

COMBISTOP **M**

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

Translation of the original manual
Document 20351416 EN 03

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.

Table of Contents

Preface **3**
Signal words and symbols 3
More symbols 3
Laws and guidelines 4
Warranty and liability 4
Support 4
Copyright 4
Table of Contents **5**

1 Basic Safety Instructions 8
1.1 Target group **8**
1.2 Transport, storage and proper use **8**
1.3 Installation and mounting **9**
1.4 Electrical connection **9**
1.5 Start-up and operation **10**
1.6 Maintenance **11**
1.7 Disposal **12**

2 Product description 13
2.1 Intended use **13**
2.2 Residual risks **13**
2.3 Improper use **13**
2.4 Type code **14**
2.5 Type code magnet and magnet system **15**
2.6 Overview COMBISTOP M Type 08 ..... **16**
2.7 Functional description **16**

3 Technical data 17
3.1 Operating conditions **17**
3.1.1 Climatic environmental conditions 17
3.1.2 Electrical operating conditions 17
3.2 Device data COMBISTOP M Type 08 ..... **18**
3.2.1 Overview 18
3.2.1.1 Switching timing diagram 19
3.3 Dimensions and weights **20**
3.3.1 Size 0B without options 20
3.3.2 Size 0B without options 21
3.3.3 Dimensions with hand release and flange 22

4 Mounting 23

4.1 Notes on mounting 23

4.1.1 Inspections to be done prior to mounting the brake 23

4.1.2 Observe during mounting 24

4.2 Mounting the brake 24

4.2.1 Step 1: Mounting the hub 25

4.2.2 Step 2: Mounting the lining 26

4.2.3 Step 3: Mounting the magnetic system 27

5 Electrical connection 28

5.1 Connection of the brake 28

5.1.1 AC side switching 29

5.1.1.1 Connection for AC side switching 29

5.1.1.2 Connection in the terminal box for AC side switching 30

5.1.2 DC side switching 31

5.1.3 DC and AC side switching 32

5.1.4 Protective earth 32

6 Start-up 33

6.1 Inspections prior to start-up of the brake 33

6.1.1 Visual inspection 33

6.1.2 Load-free testing 33

6.1.3 Run in of the brake 33

6.1.3.1 Friction work, operational frequency, type 08 34

7 Operation 35

7.1 Hand release (option) 35

8 Troubleshooting 37

9 Maintenance and service 38

9.1 Maintenance intervals 38

9.2 Service 38

9.2.1 Dismount the brake 38

9.2.2 Check air gap 39

9.2.3 Replacing the lining 40

9.2.4 Check the function hand release (option) 40

9.2.4.1 Checking the adjustment dimension 41

10 Demontage und Entsorgung 42
10.1 Dismounting 42
10.2 Disposal 42
11 Certification 43
11.1 EU declaration of conformity 43
11.2 CSA certifikat 43
11.3 Further information and documentation 44
12 Revision history 45
Glossary 46
List of Figures 48
List of Tables 49

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- 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 through 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.

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.

On arrival the brake needs to be checked for visible transport damages. Immediately report transport damages to the transport company and the manufacturer.

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

NOTICE

Damage resulting from improper storage.

No liability is assumed for any damage that occurs due to improper storage.

Don't storage devices or parts

- in the environment of aggressive and/or conductive liquids or gases.
- with direct sunlight.
- outside the specified environmental 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.
- ► A pollution degree of 2 in accordance with *DIN EN IEC 60664-1* must not be exceeded.

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 coupling, switch off the supply voltage to the motor 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 drop of the braking torque!

- ► Exceeding the technical specifications may result in thermal overload at the braking surface or magnet. This may lead to failure of the brake.

⚠ 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 temperature and allow coupling to 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

Possible brake malfunctions!

- ► Use in safety-critical applications is not permitted.
- ► Do not operate in areas with strong external magnetic fields.

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 particles may impede the movement of the 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!

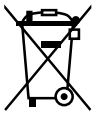
Unpredictable malfunctions!

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

1.7 Disposal

Electronic devices of the KEB Automation KG are exclusively professional devices for further industrial processing (so-called B2B devices).

Manufacturers of B2B devices are obliged to take back and recycle devices manufactured after 14.08.2018. These devices may not be disposed at the collection centres of public sector disposal organisations.



If no deviating agreement has been made between the customer and KEB or no deviating mandatory legal regulation exists, KEB products marked in this way can be returned. Company and keyword to the return point can be taken from the list below. Shipping costs are paid by the customer. Thereupon the devices will be professionally recycled and disposed.

The entry numbers are listed country-specific in the following table. The corresponding KEB return addresses can be found on our website.

Withdrawal by	WEEE-Reg.-No.		Keyword
Austria			
KEB Automation GmbH	ERA:	51976	Stichwort „Rücknahme WEEE“
France			
RÉCYLUM - Recycle point	ADEME:	FR021806	Mots clés „KEB DEEE“
Germany			
KEB Automation KG	EAR:	DE12653519	Stichwort „Rücknahme WEEE“
Italy			
COBAT	AEE: (IT)	19030000011216	Parola chiave „Ritiro RAEE“
Spain			
KEB Automation KG	RII-AEE	7427	Palabra clave „Retirada RAEE“
Česko			
KEB Automation KG	RETELA	09281/20 ECZ	Klíčové slovo: Zpětný odběr OEEZ
Slowakei			
KEB Automation KG	ASEKOL:	RV22EEZ0000421	Klíčové slovo: ”Spätný odber OEEZ”

The packaging must be feed to paper and cardboard recycling.

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.



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

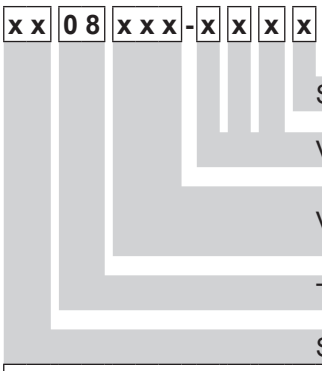
Table 1: Type code

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 brake 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.

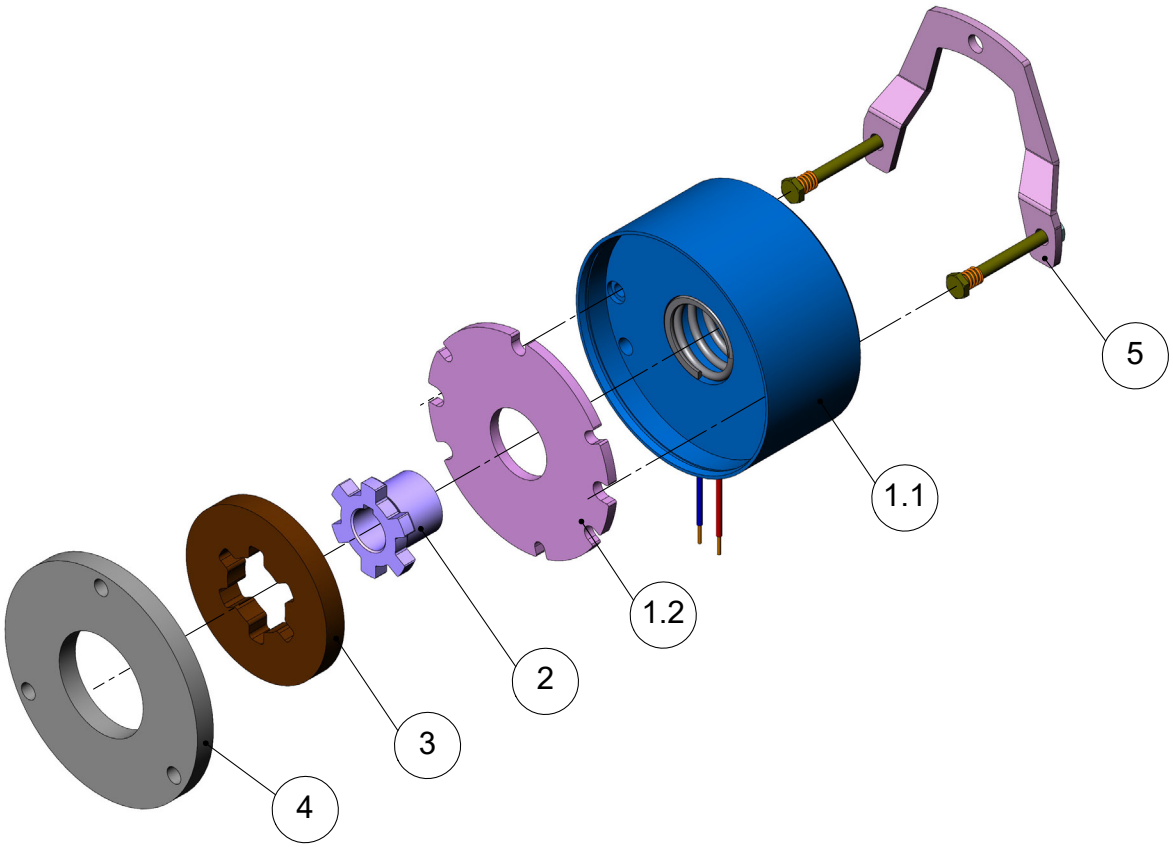


Strands	Material and length
Voltage	e.g. DC 24 V
Version	100: Without hand release 200: With hand release
Type	COMBISTOP Type 08
Size	0B, 00

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 shaft sealing ring [2] or plug
		Under fan cover without hand release	IP55	
		Under fan cover with hand release	IP55	
Table 5: Construction and degree of protection with shaft sealing ring or plug				

[1] *However, given the wide range of possible applications, the mechanical components must be tested to ensure they function correctly under the specific operating conditions.*

[2] *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		ED / %	100	
Speed for service braking		n / rpm	3000	
Max. speed for emergency braking		n_{max} / rpm	6000	
Mass moment of inertia		J / 10^{-6}kgm²	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
Engagig time AC	9)	t_{1_ac} / ms	60	100
Engaging time DC	9)	t_{1_dc} / ms	15	25
Feather key			nach *DIN 6885-1*	
Keyway				
ISO class			B (optional F and H)	

Table 7: Device data COMBISTOP M Type 08

1) *After conditioning run-in of the friction parts. Measured at quasi-static differential speed of 25* rpm *and 20 °C.*

2) *Possible steps: 0.5…2 Nm.*

3) *With increased rated torque, increased coil power up to 15 W may be necessary.*

4) *Special voltage upon request.*

5) *105 V / 180 V / 205 V 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 => „3.2.1.1 Switching timing diagram“.*

8) *Time from switching off the current until increase in torque. The values are to be regarded as guidelines => „3.2.1.1 Switching timing diagram“.*

9) *Time from switching off the current until reaching 0.9 x rated torque M_2. The values are to be regarded as guidelines => „3.2.1.1 Switching timing diagram“.*

3.2.1.1 Switching timing diagram

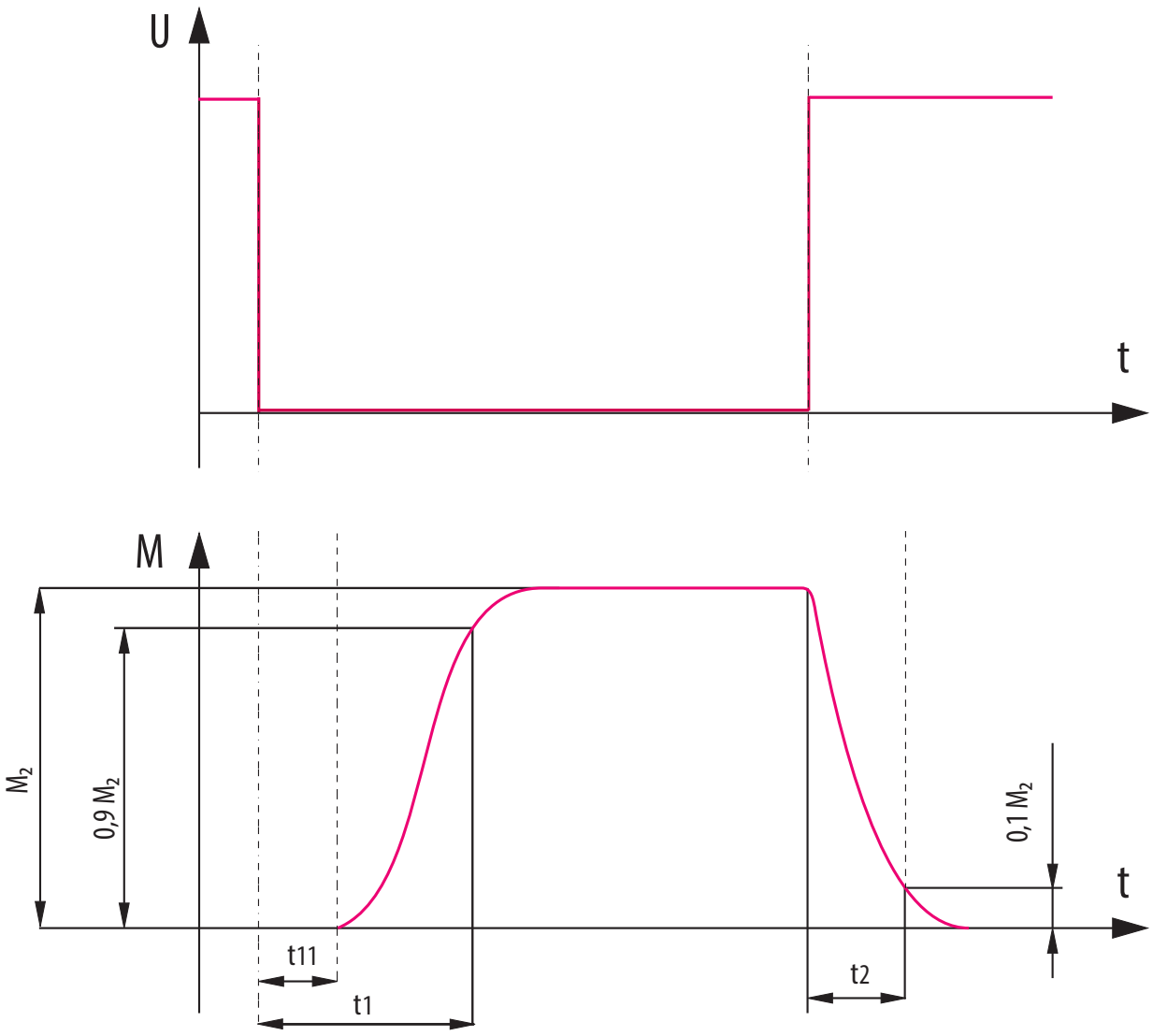
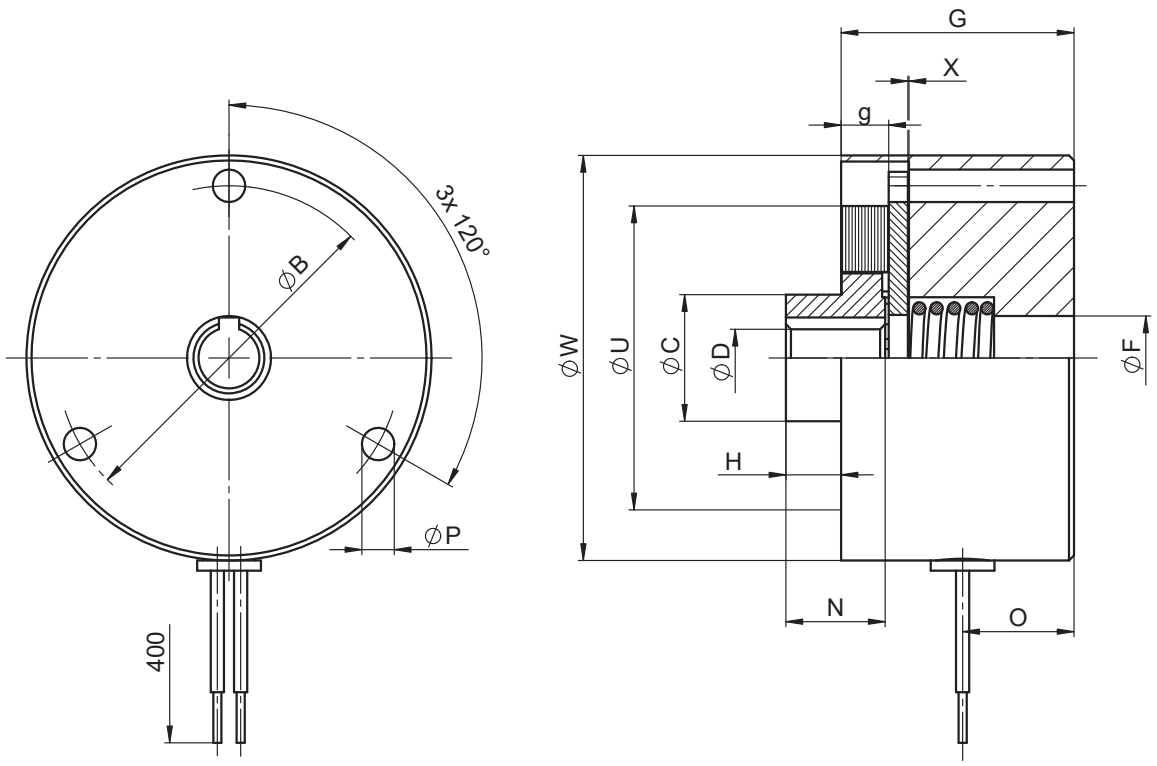


Figure 2: Switching timing diagram

3.3 Dimensions and weights

3.3.1 Size 0B without options



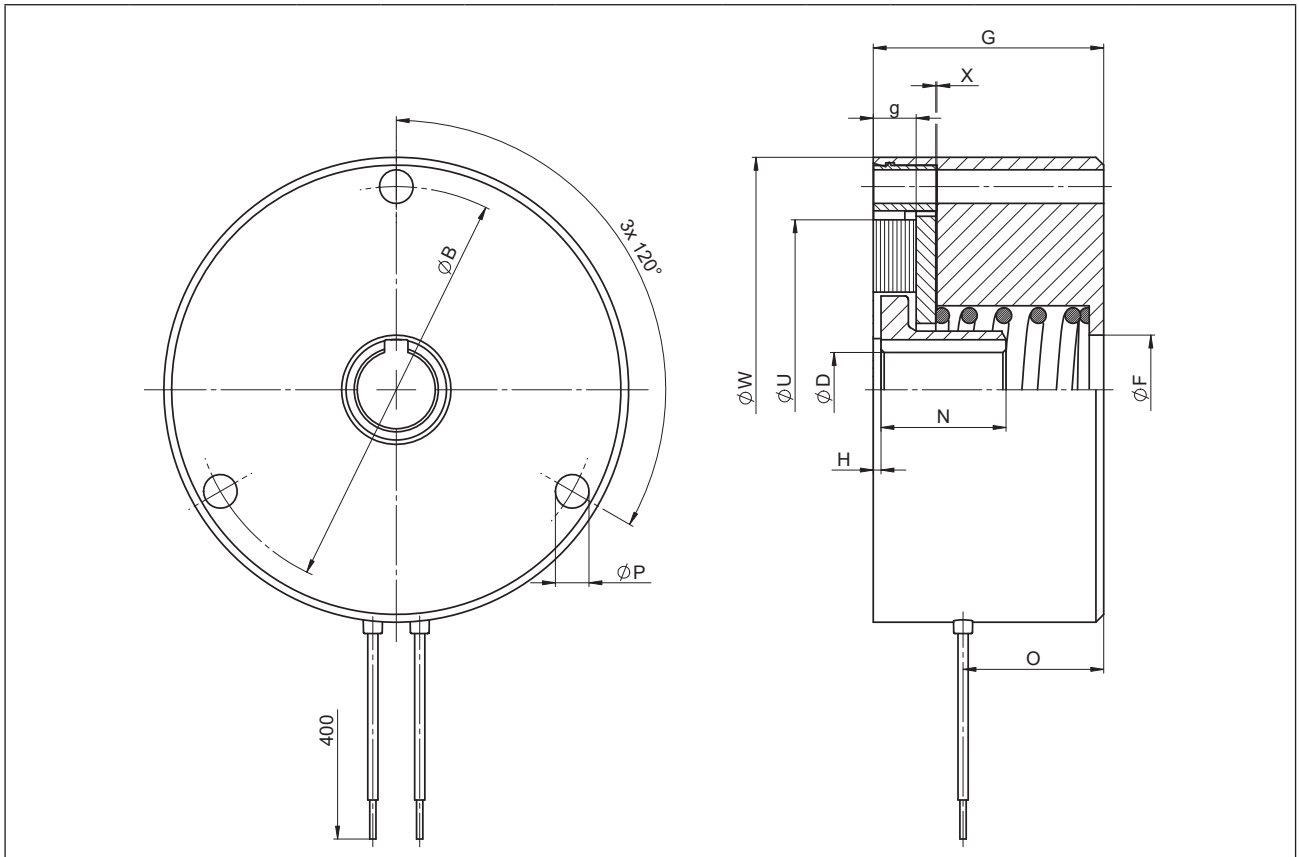
Size [1]	Dimensions / mm													Weight / kg
	B	C	D [2] max.	F	G	H	N	O	P	U	W	X	g	
0B	34	12.5	8	8.3	23	5.5	9.8	11	3.2	30	40	0.1	4.7	0.15

Figure 3: Dimensions COMBISTOP M Type 0B 08 without options

[1] *Keyway in accordance with DIN 6885-3, VDE 0580, ISO Class "B".*

[2] *Bore 10 mm tolerance H7, otherwise H8.*

3.3.2 Size 0B without options



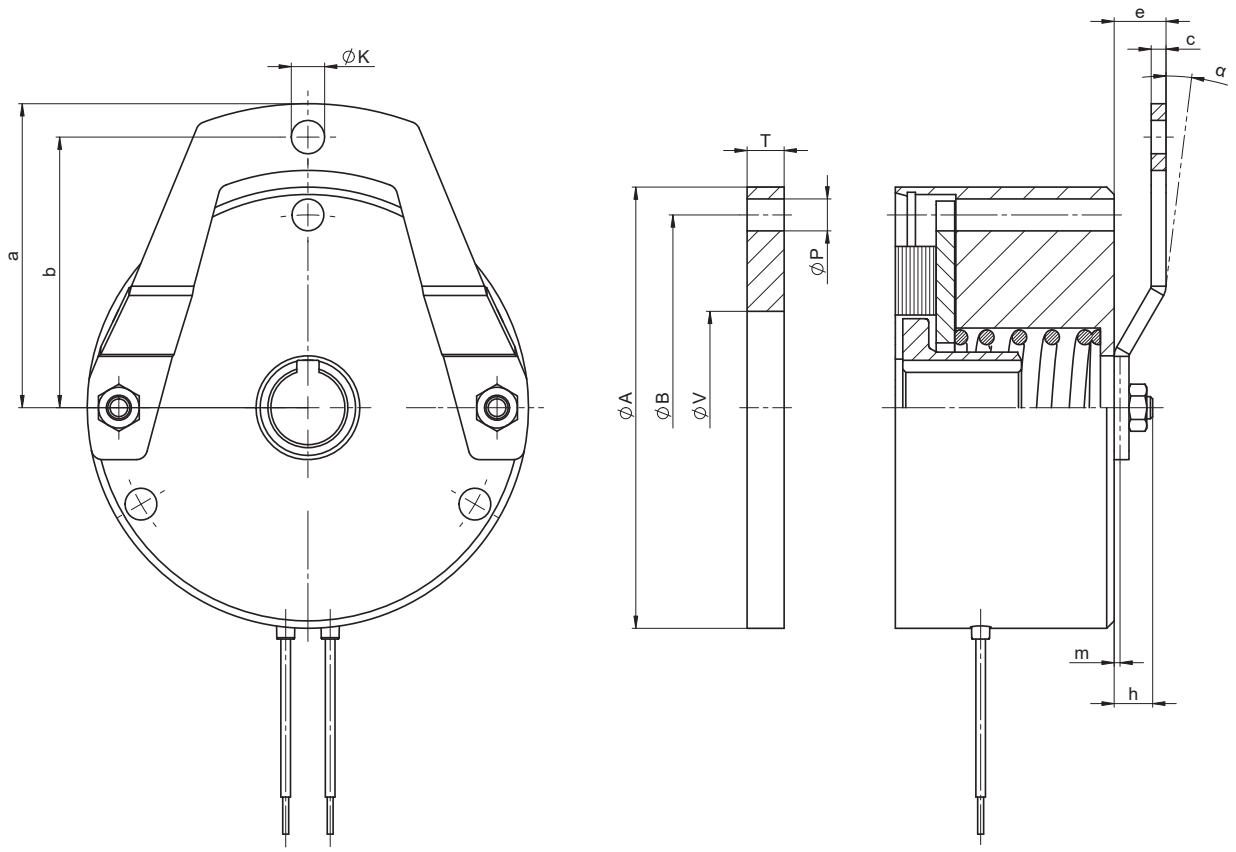
Size [1]	Dimensions / mm												Weight / kg
	B	D [2] max.	F	G	H	N	O	P	U	W	X	g	
00	52	10	14	29.5	0.5...1	16	18	4.3	43.5	59.5	0.15	5.5	0.4

Figure 4: Dimensions COMBISTOP M Type 00 08 without options

[1] *Keyway in accordance with 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												∠ / °	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 5: Dimensions COMBISTOP M Type 08 with hand release and flange

[1] *Keyway in accordance with 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 Rz 6.3 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 air gap“*.

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 Type 08	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 Type 08	0B	00
Angular deviation / mm	0.04	0.04

4.2 Mounting the brake

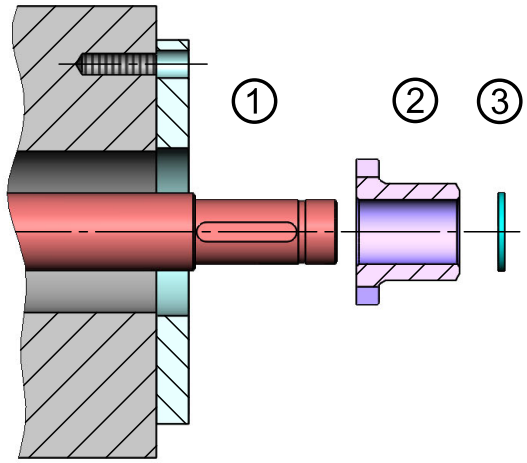
NOTICE

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.

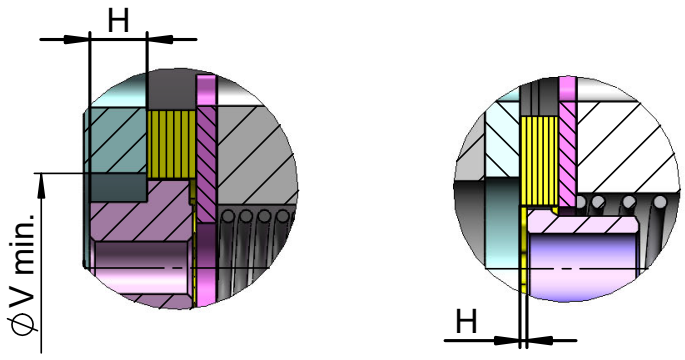


Legend			
1	Motor shaft	3	Retaining ring
2	Hub		

Figure 6: Mounting the hub on the motor shaft

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	18	5.5
00 08	–	0.5...1

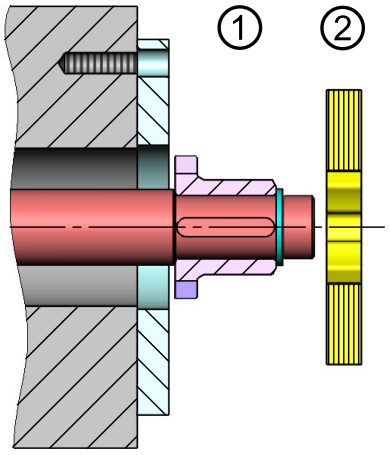


0B 08	00 08

Figure 7: Distance hub to 2nd friction surface

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.

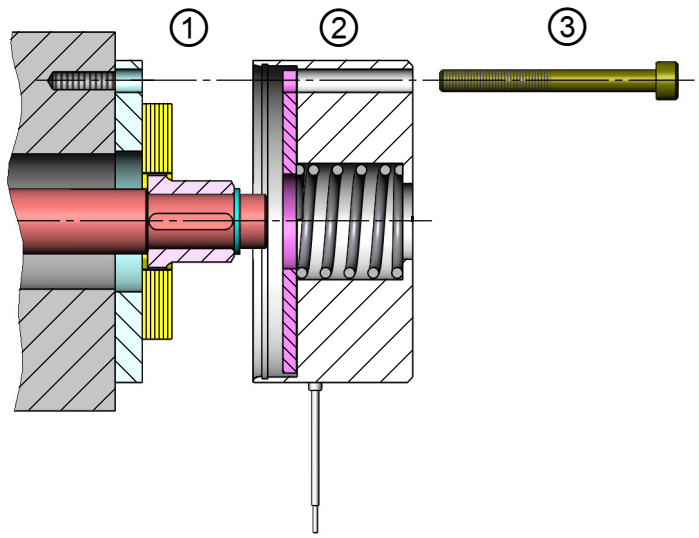


Legend			
1	Hub on motor shaft	2	Lining

Figure 8: 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!



Legend			
1	Hub on motor shaft with lining	2	Magnet system
3	Socket head screw		

Figure 9: Mounting the magnetic system

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 mm²	2 x 0.25 mm²
Connection length	400 mm + 100 mm	400 mm + 100 mm

Table 8: Preassembled connecting wires

NOTICE

Connection for drive controller operation.

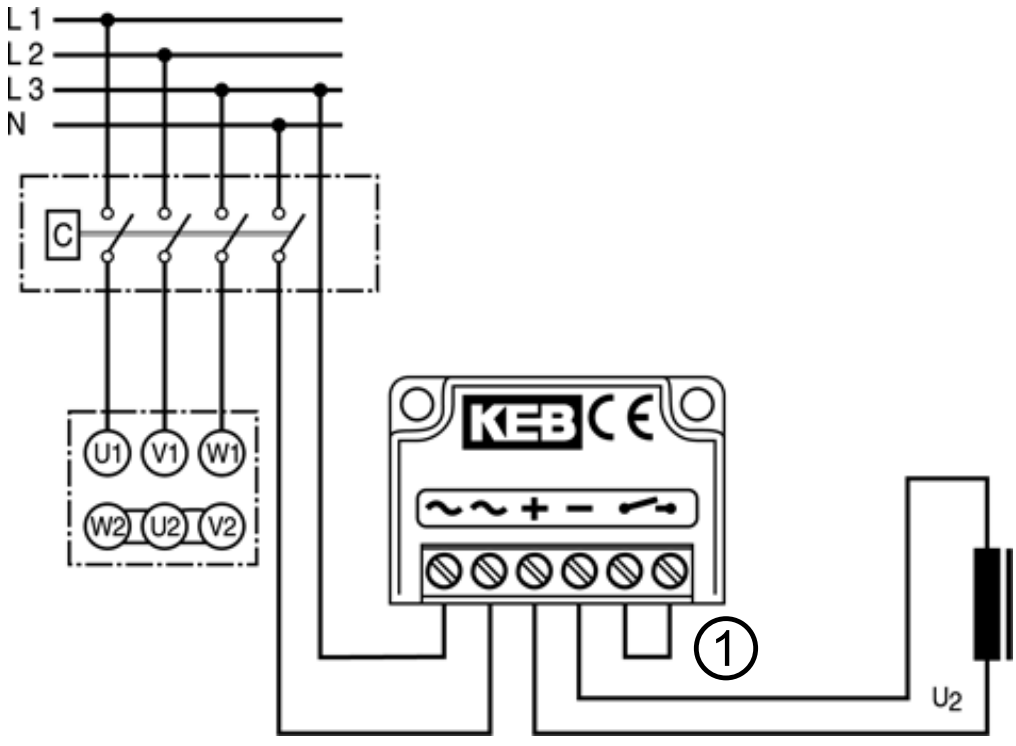
- ► Rectifiers or power boxes are destroyed when operated on drive controllers.
- ► Rectifiers or power boxes may only be connected directly to the mains.

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

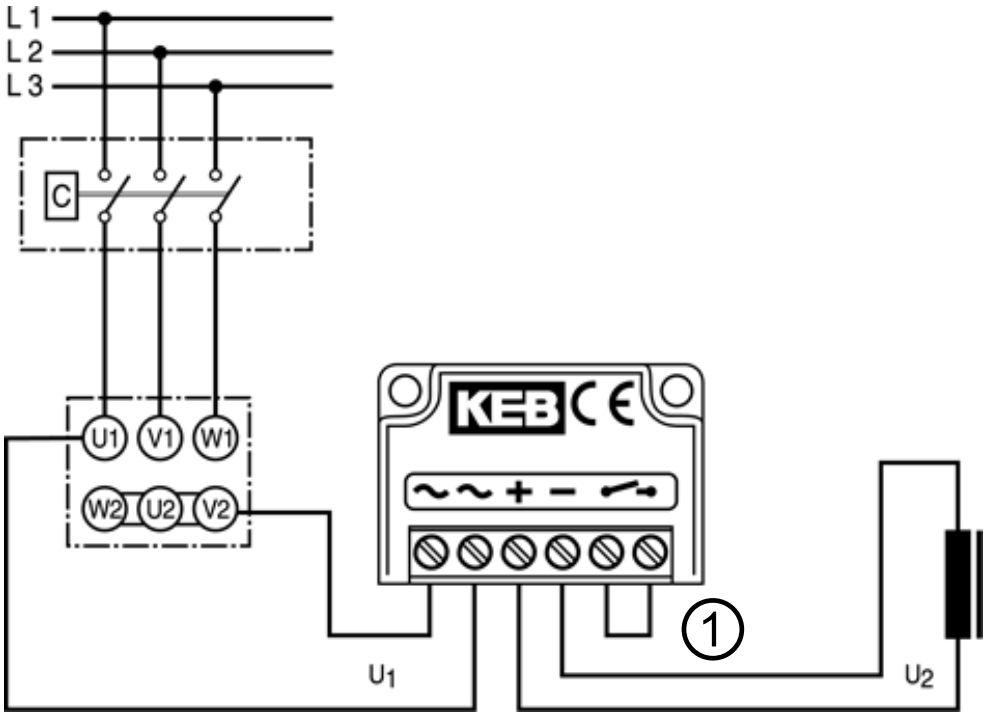


Legend	
1	Jumper

Figure 10: 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 13: Connection for DC and AC switching“*.

5.1.1.2 Connection in the terminal box for AC side switching



Legend	
1	Jumper

Figure 11: 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.

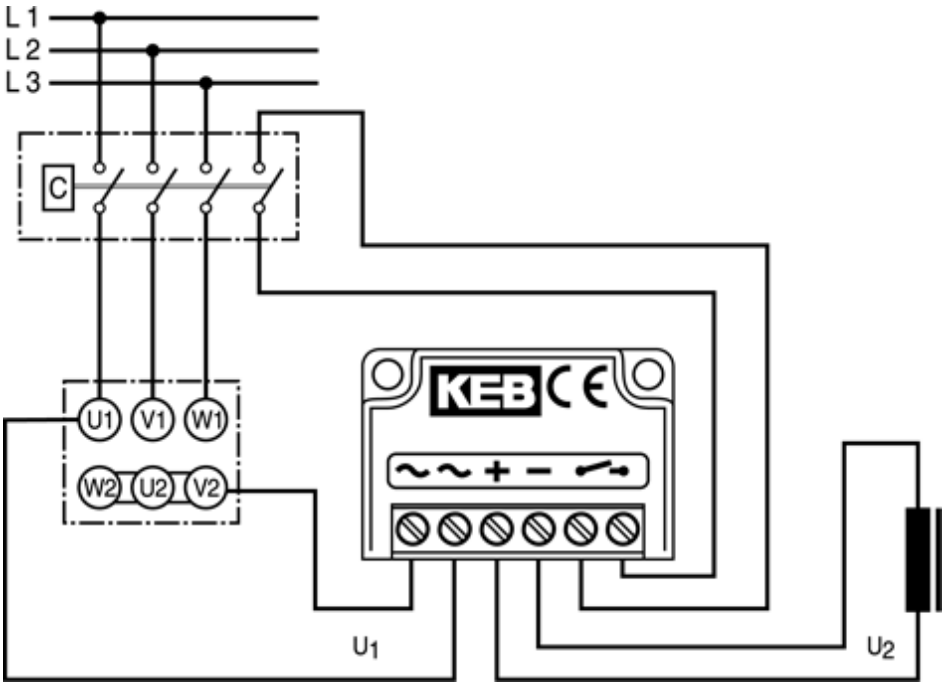


Figure 12: Connection for DC side switching

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

5.1.3 DC and AC side switching

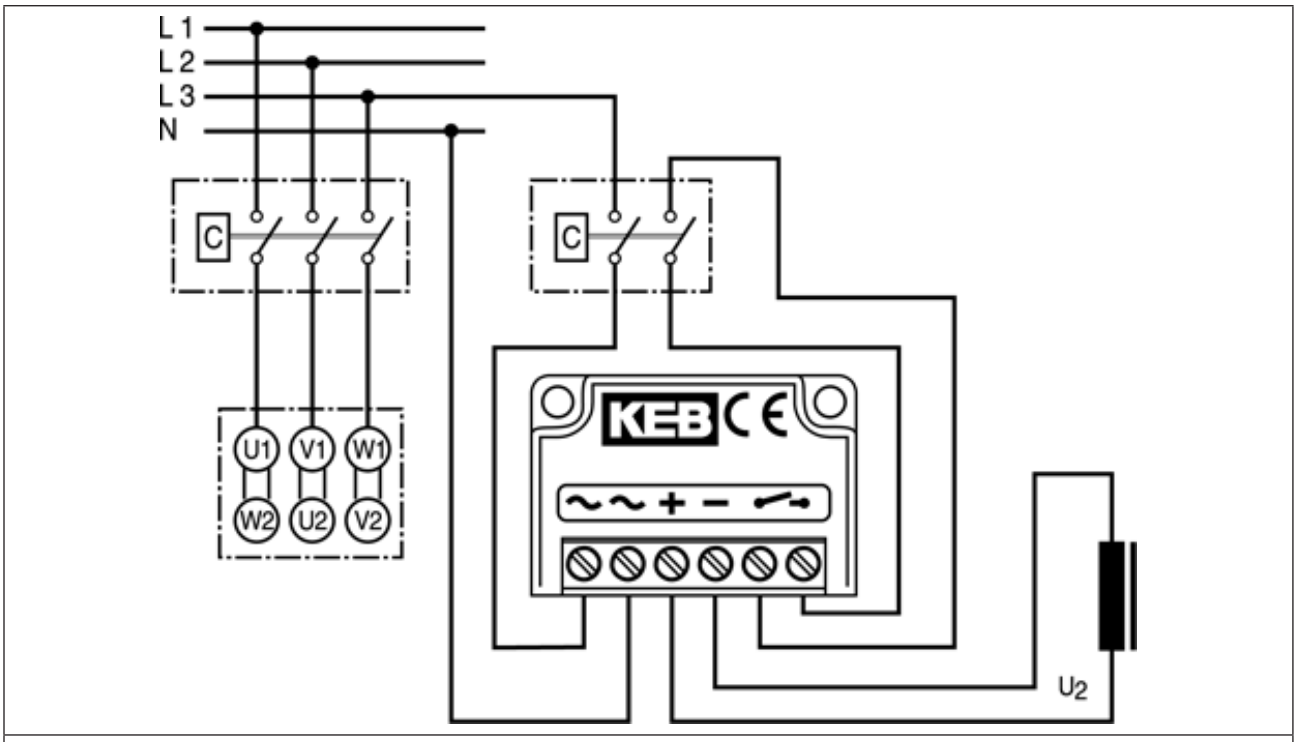


Figure 13: Connection for DC and AC switching

- 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-observance!

► 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, operational frequency, type 08

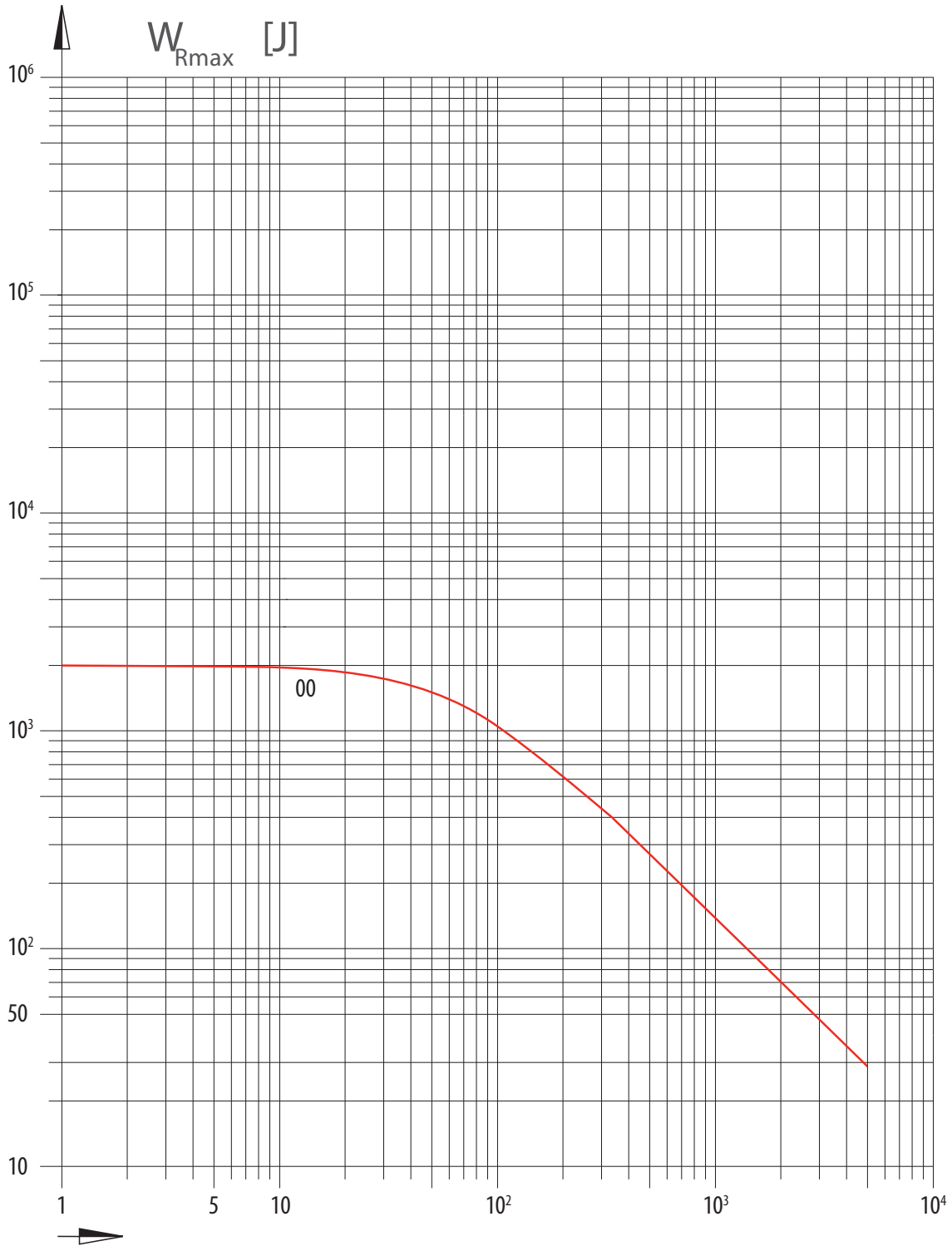


Figure 14: Friction work, operational frequency, type 08

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 COMBISTOP M Type 08“* .

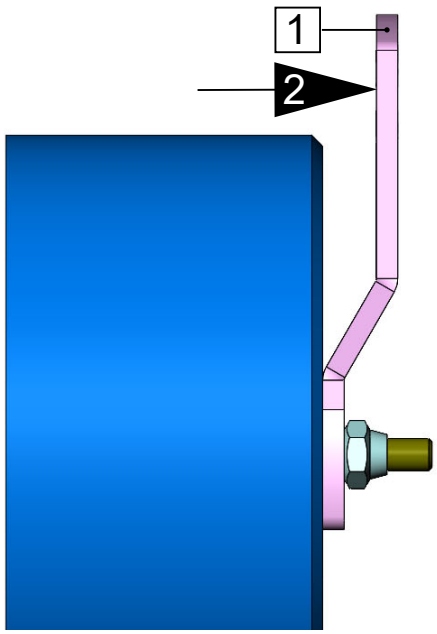
7.1 Hand release (option)

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.



Legend	
1	Lever
2	Arrow direction

Figure 15: Operation of the hand release

- ► 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.

Actuating forces hand release [N]		
Size	**N version**	**H version**
0B	—	—
00	15	22

Table 10: Actuating forces hand release

The values are subject to tolerances and depending on where the lever is used.

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.
	Solenoid coil or connecting cable defective	Replace the brake.
	Excessive heating	Insert a quick switch (e.g. KEB Powerbox).
No braking function	Damaged toothing prevents the movement of the 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 the AC side	Switch the brake on the DC side.

Table 11: Troubleshooting

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

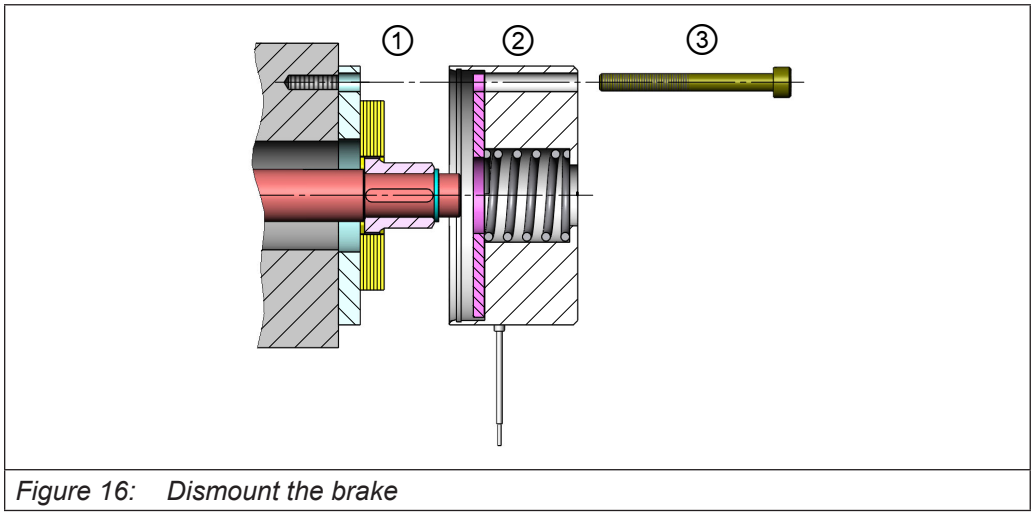


Figure 16: Dismount the brake

- ► 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 air gap

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_N
	mm	mm
0B	0.1	0.24
00	0.15	0.4

Table 12: 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 13: 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.

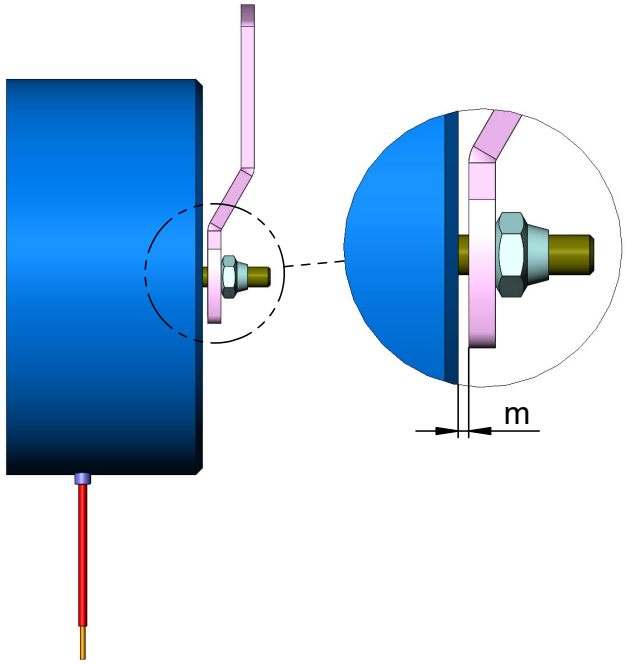


Figure 17: Adjustment dimension "m" of the hand release

10 Demontage und Entsorgung

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-Konformitätserklärung => *„11.3 Further information and documentation“*.

11.2 CSA certifikat

CSA-Zertifikat => *„11.3 Further information and documentation“*.

11.3 Further information and documentation

Additional instructions and information are available for download at
www.keb-automation.com/de/suche

General instructions
- EMC and safety instructions
- Instructions for other control boards, safety modules, fieldbus modules, etc.

Instructions for design and development
- Input fuses in accordance with UL
- Programming manual for control and power unit
- Motor configurator, for selecting the correct drive controller and for generating downloads for parameterising the drive controller

Licences and authorisations
- CE Declaration of Conformity
- TÜV certificate
- FS certification

Any other markings and approvals not listed here are, where applicable, indicated by a corresponding logo on the type plate or the device itself. The relevant supporting documents and certificates are available on our website.

Others
- COMBIVIS, the software for convenient parameterisation of drive controller via a PC (available for download)
- EPLAN drawings

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
03	2026-05	Value adjustments and editorial changes

Glossary

0V	Earth-potential-free common point
1ph	1-phase mains
3ph	3-phase mains
AC	AC current or voltage
AFE	From 07/2019 AIC replaces the previous name AFE
AFE filter	From 07/2019 AIC filter replaces the previous name AFE filter
AIC	Active Infeed Converter
AIC filter	Filter for Active Infeed Converter
Application	The application is the intended use of the KEB product
ASCL	Asynchronous sensorless closed loop
Auto motor ident.	Automatically motor identification; calibration of resistance and inductance
AWG	American wire gauge
B2B	Business-to-business
BiSS	Open source real-time interface for sensors and actuators (DIN 5008)
CAN	Fieldbus system
c.d.f.	Cyclic duration factor
CDM	Complete drive module including auxiliary equipment (control cabinet)
COMBIVERT	KEB drive controller
COMBIVIS	KEB start-up and parameterizing software
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
DI	Demineralized water, also referred to as deionized (DI) water
DIN	German Institut for standardization
DS 402	CiA DS 402 - CAN device profile for drives
ELV	Extra-low voltage
EMC filter	EMC filters are used to suppress conducted interferences in both directions between the drive controller and the mains
Emergency stop	Shutdown of a drive in emergency case (not de-energized)
Emergency switching off	Switching off the voltage supply in emergency case
EMS	Energy Management System
EN	European standard
Encoder emulation	Software-generated encoder output
End customer	The end customer is the user of the customer product
Endat	Bidirectional encoder interface of the company Heidenhain
EtherCAT	Real-time Ethernet bus system of the company Beckhoff
Ethernet	Real-time bus system - defines protocols, plugs, types of cables
FE	Functional earth
FSoE	Functional Safety over Ethernet
FU	Drive controller
GND	Reference potential, ground
GTR7	Braking transistor
HF filter	KEB specific term for an EMC filter (for description see EMC filter).
Hiperface	Bidirectional encoder interface of the company Sick-Stegmann
HMI	Human machine interface (touch screen)
HSP5	Fast, serial protocol
HTL	Incremental signal with an output voltage (up to 30V) -> TTL
IEC	IEC xxxxx stands for an international standard of the International Electrotechnical Commission
IPxx	Protection class (xx for class)
KEB product	The KEB product is subject of this manual
KTY	Silicium temperature sensor (polarized)
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
Modulation	Means in drive technology that the power semiconductors are controlled
MTTF	Mean service life to failure
NHN	Standard elevation zero; based on the specified height definition in Germany (DHHN2016). The international data generally deviate from this by only a few cm to dm, so that the specified value can be applied to the regionally applicable definition.
OC	Overcurrent
OH	Overheat
OL	Overload

OSSD	Output signal swithching device; - an output signal that is checked in regular intervals on its shutdown. (safety technology)
PDS	Power drive system incl. motor and measuring probe
PE	Protective earth
PELV	Protective Extra Low Voltage
PFD	Term used in the safety technology (EN 61508-1...7) for the size of error probability
PFH	Term used in the safety technology (EN 61508-1...7) for the size of error probability per hour
PLC	Programmable logic controller
Pt100	Temperature sensor with R0=100Ω
Pt1000	Temperature sensor with R0=1000Ω
PTC	PTC-resistor for temperature detection
PWM	Pulse width modulation
RJ45	Modular connector with 8 lines
SCL	Synchronous sensorless closed loop
SELV	Safe extra-low voltage, unearthed
SIL	The safety integrity level is a measure for quantifying the risk reduction. Term used in the safety technology (EN 61508 -1...7)
SS1	Safety function „Safe stop 1“ in accordance with IEC 61800-5-2
SSI	Synchronous serial interface for encoder
STO	Safety function „Safe Torque Off“ in accordance with IEC 61800-5-2
TTL	Logic with 5 V operating voltage
USB	Universal serial bus
VARAN	Real-time Ethernet bus system

List of Figures

Figure 1: Overview COMBISTOP M Type 08 16
Figure 2: Switching timing diagram 19
Figure 3: Dimensions COMBISTOP M Type 0B 08 without options 20
Figure 4: Dimensions COMBISTOP M Type 00 08 without options 21
Figure 5: Dimensions COMBISTOP M Type 08 with hand release and flange 22
Figure 6: Mounting the hub on the motor shaft 25
Figure 7: Distance hub to 2nd friction surface 25
Figure 8: Mounting the lining 26
Figure 9: Mounting the magnetic system 27
Figure 10: Connection for AC side switching 29
Figure 11: Connection in the terminal box for AC side switching 30
Figure 12: Connection for DC side switching 31
Figure 13: Connection for DC and AC switching 32
Figure 14: Friction work, operational frequency, type 08 34
Figure 15: Operation of the hand release 35
Figure 16: Dismount the brake 38
Figure 17: Adjustment dimension "m" of the hand release 41

List of Tables

Table 1: Type code 14
Table 2: Type code magnet and magnet system 15
Table 3: Ambient temperature 17
Table 4: Construction and degree of protection without options 17
Table 5: Construction and degree of protection with shaft sealing ring or plug 17
Table 6: Device classification 17
Table 7: Device data COMBISTOP M Type 08 18
Table 8: Preassembled connecting wires 28
Table 9: Run in of the brake 33
Table 10: Actuating forces hand release 36
Table 11: Troubleshooting 37
Table 12: Check air gap 39
Table 13: Check the function hand release 40



MORE KEB PARTNERS WORLDWIDE:

www.keb-automation.com/contact



Automation **with Drive**

www.keb-automation.com

KEB Automation KG Suedstrasse 38 D-32683 Barntrup Tel. +49 5263 401-0 E-Mail: info@keb.de