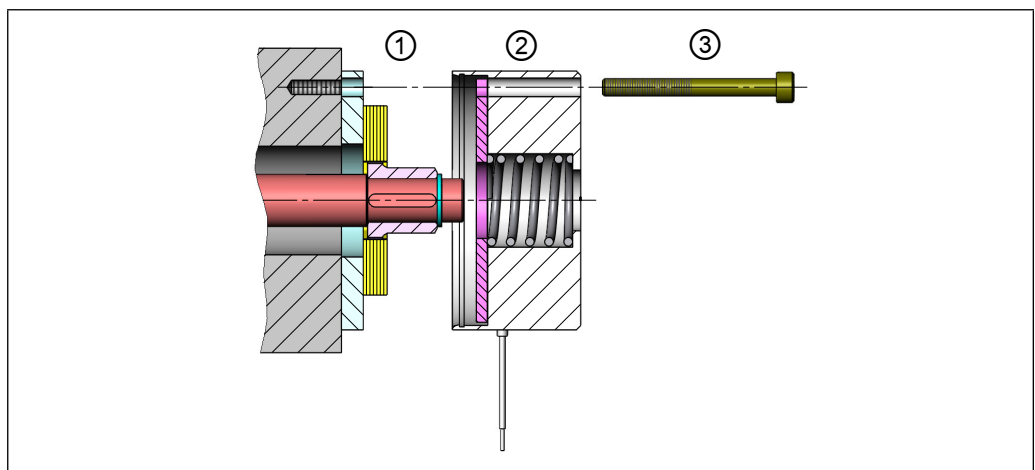


Figure 15: Dismount the brake

- ▶ Disconnect the connecting cables from the voltage supply.
- ▶ If necessary, dismount the fan from the shaft (=> instruction manual of the motor).
- ▶ Loosen and remove the three socket head screws alternately piece by piece.
- ▶ Remove the brake from the shaft backwards.

9.2.2 Check the braking energy

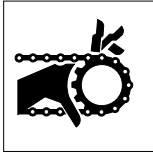
The brakes are designed in such a way that the air gap "X" is defined by the conformance components. This means that the air gap cannot be adjusted. As a result of wear, the air gap increases.

Size	Air gap	
	Nominal value X	Limit value X _v
	mm	mm
0B	0.1	0.24
00	0.15	0.4

Table 11: Check air gap

9.2.3 Replacing the lining

⚠ CAUTION



Worn or dirty linings!

Loss of braking efficiency!

- ▶ Securing the load!
- ▶ 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.

- ▶ Dismount the brake => *“9.2.1 Dismount the brake”*.
- ▶ Pull the lining off the hub => *“2.6 Overview COMBISTOP M Type 08”*.
- ▶ Place the lining straight and slide it onto the hub.
- ▶ The lining must slide smoothly onto the hub! The teeth of the hub and the lining must not be damaged!
- ▶ The brake is mounted in reverse order => *“4.2 Mounting the brake”*.
- ▶ Functional test and start-up => *“6 Start-up”*.

9.2.4 Check the function hand release (option)

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

Size	0B	00
Dimension m / mm	–	0.8

Table 12: Check the function hand release

NOTICE

Loss of braking efficiency!

- ▶ For the safe operation of the brake, the correct adjustment / inspection of the adjustment dimension "m" is mandatory.

9.2.4.1 Checking the adjustment dimension

The adjustment dimension "m" must be checked / adjusted with attracted armature! The adjustment dimension applies to characteristic torque and operation with rated voltage.



The hand release plate is attached to the housing. To check the adjustment dimension m, it must be pushed away from the housing up to the stop point.

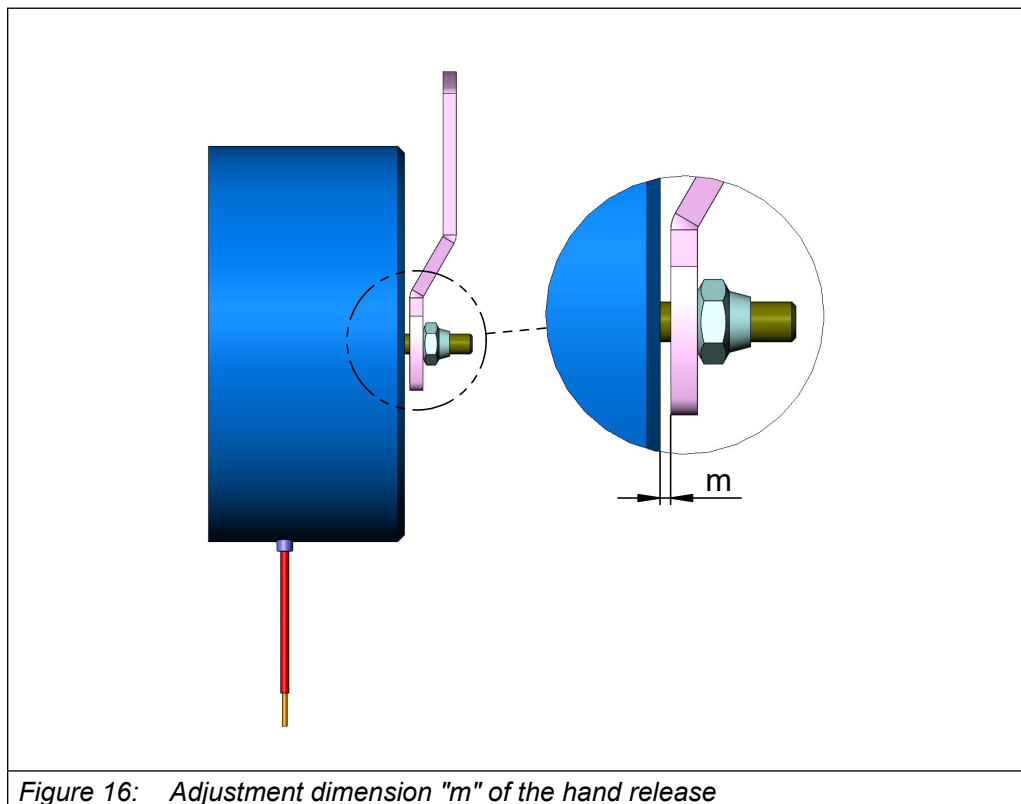


Figure 16: Adjustment dimension "m" of the hand release

10 Dismounting and disposal

10.1 Dismounting

For dismounting the brake => „9.2.1 Dismount the brake“.

10.2 Disposal



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:

Non-ferrous metals (copper is also included) (Key No.: EAK 16 01 18)

Lining (incl. steel or aluminium beams):

Brake linings (Key No.: EAK 16 01 12)

11 Certification

11.1 EU declaration of conformity

EU DECLARATION OF CONFORMITY



Document No. / month.year: ce_bc_rns-bc-b_en.docx / 01.2022

Manufacturer: KEB Automation KG
Südstraße 38
32683 BARNTRUP
Germany

Product type: spring applied fail safe brake COMBISTOP
permanent magnet - brake COMBIperm
electromagnet – clutch and brake COMBINORM
clutch – brake –combinations in one housing COMBIBOX

Size 01 up to 14
Voltage category 71...440Vdc (50 ... 690 Vac)

This declaration of conformity is issued under the sole responsibility of KEB Automation KG.

The above given product is in accordance with the following directives of the European Union

Number: **Low voltage : 2014 / 35 / EU**
Text: Directive on the approximation of the laws of the Member States relating to all electrical equipment that has a voltage rating between 50V and 1000V AC or 75V and 1500V DC.

Number: **Hazardous Substances: 2011 / 65 / EEC (incl. 2015 / 863 / EU)**
Text: Directive on the approximation of the laws of the Member States relating on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Responsible: KEB Automation KG
Südstraße 38
32683 BARNTRUP

Place, date Bartrup, 28. December 2021

Issued by:

i. A. W. Hovestadt / Conformance Officer

W. Wiele / Technical Manager

This declaration certifies the conformity with the named directives, but does not contain any assurance of quality.

The safety instructions, described in the instruction manual are to be followed.

EU DECLARATION OF CONFORMITY



Annex 1

Document-Nr. / Month.year: ce_bc_rms-bc-b_en.docx / 01.2022

Product type:	spring applied fail safe brake	COMBISTOP
	permanent magnet - brake	COMBIPERM
	electromagnet – clutch and brake	COMBINORM
	clutch – brake –combinations in one housing	COMBIBOX
	Size	01 up to 14
	Voltage category	71...440Vdc (50 ... 690 Vac)

The conformity of the above given product to the European Directive 2014/35/EU (for electrical equipment designed for use within certain voltage limits) is given by complete approval / testing to the following European harmonized standards:

EN - standard	
VDE 0580, Version 2011	Electromagnetic devices and components – General specifications
Informative:	Electronic equipment for use in power installations
EN 50178, Version 1997	

The conformity of the above given product to the European Directive 2011/65/EU with changes of 2015/863/EU (for restrictions of the use for certain hazardous substances in electrical and electronic equipment) is given by qualification of components and manufacturing process within the ISO 9001 QM system. The necessary information and declarations are documented and memorized.

EN 63000: 2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The above given product was developed, manufactured and tested within an internal quality management system. This ISO 9001 QM system was approved by:

Notified body:	TÜV - CERT
Address:	Zertifizierungsstelle des RWTÜV Steubenstrasse 53 D - 45138 Essen
No. of approval	041 004 500
Dated:	20.10.1994
Valid until:	December 2024

Figure 17: EU declaration of conformity

11.2 CSA certificat



Certificate of Compliance

Certificate:	1267150 (LR49670)	Master Contract:	172220 (049670_0_000)
Project:	70199031	Date Issued:	2018-10-05
Issued to:	KEB Automation KG Suedstrasse 38 32683 Barntrop, GERMANY		

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by: *Khalil Ouldchama*
Khalil Ouldchama

PRODUCTS

CLASS - C321107 - INDUSTRIAL CONTROL EQUIPMENT-Miscellaneous Apparatus
 CLASS - C321187 - INDUSTRIAL CONTROL EQUIPMENT-Miscellaneous Apparatus - Certified to US Standards

Spring Applied Brakes, COMBISTOP, open type, 290 VDC de or less, insulation Class B or F: Type 08 (dimensions OB - 10), 6 - 180 W

Type 28 (dimensions 01 - 10), 16 - 130 W
 Type 31 (dimensions 01 - 08), 16 - 75 W
 Type 38 (dimensions 02 - 11), 25 - 280 W
 Type 71 (dimensions 00 - 11), 6 - 300 W

Permanent Magnet Brakes, COMBIPERM, open type, 205 VDC or less, insulation Class F:
 Type P1 (dimensions 01 - 10), 8 - 50 W
 Type 15 (dimension 02-10), 8 - 50 W

Electromagnetic Clutches and Brakes, COMBINORM, open type, 205VDC or less, insulation Class B or F:
 Type 02 (dimensions 01 - 13), 6 - 85 W
 Type 03 (dimensions 01 - 13), 6 - 85 W
 Type 04 (dimensions 05 - 12), clutches 15 - 85 W; brakes 15 - 85 W



Certificate: 70199031

Master Contract: 172220

Project: 70199031

Date Issued: 2018-10-05

Notes:

1. The first two figures define the size of the product. The next two figures describe the product type, e.g. COMBISTOP. The following three figures describe the design and the last four figures describe the layout of the product type.
2. Component magnets equipped with not certified leads are supplied with levels acceptable for extra low Voltage, energy limited circuits only. Final acceptability is subjected to re-evaluation by CSA in the end use.

APPLICABLE REQUIREMENTS

CSA-C22.2 No. 14-18 - Industrial Control Equipment
ANSI/UL 508, Ed.17 - Industrial Control Equipment



Supplement to Certificate of Compliance

Certificate: 1267150 (LR49670)

Master Contract: 172220 (049670_0_000)

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70199031	2018-10-05	Update of report to cover correction of issued address and to update report in accordance with CSA-C22.2 No. 14-18 and Certification notice Industrial Control Equipment No. 60 , dated at April 26, 2018.
1817504	2006-08-25	Alternate construction and re-testing of brakes and clutches, series Combistop, Combiperm and Combinom. Rated voltage raised to 205 Vdc for Combiperm and Combinom.
1267150	2002-04-08	cCSAus Certification on Electromagnetic brakes and clutches; COMBISTOP, Types 08, 28, 31, 38, 71; COMBIPERM, Types PI, 15; COMBINORM, Types 02, 03, 04.

Figure 18: CSA certifikat

12 Revision history

Version	Date	Description
00	2023-08	First edition based on COMBISTOP Type 38
01	2023-12	Series version
02	2024-01	Change from Type M to Type 08

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Automation with Drive

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